Public Advisory Board

State Water Planning and Review Process

NEBRASKA NATURAL RESOURCES COMMISSION · 301 CENTENNIAL MALL SOUTH · P.O. BOX 94676 · LINCOLN, NEBRASKA 68509

May 9, 1980

Members of the Legislature
86th Nebraska Legislature
State Capitol
Lincoln, Nebraska 68509

Dear Members of the Legislature:

As one of its responsibilities in the State Water Planning and Review Process, the Public Advisory Board has reviewed the Policy Issue Study on Water Quality approved by the Natural Resources Commission in March, 1980. By unanimous action of the members present at its April 15, 1980 meeting, the Public Advisory Board voted to concur generally in the recommendations of the Commission. However, we have the following additional comments relating to specific alternatives:

1. Although the Public Advisory Board supports legislation requiring that all wells be installed in accordance with standards (Alternative 1, page 73), the Board members feel that licensing and certification of well drillers and pump installation contractors may not be the best approach to implementation of well standards. We recommend that consideration be given to other alternatives for the implementation of such standards. In addition, the Public Advisory Board recommends that three or more well drillers representing different geographical areas be consulted in developing the standards.

2. The Public Advisory Board recommends that guidelines for the proper storage of petroleum and chemicals be developed on a statewide basis as a high priority item because a number of communities have experienced problems. (Alternative 2, page 82.)

3. The Public Advisory Board recommends that appropriate legislation be adopted to provide regulatory and licensing authority to the state for all solid waste disposal sites operated by second class cities and villages. (Alternative 1, page 77.)

As a final matter, the Public Advisory Board has the following observation and general recommendation. The recommendations of the Natural Resources Commission in the Water Quality Policy Study differ in some respects from those contained in the Section 208 Water Quality Management Plan for the State of Nebraska. We wish to point out that the 208 plan recommendations were developed through a process with a great deal of public involvement, and therefore the results of the 208 planning process may more accurately reflect the public's acceptance of the various alternatives.

MUNICIPAL
Richard Hawes
Omaha

DOMESTIC
Alfred Gigsted
Nebraska City

GROUND WATER IRRIGATION
Robert Lowry
Cairo

SURFACE WATER IRRIGATION
Don Steen
Morrill

LIVESTOCK PRODUCTION
Jack Maddux
Wauneta

ENVIRONMENTAL
Richard Spady
Hastings

INDUSTRIAL & COMMERCIAL
Vance Anderson, Chairman
Hastings

WILDLIFE, FISH & RECREATION
Richard Nisley
Rock

1st CONGRESSIONAL DISTRICT
Elmer Schlaphoff
Waverly

2nd CONGRESSIONAL DISTRICT
William Emrich
Bellevue

3rd CONGRESSIONAL DISTRICT
Roy Stewart
Newport

Those alternatives that were recommended in the Water Quality Policy Study but were rejected in the 208 planning process, or not subjected to that extensive public input process, should be thoroughly scrutinized by the Legislature when considering possible action.

The major alternatives to which this cautionary note applies are Alternative 2, page 46 (Regulate Surface Water Irrigation Return Flows), and the first part of Alternative 5d, page 16 (Authorize Natural Resources Districts to Require Conservation Planning and Implementation in Water Quality Problem Areas). The first of these two alternatives was rejected in the 208 process while the second was not considered, although alternatives similar to it were rejected. In addition, Alternative 2, page 64 (License Septic Tank Manufacturers, Installers, and Pumpers), and Alternative 3, page 65 (Cities and Counties Adopt Septic Tank Permit Programs) were disapproved by the Governor in the 208 planning process, but were recommended by the Natural Resources Commission in the Water Quality Policy Study.

Very truly yours,

Vance Anderson
Chairman

VA:nt

NEBRASKA
NATURAL RESOURCES COMMISSION
301 CENTENNIAL MALL SOUTH
P.O. BOX 94876
LINCOLN, NEBRASKA 68509
PHONE: (402) 471-2081

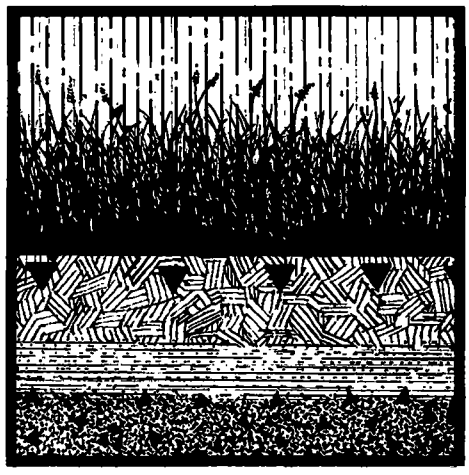
Here is a report produced by the State Water Planning and Review Process. We hope you find it informative and useful.

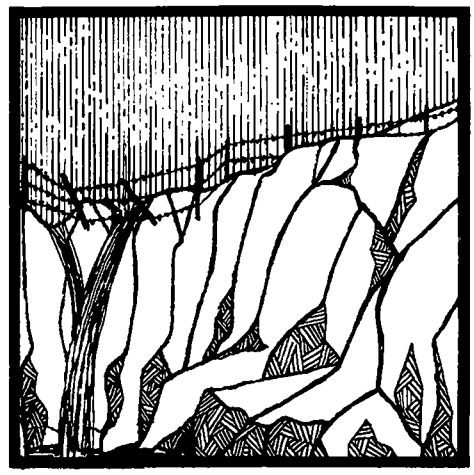
Dayle E. Williamson
Executive Secretary

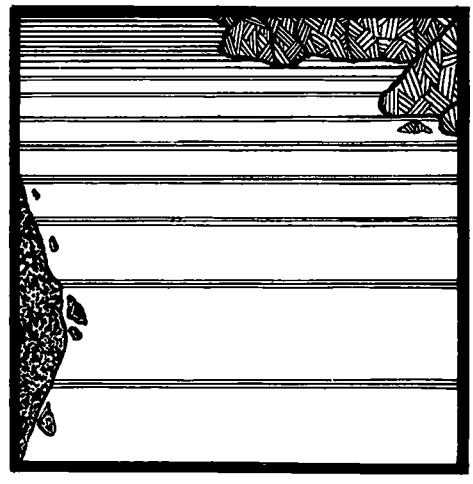
NEBRASKA
NATURAL RESOURCES COMMISSION
301 CENTENNIAL MALL SOUTH
P.O. BOX 94876
LINCOLN, NEBRASKA 68509
PHONE: (402) 471-2081

Here is a report produced by the State Water Planning and Review Process. We hope you find it informative and useful.

Dayle E. Williamson
Executive Secretary

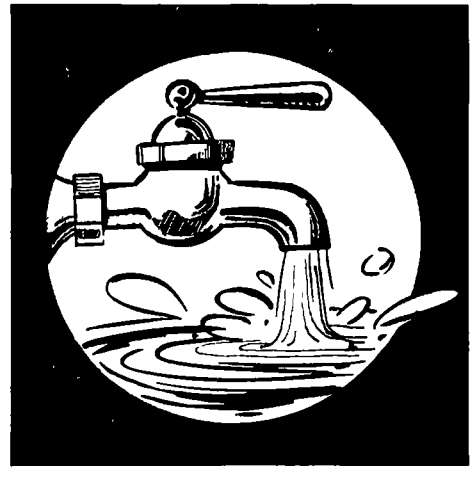






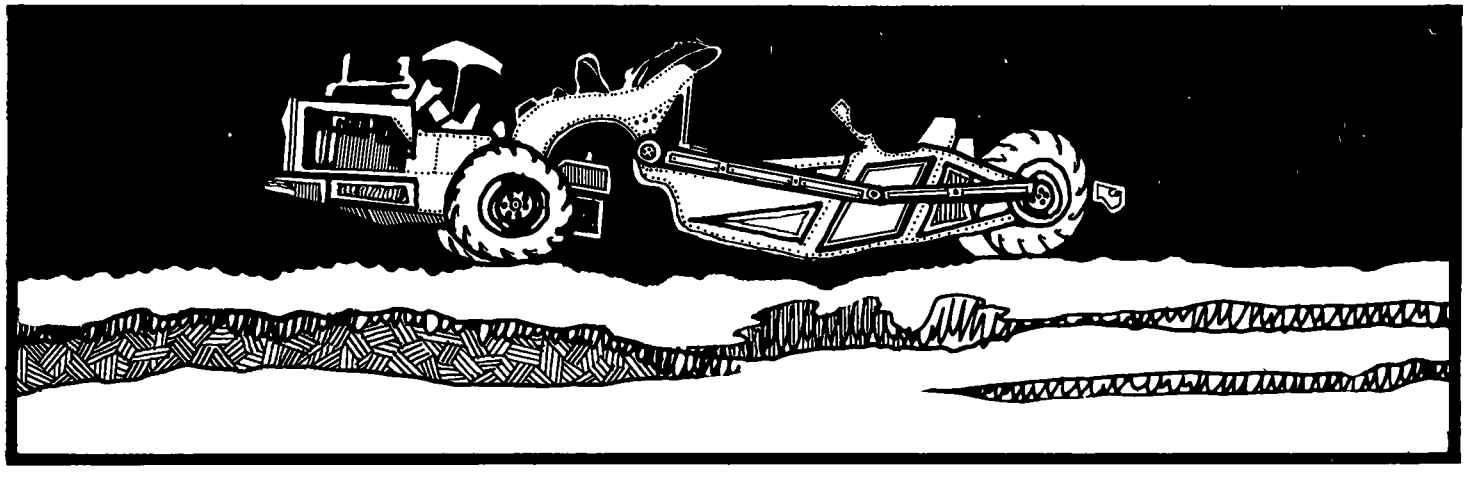
POLICY ISSUE STUDY ON

WATER QUALITY



State Water Planning and Review Process
Nebraska Natural Resources Commission

MARCH 1980



POLICY ISSUE STUDY ON WATER QUALITY

State Water Planning and Review Process

Nebraska Natural Resources Commission

March 1980

TABLE OF CONTENTS

	Page
Introduction	iii
Organization of Report	vi
Recommendations of Natural Resources Commission	vii
Highest Priority Recommendations of Natural Resources Commission	ix
Summary of Alternatives	x
Alternatives for Selected Problems	1
1. Agricultural Runoff	2
2. Leaching of Nitrates, Pesticides, and Other Chemicals Into the Groundwater	19
3. Improper Operation and Maintenance of Wastewater Treatment Plants and Insufficient Operator Training	25
4. Roadside Erosion	29
5. Streambank Erosion	35
6. Irrigation Return Flows	44
7. Construction Site Runoff	51
8. Urban Runoff	55
9. Residual Waste Disposal Site Contamination of Surface and Groundwater and Land Application of Wastewater Effluent and Sludge	60
10. Feedlots	61
11. Septic Tanks	62
12. Effects of Reduction of Quantity on Surface Water Quality	68
13. Siting, Drilling, Casing, Sealing, and Plugging of Private Water Wells (Domestic including Stock, Irrigation, and Industrial)	72
14. Contamination of Groundwater by Insecticides, Herbicides, Trace Metals, and Drugs	74
15. Runoff and Leaching from Solid Waste Disposal Sites Managed by Small Communities	76

Page

16. Separation Distances Between Potable Water Wells and Point Sources of Contamination. 78

17. Improper Storage of Chemicals and Petroleum. 80

18. Expansion of Enforcement Program Relating to Truck Washes, Fertilizer and Pesticide Washdown Facilities. 84

19. Spillage or Leakage of Petroleum Products and Designated Hazardous Substances. 86

References R-1

Appendix 1. Agencies on Water Quality Task Force. A-1

Appendix 2. Description of State Water Planning and Review Process. A-2

Introduction

This report was developed by the interagency task force on water quality for consideration by the Natural Resources Commission. It was revised by the Natural Resources Commission for use by the Legislature and Governor. The work is part of the ongoing State Water Planning and Review Process organized in 1978 and 1979 by the Legislature, the Governor, the Natural Resources Commission, and the other state agencies and university departments with responsibilities related to water.

Statement of the Issue

This policy study is to address ways to protect water quality so the water will be suitable for use by the people of Nebraska. The report lists and evaluates the alternatives available.

This particular policy study presents both legislative and non-legislative alternatives which may be used to address water quality problems. Those options which would require legislative action are identified both in the summary of alternatives and in the text on each alternative.

The alternatives presented are technically viable but may not be economically or politically feasible.

It is possible none of the alternatives would be selected and implemented for a particular problem. The outlook in that case is described in the introductory material for that problem.

Language "could" rather than "should" is used throughout the section on alternatives to emphasize the alternatives are not recommendations. Language "would" rather than "may" is used where possible.

Present Policies

The water quality policy for the State of Nebraska is set forth in the Nebraska Environmental Protection Act (The Act) which states that it shall be the policy of the state to conserve water in this state and to protect and improve the quality of water for human consumption, wildlife, fish and other aquatic life, industry, recreation and other productive beneficial uses.

The Act also established the Department of Environmental Control to carry out the policies of the Act and the national policies as presented in the Federal Clean Water Act. It is national policy that: 1) the discharge of toxic pollutants be prohibited, 2) federal assistance be provided to construct publicly owned waste treatment works, and 3) areawide waste treatment management planning processes be developed and implemented to assure adequate control of sources of pollution.

The goals to which these policies are directed are to eliminate the discharge of pollutants into the waters of the nation, and to achieve, wherever attainable, fishable and swimmable waters.

It is the policy of the state, through the Department of Environmental Control to establish water quality standards and to attain these standards, to disallow the degradation of water quality below existing quality or to a level which would preclude the use of the water for its existing benefits, to require dischargers to comply with specified limitations, to monitor the quality of the state's water, to monitor the compliance of dischargers, to seek voluntary compliance in the administration of water quality programs and to involve the citizens, interest groups and other governmental entities in the development of programs and strategies to restore, preserve and enhance water quality.

The general policy regarding protection of water quality has emphasized the correction of point source pollution discharges first. Emphasis and attention is now shifting gradually to include control or reduction of pollution from nonpoint sources as well.

Background in Nebraska

Several plans for management and protection of water quality have been made in the last ten years, the most recent being the Section 208 Water Quality Management Plan for the State of Nebraska, July, 1979.

The 208 plan was prepared over a three-year planning period, at a cost of one million dollars. Many alternatives to improve water quality were considered; some were recommended and some rejected. Over three hundred people participated on advisory committees, and over one hundred public meetings were held during this process. The 208 plan as approved by the Natural Resources Commission has been forwarded to the Governor, and the Governor has certified, conditionally certified (modified), or disapproved each recommendation.

Most but not all the alternative methods of protecting water quality that were considered in the 208 planning process were included in this policy study. Some of the measures are already being carried out.

The quality of Nebraska's water is generally good in comparison to national water quality levels. Surface water quality is improving as point sources of pollution are brought under treatment. However, problems exist. One problem is a buildup of nitrate in groundwater in some areas. Many studies have been made of water quality, yet data are still lacking about some problems, and some decisions must be tentative until more data are available.

Relation to Other Policy Issues

Several other issues, such as instream flows, groundwater management, and water rights, are being studied under the Policy Issue Analysis activity of the State Water Planning and Review Process. Water quality is related to each of these, as any management program dealing with either quality or quantity of water will inevitably affect the other. These policy issue analyses will together analyze the effects of the options available regarding Nebraska's policies for water management.

In two cases, alternatives mentioned in this study are to be analyzed in other policy studies. Alternatives concerning legislative action to protect streamflow and augmentation of streamflow are listed in the section on the effects of reduction of quantity on surface water quality. Legislative action to protect streamflow will receive full consideration in the instream flow policy issue study. Augmentation of streamflow will be considered in the supplemental water supply policy issue study.

Organization of Report

The recommendations of the Natural Resources Commission are located in the front of the report. The comments of the Interagency Water Coordinating Committee and Public Advisory Board are not included in the report, but will accompany it.

The summary of alternatives (green pages) indicates which alternatives involve legislative action.

The body of the report details the nineteen water quality problems studied. Each section includes a statement of the problem including what will happen if no alternatives are implemented, list of the alternatives studied, and description of each alternative.

A list of references, list of agencies on the water quality task force, and description of the State Water Planning and Review Process are provided.

Recommendations of Natural Resources Commission

The following alternatives are recommended by the Natural Resources Commission for implementation. In selecting these recommendations, the Commission has considered all comments received during this planning process, and the earlier 208 planning process.

We would point out that alternatives 1 under agricultural runoff, leaching of nitrates, and irrigation return flows (the first three educational alternatives) have been modified to agree with the Governor's conditional certification of the 208 plan; however, we believe the educational program should be a joint effort with the participation of the natural resources districts.

Agricultural Runoff
- Alt. 1, page 4
- Alt. 3, page 6
- Alt. 5d, page 16

Leaching of Nitrates, Pesticides, and Other Chemicals Into the Groundwater
- Alt. 1, page 20
- Alt. 2, page 21
- Alt. 3, page 22

Improper Operation and Maintenance of Wastewater Treatment Plants and Insufficient Operator Training
- Alt. 1, page 26
- Alt. 2, page 27
- Alt. 3, page 28

Roadside Erosion
- Alt. 3, page 32
- Alt. 4, page 33

Streambank Erosion
- Alt. 1, page 36
- Alt. 3, page 38
- Alt. 8, page 43

Irrigation Return Flows
- Alt. 1, page 45
- Alt. 2, page 46

Construction Site Runoff
- Alt. 1, page 52

Urban Runoff
Alt. 1, page 56

Residual Waste Disposal Site Contamination of Surface and Groundwater and Land Application of Wastewater Effluent and Sludge
None

Feedlots
None

Septic Tanks
Alt. 1, page 63
Alt. 2, page 64
Alt. 3, page 65

Effects of Reduction of Quantity on Surface Water Quality
None

Siting, Drilling, Casing, Sealing, and Plugging of Private Water Wells (Domestic including Stock, Irrigation, and Industrial)
Alt. 1, page 73

Contamination of Groundwater by Insecticides, Herbicides, Trace Metals, and Drugs
Alt. 1, page 75

Runoff and Leaching from Solid Waste Disposal Sites Managed by Small Communities
Alt. 1, page 77

Separation Distances Between Potable Water Wells and Point Sources of Contamination
Alt. 1, page 79

Improper Storage of Chemicals and Petroleum
Alt. 1, page 81
Alt. 2, page 82

Expansion of Enforcement Program Relating to Truck Washes, Fertilizer and Pesticide Washdown Facilities
Alt. 1, page 85

Spillage or Leakage of Petroleum Products and Designated Hazardous Substances
Alt. 1, page 87

Highest Priority Recommendations of Natural Resources Commission

The following alternatives are the highest priority recommendations of the Natural Resources Commission, not necessarily listed in order of priority.

