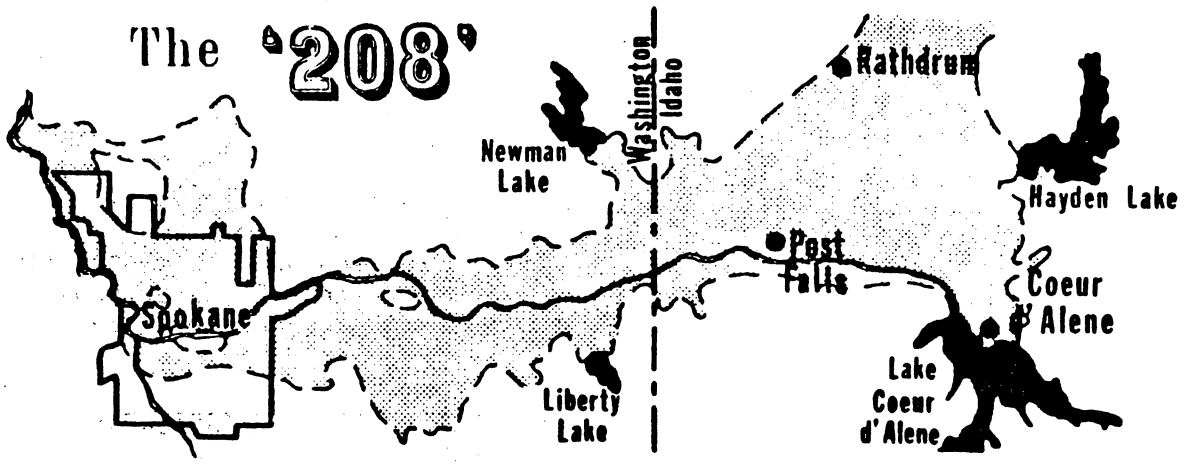
SPOKANE AQUIFER

WATER QUALITY MANAGEMENT PLAN

FINAL REPORT AND WATER QUALITY MANAGEMENT FRAMEWORK RECOMMENDATIONS FOR POLICIES AND ACTIONS TO PRESERVE THE QUALITY OF THE SPOKANE -- RATHDRUM AQUIFER

APRIL 1979

SPOKANE COUNTY, WASHINGTON '208' PROGRAM
COUNTY ENGINEERS OFFICE
NORTH 811 JEFFERSON STREET
SPOKANE, WASHINGTON 99260



Spokane Aquifer Study

N. 811 Jefferson Spokane, Washington 99260 (509) 456-3600

May 1, 1979

Spokane Regional Planning Conference
City Hall
N. 211 Wall
Spokane, WA 99201

Dear Conference Members:

Submitted herewith is the Final Report of the Water Quality Management Program (Ground Disposal) for the Spokane-Rathdrum Aquifer. This report, along with the detailed reports of the various work elements, represents completion of the program contract.

The Citizen Representatives Core committee and the Technical Advisory Committee participated in development of the recommendations contained herein and have by concensus endorsed the Plan. Your transmittal of the Plan, with a recommendation for timely implementation, to the State of Washington, Department of Ecology with a recommendation that the Plan be submitted to the Governor for adoption as part of the statewide plan for water quality management and to the various agencies listed in the Management Agency Implementation Statement section would help expedite the recommended actions for Aquifer water quality protection.

It has been a pleasure for Spokane County to work in cooperation with the Spokane Regional Planning Conference in completing this '208' study. There has been excellent cooperation of all agencies involved. Special attention must be given to the efforts of the members of the Technical

Advisory Committee and the Citizen Representatives Core committee. Without the outstanding work of these individuals, the study could not have been completed. With your continued cooperation and the cooperation of the agencies represented, the implementation of this Plan for protection of our valuable drinking water source will become a reality.

Sincerely,

Ray Card
Program Manager

Robert S. Turner
Program Director

BOARD OF COUNTY COMMISSIONERS
OF SPOKANE COUNTY, WASHINGTON

ABSTRACT

The Washington State Department of Ecology delegated the 'ground disposal' segment of its '208' comprehensive areawide water quality management program to the Spokane Regional Planning Conference. In turn, the Spokane County Engineering Department was given the responsibility for developing a Water Quality Management Plan for the Spokane-Rathdrum Aquifer which would become a basic framework for the Statewide plan for groundwater protection.

The Spokane-Rathdrum Aquifer Water Quality Management Plan was developed utilizing the advice of a Citizen Representatives Core committee and a Technical Advisory Committee by program staff. The committees, after developing an understanding of the aquifer and cause and effect relationships between aquifer water quality and the activities of man, recommend a policy of "no futher degradation" as a basic planning goal and the principle of control of potential pollutants at their source to realize the goal. Specific recommendations were developed for the control of pollutants from the following activities: gravel extraction, solid waste disposal, stormwater runoff disposal, agricultural activities, industrial activities and sanitary wastewater disposal. Recommendations for land use and wastewater management planning were developed and intergovernmental coordination and cooperation are recommended.

The Plan recommends that planning activities for the aquifer sensitive area recognize the limited capability of the aquifer to accept pollutants and retain its present quality. Since all pollutants from man's activities cannot be mitigated, the expansion of these activities, even with mitigation of pollutants from present and future sources, has an ultimate limit. The Plan contains recommendations aimed at mitigating specific threats to aquifer quality and mitigating current pollutant loads to allow additional development without increasing the total loading of pollutants on the aquifer area.

FOREWORD

This final report is an output of the Spokane County '208' Water Quality Management Program (Ground Disposal). Protection of the water quality in the Spokane-Rathdrum Aquifer in Washington is the principal objective of this program. As this program is a delegated portion of the Washington Statewide '208' Water Quality Management Program, this report is also intended as a framework document for developing water quality protection for other aquifers in Washington and for developing procedures for controlling the application of potential pollutants to the ground to protect groundwater quality.

The Spokane-Rathdrum Aquifer is of special significance since it is the sole source of water supply for the Spokane Metropolitan area and its preservation as a resource is essential to the health and welfare of Spokane area residents. This Water Quality Management Plan contains the framework for aquifer water quality preservation. The express planning goal of "no further degradation" of aquifer water quality and the earlier demonstration of the effect of ground surface activities of man on water quality are the key Plan elements. The Plan has been developed by a consortium of citizens representing all facets of activity and interest in the Spokane area, technical representatives of government agencies and the program staff and consultants. Plan implementation becomes the responsibility of governmental units serving the public interest.

This Plan was prepared in part with federal funds administered by the Environmental Protection Agency under Public Law 92-500, Section 208 and state Referendum 26 funds administered by the Washington State Department of Ecology.

ACKNOWLEDGEMENTS

The Spokane County Water Quality Management Program was funded in part by federal funds administered by the Environmental Protection Agency under Public Law 92-500 and State Referendum 26 funds administered by the Washington Department of Ecology. Project officers were Mr. Al Ewing and Mr. Myron Saikewicz from the respective agencies.

The program was conducted by the office of the Spokane County Engineer under the auspices of the Spokane Regional Planning Conference. The agreement for conduct of the program was ratified by the Spokane County Board of Commissioners.

Numerous participants in the program made significant contributions and were, in part, responsible for the final form of the Water Quality Management Plan for the Spokane-Rathdrum Aquifer. The following list of official participants is an attempt to recognize those whose time and efforts were especially valuable during the development of the plan. Many others, including citizens who participated in public meetings and workshops, provided valuable program input. The Spokane area news media, newspapers, television and radio were cooperative and helpful in delivering the '208' developments to the public and were an invaluable asset to the public information program.

LIST OF OFFICIAL PARTICIPANTS

Staff

Robert S. Turner, P.E., Program Director, County Engineer

William R. Dobratz, P.E., Assistant County Engineer

Ray Card, Program Manager

Larry A. Esvelt, Ph.D., P.E., Engineering Advisor

Stan Miller, Research

Robert J. McCann, Research

Beverly Baker, Citizen Participation Specialist

James Estep, Graphics

Staff (Continued)

John Mark Law, Graphics

Cynthia Sellards, Secretary

Janice Jones, Water Sampler

County Commissioners

Ray W. Christensen

Harry M. Larned

Jerry C. Kopet

Spokane Regional Planning Conference

Harry M. Larned, Spokane County Commissioner

Jerry C. Kopet, Spokane County Commissioner

Martha Shannon, Spokane City Council

Wayne Guthrie, Spokane City Council

Ted McCoury, County Plan Commission

Douglas L. Fullington, City Plan Commission

Mayor W. L. Clearwaters, Small Towns of County

Technical Advisory Committee (TAC)

Robert S. Turner, P.E., Chairman, Spokane County Engineer

Roger James, P.E., Director/John Bjork, P.E., City Utilities Department

E. Terry Clegg, Director/Keith Thackray, City Plan Department

Fred Dayharsh, Director/Tom Mosher, Spokane County Planning Department

Mayor W. L. Clearwaters, Chairman/Margaret Fellows, Vice Chairman, Citizen Representatives Core

Ed Pickett, R.S., Director of Environmental Health/Gene Prather, R.S., Spokane County Health District

Technical Advisory Committee (TAC) (Continued)

James Trull, P.E., Manager, Consolidated Irrigation District

Tom Justus, P.E., District Engineer, Washington Department of Social & Health Services

Jud Melton/Eugene Adreucetti, Soil Conservation Service

Larry Peterson/Jon Arnquist, P.E., Washington Department of Ecology

William R. Dobratz, P.E., Spokane County Utilities Director

Coordinating Representatives:

Jose Urcia, Director, Regional Planning Conference

Larry Belmont, Director/Jack Ross/Roy Olson, R.S., Panhandle Health District I

Citizen Representatives Core Committee (CRC)

Chairman, Mayor W. L. Clearwaters
Vice Chairman, Margaret Fellows
Second Vice Chairman, H. Allen Lewis

Chet Arnold, Board of Realtors

John Aukofer, Citizen at Large

Pansy Baker, Citizen at Large

Rich Bakes, Spokane Chamber of Commerce

Bradley Bale, M.D., Spokane Medical Society

Dick Barrett, City Plan Commission

Bruce Blackmer, American Institute of Architects

Ellwood Carlson, Home Builders Association

John Chervenell, Transportation

W. L. Clearwaters, Mayor, City of Millwood

Vern Connerly, Citizen at Large

Tony Danelo, Water Purveyors

Leslie Dill, Sand and Gravel Extractors

Patrick Downey, Citizen at Large

Citizen Representatives Core Committee (CRC)

Wick Dufford, Legal Profession

Jim L. Ellis, Washington Society of Professional Engineers

Karl B. Emery, Intermountain Grass Growers Association

Stan Fahlgren, Citizen at Large

Margaret Fellows, League of Women Voters

Gerald Greeley, International Union of Operating Engineers, Local 370

Morey Haggin, Audubon Society

Marion Hay, Industry

Fred Hobbs, Sand and Gravel Extractors

Phyllis Lamb, Citizen at Large

Dr. Bruce Lang, Education

John Leopard, Washington Environmental Council

H. Allen Lewis, Citizen at Large

Ted McCoury, Comprehensive Plan Co-ordinating Committee

Dr. Edwin Olson, Education

Don Pedersen, Spokane Valley Chamber of Commerce

Clarence Pence, Spokane County Health District

Robert Price, Quality of Life Council

Grace Rawlings, Citizen at Large

Hazel Richard, Citizen at Large

Lonnie Roe, Industry

Francis J. Schadegg, Citizen at Large

Dr. Ray Soltero, Education

Eldon Thomas, Spokane County Planning Commission

Jean Wall, American Association of University Women

Consultants and Contractors

Washington State University - Pullman, Washington

Idaho Department of Health & Welfare - Coeur d'Alene, Idaho

URS Company - Spokane and Seattle, Washington

Battelle Northwest Laboratories - Richland, Washington

Haworth & Anderson, Inc. - Spokane, Washington

K. C. Kane, Inc. - Colville, Washington

Spokane County Health District - Spokane, Washington

U. S. Geological Survey - Tacoma, Washington

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INTRODUCTION

SECTION I. INTRODUCTION

This report represents finalization of the study phase of the Water Quality Management Program for Spokane County. The report has been written in general terms. Technical reports of a more detailed and technical nature are to be made available and discussed below.

The preparation of this report and all reports, data and information collected or prepared during the course of the study was funded in part by the Federal Environmental Protection Agency, State of Washington Department of Ecology and Spokane County. Contributed services, although not a part of the matching funds for the program, came from virtually every Federal, State, and local agency involved in water quality.

The Water Quality Management Program was authorized under a contract with the Department of Ecology (DOE), who delegated the work to Spokane County, as a part of the DOE's Statewide '208' planning requirements. Spokane County undertook the study of the Spokane Aquifer as lead agency on behalf of the Spokane Regional Planning Conference.

Program Outputs

In addition to this final report which summarizes program findings, issues, policies and recommendations, a number of other documents are available or were distributed for public consumption during the course of this program.

Cause and Effect Report

This report was compiled primarily by Dr. Larry Esvelt, Special Engineering Advisor to the study. The report interpreted the water quality test results, suggested patterns and trends of aquifer water quality and identified categories of potential threats to the quality of the aquifer.

Water Quality Policies Brochure

Approximately 3,000 brochures were printed and distributed to the public so that they might gain a better understanding of the issues involved and the recommended policies adopted by the technical and citizen's advisory committees.

Project Document File

Three copies of all accumulated material will be on file in the County Engineers Office for anyone seeking unpublished preliminary material.

It will also serve as evidence of satisfactory completion of all required work items.

Technical Appendix

All of the material collected or generated during the development of the study was screened for inclusion in a Technical Appendix. Only that technical material which is complete and directly pertinent to the final recommendations are included in the Technical Appendix.

Public Involvement Appendix

One of the strong points of the study has been an extensive program for public participation. The program developed communication concerning the study between all the various elements of the community having an interest--the public, the technicians and the decision makers. This included a wide range of exposure: news releases, interviews, meetings with community groups, reports, newsletters, advisory group meetings, and public workshops.

A Technical Advisory Committee (TAC) and a Citizen Representatives Core committee (CRC) were the direct advisors to the project staff. Members are listed in this report. These committees met regularly and were active in the development of all Recommended Policies and Actions. They, after communication with their constituencies, endorsed the Water Quality Management Plan as presented in this document.

REVIEW OF THE STUDY

What is the '208' Study about? What is being done? What is it intended to accomplish? As more people in the community were contacted and became involved in the study, these kinds of questions continue to be asked. Even those involved in the study needed to re-answer these questions occasionally to make sure the study was on the right track. Having answers to these questions allowed us to gauge our progress to date and to understand how our current activities fit into the overall plan of the study.

At its inception the study was broken into the following steps or phases:

1. Collection of Information and Background Data
   This included a review of previous studies, collection of data on land use and population growth, and one full year of testing of water samples from over 150 wells and surface water monitoring points.

2. Analysis of Data
   This phase involved review of all information collected, determination of the present water quality of the aquifer and identification of possible trends or changes in groundwater quality.

3. Identification of Potential Threats
This phase of the study involved identifying activities that pose potential threats to the aquifer and a determination of how significant these threats may be to future groundwater quality. (The Cause and Effect Report summarized phases two and three of the study, presented the findings, and was the basis for Recommended Policies and Actions.)

4. Develop Alternatives
This phase involved developing for each identified problem a number of ways to either eliminate the problem or to mitigate the threats to ground water quality. (A "Issues and Alternatives" paper was used as a working document for this phase.)

5. Selection of Preferred Alternatives
This involved reviewing the effectiveness and practicality of the various suggested solutions in order to select a preferred method of dealing with each identified problem. (The Water Quality Policies Brochure was widely distributed and used in this phase.)

6. Acceptance and Implementation
These phases involve the acceptance by the community of the proposed methods for protecting the groundwater quality and recommending actions for implementation by decision makers.

FINAL REPORT FORMAT

This final report contains six Sections. The Introduction is in this Section. Section II contains a background discussion of physical aquifer attributes and previous studies of the aquifer. Section III describes the water quality testing program and contains a synopsis of the Cause and Effect Report relating the aquifer water quality to its uses and man's activities on the ground surface above the aquifer. Section IV contains a popular language summary of the Water Quality Management Plan. The Plan is presented in Section V in detailed form with each Recommended Policy and Recommended Action coded for ease of assigning implementation responsibility and coordination of the implementation effort. Section VI contains the master Management Agency Implementation Statement. This form shows the lead and cooperating agencies responsible for implementation of each recommendation included in the Plan. Copies of the signed statements from each agency are added to a limited number of copies of this report for distribution to appropriate regulatory and funding agencies.

IMPLEMENTATION

The Water Quality Management Plan for the Spokane-Rathdrum Aquifer in Washington presented in this report has been developed through years of diligent effort on the part of the '208' staff, its consultants and the Technical Advisory Committee (TAC) and Citizen Representatives Core committee (CRC). The public has been kept informed throughout the program and has

provided feedback through the Citizen Representatives Core committee. The Plan reflects the public's desires regarding this invaluable resource to the maximum degree attainable within the finances available. It is the responsibility of all agencies representing the public interest to see that this Plan is implemented for protection of our water supply while providing for orderly development of the community. It remains the public charge to inform their decision making representatives that this Plan should be implemented in a timely manner. Their persistence and sincerity may be the key to aquifer water quality protection.

SECTION II

BACKGROUND

SECTION II. BACKGROUND

The Spokane Valley-Rathdrum Prairie Aquifer lies in eastern Washington and norther Idaho and extends from Lake Pend Oreille through the Spokane Valley and exits as springs near the Little Spokane River as shown on Figure 1 and the insert regional map on Figure 2. The aquifer covers about 350 square miles and supplies water for about 340,000 people. Rapid urbanization is taking place over the aquifer and much of the development outside the City of Spokane is unsewered as well as some areas within. In addition to sanitary sewage and stormwater, other wastes are applied to the ground above the aquifer. Agencies in Idaho and Washington are developing management programs and cooperating to protect the aquifer for continued use as a drinking water supply.

GEOLOGY

According to the U.S. Geological Survey report to the EPA documenting the aquifer's role as a "sole source" water supply for the Spokane-Coeur d'Alene area[1], the aquifer is composed predominantly of glacio-fluvial deposits. The deposits consist mostly of poorly to moderately sorted sands and gravels with some beds of cobbles and boulders and a few scattered clay lenses. The sand and gravel is relatively free of fine sand and silt except in the uppermost 3 to 5 feet and at various depths at locations in the Hillyard Trough.

The aquifer thickness is not well established. Seismic surveys were made near the Idaho State Line and north of Spokane in the "Hillyard Trough". They indicated an unconsolidated thickness at the State Line of about 400 feet and about 780 feet in the Hillyard Trough. The unsaturated material above the aquifer at the State Line is about 120 feet leaving 280 feet of saturated thickness. At the Hillyard Trough, test hole data and the seismic survey were used to conclude that there is 150 feet of unsaturated material above the aquifer, about 160 feet of saturated granular materials and a clay-like low permeability formation lying below the 310 foot depth.

AQUIFER FLOW

Because of the relatively clean sand and gravel composition of the aquifer, its permeability is very high. The high permeability of the aquifer materials, the aquifer depth, and the hydraulic gradient result in calculated velocities in the aquifer of 64 to 90 feet per day at the State Line and 41 to 47 feet per day in the Hillyard Trough[1,2]. These rates are very high compared to a normal aquifer range of 5 feet per year to 5 feet per day[3]. Total flow of water at the State Line and in the Hillyard Trough was estimated at 960 and 350 cubic feet per second respectively[1].

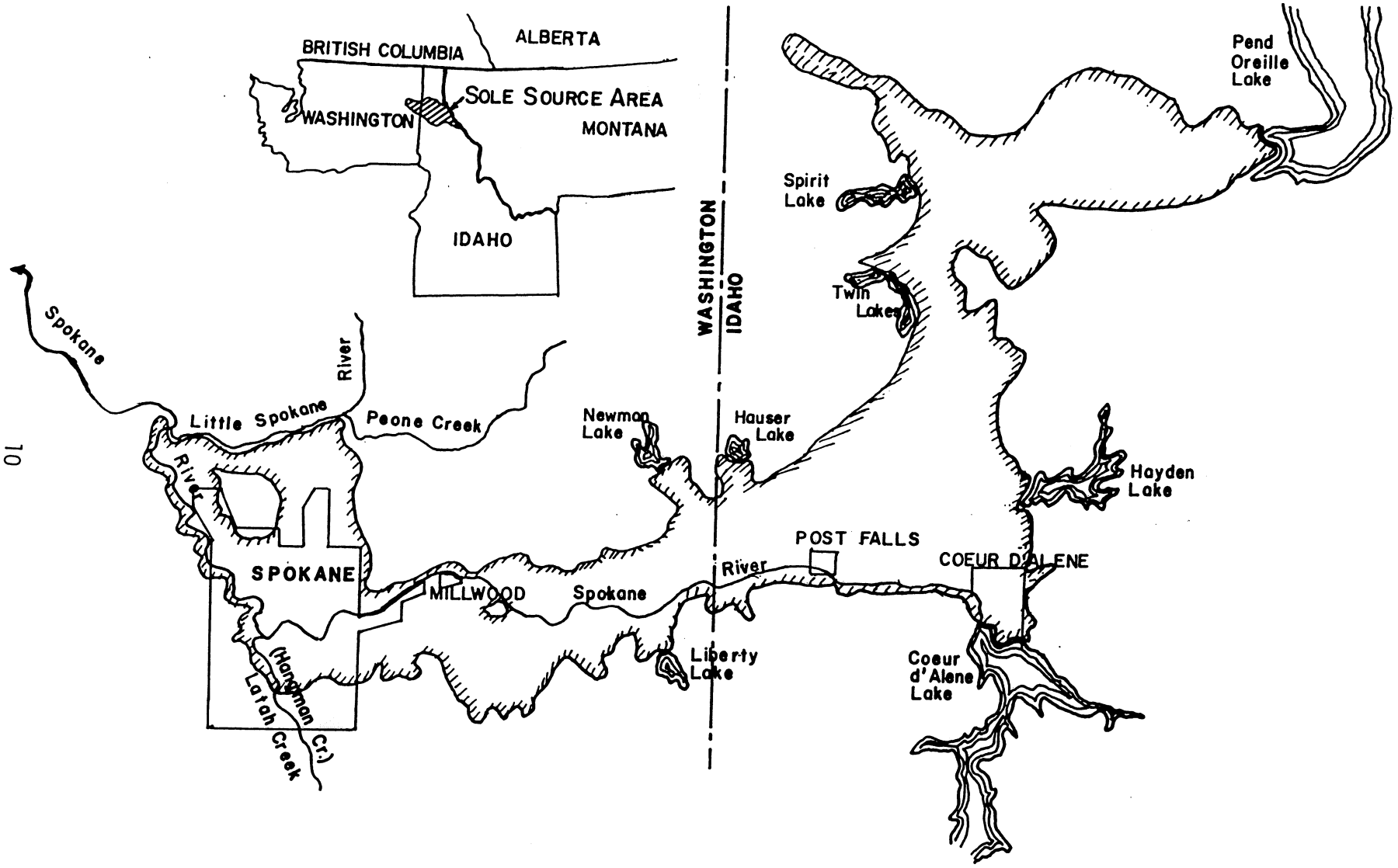
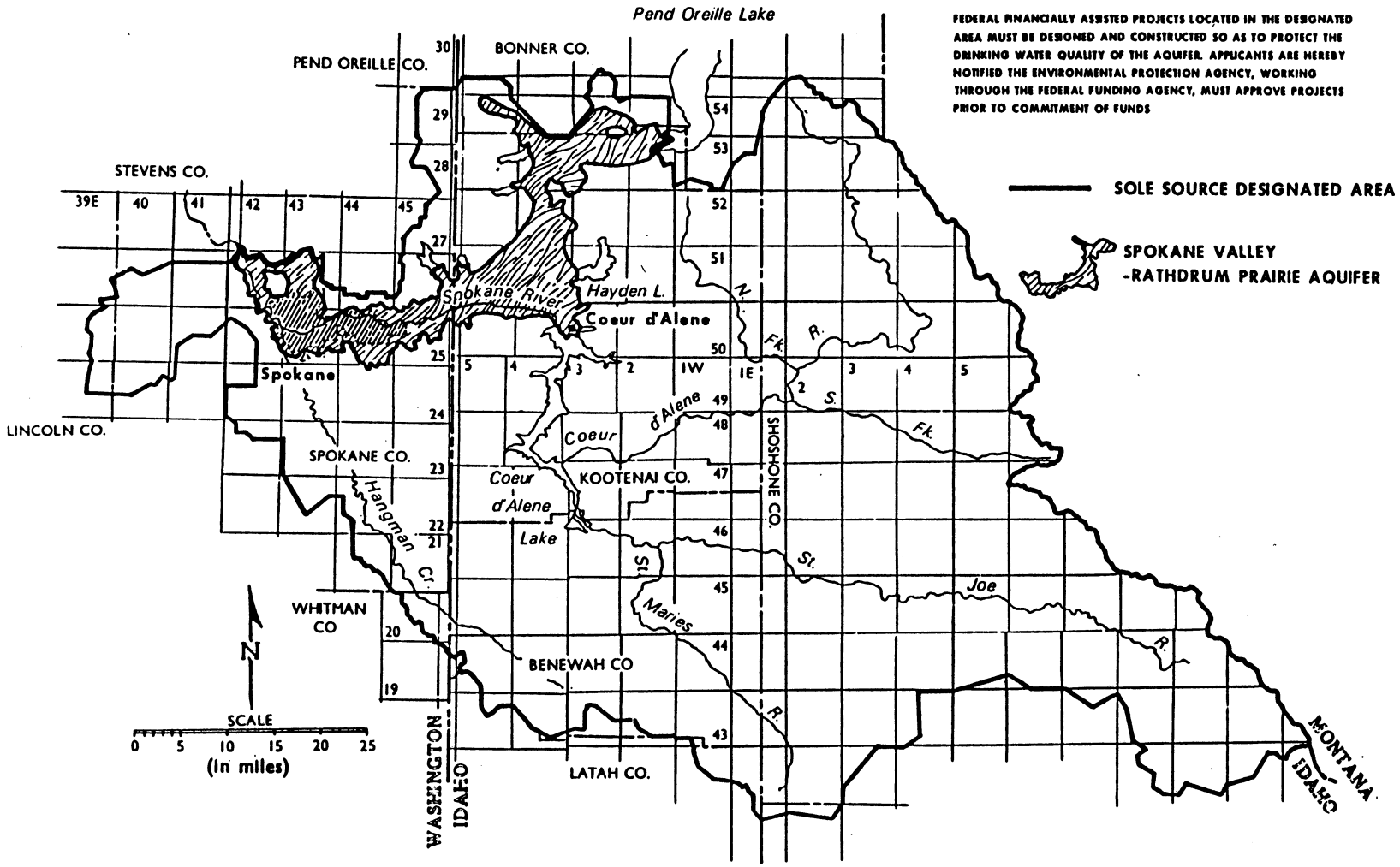


