PROPOSAL FOR

CANDIDATE MODEL IMPLEMENTATION PROGRAM

FOR AGRICULTURAL NON-POINT SOURCE POLLUTION CONTROL

IN LARIMER AND WELD COUNTIES, COLORADO

November 22, 1977

SUMMATION REPORT

MIP CANDIDATE
LARIMER AND WELD COUNTIES, COLORADO
(STATE PLANNING REGION 2)

1. DESCRIPTION OF AREA AND WATER QUALITY PROBLEMS

- 6,000 square mile region bordered on the west by the Continental Divide and on the north by Wyoming;
- Four major river systems tributary to the South Platte River;
- ½ million acres of irrigated agriculture which is greater than 55 percent of the irrigated land in the 24,000 square mile South Platte River Basin;
- Irrigated agriculture is the major water user (90 percent), and the major polluter in the region (66 percent of the total sediment waste loads; 95 percent of the TDS, salts; 62 percent of nitrogen to surface and subsurface waters, including contributions resulting from feedlot waste management practices).

2. 208 PLANNING STATUS

- 208 Plan due in February 1978;
- Best Management Practices for irrigated agricultural pollution control and management of feedlot wastes as a resource selected and will be included in 208 Plan.

3. U.S.D.A. AGENCIES INVOLVED

- U.S. Forest Service and SCS represented on 208 Citizen's Advisory Committee;
- IPA Agreement with 208 Agency (Larimer-Weld Regional Council of Governments);
- BMP Advisory Committee represented by SCS State Conservationist, ASCS, and ARS.

4. LOCAL AGRICULTURAL GROUPS INVOLVED

- Ditch companies, water users associations, water conservancy districts, ten SCD's, and County Agriculture Councils represented on 208 Citizen's Advisory Committee and BMP Advisory Committee;

- Cooperative agreement with ten SCD's State Soil Conservation Board, SCS, and 208 Planning Agency.

5. PROPOSED MIP AREA, PROBLEMS, AND SOLUTIONS

- Lone Tree Basin: 48,000 acres with 24,000 acres experiencing high nitrogen levels due to excessive utilization of manure as a soil builder available from concentrated animal feeding operations; technical assistance, education, improved operations (non-structural), show promise as BMP's;

- Little Thompson River Basin: 33,000 irrigated acres overlying weathered shale formations, with high salt content resulting in in-stream TDS concentrations exceeding 2,000 mg/l. Sediment concentrations as high as 200 mg/l are experienced during the irrigation season due to highly erodable soil conditions. Candidate BMP's (both structural and non-structural) include ditch lining, canal lining, shorten length of runs, buffer strips, grassing of drainage ways, and a variety of labor intensive improved farm practices.

6. TIMETABLE FOR MIP IMPLEMENTATION

- Detailed work plan including cost requirements for planning, analysis, sampling, monitoring, public participation, education, and BMP's will be completed in February 1978 and included in Larimer-Weld COG 208 Implementation Plan for irrigated agriculture;

- Full-scale implementation of MIP can begin in spring of 1978.

7. PROSPECTS FOR MEASURING WATER QUALITY IMPROVEMENTS WITHIN THREE YEARS

- Excellent prospects in selected areas;

- Determination of benefits (water quality and otherwise) and their distribution (agriculture, local taxpayers, national interests) feasible within the three-year period. Would lead to determining a methodology for U.S.D.A. to use in establishing percent of cost sharing for full-scale implementation of BMP's in other areas.

8. LOCAL INTEREST IN MIP

- Resolution supporting MIP designation from 208 Citizen's Advisory Committee and Governing Board (elected public officials of the 208 Planning Agency;

- Support of Ag Executive Committee representing ten SCD's in region;

- Letters of support for MIP designation committeed by following organizations:

  - Longmont SCD
  - West Greeley SCD
  - Big Thompson SCD
  - Cache la Poudre Water Users Association
  - Support from other active organizations being sought.

9. MANPOWER REQUIREMENTS TO PLAN AND IMPLEMENT BMPS WITHIN MIP AREA

- Little Thompson River Basin MIP would require slightly over eight man-years of technical assistance time to complete the MIP in three years; four man-years are available in U.S.D.A. Field Offices without major repriortization of ongoing programs;

- Lone Tree Basin would require three man-years for the three year period. This manpower requirement can be met and would be split between SCS and the Extension Service;

- The total manpower from three SCS Field Office's available to work exclusively within MIP area indicates that a deficit of four man-years exists to complete the total MIP job.

10. ECONOMIC ANALYSIS FOR APPLYING (SITE PLANNING AND INSTALLATION) BMPS WITHIN MIP AREA

- $977,100 for sediment control in Little Thompson Basin;

- $736,600 for salinity control in Little Thompson Basin;

- Technical assistance only in Lone Tree Basin for nitrate control. Some labor intensive and possible capital intensive BMP's may be justified after technical assistance is complete and could be absorbed by ongoing cost-sharing programs within the U.S.D.A. agencies following the MIP.

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1.0 INTRODUCTION

The Larimer-Weld Region of Northern Colorado, a designated 208 planning area, has been in the process of developing an Agricultural Pollution Control program for over two years. The 6,700 square mile region contains over 500,000 acres of irrigated land--one of the most concentrated irrigated areas in the western United States. The Agricultural Pollution Control Program has been a major element in the overall Larimer-Weld 208 effort.

2.0 BACKGROUND

The Larimer-Weld Region lies within the South Platte River Basin of Colorado. The state contains 19,000 square miles of the 24,000 square mile river basin, the remainder lying in southeastern Wyoming and western Nebraska. The Larimer-Weld Region occupies approximately 6,700 square miles in Northern Colorado (see sketch 1) and contains over 500,000 acres of irrigated land, which is more than one-half of the total 900,000 acres of irrigated land within the basin. Diversion of native stream supplies for irrigation was initiated in the late 1850's when farmers recognized that additional water supplies would be needed to grow crops in the semi-arid region (average rainfall 12 to 14 inches per year).

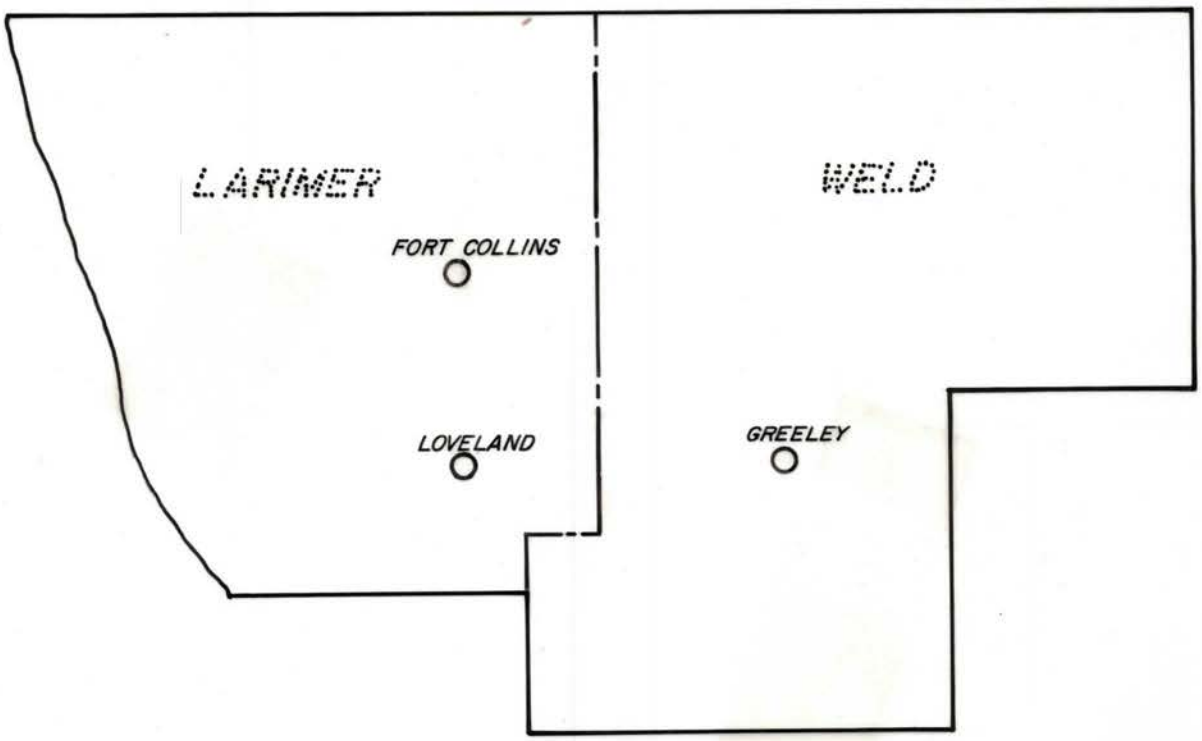
2.1 IRRIGATION SYSTEMS IN THE LARIMER-WELD REGION

The present day irrigation system supplies water to approximately 508,000 acres of irrigated land within the region. There are 87 individual diversion structures located within the streams of the region which divert water from streams to irrigation canals. There are approximately 1,250 miles of large irrigation canals in the region with capacities ranging 30 cubic feet per second to 800 cubic feet per second. It is estimated that there is an additional 1,200 miles to 2,000 miles of smaller canals supplying waters to individual farms. The irrigation supply system includes 76 individual reservoirs having a total storage capacity of 1 million acre feet. The 1974 census of irrigated agriculture indicates that irrigation water is supplied to 2,700 individual farms within the region.