Agricultural Runoff
Alt. 5d, page 16

Leaching of Nitrates, Pesticides, and Other Chemicals Into the Groundwater
Alt. 3, page 22

Improper Operation and Maintenance of Wastewater Treatment Plants and Insufficient Operator Training
Alt. 3, page 28

Siting, Drilling, Casing, Sealing, and Plugging of Private Water Wells (Domestic including Stock, Irrigation, and Industrial)
Alt. 1, page 73

Runoff and Leaching from Solid Waste Disposal Sites Managed by Small Communities
Alt. 1, page 77

Summary of Alternatives

Problem 1. Agricultural Runoff

Alternative 1. Continue the Expanded Educational Program, page 4
(Legislative Action)

Alternative 2. Adopt a State Goal for Nonpoint Pollution Control, page 5

Alternative 3. Promote the Project Area Approach, page 6

Alternative 4. Establish State Cost Share Fund For Control of Surface and Groundwater Pollution from Agricultural Activities, page 7
(Legislative Action)

Alternative 5. Strengthen and Encourage the Utilization of Statutory Provisions Relating to Mandatory Conservation, page 8
(Legislative Action)

Alternative 5a. Establish a Complaint System to Reduce Excessive Sedimentation, page 12
(Legislative Action)

Alternative 5b. Establish Natural Resources District Sediment and Erosion Control Authority, page 14
(Legislative Action)

Alternative 5c. Require Mandatory Complaince with Cost Sharing Assistance at 90 Percent of Actual Cost, page 15
(Legislative Action)

Alternative 5d. Authorize Natural Resources Districts to Require Conservation Planning and Implementing in Water Quality Problem Areas Upon Guarantee of 75 Percent Cost Share, and Establish State Cost Share Fund for Practices Needed to Protect Surface and Groundwater from Pollution Due to Agricultural Activities, page 16
(Legislative Action)

Alternative 6. Establish Land Conservation Tax Plan, page 18
(Legislative Action)

Problem 2. Leaching of Nitrates, Pesticides, and Other Chemicals Into the Groundwater

Alternative 1. Continue the Expanded Educational Program, page 20
(Legislative Action)

Alternative 2. Clarify and Strengthen the Law Regarding Backflow Preventive Devices on Groundwater Irrigation Systems, page 21
(Legislative Action)

Alternative 3. Provide Authority to Establish Groundwater Quality Control Areas, page 22
(Legislative Action)

Alternative 4. Grant Natural Resources Districts Authority to Restrict Application of Nitrogen During Fall and Winter Months, page 24
(Legislative Action)

Problem 3. Improper Operation and Maintenance of Wastewater Treatment Plants and Insufficient Operator Training

Alternative 1. Promote Circuit Wastewater Treatment Plant Operators, page 26

Alternative 2. Require Sanitary and Improvement Districts To Provide for Wastewater Treatment System Operation and Maintenance, page 27

Alternative 3. Require Wastewater Treatment Plant Operator Training and Certification, page 28
(Legislative Action)

Problem 4. Roadside Erosion

Alternative 1. Revise State Law Regarding Agricultural Cultivation of Roadways, page 30
(Legislative Action)

Alternative 2. Local Subdivisions of Government Share Roadside Seeding Equipment, page 31

Alternative 3. Establish a Recommended Back Slope for Rural Roads, page 32

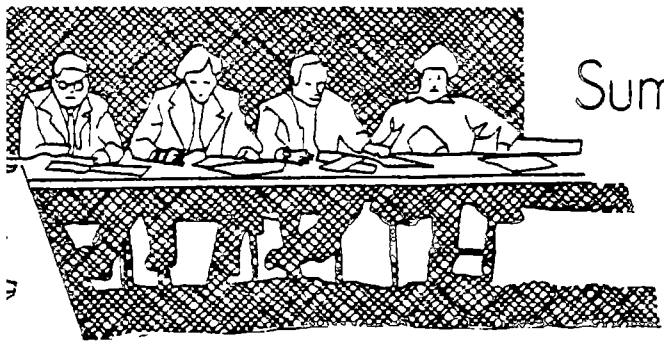
Alternative 4. Require Seeding Along New and Reconstructed Roads, page 33

Alternative 5. Revise State Law Regarding Rural Roads Under the Jurisdiction of Townships, page 34
(Legislative Action)

Problem 5. Streambank Erosion

Alternative 1. Promote Riparian Lands Protection, page 36

Alternative 2. State Assume Responsibility of Section 404 Permit Program, page 37
(Legislative Action)



Summary of Alternatives

Problem 1. Agricultural Runoff

Alternative 1. Continue the Expanded Educational Program, page 4
(Legislative Action)

Alternative 2. Adopt a State Goal for Nonpoint Pollution Control, page 5

Alternative 3. Promote the Project Area Approach, page 6

Alternative 4. Establish State Cost Share Fund For Control of Surface and Groundwater Pollution from Agricultural Activities, page 7
(Legislative Action)

Alternative 5. Strengthen and Encourage the Utilization of Statutory Provisions Relating to Mandatory Conservation, page 8
(Legislative Action)

Alternative 5a. Establish a Complaint System to Reduce Excessive Sedimentation, page 12
(Legislative Action)

Alternative 5b. Establish Natural Resources District Sediment and Erosion Control Authority, page 14
(Legislative Action)

Alternative 5c. Require Mandatory Complaince with Cost Sharing Assistance at 90 Percent of Actual Cost, page 15
(Legislative Action)

Alternative 5d. Authorize Natural Resources Districts to Require Conservation Planning and Implementing in Water Quality Problem Areas Upon Guarantee of 75 Percent Cost Share, and Establish State Cost Share Fund for Practices Needed to Protect Surface and Groundwater from Pollution Due to Agricultural Activities, page 16
(Legislative Action)

Alternative 6. Establish Land Conservation Tax Plan, page 18
(Legislative Action)

Problem 2. Leaching of Nitrates, Pesticides, and Other Chemicals Into the Groundwater

Alternative 1. Continue the Expanded Educational Program, page 20
(Legislative Action)

Alternative 2. Clarify and Strengthen the Law Regarding Backflow Preventive Devices on Groundwater Irrigation Systems, page 21
(Legislative Action)

Alternative 3. Provide Authority to Establish Groundwater Quality Control Areas, page 22
(Legislative Action)

Alternative 4. Grant Natural Resources Districts Authority to Restrict Application of Nitrogen During Fall and Winter Months, page 24
(Legislative Action)

Problem 3. Improper Operation and Maintenance of Wastewater Treatment Plants and Insufficient Operator Training

Alternative 1. Promote Circuit Wastewater Treatment Plant Operators, page 26

Alternative 2. Require Sanitary and Improvement Districts To Provide for Wastewater Treatment System Operation and Maintenance, page 27

Alternative 3. Require Wastewater Treatment Plant Operator Training and Certification, page 28
(Legislative Action)

Problem 4. Roadside Erosion

Alternative 1. Revise State Law Regarding Agricultural Cultivation of Roadways, page 30
(Legislative Action)

Alternative 2. Local Subdivisions of Government Share Roadside Seeding Equipment, page 31

Alternative 3. Establish a Recommended Back Slope for Rural Roads, page 32

Alternative 4. Require Seeding Along New and Reconstructed Roads, page 33

Alternative 5. Revise State Law Regarding Rural Roads Under the Jurisdiction of Townships, page 34
(Legislative Action)

Problem 5. Streambank Erosion

Alternative 1. Promote Riparian Lands Protection, page 36

Alternative 2. State Assume Responsibility of Section 404 Permit Program, page 37
(Legislative Action)

Alternative 3. Revise State Legislation Regarding Permits for Proposed Channel Modifications, page 38
(Legislative Action)

Alternative 4. Promote Accelerated Land Treatment and Watershed Protection, page 39

Alternative 5. Discourage Land Clearing and Cultivation near Streambanks, page 40

Alternative 6. Encourage Proper Disposal of Dead Trees and Other Vegetation, page 41

Alternative 7. Prepare Model Riparian Lands Zoning Ordinance, page 42

Alternative 8. Request Appropriate Federal Agencies to Study Possible Corrective Measures in Problem Areas, page 43

Problem 6. Irrigation Return Flows

Alternative 1. Continue the Expanded Educational Program, page 45
(Legislative Action)

Alternative 2. Regulate Surface Water Irrigation Return Flows, page 46
(Legislative Action)

Alternative 3. Establish Surface Irrigation Water User's Fee, page 47
(Legislative Action)

Alternative 4. Require Permit for Drilling Irrigation Wells, page 48
(Legislative Action)

Alternative 5. Require Permit to Develop an Irrigation System, page 49
(Legislative Action)

Alternative 6. Reduce the Amount of Water That Can Be Diverted Per Acre of Cropland, page 50
(Legislative Action)

Problem 7. Construction Site Runoff

Alternative 1. Encourage Local Governments to Require Construction Site Runoff Control, page 52

Alternative 2. Inform Owners and Developers About Best Management Practices, page 53

Alternative 3. Establish Mandatory Construction Site Runoff Control Rules and Regulations, page 54
(Legislative Action)

Problem 8. Urban Runoff

Alternative 1. Cities and Counties Evaluate Urban Runoff Pollution, page 56

Alternative 2. Informational Program for Urban Runoff Control, page 57

Alternative 3. Prepare Model Ordinances for Urban Runoff Control, page 58

Alternative 4. Require Mandatory Urban Runoff Control Programs, page 59
(Legislative Action)

Problem 9. Residual Waste Disposal Site Contamination of Surface and Groundwater and Land Application of Wastewater Effluent and Sludge

No alternatives are offered as existing authorities are adequate.

Problem 10. Feedlots

No alternatives are offered as existing authorities are adequate.

Problem 11. Septic Tanks

Alternative 1. Continue the Expanded Educational Program, page 63
(Legislative Action)

Alternative 2. License Septic Tank Manufacturers, Installers, and Pumpers, page 64
(Legislative Action)

Alternative 3. Cities and Counties Adopt Septic Tank Permit Programs, page 65

Alternative 4. Contact and Assist the Recreational Associations of Development Areas Along Lakes and Streams Regarding Septic System Installation and Maintenance, page 66

Alternative 5. State Require a Permit to Install a Septic Tank System, page 67
(Legislative Action)

Problem 12. Effects of Reduction of Quantity on Surface Water Quality

Alternative 1. Legislative Action to Protect Streamflows, page 70
(Legislative Action)

Alternative 2. Augment Streamflows, page 71

Problem 13. Siting, Drilling, Casing, Sealing, and Plugging of Private Water Wells (Domestic including Stock, Irrigation, and Industrial)

Alternative 1. Require the Licensing or Certification of Well Drillers and Pump Installation Contractors, page 73
(Legislative Action)

Problem 14. Contamination of Groundwater by Insecticides, Herbicides, Trace Metals, and Drugs

Alternative 1. Determine the Extent of the Problem, page 75
(Legislative Action)

Problem 15. Runoff and Leaching from Solid Waste Disposal Sites Managed by Small Communities

Alternative 1. Expand Current State Authority for Licensing Solid Waste Disposal Sites, page 77
(Legislative Action)

Problem 16. Separation Distances Between Potable Water Wells and Point Sources of Contamination

Alternative 1. Study the Mobility of Various Contaminants in Selected Geologic Environments in Nebraska, page 79
(Legislative Action)

Problem 17. Improper Storage of Chemicals and Petroleum

Alternative 1. Encourage Local Government to Recognize the Potential Hazard, and to Regulate Storage of Chemicals, page 81

Alternative 2. State Develop Guidelines for Storage of Chemicals and Petroleum, page 82

Alternative 3. State Develop Standards and Permit System for Storage of Chemicals and Petroleum, and Delegate Administration of the System to Capable Local Governments, page 83
(Legislative Action)

Problem 18. Expansion of Enforcement Program Relating to Truck Washes, Fertilizer and Pesticide Washdown Facilities

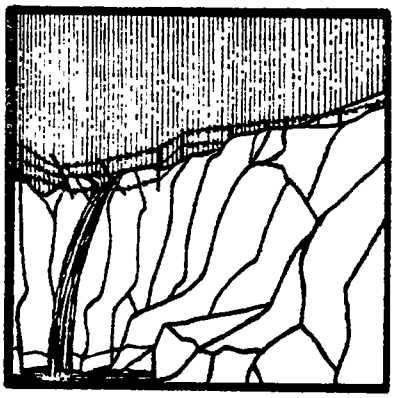
Alternative 1. Expand Existing Programs, page 85

Problem 19. Spillage or Leakage of Petroleum Products and Designated Hazardous Substances

Alternative 1. State Adopt Rules and Regulations Specific to the Spillage, Leakage, Clean-up, and Disposal of Petroleum Products and Hazardous Materials, page 87

Alternatives for Selected Problems

The discussion of each problem begins with a description of how it affects water quality, and the outlook if none of the alternatives are implemented. Alternative approaches to correct that problem are then described and evaluated.



1. Agricultural Runoff

Sediment is the primary pollutant related to agricultural runoff. Through the physical process of water erosion, soil particles are dislodged and transported by water with a fraction of the particles reaching surface waters and being subsequently identified as sediment. Sediment can interfere with the feeding and reproduction of aquatic organisms. It can reduce light penetration into the surface water thereby disrupting the photosynthetic process and reducing vegetative and oxygen production. It can also cause a scouring effect which can damage aquatic plants and organisms existing in a stream. Sediment also acts as a transportation medium for pesticides and fertilizer nutrients that become attached to the soil particles. These chemicals can make the water unfit for its intended uses. Sediment can also reduce the hydraulic efficiency of a stream and increase its potential for flooding.

In Nebraska, sediment affects water quality in almost all areas. The problems vary in kind and severity depending on the soil type, precipitation, type of stream affected, land use near the stream, and the various uses made of the water itself. These problems will continue.

If none of the alternatives are implemented, water quality problems due to agricultural runoff can be expected to get worse due to the economic benefits of intensified farming, irrigation development, conversion of poorer land to production, decreasing federal conservation programs, and increasing costs of conservation work. Factors which may slow the rate of deterioration include high energy prices and development of practices such as conservation tillage.

The alternatives are:

1. Continue the Expanded Educational Program,

2. Adopt a State Goal for Nonpoint Pollution Control,

3. Promote the Project Area Approach,

4. Establish State Cost Share Fund For Control of Surface and Groundwater Pollution From Agricultural Activities,

5. Strengthen and Encourage the Utilization of Statutory Provisions Relating to Mandatory Conservation,

5a. Establish a Complaint System to Reduce Excessive Sedimentation,

5b. Establish Natural Resources District Sediment and Erosion Control Authority,

5c. Require Mandatory Compliance with Cost Sharing Assistance at 90 Percent of Actual Cost,

5d. Authorize Natural Resources Districts to Require Conservation Planning and Implementation in Water Quality Problem Areas Upon Guarantee of 75 Percent Cost Share, and Establish State Cost Share Fund for Practices Needed to Protect Surface and Groundwater from Pollution Due to Agricultural Activities, and

6. Establish Land Conservation Tax Plan.

Alternative 1. Continue the Expanded Educational Program

An expanded educational program to promote voluntary use of best management practices and provide information on the effectiveness, cost, and selection of these practices was organized during 1979; however, only one year's funding was obtained. This program could be revised as necessary and continued as a long term effort. Agricultural runoff is one of the water quality problems that could be addressed.

Management Agency. The program could be conducted under the direction of the Department of Environmental Control. The Department could continue to contract with the University of Nebraska and the natural resources districts for preparation and presentation of educational materials.

Authority. Existing authorities are adequate.

Funding. Funding of $60,000 to $75,000 would be required if the educational program for agricultural runoff is to be continued. Federal funds may be available for a portion of this amount.

Schedule of Implementation. Planning for the second year could begin immediately.

Legislative and Administrative Mechanisms or Changes. Legislation to provide state funds would be needed.

Evaluation of Impacts, Problems, and Opportunities. Many agricultural operators would improve their practices as soon as they are aware of better practices. Some, however, would not be reached by this program or would not alter their practices.

Expansion of the education program was one of the alternatives selected during the 208 planning process. Originally it included the Natural Resources Commission as the management agency, but was modified by the Governor to designate the University of Nebraska Institute of Agriculture and Natural Resources, under the direction of the Department of Environmental Control, as the management agency. The natural resources districts have been involved in such educational work in the past, and the program could suffer if they are excluded.

Alternative 2. Adopt a State Goal for Nonpoint Pollution Control

A state goal could be established for nonpoint pollution control. Compliance with the goal would remain voluntary unless required by contract, legislation, or rules and regulations. The goal could reflect differences across the state. Soil Conservation Service guidelines could be used as a model. The performance criteria would be in terms of such measurable outputs as soil loss, sediment delivery, visual damage, or surface and groundwater quality parameters. Surface water runoff should be delivered to a natural watercourse in a nonerosive manner. Predicted annual soil loss due to water and wind erosion should not exceed the allowable soil loss established for each soil. Nutrient and pesticide applications and the management of irrigation return flows could also be addressed in the goal. Adequate opportunity for public and agency input would be provided before the state goal would be adopted. The goal could be modified as required.

Management Agency. The Natural Resources Commission in cooperation with appropriate federal, state, and local agencies, and the general public would be responsible for the preparation of a state goal for the control of nonpoint pollution. The Natural Resources Commission would be responsible for adoption of this goal.

Authority. Existing authorities are adequate to implement this alternative.

Funding. The responsible agencies would pay the costs of establishing this goal. The estimated costs of this alternative are:

NRC	$5,000

Schedule of Implementation. This alternative could be implemented one year after selection.

Legislative and Administrative Mechanisms or Changes. This would not require legislation.

Evaluation of Impacts, Problems, and Opportunities. Various groups would have to agree on what the goal should be. The goal would be helpful in evaluating agricultural practices, but not every operator will strive to meet the goal. This alternative was selected during the 208 planning process but disapproved by the Governor.

Alternative 3. Promote the Project Area Approach

A significant amount of water pollution due to agricultural runoff originates on relatively small parts of a river basin. A concentrated effort to promote the application of best management practices in these areas would be of considerable benefit to water quality. Areas with water quality problems due to agricultural runoff have been prioritized by watershed. The natural resources districts, in cooperation with appropriate state and federal agencies and committees, could intensify their efforts to promote the application of best management practices in these high-need areas. Existing cost share programs would be used in these project areas, including available natural resources district and state funds. An effort would also be made to acquire project program monies, as from the Watershed Protection and Flood Prevention Program, the Rural Clean Water Program, and any special project programs.

Management Agency. The natural resources districts would be responsible for promoting the project area approach to control agricultural runoff, in cooperation with other federal, state, and local agencies.

Authority. Existing authorities are adequate to implement this alternative.

Funding. The natural resources districts, and to a lesser extent, other state and federal agencies, would have increased administrative costs for the promotion of the project area approach. This alternative could be implemented by additional annual funding of approximately $3,000 per natural resources district, $1,500 for the state, and $2,000 for federal agencies. Public funds for construction and technical support would come from existing cost share programs.

Schedule of Implementation. This promotional effort could begin immediately and continue indefinitely.

Legislative and Administrative Mechanisms or Changes. This would not require legislation.

Evaluation of Impacts, Problems, and Opportunities. This alternative could have a positive impact in many problem areas. An advantage is the program would be managed locally and directed toward the most serious water quality problems in the area. A problem might be that some individuals would not be willing to participate. This alternative was selected during the 208 planning process but modified by the Governor to be based on the most current information of nonpoint source pollution relating to water quality, with the objective of allocating resource expenditures in areas where definite problems exist and where the most benefits would be realized.

Alternative 4. Establish State Cost Share Fund For Control of Surface and Groundwater Pollution From Agricultural Activities

A state cost share fund could be established to provide funds for control of surface and groundwater pollution from agricultural activities. A portion of this fund could be reserved for use in critical problem areas.

Management Agency. The Natural Resources Commission would be responsible for administration of the state cost share fund.

Authority. The Water Conservation Fund could be modified to provide state monies for implementation of the program.

Funding. One million dollars in state funds could be provided for cost sharing for the adoption of best management practices to control surface and groundwater pollution from agricultural activities.