Figure 1. Spokane-Rathdrum Aquifer in Washington and Idaho.



EPA

Figure 2. Spokane-Rathdrum Aquifer sole-source recharge area and stream flow source zone drainage area boundary.

The Spokane-Rathdrum Aquifer was designated as a "Sole Source" of water supply for the Spokane - Coeur d'Alene area by the EPA in 1978. This designation under Public Law 93-523, the 1974 Federal "Safe Drinking Water Act", established a boundary within which activities could affect the aquifer water quality (see Figure 2). It also provided for EPA review of all federally financially assisted projects within that area to assure that those projects would not degrade the water quality or jeopardize its useability as a drinking water supply. The USGS "Sole Source" report[1] estimated the annual average flow contribution and outflow from the aquifer as shown on Figure 3 for Washington. The figure shows recharge to the aquifer from the river in the eastern Spokane Valley where the river elevation is above the water surface elevation in the aquifer. Downstream (west) on the river, Figure 3 shows aquifer discharge to the river. The Spokane County Water Quality Management Program Cause and Effect Report showed evidence of aquifer-river interchange downstream from the recharge section shown in Figure 3 to Spokane Falls in the City of Spokane. The Corps of Engineers estimated withdrawals from the aquifer in Washington in 1976 to average 180 cfs, with a peak irrigation season withdrawal rate of about 300 cfs. They projected a 50 percent increase by the year 2020.

The U. S. Geological Survey has been charged with the responsibility of developing a flow and quality model for the Spokane-Rathdrum Aquifer in Washington. Preliminary information indicates that they may revise their aquifer flow estimates to about one-half the rate shown in the Sole Source Report. This indicates that withdrawals in Washington are approaching 50 percent of the aquifer flow at the Idaho State Line. Due to the interchange between the Spokane River and the aquifer, there is little concern for depleting the water supply source, but flow patterns within the aquifer may be altered reducing its capability to maintain the current level of water quality.

The Spokane County '208' Program conducted a one-year monitoring program of water quality in the aquifer and concurrently monitored water surface fluctuations at several wells. The '208' well locations are shown on Plate 4. The water surface elevation fluctuations in those wells and at two locations on the Spokane River are shown on Figure 4. The groundwater and river water surface elevations appear to correlate and may be interdependent.

An impervious dike apparently runs from the Spokane Falls area to Five Mile Prairie which diverts the aquifer northward through the Hillyard Trough to the outlet springs along the Little Spokane River (see Plate 1)[1]. The Cause and Effect Report indicated that water quality data showed very low flow rates in the aquifer along the Spokane River northwest of Spokane and that the aquifer is probably not continuous across the dike[4].

WATER QUALITY

Concern for water quality in the Spokane-Rathdrum Aquifer was expressed as early as the 1950's. It is virtually the sole source of water supply for domestic use in the Spokane metropolitan area. Its quality is of

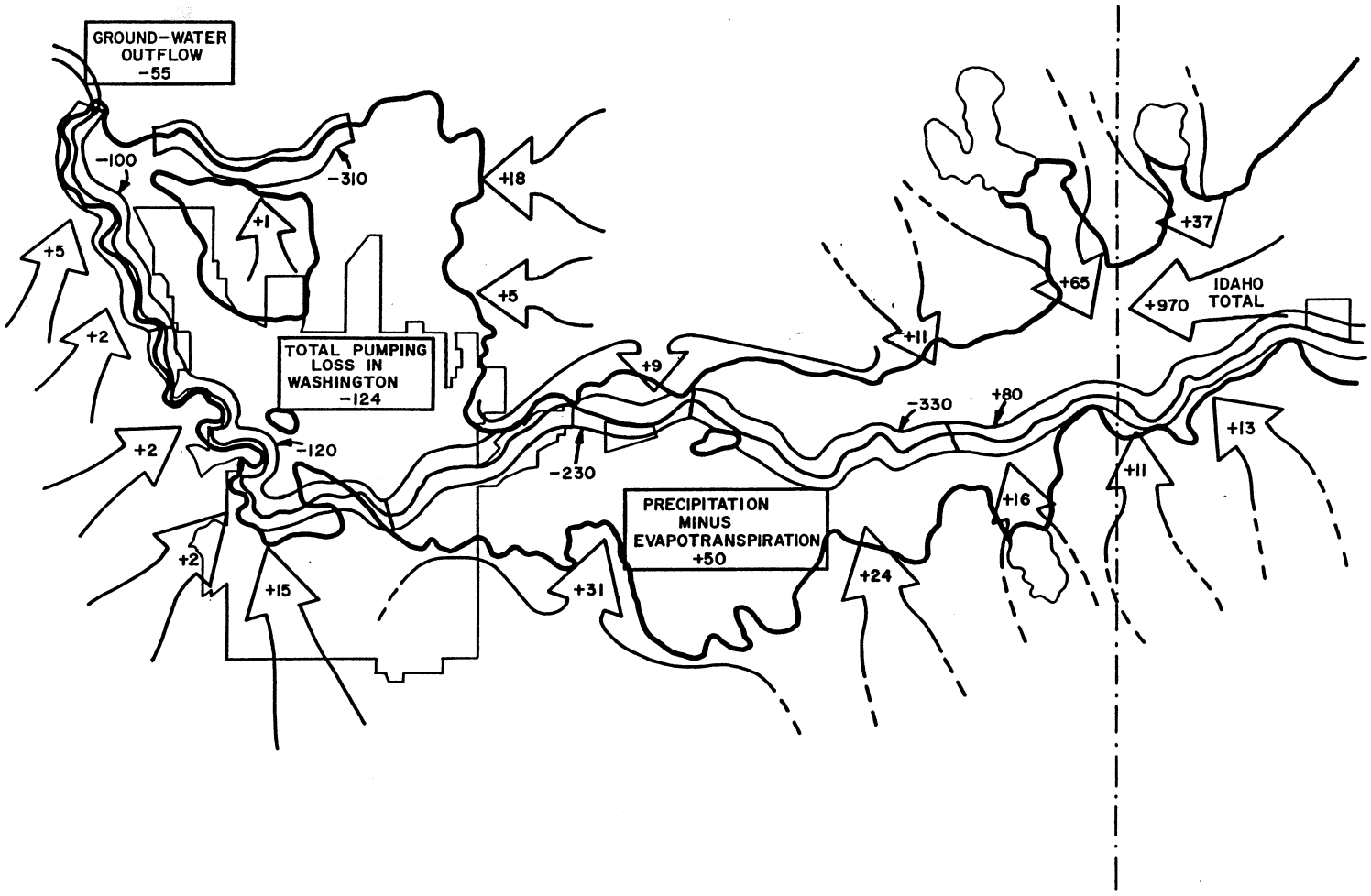


Figure 3. Average Net in and out flow of water in Spokane-Rathdrum Aquifer-Washington Portion. Flows in cfs, + is Net addition to Aquifer, - is Net Removal from Aquifer. Source: U.S.G.S. Report to EPA for Sole Source Designation of Spokane-Rathdrum Aquifer[1].

on a monthly basis for the study period (1976-1978). The amount of moisture available to fill soil moisture storage or percolate to groundwater can be estimated by finding the difference between actual evapotranspiration and percipitation. The average net moiture available for the years shown is about 6 inches. Most of this accumlates during the months of December, January and February.

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SECTION III

WATER QUALITY MONITORING

SECTION III. WATER QUALITY MONITORING

The Spokane County Water Quality Management Program (Ground Disposal) was assigned the responsibility of developing water quality management procedures for the Spokane-Rathdrum Aquifer in the State of Washington. This responsibility was delegated to Spokane County by the Washington State Department of Ecology under the '208' Statewide Water Quality Management Program.

The Water Quality Management Program ('208' Program) included a one year study of the aquifer to determine whether groundwater quality was being altered as it flows through the area and if so, the extent and causes for the alteration. The '208' aquifer monitoring program was also designed to determine if surface "recharge" is occurring to carry ground surface pollutants to the aquifer, and if so, the effect of such a phenomenon.

SAMPLING PROGRAM

Water quality monitoring was initiated in May 1977 and continued into June, 1978. Samples were collected from about 80 locations, 20 of which were specially constructed depth selective sampling wells as shown on Plate 4. The remainder were water purveyor owned wells and privately owned wells distributed over the aquifer area. A total of about 1400 samples were collected and some 21,000 individual tests were run.

Field analyses for termperature, pH, conductivity, hardness, chlorides and nitrate nitrogen were conducted by the '208' sampling crew. The Idaho Health and Welfare laboratories in Coeur d'Alene and Boise performed analyses for conductivity, chlorides, hardness, total dissolved solids, alkalinity, cations and heavy metals, and did bacteriological and pesticide testing. The Washington State University Environmental Engineering Department laboratory conducted analyses for nitrite, nitrate, ammonia, and total nitrogen, phosphate, sulfate, detergents and organic carbon.

Depth selective samples were collected from wells constructed with 6 inch perforated casing to accept a sampler designed to seal off the casing above and below a submersible sample pump as shown on Figure 7. Four to six samples were collected at measured depths below the water surface. Samples from purveyor and private wells were collected from taps at the well pump head. Sampling was conducted at approximately monthly intervals over the one year monitoring period.

The water quality monitoring results also showed that river water enters the aquifer in the Upriver Dam area and that, at least seasonally, river water enters the aquifer upstream of the Upriver Dam impoundment and between the Upriver Dam and Spokane Falls[4].

WATER QUALITY VARIATIONS WITH DEPTH

Variations in water quality with depth below the aquifer surface was tested in the wells shown on Plate 4. In all but three depth selectively sampled wells, chloride, nitrate-nitrogen and total dissolved solids concentrations were statistically significantly higher in samples taken near the aquifer water surface than in samples taken from deeper in the aquifer. Those three were: 1) the Riverside Park well which showed variations, but no consistent trend and appeared stagnant; 2) the '208' WWP well which did not show a significant variation in water quality with depth; and 3) the '208' CPM well which also didn't show a significant variation in water quality with depth. The '208' WWP well was immediately downstream of the Upriver Dam and showed evidence of river influence on the water quality. The '208' CPM well was immediately downstream of a gravel extraction penetration 50 feet or more into the aquifer which apparently was vertically mixed to some degree.

The higher concentrations of salts near the aquifer surface at the numerous sampling sites was interpreted to confirm that constituents from the ground surface over the aquifer or on adjacent side slopes are carried to the aquifer by percolating moisture. This confirms Dr. Todd's postulation that moisture recharge from the surface should occur[6].

WATER QUALITY VARIATIONS WITH TIME AND BY SPECIFIC AREA

The water quality variation with depth in the Balfour Park well (see Plate 4) showed a consistent and significant gradation from higher salt concentrations near the water surface to lower concentrations deeper into the aquifer but the surface concentration varied during the year of '208' sampling. The adjacent south Opportunity area (see Plate 6) water quality variations were mapped and shown to have the highest concentration of tracer salts beneath the urbanized area away from the interface between the aquifer and the adjacent side hill and also out of the apparent aquifer main stream. Dilution appeared to be low enough to allow the salts to accumulate to higher concentrations. Figure 8 shows the water quality in May 1978 and the location of wells sampled to determine the salt concentration pattern. The quality was similar in May 1977, but in October 1977, the zone of highest concentration shifted northward which coincided with the seasonal changes in the Balfour Park water quality variations with depth. Apparently, the seasonal fluctuation in water surface level in the aquifer (see Figure 4) allows the water mass in this area to shift northward in the fall and winter months during low water, and high water forces it back southward during the spring and summer. If the aquifer flow rate fluctuates seasonally too, it may result in higher velocities in the northern part of this area for a portion of the year.

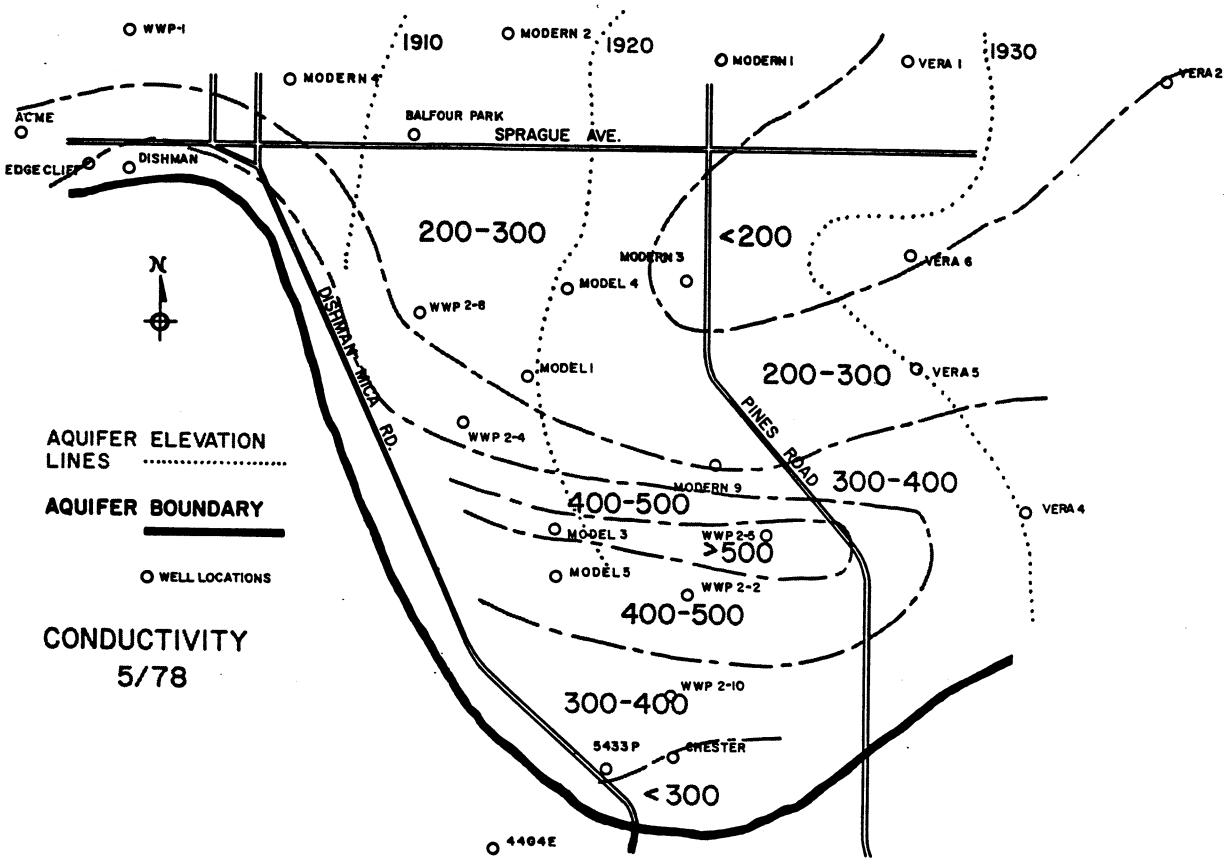


Figure 8. Aquifer water quality South Peripheral Area-Conductivity, May 1978.

The historical water quality for the aquifer was re-examined on an area by area basis[4]. Figure 9 shows historical conductivity and hardness values for wells in the south peripheral area. Three of the wells are shown on Figure 8. The Spokane Ray well is near the east Spokane city limits near the south edge of the aquifer. There appears to be a definite increase in the conductivity of water in this area over the period of record. Hardness has increased only moderately, if at all. The population of the south Opportunity area (south of Sprague) increased from about 10,000 persons in 1960 to about 20,000 in 1976. This historical conductivity increase approximately correlates with population growth. Even in the central aquifer area conductivity has increased in the past decades as shown on Figure 10 for wells in the Upriver Dam (Parkwater) area.

The water quality in some areas apparently shows the specific effect of ground surface activities. Figures 11 and 12 show that changes in water quality in a well downstream of a land disposal site for aluminum recovery tailings (Kaiser East Gate) occurred with the onset of precipitation in two different years. The water quality in wells upstream of the site (Industrial Park, (I.P.) wells) did not respond similarly. These wells are in the Trentwood area where the central aquifer flow rate is greatest. Precipitation in both years started in December following a very dry summer and fall. The aluminum recovery tailings disposal site has been abandoned and covered since the early 1960's. A similar site in the north Spokane area abandoned since the 1950's caused higher chlorides in a downstream well than other area wells. Aluminum reduction plant pot linings disposal in a ground surface disposal area in the Hillyard Trough-Mead area has been recently discovered to impart cyanide residuals to aquifer waters downstream of the site.

The rapid change in water quality after the onset of precipitation as shown in Figures 11 and 12 when considered with changes which occurred after precipitation began in the Whitworth Test well (dilution) and the '208' Idaho CID well (increase 3 months later) indicate a rapid travel time for percolate through the alluvium overlying the aquifer.

A private well in the proximity of an abandoned solid waste disposal site near the edge of the aquifer near Greenacres had water quality quite different from other aquifer sampling points with conductivity above 1000 micro mhos per centimeter compared to 200 to 300 for other wells in the area. Several wells near an active landfill and an abandoned and an active sewage lagoon northwest of Spokane were sampled. Water quality in the area had a decreasing gradient away from the disposal sites in both a northwest and southeasterly direction. No samples were taken northeast or southwest of that line of sampling wells. Chloride and nitrate nitrogen concentrations graduated away from the same point with the highest concentration at 12 to 15 and 3 to 4 milligrams per liter respectively to less than 5 and less than 2 milligrams per liter. No historical data is available from the area for comparison.

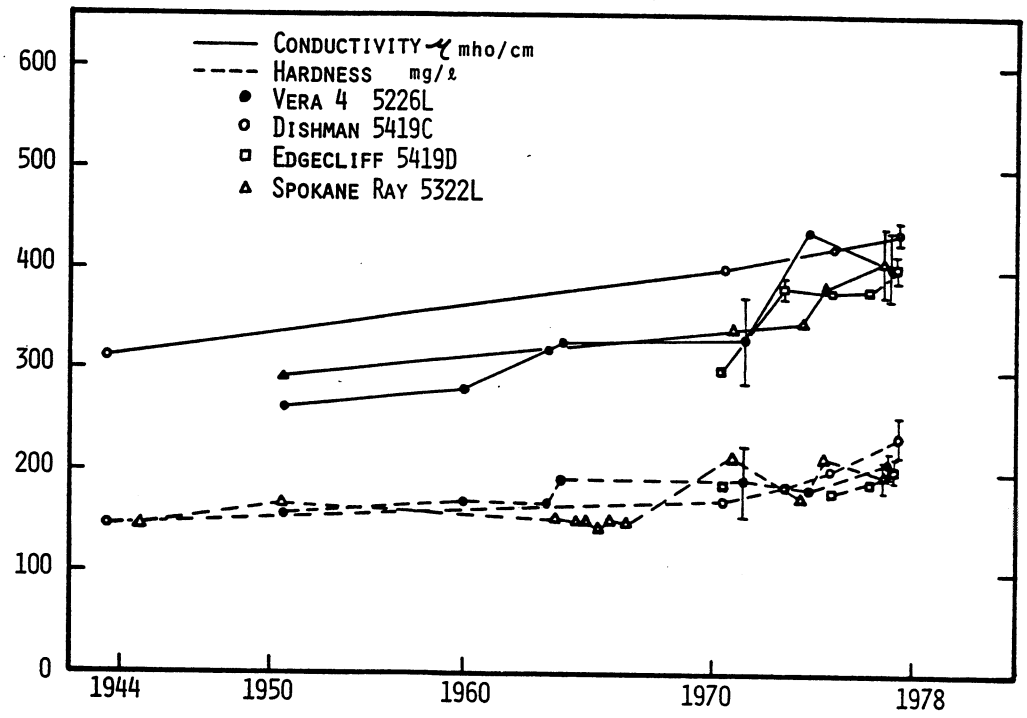


Figure 9. Historical water quality South Aquifer Peripheral Area.

