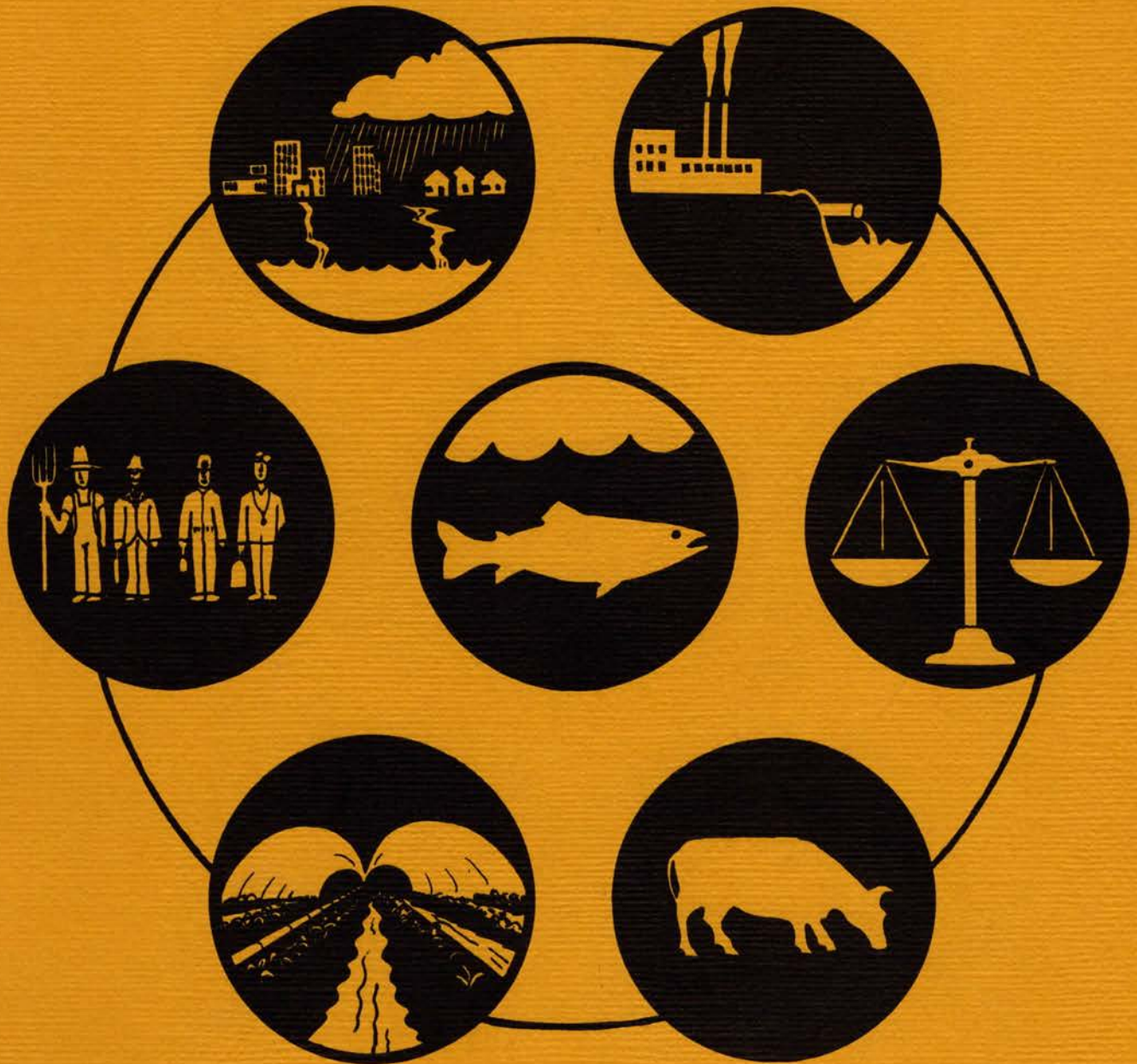


# ANALYSIS AND RECOMMENDATIONS VOLUME II

IRRIGATED AGRICULTURAL SOURCE CONTROL



## Water Quality Management Plan

LARIMER-WELD REGIONAL COUNCIL OF GOVERNMENTS  
LOVELAND, COLORADO

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BOULDER, COLORADO

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INSTITUTIONAL AND FINANCIAL  
RECOMMENDATIONS FOR CONTROL  
OF POLLUTANTS FROM IRRIGATED  
AGRICULTURE

Prepared For

LARIMER-WELD REGIONAL  
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## 1.0 EXECUTIVE SUMMARY

The Federal Water Pollution Control Act Amendments of 1972 (PL 92-500) set the nation on a course to restore and maintain the chemical, physical and biological integrity of our waters. Section 208 of the Act provides for the preparation and implementation of areawide waste water management plans (208 plans). This report contains an analysis and recommendations for the institutional and financial aspects of the Larimer-Weld Region, 208 Plan for control of pollutants from irrigated agriculture.<sup>1</sup>

At the present time, discharges from irrigated agriculture are classified as point sources of pollution. This classification is presently being reevaluated by the Congress and there are indications that the law will be amended to reclassify irrigated agriculture as a non-point source. 208 plans must develop specific procedures to control pollution from point sources sufficient to meet the goals of the law, whereas non-point sources are to be controlled "to the extent feasible."

The Act's requirements for specific point source control solutions, and the present inclusion of discharges from irrigated agriculture in the point source category, combine to pose significant problems for the Larimer-Weld region. This is because agriculture, including 1/2 million areas of irrigated lands, is the backbone of the region's economy. Further complexities arise due to the scarcity of water resources and the influence of western water law on irrigated agricultural practices.

Prior to this 208 study, little background water quality benchmark data for the region had been compiled, and there is still sparse knowledge about water quality impacts from on-farm water use and reuse. The Larimer-Weld Council of Government's 208 study is the first considered effort to address this problem. What has been found is that irrigation return flows are significant contributors to water pollution in the region, particularly with respect to sediments, salinity and nitrates. It is less clear how these pollutants affect the Act's goals in regard to achieving water quality sufficient for fishery and recreational uses and/or the potential for achieving these goals.

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<sup>1</sup> A companion report, Larimer-Weld Council of Governments, Institutional and Financial Recommendations for Control of Pollutants for Municipal and Industrial Point Sources and Non-Point Sources, BMML, Boulder, Colorado, October, 1977, contains recommendations for all other pollutant categories. The recommendations in the two reports are integrally connected, and should be considered together.

The law grants localities the opportunity to plan and execute their own programs. Thus, it is important that local efforts are successful in planning to meet the Act's goals. It is clear from the law that the choice is between local control and responsibility, or state and federal control. In the Larimer-Weld region, the challenge is in creating a new relationship between local government and the farmer. Institutional structures acceptable to the agricultural industry and the farmer, and capable of delivering implementation programs are needed.

The mandates of PL 92-500 give broad direction to the institutional functions and structures required in the 208 plan for program implementation. Four institutional functions are necessary: continuing planning, program management, operations and regulation. In addition to the legal requirements, a number of other factors are important in determining the most appropriate institutional activities, policies, program structure, and in assigning agency responsibilities for plan implementation. These include the technical program for pollutant control and technological limitations in our current knowledge. Also important is that implementation agencies have sufficient powers, financial resources, program understanding, local political sensitivity, functional capabilities, and the ability to conduct the entire wastewater implementation program so as to respect the region's specific needs within a broad context that recognizes and complements other private and governmental activities.

Limitations in our knowledge about engineering solutions and their economic effects stand in the way of designing an immediate, full-scale, areawide implementation program. Implementation activities must begin with a program to confirm the work to date regarding effectiveness, costs and the incidence of benefits of the use of best management practices for abatement and control of pollutants from irrigation discharges. As conclusions are affirmed, there must be a transition to implementation of appropriate measures throughout the region, with local funding of its fair share of costs, and mandatory controls as required. Although the program of areawide implementation can be set and committed now, flexibility for adjustment based on initial study, demonstration and model implementation must be preserved.

This report contains an overall review of the irrigated agriculture pollution problem in the Larimer-Weld region, the requirements of the law, the present state of planning and development studies, and analysis of the agency and financial alternatives in light of these and other local factors. The recommended implementation strategy flows from this analysis and is characterized by the following key concepts:

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



- . Existing institutional agencies in the 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.
- . 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 program implementation where possible.
- . 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 wastewater pollution control programs in the region should be coordinated. This includes those for municipal and industrial point sources, all non-point sources and irrigated agriculture. This suggests that agencies assigned tasks in the irrigated agriculture program have sufficient land use management powers (organized on the basis of urban service areas), and 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 service organizations.
- . Initial compliance requirements should be voluntary with mandatory controls considered only after technical and economic conclusions are firm.
- . Program funding and the distribution of program costs should recognize responsibilities of those who will 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 considered.

Application of these key concepts leads to a phased program of implementation. The initial implementation effort builds on the work done in conjunction with the 208 study and can be defined. It is conceived as Phase 2 of the program and should be funded by a mix of external and local voluntary sources. As the program moves forward into a phase of areawide implementation (Phase 3), some share of costs will be imposed locally as determined by a clearer picture of the distribution of program benefits.

Recommendations for agency designations and assignment of functional roles is shown below for the major pollutant categories and program phases. It is essential that planning and management assignments be common throughout so that integration of these activities is assured.

TABLE 1.0-A

Institutional Recommendations  
Summary

INSTITUTIONAL FUNCTION	IRRIGATED AGRICULTURE		
	PREFERRED		ALTERNATIVE
	<u>PHASE II</u> Larimer-Weld Council of Governments	<u>PHASE III</u> Larimer-Weld Council of Governments	<u>PHASE III</u> State Soil Conservation Board (S.S.C.B.)
PLANNING	Counties Cities	Counties Cities	S.S.C.B. Cities
MANAGEMENT	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)
OPERATIONS	S.H. Dept. County Health	S.H. Dept. County Health	S.H. Dept. County Health
REGULATORY	S.H. Dept. County Health	S.H. Dept. County Health	S.H. Dept. County Health

## 2.0 PL 92-500 AND AGRICULTURAL POINT SOURCES

The objective of PL 92-500 is "to restore and maintain the chemical, physical and biological integrity of the nation's waters." In support of this objective, the law provides for the development and implementation of areawide waste management plans. Section 208 of the law outlines process, content, maintenance and funding for the "208 plans." Such plans are to apply to all wastes generated within the 208 area, including those resulting from agricultural activities.

Two basic groups of pollutant sources, point and non-point, are addressed in the law. Section 208 requires the development of plans wherein non-point sources of agricultural pollution (small feedlots, manure disposal areas and non-irrigated farming) are controlled "to the extent feasible." Point sources of agricultural pollution are defined to include irrigated agriculture<sup>1</sup> and large feedlots, and in contrast to non-point sources, are to be subject to specific procedures to eliminate or control the pollution so as to meet the goals of the law.

The Act's requirements for specific point source control solutions, and the inclusion of discharges from irrigated agriculture in the point source category, combine to pose a particularly difficult problem for the Larimer-Weld region. It is estimated that in 1975 the total dollar output generated by agricultural-related activities including livestock production, irrigated agriculture, dryland agriculture, and food processing was greater than \$1.4 billion. Area agricultural assets include more than 1/2 million acres of irrigated agriculture supplied by literally thousands of miles of canals and ditches and over 200 major storage reservoirs with 1 million head of cattle marketed annually which are concentrated in more than 1,700 feedlots. The local institutional profile includes 10 Soil Conservation Districts, 81 ditch companies, 3 water conservancy districts, 16 domestic water associations and companies, and 2,700 individually-owned farms. Agriculture, and irrigated agriculture in particular, is big business in the Larimer-Weld region.

Little background water quality data for this region has been compiled, and there is sparse knowledge about water quality impacts from on-farm water use and reuse. However, indications are that irrigation return flows are significant contributors

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<sup>1</sup> This is presently being reevaluated in Congress, and there are indications that the law will be amended to reclassify irrigated agriculture as a non-point source.

to water pollution in the region. The most important pollutant constituents are sediments, salinity, nitrates, phosphates, herbicides and pesticides. The agricultural community does not view itself as a polluter. The perception is that waters considered too polluted for recreation and fisheries are actually beneficial for irrigated crop production. Salinity and other deleterious substances are not yet recognized by the agricultural community as a potential water quality problem or limiting factor to crop yields in this region.

The business of irrigated agriculture in the Larimer-Weld area is closely intertwined with western water law. Water resource management and water quality management are inseparable issues in this area. Existing Colorado water rights laws relating to prior appropriation constrain the alternatives for more efficient irrigation practices, and so water pollution control efforts. Individuals have established rights to specific beneficial uses. Upon completion of the water use, that amount not consumed in the process must be returned to the stream system for use by others who also have established beneficial uses. This obligation to return diverted flows is necessary because several uses are typically appropriated for the same water.

Various municipal, agricultural and industrial uses have long been interpreted as "beneficial." In 1973, use for maintaining minimum stream flows was also included as beneficial. However, because little unappropriated water now is available in the Larimer-Weld area, rights for flow augmentation purposes, or more intensive agricultural uses (such as recycling), would have to be purchased from persons currently involved in other uses.

Technological limitations must also be considered in planning for control of discharges from irrigated agriculture. For this problem, there is a decided lack of historical experience and knowledge regarding abatement and control techniques. In contrast to municipal and industrial point sources, it does not appear feasible to develop collection systems and central treatment facilities for agricultural discharges. In the case of municipal and industrial point sources, there are years of experience to draw upon. The source and type of pollutants and alternative treatment methods have been extensively researched. Monitoring of treatment costs and effectiveness of alternative approaches provides needed data for planning new applications. Institutions for management, operation and funding are well established. None of this background exists in the case of agricultural runoff. Thus, achieving the goals mandated by PL 92-500 dictates state of the art advances in agricultural water pollution control.

The Larimer-Weld Council of Governments' 208 study is the first considered effort to address this problem. As such, a major task is faced including assessment of the pollution problems and their priorities, determination of alternative pollution control methods, cost estimates of implementation, identification and analysis of institutional arrangements

for program support, estimation of program costs and benefits and identification of program beneficiaries, and documentation for and education of local officials (who have never had to be concerned with this problem in the past) and farmers (who are startled to find they are considered "polluters").