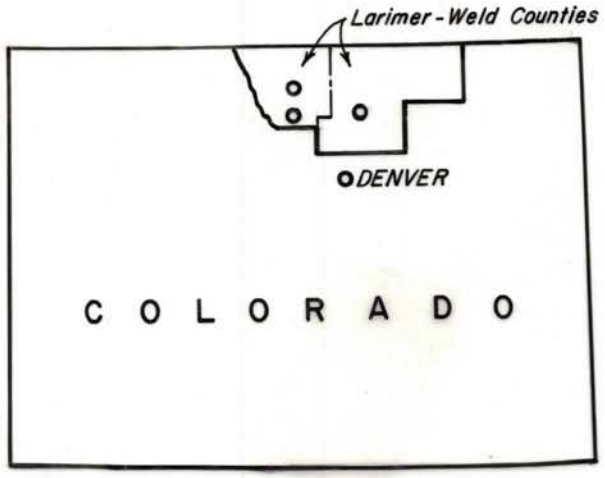
The region is the largest producer of fattened cattle in the United States. Some 1,200 to 1,500 feedlots within the region produce approximately 1 million head of fattened cattle each year.

2.2 AGRICULTURAL POLLUTION CONTROL IN THE LARIMER-WELD REGION

The first comprehensive assessment of the Agricultural Pollution Control problem in the Larimer-Weld region which



LARIMER - WELD COUNTIES



SKETCH I - LOCATION MAP - LARIMER - WELD REGION

included both irrigated agriculture and feedlot operations was conducted during the development of the State of Colorado's 303(e) Plan for the basin entitled "Comprehensive Water Quality Management Plan--South Platte River Basin Colorado". (This plan was adopted by the Colorado Water Quality Control Commission in November, 1974). Applying theoretical methods, agriculture wasteloads were calculated to be among the highest in the basin. This correlated with the fact that irrigated agriculture accounts for 90 percent of the total water demand in the South Platte Basin.

Intensive investigation of the agricultural pollution control problem was initiated through the Larimer-Weld Regional Council of Governments 208 Program in August, 1975. Major planning efforts produced the following reports:

- Water Quality Impacts of Irrigated Agriculture
- Concentrated Animal Feeding Operations--Waste Management and Resource Recovery
- Water Quality Modeling and Wasteload Allocations
- Nonpoint Source Pollution Control in the Larimer-Weld Region

In addition to the efforts mentioned above, the Environmental Protection Agency, Revion VIII, Denver, provided a special $100,000 Research and Development Grant to implement a project entitled "Identify the Methodology and the Technical/ Institutional Feasibility for the Development and Implementation of Best Management Practices for Irrigated Agriculture" (hereinafter referred to as the "Best Management Practices Analysis.")

Implementation of the 208 planning elements related to agricultural pollution control and the demonstration grant resulted in a multi-phased interdisciplinary planning program. The first phase of the program included:

- Concentrated Animal Feeding Operations--Waste Management and Resources Recovery
- Water Quality Impacts of Irrigated Agriculture
- Water Quality Modeling and Wasteload Allocations

The second phase of the program included:

- Nonpoint Source Pollution Control in the Larimer-Weld Region
- Best Management Practices Analysis

Phase 1 was initiated during the 1976 irrigation season and was completed in March, 1977. Phase 2 was initiated in April, 1977, extended through the 1977 irrigation season, and is scheduled to be completed in January, 1978. Additionally,

a comprehensive inventory and analysis of institutional and financial requirements for implementing agricultural nonpoint source control measures is completed and available for review.

2.2.1 The Phase 1 Analysis

The Phase 1 analysis, which defined the Water Quality Impacts of irrigated agriculture on streams within the region, is believed to be one of the most extensive and detailed analysis of a regional irrigated area ever conducted in the United States. It involved the following elements:

- Measurement of the volume of irrigation return flows discharging to streams
- Sampling and measuring of chemical constituents in irrigation return flows
- Measurement of the volume of stream flows to determine the relative magnitude of irrigation return flows in the streams
- Sampling of in-stream chemical constituents to determine the impact of irrigation return flows on stream water quality
- Study of soils within the region and relationship to pollutant discharges
- Definition of irrigation practices within the region
- Definition of stream hydrology within the region and the impact of irrigation diversions and return flows on stream hydrology

Water quality samples and discharge volume measurements were collected at more than 150 locations throughout the region. In many instances individual locations were sampled several times. Samples were analyzed for 5 to 15 chemical constituents depending on location and need for information.

2.2.2 Findings of the Phase 1 Analysis

Within the region approximately 200 miles of major streams and several hundred miles of tributaries in four distinct drainage basins are impacted by irrigation return flows. The most obvious problems are assoiciated with excess of salinity, nitrates, and sediments.

Major salinity problems were found to be the result of irrigation over shallow underlying shale deposits. Tile drain effluent with concentrations as high as 6,000 mg/l is discharged from these areas (see sketch 2). Approximately 20 percent of the irrigated land or 100,000 acres of land exhibit an excess salinity problem.

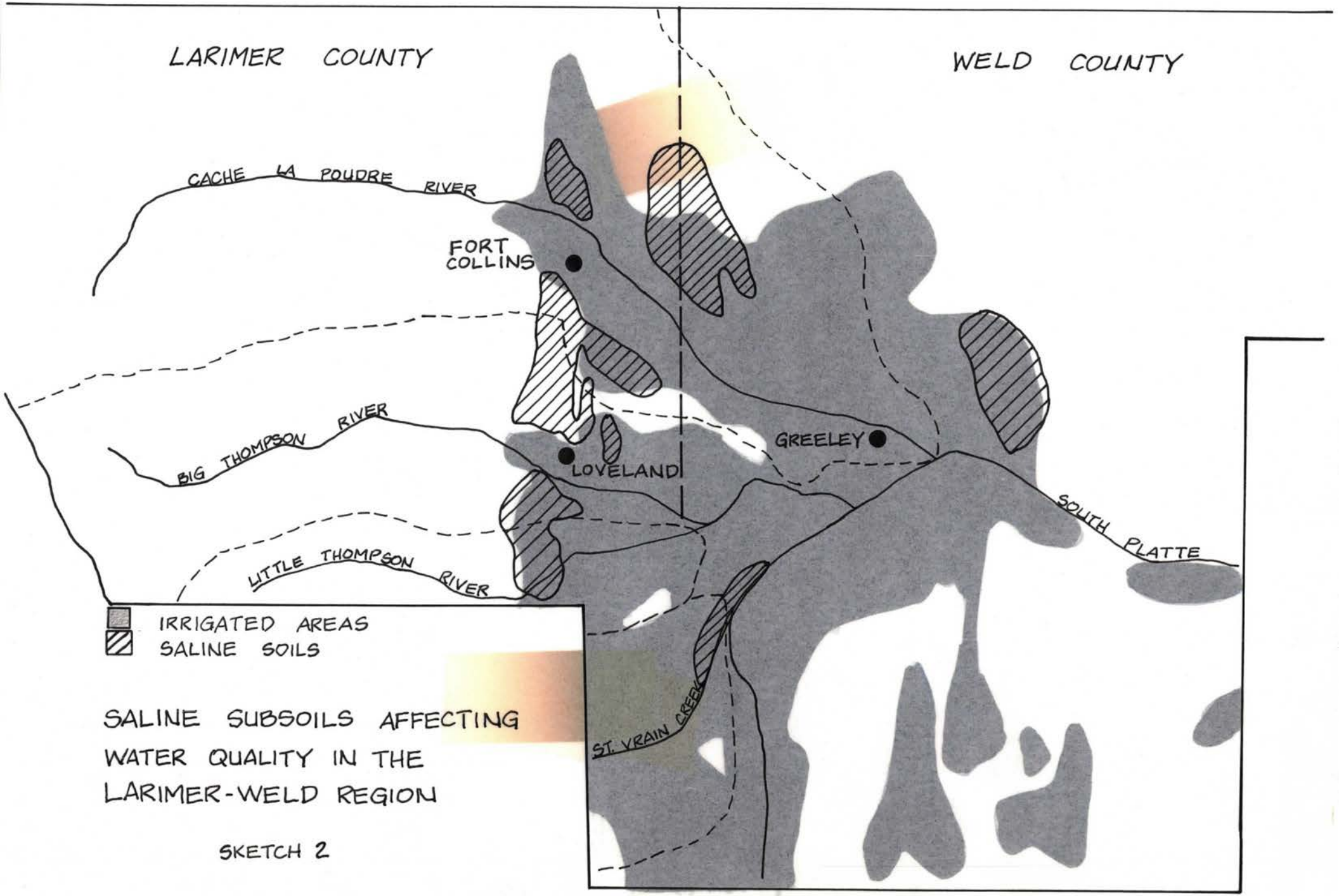
Most severe nitrate problems in the region are associated with the application of excess commercial fertilizers in addition to application of waste manure from the numerous feedlots in the region. In the vicinity of concentrated animal feeding operations, some irrigators have been applying animal waste at rates as high as 20 to 25 tons per acre year after year. In addition, most irrigators apply commercial fertilizers through irrigation water or directly to the soil. Irrigators appear to recognize the value of recycling manure as a soil amendment, but fail to recognize the fertilizer value of animal waste as a nitrogen source. In areas of sandy soils subject to excess nitrogen applications, waters with nitrate concentrations as high as 50 to 75 mg/l as Nitrogen were found to be moving from irrigated fields to the ground water (see sketch 3).