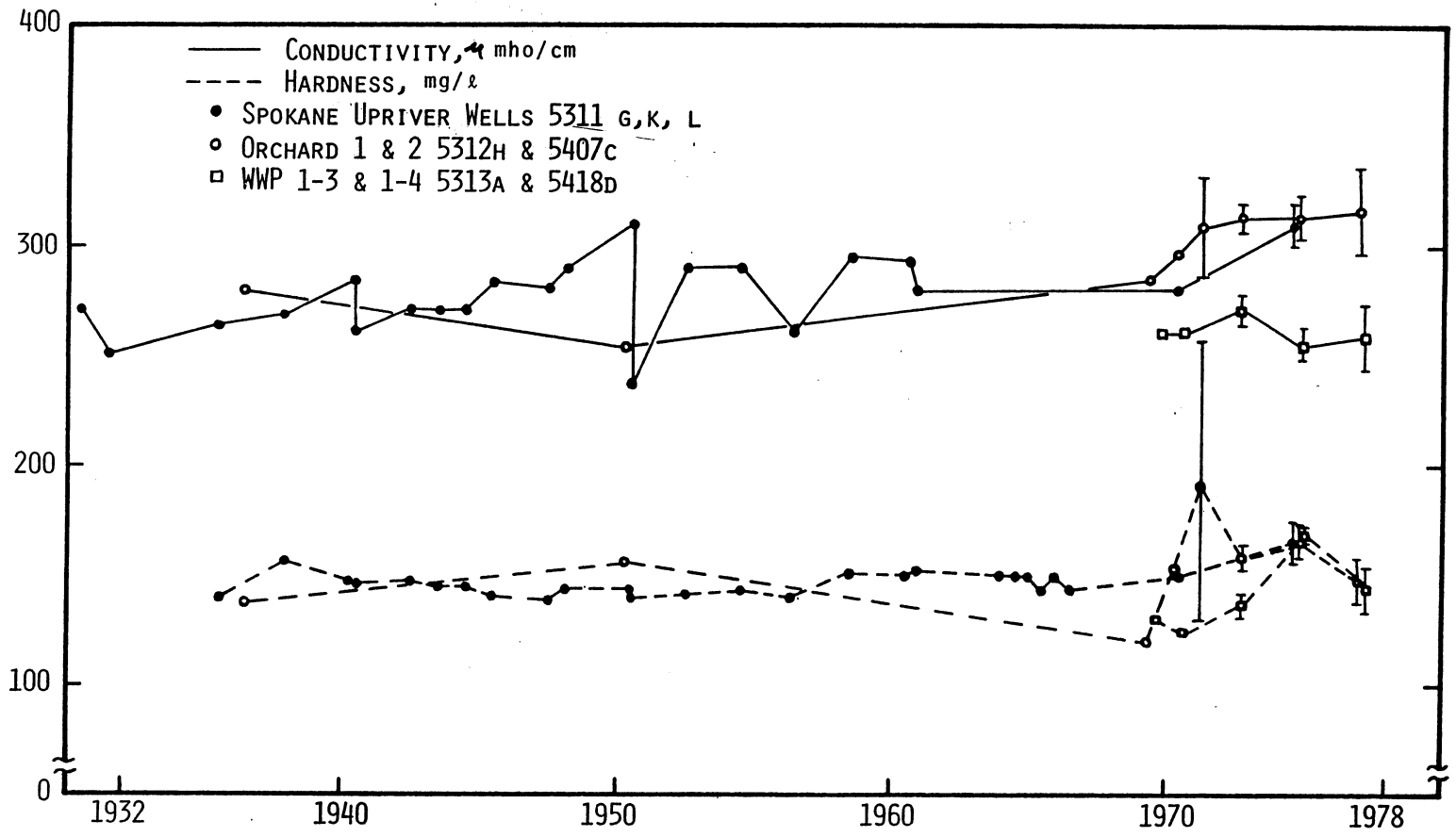


Figure 10. Historical water quality Central Aquifer Area at Dishman/Parkwater.

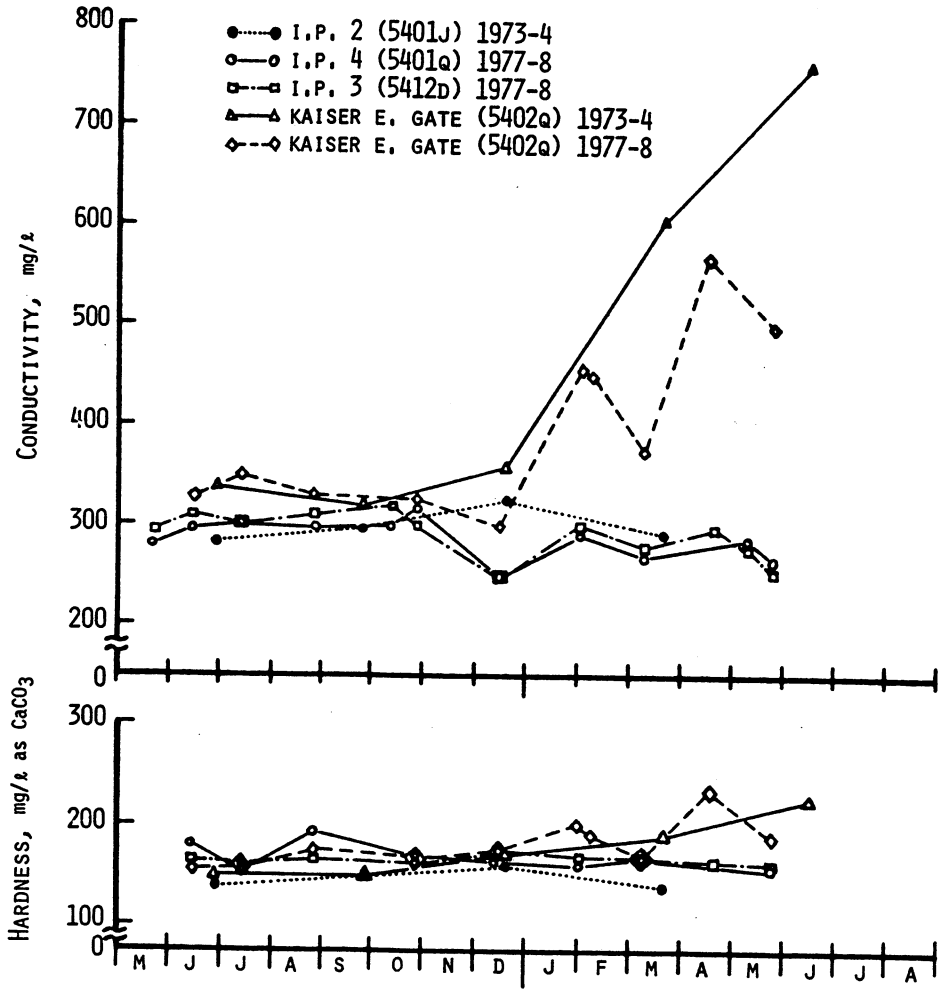


Figure 11. Water quality variations at Industrial Park and Kaiser Trentwood wells-Conductivity and hardness.

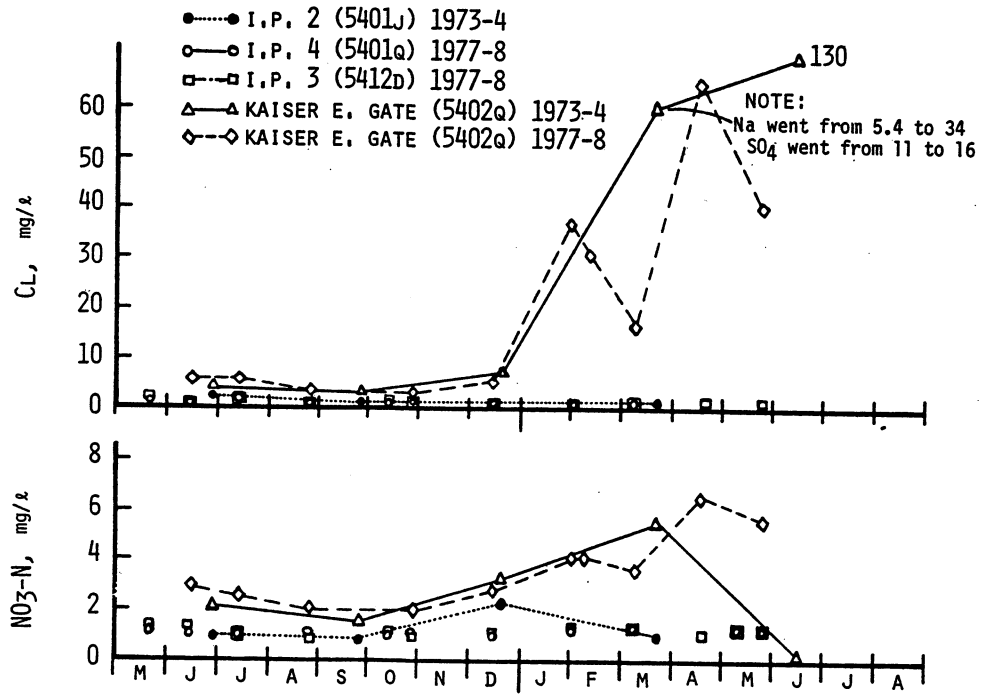


Figure 12. Water quality variations at Industrial Park and Kaiser Trentwood wells-Chlorides and nitrate.

BACTERIOLOGICAL WATER QUALITY

Samples from 44 water supply wells were collected during the study for membrane filter bacteriological analysis for coliform and fecal coliform organisms. One well, Edgecliff, near the south periphery (see Plate 4) had positive coliform and fecal coliform results in April and May 1978 after being negative in July 1977 and February 1978. The Health District had the well removed from service.

The remainder of the water supply wells (except Edgecliff and none of the depth selective sample wells) distributed over the aquifer area showed 10 positive coliform tests out of 117 samples and no positive fecal coliform tests. All positive results were confirmed to be coliform by standard procedures.

The positive coliform tests were widespread over the aquifer. If it could be assumed that all samples were taken from a single supply (the aquifer), positive samples would then be obtained according to a probability distribution and the probability would be related to the actual density of organisms in the supply. With standard statistical procedures, a probability of achieving a particular number of positive responses out of a given number of tests can be calculated for a range of organism densities and plotted. Figure 13 shows the probability of getting 10 positives in 117 samples of 100 milligrams per liter ('208' results) versus number of organisms in each 100 milligrams per liter (the density of organisms) of sample source. Also on Figure 13 are plots of the data collected by the Panhandle Health District (PHD) during their '208' studies in Idaho[7] and results of samples obtained from wells by the Spokane County Health District (SCHD) during the period from May 1977 to June 1978. The most probable number (MPN) or organisms in the sample source is the density where the maximum probability of achieving the particular results is obtained. Figure 13 shows no significant difference between the most probable density of coliform organisms from the three data sources.

The drinking water regulations call for the coliform density by MPN to be one per 100 milligrams per liter or less. The MPN of aquifer water based on the incidence of positive coliform results found during this and comparable studies (PHD, SCHD) is about one-tenth of the maximum drinking water contaminant level (MCL).

There was a positively established concentration of total aerobic organisms (total plate count) at all aquifer sampling points analyzed for total plate count. Aquifer dissolved oxygen was adequate for their survival at about 8 milligrams per liter. The log mean concentration was over 600 per 100 milligrams per liter and nearly 60 percent equaled or exceeded 500 per 100 milligrams per liter. The only known source of these organisms is from the ground surface which confirms the aquifer vulnerability to contamination as shown above based on chemical data. It also implies rather rapid transport of water from the ground surface to the aquifer (for organisms to survive), in the range of weeks. The studies by Crosby et. al.[5] showed coliform penetration to 26 feet or more and these study results confirm the validity of the Crosby results.

Generally stated, the report concluded that documentation of the link of water quality response to ground surface activities was adequate to justify regulatory implementation of a Water Quality Management Plan incorporating controls on land surface activities and source control of potential pollutants. More specifically, the report concluded the following:

1. The groundwater quality of the Spokane-Rathdrum Aquifer is currently suitable for domestic, municipal, commercial, agricultural and industrial use.

2. The glacial outwash deposited alluvium overlying the aquifer is extremely permeable making the aquifer susceptible to contamination by certain types of substances spilled or placed on the ground or in the immediate drainage area.

3. There is percolation (or recharge) of water from the ground surface to the aquifer. Water from precipitation, irrigation, waste disposal and runoff all contribute to recharge and transport constituents from at or near the ground surface to the aquifer. The addition of constituents from these sources results in the variation in groundwater quality with depth and an increase in the concentrations along the aquifer.

4. Travel time for pollutants through the alluvium overlying the aquifer is comparatively fast (i.e., weeks) considering the depth of the water table below ground surface, although it undoubtedly varies with moisture availability, soil type, quantity and distribution of the pollutant and the nature of the constituent.

5. Low flow rates near the aquifer periphery result in a greater accumulation and higher concentration of dissolved solids and other constituents than in higher flows in the aquifer main stem (nearest the center).

6. Industrial development and activities over the aquifer have resulted in water quality deterioration. Future unregulated industrial and related activities could further jeopardize aquifer water quality.

7. Solid waste disposal activities over the aquifer have caused groundwater quality deterioration.

8. A substantial portion of aquifer dissolved solids increase has resulted from man's activities over and adjacent to the aquifer. Increase in these activities accompanying population growth (urbanization) over the aquifer and on lands tributary will result in increasing deterioration of aquifer water quality.

9. There is a risk of bacteriological degradation of the aquifer which accompanies current and future development over and adjacent to the aquifer. The risk of contamination will increase with additional population growth.

10. The risk of serious contamination of the aquifer by hazardous or toxic substances, including pathogens, appears to be the same in the central portion of the aquifer and in the aquifer peripheral areas. Dilution is greater in the central portion of the aquifer but greater permeability of the overlying alluvium would transport hazardous substances to the groundwater more rapidly than through finer soils near the periphery.

11. Agricultural practices were not shown to directly affect water quality as much as man's activities in more urbanized settings but mismanagement of wastes, fertilizer or chemical applications, materials storage and other activities has the same potential for ground water contamination as if the activities were of urban origin.

12. Gravel mining and extraction, as currently practiced, is apparently not degrading water quality, but such activities do increase the susceptibility to contamination by improving accessibility to the aquifer.

13. Surface waters enter the aquifer from the Spokane River in two major reaches, from the State Line downstream to Greenacres and in the vicinity of Upriver Dam. There is also interchange in reaches where the net flow is from the aquifer to the river. Surface waters from many tributary drainage basins also enter the aquifer (e.g., Newman Lake, Liberty Lake, Plouf Creek).

14. Groundwater along the Spokane River valley where it runs northerly, west and northwest of Spokane may not be a continuous part of the Spokane-Rathdrum Aquifer.

15. There is a tributary aquifer entering the main aquifer in the Mead area. This aquifer originates from the Peone Prairie area and affects water quality in several water supply wells.

16. The level of some toxicants such as mercury, organochlorides and cyanide is sufficient to warrant continued monitoring.

SECTION IV

SUMMARY OF RECOMMENDATIONS

SECTION IV. SUMMARY OF RECOMMENDATIONS

The Spokane County Wastewater Management Plan for the Spokane-Rathdrum Aquifer was developed during a two year period from 1977 through 1979 by the '208' staff and consultants under the direction of the Spokane County Engineering Department, and by technical and citizens committees which provided advisory support throughout the process. The Plan consists of recommendations developed by the '208' program which have been edorsed by the citizens and technical committees. The recommendations were developed based on the results of a one year aquifer monitoring program and are intended for application within an Aquifer Sensitive Area as shown on Plate 5. The results were included in a Cause and Effect Report which showed that the aquifer water quality, while being suitable for all its current uses, has been and is being degraded by man's activities on the land surface over the aquifer. It showed that these activities of man on the aquifer land surface area, if allowed to increase unchecked, will further degrade the aquifer and lead to increased risk of serious contamination which could affect the aquifer's usefulness.

Non-degradation

The advisory committees for the Spokane County Water Quality Management Program, after review of the Cause and Effect Report, quality standards and other information, recommend that a goal for future planning for water quality protection be no further degradation of the Spokane-Rathdrum Aquifer. In other words, all activities which could cause harm to the aquifer should be controlled and future activities which could potentially degrade the aquifer water quality should be curtailed unless offsetting pollutant reduction measures are implemented. The committees' expressed intent was not an immediate cessation of degradation and they acknowledged that the degradation rate could continue for a short period of time before mitigating measures could be initiated to stop and reverse the trend.

Water Quality Management Strategy

The planned strategy for protecting the Spokane-Rathdrum Aquifer is to support further integration of areawide water quality management planning with the local comprehensive planning processes, as well as state and federal water quality management procedures. This would entail development of a comprehensive wastewater management plan, the coordination of surface water and ground water management planning and coordination of wastewater and water quality planning with land use planning. The planning effort should take into account the interchange between the river and the aquifer in planning for wastewater disposal sites to the Spokane River. The planning should also take into account the finite nature of the aquifer as identified

in Corps of Engineers and U. S. Geological survey studies, and the limitations for future population and economic growth that are necessary in light of the non-degradation policy and the finite limitations.

Control of Potential Pollutants

The desire for no further aquifer degradation and the difficulty of identifying the particular source of a degrading substance have prompted recommendations for control of all potential pollutants to the aquifer at their source on the ground's surface. The controls would be effective in the entire area where pollutants could affect the aquifer water quality. This area has been designated the Aquifer Sensitive Area as shown on Plate 5. It is also recommended that a continuing and ongoing water quality monitoring program for the aquifer be established in order to assess the effectiveness of the pollutant reduction program and also to determine whether additional sources, other than those identified, are possibly affecting the aquifer. It is recommended that the areawide comprehensive planning process and planning efforts for land use, transportation, air quality, wastewater management, solid waste, water supply and other public facilities address water quality as a portion of their programs. Coordination for aquifer water quality protection with the State of Idaho is felt to be necessary, and coordination between the various entities, such as city and county governments is also felt to be an essential portion of the program to protect aquifer water quality. The development of each of these plans should recognize the potential limitations on development based on the limited flow in the aquifer and its flow changes after increased withdrawals. They should recognize the impossibility of totally eliminating pollutant contribution from human activities even with the most advanced presently known mitigative measures. This means that if nondegradation is our goal, there is an upper limit to our development activities in the Aquifer Sensitive Area.

SPECIFIC CONTROL NEEDS FOR POLLUTION SOURCES

Various specific activities being conducted over the aquifer were identified as potential sources of pollutants to the groundwater. Specific recommended policies regarding the potential sources of pollutants and recommended actions responsive to the policies were developed during the Spokane County Aquifer '208' Program.

Aquifer Penetrations

A number of gravel extraction penetrations have been excavated above the aquifer and into the aquifer. The Cause and Effect Report did not identify specific changes in aquifer water quality related to the active mining of gravel in these excavations, but the '208' program identifies these as potential future sources of pollution for the aquifer as they will perist as access points to the aquifer. The '208' recommended policy supports productive, but non-polluting utilization and rehabilitation of pits after they are worked out and the requirement that owners of the pits police them and establish a plan for rehabilitation.

For existing pits that penetrate into the aquifer water, action would be taken to assure that the water is protected in perpetuity from contamination by spills or placement of foreign materials into it. The operators of the pits are obligated to develop plans for this protection. It is apparently unfeasible from the standpoint of suitable materials available to fill all of these pits back to the water level, and therefore some must be protected with the aquifer exposed. The recommended actions are not so restrictive as to eliminate innovative ways of using these pits in a non-polluting manner.

The recommendations for new pits would require that the site in its reclaimed condition would not have exposed aquifer areas. The operators would be allowed to penetrate the aquifer water during the operation, but would have a phased rehabilitation program whereby the aquifer is adequately covered following final site grading. In addition, special precautions to prevent drainage water from seeping to the aquifer through the reduced overburden and to prevent toxicant use and potential spill in these areas would be mandatory.

Solid Waste and Sludge Disposal

In the past, there have been a number of solid waste sites over the aquifer and in its drainage area. The recommended policy calls for future sites to be located outside the Aquifer Sensitive Area and gradual removal of existing sites from service. In addition, the recommendations call for strict compliance with requirements for preventing the introduction of hazardous or toxic materials into landfills and urge that innovative solid waste disposal methods be investigated and implemented if they are feasible. This could include recycling, recovery or utilization of solid waste. The recommendations also call for the phased out solid waste sites to be placed into uses where they do not have artifical moisture applied which would increase the possibility of leachate being carried from the solid waste site to the ground water.

The recommendations call for treatment plant sludges to be disposed of in the most environmentally acceptable manner which would reduce groundwater potential pollution. This could include land application of sludges for use of their nutrients as a fertilizer source.

Septic tank pumpage is currently disposed of untreated to the ground at sites in the aquifer sensitive area. The recommendations call for termination of these existing sites and prohibition of new septic tank pumpage disposal sites. They recommend that septic tank pumpage be handled through municipal treatment systems.

There is some commercial animal wastes storage and disposal in the aquifer area. It is recommended that these sites be removed from service. This commercial animal waste disposal does not include animal waste from agricultural operations.

Stormwater Runoff

Stormwater runoff from paved and other impervious surfaces carries a significant load of pollutants to the ground surface over the aquifer, and is a significant potential source of pollutants to the aquifer. Alternative solutions to the stormwater problem, in order to maintain the non-degradation goal, include collecting stormwater from areas over the aquifer and in tributary areas and transporting it to a disposal site off the aquifer, such as the Spokane River and means of stormwater handling to reduce its pollutant load prior to its entering the ground. The Plan recommends storm sewers where economically feasible and pollutant reduction measures elsewhere. The recommended action for non-storm sewered developing areas is that storm drainage from all paved and impervious surfaces be disposed of through "grassed percolation areas". These grassed percolation areas would provided treatment for the stormwater by soil organisms, chemical precipitation and ion exchange. Very little treatment capacity exists in dry wells or percolation pits. Disposing of stormwater through grassed percolation areas during extremely heavy runoff from peak storms and when the ground is frozen is impractical and some means of disposing of the excess flows must be retained. It was estimated that 80% of the stormwater from an area could be disposed of through the grassed percolation areas if slightly in excess of one half inch of rainfall runoff could be handled by the grassed area. The other 20% of the runoff would occur from peak storms and from the runoff that occurs during frozen ground conditions in late winter.

The grassed percolation areas could include green belt areas in developments, median strips in major boulevards, edge strips on surface streets, or areas on private property. The drainage provisions would have to be retained in perpetuity in order to retain the reliability of the drainage system. Commercial areas could provide green strips to accept the runoff from their parking and impervious areas. Stormwater collection systems with lined storage basins and irrigation systems may be feasible in larger developments. The recommendations call for implementation of similar runoff control procedures in existing areas that may be redeveloped or where major reconstruction of facilities occurs.

Agricultural Practices

Control of potential pollutants from agricultural practices was recommended to be achieved principally through educational means. Soil testing for nutrient needs, minimization of application of pesticides and fertilizers and proper disposal of animal wastes were recommended.