Thus far, two years of Larimer-Weld Council of Governments study have documented a program of best management practices (BMP's) for water quality control that promises both a reduction of a broad range of pollutants reaching the stream as well as conservation of water resources. On the other hand, at this point, important questions remain unanswered:

- . How effective are BMP's demonstrated on a farm basis when applied areawide?
- . What is the cost effectiveness of areawide BMP's?
- . Who benefits? What is the distribution among the farmer, the public-at-large, and other specific groups and/or areas?
- . How are stream benefits (say reducing salinity by 400 mg/l) assessed?

These and other questions pose fundamental missing facts that stand in the way of structuring immediate cost-effective, equitable programs for control and abatement of agricultural point sources.

The Federal Water Pollution Control Act Amendments of 1972 (Public Law 92-500) made it illegal to discharge pollutants into navigable waters without a permit. In establishing the regulations for the issuance of National Pollutant Discharge Elimination System (NPDES) permits by the Federal government, irrigation return flows, among others, were excluded from the requirement of having a permit. This exclusion was challenged in court and the court ordered EPA to propose and promulgate regulations extending the NPDES permit system to include those previously excluded categories. The regulations for "general permits" were promulgated for agricultural activities (surface irrigation return flows) on July 12, 1976.

The proposed general permit program will provide for permit coverage for point sources in agricultural activities. However, rather than to require individual permits for agricultural point sources, the intent is to initially issue one or more general permits to cover most, if not all, of these point sources in a state. Those point sources not covered by a general permit would be required to obtain individual permits.

A general permit would be issued for an area known as a "general permit program area" (GPPA). All owners or operators of agricultural

point sources within a GPPA, excluding those covered by individual permits, are subject to the same general permit. The general permit would be issued for a term not to exceed five years.

Depending on the situation, the general permit might contain specific requirements for self-monitoring and/or the use of best management practices. The intent is to use input from 208 agencies and other appropriate sources, with the emphasis to be placed on the areas with water quality problems. In GPPA's where there are not any applicable water quality problems and/or the 208 recommendations are not yet available, there probably would not be any specific requirements included in the general permit. A general permit cannot be issued in conflict with an approved 208 plan.

Notwithstanding the importance and complexities of irrigated agriculture in the Larimer-Weld region, the law is clear in requiring the development of a plan for pollution abatement and a program for implementation. Note that implementation is the heart of the 208 program and of PL 92-500. Thus, it must be the center of concern for local leaders as well.

Without successful local efforts designed to meet the goals of clean water, there will be state or federal intervention to implement the law. The law will not go away simply through "benign neglect" by local governments. The choice is between local control and responsibility, or state and federal control. The challenge is in creating a new relationship between local government and the farmer. The ability to develop institutional structures capable of delivering implementation programs while still being acceptable to the agricultural industry and the individual farmer is the challenge. To this end, any implementation program will only be as successful as the program is politically realistic.

3.0 CHARACTERISTICS OF AGRICULTURE AND  
AGRICULTURAL POLLUTION IN LARIMER  
AND WELD COUNTIES

3.1 AGRICULTURE IN LARIMER AND WELD COUNTIES

Agriculture, including both crop and livestock production, has been the major economic base of the Larimer-Weld region since the 1870's. Even though the area faces the problem of rapid conversion of farm land to more urbanized uses, agriculture and related industries such as meat packing and sugar beet processing remain the foundation of the area's economy.

The 508,500 acres of irrigated agricultural land in the two-county area is spread over several river basins (Table 3.1-A). Much of the irrigated land lies west and north of the South Platte. The use of wells and center pivot sprinklers in the past decade has led to the development of additional irrigated land in the portion of Weld County southeast of the South Platte.

TABLE 3.1-A

Irrigated Acres by Subbasin Within  
Larimer and Weld Counties

<u>Subbasin</u>	<u>Larimer County</u>	<u>Weld County</u>
Big Thompson (includes Big Thompson and Little Thompson)	32,400	45,500
Cache la Poudre	70,600	83,300
South Platte	0	133,900
South Platte Tributaries (includes Boxelder, Lost Creek and Crow Creek subbasin)	0	109,600
St. Vrain (includes Boulder Creek subbasin)	<u>0</u>	<u>33,200</u>
Subtotal	103,000	405,500
Total for Two-County Area -----	508,500	



Eighty percent of the irrigated land is in Weld County, primarily in the southwest portion. In Larimer County, irrigated areas lie in the eastern part of the county.

The climate and growing season in the region varies with the geography. In the western, mountainous areas of Larimer County, winters are cold, summers mild and short, average precipitation higher than on the plains (and usually in the form of snow), and the growing season relatively short -- although it is as long as 115 days in the lower valley. A few irrigated areas exist along the Laramie River. Native hay is the principal crop in the higher elevations of the region.

In the foothills of central Larimer County, summer and winter temperatures are moderate, and annual precipitation averages 15-20 inches. Little irrigated land is located in the foothill area.

On the plains in eastern Larimer County and all of Weld County, temperatures are generally moderate, and annual precipitation averages about 15 inches; this ranges from a low of about 12 inches in the Greeley area to about 19 inches in some areas further east. Here the growing season is at least 135 days, and often longer.

Agricultural production in the region consists of both crops and livestock. Crop production accounts for 20% of the annual agricultural wealth in the region. Farms in the two-county area produce 48% of the state total of corn for silage, 38% of the sugar beets, 28% of the dry beans, 24% of the barley, 19% of the corn for grain, 18% of the oats, and 17% of the hay. Potatoes and winter wheat account for 10% and 9%, respectively, of the total state production. A portion of these crops support the livestock feeding operations in the area. The value of crop production in the area was \$173 million in 1975, an increase of 122% over crop production value in 1970. Most of this production was from irrigated lands; dry-land production is primarily winter wheat.

The area is one of the nation's largest producers of fattened beef cattle, with an average annual production of 900,000 head from feed lots in the area. In addition to beef cattle, dairy cattle, sheep, swine and poultry are produced in the region. In 1974, the total value of all livestock and livestock products sold in the area was \$506 million -- 40% of the total value of such production in the state, and an increase of 58% over the 1969 value. The livestock industry provides 80% of the agricultural wealth produced annually in the region.

The water supply for irrigation consists of natural runoff from snow melt on the east slope of the Continental Divide, augmented by water from the west slope by the Colorado-Big Thompson and other trans-mountain diversion projects. Natural river flows

provide water early in the irrigation season; later on, irrigators must depend on winter storage, trans-mountain diversions, and irrigation return flows.

Diversion structures have been built on all streams in the region. During irrigation season, diversions on the Cache la Poudre and its tributaries dry up the river at several points. Other rivers with a smaller number of diversions may be totally depleted by these diversions.

Storage and exchange of water among irrigators optimizes water availability. Storage reservoirs in the region have a total capacity of 685,000 acre-feet; nearly 40% of this capacity is in Colorado-Big Thompson reservoirs on the eastern slope. The remainder is in private reservoirs, most of which are concentrated along the western edge of the irrigated region.

The canal system in the region consists of approximately 1,243 miles of major canals with capacities ranging from 30 to 1000 cfs. Less than 40 miles of these canals are concrete lined. Small ditches and laterals having capacities from 5 to 30 cfs are estimated to total approximately the same mileage as the major canals. A greater percentage of the laterals are lined. It is estimated that one-third of the water diverted for irrigation is "lost" through seepage from unlined canals, although it eventually returns to lower canals and rivers.

Irrigation methods in the region include furrow, flooding, and sprinkler irrigation. About 57% of the irrigated acreage is watered by the furrow method; 34% of water by flooding; and 10% by sprinklers.

Furrow irrigation is used with row crops, such as corn, beets and beans. Water is siphoned out of the head ditch and run down a furrow which ranges from 1/16 to 1/4 mile long, depending upon the soil. Close-growing crops such as alfalfa, small grains and pasture grasses are watered by a variation of the furrow method -- corrugation irrigation.

Flood irrigation methods used in the region are of two types: graded border and contour ditch. Pasture grasses and alfalfa hay are the major crops irrigated by flood irrigation. The contour ditch method, which is one of the least effective methods of irrigation, is generally used on fields that are too steep (over 3 to 4 percent) for other methods of surface irrigation. Ditches are constructed along contours, spaced at intervals throughout the field.

Border irrigation, one of the most effective methods of surface irrigation, is used on about the same amount of land as is the contour ditch method. This method involves a strip of land which has been leveled somewhat to reduce slope, then is sloped away from the head of the field.

Sprinkler irrigation is becoming increasingly popular in the region. Nearly all of the recent systems use the center-pivot sprinkler. These systems are generally quite effective in water use, although higher in energy requirements than other methods, and may be used with almost any crop. In the Larimer-Weld region, sprinkler systems are generally used with underground water sources rather than with ditch irrigation systems.

### 3.2 WATER QUALITY IMPACTS OF IRRIGATION RETURN FLOWS AND BEST MANAGEMENT PRACTICES

Irrigated agriculture has been found to be a major contributor to water pollution in the Larimer-Weld region (including 66 percent of the suspended solids or sediment waste loads; 95 percent of total dissolved solids or salts; and 55 percent of nitrogen contribution to surface and groundwater systems).

A special effort was conducted in conjunction with the Larimer-Weld 208 plan to define water quality impacts of irrigated agriculture and to analyze the potential for abatement using certain best management practices (BMP's). The BMP analysis is continuing as of this date with focus on case studies at four farm sites in the region and water sampling for sediment, salts and nitrates. Defining the cost effectiveness of the BMP's is especially difficult due to the fact that some benefits occur on a river basin level. Final resolution of cost and benefit issues will likely require extension of the present work to demonstration projects implemented throughout the entire region.

#### 3.2.1 Assessment of Water Quality Impacts

Results of the technical work to date are reported in the engineering report on irrigated agriculture<sup>1</sup> and are summarized as follows:

- . Factors affecting on-farm generation of agricultural waste loads include irrigation methods, drainage practices, physical characteristics of the soil, chemical characteristics of the soil, quality of water applied for irrigation, topography, on-farm irrigation efficiency, and subsoil conditions.
- . Factors affecting on-farm generation of agricultural waste loads are highly variable within the region, and will produce variable results in terms of quality and quantity of discharges.

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<sup>1</sup> Larimer-Weld Council of Governments, Water Quality Impacts of Irrigated Agriculture, Executive Summary, Toups Corporation, Loveland, Colorado, April, 1977.

- . The principal pollutants discharged by irrigated agriculture in the Larimer-Weld region are salinity, nitrates, and sediment.
- . Levels of biochemical oxygen demand, ammonia, and fecal coliforms were uniformly low in irrigation discharges.
- . Sediment problems were limited to a few streams in the area.
- . Water quality impacts of irrigation return flows are directly dependent on the hydrology of streams in the region.
- . Through the many reaches of streams, irrigation return flow is the sole source of water supply.
- . Irrigation return flows increase levels of salinity from approximately 50 mg/l as the major tributaries leave the mountains to 1200 to 1500 mg/l at the confluence of the South Platte.
- . Salinity levels of the South Platte River increase from approximately 700 mg/l to 1200 mg/l as it flows through the Larimer-Weld region.
- . Irrigation discharges to streams are by far the largest discharge and are on the order of 345 mgd as compared to approximately 46 mgd from municipal and industrial discharges.
- . Diversion of waters in the streams for municipal, industrial, and agricultural water supply is the controlling factor limiting the legally specified water quality goals, i.e., fishery and recreation.
- . Irrigation return flows have contributed to excess salinity and nitrates experienced in groundwater basins.
- . Due to the highly variable factors controlling discharge of pollutants from the 2,700 irrigated farms in the region, the application of control measures must be site specific in order to be effective in preventing, controlling or abating pollution from irrigated agriculture.
- . The potential for pollutant reduction exists through best management practices developed and applied in specific areas of the region.
- . Discharge of salts could be reduced by reducing excessive seepage and subsurface return flows across shallow lying shale areas of the region.

- . Nitrate levels could be reduced through better fertilizer management.
- . No information is presently available on the cost-effectiveness of such measures.
- . Application of best management practices for reduction of pollutant discharge could have both long-term and short-term effects.

Some of the questions raised regarding cost-effectiveness of pollution control measures for irrigated agriculture will be answered in the best management practices analysis.

### 3.2.2 Best Management Practices

Experience gained as a result of developing the agricultural source analysis and other projects indicates that there is a potential for reducing the discharge of pollutants -- salinity, nitrates and sediment -- in the Larimer-Weld region.

The salinity problem associated with shallow shale deposits is the result of seepage of irrigation water below the root zone and the flow of that water across the shale deposits. It would appear that reduction of the amount of water flowing across the shale deposits will reduce the total amount of salts discharged in the region. This reduction in the amount of water flowing across the shale deposits could be accomplished by a number of methods, including canal lining, irrigation scheduling, and other measures which have long been practiced as soil and water conservation measures.

Excessive discharges of nitrates are the result of over-application of manure and commercial fertilizers in excess of crop requirements. Improved fertilizer management could reduce nitrate discharges to streams in the region.

Significant direct discharges of sediment as a result of irrigation occur only in limited areas within the region. However, it is probable that better management of irrigation tailwater would reduce the quantity of sediment discharged to streams.

Table 3.2.2-A lists a number of potentially useful BMP's and their effectiveness in reducing pollution loads.