The most severe sediment problems were found in the Little Thompson basin where total suspended solids levels at the mouth were observed to be about 200 mg/l during the irrigation season. This high sediment load is attributable to the fine soils found in the basin and the fact that the Little Thompson does not support the non-irrigated flood plain typical of the other rivers of the region. The lack of non-irrigated flood plain allow the farming of row crops right up to the edge of the river and promotes the emptying of sediment laden tributaries into the river.

The factors affecting on-farm generation of agricultural pollution loads include: irrigation methods, drainage practices, physical and chemical characteristics of irrigated soils, quality of applied irrigation water, topography, on-farm irrigation efficiency and sub-soil conditions. These factors constitute an extremely complex matrix which is found to be highly variable within the Larimer-Weld region. Analysis of these factors as they apply to any one of the 2,700 individual irrigated farms within the region will produce variable results in terms of quantity and quality of discharges.

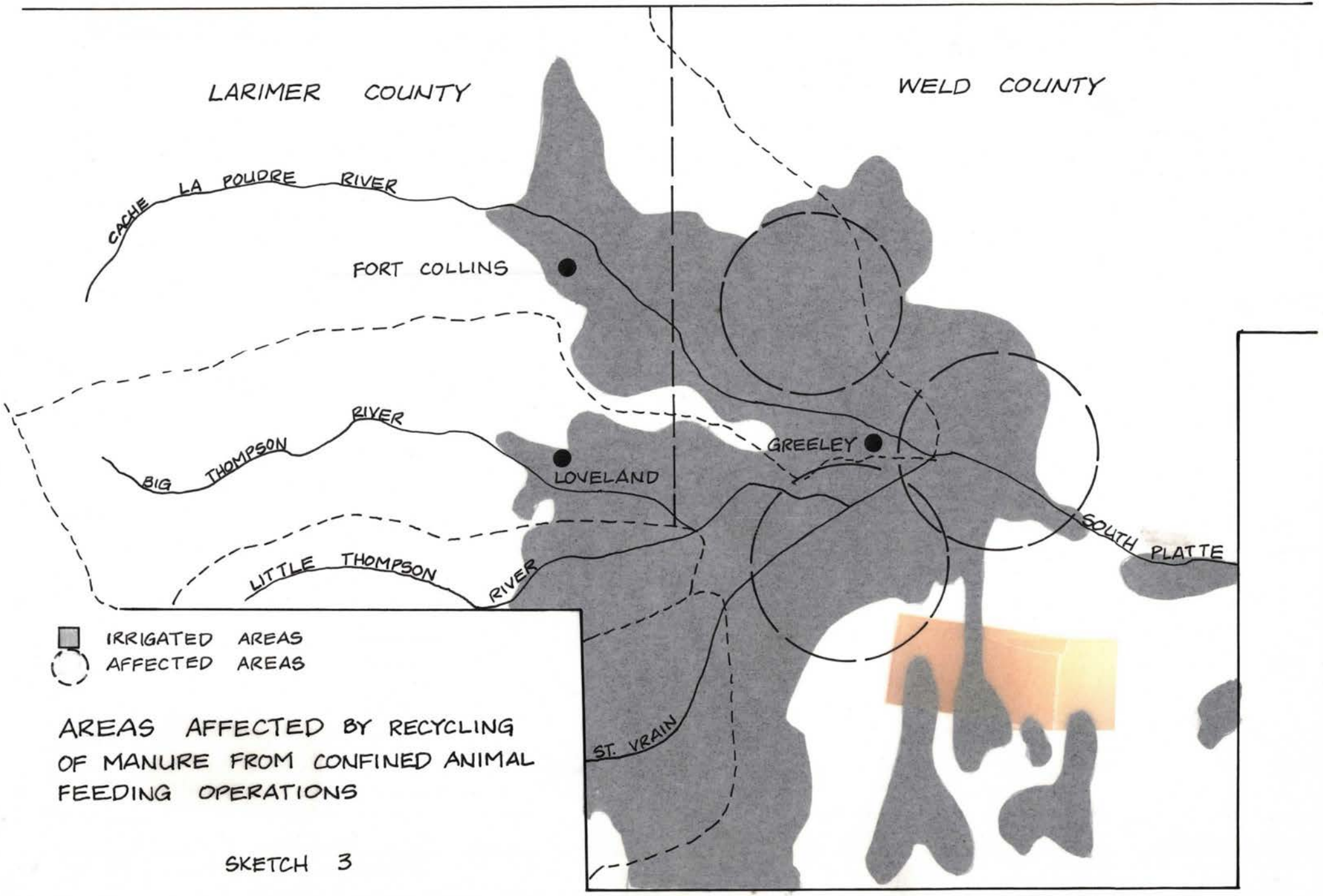
2.2.3 Phase 2 of the Agricultural Pollution Control Program

Recognizing that on-farm practices and conditions essentially control the discharge of pollutants, the Phase 2 program was oriented towards: defining and quantifying the interrelationships of physical conditions (soils, topography), practices



SALINE SUBSOILS AFFECTING WATER QUALITY IN THE LARIMER-WELD REGION

SKETCH 2



AREAS AFFECTED BY RECYCLING OF MANURE FROM CONFINED ANIMAL FEEDING OPERATIONS

SKETCH 3

(irrigation methods, crop types, irrigation efficiencies), and the nature of pollutant discharges (salt, sediment, nitrates). It was recognized that if these interrelationships could be established Best Management Practices (i.e., canal lining, ditch lining, irrigation scheduling, land leveling, buffer strips, etc.) could be evaluated for effectiveness in reducing pollutant discharges. The cost of those BMP's considered to be most effective could then be determined, and cost effective relationships could be established between Best Management Practices and Water Quality Improvement.

In order to establish the relationships among the factors controlling pollutant discharges, Phase 2 included an extensive on-farm sampling program. Four farm sites in the region were selected for detailed sampling. Two of the farms were located in areas exhibiting excess salinity discharges. One farm was located in an area exhibiting excess sediment discharges, and one farm was located in an area exhibiting excess nitrate discharges.

The on-farm sampling program included sampling of water in the soil column, sampling of the ground water and determination of ground water elevation with observation wells, sampling of water as it ran off the end of the field and sampling of applied water. In addition, the volume of water applied and the volume of run-off were measured. Available crop-evapotranspiration data and irrigation efficiency analysis were used to determine return flow volumes.

2.2.4 Findings of the Best Management Practices Analysis

The final results of the BMP analysis are in the process of being developed; however, enough has been learned from the on-farm sampling program conducted during the 1977 irrigation season to state the following conclusions:

1. Much of the pollutant load results from inefficiencies in the conveyance and water application systems. Higher irrigation efficiencies will reduce wasteloads from irrigated agriculture.

2. Best Management Practices which improve irrigation efficiencies will reduce wasteloads from irrigated land.

3. In order to be most effective, Best Management Practices must be defined on an individual farm basis.

4. The hypothesis concerning cost effective analysis has been born out. Cost effective analysis will be dependent on defining:

a. Physical characteristics of the irrigated land
b. Irrigation practices
c. Water quality problems resulting from the combination of practices and physical characteristics
d. The potential for reducing wasteloads by applying specific Best Management Practices
e. The cost of those Best Management Practices

5. Best Management Practices generally being discussed have been applied for many years as soil and water conservation measures. However, these practices have not been evaluated in terms of their effectiveness in reducing pollutant loads or in water quality improvement. This is especially true with regard to dissolved pollutants, such as salinity and nitrates.

6. Because of Best Management Practices have not been widely evaluated for water improvement, there is a need for implementation of demonstration projects to evaluate the true cost and effectiveness of BMP's as water quality control measures.

Some of the BMP measures being considered for implementation are listed in Table 1 along with their projected effectiveness in reducing salinity, nitrates, sediments, phosphorus and pesticide loadings. Cost data is being developed for each drainage basin within the two county area and estimates of cost effectiveness of these measures will be included in the final BMP report. Preliminary costs are presented in Tables 3 and 4.