Commercial and Industrial Pollution Sources

Sources of potential pollutants from industry include spills from utilization, storage or transport of materials used during the processing operations, disposal or storage of wastes from industrial and commercial operations, sanitary waste disposal, and runoff from the site occupied by the operation. It was demonstrated during the '208' program that any materials placed on the ground surface over the aquifer do reach the aquifer, and especially those that are in liquid form or soluble. In order to maintain

aquifer nondegradation and also to avoid specific pollution incidents, the '208' program recommends that controls be put into effect for these potential pollution sources from industrial and commercial operations. It also recommended that the land use planning process attempt to control potential pollution from industrial and commercial sources by placing restrictions on some types of land uses over the aquifer and encouraging industries that utilize quantities of critical substances that could harm the aquifer to locate outside of the aquifer sensitive area.

Based on the Cause and Effect Report documentation of a direct hydraulic link between the ground surface and the aquifer, it is recommended that the Department of Ecology establish waste discharge permit requirements for all industries in the aquifer environmental area. This would be the principal method for control of the disposal of industrial and commercial wastes. It is recommended that industrial and commercial wastes not be disposed of in the aquifer sensitive area unless demonstrated methods to prevent pollution from reaching the aquifer are used.

It is recommended that all industrial and commercial operations with potential sources of spills be required to produce a spill control and prevention plan and to implement the plan. Containment of all runoff from areas where critical materials might be spilled including containment areas where fire fighting activities could spill or wash pollutants to the aquifer. This will minimize the likelihood that toxic or hazardous materials, petroleum products and other critical substances spills could contaminate the aquifer. It is also recommended that storage for solid and liquid waste be controlled to prevent aquifer contamination from these sources. The recommendations for aquifer pollution prevention also cover transportation related spill potential and call for regulation of truck and rail transport of critical materials, including hazardous and toxic substances.

Sanitary Wastewater Handling and Controls

Sanitary sewage is also a significant contributor to aquifer pollution especially in areas that are unsewered in the Spokane Valley and in North Spokane. Sanitary wastewater is discharged to the ground through septic tank - drainfields and package treatment facilities in these areas and within the City of Spokane. The recommendations for handling sanitary wastewater and mitigation of its pollution to the groundwater include the collection of all sewage from urbanized areas and treatment for discharge in such a manner that the pollutants cannot enter the aquifer. Central sewer planning within the aquifer sensitive area should result in sewering of areas that have been urbanized or are to be urbanized.

Development of a priority sewer service area and a general sewer plan area are recommended. The priority sewer service area would encompass the City of Spokane and portions of the north Spokane and Spokane Valley lying in the aquifer sensitive area which are currently urbanized or in the process of urbanization and could feasibly be provided with interceptor sewer service in a short range time frame. The preliminary boundaries are shown on Plate 6. The short range time frame is defined to be project initiation in 5 years and completion in 10 years. A general sewer

service plan area would define the areas for future sewer service for the City of Spokane, the Spokane Valley and the north Spokane area anticipated for urbanized development. The constraints of total growth limitation for aquifer nondegradation would be considered in development of this ultimate sewer area.

The plan recommends that all future development be compatible with future sewer service. This would include new subdivision requirements for dry line sewers or active sewers with interim community sewage treatment and disposal facilities. New commercial and industrial installations would provide for sewer connection as soon as central sewer service is available. New individual lot development would have attachments to their permit for septic tank, drainfield or other onsite interim system which would carry the provision that the property owner or future owners would not oppose sewer construction, legally imposed charges for public sewering or connection when public sewers became available. For areas that are presently developed, it is recommended that the responsible entity (such as the City, County or special district) sponsor Utility Local Improvement Districts (ULIDs) by resolution if such districts are not formed by petition within three years after the availability of interceptor sewer systems and each five years thereafter if the ULID is rejected by the legally prescribed process. Community systems that are currently discharging to interim treatment and disposal facilities, such as package plants and drainfields or septic tanks and drainfields for larger service areas than a single residence would be expected to connect to the interceptor sewer system immediately when it becomes available.

In order to provide additional incentive for sewering the currently urbanized areas in the Spokane Valley and North Spokane, it has been proposed that new urbanizing developments be restricted to the priority sewer service area until interceptor sewers become available within that area. Thus, new development will fill in the existing sparcely developed areas to a greater density thereby lowering the cost per unit to provide sewers and bringing more of the population onto sewer service. New development within the area would be obligated to connect to the sewer and obligated not to oppose the ULID and legally imposed charges. Land outside this priority sewer service area could not be developed to less than 5 acres per dwelling unit density in order to retain a low enough density for resubdivision at some future time when the priority sewer service area boundaries are expanded, and to minimize the population in unsewered areas. Alternatives which could be feasible include a charge system to assess development outside the priority sewer service area at a rate sufficient to provide interceptor sewer service within the priority sewer service area and the extension of the interceptor sewers to the outside areas being developed.

Specific recommendations for the City of Spokane, the North Spokane area and the Spokane Valley area recommend that central sewer systems be extended or constructed for transport of the wastewaters to treatment and discharge so that the discharge cannot enter the ground water.

Land Use Controls

Within the other various specific recommendations there are many references to coordination between land use controls and the specific recommendations for mitigating pollutants to the aquifer. Included is the recommendation for protection of the aquifer water quality for no further degradation as a portion of the continuing planning process. It is recommended that the water quality mangement plan be adopted as a portion of the City and County comprehensive plans. It is recommended that specially designated areas such as landfills, aquifer penetrations and others be given special consideration in land use control regulation to prevent their being a source of pollutants to the aquifer.

The recommendations call for the comprehensive planning process to adopt the priority sewer service area and the general sewer plan areas, and to confine growth to the appropriate area so that it can be sewered in a timely manner and in a coordinated fashion to prevent further aquifer degradation.

Recommendations for land use controls call for innovative land development techniques which are conducive to economical sewering and economical runoff disposal via grassed percolation areas. They encourage fill-in development within the priority sewer service areas through the use of incentives where necessary. It is also recommended to restrict development to areas that can be feasibly sewered. It is recommended that an Aquifer Sensitive Area be designated as the entire aquifer recharge area and tributary areas except for discreet surface water drainage basins, such as the Liberty Lake, Newman Lake, Plouf Creek, Saltese and portions of the Peone/Deadman Creek drainage basins. Surface water discharged from these basins to the aquifer would be controlled so as to not allow aquifer degradation from these sources, and urbanization within these areas would warrant inclusion within the aquifer sensitive area for imposition of the various other controls recommended. The Aquifer Sensitive Area boundaries are shown on Plate 5.

Finally, it is recommended that the program recommendations should be implemented and underway for all activities by 1983. The alternative to initiation within this time frame would call for the activities to be curtailed until implementation was initiated. It is also recommended that the Plan for the Spokane-Rathdrum aquifer is applicable to aquifers in other areas with only alteration of some specific recommendations required.

MANAGEMENT AGENCIES AND REGULATORY PROGRAMS

In order to implement the various specific recommendations of the '208' Water Quality Management Program, it is necessary to address the responsibilities and coordination for the implementation effort. The water quality management plan recommendations cover several aspects of these requirements.

Local Coordination

The Plan recommends that the '208' Technical Advisory Committee and Citizen Representatives Core committee continue in advisory capacities and coordinating capacities to assist in the plan implementation. It is recommended that a '208' Implementation Coordination Office be set up to assist in the operation of these committees, to review the work of various agencies for compliance with the Plan and compatibility with other agencies' actions, and to provide a focal point for inquiry and the review process which must be established to implement the recommended actions.

Institutional Framework

The plan recommends that an institutional framework be established which would provide for the coordination and/or consolidation of management agencies to avoid fragmentation or duplication of services and also recommends that coordination be included with North Idaho agencies which administer programs for aquifer protection on the Idaho portion of the Spokane-Rathdrum aquifer. Recommended actions include integration of the plan into local comprehensive plans and into the Department of Ecology statewide water quality management plan for the Spokane area. It further recommends that the Department of Ecology promote locally developed groundwater quality management planning for no further degradation as a statewide policy and that it develop functional minimal standards to protect water quality for its current and potential uses.

The Plan recommends that state, local and federal agencies with programs which impact water quality coordinate their effort through the Implementation Coordination Office and that they each address the funding necessity for implementation of the Plan. The recommendations call for state and federal actions to provide implementation funding from existing programs and also special funding for the Spokane-Rathdrum aquifer since it is a sole source aquifer for which a locally developed plan for protection has been developed.

Financing Mechanisms

The water quality management plan recommendations for local implementation financing call for financial support of new programs by those directly benefitting from the development or activity which poses a threat to the aquifer water quality. Developers should be made responsible for runoff control planning and implementation, including development of runoff control plans and final inspection and certification that the drainage facilities do comply with the runoff control plan. It also recommends that there be a fee structure sufficient for review of the runoff control plan and measures by governmental staff.

It is recommended that developers be responsible for sewage plan compliance on all new developments and that the financing be a portion of their financial obligations on the development. For smaller developments and individual units, it is recommended that legal provision for no objection to future ULID's, connections or legally imposed charges be attached to deeds, building permits or other documents needed for the development.

It was recommended that funding for areawide sewer facilities for a central sewer system such as trunk sewers, interceptors and treatment and collector sewers in existing developed areas be funded with grants to the extent possible, but that further funding should be made available from the entire metropolitan area that utilizes the aquifer as a water source as well as the specific area being served. Various methods for implementing this recommendation have been discussed, but none is specifically recommended. Alternatives which may be considered include the assessment of water users on a regular basis, the imposition of an areawide tax levy, annual wastewater permit fees, increased charges on all sewer users, and/or imposition of a substantial pollutant use charge on all new developments. The recommendations call for new collector sanitary sewer systems to be funded primarily by ULID or similar method in existing areas, but it is recommended that special funding assistance be made available from some type of areawide assessments as these. Other pollutant reduction measures in existing developed areas would also be eligible for funding from this source.

WATER QUALITY MANAGEMENT PLAN IMPLEMENTATION

Section V of this final report contains the detailed specific Recommended Policies and Recommended Actions for policy implementation. The individual Recommended Actions have been assigned to various agencies for adoption. The agencies assigned principal responsibility (lead agency) and others assigned cooperative responsibility will undertake the necessary steps to implement the recommendations. Their actions may take the form of new regulations, revisions to existing regulations, specific planning actions, other specific actions, initiation of new programs, modifications to programs or even new legislation. The agreement by the various agencies to accept their assigned responsibilities will be in "Management Agency Implementation Statements". Only the acceptance of responsibility by all assigned agencies will make this Plan a viable vehicle for protection of water quality in the Spokane-Rathdrum aquifer. It must become the responsibility of each agency to coordinate its activities with all other responsible parties to assure that the water quality is protected in the public interest while making the protection as economical as feasible. Finally, the public must continue to accept a major role in overseeing the process to assure the protection of their sole water supply source, to assure action of the agencies representing them and to assure that future activities comply with water quality protection principles.

SECTION V

WATER QUALITY MANAGEMENT FRAMEWORK

RECOMMENDED POLICIES AND ACTIONS

The Spokane County Water Quality Management Program ('208' Program) for the Spokane-Rathdrum Aquifer has developed recommendations for protection of the aquifer water quality. The recommendations were developed for the '208' Program by the Technical Advisory Committee and the Citizen Representatives Core Committee who endorsed the recommendations by concensus of the members.

The recommendations were developed following review of the Spokane Aquifer Cause and Effect Report as summarized earlier in this final report and other information. A number of alternatives were considered representing a range of policies for control of various sources of potential contamination prior to concurrence on the Recommended Policies. Recommended Actions were developed for implementation of the Recommended Policies.

The Recommended Policies and Recommended Actions of the Spokane County '208' Program are intended for implementation by various Federal, State and local agencies or a combination of the three. Generally reference is made in the recommendations to implementation responsibility by an "appropriate agency". These agencies are identified in Management Agency Implementation Statements. In these statements the agencies agree to proceed with implementation.

The recommendations are intended for application within the area where activities on the ground surface affect the aquifer water quality. Generally this is the area over the aquifer itself and on side slopes draining to the aquifer area. The area adopted by the Technical Advisory Committee and the Citizen Representatives Core Committee as the Aquifer Sensitive Area (ASA) is shown on Plate 5. Recommendations for control actions are intended for application in the ASA.

I. WATER QUALITY MANAGEMENT FRAMEWORK

I.1 Preventive and Protective Approaches to Water Quality Management

BACKGROUND:

The Spokane Aquifer Cause and Effect Report showed that man's activities on the ground surface over the aquifer and in tributary areas affects the aquifer water quality. The Water Quality Management Program has considered alternative measures for assuring that the aquifer is protected from contamination. A decision was made regarding the scope of these preventive and protective measures.

ISSUE:

How strongly should preventive and protective measures for aquifer water quality management be supported in '208' Planning?

The RECOMMENDED POLICY is:

I.1A *Support groundwater quality measures which seek to achieve a goal of no further degredation. This approach would be similar to the Federal goal for surface waters of "No Discharge of Pollutants by 1985".*

EXPLANATION: It is recognized that even immediate regulatory measures are not likely to arrest contamination of the aquifer completely, because of delayed effects of influences already set in motion. Realism dictates that further changes will occur before any management program can be implemented. Non-degredation is, therefore, recommended as a goal rather than an inflexible standard. The critical point is that management should not be predicated on any deliberate policy of permitting water quality to become further degraded up to some selected level. The purpose should be to maintain, insofar as possible, the present high quality of the resource.

DEFINITION: Non-degredation means a management policy which seeks to prevent contamination of the aquifer from exceeding the highest values measured for all parameters included in the water quality study performed for the '208' Program. The maximum levels measured in this study at each measurement point should serve as the water quality objectives for the aquifer at that point.

I.2 An Areawide Water Quality Management Strategy Integrating Surface Water and Groundwater Protection Planning and Controls

BACKGROUND:

The Cause and Effect Report considered the cause and effect relationships between man's activities and ground water quality. Remedial actions or mitigating measures for sources of potential pollutants may cause surface water quality degredation, i.e., in the Spokane River.

ISSUE:

Is planning for protection of surface water and ground water sufficiently integrated now? If not, how should integration be achieved to arrive at the most effective water quality control strategy for the Spokane area at the least social, economic and environmental cost?

THE RECOMMENDED POLICY IS:

I.2A Support further integration through development and adoption of an area wide water quality management plan which is integrated with local Comprehensive Plans, accepted as a part of the statewide plan and coordinated with water quality management planning for the Idaho portion of the aquifer.

THE RECOMMENDED ACTIONS for Implementation are:

I.2A.01 Continue to expedite efforts to coordinate wastewater and water quality planning with land use planning. Local Comprehensive Plans should include a wastewater plan element.

If the recommendations of the '208' Aquifer Water Quality Management Program are not implemented to address the identified issues by 1983, activities pertaining to that issue should be curtailed until implementation is initiated.

.02 A comprehensive wastewater management plan should be developed, coordinating surface and groundwater protection, and integrated into local Comprehensive Plans.

.03 The comprehensive wastewater management plan and continuing planning efforts should address the future of surface water disposal, the points of disposal and the level of treatment taking into account the interaction between the river and the aquifer.

.04 There appears to be a need for further study of the questions raised in the Corps of Engineers Metropolitan Spokane Region Water Resources Study regarding the aquifer as a finite resource. Future planning should recognize that there may be limitations of the aquifer and river systems to accommodate large increases in demands for water supply withdrawals and wastewater disposal assimilation. A study should be undertaken to address this question, possibly through use of the U.S.G.S. model.

II. GENERAL CONTROL NEEDS FOR POLLUTION SOURCES

II.1 Strategies for preventing and controlling pollution

BACKGROUND:

There are two general strategies for determining the need for aquifer control measures. The first is to monitor groundwater quality and trigger control measures when pollution is found. The second is to control pollutants at the sources. The Cause and Effect Report and other information showed that a pathway for pollutant travel from the ground surface to the aquifer exists. This pathway justifies the regulation of potential pollution sources on the ground surface over the aquifer and in tributary areas due to their discharge to public waters (the aquifer).

ISSUE:

Should water quality protection be implemented by control of potential pollutants of the source or to provide for controls only after degredation is confirmed to be from a specific source?

The RECOMMENDED POLICY is:

II.1A Support control of known and potential sources of pollution to the aquifer water quality.

The RECOMMENDED ACTIONS for Implementation are:

II.1A.01 The continuing strategy for the protection of aquifer quality should address control of potential sources of pollution at the source.

.02 Although the continuing strategy is to address the sources of potential pollution there is the need to establish a program of continuing aquifer wide monitoring of groundwater quality, augmented by specific site monitoring, to guide future protection actions and as a gauge of the effectiveness of past protection actions.

II.2 Preventing and Controlling Sources of Pollution Through Comprehensive Planning and Land Use Controls

BACKGROUND:

As land is developed and used more intensively there is generally an increase in pollution sources posing an increased potential threat to the aquifer. Comprehensive planning and land use controls then provides the opportunity to review these potential threats before they happen. The Recommended Policy of no further aquifer degredation and available data indicated that the aquifer is a limited resource. This suggests that consideration of an ultimate development level be incorporated into long range planning.

ISSUE:

Are current land use practices sufficiently sensitive for control of pollution sources? If not, what should the roles of various levels of government be in achieving greater consideration of such sources in the future?

The RECOMMENDED POLICY is:

II.2A Support protection through areawide comprehensive planning and land use controls for the Aquifer Sensitive Area. As used in this context aquifer sensitive area is defined as the aquifer recharge zone and its immediate drainage area. (See Plate No. 5.)

The RECOMMENDED ACTIONS for Implementation are:

II.2A.01 Areawide comprehensive planning and land use controls must be utilized in the continuing program for the protection of the aquifer through continuing coordination of all planning efforts: e.g., land use, transportation, air quality, wastewater management, solid waste, water supply and public facilities.

.02 Planning for aquifer protection should be coordinated between agencies within the state and equivalent agencies in Idaho.

.03 The Cities and County should adopt the '208' plan for the protection of the aquifer as an element of their respective Comprehensive Plans.

.04 Long range planning for the Aquifer Sensitive Area incorporate the concept of an ultimate development limit to protect the finite resource, taking into account that a constant or decreasing pollutant load will be required to maintain no further degredation of the relatively constant aquifer flow, or decreased flow, due to increased withdrawal and water use.

III. SPECIFIC CONTROL NEEDS FOR POLLUTION SOURCES

III.1 Preventive Management Strategies for Control of Pollutants Due to Penetrations to the Aquifer

BACKGROUND:

The land overlying the aquifer is currently the principal source of sands and gravels for the area. In current practice these mining operations have made extensive pits down to and into the aquifer. The '208' Program water quality monitoring results did not show degredation from current gravel extraction practices from these pits. However, such practices expose sections of the aquifer to direct access for accidental or intentional introduction of pollutants. Any pit even without actual penetration into the aquifer can increase the potential for contamination. The existing pits are extensive and it has been estimated that one of the three large existing excavations would take 70 years to fill if all suitable inert construction demolition waste from the Spokane Metropolitan area were used for that purpose.

ISSUE:

Two major issues are important. First, how should abandoned pits be rehabilitated? Second, what controls should be put on current or future operations?

The RECOMMENDED POLICY is:

III.1A For rehabilitation of existing pits after their usefullness has been depleted

Support productive but non-polluting utilization and rehabilitation of worked out pits. Provide incentives to owners to undertake non-polluting rehabilitation and adopt new regulations which require owners to police and control pits so as to minimize potential for pollution, including penalties for non-compliance.

The RECOMMENDED ACTIONS for Implementation are:

III.1A.01 The appropriate agency shall develop regulations:

A. that require owners of properties which contain pits, which were in existence prior to 5/1/79, to submit plans for the non-polluting utilization or reclamation of the pits which shall as a minimum include: a) a schedule for reclamation; b) proposed final grades of the site; c) an interim and final site drainage plan; d) a description of the reclamation program and final intended use of the site; e) a plan for control of site access and for policing of the site. The reclamation plan must be in accordance with the agency reclamation performance standards.

III.1A.01B that define non-polluting reclamation performance standards which restrict all uses potentially polluting to the aquifer and which address the following:

a. the use of non-polluting materials for fill;

b. the use and storage of chemicals or petroleum products on the site;

c. the use of fertilizers, pesticides and herbicides on the site; and,

d. the disposal of wastes and drainage.

C. that impose requirements on the owners until such time as reclamation is complete to restrict, control and police access to the site, to prevent dumpage and/or spillage of polluting substances, including penalties for non-compliance;

D. that require that the intended use of the reclaimed site must be approved and controlled in perpetuity through the zoning process regardless of the existing zoning on the site; and,

E. that place perpetual land use restrictions on the use of reclaimed site areas to protect against the handling, storage or use of polluting materials.

.02 Transporters and handlers of hazardous substances whose facilities are adjacent to pits shall take into account the pit in developing the spill control plans required in accordance with recommendations included herein.

.03 When feasible and it is deemed that a specific public benefit is to be derived from such reclamation, the appropriate public agency may seek Federal, State and local funds to assist in the reclamation cost.

The RECOMMENDED POLICIES are:

III.1B For the control of new pit operations

Support regulations which would allow pits but would limit operations to no penetrations into the aquifer without phased-in rehabilitation programs.

Support new regulations which require owners to police and control pits to minimize potential for pollution, including penalties for non-compliance.

The RECOMMENDED ACTIONS for Implementation are:

III.1B.01 The appropriate agency will develop regulations:

A. that state the criteria for evaluation of sites for which surface mining is proposed;

B. that control through the zoning process the approval, operation, reclamation and final use of any site for surface mining;

C. that require the owners of the proposed site to submit for approval plans for operation, reclamation and final use of the sites which are in accord with the agency performance standards;

D. that define non-polluting operation performance standards which provide for aquifer protection and address the following:

   a. access control and policing of site;
   b. storage and use of chemicals and petroleum products;
   c. disposal of wastes and drainage;
   d. use of fertilizers, pesticides and herbicides;
   e. fill materials;
   f. depth fill required above aquifer surface;
   g. protection from adjacent polluting materials handling, transport and/or storage facilities; and

E. that place perpetual land use restrictions on the use of reclaimed site areas to protect against the handling, storage or use of polluting materials.

III.2 Prèventive Management Strategies for Control of Pollutants due to Solid Waste and Sludge Disposal.

BACKGROUND:

The principal method of solid waste disposal in the Spokane area has been to landfills. In the past sanitary landfills have been located in the Aquifer Sensitive Area and have been used for the disposal of treated sludge from the sewage treatment plants. In addition other sites have been used for disposal of septic tank pumpage and commercial animal wastes. The Cause and Effect Report presented several instances of groundwater quality variations in the vicinity of solid waste disposal sites. Residual affects occured at some solid waste disposal sites many years after deposition of the material. Based on the aggregated information available the report concluded that some solid waste disposal activities over the aquifer have caused groundwater quality deterioration. Yet it must be recognized that solid waste disposal is a daily and continuing operation and that sanitary landfills currently represent the best practicable disposal method.

ISSUE:

Three major issues are important. First, should existing or future sanitary landfill operations be allowed in the Aquifer Sensitive Area, and if so, how strongly should solid waste management strategies, which prevent aquifer quality problems and protect water quality, be supported? Second, if landfills are allowed should they be used for the disposal of treatment plant sludge? Third, how should septic tank pumpage and commercial animal waste disposal be handled?

The RECOMMENDED POLICY is:

III.2A For solid waste disposal

Support long range development of sites and disposal methods that will mitigate environmental concerns. Update the Solid Waste Management Plan as soon as possible with strong emphasis on alternative disposal methods and sites selection for the protection of the aquifer; the prohibition of new solid waste disposal sites in the Aquifer Sensitive Area; and, the institution of monitoring and assessment studies at existing and abandoned sanitary landfill sites.