Schedule of Implementation. This alternative could be implemented within one year after approval and funding by the Legislature.

Legislative and Administrative Mechanisms or Changes. Legislation would be required.

Evaluation of Impacts, Problems, and Opportunities. The availability of cost share funds should help farmers to reduce or prevent pollution. However, a considerable amount of money would be needed. This alternative was selected during the 208 planning process but modified by the Governor to be used only in critical water quality areas to derive the most benefits relative to the intent of 208.

Alternative 5. Strengthen and Encourage the Utilization Of Statutory Provisions Relating to Mandatory Conservation

At present, natural resources districts, cities, and counties each possess regulatory authorities which are, in one degree or another, applicable to the water quality and other problems associated with uncontrolled erosion and sedimentation. Originally granted to the soil conservation districts in 1937, the regulatory authorities now possessed by natural resources districts have never been utilized and are, because of the severe restrictions placed upon them, ill suited for practical or effective application. The exercise of these authorities can be made by natural resources districts only upon the affirmative vote of 75 percent of the landowners voting in a referendum. Enforcement authorities are nonexistent when violations occur. In addition, regulations, if adopted, must be applied uniformly to all lands of the same type wherever they appear within the district. This latter limitation does not allow a district to deal with areas where the problems caused by erosion are the most serious.

The responsibilities of municipalities and counties in this regard are essentially untested and are not defined with any specificity. Some larger municipalities presently impose erosion control standards upon construction activities, such as those which occur in new subdivisions. No attempts to control erosion because of agricultural activities within the jurisdictional limits of any municipality are, however, known.

The extent of the authority of counties on this matter is also unclear. There are provisions of county zoning law relating to the designation of agricultural zones and to the purposes for which zoning may occur. These appear to provide at least some authority for erosion control ordinances. As indicated, however, these provisions are extremely general in nature and attempts to rely upon them for significant erosion control efforts would be best preceded by their refinement legislatively.

The Legislature could take action to refine and improve the authorities of natural resources districts, counties, and municipalities directed at the control of erosion or could establish entirely new authorities for such action by a state agency. Within this overall concept a number of separate and individual decisions will have to be made. The major issues which would need to be addressed legislatively are discussed below.

1. Management Agency

   Natural resources districts, counties, and cities are all local entities to which a strengthened program could be assigned, at least in part. It would also be possible for the Legislature to enact new legislation assigning a strengthened program to an existing state agency. One approach would be assignment of various aspects of the program to different entities. For example, a state agency could establish soil loss limits or minimum standards, counties and cities could be given authority over nonagricultural activities, and natural resources districts could assume the responsibility for implementation of the program for agricultural activities and could also provide technical assistance to cities and counties in the administration of their functions.

2. Procedures for Adoption

As any such measures will clearly affect future activities within the managed area, procedures for adoption need to assure meaningful input by and protection to those who would be affected by the measures. At least three overall options are possible in this regard. An approach similar to that presently taken in the natural resources district law could be utilized by requiring that a referendum of landowners only be held. Some constitutionality questions are presented by this option, but it is not clearly unconstitutional. Such constitutionality questions would be eliminated by expanding the referendum to allow the vote of all registered voters within the subject area. A third option would be to utilize the more common procedures presently relied upon by cities, counties, and natural resources districts in carrying out other responsibilities. This would allow adoption of the measures following one or more public hearings by the responsible governing body.

3. Land Area Covered

A determination as to how much land area should be subject to a strengthened program will depend in part upon the objectives of that program. If an objective would be to promote the long-term productivity of the land, it might be necessary for the program to be capable of application to all lands within the governing board's jurisdiction. Options also exist for limiting the application of the program to special areas. These special areas could be either related to existing boundaries, political or natural, or could be problem oriented. For example, if the objective of the strengthened program is solely to enhance water quality, the lands subject to the program could be limited to only those lands upon which the most critical erosion problems exist, or to sensitive areas located near streams.

4. Standards Applied

Two basic options are presented in regard to the overall goals or standards to be applied. The regulatory measures could require either that certain levels of soil loss not be exceeded or that specific types of conservation practices be applied under defined circumstances. Either option, but particularly the latter, would have to recognize the differences in soils, land slopes, and the nature of the activity being conducted, among other variables. Specification of soil loss limits, instead of specific practices, has the advantage of providing substantially greater flexibility to the individual land owner. On the other hand, the second option would allow for easier determination as to whether or not compliance was being achieved.

5. Activities Affected

Decisions will also have to be reached regarding the type of land disturbing activities subject to control. Among the options which are presented are (a) all land disturbing activities, (b) all nonurban land disturbing activities, and (c) specific activities only, such as those resulting from agriculture.

6. Determining Compliance

Simply writing requirements into rules and regulations does little if anything to assure compliance with those provisions. An administrative system of some type would need to be established to follow through on implementation and to identify violators. Because of the very nature of the activities being regulated, this administration will be extremely difficult under any circumstances in a mandatory conservation program. For new activities, such as construction activities or conversion of grass land to crop land, review and approval of plans for such activities could be required in advance of the activity. Attempting to achieve compliance with the regulations for land disturbing activities which were being carried on prior to the effective date of the regulations will be more difficult. One approach which has been utilized in some other states is to require development and implementation of a conservation plan within a specified time frame. Another alternative, a complaint system, could be implemented either as part of an overall program or by itself as the sole administrative measure for compliance. In administering the groundwater runoff regulations required by the Groundwater Management Act, natural resources districts have relied almost exclusively upon the complaint system. It would be easier to implement than the other options presented, but would result in limited compliance with the measures adopted.

7. Enforcement Measures

Whatever administrative measures are adopted for achieving compliance with the provisions, enforcement powers will be needed to deal with noncompliance when identified. Alternatives presented in this regard include the issuance of cease and desist orders and injunctions, the imposition of criminal penalties (monetary or otherwise) and the imposition of civil monetary penalties. As the Legislature cannot delegate the authority to establish crimes, constitutionality problems would be presented by attempts to impose a criminal penalty. It is possible, however, that similar results could be obtained from utilization of the civil penalty approach. Under this option, the violator could be liable for the cost of remedying any private and/or public damages resulting from the violation.

8. Cost Sharing

Some states, like Iowa, have made implementation of their mandatory conservation programs dependent upon availability of public funds for a specific percentage of the cost of the necessary conservation measures. If the same decision were reached in Nebraska the questions which would have to be resolved include the rate of cost sharing required and the types of activities for which that cost sharing would be allowed. For example, it is possible to require the availability of cost sharing only for agricultural land disturbing activities and to make the cost sharing funds available only for those activities.

A large number of possible combinations exist for a strengthened program, depending on how the preceding issues are resolved. Several different examples can be observed from the legislation of those states which have adopted authorization for mandatory conservation measures. Any program developed would have to recognize the differences in topography, precipitation, soils, and other conditions which exist throughout the state. Four possible combinations for a strengthened program are described in alternatives 5a, 5b, 5c, and 5d on the following pages.

Alternative 5a. Establish a Complaint System to Reduce Excessive Sedimentation

State statutes could be modified by establishing a complaint system to provide recourse for damages caused by sediment from soil erosion. A state performance standard would be established to define limits for soil erosion. The injured party would be able to file a complaint in writing with the natural resources district. The district would make an inspection to determine if (a) the damages are, in fact, occurring as charged in the complaint and (b) erosion is occurring in excess of the state performance standard for soil erosion. If the district finds that the landowner or operator is in violation, he would be notified and placed on a compliance schedule to correct the problem. Cost share assistance could be available and committed to the landowner or operator before requiring mandatory application of best management practices on agricultural land. State cost share funds could be made available to implement this program with a portion of the money reserved for those put on a compliance schedule. Penalties would be established for violation of the compliance schedule.

Management Agency. The natural resources districts would be responsible for managing the complaint system. The Department of Environmental Control, in cooperation with the Natural Resources Commission, would establish the state performance standard for soil erosion. The Natural Resources Commission would be responsible for administration of the state cost share fund.

Authority. State statutes would have to be changed to give natural resources districts authority to require application of best management practices within the complaint system framework. The Water Conservation Fund would have to be modified or a new fund established to provide state monies for implementation of this program.

Funding. Applicable federal and local cost share programs would be used to help landowners or operators pay for best management practices as required under this program. State funds would supplement these funds. The complaint system may increase the demand for Agricultural Conservation Program funds. Natural resources district administrative costs to implement this recommendation may be significant. The yearly state and local cost to implement the complaint system, including administration, and for land treatment done under a compliance schedule or done voluntarily, is estimated to be:

State Cost Share Program	$1,000,000
NRD Administration	50,000
SCS Technical Assistance	100,000
Landowner Costs	500,000

Schedule of Implementation. This alternative could be implemented within one year after approval and funding by the Legislature.

Legislative and Administrative Mechanisms or Changes. Legislation would be required.

Evaluation of Impacts, Problems, and Opportunities. Positive impacts include abating obvious agricultural runoff problem areas. Negative aspects include the probability of some unjustified complaints, and reluctance of local officials to regulate their neighbors' activities. This alternative was rejected during the 208 planning process, primarily because of concern about complaints against neighbors.

Alternative 5b. Establish Natural Resources District Sediment and Erosion Control Authority

State statutes could be amended to provide natural resources districts with the authority to adopt and enforce sediment and erosion control rules and regulations governing the management of land within the district in the interest of conserving soil and water resources and preventing or reducing water pollution from sediment. A state performance standard could be established to define limits for soil erosion. In natural resources districts that elect to adopt and enforce sediment and erosion control rules and regulations, municipal, county, and state regulations could take precedence if the latter regulations are in conformance with the state performance standard. State cost share funds could be made available to implement this program with a portion of the money reserved for landowners or operators found in violation.

Management Agency. The natural resources districts would be responsible for implementation of the sediment and erosion control authority. Utilization of this authority would be at the discretion of the natural resources districts. The Department of Environmental Control, in cooperation with the Natural Resources Commission, would establish the state performance standard for soil erosion. The Natural Resources Commission would be responsible for administration of the state cost share fund.

Authority. State statutes would have to be modified to give natural resources districts authority to adopt and enforce sediment and erosion control rules and regulations.

Funding. Applicable federal and local cost share programs would be used to help landowners or operators pay for nonpoint source pollution control measures. State funds would be used to supplement these funds. As natural resources districts would not be required to implement this authority, total costs cannot be estimated. One million dollars in state funds could be provided for cost sharing on conservation practices.

Schedule of Implementation. This alternative could be implemented within two years after approval and funding by the Legislature.

Legislative and Administrative Mechanisms or Changes. Legislative action would be required.

Evaluation of Impacts, Problems, and Opportunties. Positive impacts include the possibility of considerable progress in dealing with pollution caused by agricultural runoff. Negative aspects include the need for rules and regulations, the administrative costs, and the likelihood of an inconsistent program across the state. This alternative was rejected during the 208 planning process, as people were not convinced it was necessary.

Alternative 5c. Require Mandatory Compliance with Cost Sharing Assistance at 90 Percent of Actual Cost

All areas identified by the natural resources districts to be causing water pollution problems could be required to have a conservation plan prepared by the landowner or operator. He could have a period (perhaps 10 years) to carry out his complete plan. A state performance standard for control of nonpoint sources of water pollution could be established. In addition to being guaranteed cost sharing to establish the minimum necessary land treatment at 90 percent of actual cost, a landowner could receive a payment for taking land out of production while the land treatment was being installed. State cost share funds could be made available to implement this alternative. Penalties, including fines, would be established for noncompliance.

Management Agency. The natural resources districts would enforce the requirement to have a conservation plan. The Agricultural Stabilization and Conservation Service and natural resources districts would distribute the cost sharing funds for installing the best management practices. The natural resources districts would be responsible for developing the conservation plan with assistance from the Soil Conservation Service. The Natural Resources Commission would act as a coordinating agency and administer any state funds involved. Changes in federal policy may also be needed.

Authority. Present authorities are not adequate to conduct this program.

Funding. Applicable federal and local cost share programs would be used for necessary conservation work. State funds could be used to supplement these funds. The cost of the conservation work would be high, and cannot be estimated at this time. Administrative and implementation costs of this alternative would also be high.

Schedule of Implementation. This alternative could be implemented within two years after approval and funding by the Legislature.

Legislative and Administrative Mechanisms or Changes. Legislation would be needed.

Evaluation of Impacts, Problems, and Opportunities. This would be a high cost regulatory program. There would be public support for the goals being pursued, but many people would resist mandatory conservation planning. A long time would have to be allowed for implementation. Present levels of funding for conservation work would not come close to supporting this program. This alternative was rejected during the 208 planning process, because of the mandatory aspects. The 90 percent cost share rate was also rejected in favor of a 75 percent rate.

Alternative 5d. Authorize Natural Resources Districts to Require Conservation Planning and Implementation in Water Quality Problem Areas Upon Guarantee of 75 Percent Cost Share, and Establish State Cost Share Fund for Practices Needed to Protect Surface and Groundwater from Pollution Due to Agricultural Activities

All areas identified by a natural resources district, and confirmed by the Department of Environmental Control, to be causing a water pollution problem could be required to have a conservation plan prepared by the landowner or operator. Implementation of the plan could be required upon guarantee of 75 percent of the actual cost being paid from public funds.

A complaint system could be used as one method of enforcement.

A state cost share fund could be established to provide funds for cost sharing on practices to protect surface and groundwater from pollution due to agricultural activities. A portion of the fund could be reserved for use in designated water quality problem areas.

Management Agency. Those natural resources districts that elect to take part in the program could handle the local aspects. They could be assisted by the Department of Environmental Control. The Natural Resources Commission would administer the state cost share fund.

Authority. Present authorities are not adequate to conduct the mandatory aspects of this program.

Funding. The Water Conservation Fund could be modified to provide state monies for implementation. All applicable federal and local cost share programs would be used to help landowners or operators pay for practices required or recommended under this program. State funds would supplement these funds. This program may increase the demand for Agricultural Conservation Program funds.

The annual cost is estimated to be:

State Cost Share Program	$1,000,000
NRD Administration	50,000
DEC Administration	10,000
SCS Technical Assistance	100,000
Landowner Costs	500,000

Schedule of Implementation. This alternative could be implemented within one year after approval and funding by the Legislature.

Legislative and Administrative Mechanisms or Changes. Legislation would be required.

Evaluation of Impacts, Problems, and Opportunities. There would be public support for the goals being pursued. The availability of more cost share funds should help owners and operators reduce or prevent pollution in problem areas.

There would be some resistance to the mandatory aspects of the program. A considerable amount of time and money would be needed. Some natural resources districts may not participate.

Alternative 6. Establish Land Conservation Tax Plan

Each acre of land not adequately treated to protect against erosion and causing a water pollution problem could be taxed for conservation. For example, Class II land not treated could be taxed $1/acre, Class III $3/acre, etc. The tax collected could be redistributed to farmers through a cost sharing program to apply best management practices on the land. The natural resources districts would identify the areas not adequately treated to protect against water quality degradation.

Management Agency. The county treasurers would be responsible for collecting the tax from landowners, and the natural resources districts would redistribute the tax collected through the cost sharing program. Technical assistance for this conservation work would be provided by the natural resources districts.

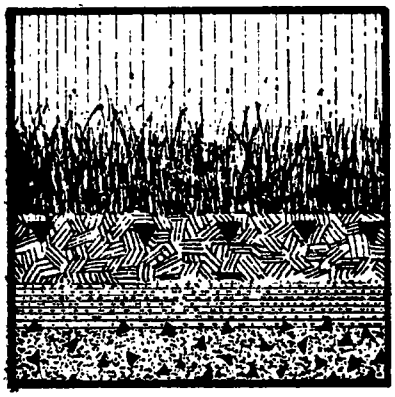
Authority. Existing authorities are not adequate to conduct this program.

Funding. This alternative would be designed to generate revenue from the conservation tax. This would be a high cost alternative, both for administration and implementation. Total costs cannot be estimated at this time.

Schedule of Implementation. This alternative could be implemented within two years after approval and funding by the Legislature.

Legislative and Administrative Mechanisms or Changes. Legislation would be required.

Evaluation of Impacts, Problems, and Opportunities. The foremost negative aspect would be the extensive amount of resources (both financial and personnel) required to implement and enforce this alternative. A positive impact would be a considerable accumulation of funds for abating nonpoint pollution. This alternative was rejected during the 208 planning process as being expensive and difficult to administer.



2. Leaching of Nitrates, Pesticides, and Other Chemicals Into the Groundwater

As water moves through the soil profile, it dissolves water soluble chemicals. These chemicals, including salts, nutrients, and pesticides, can be carried to the groundwater and can contaminate the groundwater supply so as to make it unfit for its intended uses. Of particular concern is the presence of nitrates in groundwater drinking supplies. Nitrates may endanger human and animal health.

Nitrates are already a public health problem in some areas of Nebraska, particularly the Central Platte and Holt County areas, and they are expected to increase. More areas of the state, especially areas with sandy soils and irrigation development, are expected to develop a nitrate problem. If none of the alternatives are implemented, the only factors which may slow this worsening situation are the high prices of fertilizer, energy, and equipment.

The alternatives are:

1. Continue the Expanded Educational Program,

2. Clarify and Strengthen the Law Regarding Backflow Preventive Devices on Groundwater Irrigation Systems,

3. Provide Authority to Establish Groundwater Quality Control Areas, and

4. Grant Natural Resources Districts Authority to Restrict Application of Nitrogen During Fall and Winter Months.

Alternative 1. Continue the Expanded Educational Program

An expanded educational program to promote voluntary use of best management practices and provide information on the effectiveness, cost, and selection of these practices was organized during 1979; however, only one year's funding was obtained. This program could be revised as necessary and continued as a long term effort. Leaching of nitrates, pesticides, and other chemicals into the groundwater is one of the water quality problems that could be addressed.

Management Agency. The program could be conducted under the direction of the Department of Environmental Control. The Department could continue to contract with the University of Nebraska and the natural resources districts for preparation and presentation of educational materials.

Authority. Existing authorities are adequate.

Funding. Funding of $60,000 to $75,000 would be required if the educational program for leaching of nitrates, pesticides, and other chemicals is to be continued. Federal funds may be available for a portion of this amount.

Schedule of Implementation. Planning for the second year could begin immediately.

Legislative and Administrative Mechanisms or Changes. Legislation to provide state funds would be needed.

Evaluation of Impacts, Problems, and Opportunities. This alternative could be very important in farmers' efforts to prevent pollution from chemicals. The only negative aspect is some people would not use the information.

Expansion of the educational program was one of the alternatives selected during the 208 planning process. Originally it included the Natural Resources Commission as the management agency, but was modified by the Governor to designate the University of Nebraska Institute of Agriculture and Natural Resources, under the direction of the Department of Environmental Control, as the management agency. The natural resources districts have been involved in such educational work in the past, and the program could suffer if they are excluded.

Alternative 2. Clarify and Strengthen the Law Regarding Backflow Preventive Devices on Groundwater Irrigation Systems

State statutes regarding backflow preventive devices on groundwater irrigation systems through which fertilizers or pesticides are applied, Section 46-612.01, could be modified to establish minimum standards for acceptable devices and establish stronger penalties to help insure compliance. A well not in conformance with Section 46-612.01 as presently written is declared to be an illegal well by Section 46-657(8) of the Groundwater Management Act. Pursuant to this act natural resources districts have authority to issue cease and desist orders to restrain the pumping of water from such a well. The natural resources districts could increase their utilization of this authority to help remedy the problem of noncompliance with the law regarding backflow preventive devices.