2.2.5 Findings of the Institutional and Financial Analysis

A detailed analysis of the institutional and financial requirements to control pollution from irrigated agriculture has been published and is available in a 91-page document (Briscoe, Maphis, Murray, and Lamont, Inc., October 1977). The recommended implementation strategy is characterized by the following key concepts:

- Local control over the program and local responsibility for managing implementation consistent with other demands of the area is highly desirable.

- Existing institutional agencies in Larimer-Weld region have sufficient powers and capabilities for the most part to perform the required tasks of the 208 program. Existing local agencies should be assigned the primary functional activities with support from existing federal and state agencies.

TABLE 1

ESTIMATED REDUCTION IN POLLUTANT LOADING

FOR VARIOUS CONTROL OPTIONS

	POLLUTANTS				
CANDIDATE TECHNOLOGY (BMP)	SALINITY	NITRATES	SEDIMENT	PHOSPHORUS	PESTICIDES (1)
IRRIGATION SCHEDULING	5-10%	5-10%	0- 5%	0- 5%	0- 5%
LATERAL LINING & PIPELINE	5-20%	0	0-10%	0	0
CANAL LINING	5-20%	0	0-10%	0	0
IMPROVE SURFACE SYSTEMS	5-20%	5-20%	0-10%	0-10%	0-10%
SPRINKLERS	30-50%	30-70%	95%	95%	95%
LAND LEVELING	0-25%	0-25%	0-10%	0-10%	0-10%
DRAINAGE	5-20%	0-10%	0	0	0
WATER MEASURE DEVICE	0-5%	0-5%	0- 5%	0- 5%	0- 5%
SEDIMENT PONDS	0	0	15-90%	15-90%	15-90%
T.W. PUMPBACK	0	0	15-90%	15-90%	15-90%
BUFFER/FILTER STRIP	0	0	5-40%	5-40%	5-40%
GRASSED WATERWAYS	0	0	5-40%	5-40%	5-40%
SLOW RELEASE NITROGEN	0	10-30%	0	0	0

(1) Pesticides travelling with soil only.

- Because of their broad powers and ability to coordinate water quality programs with other governmental activities, general purpose local governments should be in charge of the program implementation where possible.

- Soil Conservation Districts and County Agricultural Councils should play key roles in plan preparation and maintenance, management, and operation functions of implementing agricultural pollution control strategies.

- Planning and development activities should precede areawide implementation and be sufficiently complete to serve as a basis for predicting the results in water quality terms that can be expected from the application of specific implementation programs.

- All waste water pollution control programs in the region should be coordinated. This includes those from municipal and industrial point sources, all nonpoint sources, and irrigated agriculture. This suggests that agencies assigned tasks in the irrigated agricultural program have sufficient land use management powers when viewed in light of the overall program requirements of 208 implementation.

- Management agencies should delegate "operational activities" to qualified agencies via intergovernmental and/or private contracts to the greatest extent possible. This will assure availability of the required implementation skills by making maximum use of existing institutional structures and services organizations.

- County and city general purpose governments should be assigned management responsibilities having primary responsibility for meeting the requirements of the implementation plan.

- Intergovernmental contracts should be developed between the management agencies and Soil Conservation Districts as operational agencies.

- Initial compliance requirements should be voluntary with mandatory controls considered only after technical and economic conclusions are firm.

- Unlike institutional arrangements to insure implementation of the 208 Plan for municipal and industrial

point sources and urban runoff control, flexibility in assignment of implementation responsibilities (i.e., areawide planning, management, operations, and regulation) should be maintained for agricultural source control. In the initial implementation phase involving testing and demonstration of BMP's for water quality improvement and determination of distribution of costs and benefits, Soil Conservation Districts should be operational agencies with a strong voice in determining and recommending Best Management Practices for agriculture which are in accordance with the Plan provisions.

- Program funding and the distribution of program costs should recognize the responsibilities of those who benefit from implementation as well as the positive incentives for efficiency that arise when the polluter is asked to help pay for pollution abatement programs. Likewise, the local area's ability to pay must be determined.

2.3 PUBLIC PARTICIPATION IN THE LARIMER-WELD 208 WATER QUALITY PROGRAM

There are three major elements of the 208 public participation program which are as follows:

1. The Citizen's Advisory Committee
2. Special Cooperative Agreements
3. Intergovernmental Task Force for Agricultural Pollution Control

2.3.1 Citizen's Advisory Committee

The Larimer-Weld 208 Areawide Planning Committee consists of 81 members representing diverse interests and points of view at the local, state, and federal level. Representation includes as examples, environmental groups and organizations, chambers of commerce, elected officials, and representatives from 33 municipalities and 2 county governments, water user organizations, and other agricultural interests, industry, League of Women Voters, and so forth. The Citizen's Advisory Committee is divided into five subcommittees. They include Subcommittees on water quality, population and land use, environmental impact, institutional and financial management, and a committee at large which acts as state-wide issues committee. Each of the committees was assigned specific tasks, such as urban runoff control measures, institutional/ financial arrangements, water quality classifications and standards, technical strategies for meeting water quality

goals, priorities for funding of municipal wastewater treatment facilities, and others.

2.3.2 Cooperative Agreements

At the urging of local farmers, the Larimer-Weld Countil of Governments on August 19, 1976, entered into a cooperative agreement with the U.S. Department of Agriculture, Soil Conservation Service, the State Soil Conservation Board, and the ten Soil Conservation Districts in the Larimer and Weld Counties area.

The purpose of this cooperative agreement was to establish lines of accountability, as well as cooperation amongst the various parties involved in a locally-oriented water quality management planning process. In support of this cooperative agreement, the COG entered into an IPA contract agreement with the U.S. Department of Agriculture, Soil Conservation Service. The Soil Conservationist assigned to the Council of Governments has provided invaluable technical assistance in the development of technical and institutional strategies for the control of pollution from agricultural sources, including irrigated agriculture, non-irrigated agriculture, and feedlots.

Additionally, a three-man Executive Committee consisting of local agriculturalists has been selected by the ten Soil Conservation Districts to represent them in the course of the 208 Planning Program. These three individuals, along with agricultural interests represented on the Citizen's Advisory Committee, represent the principal liaison with the agricultural interests in the region and the state.

The cooperative agreement amongst the parties mentioned has been used throughout the Western United States as a model for intergovernmental cooperation and citizen's participation in agricultural pollution control planning.

2.3.3 Policy Advisory Committee for Agriculture Pollution Control

Because of the unique technical and institutional challenges associated with developing cost-effective pollution control strategies for irrigated agricultural sources, a special Best Management Practice Advisory Committee was formed of representatives of federal, state, and local governmental agencies and local farmers involved with agricultural practices. The Committee structure is as follows: the State Conservationist, Soil Conservation Service, U.S. Department of Agriculture; the Commissioner of Agriculture, State of Colorado; the Chairman of the Soil Conservation Board, State of Colorado; the President of the Colorado Association of Soil Conservation Districts, who acts as Committee Chairman; a representative

from the USDA Agricultural Research Service. Ex-officio members include the Chairman of the 208 Citizen's Advisory Committee (a former member of the National Water Quality Committee of the Department of the Interior); representatives of the U.S. EPA; the Colorado State 208 Coordinator; representatives of Colorado State University Agricultural Extension Service and Department of Chemical Agricultural Engineering; Agricultural Stabilization and Conservation Service.

This body was formed in recognition that in order to effectively carry out agricultural pollution control programs in the Larimer and Weld region and throughout the State of Colorado, policies and coordinative actions heretofore not established will be required on the part of state and federal agencies involved in agricultural practices and water pollution control. The objective of the Committee is to reach a meeting of the minds amongst local, state, and federal governmental officials involved in agriculture and pollution control, as well as area farmers, on the timing and phasing of agricultural pollution control program,s including technical, institutional, and funding requirements.

3.0 THE PROPOSED IMPLEMENTATION PROGRAM

The general goals and objectives of the MIP program have been set forth in various EPA and USDA memoranda. Experience gained in Northern Colorado indicates that these objectives can be defined much more specifically at this time. The preliminary statement objectives for the MIP program might be as follows:

1. Define the effectiveness of structural and non-structural Best Management Practices in achieving water quality improvements.

2. Establish reasonable levels of expectation for time phased achievement of water quality goals.

3. Define the cost of achieving water quality goals through implementation of Best Management Practices.

4. Define the cost effectiveness of Best Management Practices.

5. Define the methodology for distributing and allocating benefits of implementing Best Management Practices, including those benefits to be derived by farmers, local residents, state government, and federal government.

6. Based on the benefit analysis, define a logical method of cost distribution for implementation of BMP's to the beneficiaries.

7. Define the appropriate institutional relationships for broad scale implementation of Best Management Practices, including those agencies at the federal-state-local level which should be involved specifically in the activities of planning, management, operation, and regulation.

Achievement of these objectives will meet the broad program goals defined by EPA and USDA. In order to meet these objectives, criteria can be established which will assure successful completion of the MIP program. Criteria should include at least the following:

1. Water quality management problems caused by nonpoint source pollution should be identified.

2. A background water quality data base should be established which will enable the implementing agency to monitor the positive impacts of BMP's developed under MIP.