Most BMP's that would affect discharges of sediments, salts or nitrates involve capital investments and operating costs. Some practices such as canal lining, irrigation scheduling, tailwater recovery systems, etc. have previously been used for soil and water conservation purposes. Yet, benefits that might be achieved in upgrading streams for fish and recreational uses are not well defined. Although some BMP's may result in spin-off benefits such as water conservation, reduced fertilizer use,

TABLE 3.2.2-A

**Larimer - Weld**  
**ESTIMATED REDUCTION IN POLLUTANT LOADING**  
**SEPT. 1, 1977**

<i>CANDIDATE TECHNOLOGY (BMP)</i>	<i>POLLUTANTS</i>				
	<i>SALINITY</i>	<i>NITRATES</i>	<i>SEDIMENT</i>	<i>PHOSPHOROUS</i>	<i>PESTICIDES</i>
<i>IRRIGATION SCHEDULING</i>	5 %	5 %	5 %	5 %	5 %
<i>LATERAL LINING &amp; PIPELINE</i>	10 %	0	5 %	0	0
<i>CANAL LINING</i>	10 %	0	5 %	0	0
<i>IMPROVE SURFACE SYSTEMS (Irr. Water Mgmt.)</i>	10 %	10 %	5 %	5 %	5 %
<i>SPRINKLERS</i>	50 %	50 %	95 %	95 %	95 %
<i>LAND LEVELING</i>	10 %	5 %	5 %	5 %	5 %
<i>DRAINAGE</i>	10 %	5 %	0	0	0
<i>WATER MEASURE DEVICE</i>	5 %	5 %	5 %	5 %	5 %
<i>SEDIMENT PONDS</i>	0	0	70 %	60 %	60 %
<i>T. W. PUMPBACK</i>	0	0	70 %	70 %	70 %
<i>BUFFER/FILTER STRIP</i>	0	0	30 %	30 %	30 %
<i>GRASSED WATERWAYS</i>	0	0	30 %	30 %	30 %
<i>SLOW RELEASE NITROGEN</i>	0	20 %	0	0	0

or possibly increased crop yields, it is their ability to improve stream quality that must be better understood. More information on benefits in terms of fish and recreation uses is essential, as well as data to help identify who benefits and over what period of time. A regionwide demonstration program, building on the current efforts, and integrated with the proposed Larimer-Weld 208 plan would go far to answer these questions.

### 3.3 CURRENT FUNDING OF CONSERVATION PRACTICES

Two federal programs (Department of Agriculture) have provided partial funding of conservation practices (CP's) in the Larimer-Weld irrigated region in recent years. These are the Great Plains Conservation Program and the Agricultural Conservation Program. Although the conservation practices are primarily for the purpose of soil and water conservation, there are many similarities between these and BMP's for water quality, and these existing programs might form the basis for funding implementation of water quality measures.

#### 3.3.1 Great Plains Conservation Program

This program provides cost-sharing assistance and technical services to participating land owners or operators in the Great Plains area (including Colorado) in the development and installation of long-term conservation plans and practices for their land. It is a voluntary program which complements other agricultural conservation programs in the Great Plains States. Contracts with individual land owners for the program range in time from three to ten years. Internal agency priorities have channeled funds primarily to non-irrigated lands to date because of less stable soil and water conditions in those areas.

Conservation plans for operation on farms are made as a basis for cost-sharing certain practices. The fundamental purposes of this program are to achieve needed land use adjustments, conservation treatments and economic stability of each operating farm unit. The conservation plan describes the work that is to be performed under each contract according to a specific time schedule.

The Soil Conservation Service, who administers this program for the Department of Agriculture, had a backlog of unserved program applications of about 5,000 as of June 30, 1976. This is not a major problem. There are about 5,000 written annually with the present staff. It presently has under contract approximately 15,000 active agreements with farm operators. Cooperating land owners or operators finance the entire cost of installing recurring management type practices and pay a specific part of the cost-shared practices installed upon their land.

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<sup>2</sup> Appendix to the (U.S.) budget for fiscal year 1978, pg. 160.

Program regulations provide that cost-shared rates offered in any contract shall not exceed 80 percent of the cost of installing eligible practices within the designated county. The rates vary from states and practices due to differences in conservation and program needs. Cost-sharing for irrigation practices in any one contract shall not exceed \$7,500 or one-fourth of the total federal obligation. There is a cost-sharing limitation of \$25,000 for any one contract. Farm operators who sign Great Plains program contracts are responsible for implementing this plan of operation. The Department is committed to furnish the necessary technical help needed for design, layout and other services. Cooperating landowners and operators are encouraged to make use of other available assistance under local, state and federal programs as a means of further improving their land and water resources.

### 3.3.2 Agricultural Conservation Programs

The Agricultural Conservation Program (ACP) is another program of the Department of Agriculture that deals with farm operators and Department of Agriculture cost-sharing programs for enhancement of agricultural conservation purposes. The program within the Department of Agriculture is administered for funding purposes by the ASCS (Agricultural Stabilization and Conservation Service). Another division of the Department of Agriculture, the SCS (Soil Conservation Service) handles the technical and application processing phases of the program.

The ACP program has some similarities to the Great Plains Program in that it provides a cost-sharing process by which on-farm operators may participate with the federal government to enhance the usability of their land for agricultural purposes and conserve soil and water resources.

The program basically provides for a cost-sharing program for land conservation, soil fertility, soil erosion protection, flood control protection and prevention of agriculture-related pollution. It may be executed by the development of conservation plans which prescribe management practices that are funded under the program. Usually, however, the requirement of a conservation plan does not exist because the applications are for a single practice or at most a few management practices to be applied. The limitations on funding make this at present an item-by-item program done on an annual basis.

Funding for the program is done more on a year-to-year basis than a long-term basis as the Great Plains program, and cost-sharing relationships are developed with the Department of Agriculture for 50% to 75% funding on projects that do not exceed \$5,000 per agreement. There is a proposal to lift the \$5,000 limit for the years 1978 and 1979.

Federal ASCS offices exist at County and State levels to provide program administration.



### 3.3.3 Potential for Funding Water Quality Activities

Both of these programs appear to lend themselves, through some modification, to being vehicles for implementing agricultural BMP's with water pollution abatement activities as the focus. These two programs have farmer acceptance and have been in place long enough to have established proven administrative procedures. The Great Plains Program format, with the emphasis on larger, more comprehensive efforts, offers the better example of an approach that is compatible with the 20 year planning scale of the 208 program and the scope of the agricultural pollution abatement problem. It is logical to implement BMP programs through existing channels if possible rather than create a new and untried structure that would actually parallel the contract with farmers.

Jointly, approximately \$500,000 has been coming into the Larimer-Weld irrigated areas through these programs in recent years. This has represented approximately 30% of the annual local spending on CP's. The local farm community has been spending another \$1.2 million so that total outlays have averaged approximately \$1.7 million. This amounts to about \$3.34 per irrigated acre in the two counties. Priorities are set on a county-by-county basis by farmers in that county for what funds are available.

This present split between federal sources and the farmer reflects the ceiling limitations for federal sharing of costs per contract. Although the federal share may be 50% or more on small projects, because of limits on total dollar participation, the average sharing works out to the lesser 30% figure. Also, these programs contain no provisions for funding non-structural BMP's, such as irrigation scheduling.

The appropriate cost sharing for water quality BMP's may well differ from that arising from these existing programs and should be based on considerations of who is causing the water pollution and who benefits from remedial activities. Financial requirements for the water quality program are discussed further in Section 4.4 below.

A further consideration is the requirement that BMP funding programs fit with the overall 208 institutional and technical requirements. It is essential that the base of present work be utilized, that needed additional data on BMP benefits be developed, and that the proposed institutional structure be supported by the financial arrangements.

#### 4.0 GUIDELINES FOR INSTITUTIONAL/FINANCIAL ARRANGEMENTS FOR IMPLEMENTATION OF IRRIGATED AGRICULTURAL POLLUTION CONTROL MEASURES

The institutional arrangements necessary to implement the 208 technical plan are strongly influenced by the Act's legal requirements, principles of good government, and financial considerations. While the legal aspects are primarily derived from the Act, the good government practices result from attitudes and accepted practices in the region as well as accepted principles of good government. The financial guidelines are based on the law and accepted principles of equity, efficiency, and practicality. It is important to bear in mind that although this report deals specifically with the problems of irrigated agriculture, an institutional and financial program for all pollution sources in the Larimer-Weld area must be developed. This section focuses heavily on the needs in the irrigated agricultural area, yet the reader should be aware that additional requirements arise in the other point and non-point categories. An integrated 208 plan must respect the broad needs arising from the entire spectrum of pollutant sources.

##### 4.1 LEGAL REQUIREMENTS: PLANNING, MANAGEMENT, OPERATIONS AND REGULATION

The institutional/financial requirements of the 208 implementation program are established by legal, technical, financial, and political forces. Specifics of the Clean Water Act (PL 92-500) generally outline the tasks the management system must carry out with respect to all pollutant sources in the region. The Act states that the minimum content of the 208 plan must include the following elements:<sup>1</sup>

"(A) the identification of treatment works necessary to meet the anticipated municipal and industrial waste treatment needs of the area over a twenty-year period, annually updated (including an analysis of alternative waste treatment systems), including any requirements for the acquisition of land for treatment purposes; the necessary wastewater collection and urban storm water runoff systems; and a program to provide the necessary financial arrangements for the development of such treatment works;

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<sup>1</sup> PL 92-500, Sec. 208(b)(2).

"(B) the establishment of construction priorities for such treatment works and time schedules for the initiation and completion of all treatment works;

"(C) the establishment of a regulatory program to --

"(i) implement the waste treatment management requirements of section 201(c)

"(ii) regulate the location, modification, and construction of any facilities within such area, and

"(iii) assure that any industrial or commercial wastes discharged into any treatment works in such area meet applicable pretreatment requirements;

"(D) the identification of those agencies necessary to construct, operate, and maintain all facilities required by the plan and otherwise to carry out the plan;

"(E) the identification of the measures necessary to carry out the plan (including financing), the period of time necessary to carry out the plan, the costs of carrying out the plan within such time, and the economic, social, and environmental impact of carrying out the plan within such time;

"(F) a process to (i) identify, if appropriate, agriculturally and silviculturally related nonpoint sources of pollution, including runoff from manure disposal areas, and from land used for livestock and crop production, and (ii) set forth procedures and methods (including land use requirements) to control to the extent feasible such sources;

"(G) a process to (i) identify, if appropriate, mine-related sources of pollution including new, current, and abandoned surface and underground mine runoff, and (ii) set forth procedures and methods (including land use requirements) to control to the extent feasible such sources;

"(H) a process to (i) identify construction activity related sources of pollution, and (ii) set forth procedures and methods (including land use requirements) to control to the extent feasible such sources;

"(I) a process to (i) identify, if appropriate, salt water intrusion into rivers, lakes, and estuaries resulting from reduction of fresh water flow from any cause, including irrigation, obstruction, ground water extraction, and diversion, and (ii) set forth procedures and methods to control such intrusion to the extent feasible where such procedures and methods are otherwise a part of the waste treatment management plan;

"(J) a process to control the disposition of all residual waste generated in such area which could affect water quality; and

"(K) a process to control the disposal of pollutants on land or in subsurface excavations within such area to protect ground and surface water quality."

Consistent with the mandate of the Act, a management system to carry out the 208 plan can take many forms. Indeed, a great deal of local latitude is permitted to allow creation of a system specifically designed for the study area. However, whatever form the system may take, it should have certain basic functional elements to deal with the specific tasks required to implement the plan. The Law (PL 92-500) and the federal regulations Part (131) outline the general institutional structure to plan and implement a water quality system for the Larimer-Weld region. The four functions of planning, management, operations and regulation are all specifically identified in the Law or the regulations. With this authority, it is necessary to review the four functions for the Larimer-Weld region based upon (1) knowledge of the local scene, (2) external forces at work that affect program implementation, and (3) general good government practices.

#### 4.1.1 Continuous Planning

Once the initial 208 plan is prepared and the adoption process complete ((1) Larimer-Weld Council of Governments, (2) State of Colorado, (3) Federal EPA), the agency designated in the plan as the continuing planning agency will have certain responsibilities and powers:

- . The approved areawide plan must be annually reviewed, evaluated, updated, and recertified by the Governor.<sup>2</sup>
- . Any proposed changes by the management agencies that could have an effect upon water quality and the 208 plan (e.g., expansion or contraction of service area boundaries, addition or deletion of treatment facilities, or changes in management areas) must be approved by the planning agency before they can become part of the 208 plan.
- . A continuous water pollution control planning process of implementation will necessitate a variety of additional tasks. These include:
  - Providing assistance to management agencies in carrying out their activities.
  - Monitoring, evaluating, and suggesting corrective actions, if necessary, to assure that the

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<sup>2</sup> Refer to Appendix A for a detailed discussion of the annual recertification process.

implementation aspects of the 208 plan are being carried out.

- As specified by the 208 plan, carrying out water pollution abatement activities in non-designated management areas of the county.
- Assuring that the 208 pollution abatement activities of the plan are integrated in a meaningful way with the other urban and rural activities of the County, e.g., land use, land use development controls, solid waste management, water resources, and air quality.
- Integrating the areawide 208 plan activities with neighboring 208 planning agencies.
- Providing a liaison for information on 208-related activities and regulations between the EPA, state management agencies, and the public.

These powers and responsibilities vested in the planning agency derive from the following provisions of PL 92-500.<sup>3</sup>

- . Changes to the original 208 plan may occur only when recommended by the areawide planning agency to the Governor and ultimately approved by him and the EPA as a plan revision.
- . Liquid waste generators may not discharge wastes without a NPDES permit, and no NPDES discharge permit may be issued to any point source discharger that is not in conformance with the 208 plan.
- . Only designated management agencies and only treatment works developed as a part of the 208 plan are eligible for federal construction grant assistance.

#### 4.1.2 Management

The law sets the minimum requirements for the management agency.<sup>4</sup> It does not specifically distinguish between the "management" function and the "operations" function. Yet it is clear that the management agency has broader responsibilities than day-to-day operational activities. In fact, it has the basic responsibility to implement the 208 plan, but may or may not directly conduct the operations function (and/or certain other of its mandated functions). For example, a qualified city might be a

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<sup>3</sup> PL 92-500, Sec. 208(d).

<sup>4</sup> PL 92-500, Sec. 208(c).

management agency and also perform the operations function. Yet, in a broader sense, the management agency might delegate the operations tasks to another agency, while retaining overall responsibility for the tasks' performance. The management agency task is literally program management and thus need not involve itself in every detailed activity.

Institutional and financial arrangements may be affected by this distinction. Therefore, we differentiate between management agencies who are responsible to carry out the areawide plan for irrigated agriculture and the other pollutant categories and operating agencies who are the "hands on" people. To be sure, in some cases the management agency and the operational agency may be one and the same. In other cases, the best choice for an operational agency will not be the best choice for the management agency, perhaps because it cannot meet all the requirements of the 208 law.