Management Agency. The Department of Water Resources and the natural resources districts would both be responsible for bringing violations of Section 46-612.01 to the attention of county attorneys. The natural resources districts would be responsible for increasing their efforts to remedy the noncompliance problem by utilizing their power to issue cease and desist orders. The University of Nebraska could assist regarding minimum standards.

Authority. State statutes would have to be modified to clarify and strengthen the existing law regarding backflow preventive devices.

Funding. Costs associated with this alternative include the cost of preparing the legislation and the minimum standards, administration costs, and the cost to the individual for installing the required equipment. Cost estimates for these items are:

Draft Legislation	$1,000
Prepare Standards	$1,000
DWR and NRD Adminstration/yr	$10,000
Per Backflow Prevention System	$150-$600

Schedule of Implementation. This alternative could be implemented within one year after approval by the Legislature.

Legislative and Administrative Mechanisms or Changes. More enforcement could be provided with or without legislation. Legislation would be required to establish minimum standards or to increase the penalty.

Evaluation of Impacts, Problems, and Opportunities. More enforcement and stronger penalties to encourage irrigators violating the law to take quicker action in installing the devices would be a positive aspect. This type of law is difficult to enforce effectively, but is important in protecting the groundwater. This alternative was selected during the 208 planning process when it stated a system of two check valves, one on the well and one on the line from the chemical tank, would be required, but was modified by the Governor to emphasize minimum design criteria in realizing an effective system for backflow prevention and not be specific with regard to the number of check valves needed.

Alternative 3. Provide Authority to Establish Groundwater Quality Control Areas

State statutes could be modified to provide for the establishment of groundwater quality control areas if groundwater quality parameters approach or exceed recommended safe drinking water limits. The procedure for the establishment of groundwater quality control areas would be similar to the procedure for establishment of groundwater quantity control areas provided in the Groundwater Management Act. A program to monitor the groundwater quality in a control area would be established. Within the defined area the use of irrigation water and, to some extent, the use of fertilizer, pesticides, and other chemicals could be regulated. These regulations could include one or more of the following provisions.

(a) Permits for the installation of any new irrigation systems, including the construction of new wells

(b) Meters or other measuring devices on groundwater wells and stream diversions

(c) Well spacing requirements

(d) Limits on the total amount of irrigation water applied

(e) Limits on the length of fields served by gravity irrigation systems

(f) Minimum standards for irrigation systems

(g) A requirement that each irrigator complete an acceptable training course on irrigation scheduling

(h) A requirement that each irrigator in the area purchase and use soil moisture measuring equipment

(i) A requirement that each irrigator implement an irrigation scheduling program that will, to the extent possible, schedule the application of water in amounts which will not move below the root zone

(j) Restrictions on the application of nitrates, or other chemicals of particular concern, during the fall and winter months

(k) A requirement that natural resources districts provide each landowner or operator with copies of current University of Nebraska fertilizer guidesheets.

Management Agency. The initiative to establish a groundwater quality control area would be a responsibility of the natural resources district board of directors. The Department of Water Resources acting in consultation with the Department of Environmental Control would be responsible for the establishment of the groundwater quality control areas, including holding the hearing, determining if a control area should be established, and establishing the boundary. The natural resources districts would establish and administer rules and regulations for the groundwater quality control areas.

Authority. State statutes would have to be modified to give the authority for this program. This could be accomplished by amending the existing Groundwater Management Act or enacting new legislation. Authority to provide supplemental natural resources district funding may be required.

Funding. Costs associated with this recommendation include administrative costs of the Department of Water Resources and affected natural resources districts, and costs of the landowners or operators. The yearly cost for the establishment and administration of groundwater quality control areas cannot be estimated at this time. Administration of groundwater quality control areas would be quite costly. Existing control area administration costs vary from $60,000 to $109,000 per year, and are expected to increase. These costs are now $30 to $115 per square mile per year.

Schedule of Implementation. This alternative could be implemented within one year after approval by the Legislature.

Legislative and Administrative Mechanisms or Changes. Legislation would be required.

Evaluation of Impacts, Problems, and Opportunities. This alternative would provide a strong method of controlling the worst areas of groundwater pollution. It provides local control over the regulations. Some individuals could experience an economic loss due to following the regulations. Such regulations probably could only be approved when the alternatives is public health problems. This alternative was selected during the 208 planning process when it stated the Department of Environmental Control would establish control areas, but was modified by the Governor to make the Department of Water Resources responsible for the establishment of groundwater quality control areas acting in consultation with the Department of Environmental Control.

Alternative 4. Grant Natural Resources Districts Authority to Restrict Application of Nitrogen During Fall and Winter Months

Natural resources districts could be granted authority to restrict application of nitrogen during fall and winter months. Cease and desist orders could be issued to those violating the restrictions. A complaint system could be one means of enforcement.

Management Agency. Those natural resources districts that elect to participate in this program could establish their own restrictions, in consultation with the University of Nebraska, following public hearings.

Authority. The districts do not have adequate authority to do this.

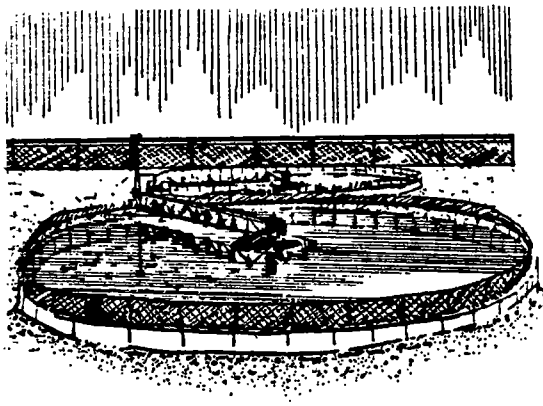
Funding. The cost of establishing such restrictions would be at least $5,000 per district. The cost of enforcement cannot be estimated at this time.

Schedule of Implementation. This alternative could be implemented within one year after approval by the Legislature.

Legislative and Administrative Mechanisms or Changes. Legislation would be required.

Evaluation of Impacts, Problems, and Opportunities. Such restrictions could reduce contamination of groundwater due to leaching of chemicals outside the growing season, in some areas. The benefits would be greater in some years than others.

The restrictions would be difficult to enforce. Some individuals may experience an economic loss due to the restrictions.



3. Improper Operation and Maintenance of Wastewater Treatment Plants and Insufficient Operator Training

The removal of pollutants from wastewater to amounts acceptable for discharge is a relatively complex process. Wastewater treatment systems cannot function correctly without proper operation and maintenance. Therefore, the plant operator must be adequately trained to properly operate and maintain the system.

Improper operation and maintenance and insufficient operator training cause many adequately designed treatment systems in Nebraska to function poorly. This situation will continue, and some treatment works may have to be prematurely abandoned, if none of the alternatives are implemented.

The alternatives are:

1. Promote Circuit Wastewater Treatment Plant Operators,

2. Require Sanitary and Improvement Districts to Provide for Wastewater Treatment System Operation and Maintenance, and

3. Require Wastewater Treatment Plant Operator Training and Certification.

Alternative 1. Promote Circuit Wastewater Treatment Plant Operators

The concept of a circuit wastewater treatment plant operator could be promoted. An adequately trained and certified operator could serve several small wastewater treatment facilities which are in close proximity. This would result in improved operation and efficiency as long as the arrangement was able to deal with the many problems of treatment plant operation. This concept could be promoted by suggesting the sharing of an operator during normal contacts with the communities, particularly when problems with operation and maintenance are discussed.

Management Agency. The Department of Environmental Control could be responsible for promoting the concept of circuit wastewater treatment plant operators. Cities and villages would have the responsibility to enter into agreements with one another and hire a circuit operator. Councils of government and natural resources districts could provide leadership in bringing communities together and initiating such a voluntary program.

Authority. Existing authorities are adequate to implement this alternative.

Funding. The costs of this alternative include that for promotion and, if a circuit operator system is established by communities, salary and administrative costs. The costs could be paid by the responsible agencies; communities sharing an operator would have to arrange to share personnel costs. Costs are estimated to be:

Promotion	$1,000 per year
Operator Salary	$1,200-1,400 per month
Community Administration	$ 100 per month

Schedule of Implementation. This alternative could be implemented immediately and continue indefinitely.

Legislative and Administrative Mechanisms or Changes. This would not require legislation.

Evaluation of Impacts, Problems, and Opportunities. Communities which reach an agreement to pool their resources would be able to employ a competent, full-time operator and save money on repair and replacement of treatment works. This alternative was selected during the 208 planning process.

Alternative 2. Require Sanitary and Improvement Districts To Provide for Wastewater Treatment System Operation and Maintenance

Sanitary and improvement districts are established in unincorporated urban areas to provide any of a number of services including wastewater treatment and disposal. Operation and maintenance of wastewater treatment systems by sanitary and improvement districts have, in some cases, been very poor. In order to help insure that sanitary and improvement districts provide adequate treatment, the county and/or city with authority to approve subdivisions could review a district's plans for operation and maintenance. Sufficient resources could be committed to operation and maintenance before a new development is approved. Also, as communities grow and new treatment systems are required, they could regionalize wastewater treatment, taking this responsibility from the sanitary and improvement districts wherever this proves to be cost effective.

Management Agency. Cities and counties, in using their authority for reviewing applications for subdivision development, would have the responsibility to see that sanitary and improvement districts have sufficient resources committed to operation and maintenance of the wastewater systems in proposed subdivisions. Communities, with assistance from the Department of Environmental Control, would assume the responsibility for wastewater treatment from sanitary and improvement districts as this becomes cost effective.

Authority. Existing authorities are adequate to implement this alternative.

Funding. The cost of the additional subdivision application review would be borne by the cities and counties and would be approximately $100 more per application. Any additional costs of operation and maintenance would have to be paid by the landowners in the districts.

Schedule of Implementation. This alternative could be implemented immediately and continue indefinitely.

Legislative and Administrative Mechanisms or Changes. This would not require state legislation.

Evaluation of Impacts, Problems, and Opportunities. A well maintained and operated wastewater treatment plant will be cheaper in the long run. Additional planning costs would be involved in a regional approach to wastewater treatment. This alternative was selected during the 208 planning process but modified by the Governor to insert the word "certain" in the title before the word sanitary.

Alternative 3. Require Wastewater Treatment Plant Operator Training and Certification

State statutes could be amended to require all wastewater treatment plant operators to be trained and certified. The level of required training should correspond with the size and complexity of the facility.

Management Agency. The Department of Environmental Control would be responsible for enforcing this requirement, including certifying the operators. Training would be provided by those entities that now do so.

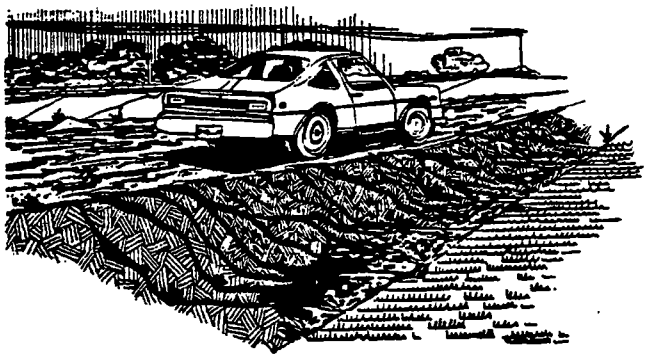
Authority. State statutes would have to be amended to require wastewater treatment plant operator training and certification.

Funding. Department of Environmental Control costs to implement this program would be minimal. Training costs will be from zero to $2,000 per operator. At least one natural resources district participates in funding training of operators from their area.

Schedule of Implementation. This alternative could be implemented within two years after approval by the Legislature.

Legislative and Administrative Mechanisms or Changes. Legislation would be required.

Evaluation of Impacts, Problems, and Opportunities. This would insure that operators of wastewater treatment facilities are trained for the safe and efficient management of these plants. It could increase short term costs as a more qualified plant operator may be required. However, a well maintained and operated plant will be cheaper in the long run. This alternative was selected during the 208 planning process but modified by the Governor to require the Department of Environmental Control to provide to the Governor's office further information concerning the relative merits of such requirements.



4. Roadside Erosion

The major pollutant stemming from roadside erosion is sediment. Through the physical process of water erosion, soil particles are dislodged and transported by water with some of the particles reaching bodies of water. Roadside erosion is accelerated by removing the ground cover for maintenance or construction or by cultivation. Sediment can make the receiving water unfit for fish and wildlife, recreation, and other intended uses.

The roadside erosion problem will continue on roads that do not have a proper backslope or have not been stabilized with vegetation. Although few new roads are being built, more roads will need to be reconstructed in the next few years. If none of the alternatives are implemented, these roads may still have roadside erosion problems, creating safety hazards as well as water quality problems.

The alternatives are:

1. Revise State Law Regarding Agricultural Cultivation of Roadways,
2. Local Subdivisions Of Government Share Roadside Seeding Equipment,
3. Establish a Recommended Back Slope for Rural Roads,
4. Require Seeding Along New and Reconstructed Roads, and
5. Revise State Law Regarding Rural Roads Under the Jurisdiction of Townships.

Alternative 1. Revise State Law Regarding Agricultural Cultivation of Roadways

State Statute 39-703 regarding agricultural activities in rural road right-of-way could be revised to clearly prohibit agricultural cultivation of rural road right-of-way. After action by the Legislature, county attorneys could readily process violations of the statute.

Management Agency. The counties and townships would continue to manage rural roads.

Authority. State Statute 39-703 would have to be revised by the Legislature.

Funding. The cost of this alternative would be less than $1,000.

Schedule of Implementation. This alternative could be implemented within one year after approval by the Legislature.

Legislative and Administrative Mechanisms or Changes. Legislation would be required.

Evaluation of Impacts, Problems, and Opportunities. This alternative would reduce a major cause of roadside erosion. Many people feel they have a right to cultivate the right-of-way because they pay taxes on it and they feel a need to control weeds and other undesirable vegetation. Some tax assessments have been adjusted due to the presence of right-of-way. This alternative was selected during the 208 planning process but disapproved by the Governor.

Alternative 2. Local Subdivisions Of Government Share Roadside Seeding Equipment

Counties and natural resources districts that have the need could purchase roadside seeding equipment such as narrow grass drills, hydroseeders, and mulchers on a voluntary but coordinated basis. The equipment could then be shared by the cooperating entities to their best advantage. The counties and natural resouces districts could be encouraged to consider such arrangements.

Management Agency. The Natural Resources Commission, Nebraska Association of Resources Districts, and Nebraska Association of County Officials would be responsible for promoting this concept. The counties and natural resources districts would be responsible for entering into cooperative agreements for the purchase and use of this equipment.

Authority. Existing authorities are adequate to implement this alternative.

Funding. The responsible agencies would bear the costs associated with this recommendation. Equipment would be the major cost item. Grass drills cost approximately $4,000 to $5,000; mulchers cost approximately $7,000 to $10,000; and hydroseeders cost from $3,000 to $50,000. Costs for promotion may be approximately $500 per year for each agency. Sharing this equipment may result in considerable savings.

Schedule of Implementation. This alternative could be implemented immediately and continue indefinitely.

Legislative and Administrative Mechanisms or Changes. This would not require legislation.

Evaluation of Impacts, Problems, and Opportunities. A sharing arrangement may permit effective erosion control and, at the same time, may reduce cost to local governments below that incurred if localities undertook seeding programs alone. This alternative was selected during the 208 planning process.

Alternative 3. Establish a Recommended Back Slope for Rural Roads

The Nebraska Board of Public Roads Classifications and Standards could change its design standards for back slopes on rural roads. The standards, which currently state that the back slope is variable, could recommend a minimum back slope for rural road construction. The minimum needs to be different for different soils and areas of the state. Compliance by counties and townships would be on a voluntary basis because in some cases this standard would be infeasible. It is felt that this recommended back slope standard would give leverage to counties and townships in their dealings with landowners to acquire adequate right-of-way for road construction and reconstruction.

Management Agency. The Board of Public Roads Classifications and Standards would be responsible for making this change in the standards. Counties and townships would be responsible for compliance on a voluntary basis.

Authority. Existing authorities are adequate to implement this alternative.

Funding. The Board of Public Roads Classifications and Standards would absorb the administrative cost involved with this revision of the standards which is estimated at $250. Counties and townships would bear the implementation costs which would vary depending upon the costs of easements, extra dirt moving, fencing, and labor arrangements.

Schedule of Implementation. The back slope standard could be revised within one year.

Legislative and Administrative Mechanisims or Changes. This would not require legislation.

Evaluation of Impacts, Problems, and Opportunities. This alternative would reduce roadside erosion, and also improve safety conditions. However, since it is optional for counties and townships to abide by the standard, many may not use it. This alternative was selected during the 208 planning process.

Alternative 4. Require Seeding Along New and Reconstructed Roads

The Nebraska Board of Public Roads Classifications and Standards could change its minimum design standards for rural roads to require seeding of all disturbed areas during the reconstruction of a road or the construction of a new road. Physical maintenance activities would not be affected by this change in the standards.

Management Agency. The Board of Public Roads Classifications and Standards would be responsible for making this change in the standards. Counties and townships would be responsible for compliance.

Authority. Existing authorities are adequate to implement this alternative.

Funding. The Board of Public Roads Classifications and Standards would absorb the administrative cost involved with this revision of the standards which is estimated at $250. Counties and townships would bear the costs associated with implementation which would vary depending upon type and amount of seed, fertilizer, and mulch used. This may cost $500 to $1,000 per mile of roadway which is about 4.8 acres. The Game and Parks Commission will pay $150 per mile to reimburse the counties and townships for the cost of seed. Some natural resources districts may also provide financial assistance.

Schedule of Implementation. This revision in the standards could be made within one year.

Legislative and Administrative Mechanisms or Changes. No legislation is necessary. The Board of Public Roads Classifications and Standards can make this change following a public hearing.

Evaluation of Impacts, Problems, and Opportunities. Required seeding is considered an effective means to control roadside erosion and sedimentation. This alternative will result in increased short term costs to local units of government, but it should reduce their long term costs for road maintenance and construction. This alternative was selected during the 208 planning process.

Alternative 5. Revise State Law Regarding Rural Roads Under the Jurisdiction of Townships

Nebraska state law (Chapter 39, Article 15) could be revised to clearly state that township roads must be designed, constructed, and maintained in compliance with rules and regulations administered by the Board of Public Roads Classifications and Standards.

Management Agency. The townships or counties and Board of Public Roads Classifications and Standards would be responsible for implementation of this alternative.

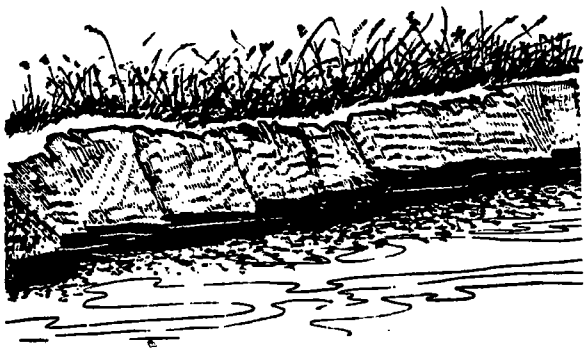
Authority. Authorities to require such compliance are questionable at this time.

Funding. The costs involved with enacting this alternative would be less than $1,000. Implementation costs would be variable. The townships or counties would bear the costs involved with implementation and the Board of Public Roads Classifications and Standards would bear the costs involved with enforcement.