The RECOMMENDED ACTIONS for Implementation are:

III.2A.01 Update the Solid Waste Management Plan to include an evaluation of alternative landfill sites outside the Aquifer Sensitive Area, a schedule for phasing out existing landfill operations, a capital improvement program for acquisition and development of solid waste disposal sites and a schedule for implementation of the plan.

III.2A.02 In order to assure continued protection of the aquifer and lessen potential water quality deterioration no new solid waste ground disposal sites will be permitted in the Aquifer Sensitive Area. (This recommendation addresses disposal sites and is not intended to include transfer sites.)

.03 No toxic or hazardous wastes will be disposed of in landfills (sanitary or other) located in the Aquifer Sensitive Area.

.04 The update of the Solid Waste Management Plan for the City of Spokane and Spokane County shall include an investigation of the establishment of a joint city-county waste disposal site outside the Aquifer Sensitive Area for disposal of substance which pose an unusual potential for contamination of the aquifer.

.05 A program of citizen education shall be established as a part of the Solid Waste Management Plan update. The purpose of this program will be to inform the public and private refuse collectors, private enterprise and citizens of the importance of proper handling and disposal of hazardous and toxic substances and their containers.

.06 The updated plan should include consideration of best management practices for final use of completed landfill sites within the Aquifer Sensitive Area, and addressing the benefits to be derived from the use of less moisture application (such as green belts and natural areas).

.07 The updated plan should address resource recycling and recovery and other innovative disposal methods that specifically address reducing the potential of solid waste contamination of groundwater.

The RECOMMENDED POLICY is:

III.2B For sludge disposal

Support the best practicable sludge management strategy which minimizes environmental and public health risks

The RECOMMENDED ACTIONS for Implementation are:

III.2B.01 Comprehensive wastewater management planning must address the problem of sludge disposal within the Aquifer Sensitive Area and develop alternatives for future use. Such planning should be coordinated with the Solid Waste Management Plan update.

.02 There should be continued investigation of land application of sludges from the metropolitan Spokane area as a long term sludge management and resource recovery strategy.

The RECOMMENDED POLICY is:

III.2C For septic tank pumpage disposal

Support strategies that eliminate the disposal of septic tank pumpage to the ground in the Aquifer Sensitive Area, by phasing out existing disposal sites, prohibition of new disposal sites, and recognizing that the solution for disposal is to municipal treatment plants.

The RECOMMENDED ACTIONS for Implementation are:

III.2C.01 The appropriate agency will develop regulations to:

A. phase out existing disposal sites; and,

B. prohibition of new disposal sites;

.02 Steps shall be taken to make provision for the disposal of septic tank pumpage to municipal treatment plants.

The RECOMMENDED POLICY is:

III.2D For commercial animal waste disposal

Discourage disposal of commercial animal waste by methods other than those which utilize the material for soil application and nutrient uptake by growing crops, and discourage storage that promotes aquifer degredation.

The RECOMMENDED ACTIONS for Implementation are:

III.2D.01 Prohibit dumping or unacceptable disposal of commercial animal wastes.

.02 Develop acceptable procedures for commercial animal waste storage and disposal in a manner to minimize impact on the aquifer water quality.

.03 Advise commercial animal operation of acceptable waste storage and disposal methods.

III.3 Preventive Management Strategies for Control of Pollutants in Stormwater Runoff

BACKGROUND:

For most areas outside the City of Spokane and some areas within, the principle method of disposal of stormwater runoff is to the ground by seepage basins. Stormwater runoff from urbanized areas does carry contaminants and contributes a significant portion of the pollutants from man's activities on the ground surface. Activities in urbanized areas were shown in the Cause and Effect Report to cause degredation of the aquifer water quality. A significant portion of the potential pollutant contribution from residential urbanization including localized commercial and public services is contained in stormwater runoff from streets and other impervous areas. Runoff from industrial development and regional commercial development contains additional pollutants which may enter the aquifer.

ISSUE:

Three major issues are important. First, how strongly should preventive management strategies for pollutants in stormwater runoff be supported? Second, in developing areas, how much should runoff pollutants, volume and peak flow be reduced in new development? Third, in developed areas, how strongly should operational changes in stormwater management be supported to protect water quality?

The RECOMMENDED POLICY is:

III.3A For overall runoff management

Support management of wasteloads in runoff to protect water quality throughout the Aquifer Sensitive Area simultaneously with additional research.

The RECOMMENDED ACTIONS for Implementation are:

III.3A.01 Where economically feasible convey stormwater to disposal where it will not impact the aquifer water quality.

.02 Establish a planning objective that a minimum of 80% of annual runoff from all impervious areas disposed of to the ground be introduced through grassed percolation areas.

.03 Appropriate agencies shall when reviewing for approval proposals for improvements and new development require consideration of measures to mitigate stormwater runoff contamination.

.04 Appropriate agencies initiate programs of vacuum sweeping for paved surfaces.

.05 Additional studies of stormwater contamination potential should be undertaken to better quantify the problem and the effectiveness of mitigating measures.

III.3A.06 A pilot project should be undertaken to evaluate the use of porous pavement in parking lots.

.07 Initiate an education program which informs the public of problems associated with runoff, eg., use of fertilizers, pesticides, herbicides, solvents and petroleum products, etc.

.08 The implementing agencies should coordinate control strategies with the Spokane County Air Pollution Control Authority. An approved site drainage plan must be prepared for parking lots required to be paved.

The RECOMMENDED POLICY is:

III.3B For runoff management in developing areas:

Support measures to reduce the input of contaminants from runoff as well as reducing volume and peak flow in new developments to prevent aquifer water quality problems.

The RECOMMENDED ACTIONS for Implementation are:

III.3B.01 The appropriate agencies shall adopt regulations which require consideration of innovative development schemes for the dispersion of runoff in accordance with overall runoff management for new developments. For example, Planned Unit Development and campus type commercial and industrial developments.

.02 The appropriate agencies shall develop regulations for the control of runoff in new developments. Due to the types of materials which may be stored or handled in commercial and industrial areas these sites may require special attention. The regulations should include:

A. require grading and drainage plans for lots and streets which maximize runoff retention on site and disposal to grass percolation areas;

B. require site plans and easements which describe the grassed percolation areas to be used for those portions of private property planned for acceptance of public drainage;

C. the appropriate agency shall develop specifications for grassed percolation areas, and the disposal methods approved for the excess over the capacity of the percolation area;

D. require that retention or settling basins, where employed, be impervious with overflow to an approved treatment or dispersion system;

E. require certification by a licensed Engineer, or other appropriate developer representative, that grading, drainage and site plans have been complied with during development and construction. The developer shall be responsible for this certification before occupancy is allowed;

F. require covenants or deed restrictions publically enforceable which prohibit alteration or filling in of grassed percolation areas. Owners shall provide maintenance of the areas for their intended use but easements for access by maintenance personnel shall be provided. Require that the conditions imposed on the approval of drainage and grading plans shall become public enforceable covenants or deed restrictions. These covenants or deed restrictions shall be in force in perpetuity;

G. in parking lots with limited use parking, consideration should be given to paving the travelled way only, leaving the parking stall unpaved. This approach should be employed only if grassed percolation areas are not possible;

H. require that the plans developed for commercial and industrial areas make special provision for handling runoff which may contain materials which pose a special threat to aquifer water quality degredation, e.g., loading or material transfer areas;

I. all building and occupancy permits shall be accompanied by a pamphlet summarizing the recommended runoff control strategies. The availability of drainage planning assistance to individuals and small businesses shall be outlined.

J. require public agencies which participate in capital improvement projects to adopt and implement regulations and policies which follow runoff management concepts; and

K. control runoff during periods of construction in order to preserve the effectiveness of the approved drainage plan.

The RECOMMENDED POLICY is:

III.3C For runoff management in developed areas:

Support cost effective operational changes in stormwater systems management in developed areas to protect water quality.

The RECOMMENDED ACTIONS for Implementation are:

III.3C.01 The City of Spokane Combined Sewer Overflow Abatement Project should include interception of stormwater discharges to the ground over the aquifer where possible.

.02 Development of lots within existing developed areas should incorporate pertinent strategies for developing areas and should be referred to the appropriate agency for specific control measures.

.03 The drainage disposal methods used in connection with street improvements in existing developed areas shall to the extent practicable incorporate the strategies enumerated under "A. overall runoff management".

.04 A demonstration program for urban runoff is needed to develop new means to solve drainage problems, to develop practical designs and to train local personnel in implementation techniques. Local (development administration), State (state groundwaters) and Federal (sole source administration) interests will be served by such a program and should each participate in its cost.

III.4 Preventive Management Strategies for Control of Agricultural Sources of Pollution Potential

BACKGROUND:

The alluvium overlying the aquifer is extremely pervious and capable of transmitting contaminants from natural and applied moisture. Potential pollutants from agricultural areas can reach the aquifer. Agricultural activities that pose the greatest potential for pollution are runoff from fertilized fields and from animal feed lots.

ISSUE:

How strongly should preventive management strategies for agricultural sources be supported?

The RECOMMENDED POLICY is:

III.4A Support management strategies for agricultural sources to protect water quality, through education and selective controls.

The RECOMMENDED ACTIONS for Implementation are:

III.4A.01 Encourage soil tests for farming operations to reduce overfertilization, e.g., through the Soil Conservation Service or Extension Service, et al.

.02 Encourage the use of Best Management Practices developed through the dry-land and irrigated agriculture '208' programs and encourage the educational efforts of these '208' programs to include recommendations for groundwater quality protection.

.03 The appropriate agencies should expand the application of control measures for surface water quality protection to include protection of groundwater quality.

.04 The appropriate agencies shall develop regulations for the specific control measures to:

A. discourage the disposal or storage of animal wastes in an unacceptable manner; and

B. discourage further development of intensive containment of animals.

.05 Make provisions for permanently maintained agriculturally operated areas, with appropriate incentives, to accept surface runoff into grass percolated areas.

III.5 Preventive Management Strategies for Control of Commercial and Industrial Sources of Pollution

BACKGROUND:

Commercial and industrial activities in the Aquifer Sensitive Area do pose threats of pollution. Several activities are of concern. Storage, handling and transport of chemical and petroleum products pose potentials for accidental spills and unprotected storage or ground disposal of nondegradable products can leach to the aquifer. Several specific instances of harmful materials from industrial sources reaching the aquifer have been recorded and a direct link from surface deposited or disposed of materials to the groundwater has been established.

ISSUE:

How strongly should preventive management strategies for commercial and industrial sources be supported?

The RECOMMENDED POLICIES are:

III.5A For Spill Control

Support local and other regulations to control all spill potential activities. This would require existing and new operations to develop spill prevention control and cleanup plans.

Support local and other regulations to encourage all commercial and industrial activities which handle, store or use large amounts of critical substances to locate outside the Aquifer Sensitive Area.

The RECOMMENDED ACTIONS for Implementation are:

III.5A.01 The appropriate agency shall develop regulations and special use permits for control of commercial and industrial activities which handle, store and use critical substances which provide that:

A. runoff from impervious surfaces at such sites which do not have spill potential shall be handled in the same manner as was developed for impervious areas as provided in '208' recommendations for runoff control. The strategies listed for runoff management will be considered as the minimum. Additional requirements for areas where critical substances are handled, stored, or used shall be developed in accord with the type of activity or substance being utilized. Direct discharge to ground shall not be permitted except when it is the only practicable method and materials and substances available at the site would not pose a threat to water quality; and

III.5A.01 B. existing and new industries and commercial operations using critical substances be required to submit for approval storage, spill control, drainage, fire prevention and cleanup plans.

.02 Industries which utilize, store, handle, package or manufacture critical substances will be encouraged to locate outside the Aquifer Sensitive Area.

.03 When practical opportunities occur existing businesses and industry which presently utilize such substances should be gradualy phased out of the Aquifer Sensitive Area unless protection of the aquifer can be assured.

.04 That the DOE take the lead in education and planning with fire departments and others involved in spill cleanup.

.05 That the EPA/DOE provide an inventory of industry and commercial operations as to storage and handling methods of critical substances.

.06 That the EPA/DOE coordinate an educational program on best management practices and recommendations.

.07 That EPA/DOE develop and maintain in cooperation with local agencies a definitive list of critical substances including critical quantities of such substances.

The RECOMMENDED POLICIES are:

III.5B For control of the transport of critical substances

Support regulations requiring transport activities to have control, cleanup and reporting plans with sanctions for non-compliance.

Support educational efforts for operators to better understand potential critical substances spill threats and encourage good practices.

Support restrictions on transport of highly toxic substances and coordinate with the State of Idaho on requests for Department of Transportation (DOT) action.

The RECOMMENDED ACTIONS for Implementation are:

III.5B.01 The Department of Ecology and/or Department of Emergency Services, in conjunction with other agencies, shall develop plans for the cleanup of spills resulting from the transport of critical materials over the Aquifer Sensitive Area. These plans shall:

III.5B.01 A. assign responsibility for each phase of the clean up action (e.g., reporting the accident, actual clean up, disposal of materials, inspection of site following clean up) to the appropriate agency;

B. designate the type of action to be taken for various types of spill and spilled material; and,

C. develop and implement penalties for non-compliance with clean up control procedures.

D. require or provide for appropriate local response equipment (i.e. trucks, pumps, absorbants, etc.) and mechanisms to assure proper response is made to all emergency spill situations.

.02 In order to facilitate clean up operations in the event of spills, carriers handling critical materials shall be encouraged to travel over specified routes over the Aquifer Sensitive Area.

.03 As reconstruction projects are scheduled for routes heavily used for transport of critical materials changes in drainage characteristics which would ease spill clean up should be included.

.04 Due to the large amount of transport on freeways the feasibility of collection and/or treatment of freeway runoff or other means should be investigated for preventing contamination of groundwater by spilled materials.

.05 Establish a spill cleanup revolving fund maintained from assessments to transporters and from spill penalties and reimbursements.

.06 Establish a mandatory educational training program for operators of critical substance transport vehicles.

.07 EPA and/or UTC require railroads to have control, cleanup and reporting plans.

.08 That the EPA and/or ICC require truck transporters to have control cleanup and reporting plans.

.09 That the DOT strictly enforce safety, placarding, educational and equipment regulations.

The RECOMMENDED POLICY is:

III.5C For storage and ground disposal of wastes

Support educational efforts and development of regulations to control both existing and new operations with sanctions for non-compliance.

The RECOMMENDED ACTIONS are:

III.5C.01 the DOE shall develop waste discharge permit requirements for industrial wastes.

.02 performance standards on critical materials storage and handling areas be developed and incorporated into local zoning ordinances and the DOE permit system.

.03 solid waste disposal requirements regarding industrial wastes be developed by the Spokane County Health District and the Department of Ecology.

.04 the appropriate agency shall develop regulations to require that:

A. industrial solid waste be disposed of at an approved solid waste disposal site;

B. inert low solubility industrial wastes and demolition waste be disposed of in an approved manner;

C. lagoon construction must be impermeable to prevent percolation;

D. ground disposal of industrial waste limited to proven methods which will not degrade the aquifer water quality;

E. provide for spill control plan requirements for groundwater protection from petroleum storage which are equivalent to current planning requirements for surface water protection.

F. new underground storage tanks shall have leak prevention and/or detection provisions;

G. storage and handling facilities for chemicals shall be enclosed so as to prevent contact with precipitation or surface runoff; and

H. the internal drainage and fire sprinkler systems for portions of new or newly remodeled buildings used by industries for storing critical substances be self-contained to avoid contaminating the groundwater including consideration for fire flows. For existing construction see III.5A.01.

III.6 Management Strategies for Sanitary Wastewater Handling and Controls

BACKGROUND:

The Cause and Effect Report showed that water quality degredation in the aquifer is occurring in the vicinity of urbanization and that historical water quality changes have approximately paralleled population growth. In urbanized unsewered areas the aquifer pollutant contribution to the ground is a significant portion of the overall pollutant loading. In order to achieve the goal of no further aquifer degredation, future sources of potential pollutants must be mitigated and existing sources must be reduced to accommodate the future unmitigatable pollutants. Virtually all sanitary wastewater disposal outside the City of Spokane and in the Aquifer Sensitive Area is via ground application, through individual septic tank-drainfield systems or community treatment-drainfield disposal systems. In the North Spokane area, a plan has been developed to provide a central sanitary sewer system. Some areas of the City of Spokane have homes with only on-site disposal. In the Valley, where soils are highly permeable virtually all waste is disposed of into on-site systems.

ISSUE:

Several major issues are important: Should wastewater management strategies be revised? As decisions are made regarding sewer systems for the Aquifer Sensitive Area, alternatives for phasing in these systems must be considered. How should existing sewage disposal methods be phased out and sewer systems be phased in for areas proposed to be sewered?

The RECOMMENDED POLICIES are:

III.6A For wastewater handling and controls

Support collection of all sewage and treatment for discharge in such a manner that the pollutants cannot enter the aquifer.

Support development of central sewer planning within the Aquifer Sensitive Area.

Support coordination of sewer policies between implementing agencies.

Support policies and procedures that lead to sewering all areas that are urbanized within the Aquifer Sensitive Area.

The RECOMMENDED ACTIONS are:

III.6A.01 Determine an interceptor sewer service area for the urbanizing areas within the Aquifer Sensitive Area to be served in a short range time frame and designate these as priority sewer service areas. "Short range" as used in this context is intended to mean initiation within the next five years and completion within ten years. (See III.7A.05)

.02 The Comprehensive Wastewater Management Plan shall include a defined long range interceptor sewer service area which has been coordinated with the City and County Comprehensive Plans. Such long range interceptor sewer service area shall be considered to be the General Sewer Plan area and shall include the future sewer service areas.

.03 Expand the priority sewer service area boundary only after interceptor service is available in the original area for connection of the expanded area.

.04 The appropriate agencies will designate that all sewage systems with ground disposal within the General Sewer Plan Areas are considered to be interim facilities.

.05 A. New subdivision development of less than 5 acre tracts be permitted within the priority sewer service areas which are anticipated for interception by an interceptor sewer system in a short range time frame and should include conditions requiring: installation of dry line sewers or an operating sewer system with an approved temporary treatment facility; an obligation to not oppose legally imposed charges involved in connection of the subdivision system to the central sewer system; and an obligation to make immediate connection as the interceptors are built and available.

B. New subdivision development of less than 5 acre tracts be restricted from the general sewer plan area, except within the priority sewer service area and its future extensions.

C. Within the Aquifer Sensitive Area, but outside the general sewer plan area, semi-rural and rural lifestyle development of tracts at a 2 acre minimum be permitted when in accordance with adopted plans and ultimate development limitation planning and should include conditions requiring stringent review and approval of wastewater disposal methods. Innovative land development proposals should be encouraged for these areas.

.06 Require that all commercial, industrial and multi-family construction provide an on-site collection system with a single interim treatment facility and make provision for future connection to a central sewer system, agree not to oppose sewer construction by ULID and other legal charges, and be obligated to connect when the sewer becomes available.

.07 Require that all building permits for new construction within the General Sewer Plan area utilizing on-site systems contain the provisions for double plumbing and within priority sewer service areas stubouts to the collector sewer property line.

.08 The appropriate agency shall promote connection of existing development to sewers where density is 1 household or more per acre within the area served by an interceptor system by initiating Utility Local Improvement Districts by resolution on an area by area basis within 3 years of the interceptor becoming available and at least every 5 years thereafter for areas that reject the Utility Local Improvement District by the prescribed legal process.

.09 Encourage fill-in development, through the use of incentives where necesary.

.10 Individual treatment system drainfields within the General Sewer Plan area receiving new permits shall be designated as interim facilities and permittees shall be obligated to not oppose construction of sewers by ULID and shall be obligated to connect to the sewer when available.

.11 Develop and keep current a Comprehensive Wastewater Management Plan for the Spokane Metropolitan Area and proceed in accordance with said Plan.

.12 Coordinate sewer development plans and policies between agencies serving the area.

The RECOMMENDED POLICY is:

III.6B For wastewater handling and controls in the North Spokane area

Support current procedures to pursue a central sewer system (North Spokane Sewer Plan) as soon as possible.

The RECOMMENDED ACTIONS for Implementation are:

III.6B .01 Support the development of a central sewer system for the North Spokane area.

.02 Establish funding priorities in construction for 1980 on the local, State and Federal levels to allow completion of the sewer system in the Sewer Plan initial collection area plus interceptors to serve the designated priority sewer service area.

.03 Expand the North Spokane Sewer Plan boundary to include all continuous developing areas.

.04 Apply the recommendations under III.6A for the Aquifer Sensitive Area to the entire North Spokane Sewer Plan area.

The RECOMMENDED POLICY is:

III.6C For wastewater handling and controls within the City of Spokane

Support development of city policies, programs and plans that speed up removal of on-site systems, provides sewerage service to annexed areas and promotes expansion of the existing system.

The RECOMMENDED ACTIONS for Implementation are:

III.6C .01 Coordinate appropriate northerly portions of the City with the North Spokane Sewer Plan.

.02 Accept sewage from areas outside the City limits to the extent that it is compatible with the City sewer system and shown to be economically and timely feasible by the Comprehensive Wastewater Management Plan.

.03 Provide interceptor sewer service for all developed and developing areas inside the City limits and promote connection in accordance with recommendations under III.6A for wastewater handling and control within the Aquifer Sensitive Area.

The RECOMMENDED POLICIES are:

III.6D For wastewater handling and control for the Spokane Valley area

Support central sewer system planning for the Spokane Valley area.

Support interception of interim industrial, commercial, multi-family and housing wastewater facilities as soon as possible.

Support procedures which require all new subdivisions to make provisions for sewers.

Initiate sewer proposals for existing home owners' consideration in the developed areas.

The RECOMMENDED ACTIONS for Implementation are:

III.6D .01 Develop a General Sewer Plan, in conformance with a Comprehensive Wastewater Management Plan, for the Spokane Valley area.

.02 Provide as soon as possible within the short range time frame interceptor sewer service for the Valley priority sewer service area and intercept interim commercial, industrial, multi-family and housing development wastewater facilities.

.03 Provide funding to install the interceptor sewer system through Federal, State and local sources in a short range time frame to accomplish the '208' recommendations.

.04 Require all new Valley area subdivisions to comply with recommendations under III.6A for the Aquifer Sensitive Area. The priority service area boundaries shall be the minimum criteria for whether service will be available within the short range time frame.

.05 The Department of Ecology's and the Environmental Protection Agency's review of all NPDES applications for discharges to the Spokane River shall be part of the agencies' efforts to protect the quality of the aquifer. For river segments suspected of contributing significant flows to the aquifer, as is indicated for the segment upstream of Upriver Dam, effluent requirements shall be established with purpose of maintaining, insofar as possible the present high quality of the aquifer.

.06 Comprehensive Wastewater Management planning for the Valley area should include consideration of wasteloads generated in Idaho and their removal from the Aquifer Sensitive Area.

.07 With the purpose of better understanding the significance of Spokane River interchange to aquifer water quality, the Department of Ecology and the Environmental Protection Agency, in cooperation with other federal as well as local agencies, and subject to budget constraints, shall undertake a study of surface water quality affects on aquifer water quality. It is intended that the study results be used to establish water quality criteria for constituents found critical to aquifer water quality. Using these criteria the department will propose as part of the Water Quality Standards review required under the Clean Water Act to establish standards in the Spokane River to provide protection to the water quality of the Spokane Aquifer and River.