Section 208(c)(2) of the law specifies management agencies must be capable of at least the following:

"(A) to carry out appropriate portions of an area-wide waste treatment management plan developed under subsection (b) of this section;

"(B) to manage effectively waste treatment works and related facilities serving such area in conformance with any plan required by subsection (b) of this section;

"(C) directly or by contract, to design and construct new works, and to operate and maintain new and existing works as required by any plan developed pursuant to subsection (b) of this section;

"(D) to accept and utilize grants, or other funds from any source, for waste treatment management purposes;

"(E) to raise revenues, including the assessment of waste treatment charges;

"(F) to incur short- and long-term indebtedness;

"(G) to assure in implementation of an areawide waste treatment management plan that each participating community pays its proportionate share of treatment costs;

"(H) to refuse to receive any wastes from any municipality or subdivision thereof, which does not comply with any provisions of an approved plan under this section applicable to such area; and

"(I) to accept for treatment industrial wastes."

In addition, management agencies must be capable of adopting and implementing systems for industrial cost recovery and user charges per Section 204(b) of the law, and to obtain and possess NPDES permits per Section 402(a).

Various of these functions may be delegated to separate

operations agencies, by contract with the management agency, in certain cases. See Section 7.2 for details of this management agency "pass-through" concept.

PL 92-500 and federal regulations Part 131 require planning agency and management system responsibilities to cover the entire geographic boundaries of the designated planning area (i.e., Larimer and Weld Counties). The law and the regulations also require that management agencies possess certain mandatory powers for the geographic areas for which they are assigned responsibilities. Colorado state law limits the powers granted to local and regional agencies to specific boundaries. The requirements of PL 92-500, together with the limited capabilities of the candidate institutions, dictate careful matching of the team of management agencies to assure full geographic coverage by entities that possess sufficient powers to carry out the required management tasks.

#### 4.1.3 Operations

In some cases, the operations functions will be performed by the management agency. On the other hand, various activities might be separated from the management function in an institutional sense so as to be conducted by another agency that would assume the posture of an operating division of the management agency. Different sets of activities might be delegated to the operations agency depending on the circumstances. In such a case, operations agencies could have a great deal of autonomy in terms of implementing BMP activities. Yet they would always be subject to supervision, plan coordination, fiscal guidance, and 208 management control of the management agency.

#### 4.1.4 Regulation

Rules and regulations published by the EPA in the Federal Register, Vol. 40, No. 230, November 28, 1975, Part 131, describe the details of the responsibilities of planning and management agencies. Included in the definition of management agency responsibilities is the identification of operating agencies and regulatory agencies. Details of the requirements for regulatory agencies are also contained in this section.

The regulatory functions fall into two major subcategories, the first being the administration of the 402 permit program for all point discharges.<sup>5</sup> This responsibility is now assigned by law to the state water quality control agency. As a practical matter, this means the state, in conjunction with its operating partner and subordinate, the county health departments, will be the responsible regulatory agency (system).

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<sup>5</sup> PL 92-500, Sec. 402(a).

The second category of regulatory activities deals with land use and land management control. While these activities may not be directly controlled by the 208 program, they will have significant impact on an area's ability to move towards the clean water goal. The law's regulations specifically require a tie between the region's water quality goals and the region's land management process.<sup>6</sup> This category of regulatory activities reinforces the concept that water quality activities are deeply tied to most of the other activities of local government and cannot be effectively dealt with in a vacuum. Examples of regulatory activities in this category are as follows:

- . Zoning
- . Flood plain zoning and regulations
- . Environmental performance zoning
- . Subdivision regulations
- . P.U.D.'s
- . Housing codes
- . Building codes
- . Construction permits
- . Hillside development requirements
- . Runoff control and management
- . Drainage controls - on site
- . Gravel pit operation
- . Grading regulations
- . Soil erosion and sediment control ordinances
- . Solid waste control ordinances
- . Septic tank ordinances
- . Taxation policies
- . Public investment policies

In time, it is likely that the cost of facilities, advancement of technology and the reduction of streams' abilities to absorb expanding amounts of pollutants, will place greater and greater emphasis on utilization of land use and land management techniques to reduce pollution quantities and undesirable characteristics. Coordination of these efforts must cut across political boundaries to be effective. Drainage, for example, follows natural, not administrative, boundary lines.

#### 4.2 BMP TECHNOLOGY: STATE OF THE ART LIMITATIONS AND IMPLEMENTATION PHASING

Agricultural pollution control studies are now being conducted by the Toups Corporation as part of this 208 project. These technical analyses appear to indicate that agriculture in some form is a significant contributor to instream pollutants in at least these areas: suspended solids, dissolved solids and nitrogen. This work has also identified, through case studies, a number of BMP's that are effective in reducing

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<sup>6</sup> EPA Regulations, Part 131.11(N).



the impact of the pollutants from individual farms. However the extent of the case studies is not large enough, nor is the time period of observation of the results long enough, to confirm that these BMP applications demonstrated can be extrapolated over the entire region, or even throughout a subbasin. This suggests that before moving aggressively to implement a full-scale BMP program throughout the planning region, possibly involving local cost-sharing and perhaps even mandatory compliance, the effectiveness of the BMP practices in achieving pollution control at least within an entire subbasin should be demonstrated.

A second limitation with current BMP technology is in the area of the cost-effectiveness of the various practices. For example, conclusions relating to cost-effectiveness may depend on the extent of the BMP application throughout the region. Some practices may have to be applied region-wide to be cost-effective, whereas others might be cost-effective only for a particular subbasin or even particular farm sites. More research and on-farm application appears to be desirable to assure BMP applications are worth the price that will be paid.

BMP technology is likewise insufficient to confirm the distribution of costs and benefits from BMP applications. Ideally, institutional/financial arrangements would seek to establish program funding responsibilities on program beneficiaries. This will not be possible given the current state of knowledge.

Finally, there is a lack of documentation of the benefits of agricultural pollution control measures that may be used to educate individual farmers and the community at large.

The preceding points relating to the state of BMP technology present serious difficulties in designing full-scale implementation programs at this time. For instance, mandatory programs can hardly be considered, and would surely meet with strong resistance in view of current knowledge limitations. Likewise, without thorough knowledge of who benefits, financing programs that would impose costs on the local community cannot be fairly evaluated. Also, the use of new regulatory measures would be inhibited as the rationale for their directives would be exposed to constant attack.

This suggests that the initial efforts planned take a course of facilitating further study and demonstration where cumulative effects of BMP knowledge is weak. The early work should avoid imposing cost burdens on the local farmers, avoid inflexible mandatory controls and other institutional/financial structures, and focus on BMP evaluation and communication of results. This course should not preclude the judicious use of BMP techniques that have been shown to be cost-effective in technical studies. Rather, it must minimize the local burden of conducting this

background effort. Once the required answers have been obtained, the local community can be reasonably assigned their responsibilities and share of the burden.

Along these lines, it is useful to conceive of the irrigated agricultural program as having three evolutionary phases and to recognize that the ultimate institutional and financial aspects of the irrigated agricultural portion of the plan will only take shape as the program progresses. The first phase coincides with the initial 208 study program. Phase 2 will focus on completing the study and demonstration effort to confirm BMP (and possibly institutional) effectiveness, costs and benefits needed to settle on an appropriate final plan. Phase 3 is the full-scale implementation program based in part on the results of the Phase 2 effort. Note that this phasing program does not specifically define the time required for, or the level of the Phase 2 effort, or for that matter, the extent to which "model implementation" activities might occur. This will largely be determined by the availability of funding. Demonstration can occur on a large scale -- a number of subbasins -- and provide an excellent basis for evaluation and monitoring of BMP effectiveness, benefits and substantial relationships. If necessary, a more modest program with scaled down expectations can be instituted.

The phasing program aims to assure that adequate knowledge of BMP effectiveness, costs, and benefits are acquired for the design of a sensible implementation program. The phasing program should also seek to minimize the local burden throughout the initial stages and to preserve flexibility in designing optimal institutional and financial structures for the ultimate implementation effort.

The USDA-EPA model implementation program (or other similar program) appears to hold promise for contributing to the Phase 2 effort required in the Larimer-Weld region. Its implementation activities would serve the study/evaluation requirements and no mandatory cost burden would be imposed on the Larimer-Weld community. Any local cost sharing would occur on a voluntary participation basis. It is less clear as to whether or not inappropriate institutional precedents would be established. Along these lines, program requirements and structure should be checked for consistency with the Phase 2 structure proposed herein. The Phase 2 institutional structure proposed in this study is discussed in detail in Section 7.0. It is essential that, whatever the source of funding for Phase 2 efforts, the institutional structure proposed herein be sustained and supported to assure full implementation of the 208 program and the enhancement of the opportunities for successful implementation of the areawide plan.

#### 4.3 REQUIREMENTS FOR 208 IMPLEMENTATION AGENCIES

##### 4.3.1 Agriculture and 208 Implementation Roles

The basic nature of agriculture undermines simple institutional

solutions. Farmers have a long tradition of independence and even conflict with organized general purpose government. County governments have historically provided caretaker services to the unincorporated areas, but have never been called upon to become involved in regulating land use practices on the farm. Zoning and building permits, neither of which directly affect the nature of how farming occurs, have been bitterly fought in most agricultural areas. State and federal programs affecting farming practices have been primarily voluntary with incentives to the farmer to comply or utilize the program. In most cases, the farmers themselves have associated together to deal with common problems -- erosion control and water resource development and delivery systems. Usually the result is simple functional organizations designed to react to a potential issue. What coordination between programs occurs (e.g., water resource development, conservancy district, delivery system, and ditch companies) results from the same individual farmer being active in a variety of agencies to which he belongs.

Many local institutions (counties and regional agencies) seldom deal directly with the farmer. Service associations which do deal directly with the farmers frequently have no general purpose governmental powers and are voluntary in nature (soil districts, water districts, ditch companies). State and federal agencies (Department of Agriculture, State Soil Conservation Board, Water Quality Control Commission, Soil Conservation Service, Water Conservation Board, Agricultural Stabilization and Conservation Service, Corps of Engineers, Environmental Protection Agency, etc.) which deal with farming, directly and indirectly, rarely do so in a mandatory program role.

In the initial phase (Phase 2) of implementation for irrigated agricultural pollution control, the most important agency requirement is for organizations which can oversee efforts, be coordinators, conduct research, integrate water and soil interests, have rapport with the agricultural interests, coordinate the effort with other 208 abatement efforts, have geographical interests which extend to entire basins and which are capable of interstate perspectives and contacts. While general purpose governments (cities and counties) may be involved, they do not warrant a dominant role during Phase 2. Their orientation is not towards research; they are limited in outlook to their political boundaries or service areas, whereas the problem is tied to natural boundaries. Furthermore, funding a myriad of individual research programs (for various cities/counties) is unrealistic. They must be aware of the efforts and understand how their decisions affect abatement efforts but the force for demonstrating the BMP's is best directed by people with technical expertise.

The institutional structure of Phase 2 of the agricultural pollution abatement program should be dominated by agencies now involved in agriculture-related activities. New agencies, if appropriate at all, should be considered only for the

ultimate implementation phase (Phase 3). General purpose government roles, at this stage, if at all, are of a pass-through nature.

#### 4.3.2 Pollutant - Institutional Relationships

The alternative of developing separate institutional structures to perform separate planning, management and/or regulatory functions for each pollutant or group of pollutants creates two basic problems which would have serious detrimental effects on the ability to achieve success: (1) the need for a massive coordination and overseeing role arises that would be difficult to achieve; (2) the powers and capabilities of certain elements of the institutional structure to effectively carry out multiple functional tasks are possessed by very few agencies, some of which are not in a logical position to use them (i.e., state using its police power to enforce local land use decisions is political suicide as the State Land Use Commission, who just comments on issues, is well aware of).

It is highly desirable for the institutional structure that is to carry out all phases of the implementation of the overall 208 plan to be as near to a single structure as is possible. Particularly, it is desirable for the planning, management and regulatory functions to be assigned to an agency that has domain over all forms of stream pollutants (e.g., municipal, industrial and agricultural). The operations agency will need to be customized to specific problems. This suggests that although a separate report is being prepared for irrigated agriculture, integrating this program with the 208 plan for other sources is an essential requirement.

#### 4.3.3 Required Institutional Orientation and Powers

Agencies must be identified to perform the functions of planning, management, operations and regulation discussed in 4.1 above. In the initial program phase (Phase 2), the focus will be on areawide planning, coordination and regulation. The primary responsibilities of the continuing planning agency will be coordination of the 208 program with other regional programs, liaison with the state and federal governments, leadership in the continuing planning, research and demonstration effort, technical assistance to other program participants, and overall program guidance in dealing with the requirements of the law and the 208 plan; and, most importantly, setting priorities for the continuing planning, research and development and demonstration activities of Phase 2 of the program.

The regulatory role for this Phase 2 program will be one primarily of assistance to the planning agency in the areas of monitoring and testing to provide data and information to complete the testing and demonstration aspects of the Phase 2 program.

Later in the program, all four functions will be important for areawide implementation.

The following Table 4.3.3-A details agency characteristics (excluding those of a financial nature that are discussed in Section 4.4) that will be required for the performance of the planning, management, operations and regulatory function throughout the initial and areawide implementation phases of the program. If such agencies are designated, these are the characteristics. Note, however, it may not be necessary for all four roles to be designated initially.

The importance of various of these institutional requirements will depend on how the final implementation phase eventually develops. For instance, the precise responsibilities of general purpose local governments could be affected by whether or not mandatory compliance becomes a requirement. While general purpose governments are not the best agencies for carrying out the Phase 2 (planning, research and development, and demonstration activities) activities of the agricultural pollution abatement program, they are best equipped for implementation if it is a mandatory program. General purpose local governments, with their broad range of powers for enforcement and regulation and their direct accountability to the people of the area, are the logical candidates to get the job done. They are the political agency and are the proper candidate to be held responsible by the citizens and to provide coordination of efforts by various single program functional agencies in their area.

If implementation of agricultural pollution abatement programs never becomes a mandatory requirement but rather remains a voluntary program with various forms of nonmandatory inducements, institutional agencies other than general purpose local governments might be appropriate. Integration into the overall 208 plan could be adversely affected should this approach be taken.