3. Cause and effect relationships should have been established between physical characteristics of the problem area, existing management practices, and water quality problems.

4. Institutional relationships should be established among the planning agency and the principal participants in the MIP, including EPA, state planning agencies, SCS, ASCS, Extension Service FmHA, SCD, and individual land owners.

With respect to the objectives and criteria studied above, the Larimer-Weld Region is uniquely suited for designation as a Model Implementation Program area. Nonpoint source problems associated with irrigated agriculture have been identified and quantified; specific problem areas within the region have been identified. Best Management Practices which could alleviate these problems have been identified, and ongoing relationships with all the potential agencies involved in the program are well established. Finally, the region has a proven tract record in the high degree of coordination that will be needed to implement the MIP.

3.1 SELECTION OF MIP AREAS

The extensive analysis of the impacts of irrigated agriculture in the Larimer-Weld region and establishment of the cause and effect relationships associated with irrigated agriculture indicates two specific sub-basins within the region which will be most amendable to successful completion of the MIP.

In the selection of these areas, three criteria have been applied:

1. The areas selected will have been defined as high priority areas in 208 planning for implementation of BMP's to control agricultural pollution.

2. The area should be small enough so as not to require extremely large capital investments during the MIP program.

3. The area selected should be small enough so as to be manageable from the standpoint of monitoring water quality improvements resulting from the MIP.

Concerning the size of the MIP area, experience developed to date in Northern Colorado indicates that the general criteria stated in EPA and USDA memoranda of an area of 100,000 - 500,000 acres is too large to meet criteria number 2 and 3 stated above, especially within the irrigated area of the Larimer-Weld Region where the average size farm is approximately 160 acres in size.

Application of the above criteria within the region results in the selection of Little Thompson River Basin and the Lone Tree River Basin as potential demonstration areas (see sketch 4).

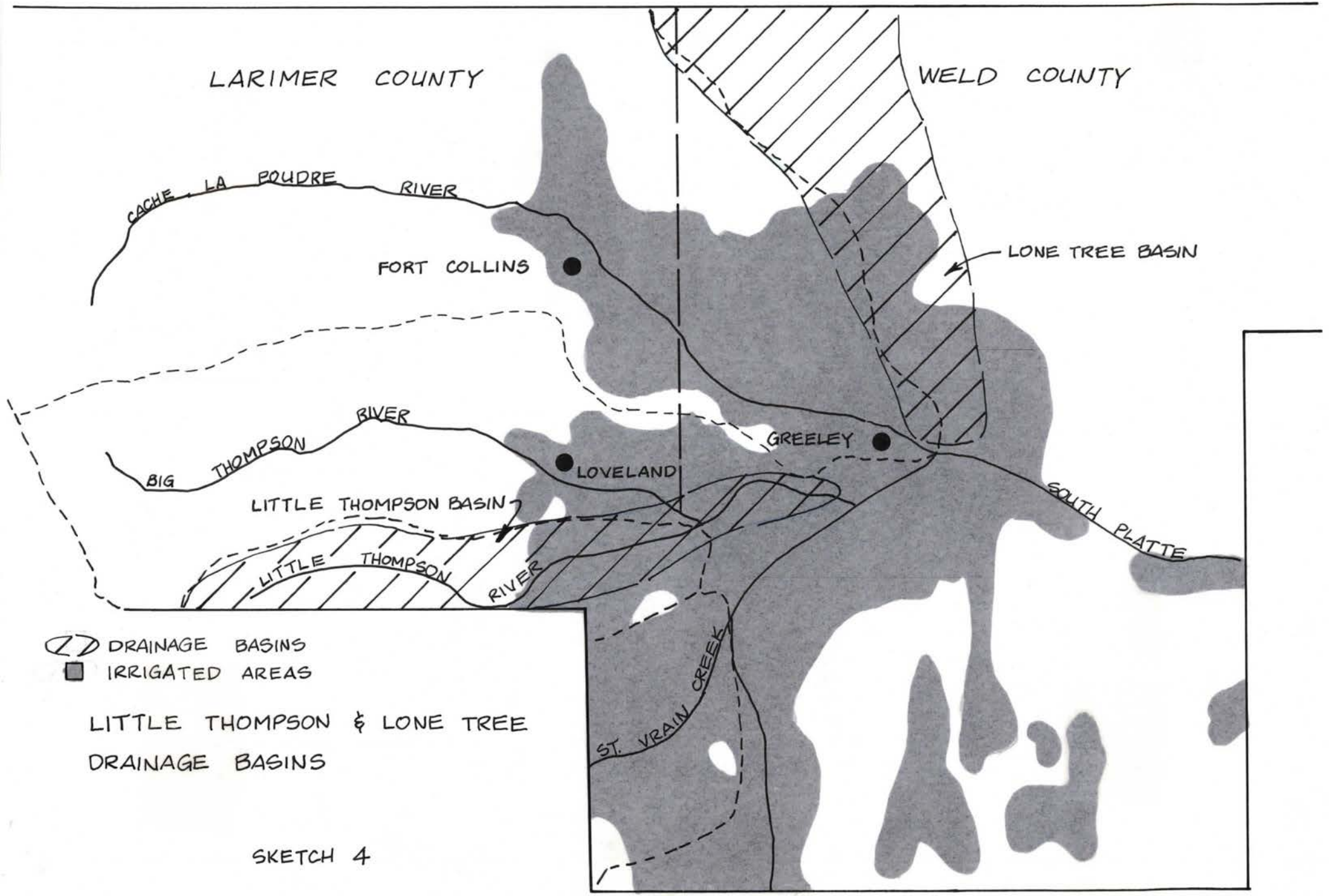
3.1.1 Little Thompson River Basin

Problems exhibited in the Little Thompson River Basin include:

1. Excess salinity discharged from irrigated land.

2. Excess sediment loads in the Little Thompson River resulting largely from agricultural practices.

Little Thompson River Basin contains approximately 33,500 acres of irrigated land. Salinity problems result from irrigation waters leaching across underlying weathered shale formations having a high salt content, in addition to the concentrating effects of irrigation itself. Sediment problems result from the irrigation of highly erodible soils in the basin and lack of adequate erosion control measures.



LITTLE THOMPSON & LONE TREE DRAINAGE BASINS

SKETCH 4

BMP's suggested for the salinity problem in the basin could include a number of structural measures, such as ditch lining, canal lining, shortening length of run, and a number of improvements on on-farm practices. Sediment problems can be mitigated with better on-farm water management possibly in placement of buffer strips to filter water before it reaches the river, as well as grassing of drainage ways. Little Thompson River Basin offers the advantage of being a small, well-defined hydrologic drainage. In-stream sampling took place in both Phase 1 and Phase 2 of the Larimer-Weld Regional Agricultural Pollution Control Program. In addition, two of the farms included in the 1977 on-farm sampling program were located in the Little Thompson River Basin. The basin offers two types of problems, i.e., sediment and salinity, for study which appears to be amendable to solution by structural and nonstructural control measures.

3.1.2 Lone Tree Basin

Lone Tree Creek is a small tributary of the South Platte which enters the Platte a few miles east of Greeley. The basin contains approximately 48,000 acres of irrigated land. The primary water quality problem in the Lone Tree Basin is excess nitrates. Excess concentrations of nitrates are exhibited in both the surface waters and ground waters of the area. This results from a combination of factors including 1) sandy soils capable of passing large quantities of dissolved minerals and 2) application of excess commercial fertilizers in addition to heavy applications of waste manure from concentrated animal feeding operations.

There are many large feedlots in the vicinity of Lone Tree Basin which provide a readily available source for manure. The farmers in this area, as well as in other areas of the region, recognize the value of manure as a soil amendment, but fail to recognize the true value of manure as a fertilizer. This results in the addition of commercial fertilizers in excess of crop needs. It has been documented through the Larimer-Weld 208 Program that available nitrogen on some farms is twice the annual amount required by the crops. Sandy soils allow easy leaching of nitrate laden return flows into the ground water table and subsequently into tributaries of the South Platte.

Nonstructural control measures would appear to be the most cost effective for solving the nitrate problem. This would include technical assistance and advice to the farmer in the application of nitrogen, including more extensive sampling of soils, water, and manure to determine the available nitrogen, as well as presenting this information to area farmers in a readily understandable format. Benefits to be realized by individual farmers could include reduced fertilizer cost.

3.2 INSTITUTIONAL ASPECTS OF THE MIP

Most of the discussion to date at the national-state-local level concerning agricultural pollution control is focused on technical issues. Historically, this results from the fact that many technical issues associated with agricultural pollution control, including critical issues such as cost effectiveness, have not been resolved. Without resolution of these fundamental technical issues, there was no appropriate setting to define the institutional needs of an Agricultural Pollution Control Program.