III.7 Strategies for Water Quality Management Using Land Use Controls

BACKGROUND:

Water quality management controls and land use controls are interrelated. The implementation of the stated goal of no further degredation of the aquifer and the specific policies for control of potential pollutants developed by the '208' Program can be enhanced through proper land use planning and land use control measures. The aquifer is a limited resource and its' capability for assimilation of pollutants will undoubtedly diminish with increased water withdrawal. Mitigating measures will reduce the potential pollutant load from existing and future development but development will continue to be a source of potential pollutants at a significant level. Therefore an ultimate development level limitation is a necessity if no further degredation of the aquifer is to be realized. Measures such as the installation of sanitary sewers and control of pollutant removal from stormwaters can be more widely and rapidly implemented by making land use planning and controls supportive of the water quality management process. Long range land use planning and sewer system planning objectives are complimentary.

ISSUE: How strongly should land use controls be used in strategies for wastewater quality management?

The RECOMMENDED POLICIES are:

III.7A Support development of land use controls that encourage fill-in development of existing urbanized areas, thus making ultimate sewering more feasible, and require new unsewered development to be of low density. Use land use controls to assist in implementation of RECOMMENDED POLICIES and ACTIONS for specific sources of potential pollutants.

The RECOMMENDED ACTIONS for Implementation are:

III.7A .01 The comprehensive plans and subsequent land use controls should strive as a principle objective toward maximizing the protection to aquifer water quality with no further degredation of the aquifer as a continuing planning goal.

.02 That local agencies adopt Comprehensive Plans and zoning, subdivision and other ordinances that reflect the recommendations contained in this document.

.03 Recognize that ultimate development level limitations do exist for aquifer water quality protection and adopt land use restrictions that reflect those limitations. Comprehensive Plan development and periodic updates shall incorporate the limitations.

.04 Restrict development in specially designated areas (e.g., landfills, rubble filled penetrations, sumps, flood plains, etc.) to non-polluting activities.

.05 The appropriate agencies shall adopt a priority sewer service area. A designation of the priority sewer service areas for which short-range interceptor sewer service should be provided has been made by this study (See Plate No. 6) and should be used as a base for beginning the process of review and adoption. It is intended that the priority sewer service area be reviewed and refined by interaction between the development of the Comprehensive Wastewater Management Plan and the development of the City and County Comprehensive Plans to assure that sewer service in the short time frame range will be provided to those areas expected to be urbanized within the short-range. Through this process, including consideration of the ultimate development limitations referenced in III.7A.03, the priority sewer service area should be integrated with and become a part of the Comprehensive Plans of the City and County.

The comprehensive planning process is using the sketch plan procedure. The initial sketch plans have taken into consideration a number of factors including the early findings of this study. The final recommendations of this study should be taken into consideration in the continuing process to develop the Comprehensive Plans including the following:

A. any expansion of the urban or suburban lifestyle areas should only be with assurance of accompanying interceptor sewer expansion e.g., interceptor sewer service must keep pace with urbanized growth;

B. contiguous commercial and existing industrial lifestyle areas should be included in the priority sewer service areas. Expansion of industrial areas should be carefully considered in relation to the '208' recommendations. Interceptor service is needed for industrial areas.

.06 Encourage development compatible with reduction in pollutants from stormwater by percolation through grassed areas.

.07 In determining the intensity and type of development allowed, the impact of the development on the ultimate plan for the protection of the aquifer shall be taken into consideration using the criteria herein set forth.

.08 Intensity controls as related to aquifer protection should address:

A. economical feasibility of sewer service;

B. avoiding permanent low density barriers to sewer system expansions;

C. minimizing the ultimate unsewered population and associated development;

D. the maximum allowable development under limitations imposed by the no further degredation policy.

Land use controls in existing developed areas should lead to realization of a sewer system for the areas and additional urbanization should not occur without sewer service.

.10 Approved preliminary plats and unfinalized zone changes which require time extensions shall be reviewed for compliance with the recommendations of this document.

.11 Encourage innovative techniques for all land development which are conducive to economical sewering through clustering of buildings and minimize runoff disposal problems through maximizing open spaces.

.12 Encourage fill-in development within priority and initial sewer service areas through the use of incentives where necesary, to make sewering more feasible.

.13 Discouragement of development outside of existing urbanized areas should be practiced until sewer system installation and stormwater pollutant mitigating measures are implemented and any expansion of the urbanized areas should be accompanied by interceptor sewer extension and stormwater controls as recommended.

.14 Industrial development should be carefully considered and controlled recognizing that it can represent a concentration of potential contaminant sources. Interceptor sewer service, runoff controls and spill control implementation should accompany industrial development.

.15 If recommendations of the '208' Aquifer Water Quality Management Program are not implemented to address the identified issues by 1983, activities pertaining to that issue should be curtailed until implementation is initiated.

.16 An Aquifer Sensitive Area should be adopted by the appropriate agencies. A draft or preliminary designation of the "Aquifer Sensitive Area", the area within which the '208' recommendations are applicable, has been made and is shown on Plate 5.

A. the area should be reviewed and adopted by the appropriate agencies.

B. the following drainage basins, although initially excluded from the area, are tributary to the aquifer recharge area and the quality of surface and/or ground water from these basins can affect the quality of the aquifer flows. Therefore stringent enforcement of the water quality control measures for discharges from these basins is necessary: Peone/Deadman Creek, Newman Lake, Liberty Lake, Saltese, Plouf Creek. Water Quality control measures in these basins shall be adequate to allow surface waters to percolate to the aquifer without compromising the various Recommended Policies in this Plan.

C. urbanizing development pressures (urban and suburban lifestyles) within these basins should be considered warrants for application of the Aquifer Sensitive Area recommendations within these basins.

D. the '208' recommendations were developed specifically for protection of the Spokane Aquifer. Their applicability to other aquifers or the expansion of the herein defined aquifer environmentally sensitive area to provide protection for ground waters in other aquifers may require alteration of some specific recommendations.

I.V. MANAGEMENT AGENCIES AND REGULATORY PROGRAMS

IV.1 Institutional Arrangements and Management Systems for Areawide Water Quality Management

BACKGROUND:

In order to implement the various recommendations developed by the '208' Water Quality Management program many regulations must be developed and enforced, interagency agreements must be negotiated and the responsibility for implementation of each recommendation must be accepted by an appropriate agency. Coordination must be carried forward to assure all aspects of the plan are implemented as intended and that duplication and confusion does not reign.

ISSUE:

What is the appropriate role of various levels of government in implementing the '208' Plan? Also, should changes in the present institutional framework be supported?

The RECOMMENDED POLICY

IV.1A For a management system is:

Support the establishment of a local management agency to coordinate the implementation of the '208' Plan recommendations and with the North Idaho program.

The RECOMMENDED ACTIONS for Implementation are:

IV.1A .01 The '208' Technical Advisory Committee act as a review, coordinating and recommending body to expedite implementation by advisory assistance and to resolve conflicting actions among agencies.

.02 That the Citizen Representatives Core committee continue in an advisory capacity to assist in the local planning and regulation adoption process.

.03 That an on going '208' Implementation Coordination Office be set up and jointly funded by Federal, State, and local agencies to oversee implementation of '208' recommendation. Duties of the '208' Implementation Coordination Office would be as follows:

A. provide staff support to the continuing functions of advisory committees;

B. coordinate with the appropriate Idaho agencies including establishment of an interstate coordination group;

C. coordinate the integration of '208' and Sole Source activities;

D. coordinate with local, Federal and State agencies;

E. coordinate the CRC continuing public participation efforts regarding agency implementation activities;

F. coordinate the '208' implementation phase with the Spokane County Comprehensive Wastewater Management Plan study and other similar '201' efforts in Washington and Idaho;

G. review Environmental Impact Statements and/or Ground water Impact Evaluations;

H. review actions and permits of agencies as to '208' recommendations;

I. coordinate '208' recommendations with the development or update of other Federal and State mandated plans, such as solid waste, air quality, transportation and housing;

J. coordinate '208' recommendations with the development or update of other local plans, such as the County or City Comprehensive Plan, water supply plans, runoff plans,etc.;

K. advise departments, offices, agencies and commissions on ground water impacts not covered in the permit process;

L. provide advice and assistance in educational efforts to improve practices in support of '208' objectives; and,

M. seek sponsorship funding and promote development of the following studies and if undertaken provide contact for coordination with the '208' Plan efforts:

   a. conduct a program of continuing monitoring of ground water quality, augmented by specific site monitoring;

   b. develop a program of continuing monitoring of surface runoff;

   c. undertake a detailed analysis of interchange between surface waters and groundwater;

d. undertake a detailed analysis of water demand and the aquifer supply as a finite resource;

e. develop a program of aquifer physical investigations such as seismic, geological, flow or dispersion studies;

f. application of the USGS, Corps of Engineers and other models to the local planning process; and,

g. develop a program for monitoring withdrawals, export, usage and availability of aquifer water quantity.

The RECOMMENDED POLICY

IV.1B For an INSTITUTIONAL FRAMEWORK is:

Support improvements in the institutional framework for water quality management, in particular the coordination or consolidation of management agencies to avoid fragmentation or duplication of services and include coordination with the North Idaho program.

The RECOMMENDED ACTIONS for Implementation are:

IV.1B .01 Integrate the recommendations contained within this document into local Comprehensive Plans.

.02 Integrate the recommendations contained within this document into the DOE statewide water quality management plan for the Spokane area and incorporate needed additional studies and water pollution control projects into the funding priority rating system on the scheduled indicated.

.03 That DOE promote a local groundwater quality management planning approach for no further degredation, but minimum functional standards should protect and provide for existing and future uses of the ground water. The implementation of management procedures for groundwater quality protection should be coordinated with local planning and other local programs to the extent possible.

.04 Develop a structured bi-state coordinating effort among agencies within Washington and equivalent agencies in the State of Idaho to implement aquifer water quality measures, including wastewater management planning coordination and/or joint handling agreements.

.05 Urge the enactment of new legislation deemed necesary to protect the aquifer water quality, including enabling legislation for agency activities and restrictive measures on various activities as recommended.

.06 The Comprehensive Wastewater Management Plan should develop a recommended framework of agencies and interfacing responsibilities for its implementation, including consideration of limiting the total number of agencies involved and consideration of institutional constraints and requirements for interstate cooperative sewerage programs which may assist areas in Idaho with controlling sanitary wastewater disposal in the aquifer area.

.07 All Federal, State and local agencies with programs which may impact aquifer water quality coordinate their efforts through the '208' Implementation Coordination Office and the appropriate coordinating committee.

.08 The DOE and EPA shall initiate funding proposals through the State and Federal appropriation processes for additional financial assistance to implement water quality protection measures determined through the '208' process for Sole Source or critical aquifer areas (e.g. the special funding provisions for lake water quality protection).

.09 State action should be taken to recognize the Aquifer Sensitive Area to accomplish the protection recommended through local and statewide water quality management programs, and to provide additional funding.

.10 Federal action should recognize Sole Source aquifer areas and protection measures recommended through local and statewide water quality management programs and provide additional funding for implementation.

IV.2 Equitable Financing Mechanisms for Sewer Systems and Other Control Measures

BACKGROUND:

In order to finance water quality management program recommendations, public funding of large expenditure programs is necessary. Funding sources must also be secured to carry out regulatory programs.

ISSUE:

What types of financing mechanisms for municipal wastewater systems and other plan items should be supported?

The RECOMMENDED POLICIES are:

IV.2A In sewer system financing:

Support the application for full Federal and State funding of all eligible portions of interceptor and treatment facilities costs.

Support seeking additional Federal and State assistance due to 'Sole Source' designation.

Support distribution of the system cost to area users dependant on the aquifer as a drinking water source.

Support consideration of alternative wastewater handling methods which are cost effective and may provide higher priority and funding eligibility.

The RECOMMENDED ACTIONS for Implementation are:

IV.2A .01 Developers will be responsible for sewage plan compliance:

A. install dry sewers or wet sewers with interim public treatment works until interceptor sewers are available, and sewer systems with connection to the interceptor system when available, according to the Wastewater Management Plan;

B. attachment of provision for non-objection to ULID formation and/or legal ULID or other implementation charges for providing central sewer systems; and,

C. pay or provide for payment of charges for facilities to accommodate the sewage from construction or developments.

.02 On-site disposal system and/or building permittees will:

A. accept the designation of individual or commercial or multi-family on-site wastewater treatment and disposal systems as interim in the Aquifer Sensitive Area; and,

B. accept attachment of an obligation to the improved property to not oppose a ULID or legally imposed charges for installation and connection to a central sewer system.

.03 Local funding should follow the general premise of:

A. new facilities and connections should be assessed according to the capacity of the works used, or required in a future expansion to replace the capacity used;

B. owners of existing individual on-site disposal systems within the priority sewer service area should be given financial incentives for connection to the central sewer system through areawide funding assistance, low interest loans, tax consideration or other means.

C. areawide funding of central sewer facilities such as major trunk sewers, interceptors and treatment works, with grants as available, should be used to balance the financial load on all users in the metropolitan area.

D. attaching enforceable covenants to plat and all deeds for compliance with drainage and runoff plans and future maintenance and non-alteration of runoff control facilities on private property.

IV.2B .02 Storm runoff control measure implementation in existing areas will be financed as a part of street, parking area or other reconstruction or improvement projects and shall be eligible for Areawide '208' Implementation Funding Assistance Program assistance if available.

.03 The funding for local governmental control of programs which are the responsibility of private entities (i.e. developers, industries, etc.) will generally be through a user fee structure (i.e. permit fee, filing fee, review fee, inspection fee, etc.)

IV.2A .04 Collector sewer systems should be funded as follows:

A. in new developments the developer shall provide the facilities;

B. in existing developed areas the users shall finance the improvements by ULID or similar method supplemented by Federal and State grant funds and areawide funding assistance; and,

C. City, County and/or Special District governments will promote sewering of existing developed areas by providing engineering, planning, financial services, and assistance in obtaining outside financial aid.

.05 Treatment and disposal, interceptor sewers and major trunk sewers will be coordinated and controlled by City or County government.

.06 An Areawide '208' Implementation Funding Assistance Program should be established, administered by an appropriate agency and to be used for assistance in obtaining sanitary sewering in existing developed areas, assistance in complying with stormwater control policies and other public projects aimed at implementing the Spokane Aquifer Water Quality Management Plan. Sources of funds could include: assessments on users of aquifer water for a drinking water source, charge rate balancing adjustments on sewer users, septic tank users fees or other revenue sources.

The RECOMMENDED POLICY is:

IV.2B For OTHER CONTROL MEASURES:

Support the distribution of water quality protection costs to potential polluters to be regulated.

The RECOMMENDED ACTIONS are:

IV.2B .01 Developers will be responsible for runoff control planning and implementation of:

A. drainage and runoff disposal plans and pay a fee for review of plans;

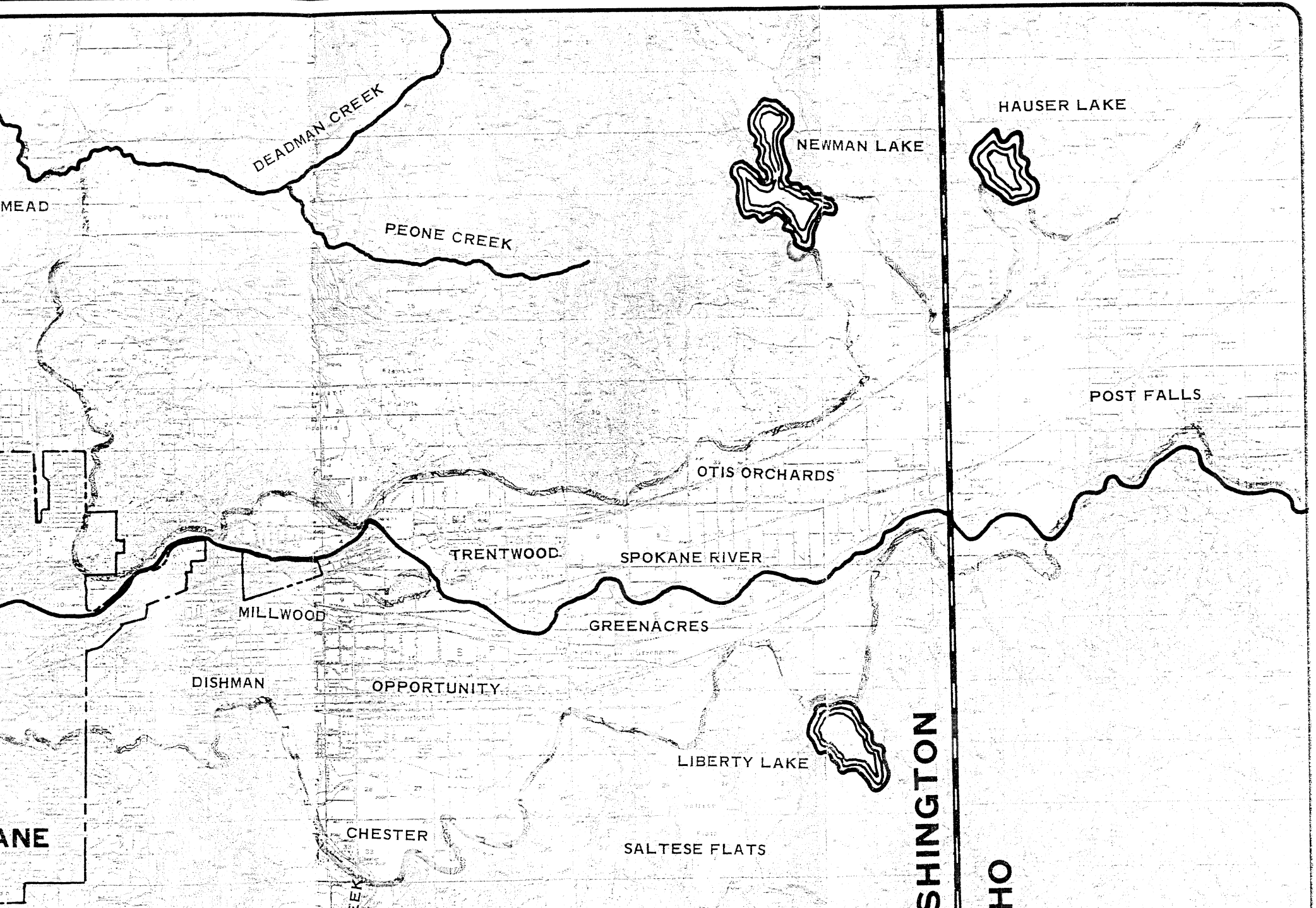
B. compliance with the plans during development and construction;