#### 4.4 FINANCIAL REQUIREMENTS FOR PROGRAM SUPPORT

Funding arrangements should differ for the two phases of program implementation. Heavy reliance on external sources will be required early on. For this reason the necessary financial resources and abilities of the involved agencies might differ from Phase 2 to Phase 3. On the other hand, the need for transition from Phase 2 to Phase 3, and the need to integrate the agricultural program with the rest of the plan suggest that different structures be carefully considered.

##### 4.4.1 Phase 2 Requirements

The primary activities of Phase 2 involve demonstration, analysis of results, communication of results, and planning how BMP activities can be integrated with the areawide 208 implementation program. As such, the most critical financial requirement will be that of raising funding to support research/

TABLE 4.3.3-A

Required Agency Characteristics  
By Function By Phase \*\*\*

<u>Phase 2</u>	<u>Phase 3</u>	
P-M-O	P-M-O	Local involvement and direct accountability to the area's residents
P-M-O	P-M-O	Opportunities for technical input from locally active water and soil organized interests
M-O	M-O	Ability to raise local funding, if necessary, to meet minimum staffing needs or match federal or state planning and research monies
O	O	An established rapport with farming interests
P	P	Capability to comprehend the relationship and overview coordination of areawide planning involving both municipal and agricultural pollution from both point and non-point sources. An areawide perspective.
M-O	M-O	Authority to accept and utilize grants
P-M	P-M	Ability to complete the research developed in Phase 1 and test its application area-wide
P	P	Ability to track and react to state and federal wastewater related actions and interpret their potential effect on local interests and costs
O-M	O-M	Interest in economic efficiency
O	O	Ability to demonstrate cost-effectiveness to the farmer to achieve a maximum level of local participation and cooperation
	M	Authority to mandate compliance with the plan
M	M	Regulatory powers over land use -- location control and methods of development
O	O	Authority to charge fees, tax, and raise revenues
M-O	M-O	Authority to incur debt

\*\*\* P - Planning Agency  
R - Regulatory Agency

O - Operations Agency  
M - Management Agency

TABLE 4.3.3-A (Continued)

<u>Phase 2</u>	<u>Phase 3</u>	
P-M	P-M	Authority to require coordination across political boundary lines
P-M	P-M	Ability to monitor plans and update individual efforts to achieve plans
P	P	Ability to interpret wastewater concerns with other areawide issues
P-M-R	P-M-R	Perpetual in nature
M-O	M-O	Adequate staff to administer the program and provide technical support to the people actually carrying out the plan, including an educational system to disseminate the BMP's and customize them to an individual farm or subbasin's needs. The "selling" of the advantages of the program will have to be done locally
P-M	P-M	How to integrate utility planning and comprehensive planning
P-M	P-M	Provide guidance in how to go about developing a wastewater treatment system
M	P-M	Provide assistance in where and how to seek grants
M	P-M	Technical advice on the legal, financial engineering or planning aspects of the 208 program

\*\*\* P - Planning Agency  
 R - Regulatory Agency  
 O - Operations Agency  
 M - Management Agency

evaluation and planning activities.

Program funding for continuing problem definition, research and development and the initial stages of program implementation, should continue to be derived from the federal government with possible supplements from the state. Indications from the limited case studies conducted so far indicate there may be cost savings to the agricultural industry from some of the BMP's, as well as conservation of resources. Thus, some level of voluntary local participation might be sought. Mandatory local participation in program funding will be appropriate only when implementation of the Areawide Plan is shown to be effective, necessary, and beneficial to the area. The problem and solution definition stage should appropriately be funded by the creator of the program. The USDA-EPA model implementation program may fit this need and funding should be considered for the Larimer-Weld region.

It is not intended that funding for soil conservation plans and programs be suspended until BMP's for pollution control are developed and useable. But funding of massive new programs for immediate implementation with strong expectations of known results before the research is completed appears illogical and potentially wasteful. To this time, research money has been derived from the Environmental Protection Agency Clean Water Act. Any new monies that might be made available through the Department of Agriculture should be used to supplement the 208 funds in defining BMP's, testing their application by subbasins, testing cost-effectiveness, and to begin at the appropriate time, early phases of program implementation and demonstration of the effectiveness of the total approach to pollution abatement. The problem definition and the benefits of solving the problem should precede implementation funding programs to avoid false expectations and subsequent disillusionment on the part of the funders.

With Phase 2 funding coming from outside the area, it is not necessary for the local agencies involved to possess taxing and borrowing capabilities. Rather the critical skills will be more akin to those of grant administration, or large scale contract management. Knowledge of the area, understanding of the broad 208 picture and results to date, and coordinating skills are all more important than financial abilities. These requirements are similar to those presently needed by LWCOG in coordinating and directing the 208 plan development. It should be emphasized, however, because of the need during Phase 2 for local involvement and coordination, any outside funding should definitely flow, subject to the priorities and program coordination efforts of the local (planning) agency. Clearly, such allocation must be consistent with the intent and content of the 208 plan. This will be necessary to assure its coordinating role and to support its integrating efforts with other 208 abatement efforts.

A further consideration for agency financial requirements during



Phase 2 is the need to smoothly work into Phase 3 of the agriculture program and to integrate with the overall 208 plan. Broader financial requirements will exist in Phase 3 and the other plan elements.

#### 4.4.2 Phase 3 Requirements

Phase 3 of the irrigated agriculture program will stress implementation of BMP's and other measures shown to be appropriate in view of the pollution problem. At this point, the precise nature of the needed financial resources and capabilities is obscure due to our imperfect picture of the final implementation program. However, it is possible to state certain principles, and reiterate the importance of integrating the irrigated agricultural fiscal program with that of the rest of the 208 plan for all point and non-point sources.

##### 4.4.2.1 Financial Requirements Implied by the Act

Section 208(b)(2) of the Act suggests a number of financial capabilities that will be required of the agencies implementing the plan. Among this section's important provisions (with respect to financial capabilities of implementing agencies) are the requirements for annual updating of the twenty-year facilities program together with the necessary financial arrangements; scheduling initiation and completion of treatment works (including financing); regulation activities per 208(b)(2)(C); measures to be used by agencies to carry out the plan (including financing); procedures and methods to control to the extent feasible various non-point pollution sources.

These legal requirements suggest the need for implementation agencies that possess considerable financial skills and abilities. Of particular importance will be:

- . Ability to assess the financial effects of proposed changes in the plan;
- . Ability to obtain and interpret financial information reflecting the status of the region's agencies involved in 208 plan implementation;
- . Ability to coordinate and resolve conflicts in various agencies' individual financial plans as they relate to implementation activities;
- . Ability to utilize a broad range of financial tools as incentives to support regulatory efforts;
- . Ability to fund regulatory efforts;
- . Ability to utilize a variety of revenue measures to provide funding for construction, operations, and program support activities for all aspects of the plan.

Section 208(c)(2) suggests further requirements. Here the focus is on the tasks specified for the management agencies in particular. Having primary responsibility for plan implementation, these agencies will need the broadest financial skills. In addition to those noted above (excepting regulatory related), management agencies must have authority to:

- . Accept and utilize grants, or other funds from any source, for waste management purposes (208(c)(2)(D));
- . Raise revenues, including the assessment of waste treatment charges (208(c)(2)(E));
- . Incur short- and long-range indebtedness (208(c)(2)(F));
- . Assure each participating community pays its proportionate share of treatment costs (208(c)(2)(G));

The requirements of the Act clearly favor the designation of general purpose local governments as management agencies. They have traditionally been effective in obtaining grant funds, and more importantly, in Colorado, have by far the broadest range of options for raising revenues. Such options are typically under local control (at most requiring a vote of the electorate), involving no special state legislative action. The ability to raise debt funds suggests the agency should have alternatives available (revenue bonds, general obligation bonds, general improvement bonds, etc.), a good credit rating/strong tax base, and experience in debt financing.

#### 4.4.2.2 Financial Requirements of Program Implementation

The Clean Water Act cites several important financial qualifications of the implementing agencies. In view of the magnitude and significance of the program, the need for highly professional financial management, and for a broad range of financial opportunities is obvious. Financial planning, decision making regarding financial alternatives, revenue system administration, debt financing, investment management, accounting and control, capital programming and annual budgeting, auditing, and other skills and experience will be required. Managing the program's financial aspects will itself be a major program. Some particularly important items should be highlighted:

- . Experience with large scale enterprise fund programs is highly desirable for the management agency;
- . Institutional arrangements should strongly support other program highlights with its financial policies (fees as regulatory incentives, program beneficiary pays, etc.);
- . There should be financial alternatives for the implementing agencies aside from total dependence on state and federal grants;

- . Implementation of a true regional plan must not be allowed to stumble on the present myriad of local financial commitments;
- . Financial responsibility to the local electorate will be the best check on program value (in relation to costs) and efficiency in implementation. Agencies with a high degree of political responsibility are indicated.

#### 4.4.2.3 Phase 3 Funding

The sources of funding for Phase 3 may have to come from sources other than the farmer. If benefits to the farmer are negligible or non-existent, it will clearly be difficult to have them voluntarily participate. Conceivably, if it is the public at large who is the beneficiary, then the county or state could be expected to meet the local share -- not unlike other matching fund programs for areawide benefit or for that matter the matching funds for sewer treatment facilities in urban areas. The farmer, as an individual, should not be expected to assume the financial burden in total any more than the urban user of the wastewater treatment system assumes the full burden of cleaning up the streams. The benefit factor is critical to an equitable funding program.

The agricultural funding program has some of the same prerequisites as the revenue sharing program for cities. It needs stability and predictability. Commitments should be for at least 5 years for planning purposes. The money must be available when the farmer has the money to match his portion. There is no such thing as stability in agricultural earnings on an annual basis. The availability of funds is an average situation. Two bad years and then one good one. The program funding must reflect these characteristics of the industry and be capable of responding. The same opportunity that cities have to spread capital costs over 10-20 years should be available to the farmer in instituting capital intensive BMP practices.

Furthermore, BMP's which require facilities will have to be constructed or installed, in most cases, between growing seasons. This has an effect on timing and funding. The ability to plan ahead and to ride out adverse weather conditions may make carry over of funds critical.

If existing Federal Cost-Sharing Programs for soil conservation practices are to be modified and then utilized as the vehicle to program and fund BMP's, it may be necessary to remove the present financial limitations from these programs. Presently there are limits of \$2500 on the Agricultural Stabilization and Conservation Service Program and \$25,000 on the Great Plains Program. These limits effectively determine the federal share at approximately 30%. This may or may not be an appropriate level of federal participation in light of program benefits.

Once Phase 3 is entered, there are a number of potential sources of funding available. Those agencies which are capable of funding projects and raising revenues through user fees or mill levies are identified in Section 6.0 of this report. Districts of all sorts, local government, and the state all have some of these powers. In addition there are:

- . Direct grants to the management agency by the Environmental Protection Agency or state from 208 program funds;
- . Environmental Protection Agency or state funds granted to the planning agency for 208 planning, in part, passed through to the management agency;
- . Department of Agriculture funds - federal and state;
- . General tax revenues -- local or state -- mill levies, income tax;
- . Special taxes - sales, liquor, cigarette, etc.;
- . Special districts (including Soil Conservation Districts) with special ad valorem levy on all property;
- . Surcharge on the fee or tax structure of areawide systems within the county or district to be passed through to the management agency (provided for in intergovernmental contracts between agency and county; and
- . Direct funding from farmers or other program beneficiaries.

#### 4.5 POLICY AND PROGRAM REQUIREMENTS

##### 4.5.1 Mandatory Versus Voluntary Compliance

Existing programs designed to conserve soil and water resources have been largely based on positive incentives to the farmer. As noted in Section 3.3.3 above, federal spending of \$1/2 mil. each year in recent history has induced total spending of three times the federal share. Obviously, the farmer has understood these efforts to serve his own interests and so has responded enthusiastically and voluntarily.

Whether a program of water quality BMP's would receive this level of voluntary support is not now predictable. Inadequate cost-effectiveness data is available, as is information on the distribution of benefits to farmers and others. This suggests an initial approach based on voluntary compliance as contrasted to an immediate move to mandatory controls. The state of the art in dealing with these categories of pollutants is such that while the continuing developmental planning, research and demonstration activities are ongoing, voluntary compliance activities,

accompanied by gradual implementation of programs that appear viable first in a planning setting and later in a demonstration and full implementation setting are a rational approach to a complex program that must evolve gradually from its present state to a more advanced state where mandatory compliance and mandatory program implementation could be seriously considered.

#### 4.5.2 Program Integration

It has been mentioned previously that integrating the irrigated agricultural program with the plan for other point and non-point sources is important. This is particularly true in the planning and management functions which must be area oriented and not repeated for various classes of pollutants. Overall coordination would then be seriously undermined and efforts substantially diluted. Assuring ultimate integration implies that initial choices for planning and management agencies must be coordinated and made in light of the requirements of all pollutant categories. This is the reason that the management agencies involved in irrigated agriculture must have land use powers (and the ability to coordinate these under the urban service area concept), as well as powers to levy utility-oriented user charges. Without these powers, the management agencies involved in irrigated agriculture could never perform the tasks required in dealing with pollution from most other pollutant sources. Ideally, the very same agencies will be designated (in each given area of domain) for handling the planning and management functions for all pollutant categories, including irrigated agriculture.

## 5.0 STRATEGY FOR IMPLEMENTING THE AREAWIDE PLAN

Development of an implementation program under the Federal Water Pollution Control Act as specified in Section 208 begins with the assessment of the existing pollution situation in a planning area. This is contained in separate technical reports and summarized for agricultural sources in Section 3.0 above. The development of an action program in light of the physical situation in the Larimer-Weld planning area is the heart of the program. Accepting this, it is clear that the institutional structure that will serve as a framework for program implementation, financing, and monitoring must be phased. Sequential actions dealing with the complex issue of pollution control are necessary. Not all physical problems are capable of immediate solution in the Larimer-Weld region.

The problem solving process recognized the circular nature of the key elements of the program. These are problem identification in light of the requirements of the law, development of alternatives that can achieve the objective of the law established in the framework of the local situation, and development of an institutional and financial structure that can carry out the technical program once it is developed. None of these elements can be developed without recognition of the other parts. Each must be played back against the other and in some cases alternatives must be chosen because of a related element that cannot function with the desired element.