Schedule of Implementation. This alternative could be implemented within two years after approval by the Legislature.

Legislative and Administrative Mechanisms or Changes. Legislative action would be required.

Evaluation of Impacts, Problems, and Opportunities. This alternative would improve township roads. Positive impacts include a reduction in the erosion potential and improved safety conditions. Negative aspects include possible higher construction and maintenance costs. This alternative was rejected during the 208 planning process, primarily due to the cost of bringing township roads up to standards.



5. Streambank Erosion

Streambank erosion is a natural process which is often accelerated by channel straightening or realignment or by clearing of protective cover from banks. Soil particles dislodged from the streambank become sediment in the stream. This sediment can cover the bottom of the stream interfering with feeding and reproduction of aquatic organisms. It can cause a scouring effect which can damage aquatic organisms existing on the stream bottom. It can reduce light penetration into the stream, slowing photosysthesis and reducing vegetative and oxygen production. Other impacts due to sedimentation include loss of reservoir capacity, reduced recreation demand, increased drainage maintenance costs, reduced capacity of waterways, and increased potential for downstream flooding.

If none of the alternatives are implemented, the streambank erosion problem will continue to get worse in certain areas of the state.

The alternatives are:

1. Promote Riparian Lands Protection,
2. State Assume Responsibility of Section 404 Permit Program,
3. Revise State Legislation Regarding Permits for Proposed Channel Modifications,
4. Promote Accelerated Land Treatment and Watershed Protection,
5. Discourage Land Clearing and Cultivation near Streambanks,
6. Encourage Proper Disposal of Dead Trees and Other Vegetation,
7. Prepare Model Riparian Lands Zoning Ordinance, and
8. Request Appropriate Federal Agency to Study Possible Corrective Measures in Problem Areas.

Alternative 1. Promote Riparian Lands Protection

Natural resources districts could encourage landowners to participate in the existing habitat programs administered by the districts and the Game and Parks Commission. The purpose of these programs is protection and development of wildlife habitat but they also serve to protect riparian lands and reduce streambank erosion. Preservation of existing habitat and conversion of marginal lands would be included. This could help to preserve a vegetative strip along streams that would provide additional protection against streambank erosion.

Management Agency. The natural resources districts participating in this program would be responsible for promoting these habitat programs. The Game and Parks Commission and the Natural resources districts would continue to administer the program.

Authority. Existing authorities are adequate to implement this alternative.

Funding. The cost of promoting the program would be minor. The program will continue to be funded by the Game and Parks Commission and participating natural resources districts. Payments under the habitat program are established by the natural resources districts. The Game and Parks Commission provides cost sharing of 75 percent up to a maximum rate as follows:

(a) $25/acre/year under contracts for 3 to 10 years for establishing permanent cover on marginal cropland.

(b) $15/acre/year under 10 year contracts for protecting existing wetlands or areas with mixed woody and herbaceous cover.

(c) $7.50/acre/year under 10 year contracts for protecting herbaceous cover.

Schedule of Implementation. Implementation could begin immediately.

Legislative and Administrative Mechanisms or Changes. This would not require legislation.

Evaluation of Impacts, Problems, and Opportunities. This alternative could help reduce streambank erosion and sedimentation. No changes in the habitat program are proposed, only full utilization of the program. This alternative was selected during the 208 planning process but modified by the Governor to change the title to "Promote streambank protection through use of Game and Parks Habitat Program".

Alternative 2. State Assume Responsibility Of Section 404 Permit Program

The Department of Environmental Control could assume responsibility for the Section 404 permit program, which regulates the discharge of dredged and fill materials into surface waters, as soon as they are able to do so. The Corps of Engineers presently administers the program and would continue to handle permits on the Missouri River. A permit must be obtained before channel alternations can be made. Projects which would result in significant streambank erosion can be stopped in this way. Enforcement of this program by a state agency is more acceptable to the public, as Department of Environmental Control personnel would be closer to the problem and could better coordinate the review with other state agencies. The Environmental Protection Agency could expedite development of appropriate rules and regulations to allow for the Department of Environmental Control to assume this responsibility from the Corps of Engineers. The Department of Environmental Control could initiate an educational program to improve public awareness of the 404 permit program and also the floodplain permit program authorized by Legislative Bill 108 (sections 2-1506.15 through 2-1506.27, R.R.S. 1943) enacted in 1975 and administered by the Department of Water Resources. The Department of Environmental Control would work closely with the Department of Water Resources to regulate stream channel alteration projects; these agencies would coordinate their efforts with the Game and Parks Commission and the Natural Resources Commission.

Management Agency. The Department of Environmental Control would be the agency responsible for administration of the Section 404 permit program.

Authority. State statutes would have to be modified to give the Department of Environmental Control authority to administer the Section 404 permit program. The Environmental Protection Agency would have to transfer the responsibility to administer the Section 404 permit program to the Department of Environmental Control.

Funding. The cost of administering the Section 404 permit program for Nebraska is estimated to be $200,000 to $250,000 per year.

Schedule of Implementation. This alternative could be implemented within two years after approval and funding by the Legislature.

Legislative and Administrative Mechanisms or Changes. Legislation would be required.

Evaluation of Impacts, Problems, and Opportunities. The program would, in most cases, be received more favorably if implemented by the state rather than the federal government. However, this alternative would result in the state incurring more costs. This alternative was selected during the 208 planning process but disapproved by the Governor.

Alternative 3. Revise State Legislation Regarding Permits for Proposed Channel Modifications

State statutes could be amended to include consideration of potential downstream effects on water quality and flood hazard that may result from proposed channel modifications. The present Department of Water Resources floodplain permit program authorized by Section 2-1506.15 - 1506.27 provides for a review of proposed channel modifications to assess the potential flood hazard to upstream and adjacent lands. Channel modifications, particularly realignments, present other potential erosion and flood problems which could be considered before state permits are issued. Realignments generally involve decreasing the original length of a given stream reach, which cause the velocity to increase. Increased velocities often result in bank and channel erosion. These problems continue upstream as the altered channel slope stabilizes. This material is transported and deposited downstream where velocities are lower. Potential flooding is also caused by channel realignment because channel storage is reduced.

The amendments could be accomplished as part of a state assumption of the Section 404 permit program or, if Section 404 program assumption does not occur, by amending the Department of Water Resources floodplain authority. If the latter route is taken, assessment of the water quality impacts should be provided by the Department of Environmental Control prior to issuance of the LB 108 permit by the Department of Water Resources.

Management Agency. The Department of Water Resources would be responsible for reviewing permit applications for channel modifications, and assessing downstream as well as upstream effects. The Department of Environmental Control would also be required to review applications for downstream effects.

Authority. State statutes would have to be amended to provide this authority.

Funding. The additional cost to administer this modified floodplain permit program is estimated at $50,000 per year.

Schedule of Implementation. This alternative could be implemented within one year after approval and funding by the Legislature.

Legislative and Administrative Mechanisms or Changes. Legislation would be required.

Evaluation of Impacts, Problems, and Opportunities. Streambank erosion and downstream water quality degradation caused by channel modification could be reduced. The additional reviews would take time and cost money. This alternative was selected during the 208 planning process.

Alternative 4. Promote Accelerated Land Treatment and Watershed Protection

The benefits of land treatment and watershed protection to streambank erosion control could be recognized and acceleration of these practices could be promoted. The Watershed and Flood Prevention Act, Agricultural Conservation Program, Rural Clean Water Program, Water Conservation Fund, and appropriate natural resources district cost share programs could be more adequately funded. Additional technical measures to assist in streambank stabilization could be included in these programs.

Management Agency. The Natural Resources Commission and natural resources districts could promote accelerated land treatment and watershed protection, in cooperation with other federal, state, and local agencies.

Authority. Existing authorities are adequate to implement this alternative.

Funding. Federal, state, and local funding could be increased to accelerate land treatment and watershed protection. The cost cannot be estimated at this time.

Schedule of Implementation. This alternative could be implemented immediately and continue indefinitely.

Legislative and Administrative Mechanisms or Changes. This would not require legislation.

Evaluation of Impacts, Problems, and Opportunities. The impact of streambank erosion would be lessened if this alternative were implemented. This alternative was selected during the 208 planning process but modified by the Governor to require emphasis on accelerated land treatment be directed toward areas of critical water quality problems.

Alternative 5. Discourage Land Clearing and Cultivation near Streambanks

Land clearing and cultivation near streambanks could be discouraged to preserve a vegetative strip along streams. A vegetative strip would provide protection against streambank erosion.

Management Agency. The Natural Resources Commission, natural resources districts, and other federal, state, and local entities would discourage land clearing and cultivation near streams. Individual landowners must make the decision on these activities.

Authority. Existing authorities are adequate to implement this alternative.

Funding. The cost of discouraging these practices would be less than $1,000.

Schedule of Implementation. Implementation of this program could begin immediately.

Legislative and Administrative Mechanisms or Changes. This would not require legislation.

Evaluation of Impacts, Problems, and Opportunities. Bank erosion would be substantially reduced in those areas where farmers were farming the streambank. However, cropland would be taken out of use. This may not be practical in certain areas of the state. This alternative was selected during the 208 planning process but modified by the Governor to insert the word "indiscriminate" before the words Land Clearing in both title and text.

Alternative 6. Encourage Proper Disposal of Dead Trees and Other Vegetation

The practice of placing dead trees and other vegetation in stream channels and immediately adjacent to the channel could be discouraged as it results in damage to structures in the channel and contributes to streambank erosion. Removal of dead trees and other vegetation from the area adjacent to the stream could be encouraged to prevent this material from eventually reaching the stream and contributing to structural and erosion problems. The proper utilization or disposal of these materials could be encouraged.

Management Agency. The Natural Resources Commission, natural resources districts, and other federal, state, and local entities could encourage proper disposal of dead trees and other vegetation. Individual landowners and, to some degree, counties and other units of government have the responsibility for disposal of these materials.

Authority. Existing authorities are adequate to implement this alternative.

Funding. The cost of encouraging proper disposal would be less than $1,000.

Schedule of Implementation. Implementation of this alternative could begin immediately.

Legislative and Administrative Mechanisms or Changes. This would not require legislation.

Evaluation of Impacts, Problems, and Opportunities. Streambank erosion and destruction of structures in the stream channel would be reduced. This alternative was selected during the 208 planning process.

Alternative 7. Prepare Model Riparian Lands Zoning Ordinance

A model riparian land zoning ordinance could be developed and promoted. Local governments which elect to adopt the ordinance could use it to control development and use along streams in areas where streambank erosion is a problem or potential problem. Best management practices that could be used on riparian lands could be identified.

Manangement Agency. Those natural resources districts, counties, and cities which elect to adopt the ordinance could enforce it. The Nebraska Game and Parks Commission could develop and promote the model ordinance.

Authority. Adequate authorities exist.

Funding. Costs, which would be less than $1,000, would be borne by the participating units of government.

Schedule of Implementation. This model ordinance could be prepared within two years and promotion could continue indefinitely.

Legislative and Administrative Mechanisms or Changes. This would not require legislation.

Evaluation of Impacts, Problems, and Opportunities. This alternative would only affect streambank erosion in those areas where local governments adopted the ordinance. This alternative was rejected during the 208 planning process because people were not convinced it would do any good.

Alternative 8. Request Appropriate Federal Agencies to Study Possible Corrective Measures in Problem Areas

The natural resources districts could request such studies in areas having streambank erosion problems.

Management Agency. Cities, counties, and natural resources districts could determine corrective actions based on such studies. These local governments could sponsor project action where justified.

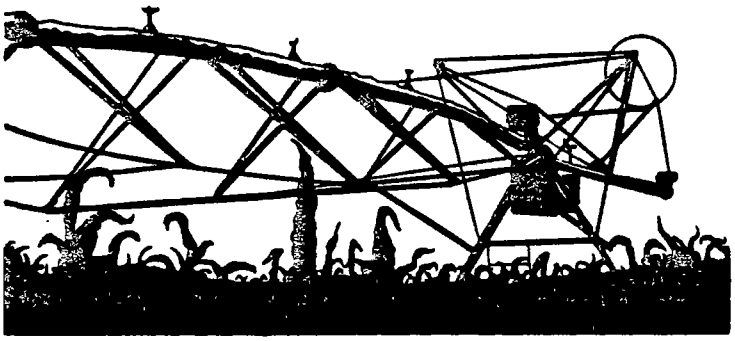
Authority. Existing authorities are adequate.

Funding. All applicable federal, state, and local funding sources would be explored on a case by case basis. The cost would be variable.

Schedule of Implementation. Implementation could begin immediately and continue indefinitely.

Legislative and Administrative Mechanisms or Changes. Legislation would not be needed.

Evaluation of Impacts, Problems, and Opportunities. This would result in identifying some feasible corrective measures in streambank erosion problem areas. A large area would have to be included in most studies so the corrective measures adopted would not cause other problems either upstream or downstream.



6. Irrigation Return Flows

Irrigation return flows include water diverted from a stream to irrigate cropland that returns to a stream or seeps to the groundwater aquifer and excess well irrigation water that flows to a stream or seeps into the groundwater aquifer. Salts, nutrients, pesticides, sediment, bacteria, and floating debris may be contained in surface return flows in greater concentrations than the original water supply. These materials can affect surface water usage in many ways. Drainage water that moves through the soil profile may contain higher concentrations of salts and nutrients and pesticides than in the original water supply. It should be pointed out, however, that irrigation return flows have become an expected water source for some uses.

If none of the alternatives are implemented, irrigation return flows from groundwater will probably decrease due to energy and other production costs, and implementation of the Groundwater Management Act. Irrigation return flows from surface water may stay about the same over the next few years or may decrease slightly due to rehabilitation of systems.

The alternatives are:

1. Continue the Expanded Educational Program,
2. Regulate Surface Water Irrigation Return Flows,
3. Establish Surface Irrigation Water User's Fee,
4. Require Permit for Drilling Irrigation Wells,
5. Require Permit to Develop an Irrigation System, and
6. Reduce the Amount of Water That Can Be Diverted Per Acre of Cropland.

Alternative 1. Continue the Expanded Educational Program

An expanded educational program to promote voluntary use of best management practices and provide information on the effectiveness, cost, and selection of these practices was organized during 1979; however, only one year's funding was obtained. This program could be revised as necessary and continued as a long term effort. Irrigation return flows are one of the water quality problems that could be addressed.

Management Agency. The program could be conducted under the direction of the Department of Environmental Control. The Department could continue to contract with the University of Nebraska and the natural resources districts for preparation and presentation of educational materials.

Authority. Existing authorities are adequate.

Funding. Funding of $25,000 to $35,000 would be required if the educational program for irrigation return flows is to be continued. Federal funds may be available for a portion of this amount.

Schedule of Implementation. Planning for the second year could begin immediately.

Legislative and Administrative Mechanisms or Changes. Legislation to provide state funds would be needed.

Evaluation of Impacts, Problems, and Opportunities. This educational program would be utilized by some individuals in adjusting their practices, but many would not use it.

Expansion of the educational program was one of the alternatives selected during the 208 planning process. Originally it included the Natural Resources Commission as the management agency, but was modified by the Governor to designate the University of Nebraska Institute of Agriculture and Natural Resources, under the direction of the Department of Environmental Control, as the management agency. The natural resources districts have been involved in such educational work in the past, and the program could suffer if they are excluded.

Alternative 2. Regulate Surface Water Irrigation Return Flows

Return flows from surface water could be regulated in a manner similar to return flows from groundwater origin. This would involve declaring that unreasonable return flows from surface water are illegal. "Unreasonable" would have to be defined and would be different for surface water than it is for groundwater.

Management Agency. The irrigation districts and natural resources districts would be the agencies most capable of managing this program.

Authority. The districts do not have adequate authority.

Funding. The irrigation districts and natural resources districts would need access to additional funds to operate this program. The cost would be approximately $200,000 per year.

Schedule of Implementation. The management agencies could begin to implement the program one year after authority and funding were granted.

Legislative and Administrative Mechanisms or Changes. This alternative would require legislative action.

Evaluation of Impacts, Problems, and Opportunities. The impacts of this alternative are difficult to determine. It would reduce return flows from surface water to surface water, but might increase flows from surface water to groundwater. Less water might be diverted, which might make water available for more appropriators. There might be a buildup of salts in some soils.

Problems with this alternative would be complex. Since return flows to both surface water and groundwater would need to be included, considerable administrative and technical expertise would be needed. Monitoring would be necessary in some cases. It is possible the return flows could be of worse quality than at present. There could be a very significant change in some irrigation operations, with unknown effects on an area's hydrology.

This alternative could result in more efficient use of surface water, which would leave less slack in the system for conservation in future times of drought.

Opportunities include the possible reduction of pollution to surface water and groundwater due to reduction in return flows.

This alternative was rejected during the 208 planning process, because it was only indirectly related to water quality, and people were not convinced it was needed for water quality.

Alternative 3. Establish Surface Irrigation Water User's Fee

Efficient use of irrigation water could reduce or eliminate irrigation return flows. A substantial fee applied to all surface irrigation water could encourage efficiency. The receipts from the fee could be distributed back to the area it was collected from to be used on cost sharing for those best management practices aimed at reducing irrigation return flows originating with surface water.

Management Agency. The natural resources districts could collect the fee and utilize it for local cost sharing.

Authority. The management agencies do not have authority to conduct this program.

Funding. Administrative costs of this program would vary across the state, and could reach $30,000 per year in some districts.

Schedule of Implementation. This program could be implemented within three years and continue indefinitely.

Legislative and Administrative Mechanisms or Changes. Legislation would be needed.

Evaluation of Impacts, Problems, and Opportunities. This fee could cause irrigators to use less water, thereby reducing return flows and groundwater recharge. The water might be available to more irrigators. This alternative could be quite disruptive to irrigation district operations, and could alter the hydrology of an area. Imposing water user's fees upon holders of existing water rights would raise constitutional questions. It should result in less irrigation return flows, which should be beneficial to water quality in most cases. This alternative would promote more efficient use of surface water, which would leave less slack in the system for conservation in future times of drought.

This alternative was rejected during the 208 planning process, when it was applied only to irrigation district water, because it is only indirectly related to water quality, and people were not convinced it would help water quality.

Alternative 4. Require Permit for Drilling Irrigation Wells

Legislation could be enacted to require a permit for drilling an irrigation well. Such legislation could require the denial of the permit if it is determined that the irrigation development would adversely affect surface water quality because of increased erosion or would adversely affect groundwater quality because of anticipated leaching of chemicals. When such adverse effects could be eliminated by management practices, the permit could be issued but could establish conditions for the development and operation of the irrigation system.

Management Agency. The permitting authority could probably best be handled in a manner similar to that presently found in the Groundwater Management Act. Local responsibilities could be assumed by the natural resources districts with assistance at the state level being provided by the Department of Water Resources and/or the Department of Environmental Control. Technical assistance would also be available from the Soil Conservation Service.

Authority. These authorities do not presently exist.

Funding. Financial needs would vary depending upon the number of applications and the topography, soils, and other conditions in each natural resources district. Most districts would require at least one additional full time professional, resulting in a cost of not less than $30,000 per district per year.

Schedule of Implementation. At least a year would be required after approval by the Legislature to inform the public of the requirements and to train individuals responsible for implementation.

Legislative and Administrative Mechanisms or Changes. This would require legislative action.