In the development of the Larimer-Weld Regional Agricultural Pollution Control Program, significant resolution of a number of major technical issues has occurred within the short period of two years. This is reflected in the development of a rational approach to cost effective analysis which integrates water quality problems, physical characteristics of the problem area, and existing management practices in the context of BMP's and the cost of implementing BMP's. This is considered to be a major breakthrough in agricultural pollution control technology. Short of actual demonstration of the cost effectiveness approach, the resolution of technical issues achieved in the Larimer-Weld program has provided information to initiate analysis of institutional requirements and development of alternative institutional strategies for carrying out the Agricultural Pollution Control Program in the demonstration phase and the full implementation phase. Development of institutional alternatives has progressed to the point at which specific institutional responsibilities for planning, management, operations, and regulations have been defined (see Table 2).

In the institutional analysis, Phase 2 is defined as further research development and demonstration of the technical solutions developed and proposed to date. It would also allow for the monitoring and evaluation of the institutional effectiveness of those proposed to carry out the planning, management, operational and regulatory functions. Phase 3 would be the actual full scale implementation program. A mandatory compliance program may be required in a full scale implementation program.

Given the existing level of knowledge, the effectiveness of BMP's for agricultural pollution controls has been projected and analyzed. In the same light, existing institutions have been analyzed and a role has been suggested for those institutions in implementing an Agricultural Pollution Control Program. Neither the technical nor the institutional recommendations have been proven through actual demonstration. As a result, there will be a need for continued analysis and evaluation of the institutional effectiveness as part of the MIP Program.

TABLE 2

Institutional Recommendations
Summary

INSTITUTIONAL FUNCTION	IRRIGATED AGRICULTURE			
	PREFERRED		ALTERNATIVE	
	PHASE II	PHASE III	PHASE II	PHASE III
PLANNING	Larimer-Weld Council of Governments	Larimer-Weld Council of Governments	State Soil Conservation Board (S.S.C.B.)	State Soil Conservation Board (S.S.C.B.)
MANAGEMENT	Counties Cities	Counties Cities	S.S.C.B. Cities	S.S.C.B. Cities
OPERATIONS	S.C.D.'s (S.C.S. and S.C.Bd. in key support roles)	S.C.D.'s (S.C.S. and S.C.Bd. in key support roles)	S.C.D.'s (S.C.S. in key support role)	S.C.D.'s (S.C.S. in key support role)
REGULATORY	S.H. Dept. County Health	S.H. Dept. County Health	S.H. Dept. County Health	S.H. Dept. County Health

It is anticipated that this testing of the carrying out of implementation responsibility in Phase 2 (MIP) will result in the improved effectiveness of those organizations involved in the program, and possibly some reassignment of the role of various institutions for full scale implementation.

3.3 FINANCIAL ASPECTS OF THE MIP

A fundamental necessity of the MIP Program is to develop a logical methodology for allocation and distribution of cost and benefits associated with implementation of BMP's and Agricultural Pollution Control Program. This complex question has been considered in the development of the Larimer-Weld Regional Agricultural Pollution Control Program. However, the information on which to make a rational decision can only be gained through a demonstration project, or by trial and error through an implementation program.

The complexity of the problem can be visualized by considering the implications of implementing specific BMP's on individual farms. For example, implementation of ditch lining could reduce the quantity of water flowing across underlying saline shale deposits and thus reduce salinity loadings to a stream. The benefit to the farmer would accrue in labor savings and reduced water demand. Downstream water users would also benefit from better water quality. Establishment of national water quality goals indicates that the nation as a whole benefits from clean water, as well as the state, region, and local residents.

The questions raised and the example given above indicate the need for the development of a supportable, logical rationale for cost sharing as part of the MIP Program.

3.4 PROSPECTS FOR MEASURING WATER QUALITY IMPROVEMENTS

It is believed that the prospects for measuring water quality improvements in the selected areas in a three year period is excellent. Further, the process utilized in the course of the MIP to improve water quality will provide an excellent testing ground for financial analysis and determination of the distribution of costs and benefits, institutional arrangements, direct farmer involvement, and public awareness, and methods of maximizing the effectiveness of available resources from involved governmental agencies.

3.5 RELATED ONGOING PROGRAMS AND MANPOWER AVAILABILITY

3.5.1 Related Ongoing Programs

Ongoing programs within the two county region includes two active PL 566 Watershed Projects. The Boxelder Watershed Project is basically a flood control project in the northern portion of Larimer County. The Consolidated Home Supply Ditch and Reservoir Company and the Handy Ditch Company are involved in a second active PL 566 project. This project is a water resource project within irrigated portions of the region. Much of this project lies within the Little Thompson Basin which is advantageous for an intensified MIP program in the area.

Other ongoing programs include the SCS's (Great Plains Conservation Program) where about 65 active contracts are held with farmers and ranchers throughout the region. The ASCS's Agricultural Conservation Program is active with approximately $500,000 expended yearly for conservation measures throughout the two county area. Another $300,000 of federal funds was expended during 1977 through the Drought Relief Act to assist land owners in drought related conservation measures.

The Environmental Protection Agency Region VIII in Denver, Colorado, made a special $100,000 research and development grant to the Larimer-Weld Regional Council of Governments in 1976. This grant was to implement a project entitled "Identify the Methodology and the Technical/Institutional Feasibility for the Development and Implementation of Best Management Practices for Irrigated Agriculture". The RND project will be completed in February 1978.

During the field testing stages of this project (summer of 1977) many agencies cooperated with the Larimer-Weld COG in providing free of charge water measuring devices including flumes, weirs, stage recorders, infiltrometer rings, and others. Contributing organizations included the ARS, the SCS, and Colorado State University. It is expected that much of the sampling and measuring equipment needed for effective implementation of the MIP would be available from these sources as they have been in the past.

A 20-man board was organized in April 1977 to recognize and coordinate drought-related problems in the two county region. The organization is known as the Larimer-Weld Drought Committee, and holds regular meetings. The drought planner is in the process of being employed by the Larimer-Weld COG to develop an inventory of water conservation needs in the region. Coordination with ongoing agricultural pollution control

studies will be intensified once this individual is on board as most of the basic data has been collected and analyzed in the 208 planning process. It is anticipated that funding from drought relief sources could be integrated effectively into implementation of an MIP in the Larimer-Weld region.

Another important asset for a MIP designation within the region is that the Northern Colorado Research Demonstration Center is located within the Lone Tree Basin. The Northern Colorado Research Demonstration Center (NCRDC) was originally used by the U.S.D.A. for potato and onion research. In 1968, Colorado State Extension Service in cooperation with the six counties of Weld, Morgan, Larimer, Logan, Adams, and Boulder began to operate the station as a Demonstration Center. The objective was to apply practices in crop production-irrigation, fertilizer use, pesticide application, and new crop varieties. These demonstrations were conducted to keep the farmers' agricultural industry and agribusiness people up to date on the latest research in practice. The information obtained from these demonstration are applicable to all of Colorado.

The Center is in the Lone Tree Basin located about five miles northeast of Greeley, Colorado. There are about 70 irrigated acres divided into two acre plots, suitable for large demonstration using conventional farm equipment.

The "Center" is directed by an Advisory Committee consisting of an Extension Agent and three farmers from the counties that participate in the "Center's" activities.

The Center is situated ideally to serve as a demonstration farm for such practices as: irrigation scheduling, water quality monitoring, pesticide monitoring, sediment studies, and various irrigation systems.

Farmers' contact has been established by past programs and demonstrations; therefore, the "Center" serves as an educational point for new practices, programs, etc. Cooperation with other federal agencies and agriculturally-related industry has been established by past participation in various cooperative programs.

Information gained from demonstrations at the center is applicable to all Colorado and adjoining Western States.

3.5.2 Manpower Availability

A meeting with SCS District Conservationists was held on November 21, 1977, to determine technical manpower availability for the Little Thompson and Lone Tree Basins. The District Conservationists represented were from the Greeley, Fort Collins, and Longmont SCS field offices. All three of the field officers have some jurisdictional area within the Little Thompson Basin which is divided into approximately 160 family-owned farming units. The jurisdictional overlap is ideal because the combined efforts of all three field offices would permit maximum manpower efforts for an MIP within the Little Thompson Basin. Another advantage is that one of the four SCS area offices within Colorado is located in Greeley, only a few miles from the Lone Tree Basin and the Little Thompson Basin. The SCS area office could provide additional technical support to an intensified MIP program.

The consensus of the District Conservationists was that 27 farm plans could be prepared for each man year available. The following manpower was determined to be available for MIP efforts within the Little Thompson Basin without requiring major alterations of priorities or modifying existing commitments.

AVAILABLE MANPOWER
(Current Staffing Levels)

	Man-month
Planners	
Greeley Field Office	12
Fort Collins Field Office	8
Longmont Field Office	6
Greeley Area Office	6
Technicians	
Greeley	3
Longmont	3
Fort Collins	6
Professional Engineering	
Greeley Area Office	3
TOTAL	47

3.6 ADMINISTRATION OF THE MIP

There are several possibilities regarding administration of the MIP which could be considered. However, it is recommended that overall responsibilities for program administration at the local level should rest with the Larimer-Weld Regional Council of Governments for the following reasons:

- A locally oriented implementation program for agricultural nonpoint sources is in keeping with the broad objectives of the MIP.