This interrelated process has occurred throughout the Larimer-Weld 208 study. The plan which is being presented for public discussion and legislative decision acknowledges three basic issues of the program, i.e., (1) what are the pollution problems in our area, (2) what are the technical alternatives for dealing with those problems, and (3) what are the institutional and financial arrangements that are necessary to implement such a program. The overall plan proposed, and the underlying strategy, derives from a resolution of these basic issues.

### 5.1 POLLUTION PROBLEMS IN LARIMER-WELD COUNTIES

Pollutants in the Larimer-Weld area come from a large variety of sources. An overview discussion of these sources is contained in Section 3.0 of this report on irrigated agriculture, and in a related study<sup>1</sup> on other point and non-point sources

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1 "Institutional and Financial Recommendations for Control of Pollutants for Municipal and Industrial Point Sources and Non-Point Sources", Briscoe, Maphis, Murray & Lamont, Inc., October, 1977.

in the region. Further detail is contained in technical reports prepared by the Toups Corporation and published by the Larimer-Weld Council of Governments.

It is important to note that though some pollutant types require special technical and institutional/financial consideration, an integrated plan is still needed for the entire area. Fragmentation is to be avoided if at all possible.

## 5.2 PROPOSED TECHNICAL SOLUTIONS

The problem definition and proposed solutions for the municipal and industrial point sources have been clearly articulated as a result of the 208 study. Who the dischargers are, the capacity of their systems, when they will have to upgrade their system to meet the state discharge requirements, the relation to the water quality standards and stream classifications, the hydrology of the region and alternative treatment methods for achieving the goals of the law are all weighed as part of the technical report.

The problem definition for irrigated agriculture and the various non-point sources is much softer. Background data on the magnitude of the problems and their effect on the region's streams are just now being accumulated. There was little or no history before the 208 study began.

This suggests that the areawide plan is ready for full-scale implementation for municipal and industrial point source dischargers, but not yet fully ready for certain non-point sources and irrigated agriculture. Additional monitoring and analysis for specific information is needed. Nonetheless, efforts can be taken to avoid compounding problems using various regulatory tools and sound engineering practices that can be presently justified.

In view of this situation, integration of the point, non-point, and irrigated agricultural efforts will be essential when the problem identification and solutions are at a similar level of accomplishment.

The proposed technical solution for irrigated agriculture involves application of a number of BMP's throughout the irrigated areas of the two counties. Both capital and operating costs are involved. At this point, cost estimates are highly tentative and total some \$51 million in 1977 dollars.

## 5.3 INSTITUTIONAL AND FINANCIAL CONSIDERATIONS ASSOCIATED WITH IMPLEMENTING IRRIGATED AGRICULTURE CONTROLS

The agricultural pollution control program is in the very beginning of a long term evolutionary process that can, over many years, produce a reduction in stream pollutants that

originate on the farm lands of the Larimer-Weld region. The program cannot happen overnight. To think otherwise is to fail to understand the nature of the problem. However, change can occur. The goals of PL 92-500 are achievable in a large part, if rational program development occurs. Success will occur if a considerate mix of financial incentives and regulatory mandates are logically integrated into a time-phased program that retains local controls to a significant degree. The agricultural issue must be integrated into the overall areawide plan of water pollution control. Whereas it can be isolated for the purpose of initial problem definition and development of solutions, implementation of pollution control programs must be integrated with the municipal and industrial efforts.

The irrigated agriculture pollution control program in Larimer-Weld Counties is nearing the end of the first phase of a long-range program that began with the Larimer-Weld 208 agriculture pollution study. The definition of the agriculture pollution problem that has developed to date suggests that from an overview perspective, the first three phases of the irrigated agriculture pollution abatement program could be characterized as follows:

Phase 1 (initial 208 study phase):

- . Years 1 and 2 (coincides with initial 208 plan period)
- . Partial problem definition
- . Definition of planning work undone
- . Four on-farm case studies
- . Initial BMP development and costing
- . Understanding of institutional needs and possibilities
- . Broadening of program understanding by agriculture people
- . Developed program direction for future

Phase 2 (Planning, R & D Completion, BMP Basin Demonstration, Beginning of Implementation):

- . Years 3, 4 and 5 (timing is partly dependent on the availability of funding for Phase 2 activities)
- . Completion of planning studies indicated in Phase I work



- . Demonstration of alternative BMP effectiveness and costs on a basin-wide basis
- . Avoidance of mandatory participation (use positive incentives) and minimization of local cost burden
- . Expansion of educational process
- . Completion of mid-course corrections in federal law and regulations
- . Testing of viability of institutional structure
- . Development of program for Phase 3 (implementation)
- . Measurement of benefits -- to the farmer, to the region's waters
- . Assessment of the program's ability to achieve the PL 92-500 goals and state standards
- . Some limited Phase 3 activities may occur concurrently with Phase 2 activities for certain limited BMP's

#### Phase 3 (Implementation)

- . Phase 3 begins when Phase 2 activities have produced a sufficient basis for implementing a program that has been demonstrated to produce results
- . First period of serious regulatory activities and adoption of new policies or requirements as needed
- . Expanded educational efforts based on the empirical study results
- . Program fine tuning (technical and institutional)
- . Financial assessment and allocation of costs with a long range capital improvement program developed for the region
- . Continued research and development as required

The institutional structure to provide movement for the program into and through the second and third phases is very important. The success or failure of the program probably depends, as much as anything, upon how the institutional framework is set up, and how it functions.

The institutional structure, like the program itself, must evolve as the program moves along. The institutional structure now in place that is guiding the Larimer-Weld region through Phase 1 of the agricultural pollution abatement program may gradually become inappropriate during Phase 2 activities and may be completely inadequate by the time Phase 3 begins. Although certain institutional features will run from one phase to another, changes in the overall structure will be required as the job at hand changes from planning and study activities, in early program phases, to an implementation role in Phase 3 and beyond. Change will be the name of the game. Decision makers must be prepared to think in such terms. The ability of local leadership to respond to changes in financial needs, functions, staff needs, and evaluation of future consequences will determine the degree of local control that will remain. State and federal agencies will have to step in if local efforts fail.

The establishment of an institutional framework to guide any phase of the program will be subject to a great many forces. Compromise will be required. Sensitivity to issues of the day in the Larimer-Weld region will be required even if they appear unrelated to an agricultural pollution abatement program. The Larimer-Weld region is alive with all kinds of pressures from various urban, suburban, and rural issues. Institutional systems are not being established in a "pure" political environment with agriculture pollution activities as the only consideration.

Some of the significant forces that will have major effects on the structure of the institutional approach are as follows:

- . Will irrigated agriculture remain as a point source category pollutant subject to regulations under Section 402 of the federal law or will it be re-defined as a non-point source pollutant and be subject to regulation as part of the 208 non-point program?
- . Will the Federal Government through EPA allow agricultural pollution abatement activities to proceed in a voluntary implementation mode, with various incentives, as is now advocated by many, or will they insist upon a mandatory implementation program for all farm pollution generators? Will their position vary based upon the decision in question 1 above or will it be hard and fast for all situations?
- . Will general purpose local governments who appear to be the logical choice for major roles in the institutional structure to carry out the municipal and industrial point source programs be willing to get involved in the agriculture pollution abatement programs? Particularly, will counties who have signifi-

cant powers in areas in and around irrigated agriculture lands be willing to become involved in the water quality issue when they have in most cases not been involved in such matters heretofore?

- . With stream pollutants coming from such a diverse list of sources as was identified in the Larimer-Weld 208 technical studies; i.e.,
  - Municipal and Industrial
  - Irrigated agriculture
  - Agriculture
  - Urban runoff
  - Rural roads runoff
  - Silviculture
  - Mine related
  - Construction
  - Residual wastes
  - Solid waste sites
  - Feed lots

is it realistic to think that one institutional structure can deal with them all or is it necessary for separate structures to deal with each pollutant or groups of pollutants?

All of these factors and more have no obvious answers at this time, but must be dealt with as decisions are made. An institutional structure that fails to recognize such issues stands little chance of achieving the desired objectives. Decision makers will need insight and good program perception to make the right choices initially and to remain flexible to change as the factors change.

#### 5.4 RECOMMENDED STRATEGY FOR PROGRAM IMPLEMENTATION

An overall review of the nature of the pollution problem in the Larimer-Weld region, the requirements of the law, the present state of planning and development studies, and the key program components of the technical and institutional/financial alternatives now under consideration suggest an overall program strategy. This strategy is characterized by the key concepts contained in the following paragraphs of this section.

##### 5.4.1 Local Control and Local Responsibility

Because of the complex nature of the water quality control program and the fact that implementation of this program will become intertwined with other forms of urban services being delivered by local agencies, and because the financial impact of this program, even with substantial federal funding assistance, is a very major one, it follows that to the greatest extent possible, local control over the program and local

responsibility for managing its implementation in a rational fashion, consistent with the other demands of the area, is highly desirable.

#### 5.4.2 Maximum Use of Existing Institutional Structure

The concept of using to the greatest extent possible existing institutional structures to carry out various functions of the water quality program is sound when viewed in the light of the alternatives. These call for new and innovative institutional forms that will present the possibility of new and unpredictable experiences for the people of the area and will require the maturing period that all new organizations must go through before they can effectively carry out the tasks at hand. It appears rational that since the existing institutional agencies in the Larimer-Weld area have sufficient powers and capabilities for the most part to carry out the required tasks of the 208 program that they represent the logical institutional choice. Furthermore, existing state and federal agencies dealing in the agricultural and water arenas have established delivery systems that should be fully utilized where they have positive images.

#### 5.4.3 General Purpose Local Governments in Charge of Program Where Possible

There are two basic reasons why general purpose local governments are the preferred alternative for carrying out the water quality program in the Larimer-Weld area. The first is because the water quality program cannot be implemented in a vacuum. It must be coordinated with all other pollution abatement activities of the area. Since for the most part these are being proposed to be the responsibility of general purpose local governments, they present a far superior choice for implementing the program than would another special agency with only water quality control activities on their mind. The need for coordination between water quality activities and all the other service activities that relate to water quality is thus avoided. The second major reason that general purpose local government should be in charge of the program is that institutionally they possess by far the best set of powers and capabilities for dealing with the complexities of the task at hand, including political representation with the state and federal governments' efforts to implement the law.<sup>2</sup>

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<sup>2</sup> The Urban Service Area concept and land use management are key elements for implementation of an overall program of pollution abatement in the region. Thus they are also essential in the case of irrigated agriculture which must fit into the overall picture. For more discussion of these requirements, see *Ibid.*, p. 40.

#### 5.4.4 Urban Service Area Concept -- Area of Domain (U.S.A.)<sup>3</sup>

The U.S.A. concept which describes an area of domain for responsible management agencies for, in this case, the water quality control program is a necessary means of identifying which agency is responsible for carrying out the program and finding the geographical boundaries of that responsibility assignment. The U.S.A. concept simply says that some agencies should be made responsible for delivering all forms of urban services to citizens of an area in a rational and effective manner and that this basic responsibility should be assigned the general purpose local governments of the area. For example, the comprehensive planning area of a city ordinarily describes the growth and development activities that will be occurring in and around the community for a 20-year period. The U.S.A. concept implies that if a community is planning to provide services in this area, either now or in the reasonable planning future, that it should be assigned planning and management functions to the greatest extent possible within that geographical area. All areas in the county outside the urban service area boundaries of the cities are left under county domain with provisions for services in those areas under county control. The area inside the service area also remains under county control but the introduction of a joint, mutually supportive effort, is introduced.

#### 5.4.5 Land Use Management<sup>3</sup>

Land use management concepts are significant for both point source control and non-point source control.

The Larimer-Weld 208 technical studies have shown that land use decisions in the Larimer-Weld area made by those agencies that have land use powers, namely general purpose local governments, cities, towns and counties, have major impact on not only point source controls for water quality activities, but also to a major degree have influence over non-point source pollutant characteristics. It seems obvious that with the major role that land use decisions play in affecting water quality characteristics, both from point and non-point sources, that it is absolutely mandatory that the responsible management agencies who are given the task of implementing the water quality control program must also possess powers and capabilities to directly apply land use regulations in behalf of their pursuit of a logical pollution abatement program.

#### 5.4.6 Complete the Planning before Implementation

This concept simply suggests that until the planning and development is done on most or all forms of pollutants, and in particular for those which have a major interrelationship with

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<sup>3</sup> Ibid., p. 40.

others, that the planning job should be done so that the results of implementation activities can be predicted and cost effectiveness of alternatives assessed in light of the overall program. Caution should be exhibited in jumping aggressively into implementation activities for any phase of water quality control programs until the planning task is 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.

#### 5.4.7 All Pollution Abatement Programs Should be Coordinated

This includes those for municipal and industrial point sources, non-point sources, and irrigated agriculture. The program has assessed the full spectrum of pollution forms in basically the three categories mentioned above. Nevertheless, for both technical and institutional reasons, it should be clear that that separation and categorization for study purposes was for the convenience of the exercise and that the program itself must be viewed as a single overall coordinated program. Pollution sources must be viewed in their overall context and abatement activities carried out only in terms of impacts on the overall program. As the end of the study process is reached, the program needs to be viewed as a single program and not three or four separate programs.

#### 5.4.8 Management Agency and Operation Agencies "Pass-Through" Concept

Arguments were presented above that general purpose local governments should be basically in charge of the program. Yet, not all general purpose governments are fully capable of performing all tasks. There is also the desire to make maximum use of existing institutional structures and service organizations. The pass-through concept is utilized to deal with these problems. For irrigated agriculture, this will involve the soil conservation districts being assigned the operations agency tasks in the 208 institutional structure with a general purpose local government being the management agency. The management agency exercises some form of overview as to operations activities. The pass-through concept suggests that to the greatest extent practical, that the legal tasks of the management agency be passed through to the operations agency via an intergovernmental contract. Some of the management agency responsibilities will, by necessity, be kept by the agency itself, but each specific situation will dictate the terms of the pass-through contract. The intent is to provide as little disruption as is possible to the present "way of doing business," and at the same time achieve the objective of the Law and the requirements of Section 208.