Evaluation of Impacts, Problems, and Opportunities. This alternative would not eliminate any present water pollution problem areas, but could prevent the intensification of existing problem areas. It could also minimize adverse impacts on surface and groundwater quality from future well irrigation development.

Problems include the need for additional regulations, permits, and paperwork by all parties. Adequate technical assistance could be a problem, as could the reluctance of local officials to regulate their neighbors' activities.

In addition to the water quality opportunities presented, water quantity benefits could be obtained in areas where declining water tables exist or would be experienced with uncontrolled development.

This alternative was rejected during the 208 planning process, because it is only indirectly related to water quality.

Alternative 5. Require Permit to Develop an Irrigation System

A permit could be required before an irrigation system could be installed. The permit could be denied if there was reason to believe operation of the system would add to pollution of surface water or groundwater. If such pollution could be prevented by management practices, the permit could be issued but could establish conditions for operation of the system.

Management Agency. The permit would be issued by the local natural resources district which could call on the Department of Water Resources, Department of Environmental Control, and Soil Conservation Service for technical assistance in reviewing the information.

Authority. The districts do not have adequate authority to conduct this program.

Funding. Local funding through natural resources districts would be needed. This would cost $30,000 per year for many districts.

Schedule of Implementation. This alternative could be implemented within three years and continue indefinitely.

Legislative and Administrative Mechanisms or Changes. Legislation would be required.

Evaluation of Impacts, Problems, and Opportunities. Positive aspects include the permit process would help insure irrigation systems do not cause surface and groundwater pollution. Negative impacts include the cost of any regulatory program. This alternative was rejected during the 208 planning process, when it was applied only to center pivot systems, because it was only indirectly related to water quality.

Alternative 6. Reduce the Amount of Water That Can Be Diverted Per Acre of Cropland

The amount of water that can be diverted from streams for irrigation on a depth per acre basis could be reduced. All water rights for irrigation would be affected.

Management Agency. The Department of Water Resources would administer the program.

Authority. The Department does not have authority to make this change.

Funding. The Department would need extra state funding of approximately $10,000.

Schedule of Implementation. This could be done one year after authority and funding were received.

Legislative and Administrative Mechanisms or Changes. Legislation would be needed.

Evaluation of Impacts, Problems, and Opportunities. This alternative would cause less diversion by some appropriators, and therefore less irrigation return flow. Groundwater recharge could be reduced in some areas.

Problems with this alternative include the administrative burden and possible lack of public acceptance. Reducing existing water rights in this manner would raise constitutional questions.

This alternative would alter the hydrology of some areas, causing both beneficial and adverse effects. It would promote more efficient use of surface water, which would leave less slack in the system for conservation in future times of drought. Opportunities are to improve conservation of water and reduce return flows for the benefit of water quality.

This alternative was rejected during the 208 planning process, because it was only indirectly related to water quality, and it would interfere with people'e water rights.

7. Construction Site Runoff

The major pollutant stemming from construction site runoff is sediment. Through the physical process of water erosion, soil particles are dislodged and transported by water with a fraction of the particles reaching streams, lakes and other surface water and being subsequently identified as sediment. Along with adversely affecting aquatic organisms and their habitat, other impacts due to sedimentation include loss of reservoir capacity, reduced recreation demand, increased drainage maintenance costs, and reduced capacity of waterways.

If none of the alternatives are implemented, construction site runoff will continue to be a problem due to urbanization activities in many areas.

The alternatives are:

1. Encourage Local Governments to Require Construction Site Runoff Control,

2. Inform Owners and Developers About Best Management Practices, and

3. Establish Mandatory Construction Site Runoff Control Rules and Regulations.

Alternative 1. Encourage Local Governments to Require Construction Site Runoff Control

City and county governments could adopt rules and regulations to require developers and owners to submit and implement sediment and erosion control site plans in order to control construction site runoff and limit sedimentation to acceptable limits. Sediment control plans could be required for all developments that require grading, except for minor activities, agricultural activities, or sites covered by the National Pollutant Discharge Elimination System. Cities and counties could (1) review the sediment control plans or contract with another party such as a natural resources district to review them, (2) approve the plans if requirements were met, (3) make periodic inspections of the construction sites, and (4) provide enforcement if required. The construction runoff control program could be tied to existing processes such as subdivision approval wherever possible.

Management Agency. Cities and counties would be responsible for the construction site runoff control programs.

Authority. Existing authorities are adequate to allow city and county governments to require controls for construction site runoff.

Funding. Sediment control plan preparation and plan implementation costs are variable and would most likely be passed from the developers to the consumers. Costs for program management, including plan approval, inspection, and enforcement, have been estimated to be about $120 per developed acre.

Schedule of Implementation. Implementation of this alternative could begin immediately.

Legislative and Administrative Mechanisms or Changes. This would not require state legislation.

Evaluation of Impacts, Problems, and Opportunities. This alternative should help reduce runoff from construction sites. As with any regulatory program, there would be some administrative cost. Technical assistance may be needed. This alternative was selected during the 208 planning process but modified by the Governor to change the title to read "Encourage Construction Site Runoff Control".

Alternative 2. Inform Owners and Developers About Best Management Practices

The Natural Resources Commission could meet with the Association of General Contractors, Land Improvement Contractors Association, Home Builders Association, and consulting engineers to inform them that many of the known conservation measures have been identified as best management practices and that they should apply these measures to areas they are working on.

Management Agency. The Natural Resources Commission would be responsible.

Authority. Existing authorities are adequate.

Funding. Costs for this alternative would be paid by state funds, and would be less than $1,000.

Schedule of Implementation. This program could begin immediately and become a continuing effort.

Legislative and Administrative Mechanisms or Changes. Legislation would not be needed.

Evaluation of Impacts, Problems, and Opportunities. Since this alternative is voluntary, a negative aspect would be that little, if any, action might be taken. A positive aspect is that construction site runoff control measures might be implemented. This alternative was rejected during the 208 planning process, because it might not be very effective.

Alternative 3. Establish Mandatory Construction Site Runoff Control Rules and Regulations

Construction site runoff control legislation could be enacted. City or county governments could be required to adopt rules and regulations to conform with this legislation. Developers and owners could be required to submit to city or county governments a sediment and erosion control plan for each construction site. The local government would determine if the plan is adequate. Each construction site with an approved erosion control plan would be subject to inspection during the course of construction.

Management Agency. City or county governments would adopt rules and regulations and would enforce them. The Department of Environmental Control would approve the rules and regulations and would monitor the local enforcement.

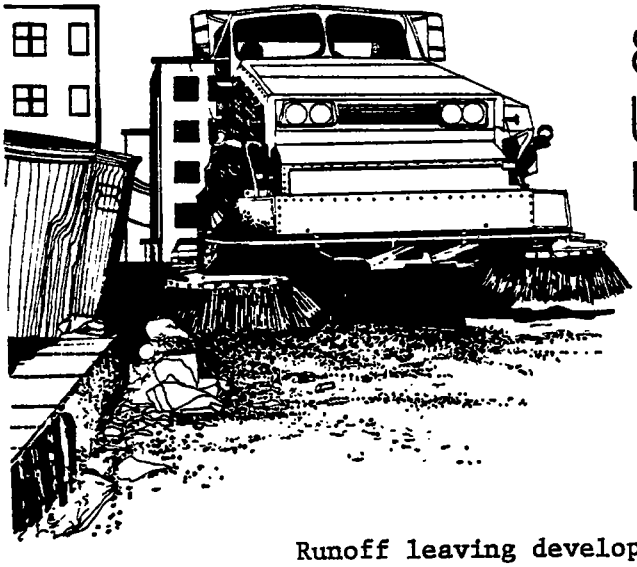
Authority. State agencies do not have authority to conduct this program.

Funding. Owners and developers would pay the cost of developing and carrying out the plan. Local governments would pay the cost of reviewing and approving the plans. The cost of plan development and approval is estimated at $120 per developed acre. Implementation costs would be variable.

Schedule of Implementation. This alternative could be implemented in three years and continue indefinitely.

Legislative and Administrative Mechanisms or Changes. Legislation would be required.

Evaluation of Impacts, Problems, and Opportunities. Some local governments presently use similar programs. The costs and regulatory aspects are negative factors. This alternative was rejected during the 208 planning process, because it did not seem justified.



8. Urban Runoff

Runoff leaving developed residential, commercial, and industrial areas carries with it sediment, fertilizer nutrients, pesticides, heavy metals, and oils. Sediment can adversely impact aquatic organisms and their habitat. The fertilizer nutrients enrich surface water resulting in imbalance of animal and plant organisms coexisting in the surface water. Pesticides can eliminate nontarget plant and animal aquatic organisms. Heavy metals, although not always toxic to smaller organisms in the aquatic food chain, can become concentrated in the tissue of larger aquatic organisms, becoming toxic in some cases, and resulting in such abnormalities as stunted growth and lack of reproduction. Other uses of surface waters, such as recreation, agriculture, industrial, and water supply, are also adversely affected by pollution from urban runoff.

Urban runoff may get worse in the future, due to continued concentration of activities in urban areas, more use of chemicals, and deteriorating streets, if none of the alternatives are implemented.

The alternatives are:

1. Cities and Counties Evaluate Urban Runoff Pollution,
2. Informational Program for Urban Runoff Control,
3. Prepare Model Ordinances for Urban Runoff Control, and
4. Require Mandatory Urban Runoff Control Programs.

Alternative 1. Cities and Counties Evaluate Urban Runoff Pollution

Cities and counties could periodically evaluate the potential for water pollution from urban runoff in their jurisdications. Areas that could be reviewed include street cleaning practices, open storage of materials such as pesticides, petroleum products, paper, and solid waste, industrial and commerical activities, and construction activities. (Construction activities are specifically addressed under construction site runoff.) The cities and counties could request assistance in this evaluation from the Department of Environmental Control. The entire hydrologic system for stormwater runoff could be included in this evaluation. If a significant pollution potential becomes evident, the following items may need to be developed or improved to reduce pollution from urban runoff to an acceptable limit: (a) street cleaning; (b) anti-litter laws; (c) open storage regulations; (d) erosion control regulations; (e) zoning laws; and (f) building codes. Construction of stormwater detention facilities or other modifications in the stormwater runoff system could also be needed.

Management Agency. The cities and counties would be responsible to implement this alternative. The Department of Environmental Control could assist these entities and conduct their own investigations when urban runoff is suspected of polluting waters of the state.

Authority. Existing authorities are adequate to implement this alternative.

Funding. Funds would be required for the evaluation, for the implementation of any new programs, and for construction if that is required. Costs cannot be estimated at this time.

Schedule of Implementation. Implementation of this recommendation could begin immediately and continue indefinitely.

Legislative and Administrative Mechanisms or Changes. This would not require legislation.

Evaluation of Impacts, Problems, and Opportunities. This alternative should help reduce runoff from urban areas. However, it could lead to an expensive program in the future if many urban runoff pollution problems are found. This alternative was selected during the 208 planning process.

Alternative 2. Informational Program for Urban Runoff Control

An informational program could be developed to make city officials and employees, consulting engineers, and also the general public more aware of the effects of urban runoff on water quality. The various methods to reduce the urban runoff waste loads could also be explained.

Management Agency. The Department of Environmental Control would be responsible for this informational program.

Authority. Existing authorities are adequate.

Funding. State funds would be used. The cost would be less than $5,000.

Schedule of Implementation. This alternative could be implemented immediately and continue indefinitely.

Legislative and Administrative Mechanisms or Changes. No legislation would be needed.

Evaluation of Impacts, Problems, and Opportunities. A positive impact would be that information concerning urban runoff would be brought to the public's attention. However, it is possible little would be done about it. This alternative was rejected during the 208 planning process, because it might not be very effective.

Alternative 3. Prepare Model Ordinances for Urban Runoff Control

Preparation of model ordinances applicable to cities, villages, and counties could be a first step to controlling urban storm runoff. These ordinances could include anti-litter laws; regulations for open storage of pesticides, oil and lubricants, paper, solid waste, etc., for industrial and commercial enterprises; erosion and sediment control regulations; and also zoning laws, building codes, and other regulations that would reduce urban storm runoff to acceptable limits. Local governmental units could be made aware of these model ordinances and urged to adopt them.

Management Agency. The Department of Environmental Control would be responsible for the preparation and promotion of these model ordinances.

Authority. Existing authorities are adequate.

Funding. State funds would be used. The cost would be less than $1,000.

Schedule of Implementation. The model ordinances could be prepared within two years and their promotion could continue indefinitely.

Legislative and Administrative Mechanisms or Changes. No legislation would be needed.

Evaluation of Impacts, Problems, and Opportunities. Urban runoff regulations could reduce pollution from this source. On the other hand, since the implementation and enforcement of such an ordinance is contingent upon local adoption, the program might not be implemented in problem areas. This alternative was rejected during the 208 planning process, because model ordinances are available now.

Alternative 4. Require Mandatory Urban Runoff Control Programs

A mandatory urban runoff control program could be enacted to require each community to prepare and submit an urban runoff control plan for approval by the managing agency. These plans would include (a) a description of the physical system including storm sewers, detention basins, etc., (b) street cleaning and catch basin cleaning programs, (c) a description of the communities use of deicing salt, and (d) an education program directed at community residents. Requirements which would insure the reduction of pollutant loads to an acceptable level could be established. The managing agency would approve the local plans if they met minimum requirements, taking into account local conditions. A penalty, including fines, could be established and imposed for noncompliance.

Management Agency. The Department of Environmental Control would be the management agency. Each community would be required to have an approved plan. Smaller communities may be exempt; communities not near surface water may also be exempt as some feedlots are exempt from the runoff control requirements.

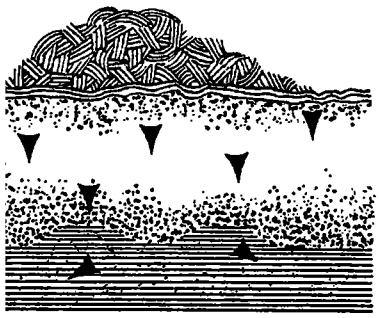
Authority. The Department of Environmental Control does not have adequate authority to carry out this program.

Funding. The cost of administering the program would be at least $70,000 per year; state funds would be used. Local funds would be needed by the individual communities to prepare plans and implement them. Their costs would be high, and cannot be estimated at this time.

Schedule of Implementation. All nonexempt communities in the state could be required to submit an urban runoff control plan within three years after program requirements are established.

Legislative and Administrative Mechanisms or Changes. Legislation would be required.

Evaluation of Impacts, Problems, and Opportunities. This alternative would reduce pollution due to urban runoff. However, it may be unacceptable to the public for the state to regulate these local activities. This alternative was rejected during the 208 planning process, as it did not appear to be justified.



9. Residual Waste Disposal Site Contamination of Surface and Groundwater and Land Application of Wastewater Effluent and Sludge

Considerable quantities of sludge are produced by conventional wastewater treatment. The sludge is normally buried in landfills or spread on agricultural land or incinerated. Wastewater effluent is also applied to land by a small but growing number of communities. Land application of sludge or effluent if done properly is not only an environmentally sound method of disposal but also a method of resource recovery. Surface and groundwater quality problems can result if the site is not carefully selected, if the rate of application is too great, or if the waste is not properly incorporated into the soil. The pollutants of concern include organic material, nutrients, bacteria, and heavy metals in sludge and suspended solids, bacteria, and biochemical oxygen demand in effluent.

Another environmentally sound method for recovery of this resource is composting, which results in a stable material with qualities similar to black dirt. An excellent soil amendment, it is also used in reclaiming strip-mined areas, as landfill cover, and when simply disposed of in a landfill it does not create problems that sludge-slurries cause.

Residual waste disposal problems will increase in the future due to increasingly effective treatment processes that produce more sludge, and competition from other land uses for suitable disposal or reuse sites.

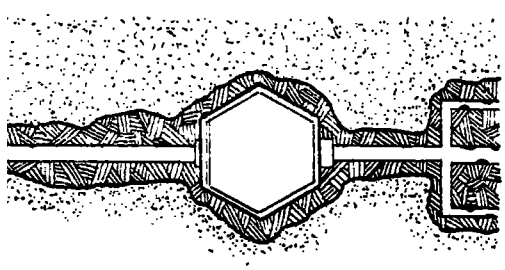
Residual waste disposal remains a water quality problem, but the Department of Environmental Control has the authorities necessary to correct the problem. Therefore, no alternatives are offered.

10. Feedlots

Manure produced by domestic animals in feedlots is characterized by large quantities of organic material, nitrogen compounds, phosphorus, and coliform organisms. Uncontrolled, these pollutants can be carried with runoff from rain or snowmelt and reach surface waters. Organic material when reaching surface waters can deplete the dissolved oxygen in the water and can lead to fish kills. Nitrogen and phosphorus can cause accelerated eutrophication and seriously degrade a water body. The presence of coliforms in surface waters indicates the potential for disease for those utilizing the water.

Water quality problems caused by feedlots are expected to decrease.

Feedlots remain a water quality problem, but the Department of Environmental Control has the authorities necessary to correct this problem. Therefore, no alternatives are offered.



11. Septic Tanks

Septic tank systems, when properly constructed, located, and maintained, can be a satisfactory means of treating wastewater from single family dwellings. However, all too often the proper precautionary steps are not taken and water quality and public health may be affected. An improperly constructed, located, or maintained septic tank system can discharge viruses, bacteria, chlorides, nitrates, and detergents to surface or groundwater. These pollutants may cause water quality degradation and make water unsafe for human consumption. Detergents can be carcinogenic; nitrates can cause methemoglobinemia; bacteria and viruses can lead to many diseases.

If none of the alternatives are implemented, water quality problems caused by septic tanks are expected to increase due to urbanization and recreational developments, some on poor sites for septic tanks.

The alternatives are:

1. Continue the Expanded Educational Program,

2. License Septic Tank Manufacturers, Installers, and Pumpers,

3. Cities and Counties Adopt Septic Tank Permit Programs,

4. Contact and Assist the Recreational Associations of Development Areas Along Lakes and Streams Regarding Septic System Installation and Maintenance, and

5. State Require a Permit to Install a Septic Tank System.

Alternative 1. Continue the Expanded Educational Program

An expanded educational program to promote voluntary use of best management practices and provide information on the effectiveness, cost, and selection of these practices was organized during 1979; however, only one year's funding was obtained. This program could be revised as necessary and continued as a long term effort. Septic tanks are one of the water quality problems that could be addressed.

Management Agency. The University of Nebraska Institute of Agriculture and Natural Resources could be the management agency in consultation with the Department of Health and Department of Environmental Control.

Authority. Existing authorities are adequate.

Funding. Funding of $35,000 to $45,000 would be required if the educational program for septic tanks is to be continued. Federal funds may be available for a portion of this amount.

Schedule of Implementation. Planning for the second year could begin immediately.

Legislative and Administrative Mechanisms or Changes. Legislation to provide state funds would be needed.

Evaluation of Impacts, Problems, and Opportunities. Existing educational programs on septic systems are well received, so more work in this area may help solve the problem. No educational program can reach everyone who is involved with septic systems.

Expansion of the educational program was one of the alternatives selected during the 208 planning process. Originally it included the Natural Resources Commission as the management agency, but was modified by the Governor to designate the University of Nebraska Institute of Agriculture and Natural Resources as the management agency in consultation with the Department of Health and Department of Environmental Control.