- Implementation of the MIP would be in accord with the recommendations of the 81 member 208 Citizen's Advisory Committee for 208 plan implementation responsibilities. The COG would be the continuing planning agency and the City and counties would be management agencies. By virtue of the COG membership (cities and counties) management agencies would be directly involved throughout the program. During this test phase, general purpose local government and the SCD's (operational agencies) would be able to develop meaningful communications and evaluate their respective roles for full-scale nonpoint source implementation following the MIP.

- The Larimer-Weld COG has a proven track record in water pollution control program administration and has in-placed necessary intergovernmental agreements and liaison with the Soil Conservation Districts and other agricultural interests (Water Conservancy Districts, ditch companies, water users associations).

It is further recommended that a SCS Soil Conservationist be assigned to the Larimer-Weld COG (similar to the current arrangement) and that the Soil Conservationist be responsible as project manager. The Larimer-Weld 208 Water Quality Department would assure coordination of the agricultural implementation program with other point and nonpoint source implementation action. This precept is considered essential in the development of implementation and evaluation of agricultural nonpoint source pollution control programs.

It is recommended that outside consultant assistance in addition to expertise that may be available through the ARS be considered to assume the following technical responsibilities:

1. Assist in development of a detailed work plan.

2. Design and coordinate a mobil and fixed station water quality sampling and monitoring program.

3. Analyze all water quality data and evaluate effectiveness of implementation as it pertains to the improvement of groundwater and instream water qualities.

4. Coordinate reduction and pollutant loading and concentration levels resulting from BMP implementation to other point and nonpoint sources in the test areas.

5. Provide training to SCS personnel in water quality related aspects of the program, specifically with regards to selection of the optimum mix of BMP's as they relate to potential water quality improvements on a site-specific basis.

6. Evaluate and recommend final institutional arrangements for full-scale implementation of BMP's including mandatory measures if applicable.

7. Develop methodology and determine distribution of costs and benefits (water quality, energy consumption/savings, water conservation, operations, crop productivity).

Outside consultants include private consulting firms and experts from Colorado State University. Additionally, technical oversight of the MIP implementation will be sought from the United States Environmental Protection Agency, Robert S. Kerr Research Center in Ada Oklahoma.

3.7 TIMETABLE FOR MIP IMPLEMENTATION

The Larimer-Weld 208 plan for agricultural pollution control will contain the substance of an MIP work plan and be available in February 1978. The plan will include:

- Proposed BMP's for the selected areas with significant water quality problems resulting from agricultural practices.

- Institutional assignments including appropriate intergovernmental contracts and agreements for continued planning, management, operations, and regulation.

- Educational programs.
- Cost estimates for BMP implementation, maintenance, sampling, and analysis.
- Methodology for site specific selection of effective mix of BMP's.
- Timetable for implementation and reporting.

With assistance the EPA and USDA, and MIP work plan could be finalized by March 1978. The MIP program could be initiated in the Spring irrigation season of 1978.

3.8 LOCAL INTEREST IN THE MIP

A resolution supporting the designation of the Larimer-Weld counties region has been adopted by the 81 member 208 Citizen Advisory Committee and the Board of Elected Public Officials of the Designated 208 Planning Agency (see attached).

The Executive Committee representing the SCDs support the MIP designation.

The following agencies have committed to submit letters of support for the Larimer-Weld Region being MIP designated.

1. Longmont Soil Conservation District
2. Big Thompson Soil Conservation District
3. West Greeley Soil Conservation District
4. Cache la Poudre Water Users' Association
5. Home Supply Cons. Ditch and Rservoir Company

3.9 PRELIMINARY ASSESSMENT OF THE COST OF IMPLEMENTATION OF THE MIP

Detailed cost estimates for full-scale implementation of the MIP in the Larimer-Weld Region of Colorado are being developed. Four categories for which costs will be assigned are:

- Monitoring and sampling
- Technical analysis and evaluation
- Best Management Practice Implementation (including capital costs, operation and maintenance costs, and on-farm technical assistance-manpower requirements)
- MIP Program Administration

Preliminary estimates of the BMP Implementation costs only are included at this time.

3.9.1 Lone Tree Basin - Cost of BMP Implementation

The Lone Tree Basin lies entirely within the work boundaries of the Greeley Soil Conservation Service Field Office. Approximately 24,000 acres of the 48,000 acre subbasin is considered to be extremely high in nitrate loadings to the groundwaters. There are approximately 130 operating farms encompassing the 24,000 acre area of the Lone Tree Basin.

It is proposed that an educational/technical assistance program be implemented through SCS personnel and CSU Extension Service personnel combined.

It is estimated that for the educational and on-farm technical assistance efforts, that approximately one man-year per year for three years will be required for the Lone Tree Basin. Indications are that one half man-year per year each could be contributed by the SCS Field Office in Greeley and the CSU Extension Service, thereby negating a need for increase in staffing in the USDA for this assignment in the Lone Tree Basin. Such programs, however, will improve the effectiveness of BMP's (i.e., the proper application of commercial fertilizers and available manure) which will be developed through the MIP for the Lone Tree Basin. However, should the funds be available, labor intensive as well as capital intensive BMP's could be applied to the Lone Tree Basin to increase the effectiveness of the reduction of nitrogen loads to the groundwater from agricultural practices.

3.9.2 Little Thompson River Basin - Cost of BMP Implementation

Tables 3 and 4 describe potential costs and effectiveness of implementation of BMP's under the MIP program - sediment and salinity in the Little Thompson Basin. The estimated costs and effectiveness of implementation of BMP's are summarized below.

Pollutant	Cost	Effectiveness
Sediment	$977,000	31.1%
Salinity	736,000	13.3%

It should be noted that effectiveness of reduction of pollutants in each of the two categories has been computed by multiplying the reduction in pollutant loading times the percent of acreage

in the basin for which practices are recommended times the estimated percent of participation of farmers in the affected areas. Further, the determination of the percent of participation of farmers is based upon the current levels of cost sharing for the various type practices and their level of acceptance by farmers in the area. It should be noted that the participation rate could be increased substantially by increasing the percent of federal cost sharing which would in turn increase the effectiveness of reduction of the pollutant in the basin.

During preparation of the detailed work plan, a survey could be conducted to determine the actual degree of participation of farmers in the affected areas of the Little Thompson Basin. Such a survey could be used to determine the level of federal participation beyond the existing cost sharing ratios currently applied in the Larimer-Weld area to maximize the reduction of pollutants in the three year MIP period.

Total manpower requirements for site planning and technical assistance for implementation of BMP's is estimated to be 99 man months or slightly over 8 man years. Additional design time for complicated engineering structures may increase the total man-year work load by 10 percent. However, only a few complicated structures are anticipated. Non-structural BMP's (irrigation water management and irrigation water scheduling) are anticipated to use 54 man months out of the 99 man months needed.

Assessment of available resources in the SCS field offices (see Section 3.5.2) indicates that 47 man months or approximately 4 man years could be made available for the MIP in the Little Thompson River Basin necessitating an additional 4 man years to assure completion of the program in three years. It should be remembered that the MIP is an accelerated program requiring some training of field personnel in the U.S. Department of Agriculture. As a longer term aggressive implementation program is pursued following the MIP period, it is anticipated that greater efficiency can be achieved, i.e., fewer technicians and planners can cover a larger geographic area in a given period of time.

TABLE #3

LITTLE THOMPSON BASIN - POTENTIAL WATER QUALITY IMPROVEMENTS (SEDIMENT)

a	b	c	d	e	f	g	h	i
BMP	UNIT	REMAINING BMP NEEDS	% REDUCTION IN SEDIMENT LOADING TO LITTLE THOMPSON RIVER	% OF ACREAGE FOR WHICH PRACTICE IS RECOMMENDED	PARTICIPATION ESTIMATED % (WITH COST SHARING (1)	% EFFECTIVENESS IN REDUCING SEDIMENT LOADING (3)	THREE YEAR COST ($)	THREE YEAR MANPOWER NEEDS IN MONTHS
Buffer Strip	acre	700	30%	50%	50	7.5%	28,000	4
Sediment Ponds	number	100	70%	45%	20	6.3%	20,000	3
Detention Dikes	miles	30	70%	14%	30	2.9%	22,500	4
TW Pumpback	number	16	70%	7%	30	1.5%	60,000	1
Grassed Waterways	acre	160	30%	30%	20	1.8%	16,000	2
Sprinkler (change to)	acre	500	95%	6%	40(2)	2.3%	60,000	1
Land Leveling	acre	3,000	5%	10%	40	0.2%	480,000	6
Ditch Lining and/or Pipelines (on-farm)	miles	15	5%	20%	40	0.4%	120,000	4
Canal and Lateral Lining	miles	1	5%	12%	100	0.6%	75,000	2
Irrigation Water Management - Includes Cut Back Irrigation, Shorten Length of Run, and Alternate Furrows	acre	7,500	60%	30%	40	7.2%	75,000	18
Irrigation Water Scheduling	acre	9,000	5%	35%	20	0.4%	21,600	9
						31.1% TOTAL EFFECTIVENESS	$977,100 TOTAL COST	54 MAN MONTHS

(1) 50-75 percent cost sharing.
(2) 10 percent cost sharing on system.
(3) At 90-100 percent cost sharing, it is anticipated that farmer participation would increase by 50 percent which would produce an overall effectiveness of about 46 percent.
(4) Effectiveness is computed by multiplying columns c x d x e.