C. final inspection and certification that drainage facilities comply with approved plan; and,

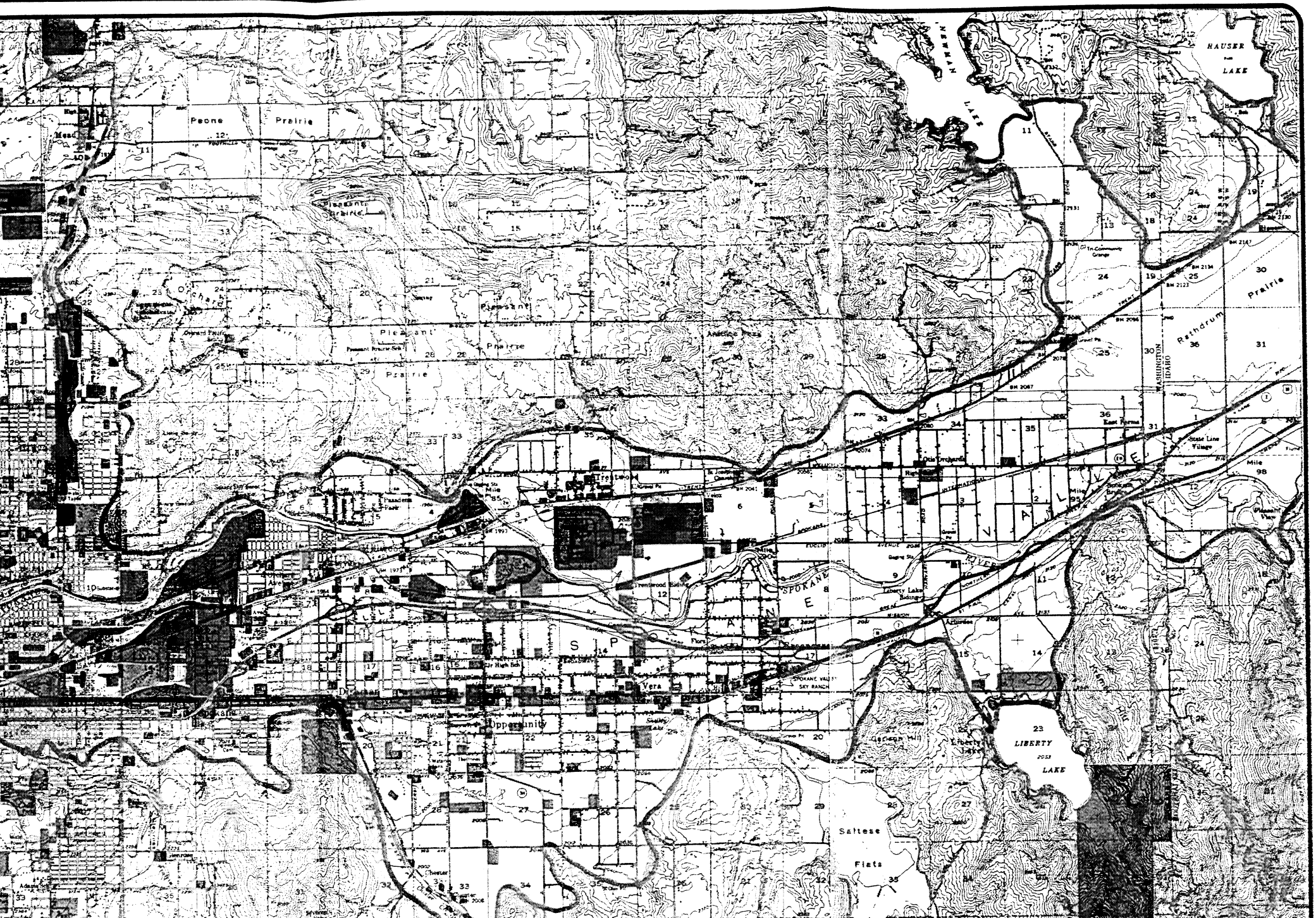
SECTION VI

PLATES

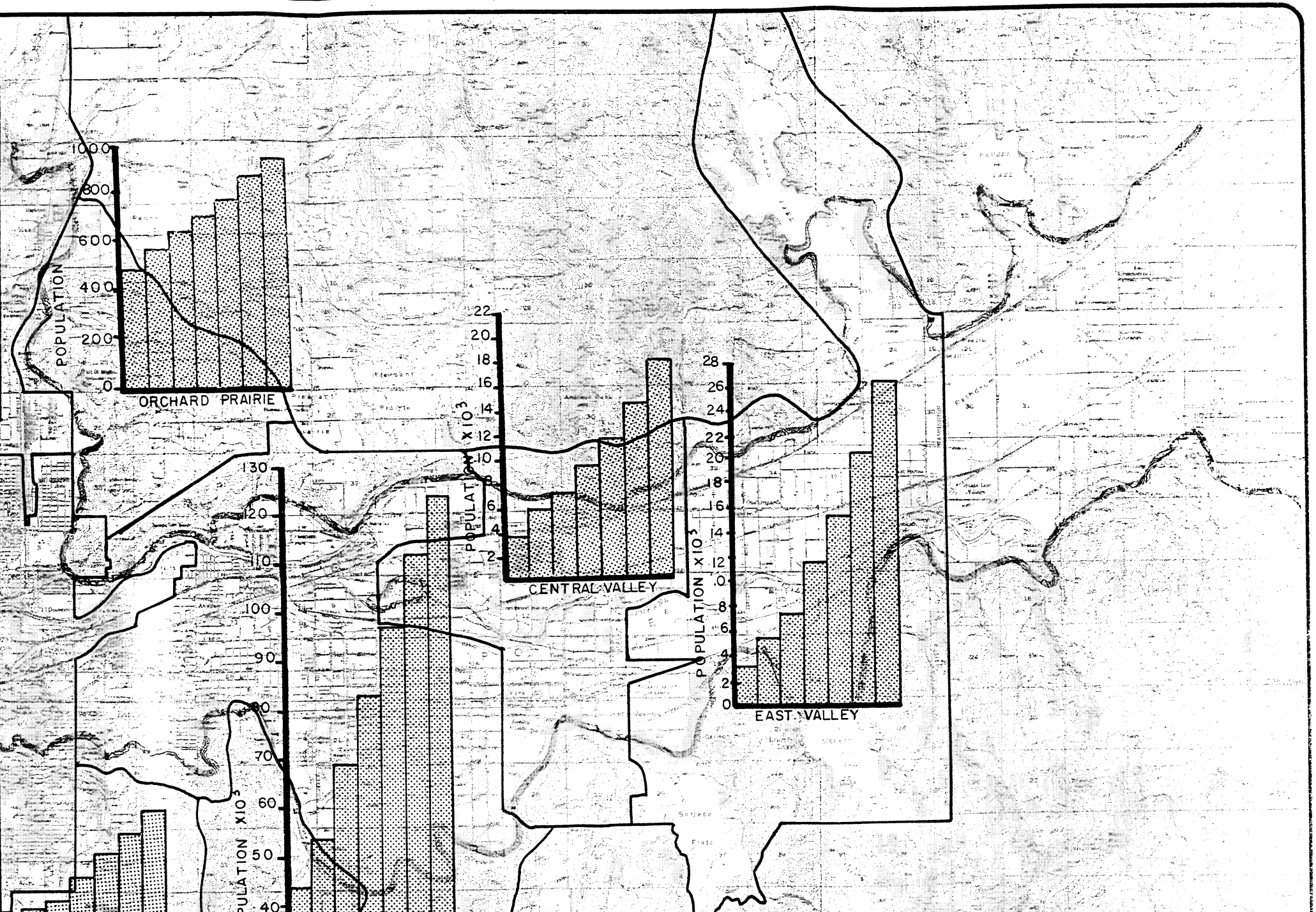
GEOGRAPHIC SETTING



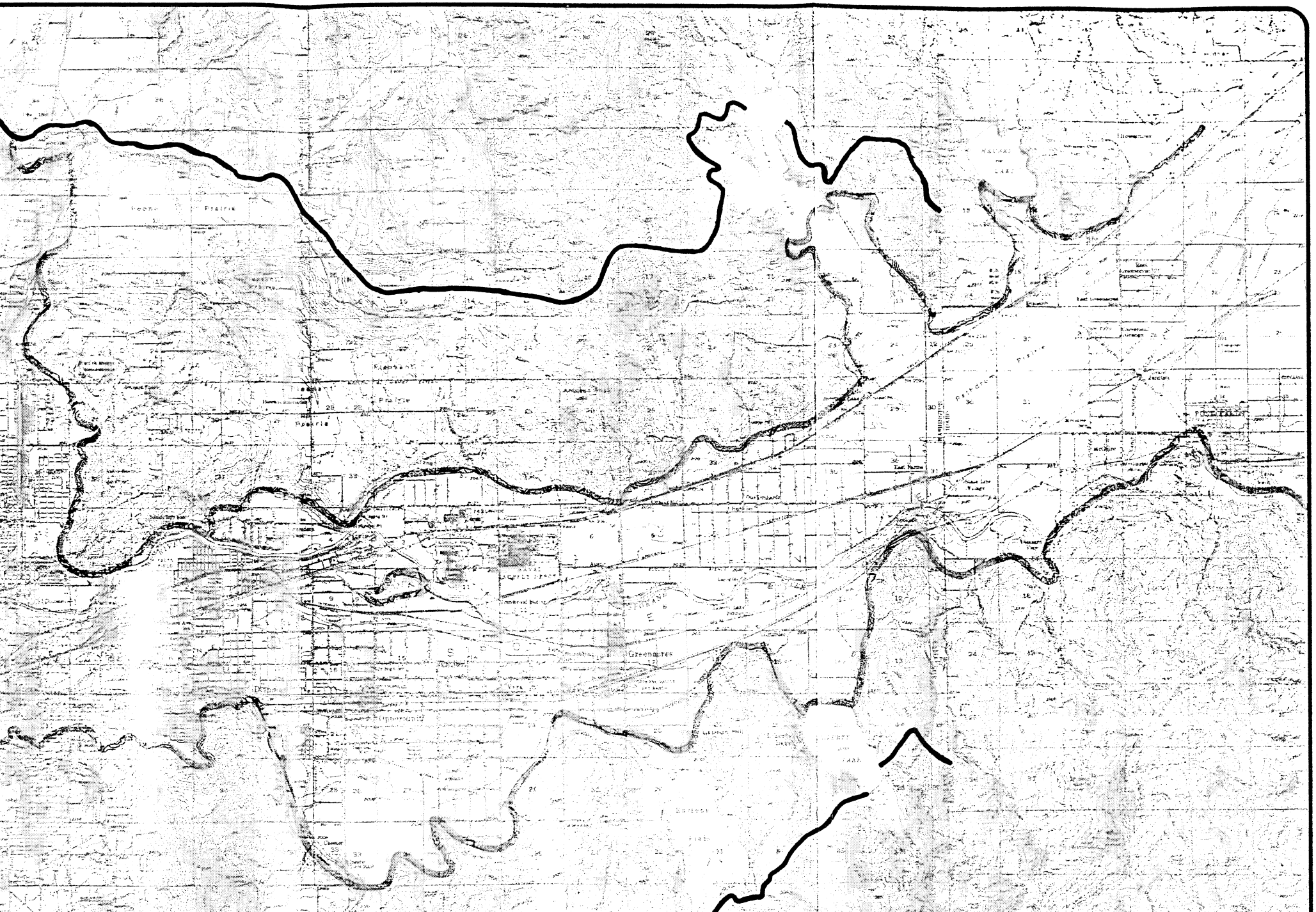
TING GENERALIZED LAND USE 1976



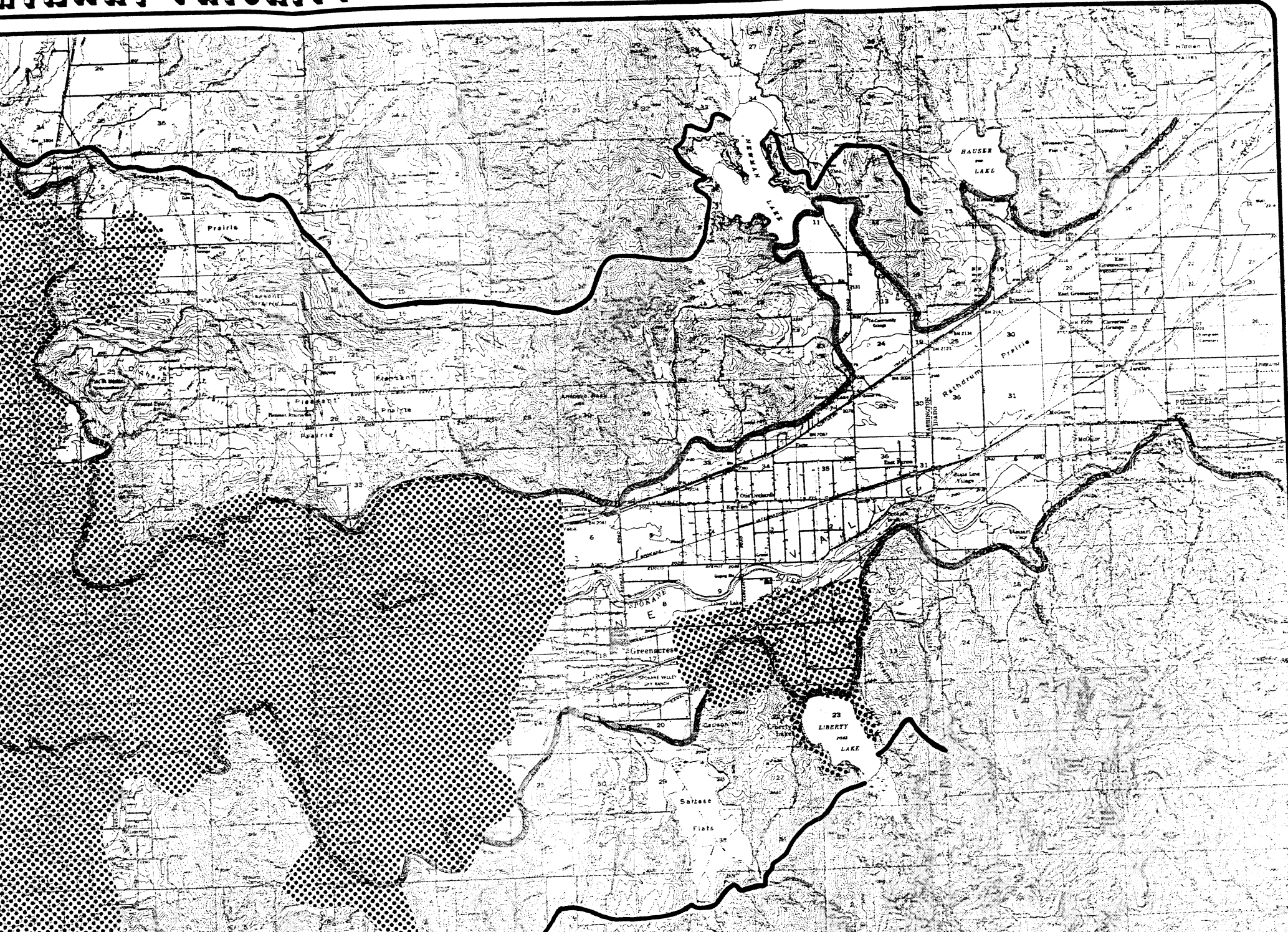
POLITAN AREA POPULATION 1970-2020



AQUIFER SENSITIVE AREA



MINARY PRIORITY SEWER SERVICE AREA



SECTION VII

MANAGEMENT AGENCY IMPLEMENTATION STATEMENTS

Section VII

MANAGEMENT AGENCY IMPLEMENTATION STATEMENT (M.A.I.S.)

The Management Agency Implementation Statement is a document which spells out each agency's role in the implementation of the Water Quality Management Program. It is the primary instrument to be used in the implementation process. Upon adoption of the Recommended Policies and the associated Recommended Actions, a review of each participating agency's capability for implementing the Water Quality Management Program was conducted. This review included an evaluation of statutory authority and administrative responsibility, and an evaluation of the Federal, State and local government institutional frameworks. Assignment of Actions to be initiated was then made to the appropriate agencies.

Management Agency Implementation Statements were then developed by each agency to which recommendations for implementation actions had been assigned. Acceptance by the agency of the M.A.I.S. indicates an intention to undertake the Recommended Actions. The Technical Advisory Committee has reviewed each agency's ability to cope with the identified problem.

Each agency's progress toward implementation is intended to be continually reviewed by the Technical Advisory Committee. This will assure that implementation is smooth and that the necessary adjustments in the implementation schedule can be made. Changes in technology and newly developed data will also be considered in this review.

The Management Agency Implementation Statements are the key elements to the implementation of the Water Quality Management Program. By acceptance of the statements the agencies make a commitment of intent to carry out the Recommended Actions. The actual implementation process for the Recommended Actions must be carried out through the agency's established procedures of public notice and hearings as are applicable for revising, amending or adopting plans, ordnances, procedures, rules or regulations as may be needed for implementing the specific Recommended Actions.

MANAGEMENT AGENCY IMPLEMENTATION STATEMENT

(Assignment of Responsibility and Degree of Involvement)

Responsible Agency / Recommended Action	City Plan	County Planning	Regional Planning Conf.	City Engineer	County Engineer	City Utilities	County Utilities	City Bldg. Dept.	County Bldg. Dept.	County Ext. Office	S.C. Health District	SCAPCA	CWSSA	City of Millwood		DSHS	DOE	DNR	DOT-State	D of ES	UTC	S.C. Conservation Dist.			EPA	HUD-FHA	USDA-SCS	DOT-Federal	ICC			
L = Lead Agency C = Cooperative	Local															State									Federal							
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II.1																																
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	C. P.	Co. P.	R. P. C.	C. E.	Co. E.	C. U.	Co. U.	C. B. D.	Co B. D.	E. O.	S.C.H.D.	SCAPCA	CWSSA	Millwood		DSHS	DOE	DNR	DOT	D of ES	UTC	S.C.C.D.			EPA	HUD-FHA	USDA-SCS	DOT	ICC			
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	C. P.	Co. P.	R. P. C.	C. E.	Co. E.	C. U.	Co. U.	C. B. D.	Co B. D.	E. O.	S.C.H.D.	SCAPCA	CWSSA	Millwood		DSHS	DOE	DNR	DOT	D of ES	UTC	S.C.C.D.			EPA	HUD-FHA	USDA-SCS	DOT	ICC			
2C																															
2C.01	C	C				C	C				L					C	C								C						
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B	C	C		L	L																				C						
C	C	C		L	L																				C						
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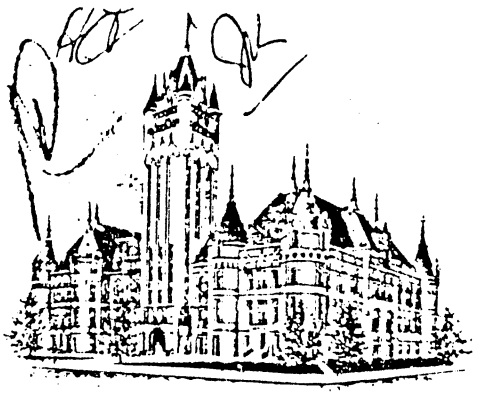

SPOKANE COUNTY
OFFICE OF COUNTY COMMISSIONERS

RAY W. CHRISTENSEN
First District

HARRY M. LARNED
Second District

JERRY C. KOPET
Third District

SPOKANE, WASHINGTON 99201

June 6, 1979

RECEIVED

JUN 12 1979

COUNTY COMMISSIONERS

Mr. John F. Spencer
Assistant Director
Office of Water Programs
Department of Ecology
Olympia, Washington 98504

Dear Mr. Spencer:

The Water Quality Management Plan for the Spokane Aquifer was submitted to the Spokane Regional Planning Conference on May 22, 1979, by the '208' staff. At the meeting, the Conference accepted the plan as presented and authorized Chairman Kopet to transmit the plan to the affected agencies and departments, instructing them to review the recommended actions for implementation as soon as possible. The transmittal letter also requested that affected agencies and departments return their signed Management Agency Implementation Statements (M.A.I.S.'s) to the '208' staff by July 1, 1979, for inclusion in the completed Water Quality Management Plan. It is our understanding that the authorized transmittal of the plan to the affected agencies has been carried out.

We feel that acceptance of the plan by the Conference completes the terms of our Contract #C0077092 as amended, with the exception of on-going implementation efforts which are being funded by the City of Spokane, Spokane County and unused Environmental Protection Agency funds.

It has been a pleasure working with the Department of Ecology on this delegated work task. We are sure the citizens of Spokane County will benefit from the information and the recommended actions that have been developed for the preservation of our Spokane Aquifer.

Sincerely yours,

Board of County Commissioners
of Spokane County, Washington

Ray W. Christensen

Ray W. Christensen, Chairman

Jerry C. Kopet

Jerry C. Kopet

Harry M. Larned

Spokane Regional Planning Conference

June 1, 1979

Dear

The Final Report of the Water Quality Management Program (Ground Disposal) has been finalized and limited draft copies distributed. The distribution of this report was limited in number as the Final Report will need to incorporate letters of transmittal, endorsements, resolutions and signed Management Agency Implementation Statements (M.A.I.S.'s).

One of the most important aspects of the study includes our intention to carry-through and implement the Recommended Actions. The Conference is asking that you review the Plan and Recommended Actions, fill out the Management Agency Implementation Statements and return them to the '208' staff by July 1st, if possible. The staff will then bind the Final Report for widespread distribution. We have received many requests for the 'Plan' so timely distribution is very important.

The Plan will then be sent to the Governor for certification and inclusion in the Statewide Plan for Water Quality Management. The public hearing and adoption process, by the Governor, should take place in September, 1979. However, we need not wait for the Governor's certification to begin implementing the Recommended Actions. Preservation of the aquifer benefits all of us. We should begin immediately to take the steps necessary to achieve the Technical Advisory and Citizens Representatives Core Committees goal of non-degradation.

If you need help and assistance please call on your Technical Advisory Committee representative or the '208' program staff.

Sincerely,

Jerry C. Kopet, Chairman
Spokane Regional Planning Conference

ADDRESS REPLY TO: SPOKANE REGIONAL PLANNING CONFERENCE, ROOM 353, CITY HALL, SPOKANE, WASHINGTON

CITY OF SPOKANE, WASHINGTON

OFFICE OF THE CITY MANAGER
Room 602 City Hall
TERRY L. NOVAK
City Manager

June 29, 1979

County Engineer
'208' Study Coordinator
N. 811 Jefferson
Spokane, WA 99201

Dear Sir:

As requested under the EPA '208' Study Guidelines, the City of Spokane has reviewed the numerous recommendations of the '208' Study designating various City Departments as lead agencies. The City Departments involved are:

Utilities
Engineering
Building
Planning

The '208' requests divide into two classifications:

1. Those requests where City staffing and authority are presently sufficient to implement the item.

2. Where City Council action is necessary either as a policy direction, ordinance adoption, or budget approval, and where time, study and research is necessary for proper and complete response.

Attached to this transmittal letter is a list, by recommendation number and City Department, showing the '208' recommendations. For those under the list titled, "Items to be Handled by Staff" the recommendation is either already being implemented or can be by staff action alone. It is our full intent to see that these actions are implemented by staff in as expeditious a manner as possible. Those items contained under the heading of, "Items to be Presented to City Council" all require an action by the City Council and/or City Planning Commission. Again it is the City administration's intent to submit each item on this second list to the City Council in as expeditious a manner as possible.

This letter along with the two attached lists constitute the City of Spokane's Management Agency Implementation Statement and furthermore is the City's agreement to actively pursue implementation of the recommended '208' actions subject to the availability of adequate funding and staffing. Should, during the implementation of any of the recommendations, it be that a change is valid for a given recommendation, the appropriate City personnel will bring this to the attention of the '208' Technical Advisory Committee. The City also pledges to work cooperatively with the other '208' implementing agencies in carrying out the intent and purpose of the '208' Study.

Finally, Mr. Roger James, Director of Public Utilities, and Mr. Terry Clegg, City Planning Director will continue to represent the City on the '208' Technical Advisory Committee as needed.

Very truly yours,

Terry L. Novak
City Manager

Enclosures

cc: 1 - Mayor
6 - City Council
1 - Vaughn P. Call - Manager-Planning
1 - Glen A. Yake - Manager-Engineering
1 - Terry Clegg - Director, Planning
1 - John A. Swanson - Director, Public Works
1 - Roger James - Director, Public Utilities
1 - Bob Reese - Director, Building Dept.
1 - Dan Robison - Director, Environmental Programs

CDR:GAY:ajg

CITY OF SPOKANE M.A.I.S.

Items to be presented to City Council.

UTILITIES

I.2A.02
I.2A.03
III.2A.04
III.6A.08
III.6A.11
III.7A.05
IV.2A.01 A,B & C
IV.2A.03 A
IV.2A.03 B
IV.2A.03 C

ENGINEERING

III.3A.01
III.3A.02
III.3A.03
III.3A.04
III.3A.05
III.3A.06
III.3B.02 A
III.3B.02 D
III.3B.02 E
III.3C.03
IV.2B.01 A,B & C

BUILDING

III.3B.02 H & I
III.5C.04 F,G & H

PLANNING

II.2A.03
III.1A.01 D & E
III.3B.01
III.3B.02 B & F
III.4D.05
III.5C.02
III.6A.05 A,B & C
III.7A.02
III.7A.03
III.7A.04
III.7A.05 A & B
III.7A.09
III.7A.13
III.7A.14
III.7A.16 A & B

CITY OF SPOKANE M.A.I.S.

Items to be handled by Staff.

UTILITIES

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III.2A.06
III.2B.02
III.2C.02
III.3C.01
III.6A.12
III.6B.01
III.6C.01
III.6C.02
III.6C.03
IV.2A.04 A,B & C
IV.2A.05

ENGINEERING

III.3A.01
III.3A.02 B,C,G,I,J & K
III.3C.02
III.5B.03
III.6A.08
IV.2B.02

PLANNING

I.2A.01
II.2A.01
III.1B.01 A,B,C,D & E
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III.5A.03
III.7A.01
III.7A.06
III.7A.07
III.7A.08 A,B,C & D
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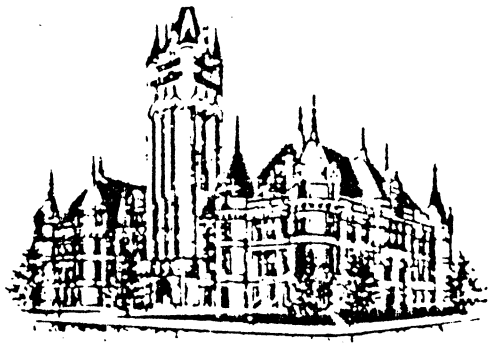
III.7A.11
III.7A.12
III.7A.16 C & D
IV.1B.01
IV.2B.01 D



SPOKANE COUNTY
OFFICE OF COUNTY COMMISSIONERS

RAY W. CHRISTENSEN
First District

HARRY M. LARNED
Second District

JERRY C. KOPET
Third District

SPOKANE, WASHINGTON 99201

July 19, 1979

TO: PLANNING, ENGINEERING, UTILITIES, BUILDING CODES AND FIRE MARSHAL

FROM: Board of County Commissioners Ray W Christensen Chairman

RE: '208' Recommendations

The recommendations of the '208' Study have been accepted for transmittal by the Regional Planning Conference as evidenced by their request that you complete and return a Management Agency Implementation Statement by July 1, 1979. Spokane County agencies have been identified as having responsibility to implement portions of the '208' program. Under the proposed plan, each of the departments has a number of recommendations which fall within their jurisdiction for implementation.

While recognizing that implementation of the full '208' program will take time, because of the broad nature of the study, it is also recognized that the process must be started if the recommendations are to be developed in a timely fashion and coordinated with other on-going department work efforts. Therefore, the Board directs that the affected departments begin the work necessary to implement the recommendations assigned to the respective departments.