#### 5.4.9 Voluntary Compliance Efforts Versus Mandatory Compliance for Irrigated Agriculture and Non-Point Source Pollutants

Studies done in the Larimer-Weld area on both irrigated agriculture and non-point source pollutants suggest that both these programs lend themselves to an initial effort that is voluntary in nature as contrasted to immediately moving to a mandatory compliance program. The state of the art in dealing with both these categories of pollutants is such that while the continuing developmental planning, research, and demonstration activities are on-going, voluntary compliance activities are all that is justified. Gradual implementation of programs that appear viable first in a demonstration setting and then in a full implementation setting, is a rational approach to a complex program that must evolve gradually from its present state. Mandatory compliance and mandatory program implementation can only be seriously considered when all the facts are known.

#### 5.4.10 Fiscal Concept - He Who Benefits Versus He Who Pollutes

The fiscal concept of "He who benefits should pay" applies as well to water quality control activities as it does to other forms of urban service delivery programs. This concept suggests that there should be some form of equitable distribution of program costs and that the foundation for that distribution is some form of measurement of who and to what extent individuals or groups of individuals are benefited by the program. On the other hand, the concept that the polluter should pay brings to bear some positive motivational factors that develop when an agency or private party perceives that when he is causing a pollution problem, he will be asked to pay to abate that problem. In that process, pollutant generators are motivated to take steps under their own control to reduce the amount of pollutants generated so that their required payments of abatement activities will be reduced. They may reduce their polluting activities by process alterations or abate the pollution problem in other ways. Thus, ingenuity of people is rewarded when pollution abatement improvement activities are conceived or when generation activities are altered without costing them money to rectify the situation after it occurs.

In many irrigated agriculture cases, we will find that those who benefit are a different group than those who pollute. The financial program must endeavor to balance the cost burden to preserve both equity and the positive motivational factors within the financial realities of a major cornerstone of the region's economy and through realistic application of the goals of the law.

#### 5.5 MODEL IMPLEMENTATION FOR DEMONSTRATION OF BMP'S

The USDA - EPA model implementation program presents an opportunity for accomplishing BMP study/demonstration, as well as some level of implementation in the Larimer-Weld area.

The key requirements of the Phase 2 program recommended herein are (1) that mandatory controls are not imposed during this phase or for these initial activities; (2) that program costs are a mix of external funding and voluntary local participation; and (3) that institutional structures and roles are consistent with those recommended for Phase 2 in this report, and do not become locked in by virtue of precedent. The intent of Phase 2 is to demonstrate BMP effectiveness, costs and benefits, and to test and monitor institutional performance. Implementation for known results is not a primary objective.

To the extent any form of model implementation program meets these needs, and serves the objectives of its sponsor, the scale of spending and/or extent of implementation of model BMP's seems unimportant. It may well be that a federal sponsor could justify a larger investment than could the state or region on the basis of the potential for a transfer of technology throughout a multi-state area. A complete testing of entire sub-basins would permit the development of such empirical knowledge for transfer. Smaller scale efforts might not be as transferable, but more place specific.



6.0 ALTERNATIVE AGENCIES FOR I/F  
FUNCTIONS AND RECOMMENDED ROLES

6.1 INVENTORY OF AGENCIES FOR I/F FUNCTIONS

The following pages summarize federal, state, regional and local institutions that might play some role in 208 implementation in the Larimer-Weld region. For each, a recommended role in the program is identified. These recommendations form the basis for the proposed 208 institutional structure discussed in detail in Section 7.0.

KEY FEDERAL AGENCIES INVOLVED IN THE 208 AGRICULTURE PROGRAM

AGENCY	FUNCTIONS	PROGRAM ACTIVITIES	ROLE IN THE 208 AGRICULTURE PROGRAM
1. SOIL CONSERVATION SERVICE	<p>The SCS administers activities involving technical and financial assistance relating to the protection and improvement of water and land resources. Local participation and control is provided by Soil Conservation Districts. The SCS channels its grant assistance through local districts to land owners.</p>	<p>Major activities include technical assistance, agricultural water management and flood prevention, erosion control, cost sharing through the Great Plains Conservation Program to protect water and land resources, development of measures and facilities for water quality management, control of agricultural pollution and water storage for rural communities, development of irrigation projects and inventory and monitoring of soil and water resources.</p>	<p>Technical advisory role to planning, management, farmers and operations agencies for B.M.P. planning and implementation activities.</p> <p>Program administration for B.M.P. cost sharing program.</p>
2. FARMERS HOME ADMINISTRATION	<p>The FmHA participates with farmers and local organizations in rural areas and communities under 10,000 in population. It was established to provide loans and grants for farms, business and industry, community facilities and housing.</p>	<p>Major activities include making loans for: water and waste disposal systems, irrigation and drainage works, pollution abatement and control for family farms, soil and water conservation, recreation and flood protection.</p>	<p>Potential funding source for B.M.P. programs.</p>
3. FOREST SERVICE	<p>The Forest Service is involved with planning, research, technical assistance, monitoring and management of forest resources. The Service attempts to promote resource use, preserve and improve water quality, protect open space and secure favorable conditions for water flows.</p>	<p>Major activities include: providing assistance to agencies relative to soil erosion and runoff water, provision of cost-sharing related to watershed management and conservation, monitoring water quality, evaluation of rivers for the Wild and Scenic Rivers Program, and coordination of programs with State and local governments.</p>	<p>Technical advisory assistance to planning and management agencies for silviculture and related activities.</p> <p>Member of technical advisory committee.</p>

KEY FEDERAL AGENCIES INVOLVED IN THE 208 AGRICULTURE PROGRAM

AGENCY	FUNCTIONS	PROGRAM ACTIVITIES	ROLE IN THE 208 AGRICULTURE PROGRAM
4. AGRICULTURAL STABILIZATION AND CONSERVATION SERVICE	The ASCS is involved with the management, conservation and development of water and related land resources. These programs provide cost sharing and other economic incentives to farmers and ranchers to encourage conservation practices. The federal ASCS works with State and County ASCS officers.	Major activities include administration of the agricultural conservation program which provides cost-sharing for land conservation, soil fertility, soil erosion protection, flood control and prevention of agriculture related pollution, cost-sharing for emergency conservation practices and cropland conversion programs.	Funding source for B.M.P. cost sharing program.
5. AGRICULTURAL RESEARCH SERVICE	The ARS conducts research and contracts with public and private organizations or individuals. Much of the research is in support of the programs of other agencies in the Department of Agriculture.	Major research is involved with conservation, development and use of land, forest and water resources for agricultural purposes, as well as water management, water quality, watershed engineering and soil management.	Technical advisory services to planning and management agencies.  Member technical advisory committee.
6. ECONOMIC RESEARCH SERVICE	The ERS performs research concerning farm economics, marketing economics, and domestic and foreign economic analysis. The ERS performs research assisting the SCS, ASCS, and other agencies.	Major research includes land and water management, conservation and development, water allocation and administration, assistance in the ASCS agricultural conservation program, natural resource investment and financing, river basin planning and technical assistance to the SCS.	Support role in providing fiscal program guidance.
7. COOPERATIVE STATE RESEARCH SERVICE	The Service is an administrative agency which does not perform research. The agency administers funds appropriated for research activities carried out by the State (continued on page 3)	The Service supervises expenditures, advises the organizations doing research, and participates in planning and coordinating research programs of the states and the Department. Research deals with soil resources and (continued on page 3)	Support role to research agencies.

KEY FEDERAL AGENCIES INVOLVED IN THE 208 AGRICULTURAL PROGRAM

AGENCY FUNCTIONS PROGRAM ACTIVITIES ROLE IN THE 208 AGRICULTURE PROGRAM

<p>Cooperative State Research Service (continued)</p>	<p>Agricultural Experiment Stations, Land Grant Universities and schools of Forestry and other institutions.</p>	<p>and mapping, drainage and irrigation systems, soil and water pollution, soil and water conservation and other subjects.</p>	<p>Support role to planning and technical agencies.</p>
<p>8. DEPARTMENT OF THE INTERIOR UNITED STATES GEOLOGIC SURVEY</p>	<p>The USGS was established to perform surveys, investigations and research related to topography, geology and mineral resources and to classify land for its mineral and water resources.</p>	<p>The USGS is involved with preparation of maps, study of geological structure, measurement of water quality and supply, technical assistance to Federal agencies, and examination of Federal land to determine sites for water resource development.</p>	<p>Support role to planning and technical agencies.</p>
<p>9. BUREAU OF RECLAMATION</p>	<p>The Bureau is primarily involved with the planning, construction and operation of water facilities for the storage, diversion and development of water resources in the Western States. Reclamation projects are designed for irrigation, water quality improvement, flood control and fish and wildlife enhancement.</p>	<p>Major activities include investigation and planning relative to water resources, design and construction of projects, operation of projects which are not transferred to local organizations, provision of loans for construction or rehabilitation of irrigation systems and administration of contracts for irrigation.</p>	<p>Funding and project administration agency for flow augmentation projects or other water resource management projects.</p>
<p>10. BUREAU OF LAND MANAGEMENT</p>	<p>The BLM administers public lands under its jurisdiction. It is concerned with soil, siltation, water resources and water quality.</p>	<p>Major activities include the evaluation, planning, protection and management and development of water resources for timber, livestock and forage, and fish and wildlife, and issuance of permits for use of its land, promulgation of regulations in connection with</p> <p>(continued on page 4)</p>	<p>Support role and technical advisory services on land resource management as it relates to water pollution activities.</p>

KEY FEDERAL AGENCIES INVOLVED IN THE 208 AGRICULTURE PROGRAM

AGENCY	FUNCTIONS	PROGRAM ACTIVITIES	ROLE IN THE 208 AGRICULTURE PROGRAM
10. Bureau of Land Management (continued)		leasing, reservation of public lands for irrigation, prevention of soil erosion and entering into agreements for management of private lands to maintain water supply, regulate streamflows and prevent erosion.	
11. DEPARTMENT OF DEFENSE ARMY CORPS OF ENGINEERS	The Corps is involved with construction of facilities which provide flood control and water resources and quality, which generate power and regulate rivers.	Through the civil works program, the Corps provides planning, design, construction and operation and maintenance of works, contracts for available surplus water. The Corps issues permits for dams, dikes and dredging and filling, and provides planning assistance to states and other entities and designated flood hazard areas.	Regulatory agency - 404 program. Funding source for major water resource or flood control projects. Support role for planning and technical advice on water resource matters.
12. ENVIRONMENTAL PROTECTION AGENCY	The EPA was created in 1970 to provide coordinated action related to the environment. The EPA is involved with the control of water pollution and coordinates its activities with state and local governments, private groups, individuals and educational institutions.	Major activities as provided in the Federal Water Pollution Control Act (PL 92-500) include research, coordination and evaluation of state water quality planning programs and water quality standards, issuance of permits, enforcement of violations, publication of regulations for point source water control, evaluation of areawide plans, and providing grants to local entities.	92-500 program administrator. Regulatory agency. Funding source for 208 program implementation, planning and demonstration. Technical and policy advisory committee.

KEY FEDERAL AGENCIES INVOLVED IN THE 208 AGRICULTURE PROGRAM

AGENCY	FUNCTIONS	PROGRAM ACTIVITIES	ROLE IN THE 208 AGRICULTURE PROGRAM
13. DEPARTMENT OF COMMERCE ECONOMIC DEVELOPMENT ADMINISTRATION	The Commission is one of seven regional commissions designated by the Secretary of Commerce for the purpose of economic development. The Commission is made up of Governors of Colorado, Arizona, New Mexico and Utah and a member appointed by the President.	Major activities include technical assistance for planning, investigations, demonstration projects and training programs, supplemental grants and demonstration projects.	Supportive role.  Funding source for program demonstration projects, minor implementation or advanced planning studies.
FOUR CORNERS REGIONAL COMMISSION			

KEY STATE AGENCIES INVOLVED IN THE 208 AGRICULTURE PROGRAM

AGENCY	FUNCTIONS	PROGRAM ACTIVITIES	ROLE IN THE 208 AGRICULTURE PROGRAM
1. COLORADO WATER CONSERVATION BOARD	The Board is involved primarily with water supply, interstate compacts, conservation, flood, control and water resource planning. The Board has a Denver office and two field offices.	Activities include administration of the CWCB water project construction fund, water planning, designation of flood hazard areas, participation in federal reclamation and flood control projects and appropriation of minimum streamflows.	Potential funding source for flow augmentation projects. Technical planning assistance.
2. DIVISION OF WATER RESOURCES	The Division, headed by the State Engineer, administers surface water and underground water (not found in designated basins) according to court decrees. The Division is also charged with the planning, management and regulation of water use. The Division has a Denver office and seven division offices.	Major activities include administration of surface and underground water, approval of dams, livestock water tanks and wells, review water right applications, collection of water supply data, and performance of technical investigations.	Technical planning assistance in water resource activities. Regulatory activities - water rights.
3. GROUND WATER COMMISSION	The Commission, under the authority of the State Engineer, is responsible for the administration of the ground waters of the State found in designated ground water basins. The Commission consists of 12 members.	Major activities include definitions of ground water basins, administration of these waters, assistance in the organization of ground water management districts, supervision of water use, issuance of permits and prescribing withdrawal limits for waters where there is no district.	Technical assistance in matters relating to ground water. Regulatory activities - ground water use and management.
4. IRRIGATION DISTRICT COMMISSION	The Commission, a section of the Division of Water Resources, is composed of three appointed members. It serves as an information source for irrigation districts.	The Commission provides technical assistance to irrigation districts, receives information relative to districts and disseminates information about districts.	Technical assistance in irrigation matters.