Alternative 2. License Septic Tank Manufacturers, Installers, and Pumpers

State statutes could be modified to require septic tank manufacturers, installers, and pumpers to be licensed. To be licensed, these people would have to demonstrate sufficient knowledge and ability to practice their trade without creating a potential for surface or groundwater pollution. They would have to be knowledgeable of (a) existing rules and regulations regarding septic tank systems and disposal of solid and liquid wastes and (b) the possible effects on water quality and public health of faulty manufacture or installation of septic tank systems or improper sludge disposal. Individuals who install their own septic tank systems would not have to be licensed, but would have to follow the minimum standards.

Management Agency. The Nebraska Department of Health would be responsible for licensing the septic tank manufacturers, installers, and pumpers.

Authority. State statutes would have to be modified to provide this authority.

Funding. The cost to license the approximately 1,600 septic tank manufacturers, installers, and pumpers in the state is estimated at between $30,000 to $35,000. Part of this cost could be paid for by license fees.

Schedule of Implementation. This alternative could be implemented within one year after approval and funding by the Legislature.

Legislative and Administrative Mechanisms or Changes. Legislation would be required.

Evaluation of Impacts, Problems, and Opportunities. Licensing should help ensure that septic tanks are located and installed properly. Licensing may slightly increase installation costs. This alternative was selected during the 208 planning process but disapproved by the Governor.

Alternative 3. Cities and Counties Adopt Septic Tank Permit Programs

Cities and counties could adopt regulatory programs for septic tank installations for single family dwellings. Other establishments could be included as standards are developed for them. This could be made part of their building ordinances. State septic tank regulations could be adopted as minimum standards. Construction permits would be issued by the city or county after plan review. Permitted septic tanks would be subject to an inspection.

Management Agency. The city and county health departments or other appropriate departments would be responsible for the septic tank permit program, after being delegated this responsibility by the Nebraska Department of Health or Department of Environmental Control.

Authority. Cities and counties have authority to adopt ordinances to regulate septic tanks.

Funding. The estimated statewide total cost of these programs is $250,000 per year assuming 3,500 plan reviews and inspections.

Schedule of Implementation. Implementation of this alternative could begin immediately.

Legislative and Administrative Mechanisms or Changes. State legislation would not be needed.

Evaluation of Impacts, Problems, and Opportunities. A local permit mechanism may ensure that more septic tanks are installed properly. There will be costs and paperwork in any regulatory program. This alternative was selected during the 208 planning process but disapproved by the Governor.

Alternative 4. Contact and Assist the Recreational Associations of Development Areas Along Lakes and Streams Regarding Septic System Installation and Maintenance.

The state could assist recreational associations in possible septic tank problem areas to improve septic tank installation and maintenance.

Management Agency. Coordinated effort between the Department of Health, Department of Environmental Control, and local recreation associations.

Authority. Adequate at the state level. Recreational areas may need to form recreational associations to contact homeowners.

Funding. Additional funding of $1,000 would be required from federal funds available to the Department of Environmental Control.

Schedule of Implementation. Immediately upon selection of this alternative. An estimated timeframe to establish local contacts would be two years.

Legislative and Administrative Mechanisms or Changes. No legislation would be needed. Local associations may need to be established. These entities would need to adopt standards and a program of monitoring the sewage system development and maintenance in their recreation area.

Evaluation of Impacts, Problems, and Opportunities. Local initiative by a recreational association to encourage proper installation and maintenance of septic systems may be effective. The association would need certain technical assistance, and could not assume the legal responsibilities of the state regarding enforcement. Those responsibilities can be assumed by a local unit of government upon delegation by the Department of Health or Department of Environmental Control.

Alternative 5. State Require a Permit to Install a Septic Tank System

State statutes could be modified to require a permit to install a new septic tank system or to modify an existing septic tank system. Rules and regulations could be promulgated to administer the program. Construction permits could be issued after plan review if minimum standards were met. The septic tank systems with a permit could be subject to an inspection.

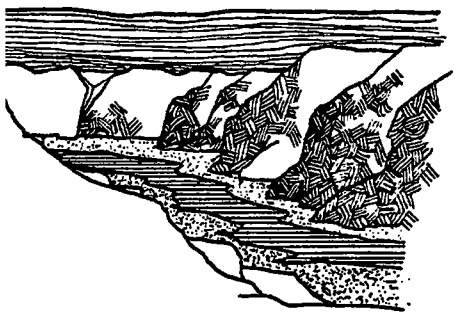
Management Agency. The Department of Health and Department of Environmental Control would be the management agencies for this program. The authority to administer the permit program could be delegated to local governments.

Funding. The estimated cost of the permit program is $250,000 per year assuming 3,500 plan reviews and inspections.

Schedule of Implementation. This alternative could be implemented two years after approval and funding by the Legislature.

Legislative and Administrative Mechanisms or Changes. Legislation would be required.

Evaluation of Impacts, Problems, and Opportunities. A permit mechanism may ensure that more septic tank systems are installed properly, thus reducing environmental damage associated with domestic waste disposal. The permit program and the inspection process may be viewed as unnecessary government regulation by some of the public. This alternative was rejected during the 208 planning process, because of the cost and doubts about whether it was necessary.



12. Effects of Reduction of Quantity on Surface Water Quality

The quantity of water and the quality of that water are inseparable components. A direct relationship generally exists between quantity and quality with quantity being the independent variable, whereas quality is the dependent variable. Although the general assumption can be made that with reduction in quantity some reduction in water quality will follow, the limitations placed on water-based benefits by the degraded quality are not fully understood or have not been quantified in Nebraska.

There are, however, general statements which can be made regarding the quantity-quality relationship and the detriment to existing benefits of aquatic ecosystems. For instance, reduction in flow of a stream is generally followed by increased temperature. Increased temperature causes reductions in dissolved oxygen concentrations, which in turn cause parameters to be in their reduced states. This can cause increased ammonia concentrations, which can be toxic to animals such as fish.

Increased temperature can also increase evaporation rates. One effect of faster evaporation could be higher pH in the water. This can increase the toxicity of ammonia to animals.

Temperature, dissolved oxygen, ammonia, and pH are important parameters in determining water quality. Water quality standards describe the acceptable levels of these parameters. These physical and chemical characteristics of water affect aquatic organisms and other uses of a stream or lake.

Likewise, reductions in the volume of water in a stream or lake will reduce the capacity of that system to receive and adequately assimilate waste. Depending upon the reason(s) for the reduced volume of water, it is possible to have increased salt concentrations and a potential detriment to water uses such as irrigation and livestock watering. If water quality standards are not met, water uses can be impaired or limited by poor water quality. This has not happened frequently in Nebraska, however. Water quality and quantity are very much interrelated and recognition of this relationship could help protect the quality of the water resource for future demands.

Presently when water quality problems are found that may be related to low streamflow, the courses of action that are available are to either require better wastewater treatment from the point sources in the area, which is costly, or relax water quality standards, which allows poorer quality water. Both these approaches have been used in recent years. If none of the alternatives are implemented, these options may have to be used more in the future.

The alternatives are:

1. Legislative Action to Protect Streamflows, and

2. Augment Streamflows.

Alternative 1. Legislative Action to Protect Streamflows

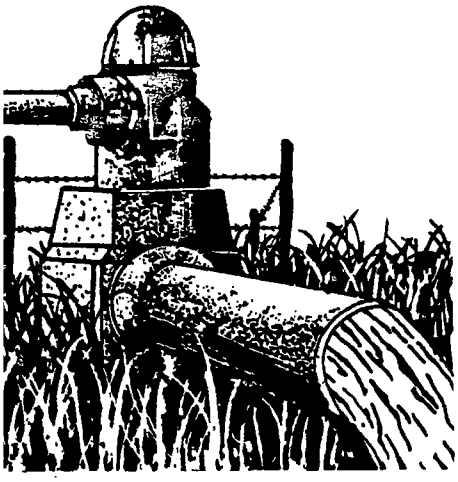
This alternative will be fully considered in the instream flow policy issue study. That study will consider alternative actions which could protect identified instream uses of water including water quality benefits. The instream flow study will specifically look at surface water management alternatives which could maintain streamflow. The effect of various groundwater management alternatives on streamflow will be discussed in the groundwater reservoir management policy issue study.

Because those studies will outline more numerous and detailed options than can be presented here, this study will not deal further with those options.

Alternative 2. Augment Streamflows

This alternative will be considered in the supplemental water supplies policy issue study. It would involve pumping groundwater into streams or releasing water from existing or new reservoirs in order to augment streamflow for the purpose of improving water quality.

Because that study will discuss the option in detail, it will not be further developed in this study.



13. Siting, Drilling, Casing, Sealing, and Plugging of Private Water Wells (Domestic including Stock, Irrigation, and Industrial)

Improperly constructed water wells can be an immediate pathway of pollutants into groundwater aquifers. In addition, water wells are constructed in areas where groundwater quality may be of questionable safety for the designated use(s). There are areas of the state where the shallower groundwater is contaminated, and it is necessary to protect deeper groundwater, which may be separated by clay layers, from contamination.

Presently, Nebraska Statutes do not allow for restrictions or requirements in locating, drilling, and minimum construction standards for water wells, other than public supply wells or for private wells which have applied for Federal Housing Administration, Farmers Home Administration, or Veterans Administration loan assistance. Consequently, private wells, either for potable supply or irrigation, are occasionally located too close to sources of contamination, are cased with nonsealed joints, or are packed with only gravel throughout the depth of the well. Practices of this type can result in groundwater contamination and a potential future health hazard. As more wells are installed, this possibility increases.

The alternative is:

1. Require the Licensing or Certification of Well Drillers and Pump Installation Contractors.

Alternative 1. Require the Licensing or Certification of Well Drillers and Pump Installation Contractors

The state could require that all wells be installed in accordance with minimum standards, and that well drillers and pump installation contractors be licensed to assure they were knowledgeable of well construction practices to protect water quality.

Management Agency. Nebraska Department of Health.

Authority. The Nebraska Department of Health does not have the necessary authority to conduct this program.

This Department, however, has been designated as the implementing agency responsible for the Safe Drinking Water Act in Nebraska.

Funding. The funding necessary to establish the rules and regulations for well construction and licensing procedures would be minimal. The funding necessary to implement the program could be much more extensive, requiring the employment of additional personnel in the Department of Health. This would cost at least $75,000 per year. Part of this cost could be covered through a licensing fee.

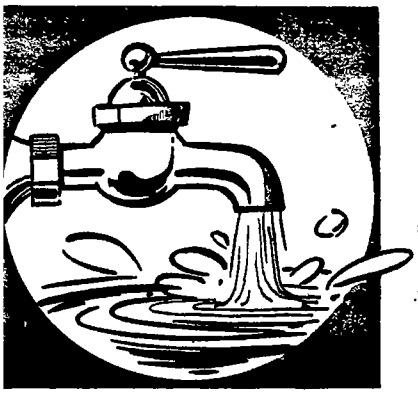
Schedule of Implementation. It would take an estimated one year to get this program into full swing after the legislation was passed.

Legislative and Administrative Mechanisms or Changes. This alternative would require the enactment of legislation giving the Department of Health authority over well construction standards along with authority to promulgate the necessary rules and regulations. In addition, the role of the Well Drillers Association should be defined, regarding preparation of standards to be followed in the certification program for well drillers. This legislation might be similar to LB 247 which was first read to the 85th legislature on January 18, 1977.

Evaluation of Impacts, Problems, and Opportunities. The positive impacts associated with implementation of this alternative include protection of groundwater quality for future designated uses, and more consistent and environmentally sound methods of well construction.

Negative impacts of implementing such programs might include slightly increased well construction costs, and some expenditure of state funds, as this would not be a self-supporting program.

Considering the significance of good quality groundwater for domestic use in Nebraska, however, the positive aspects of protecting this valuable resource from pollution in the long term will outweigh the negative impacts.



14. Contamination of Groundwater by Insecticides, Herbicides, Trace Metals, and Drugs

The extent of this problem is unknown due to lack of data. Some chemicals will be monitored in a drinking water due to the Safe Drinking Water Act.

The alternative is:

1. Determine the Extent of the Problem.

Alternative 1. Determine the Extent of the Problem

An extensive monitoring effort could determine the extent of this problem. Such monitoring could concentrate on areas which may be of concern.

Management Agency. The Conservation and Survey Division of the University of Nebraska could conduct the study.

Authority. Adequate.

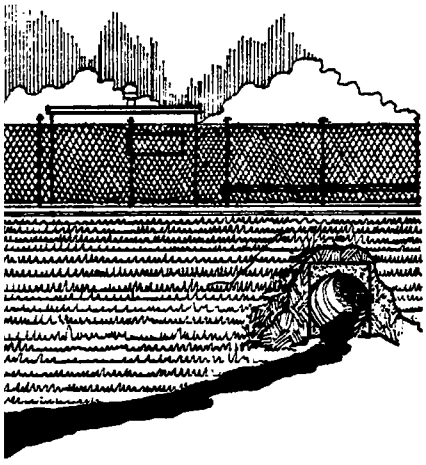
Funding. Additional state funds would be needed unless funds could be obtained from the Environmental Protection Agency. The cost would be approximately $500 per sample.

Schedule of Implementation. The study could begin six months after funding was received. Initial findings could be made after three years. It might be necessary to extend the study for several years, depending on findings.

Legislative and Administrative Mechanisms or Changes. Legislative action to provide funding would be necessary.

Evaluation of Impacts, Problems, and Opportunities. The impacts would depend on the findings. Problems would involve how to conduct the study and analyze the data. There could be complex measuring problems.

If these chemicals were found, steps should be taken to learn how they are getting into the groundwater and to reduce such contamination.



15. Runoff and Leaching from Solid Waste Disposal Sites Managed by Small Communities

Solid waste disposal in Nebraska can be a pollution source to both surface water and groundwater, if disposal sites are inadequately prepared and managed.

Currently the Department of Environmental Control has authority to regulate and license disposal sites managed by communities of the first class. There are, however, approximately 500 smaller communities in the state which may operate disposal sites. Existing state legislation does not allow for inspection or enforcement of any regulations to govern the operation of these sites, except as related to potential surface water pollution. Consequently, a significant pollution source may exist, particularly when the effect of the sites on groundwater quality is considered.

Since groundwater, once contaminated, is extremely difficult to clean up, this problem will probably get worse if no alternative is implemented.

The alternative is:

1. Expand Current State Authority for Licensing Solid Waste Disposal Sites.

Alternative 1. Expand Current State Authority for Licensing Solid Waste Disposal Sites

The legislature could provide regulatory and licensing authority over solid waste disposal sites managed by villages and second class cities in Nebraska.

Management Agency. Department of Environmental Control.

Authority. The Department of Environmental Control does not currently have the necessary authority to regulate solid waste disposal in villages and communities of the second class due to their exemption as stated in section 81-1528(6) of the Nebraska Environmental Protection Act (1971). The rules and regulations necessary to implement a program of this type do exist and would be enforceable by the Department of Environmental Control if designated by the legislature.

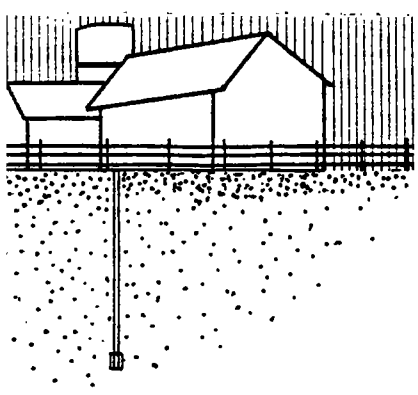
Funding. Federal funding for planning and implementation might be obtained through the Resource Conservation and Recovery Act (P.L. 94-580). This funding would vary depending on environmental impact and need. State funding would be on a match basis. The total estimated increase in funding requirements should not exceed $20,000 ($15,000 - federal, $5,000 - state).

Schedule of Implementation. This program could begin when the legislative action is completed. A 5-year schedule of implementation could be developed. This schedule would include approximately 20% of communities reaching compliance per year.

Legislative and Administrative Mechanisms or Changes. This alternative would require that Section 81-1528(6) of the Nebraska Environmental Protection Act be repealed.

Evaluation of Impacts, Problems, and Opportunities. This alternative would allow the Department of Environmental Control to implement and enforce pollution abatement policies as stated in sections 81-1501 (1 & 2) and 81-1515 of the Nebraska Environmental Protection Act. The positive impact is such a program would insure the protection of both surface water and groundwater against contamination by toxic and/or hazardous materials as well as less critical pollutant substances from solid waste disposal sites.

Negative impacts of implementing this alternative might include a greater economic burden on small communities.



16. Separation Distances Between Potable Water Wells and Point Sources of Contamination

The Department of Health has adopted minimum recommended separation distances between water supply wells and potential sources of contamination. These separation distances are used by the Department in the evaluation of proposed sites for public water supply wells. While these distances appear reasonable, they are arbitrary and of uncertain origin.

Since groundwater, once contaminated, is extremely difficult to clean up, this problem may get worse in the future.

The alternative is:

1. Study the Mobility of Various Contaminants in Selected Geologic Environments in Nebraska.

Alternative 1. Study the Mobility of Various Contaminants in Selected Geologic Environments in Nebraska

Studies could be made to indicate the variations of bacterial and chemical movement in some of the subsurface materials of Nebraska. Existing separation distances have been based largely on historical studies which were unsophisticated and relatively inexpensive. Future studies at four to six locations in Nebraska (representative of a few of the state's geologic conditions) should be able to furnish data of better quality than many of these historical studies. These site-specific data would be useful to the Department of Health. Interpretation of these data (establishing or redefining minimum acceptable separation distances) and extrapolation of results to other localities would be the responsibility of the Department of Health.

Management Agency. The Department of Health could arrange with the University of Nebraska for graduate students in geology, engineering and/or microbiology to conduct the studies under professional supervision as part of their graduate programs.

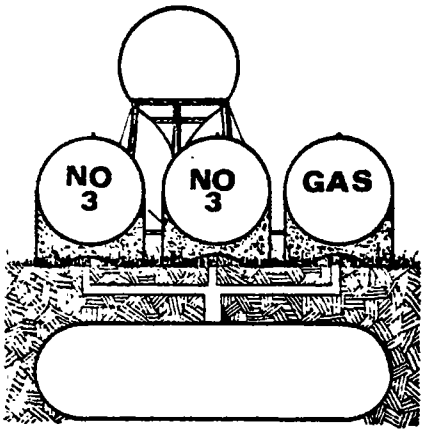
Authority. Adequate.

Funding. Additional state funds would be required unless some funding could be obtained from the Environmental Protection Agency. The cost would total approximately $100,000 over a period of three to six years.

Schedule of Implementation. The studies could begin six months to a year after funding is received.

Legislative and Administrative Mechanisms or Changes. Legislative action to provide funding would be necessary.

Evaluation of Impacts, Problems, and Benefits. This alternative would have positive impacts. Problems include the difficulty in extrapolating results to other locations, due to the diversity of conditions, pollutant sources, and well construction methods in Nebraska. The main benefit would be to better safeguard public and private water supplies with less risk of being needlessly restrictive in regulation.



17. Improper Storage of Chemicals and Petroleum

The storage of chemicals and petroleum products in the vicinity of water supply wells presents a significant threat of contamination of the water source. The Department of Health can document several instances of contamination of the groundwater by petroleum products. Detection of petroleum contamination is relatively simple because of the pronounced taste and odor associated with this type of contamination. Contamination by other products such as agricultural chemicals and fertilizers is not as readily detected but could be more hazardous to human health.