In giving this direction, the Board wishes it understood that this does not connote prior approval of these recommendations. The direction is, to do the staff work necessary to bring forward, through normal procedures, the necessary plans, policies and/or regulations that will effect implementation of the '208' recommendations. These will then come before the Board for consideration through the normal process. Obviously, all of the recommendations cannot be advanced at the same time, some require more staff work and coordination than others, but you are directed to begin the process.

The Regional Planning Conference has accepted the role of overall coordinator of the implementation process and has asked that the '208' Technical Advisory Committee continue to serve to advise and help coordinate the process. The Board expects each department to use the review of the '208' Technical Committee to help in coordinating the work of the department with the implementation efforts of other departments and agencies.

cc: Regional Planning
'208' Technical Advisory Committee

Spokane County Medical Society
W. 508 Sixth Suite 220
Spokane, WA 99204

For Further Information Contact:
Ted E. Lawson, Executive Director
456-8401

FOR IMMEDIATE RELEASE:

COUNTY MEDICAL SOCIETY ENDORSES

AQUIFER POLICY OF NON-DEGRADATION

The Executive Committee of the Spokane County Medical Society endorsed the policy of non-degradation which would direct all management planning of water quality for the Aquifer at its meeting Friday, Septmeber 8, 1978.

This policy means basically that the County Medical Society wants the drinking water quality kept as close as possible to its current status as opposed to allowing it to degradate to federal standards. This certainly is not a non-growth philosophy, but it means that any management plan to accommodate growth and development would have to be based on preservation of the underground resources as they now stand.

This policy was recommended by County Medical Society's Environmental Quality Committee chaired by Bradley Bale, M.D. (838-8538).

This is the second time the County Medical Society has taken a position relative to the environmental quality of Spokane and particularly its Aquifer.

HOME BUILDERS ASSOCIATION OF SPOKANE, INC.

H B A

113 E. INDIANA
SUITE 105-6
P O. BOX 5173
SPOKANE, WA 99205

May 11, 1979

The Home Builders Association of Spokane, Wa., being very concerned about the future of providing housing for present and future residents of those areas of Spokane County which are affected by the Sole Source Aquifer and 208 Study considers that:

WHEREAS the HBA of Spokane is committed to protecting the quality of the area's water supply and,

WHEREAS the HBA of Spokane strongly supports the continued sensible production of housing for present and future residents and,

WHEREAS the findings of the 208 Study Committee recognize that sewerage of the affected area is the only viable means of protecting the water supply and providing for reasonable housing and,

WHEREAS restriction or severance of building activity will result in undue economic and population pressures on other areas of the county and,

WHEREAS provision can easily be made in new projects to ultimately tie in to a sewer system.

BE IT RESOLVED THAT:

The Home Builders Association of Spokane endorses and supports the sewering of the affected area and,

That the design and construction of the system be pursued with due diligence and speed and,

That in the interim period, provision be made and approved in new projects in the form of drylines and double plumbing for ultimate connection to the system and,

That housing and economic activity not be restricted during the construction process.

Battelle
Pacific Northwest Laboratories
P.O. Box 999
Richland, Washington U.S.A. 99352
Telephone (509) 946-2953
Telex 32-6345

July 2, 1979

Mr. Ray Card
"208" Program Manager
Office of the Spokane County Engineer
North 811 Jefferson Street
Spokane, Washington 99201

SUBJECT: Review and Assessment - Spokane County "208" Water Quality Management Program for the Spokane - Rathdrum Aquifer

Dear Mr. Card:

Battelle-Northwest served as a consultant on the Spokane "208" Water Quality Management Program. Our primary role was to provide technical overview and evaluation of the Program. Essentially, our involvement was continuous from the final planning stage through completion of the Spokane Aquifer Cause and Effect Report.[1] We were not involved significantly in the early planning efforts nor in the final policy, institutional and implementation considerations.

Battelle's technical overview and evaluation mission was carried out by reviewing the various staff and consultant reports, attendance and participation at approximately half of the Technical Advisory Committee (TAC) meetings, attendance at several Citizen Representatives Core Committee (CRC) meetings and discussions with "208" program staff and TAC members. Our comments on the program were provided to the program manager verbally and by letter and memoranda.

The purpose of this letter is to briefly review our technical assessment of the program at the point in time when the Spokane Aquifer Water Quality Management Plan[2] has been completed and documented. Moreover, I want to provide general comments on the program from our position as an interested (but hopefully objective) observer operating outside the formal program framework.

The Program plan was well designed and, in general, effectively executed. The water quality study was a key part of the Program. We initially reviewed the well water sampling network, the preliminary water quality data, the sampling procedures, and analytical methods. Our comments were forwarded to you by letter on February 13, 1978.[3] In summary, the ground-water and surface-water sampling network was excellent both in number and location of sampling sites. The analytical parameters were comprehensive, and the study provided an unprecedented assessment of the

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existing ground-water quality in the Spokane aquifer. Some variances and discrepancies were noted in the analytical results. These discrepancies were acknowledged by the "208" staff and the problems were resolved. Depth selective well-water sampling methods were questioned as to applicability. The "208" staff ran tests to demonstrate that the methods provided representative depth samples. The need for study of the partially saturated (vadose) zone flow regime was indicated; and results from a simple one-dimensional partially saturated flow model were provided to demonstrate possible movement of waste water through the vadose zone. Funds for limited study of the partially saturated zone were requested from the Department of Ecology by the County Engineer, but funding could not be provided due to budget restraints.

The Interim Water Quality Monitoring Report was reviewed on March 6, 1978.[4] Our assessment was that the report provided a complete summary of the monitoring program results from May through November, 1977, and that the data generally support the observations summarized in the report. Various problems with data interpretation and ambiguities were noted, and the importance of having a ground-water hydrologic model was indicated.

Inspection was made of ten "208" Program test well sites on March 7, 1978.[5] A question had been raised concerning the potential for contamination of the ground water from channeling of surface water down the outside of the well casings. The inspection indicated that the geohydrologic and climatic conditions, well siting, and well construction precluded conduction of surface contamination to the ground water by the test wells.

Computer-generated evapotranspiration data (from the "EVAP-9" computer program) for the Spokane area were provided to the "208" staff on June 2, 1978.[6] These data assisted in determining the water budget for the area.

Drafts of the "Cause and Effect" Report[1] were reviewed as they were completed and comments forwarded to the "208" Program Manager on October 23, 1978, and December 27, 1978.[7,8] Comments on the final report were made on January 15, 1979.[9] The Cause and Effect Report by Dr. Larry A. Esvelt, P.E., summarizes the Spokane "208" Water Quality Monitoring Program and explains the variations observed in ground-water quality. The final report includes recommendations for preservation and enhancement of ground-water quality. The explanation of analytical procedures and findings are clearly stated. The applied methodology assures that the analyses can be relied on. The assessment in the report of the Spokane-Rathdrum aquifer water quality variations presents possible explanations of the analytical results. In some cases alternate explanations can be made for some of the observed analytical results because we don't have detailed knowledge of the hydrologic system. The ground-water hydrologic

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model would have provided this detailed information, but the model was not completed in time for use in the "208" Program.

The analytical results basically support the summary and conclusions reached in the report--either definitively or circumstantially. The recommendations outlined in the report are consistent with the policy of non-degradation adopted by both the "208" Technical Advisory Committee and the Citizen Representatives Core Committee.

As I stated before, we felt that the Program plan was satisfactorily and effectively implemented. There were a number of key factors that contributed to the success of the program. As with any other technically and politically complex program, there also were a number of problems that were evident.

Of prime importance in the success of the program was the "208" program staff (and Engineering Advisor) that gave drive and direction to the program. The participation of various commissions/committees is virtually mandatory in the "208" planning process. The value of these committees to the program (in addition to the degree of dedication and expertise of the individual participants) is directly related to the manner in which they are directed, managed, and utilized by the staff. Lack of direction or neglect of the committees is viewed as disinterest, and the committees become ineffective. Attempts to overmanage or manipulate the committees result in resistance of the members to any and all direction by staff. Thus, management of such disparate groups becomes the difficult task of treading the middle ground between disregard and domination. Two committees, the Technical Advisory Committee (TAC) and the Citizen Representatives Core (CRC) Committee, were actively involved in the Spokane "208" Program. The TAC was particularly effective due to both the participation of the individual committee members and the leadership of the Chairman. The CRC appeared to have a difficult time understanding their mission initially. As the program progressed, understanding grew and the Committee became more confident and productive. Also, the addition of another staff person assisted in meeting the CRC's administrative needs.

The role of the Department of Ecology contributed greatly to the success of the program. Personnel from DOE's Eastern Regional Office (Spokane) and the Headquarters Office (Olympia) participated actively in the program rather than serving as reactive monitors. Also, the DOE assisted in resolving administrative, funding, and technical problems confronting the program that were beyond the scope or jurisdication of the "208" staff, TAC, or CRC.

The designation of the Spokane-Rathdrum aquifer as a "sole source" of water supply for the Spokane-Coeur d'Alene area by the U. S. Environmental Protection Agency in 1978 was important in focusing attention on the

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seriousness of the potential water quality problem. This undoubtedly was beneficial to implementation of the "208" program as it created an incentive for local involvement and local solution of the problems as opposed to additional perceived Federal intervention. In other aspects, EPA's involvement in the program appeared less effective. It seemed that at least some EPA administrators were not initially aware of the special, limited nature of the Spokane study--consideration only of the ground disposal segment (aquifer protection) of the "208" Comprehensive Area-Wide Water Quality Program. This was evidenced at one point by criticism from EPA that the Spokane program was not addressing other water quality and waste disposal aspects. However, these aspects were clearly outside of the designated and contracted scope of the program. EPA conducted an assessment (by an outside contractor) of public involvement in the Spokane study. From this assessment EPA concluded that public involvement was deficient. The CRC, which was working diligently on public participation, felt that the criticism was unwarranted. In our view, the EPA evaluation was not coordinated with the "208" staff or the CRC and caused unnecessary morale problems for the CRC. The EPA also initiated a limited ground-water sampling run designed to detect organic contaminants in selected wells. This project appeared to be planned, implemented, and reported without contact or coordination with the "208" staff. This occurred during the ongoing "208" ground-water sampling program and caused credibility problems for the "208" staff.

There seemed to be similar communication/coordination problems at the Board of County Commissioners level. Although departments under the direction of the Commissioners were represented on the TAC, the Board of Commissioners appears to have had little insight on the Spokane "208" program. The Commissioners initiated a study through an outside consultant for the Spokane County Waste Water Management Program (to attract Section 201 funds for a Sprague Avenue-aligned "corridor sewer"). Apparently this study was started without the knowledge of the "208" staff, TAC, or CRC at the height of the "208" study. This had the effect of potentially compromising the "208" program. The chairman of the CRC clearly expressed that group's frustration and concern with the situation in a letter to the Board of County Commissioners (September 19, 1978).

The principal consultant on the "208" program, URS Corporation, developed and/or compiled the technical, logistic, demographic, and institutional data required as background information for development of the Spokane Aquifer Water Quality Management Plan. We felt that URS personnel did an excellent job within the existing time and funding constraints. As the project progressed, it was evident that some of the data needs changed; and, in our perception, it seemed that these needs were met by "208" staff effort rather than negotiating change orders with the consultant. Thus, some of the consultant's information was not needed or used. This caused frustration for the consultant. Some staff burden could have been eased by more effective use of the consultant. This caused no

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program deterioration or problems because of the availability of a skilled staff for the "208" program.

The U. S. Geological Survey participated in the "208" program as consultants in geohydrology, monitoring well location and construction methods, and ground-water modeling. The USGS provided initial consultation and guidance on test well locations and definition of the geohydrology of the Spokane aquifer. The USGS was also scheduled to implement numerical ground-water hydrologic and quality models for the Spokane aquifer by early 1978. The schedule was designed to permit model use for interpretation of the "208" water quality analyses. However, this schedule was not met; and the models were not completed in time for interpretative use in the "Cause and Effect" Report (December, 1978). Thus, the modeling effort was of little service to the "208" program.

The participation in the Spokane aquifer program of personnel from the Idaho Panhandle Health District No. 1 was valuable, as the Health District had recently completed a similar "208" program involving the Rathdrum Prairie portion of the aquifer. This participation gave some insight into expected problems and possible solutions.

The Spokane Aquifer Water Quality Management Plan[2] covers the comprehensive strategies and controls required to meet the goal of "no further degradation of the Spokane-Rathdrum aquifer" recommended by the TAC and CRC. The recommended actions for plan implementation cover essentially every conceivable activity that can impact ground-water quality. The Plan recognizes the complex nature of ground-water behavior which often precludes instantaneous response to given system changes. One of the accomplishments of the "208" program was the education of a significant number of people (both lay persons and technicians) on ground-water systems. The plan also recognizes the interreationships of ground water and surface water.

Because of the comprehensive nature of the recommended policies and actions, it does not seem possible that all of the Plan can be implemented in the near term. This is particularly true of the actions that have implications of such politically or economically sensitive factors as land use changes and control and population control. Also, not all of the recommended actions are of equal importance in protecting the aquifer. Therefore, we would have expected a recommendation as to priority or sequence of implementation. Perhaps this prioritization is viewed as occurring later when the cognizant agencies initiate implementation of the Plan.

The key factors have been recommended that will assure plan consideration (and hopefully implementation):

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1. Assignment of the recommended action to applicable agencies for adoption and acceptance of the actions by the agencies;

2. Continuation of the TAC and CRC to assist in plan implementation;

3. Establishment of a "208" implementation coordination office essentially to oversee the plan implementation.

We feel that it is most important that one organization (such as the Implementation Coordination Office) has Plan implementation as its sole or primary mission. Without this directed effort, the recommended action items may lose their identity and importance in competition with other priorities of the receptor agencies. We also believe that continued monitoring of ground-water quality on a comprehensive scale is required to determine the effects of the various actions. Also, use of the numerical ground-water models should be initiated as soon as the models are operational to make predictive assessment of the various actions on ground-water quantity and quality.

It has been our pleasure working with you on the Spokane "208" program, and I hope that our efforts have been helpful to you. Please call me if you need any additional information or assistance.

Sincerely,

John R. Raymond

John R. Raymond
Staff Scientist
Hydrologic Systems Section
Water and Land Resources Department

JRR:mj

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REFERENCES

[1]"Summary Report of '208' Water Quality Results and Cause and Effect Relationships for Water Quality in the Spokane-Rathdrum Aquifer," by Dr. Larry A. Esvelt, P.E., December, 1978.

[2]Spokane Aquifer Water Quality Management Plan, "208" Water Quality Management Program, Spokane County, Office of County Engineer, April, 1979.

[3]Letter Report to the Program Manager - Comments on Water Quality Data, Sampling Network, Sampling Procedures and Analytical Methods, February 13, 1979.

[4]Memorandum, "Review of the Interim Water Quality Monitoring Report," Spokane County "208" Program, March 6, 1978.

[5]Memorandum, "Inspection of Test Wells - Spokane County "208" Program, April 3, 1978.

[6]Transmittal letter, EVAP-9 Computer Program Runs for Spokane, June 2, 1978.

[7]Memorandum, "Comments on the Draft Summary Report of '208' Water Quality Results and Cause and Effect Relationships for Water Quality in the Spokane Aquifer," October 23, 1978.

[8]Letter Report to the Program Manager, "Review of the Draft Summary, Conclusions and Recommendations Section of the 'Cause and Effect' Report," December 27, 1978.

[9]Letter report to the Program Manager, "Review and Assessment - Spokane County '208' Water Quality Management Program for the Spokane-Rathdrum Aquifer," January 15, 1979.

United States Senate

WASHINGTON, D.C. 20510

December 3, 1979

Mr. Jerry Kopet
Chairman, Regional Planning Commission
Room 353, City Hall
Spokane, Washington 99201

Dear Jerry:

We appreciate very much your thoughtful presentation of the need to protect the quality of the Spokane-Rathdrum Prairie Aquifer which is so important to the entire Spokane area. Maintaining the quality of this unique resource is, we agree, a priority concern for all who are involved in the continued development and growth of Spokane County and the City of Spokane.

We have and will continue to indicate to EPA our strong commitment to work closely with that agency in being responsive to the needs and requirements of local government and have in particular urged them to stay in close touch with the Spokane Regional Planning Commission which is so involved in this matter. The designation of the aquifer as a sole source aquifer under Section 1424(e) of the Safe Drinking Water Act (PL 93-523 is indeed a unique step and has focused attention on a highly complex problem that could serve as a model for similar developments in future years. Certainly the strong commitment of you, the Spokane Regional Planning Commission, and the involved officials of both Spokane County and Spokane City is a clear indication of the determination by the Spokane community to protect its water supply so that it can remain the basis of prosperity for future generations.

Again, we assure you and the Commission of our personal commitment to do all that we can to encourage appropriate federal action at every level. We look forward to staying in close touch with you on this matter.

Sincerely,

Warren G. Magnuson

WARREN G. MAGNUSON, U.S.S.

Henry M. Jackson

HENRY M. JACKSON, U.S.S.

THOMAS S. FOLEY, M.C.

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
WEST 920 RIVERSIDE AVENUE
SPOKANE, WASHINGTON 99201

REGION X
Arcade Plaza Building
1321 Second Avenue
Seattle, Washington 98101

December 4, 1979

IN REPLY REFER TO:
10.5HT (Brinck)
456-4571

Mr. Jerry C. Kopet
Chairman, Spokane Regional Planning Conference
West 1116 Broadway Avenue
Spokane, Washington 99201

Dear Mr. Kopet:

Subject: Management Agency Implementation Statement

At the request of the '208' Staff we are amplifying our Management Agency Implementation Statement of June 26, to be more specific as to the actions we are taking and under what authority we are able to act in support of the recommendations contained in the April 30, Spokane Aquifer Management Plan.

We have identified five general recommended policies which we believe this Agency can lend cooperative support for their implementation.

First, support the further intergradation of the area-wide Water Quality Management Plan into and with local comprehensive plans.

Second, support for the management plan of waste load and surface water run-off to protect water quality throughout the aquifer sensitive area.

Third, support policies and procedures that lend to servicing all areas that are urbanized within the aquifer sensitive area.

Fourth, support development of land use control that encourages fill-in development within existing urbanized areas.

Fifth, support improvements in the institutional framework to coordinate in the implementation of the '208' plan recommendations with the North Idaho Program.

Our cooperative role in obtaining the first policy implementation will be through the working with and support of the local planning agencies, and their development of a comprehensive plan. Assisting through the use of a leverage available through this Agency by limiting the availability of HUD funds to those activities compatible with the Water Quality Management Plan and its incorporation in the locally comprehensive plan.

The authority of our Agency to give this cooperative support comes from four specific areas:

1. The National Urban Policy as presented to Congress, March 27, 1978, which contained as one of its objectives of orderly and efficient growth.

2. The Housing and Community Development Act of 1974 (Title IV, 701) "Activities assisted under this section shall, to the maximum extent feasible, cover entire areas having common or related development problems. The Secretary shall encourage cooperation in preparing and carrying out plans among all interested municipalities, political subdivisions, public agencies, and other parties in order to achieve coordinated development of entire areas. To the maximum extent feasible, pertinent plans and studies already made for areas shall be utilized so as to avoid unnecessary repetition of effort and expense."

3. Housing and Community Development Act of 1974 (Title I, CDBG) "Section 104.(a) No grant may be made pursuant to Section 106 unless an application shall have been submitted to the Secretary in which the applicant -

   (1) Sets forth a summary at a three-year community development plan which identifies community development needs, demonstrates a comprehensive strategy for meeting those needs, and specifies both short and long-term community development objectives which have been developed in accordance with area-wide development planning and national growth policies."

4. OMB Circular No. A-95, dated November 27, 1973.

   "Purpose. This circular furnishes guidance to Federal agencies for added cooperation with State and local governments in the evaluation, review, and coordination of Federal assistance programs and projects." The March 29, 1979, CFR amendment to the circular provides additional criteria for reviewing applications in addition to that already in paragraph 5, part I, Attachment A of OMB Circular No. A-95. "In addition, HUD program officials shall, with concurrence of the Office of Community Planning and Program Coordination, issue A-95 review guidelines specifying the types of clearinghouse comments which would be useful to the responsible HUD officials in making a determination on an application "(Subsection 52.101(c). Also, in Subsection 52.101(c)(2) it is clear that HUD expects to use area-wide plans in making program decisions. "HUD expects that States and area-wide clearinghouses will use all relevant comprehensive and functional plans, such as the housing and land use

elements required by the Comprehensive Planning Assistance Program (24 CFR Part 600), State Coastal Zone Management Programs, Housing Opportunity Plans and other State and regional planning consideration as a basis for their review of applications for HUD assistance and for their assessment of consistency of proposed projects with existing plans. Comments which are based on documented sources resulting from the planning process should be identified by the clearinghouse and will be used by the responsible HUD official in making decisions on applications."

The specific actions taken by this Agency to provide cooperative support in the second policy implementation is to require that when FHA mortgage insurance is requested the subdivision be so designed and constructed as to provide a minimum of 80% of the annual run-off from all impervious areas is disposed of to the ground through grassed percolation areas. That developers provide a licensed engineer's certification assuring that the drainage facilities comply with the drainage plans as approved and that protective covenants are attached to the subdivision to further assure compliance, maintenance, and non-alteration of run-off control on private properties.

To lend cooperative support for implementation of the third policy, this Department will allow new urban type subdivision development, requesting FHA insured financing, only within the priority sewer servicing area. Those subdivisions approved within the priority sewer servicing area will be required to have dry or wet line sewer interim facilities or comply with Spokane County interim policies. HUD approved multifamily construction within the priority sewer servicing area, will be required to have interim treatment facilities. All development in the aquifer sensitive area, but outside the general sewer plan, will be required to have a minimum of two acre sites for FHA insured financing.

To cooperate in the implementation of the fourth policy, this Agency will work with the appropriate local body to assure that our policies are compatible to the iterim and final comprehensive waste water management plan within the designated priority sewer servicing area. This Agency will provide relaxed criteria for single and two lot developments within the same area, and in general work with local developers to assure the availability of FHA financing on small developments within the priority sewer servicing area, and to assure compatability with overall sewer plans and existing urbanized tracts.

The authority of this Agency to implement these specific procedures for the second, third and fourth policies, are derived from the code of Federal Regulations, Title 14, Chapter 4, Section 203.40, that states in part that the mortgaged property be located in a community where the housing standards meet the requirements of the Commissioner. The Commissioner has identified these standards in Handbooks 4135.1, Subdivision Analysis and Procedures, and 4140.1, Land Planning Principles for Home Mortgage Insurance. Our further authority

comes from the Memorandum of Understanding dated September 28, 1979 between the Department of Housing and Urban Development and the Environmental Protection Agency, wherein it is agreed that all HUD assisted projects will comply with the April 1979 Spokane '208' recommendations.

The fifth recommended policy will be implemented within our Agency through the Regional Office of the Department of Housing and Urban Development which has coordinated responsibility for the HUD Programs in Washington, Oregon, Idaho, and Alaska. It has been agreed by the Regional Administrator that both the Idaho and Washington Offices of HUD will use the '208' plan and Panhandle Health District rules and regulations as a criteria for determining acceptability of HUD projects with the two States.

For your information and assistance, we have enclosed copies of the above referenced Memorandum of Understanding along with a policy of this office, dated August 13, 1979, in which the above stated support for the '208' recommendations were implemented into policy by this office.

Should you have any questions regarding our support, please do not hesitate to contact me at 509-456-4571.

Sincerely,

R. C. Brinck
Service Office Supervisor

Enclosures