TABLE #4

LITTLE THOMPSON BASIN - POTENTIAL WATER QUALITY IMPROVEMENTS (SALINITY)

a	b	c	d	e	f	g	h	i
BMP	UNIT	REMAINING BMP NEEDS	% REDUCTION IN SALINITY LOADING TO LITTLE THOMPSON RIVER	% OF ACREAGE FOR WHICH PRACTICE IS RECOMMENDED	PARTICIPATION ESTIMATED % (WITH COST SHARING) (1)	% EFFECTIVENESS IN REDUCING SALINITY LOADING (3)	THREE YEAR COST $	THREE YEAR MANPOWER NEEDS IN MONTHS
On-Farm Ditchline and Pipeline (0-3 cfs)	miles	20	5	100%	40	2.0	160,000	5
Canal and Lateral Lining	miles	5	10	100%	80	8.0	300,000	10
Irrigation Method Change (Sprinkler)	acre	1,500	50	6%	40(2)	1.2	180,000	3
Irrigation Water Management - Includes Cut Back, Shorten Length of Run, and Alternate Furrow	acre	7,500	10	40%	40	0.6	75,000	18
Irrigation Scheduling Services	acre	9,000	5	50%	20	0.5	21,600	9
						13.3% TOTAL EFFECTIVNESS	$736,600 TOTAL COST	45 MAN MONTHS

(1) 50-75 percent cost sharing.

(2) 10-20 percent cost sharing.

(3) At 90-100 percent cost sharing, it is anticipated that farmer participation would increase by 50 percent which would produce an overall effectiveness of 20 percent.

(4) Effectiveness is computed by multiplying columns c x d x e.

West Greeley Soil Conservation District

P. O. Box 86 • Greeley, Colorado 80631

November 22, 1977

APPENDIX

TO: USDA - 208 Coordinating Committee
c/o Duane Bartee, Deputy State Conservationist
Soil Conservation Service
P.O. Box 17107
Denver, Colorado 80217

SUBJECT: Model Implementation Program (MIP)
Designation Area for Colorado

The West Greeley Soil Conservation District hereby endorses the Larimer-Weld Region candidacy for MIP designation. Two years of 208 planning and investigation have shown significant sediment and salinity problems to be present in the Little Thompson Watershed Basin. The West Greeley SCD strongly supports the designation of the Little Thompson Watershed Basin as an MIP area.

We feel adequate technology has been developed from the on-going soil and water conservation program and the recent 208 planning to support a two to three year intensified program for application of Best Management Practices (BMPs) which will improve water quality and show significant reduction in salts and sediments in the basin.

The West Greeley SCD will commit a high priority for technical assistance in planning and application of BMPs if the Larimer-Weld Region is selected as an MIP area.

For the Board of Supervisors,

Robert Foss

Robert Foss, Vice President
West Greeley Soil Conservation District

Longmont Soil Conservation District

1228 MAIN STREET LONGMONT, COLORADO 80501

November 21, 1977

U. S. D. A. - 208 Coordinating Committee
% Duane Bartee, Deputy State Conservationist
Soil Conservation Service
P. O. Box 17107
Denver, CO 80217

Dear Sir:

The Longmont Soil Conservation District would very much like to see the Model Implementation Program set up here on the front range area of Colorado which has a wide range of practices and problems.

Since the Larimer-Weld COG has done an outstanding job of planning with extensive field investigations, we would like to see their plan implemented. We have a portion of the headwaters of the Little Thompson Watershed in our district. This area has a wide range of conservation needs and practices and we feel it would be ideal for the M.I.P.

Sincerely,

Lloyd A Dickens

Lloyd A. Dickens,
President

LAD:rah

Big Thompson Soil Conservation District
c/o John M. Lebsack, Rt. 1, Box 167, Berthoud, CO. 80513
~~1312 East 14th - Loveland, Colorado 80537~~

November 22, 1977

State of Colo. USDA 208 Coordinating Committee
Attn: Duane Bartee, Deputy State Conservationist
USDA-Soil Conservation Service
P. O. Box 17107
Denver, Colorado 80217

RE: Model Implementation Program (MIP) Designation Area for Colorado

Dear Mr. Bartee:

The Big Thompson Soil Conservation District hereby endorses the Larimer-Weld Region as a candidate for MIP designation. We further endorse the Little Thompson Watershed Basin within our two-county region as a basin which shows significant sediment & salinity problems, as proven by two years of 208 planning & investigation.

We feel adequate technology has been developed from on-going soil & water conservation program, and more recently through 208, that we now can apply Best Management Practices (BMP's) which will improve water quality within the Basin.

There would be three SCD's within the Basin & three SCS Field Offices that would give the Basin high priority for this Model Program.

We think that a two to three year intensified implementation within the Basin would show significant reduction in salt & sediment reductions in the Little Thompson River.

Respectfully Submitted,

John M. Lebsack

John M. Lebsack
President
Big Thompson SCD

CACHE LA POUDRE WATER USERS ASSOCIATION
P.O. Box 206
EATON, COLORADO 80615

November 21, 1977

U.S.D.A. - 208 Coordinating Committee
c/o Duane Bartee, Deputy State Conservationist
Soil Conservation Service
P.O. Box 17107
Denver, CO 80217

Dear Mr. Bartee:

The Cache La Poudre Water Users Association is a voluntary, non-profit corporation whose members consist of all of the water users on the Cache La Poudre River. Our membership includes the cities of Fort Collins and Greeley, all of the major surface users, and a good number of underground users within the Cache La Poudre River basin. We are interested in all aspects of water, including maximizing to the greatest extent possible the beneficial use of this valuable resource.

It is our understanding that the Soil Conservation Service will shortly be establishing Model Implementation Programs. The thrust of these programs will be to initiate and develop Best Management Practices (BMP's) within certain designated areas.

Many individuals who are members or representatives of members of the Cache La Poudre Water Users Association have been actively involved in the Larimer-Weld COG Section 208 Planning Process. It is our feeling that the plan being developed for our area will be an outstanding one, which will serve as an example and model for many future plans. We would like to see the Larimer-Weld 208 Plan implemented, and in this regard believe that the Lone Tree area, which lies within the service area of our Association, would be an ideal place to test the Best Management Practices developed by this plan, and we urge that this site be chosen as one for a Model Implementation Program.

Sincerely,

Harlan Seaworth
President

kc

No. 77-4

RESOLUTION

MODEL IMPLEMENTATION PROGRAM
FOR THE IMPLEMENTATION OF BEST
MANAGEMENT PRACTICES FOR AGRICULTURE

WHEREAS, the Larimer-Weld Regional Council of Governments (LWRCOG) is a designated areawide waste treatment management planning agency pursuant to Section 208 of the Federal Water Pollution Control Act Amendments of 1972; and

WHEREAS, a cooperative agreement has been entered into between the Administrator of the U. S. Environmental Protection Agency and the Secretary of the U. S. Department of Agriculture which calls for the development and implementation of Model Implementation Programs (MIP) for the control to the extent feasible of water pollution from agricultural sources; and

WHEREAS, the MIP potentially involves a substantial investment by the Federal government for farmer-implementation of Best Management Practices for agriculture which could result in water quality benefits, water conservation, and improved crop productivity; and

WHEREAS, the MIP concept is consistent with and parallel to the implementation program currently being considered as part of the Larimer-Weld 208 Plan for agricultural pollution control; and

WHEREAS, the initial Larimer-Weld 208 Planning process has identified agricultural pollution control as the first priority, and that the COG:

1. Has sufficient data and analysis to support the effective implementation of an MIP;
2. Has a proven record of performance in coordinating agricultural interests and federal, state, and local agencies, including a cooperative agreement between the ten Soil Conservation Districts of the region, the State Soil Conservation Board, and the U. S. Department of Agriculture, Soil Conservation Service;

NOW, THEREFORE, BE IT RESOLVED, that the Board of the Larimer-Weld Council of Governments expresses its willingness to:

1. Support the implementation of an MIP in the Larimer-Weld Counties area;
2. Participate in the implementation of an MIP in an appropriate manner consistent with the amount of resources available at the federal level for the involvement of the designated areawide water quality planning agency.

THIS RESOLUTION, upon Motion, was duly made and adopted this 2nd day of November, 1977.

LARIMER-WELD REGIONAL COUNCIL OF GOVERNMENTS

By _____
Charles D. Bowling
Chairman

By _____
June K. Steinmark
Vice Chairman

By _____
Maralyn G. Radice
Acting Secretary