The Department of Health has the authority to regulate the siting of proposed public water supply wells and can usually prevent the location of such wells in the vicinity of bulk chemical or petroleum storage. Once a well is constructed, the Department has no authority to prevent the installation of storage facilities in the vicinity. The only recourse is to require abandonment of the well in the event contamination occurs.

The State Fire Marshal has authority to require that accidental discharge from storage facilities be prevented from reaching waterways (natural watercourses, public sewers, or drains). There is no provision for preventing groundwater contamination caused by infiltrating agricultural chemicals or petroleum products.

This problem may get worse in the future with increased use of chemicals.

The alternatives are:

1. Encourage Local Government to Recognize the Potential Hazard, and to Regulate Storage of Chemicals,

2. State Develop Guidelines for Storage of Chemicals and Petroleum, and

3. State Develop Standards and Permit System for Storage of Chemicals and Petroleum, and Delegate Administration of the System to Capable Local Governments.

Alternative 1. Encourage Local Government to Recognize the Potential Hazard, and to Regulate Storage of Chemicals

Local general purpose governments could be encouraged to consider the possible hazards resulting from storing chemicals, especially where they could contaminate wells or streams, and to consider regulating such storage. Local ordinances could include factors such as distances from wells or streams, and standards for storage areas such as roofs or walls.

Currently many local governments have been delegated authority by the State Fire Marshal. This authority, like that at the state level, does not include protection of groundwater.

Management Agency. Any general purpose unit of local government could regulate such storage. The Department of Health could encourage it.

Authority. Adequate.

Funding. Funding to develop and enforce such ordinances would be the responsibility of the local unit of government. The cost would be variable.

Schedule of Implementation. Could begin immediately and continue indefinitely.

Legislative and Administrative Mechanisms or Changes. This would not require legislative action on the state level. It would require legislative action by the general purpose unit of local government involved. Local government could receive technical assistance from the Department of Health if necessary.

Evaluation of Impacts, Problems, and Opportunities. Positive aspects of this alternative include protection of drinking water quality by local action, and the opportunity to prevent, rather than try to correct a problem. Negative aspects include the cost and regulatory aspects.

Problems include the possible need for technical assistance, and possible reluctance of local officials to regulate local activities. There could be significant savings due to preventing a problem. This alternative would also protect the public health and safety.

Alternative 2. State Develop Guidelines for Storage of Chemicals and Petroleum

A state agency could develop guidelines regarding the storage of chemicals and petroleum, especially in areas where it might contaminate wells or streams. Such guidelines could include suggested distances, and suggested protective structures.

Management Agency. The Department of Environmental Control or Department of Health could develop the guidelines in conjunction with the Underground Injection Control Program.

Authority. Adequate.

Funding. Funding would come from the operational budget of the state agency involved. The cost would be approximately $20,000.

Schedule of Implementation. This could be done in one year.

Legislative and Administrative Mechanisms or Changes. This alternative would not require legislative action.

Evaluation of Impacts, Problems, and Opportunities. These guidelines would be useful to companies, local governments, and others who are working with chemical storage. No negative aspects or problems have been identified, except when people did not follow the guidelines, pollution could still result.

Opportunities involve giving people better information so they can do a better job.

Alternative 3. State Develop Standards and Permit System for Storage of Chemicals and Petroleum, and Delegate Administration of the System to Capable Local Governments

A state agency could develop standards regarding storage of chemicals and petroleum, especially in areas where it might contaminate wells or streams. Such standards could include required distances, and protective structures such as roofs or walls. A permit system could also be developed to give a storage permit to those facilities that meet the standards. It would be illegal to store certain chemicals and petroleum products near wells or streams without a storage permit.

Local governments which have capabilities in this area could be delegated the responsibility to issue the permits and enforce the standards in their area.

Management Agency. The Department of Health or Department of Environmental Control could develop the standards and permit program in conjunction with the Underground Injection Control Program, and delegate the program to those general purpose units of local government which wished to handle it and were capable.

Authority. The agencies do not have adequate authority to conduct this program.

Funding. State funds would be used unless federal funds could be obtained from the Environmental Protection Agency. The cost would depend on what chemicals and amounts were covered, and would be approximately $200,000 per year. Those local governments which assumed the program would provide the funding.

Schedule of Implementation. This could be implemented within two years after approval and funding by the Legislature.

Legislative and Administrative Mechanisms or Changes. This alternative would require legislative action to provide funding. A local general purpose unit of government desiring to administer the program would probably have to take legislative action.

Evaluation of Impacts, Problems, and Opportunities. This alternative should be effective in preventing pollution from storage of chemicals, but it has a significant administrative cost. Another negative aspect is the additional permits and inspections involved. Problems include informing those who store chemicals of the need for a permit, and evaluating each site to see if it is safe.

Opportunities include protection of the public health and safety by preventing pollution of the drinking water source.

18. Expansion of Enforcement Program Relating to Truck Washes, Fertilizer and Pesticide Washdown Facilities

The Department of Environmental Control currently has an ongoing program which regulates these activities on a complaint basis. Because agriculture is the primary basis for Nebraska's economy, there are many facilities requiring washdown of equipment. Examples of these facilities are truck washes, elevators, cooperatives, aerial applicators, and custom mixers and applicators of herbicides and insecticides. The major waste product of environmental concern is wash water from these facilities. Tanks containing herbicides and insecticides are washed out prior to reuse on a daily basis. Many of these facilities are located in small communities and wash either into a road ditch, alley, or other areas in close proximity to their operation. Because of this, public health becomes a major concern as well as the pollution aspects. Many of the complaints involve damage to neighbors' lawns, gardens, and trees.

Manpower is currently inadequate to handle this problem on any basis other than complaints. Annually approximately 12-15 complaints of this nature are controlled on a case by case basis. It is suspected that there are a large number of such facilities still in need of environmentally sound wash water practices.

The alternative is:

1. Expand Existing Programs.

Alternative 1. Expand Existing Programs

The state could expand the existing programs from operation on a complaint basis to a uniform program to control the wash water from these facilities.

Present rules and regulations are adequate to control such discharges, however the development of guidelines for the control of such wash water discharges will be necessary.

Management Agency. Department of Environmental Control.

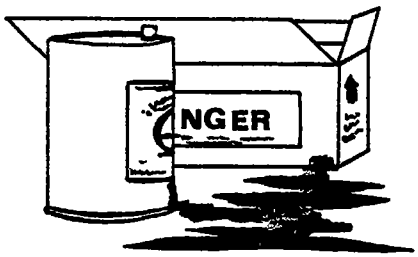
Authority. The Nebraska Environmental Protection Act, and Nebraska Department of Environmental Control Groundwater Protection Standards provide adequate authority.

Funding. Source: Federal funds available to the Department of Environmental Control and state general revenues. Estimate: $20,000/year.

Schedule of Implementation. When funding is available. Until such time as funding allows an expanded program, pollution of this nature will be handled on a case-by-case basis.

Legislative and Administrative Mechanisms or Changes. This alternative would not require legislative action.

Evaluation of Impacts, Problems, and Opportunities. Due to the large number of trucking firms, custom mixers, and applicators of herbicides and insecticides in Nebraska, a program of this nature would require several years to attain its goal. The first task would involve compilation of a complete list of trucking, insecticides, and herbicide companies requiring washdown facilities.



19. Spillage or Leakage of Petroleum Products and Designated Hazardous Substances

Present regulations concerning spills of oil and hazardous materials cover only the reporting of such incidents and clean-up of those spills which may affect groundwater. Rule 4., Nebraska Water Quality Standards for Surface Waters, requires immediate notification of spills which may enter waters of the state. Rule 5., Nebraska Groundwater Protection Standards, requires notification and clean-up of toxic or taste and odor producing substances which may enter groundwater. These two rules still leave gaps concerning the clean-up in surface water, the specifics as to the responsible parties for clean-up, and the ultimate disposal of such containments.

Current authority for requiring the necessary steps of containment, clean-up and disposal by the responsible party is contained in the general "Emergency Clause" authority of the Director of the Department of Environmental Control. This is not specific to spills of petroleum products and hazardous materials and leaves some question regarding its adequacy concerning these particular environmental emergencies.

Between January 1 and September 1, 1979, a total of eighty-one spills were reported. There was difficulty in initiating proper clean-up with four of these spills due to lack of rules and regulations. The severity of these four spills was significant. An effective spill program will become increasingly important when hazardous materials are designated in the near future.

The alternative is:

1. State Adopt Rules and Regulations Specific to the Spillage, Leakage, Clean-up, and Disposal of Petroleum Products and Hazardous Materials.

Alternative I. State Adopt Rules and Regulations Specific to the Spillage, Leakage, Clean-up, and Disposal of Petroleum Products and Hazardous Materials

The Environmental Control Council could adopt regulations governing discharges or emissions of petroleum products and other hazardous materials into the waters, in the air, or upon the land of the state. The Council could consider methods for prevention of such discharges or emissions and the responsibility of the discharger or emitter for clean-up, toxicity, degradability, and dispersal characteristics of the substance.

With the adoption of such regulations, enforcement would be handled in the routine manner through county courts. Voluntary compliance regarding containment, clean-up, and disposal would be discussed by phone at the time of spill notification. The Department of Environmental Control assists responsible parties in protecting against human or animal exposure, clean-up, and proper disposal methods. Enforcement and subsequent fines would be levied in cases of willful negligence, intentional spills, or refusal of the spiller to carry out his responsibilities as stated in the regulations.

Management Agency. Department of Environmental Control.

Authority. Section 81-1505(14), Nebraska Environmental Protection Act.

Funding. Source: Federal funds available to the Department of Environmental Control and state general funds. Estimate: $10,000 per year.

Schedule of Implementation. When funding is available.

Legislative and Administrative Mechanisms or Changes. No legislative action would be needed.

Evaluation of Impacts, Problems, and Opportunities. With the needed regulations and subsequent enforcement capabilities, the handling of spills, leakage, clean-up, and disposal could be achieved entirely under state authority. When the federal hazardous materials list is completed, the spill program will become more complex. Implementation of this alternative would allow for more equitable coverage and enforcement of spills throughout the state.

References

Section 208 Water Quality Management Plan for the State of Nebraska, Nebraska Natural Resources Commission, July, 1979.

1978 Nebraska Water Quality Report, Nebraska Department of Environmental Control.

"Groundwater Protection Standards", Nebraska Department of Environmental Control, March, 1978.

"Nebraska Water Quality Standards for Surface Waters of the State", Environmental Control Council, October, 1977.

Edward J. Peters, "The Benefits of Irrigation Return Flow on the Biota of Nine Mile Creek, Scotts Bluff County, Nebraska", University of Nebraska-Lincoln, October, 1978.

R. J. Edling, "The Influence of the Silt Run on Seepage Losses in Irrigation Canals in the North Platte River Basin", University of Nebraska-Lincoln, 1978.

County Irrigated Land Maps, Soil Conservation Service, 1978.

County Land Cover Maps, Soil Conservation Service, 1977.

County Erosion Hazard Maps, Soil Conservation Service, 1977.

County Critical Eroding Area Maps, Soil Conservation Service, 1977.

Nebraska Conservation Treatment Needs, Soil Conservation Service, 1978.

"A Survey of Roadside Seeding Programs in Nebraska", Nebraska Natural Resources Commission, May, 1977.

Nonpoint Source Control Guidebook, Soil Conservation Service, April, 1978.

"A Survey of Center Pivot Irrigation Systems", Nebraska Natural Resources Commission, 1977.

"Present and Projected Nebraska Population Levels", State Office of Planning and Programming, January, 1978.

"Future Pollution Source Problems", Nebraska Natural Resources Commission, 1978.

"Present and Projected Nebraska Economic Development", State Office of Planning and Programming, February, 1978.

"Present and Projected Nebraska Land Use", State Office of Planning and Programming, 1978.

"Central Platte Nitrate Study", Central Platte Natural Resources District, March, 1979.

"Soil Interpretations for Application of Nontoxic Biodegradable Liquid and Solid Waste for Nutrient Removal by Plants", Soil Conservation Service, August, 1978.

"Best Management Practices", Nebraska Natural Resources Commission, June, 1979.

"Alternative Technical Measures for Water Quantity Problems as They Affect Water Quality", Nebraska Natural Resources Commission, 1978.

"An Evaluation of Environmental, Social, and Economic Impacts of Proposed Alternative Technical Measures", State Office of Planning and Programming, July, 1978.

A Report on Management Arrangements Capable of Solving Water Quality Problems in Nebraska, Lower Elkhorn Natural Resources District, March, 1979.

A Report on Financial Alternatives Available to Natural Resources Districts For Proposed Alternative Solutions to Water Quality Problems, Nebraska Association of Resources Districts, November, 1978.

Raymond J. Supalla and Henry J. Geu, "A Report on Alternative Methods of Financing Section 208 Water Quality Programs in Nebraska", University of Nebraska-Lincoln, November, 1978.

"Work Element 5400 - Evaluate Social Economic, and Environmental Impacts of Proposed Alternative Solutions (Management Arrangements)", State Office of Planning and Programming, October, 1978.

Areawide Waste Treatment Management Plan, Omaha-Council Bluffs Metropolitan Area Planning Agency, April, 1979.

Nebraska Interim Plan for Agricultural Nonpoint Pollution Control, Nebraska Natural Resources Commission, September, 1978.

"Check Valve Survey Preliminary Report", Nebraska Natural Resources Commission, April, 1979.

"Public Participation in Non-point Source Planning, November Workshops", Nebraska Natural Resources Commission, 1977.

"Alternatives for Clean Water in Nebraska, 1978 Workshops", Nebraska Natural Resources Commission.

"Public Participation in Non-point Source Planning", 1976 Conference Proceedings, Nebraska Natural Resources Commission.

Groundwater Quality Atlas of Nebraska, R. A. Engberg and R. F. Spalding, University of Nebraska-Lincoln, 1978.

303(e) Basin Water Quality Management Plans, Nebraska Natural Resources Commission, 1974-76.

State of Nebraska Continuing Planning Process for Water Quality Management Planning and Implementation, Nebraska Natural Resources Commission, 1976.

Statistical Data for Selected Chemical Constituents, U.S. Geological Survey, 1977.

Nebraska Department of Environmental Control Program Plan Strategy.

A Social, Economic and Environmental Assessment of the Section 208 Water Quality Plan for the State of Nebraska, Policy Research Office, July, 1979.

Appendix 1.
Agencies on Water Quality Task Force

Natural Resources Commission

Department of Environmental Control

Department of Health

Game and Parks Commission

Policy Research Office

Water Resources Center (UNL)

Conservation and Survey Division (UNL)

Department of Water Resources

Department of Agriculture

Appendix 2. Description of State Water Planning and Review Process

In 1978 the Legislature directed the Natural Resources Commission to consult with state agencies and political subdivisions involved in water resources to devise a policy statement and work plan for redirecting and accelerating the State Water Plan. The Legislature also directed that high priority be given to the analysis of a number of vital policy issues. In response, a new State Water Planning and Review Process was designed to eliminate a number of shortcomings inherent in the development of the former State Water Plan. This Planning and Review Process is designed to be a continuing process that integrates the work of ten state agencies in the planning and review of actions involving Nebraska's water resources.

PLANNING AND REVIEW PROCESS ACTIVITIES

The process is composed of five major activities. They are:

1. Policy Issue Analysis
2. Problem Analysis and Area Planning
3. Project and Program Review
4. Project Planning and Design
5. Base Activities

The first activity was designed to respond to the legislative directive to analyze specified policy issues. The policy issue accorded first priority by the state agencies in the work plan approved by the Legislature was the Instream Flow Policy Issue Study.

PLANNING AND REVIEW PROCESS ORGANIZATION AND PROCEDURES

Primary responsibility for management coordination of the Process was assigned to the Natural Resources Commission. The Legislature also established legal and financial means by which other state agencies could take an active part in the Planning and Review Process. In addition, an Interagency Water Coordinating Committee and a Public Advisory Board were created to assist in the Process.

Interagency Water Coordinating Committee

This committee, appointed and chaired by the Governor, coordinates the efforts of ten state and university agencies on the Planning and Review Process and other water-related matters. It also has the duty of reviewing reports resulting from the State Water Planning and Review Process, and providing comments and recommended changes as deemed necessary. The Interagency Water Coordinating Committee (IWCC) is comprised of the following:

Governor Charles Thone - Chairman

Dan Drain - Department of Environmental Control

John Neuberger - Department of Water Resources

Don Leuenberger - Department of Administrative Services Budget Division

Eugene Mahoney - Game and Parks Commission

Mickey Stewart - Department of Agriculture

Dayle Williamson - Natural Resources Commission

Vince Dreeszen - Conservation and Survey Division

Gary Lewis - Water Resources Center

Don Stenberg - Policy Research Office

Henry Smith - Department of Health

The Executive Secretary of the Natural Resources Commission, Dayle Williamson, was appointed to serve as secretary of the committee.

Public Advisory Board

This Board was created by the Legislature to assist in the Planning and Review Process. It has 11 members, 8 of whom have expertise in a specified water interest area. The other 3 citizen members each represent one of Nebraska's congressional districts. The members and their constituencies are as follows:

Richard Hawes - Municipal

Alfred Gigstad - Domestic

Robert Lowry - Groundwater Irrigation

Don Steen - Surface Water Irrigation

Jack Maddux - Livestock Production

Richard Spady - Environmental

Vance Anderson - Industrial and Commercial

Richard Nisley - Wildlife, Fish, and Recreation

Elmer Schlaphoff - First Congressional District

William Emrich - Second Congressional District

Roy Stewart - Third Congressional District

The functions of the Board include providing advice and assistance in: (1) identifying legislative and administrative policy issues; (2) developing and reviewing alternative solutions for legislative and administrative policy problems; (3) recommending the types of problems needing analysis as part of the problem analysis and area planning activity and where such problems are located or likely to be located; (4) disseminating information and materials generated by the planning process to interest groups they represent and the public generally; and, (5) determining the conditions under which and the methods by which additional public input is to be obtained. In addition, the Board is to provide review and comments to the Natural Resources Commission and the Legislature on reports resulting from the Planning and Review Process.

THE POLICY ISSUE ANALYSIS ACTIVITY

This activity is one of five that comprise the Planning and Review Process.

DESCRIPTION

The Policy Issue Analysis Activity of the Planning and Review Process is designed to analyze the issues designated by Legislative Resolution 300 adopted in the 1978 session, as well as other policy issues, in a structured manner. The design of the Process specified nine policy studies which were to be undertaken in an order that would both allow priority problems to be addressed first and data from one study to be used in others. The products of these studies will be reports delineating the policy alternatives available to the state under each issue, and then analyzing the economic, social, environmental, and other impacts of each alternative.

The nine policy issue studies are:

1. Instream Flows
2. Water Quality
3. Groundwater Reservoir Management
4. Water Use Efficiency
5. Surface and Groundwater Rights Systems
6. Municipal Needs
7. Supplemental Water Supplies
8. Interbasin Transfers
9. Weather Modification

Five policy issue studies are currently in progress.

RELATIONSHIPS BETWEEN POLICY ISSUE STUDIES

In the development of the Planning and Review Process, it was found there is no magic formula for separating the multitude of policy issues

requiring possible consideration. Virtually all water issues are interrelated, making their orderly analysis extremely difficult. If sufficient time were available, all issues would be identified, designed as parts of a complete study, analyzed concurrently, and then presented in the form of a comprehensive, totally integrated water code. Unfortunately, the urgency of many issues makes this impracticable.