KEY STATE AGENCIES INVOLVED IN THE 208 AGRICULTURE PROGRAM

AGENCY	FUNCTIONS	PROGRAM ACTIVITIES	ROLE IN THE 208 AGRICULTURE PROGRAM
5. COLORADO GEOLOGICAL SURVEY GROUND WATER SECTION	The section, comprised of one individual, is involved with geologic investigations.	The section assists State agencies relative to ground water, investigates ground water supply, and studies point source pollution to ground water	Technical information - ground water.
6. SOIL CONSERVATION BOARD	The Board, which consists of nine members, is involved primarily with supervision and coordination of the 83 Soil Conservation Districts in the State. The Board also carries out certain functions on its own. The Board is not primarily involved in water quality.	The Board assists in organization of Districts, advises Districts, acts as a Board of Appeals for Districts, administers and distributes funds to Districts, studies watershed problems, and develops watershed flood prevention and underground water storage problems.	Primary role as a possible planning and/or management agency role in 208 agricultural pollution abatement program.  Technical assistance on soil conservation matters.  Technical and policy advisory committee for agricultural matters.  Non-designated study area responsibilities.
7. DEPARTMENT OF HEALTH WATER QUALITY CONTROL DIVISION	The Division, which is divided into ten geographical districts, is involved in planning, administration and enforcement relative to water quality pursuant to State and Federal Pollution control legislation.	The Major activities include administration of grants for wastewater treatment works, administration of water quality control programs, issuance of discharge permits, inspection of treatment works, data collection, monitoring discharges, enforcement and planning.	Administrative arm of key funding and regulatory agency of State (W.Q.C.C.)  Regulatory role (primary)  Technical planning activities.  Technical advisory committee.
8. WATER QUALITY CONTROL COMMISSION	The Commission, composed of an 11 member board, is involved with planning and policy making relative to water quality.	The Commission promulgates water quality standards, issues control regulations, promulgates waste discharge permit regulations, reviews sewage treatment plant proposals, reviews applications for underground discharges, reviews local government regulations for individual sewage disposal systems, and allocates (continued on page 3)	In charge of State water quality activities.  Regulatory role.  Policy advisory committee  Funding source for all water quality activities (federal and state funds)  Technical review agency of 208 plans for the Governor.



KEY STATE AGENCIES INVOLVED IN THE 208 AGRICULTURE PROGRAM

AGENCY	FUNCTIONS	PROGRAM ACTIVITIES	ROLE IN THE 208 AGRICULTURE PROGRAM
8. Water Quality Control Commission (continued)		State Construction grants for sewage treatment plants.	
9. DEPARTMENT OF AGRICULTURE RESOURCE ANALYST	The Resource Analyst conducts research relative to the inputs of agriculture; i.e., land, water, labor and energy.	Activities include information collection, analysis of the impact of proposals on agriculture, description of agricultural lands under pressure of conversion, assistance to other agencies, development of county agricultural profiles and review of environmental impact statements which relate to agriculture.	Technical advisory role for agricultural matters.  Technical advisory committee.
10. PLANT INDUSTRY DIVISION: PESTICIDE INSPECTION DEPARTMENT OF LOCAL AFFAIRS	This office is involved with regulation of pesticides and applicators.	The Division has enforcement powers relating to unlicensed or dangerous application of pesticides. It licenses dealers who sell pesticides, registers pesticides and licenses applicators.	Technical advisory role to agricultural planning program.
11. DIVISION OF LOCAL GOVERNMENT	The Division is primarily involved with grant administration and information gathering.	Primary programs include administration of grant programs for sewage plant construction, pre-design and planning and emergency water and sewage grants, information gathering relative to special districts and local governments, the excess levy approval and budget review program, and technical assistance.	Funding source for some wastewater facilities.  Policy advisory role in detail with local governments.  Information source on budgets and fiscal affairs of local governments.

KEY STATE AGENCIES INVOLVED IN THE 208 AGRICULTURE PROGRAM

AGENCY	FUNCTIONS	PROGRAM ACTIVITIES	ROLE IN THE 208 AGRICULTURE PROGRAM
12. OFFICE OF RURAL DEVELOPMENT	The office conducts planning and research and coordinates activities of other divisions in the department relative to rural affairs.	The office provides technical assistance to local governments, serves as a clearinghouse for rural development information, studies rural development, participates in Four Corners Regional Commission programs, and is involved with preparation of the State Economic Development Plan.	Technical assistance and information dissemination on rural development.
13. STATE 208 COORDINATOR	Handles 208 program coordination for state on non-technical matters.	Program coordination and inter-relationships of all designated 208 areas and state non-designated area programs. Provides staff review of 208 program for primarily non-technical portion of plan.	Review of L.W. 208 plan in non-technical areas. Member policy advisory committee. Represents Governor's office concerns about 208 plan (non-technical) content.

KEY SPECIAL DISTRICTS INVOLVED IN THE 208 AGRICULTURE PROGRAM

DISTRICT	FUNCTIONS	MAJOR POWERS	ROLE IN 208 AGRICULTURE PROGRAM
1. IRRIGATION	<p>These Districts are utilized to provide water for irrigation. They are established by local petition drives and county commissioner approval.</p>	<p>Major powers related to agriculture include power to acquire and operate construction works, purchase property and water rights, issue bonds and levy assessments on land, except that which is not capable of irrigation.</p>	<p>Supportive role.                      Facility activities that could have role in irrigation and flow augmentation program.                      Potential funding role.</p>
2. WATER CONSERVANCY	<p>These Districts, formed by local petition, are involved with construction of water facilities and water quality. They work with the Bureau of Reclamation on reclamation projects.</p>	<p>Water conservancy Districts, unlike irrigation districts, can make special assessments to property according to benefit and levy an ad valorem property tax. They may also appropriate, purchase and sell water rights, water works and property, construct and operate facilities, fix rates and issue bonds.</p>	<p>Supportive role.                      Abilities to fund and create facilities for water resource management and flow augmentation.                      Technical advisory role.</p>
3. WATER CONSERVATION	<p>Water Conservation Districts are established by the State Legislature individually - 3 exist in Colorado. They are involved in water resource development, resolving water problems involving more than one water conservancy district and work closest with the Colorado Water Conservation Board.</p>	<p>These Districts have the power to acquire property, file for water rights, maintain stream flows, conduct investigations, make special assessments, organize special assessment districts and levy property taxes.</p>	<p>Supportive role.                      Ability to fund and create water resource projects with flow augmentation capabilities.                      Technical advisory role.</p>

KEY SPECIAL DISTRICTS INVOLVED IN THE 208 AGRICULTURE PROGRAM

DISTRICT	FUNCTIONS	MAJOR POWERS	ROLE IN THE 208 AGRICULTURE PROGRAM
4. DRAINAGE	Established by local initiative, these Districts are formed for drainage of water from land.	Drainage Districts may acquire and condemn land, construct private ditches or other diversion facilities, adopt plans for drainage systems, issue bonds and special assessments based on benefits to landowners and levy taxes.	Supportive role. Technical advisory support. Create and fund facilities in special situations.
5. CONSERVANCY	Conservancy Districts are established by local petition to provide flood control.	Major powers include clean and change water courses, construct and maintain ditches and dams, plot or subdivide land, levy taxes, issue bonds, and levy assessments based on local benefits.	Supportive role. Technical advisory support. Facility capabilities - primarily flood control.
6. SOIL CONSERVATION DISTRICTS	Established by local petition, these Districts are formed to return land which has been lost through erosion or depletion of subsurface matter to productivity. These Districts work closely with the State and Federal Soil Conservation Agencies.	Soil Conservation Districts conduct research, construct and maintain facilities, furnish financial aid to landowners for flood control, erosion control or water conservation, manage SCS projects, prepare plans, make assessments, and levy property taxes.	Primary role as a possible operating agency for agricultural abatement activities. Facility capabilities for "on-farm" conservation practices. Technical advisory committee.
7. GROUNDWATER MANAGEMENT	These Districts are formed by local petition drives in conjunction with the Groundwater Commission to promote conservation and development of ground water in "designated ground water basins".	The Districts have the power to regulate the use, control and conservation of groundwater, acquire land, construct dams, regulate wells, promulgate regulations, develop plans, issue bonds, levy a property tax, make special assessments on wells and prohibit groundwater use outside district boundaries.	Supportive role. Groundwater regulatory role. Facility capabilities with groundwater objectives.

KEY SPECIAL DISTRICTS INVOLVED IN THE 208 AGRICULTURAL PROGRAM

DISTRICT	FUNCTIONS	MAJOR POWERS	ROLE IN THE 208 AGRICULTURAL PROGRAM
8. WATER AND SANITATION	Formed by local petition, these Districts provide water and sewer service.	Powers include: acquire and dispose water rights, property and facilities, operate and maintain facilities, borrow money, issue bonds, fix rates and levy taxes.	Supportive role. Possible operating agency ( M & I ). Facility funding and operation agency for M & I.

KEY LOCAL AGENCIES INVOLVED IN THE 208 AGRICULTURE PROGRAM

AGENCY	FUNCTIONS	POWERS	RELATIONSHIP TO 208 AGRICULTURE PROGRAM
1. MUNICIPALITIES	Municipalities are involved in land use decisions, raise revenues, and provide water and sewer services.	The powers of statutory cities are controlled by State legislation; home rule municipalities are governed by charter. Cities may regulate the use of land through police powers, construct and operate water and sewage treatment facilities, require connection to central systems and levy taxes.	Primary role as management agency within their city limits or service area.
2. COUNTIES	Counties are primarily involved in unincorporated areas and have a role relative to provision of water and sewer services, land use planning, regulation of solid waste disposal sites, and raising revenues.	Counties are empowered through the police power to make land use decisions, construct and operate water and sewage facilities, require sewer connections, raise revenues and issue bonds.	Primary role as management agency for areas outside of cities.  Regulatory powers for land use and land management activities - police powers.  Technical and policy role.  Potential funding role.
3. COUNTY HEALTH DEPARTMENTS AND BOARDS OF HEALTH	County Boards of Health function in a policy-making and review role. Their decisions are generally autonomous from County Commissioners and are responsible to the State Health Department. County Health Departments perform staff functions.	Through both State and County powers, these agencies review sewage treatment facility plans, review permits for individual sewage plants, monitor streams, enforce violation of water pollution laws, inspect water supplies and inspect septic systems.	Primary role as regulatory agency in conjunction with State Health Department.  Technical and policy advisory role.

KEY LOCAL AGENCIES INVOLVED IN THE 208 AGRICULTURE PROGRAM

AGENCY	FUNCTIONS	POWERS	RELATIONSHIP TO 208 AGRICULTURE PROGRAM
4. COUNCILS OF GOVERNMENTS	Regional institution that has no independent political or financial powers. Functions as a regional planning and coordinating agency under direction of local elected officials who are the governing board.	C.O.G.s have only those powers delegated to them by specific acts of the cooperating local governments that have formed the C.O.G.	Primary role as the planning agency for both agricultural and urban pollution abatement activities of the 208 institutional structure.
			Policy advisor to external agencies.

OTHER ENTITIES INVOLVED IN THE 208 AGRICULTURE PROGRAM

ENTITY	FUNCTIONS	PROGRAM ACTIVITIES	ROLE IN THE 208 AGRICULTURE PROGRAM
1. COLORADO ASSOCIATION OF SOIL CONSERVATION DISTRICTS	Soil Conservation Districts are organized into this association in order to accomplish soil and water conservation objectives and policies which would not be possible individually. All 83 Soil Conservation Districts in Colorado are members. Directors are elected from each of ten watersheds.	The Association disseminates information, promotes cooperation between districts and other agencies and educates the public relative to conservation.	Supportive role. Assistance to S.C.D.'s as operating agencies.
2. NATIONAL ASSOCIATION OF CONSERVATION DISTRICTS	This organization serves as the national instrument for conservation districts throughout the country. The Council, which governs the organization, is composed of representatives from each state.	The organization maintains relations with other organizations and government agencies, develops national policies and publishes information about districts.	Support role. Assistance to State and local S.C.D. activities.
3. COLORADO STATE UNIVERSITY - *EXTENSION SERVICE	Technical research and development. Experimentation and demonstration activities.	Water quality related projects and activities.	Supportive role. Technical advisory assistance. Member - technical advisory committee.
*STATE EXPERIMENT STATION			



## 7.0 PROPOSED ALTERNATIVE INSTITUTIONAL STRUCTURES

The proposed alternatives which have been developed reflect possible reservations on the part of county legislators to become involved in the program on a continuing basis. This may be true whether directly through their own staff or indirectly through the Council of Governments. In Phase 2 this may not be a critical issue as little is required in the way of commitment. But for Phase 3, the counties must decide to be in or out. The thought of assuming staff and budgetary responsibilities is a concern of all local governments.

### 7.1 SUMMARY OF PROPOSED ALTERNATIVES

#### 7.1.1 Recommended Alternatives

##### 7.1.1.1 Phase 2 Proposals

- . Designate the Larimer-Weld Council of Governments as the continuing planning agency.
- . Designate the counties as the management agencies for all areas except inside city limits.
- . Designate Soil Conservation Districts as operating agencies with support from the Soil Conservation Service and state Soil Conservation Board.
- . Designate the State Health Department/County Health Departments as regulatory agencies.
- . Appoint a technical advisory committee to advise on technical research priorities for demonstration projects and monitoring of results.
- . Appoint a policy advisory committee for overview of program interrelationships and policy matters.
- . Continuing planning, research and development work, and demonstration studies will be done under planning agency direction via contracts with three key parties:
  - Consultants
  - Soil Conservation Districts
  - Federal Soil Conservation Service
- . Planning agency staff should not need to exceed three people (for all 208 work, municipal, agriculture and non-point)

- . Funding for both planning agency staff and support activities plus costs of contract activities to actually do planning, research and development, and demonstration work should be funded by federal and/or state agencies.
- . Second phase planning, testing, research and development, and demonstration work should be completed within three years (depending on the scale of the demonstration program) sufficiently to move into Phase 3.
- . Phase 3 implementation work program and recommendations should be developed by the end of Phase 2 planning effort.

#### 7.1.1.2 Phase 3 Proposals

Although it is almost impossible to properly structure an institutional framework for a program that is as yet not totally defined, it is possible to suggest what appears at this stage the most likely outline for Phase 3 implementation activities.

- . Designate Larimer-Weld Council of Governments as the continuing planning agency.
- . Adopt the urban service area concept as the basis for defining management system domains.
- . Designate the counties as the management agency for all areas of Larimer-Weld Counties except (1) inside city limits of incorporated communities and (2) service area boundaries of qualified cities and towns.
- . Designate cities and towns as management agencies for those areas designated (1) and (2) in the preceding statement.
- . Designate Soil Conservation Districts as operating agencies with a significant support role for the Soil Conservation Service and State Soil Conservation Board.
- . Designate State Health Department/County Health Departments as the regulatory team.
- . Appoint a policy advisory committee and technical advisory committee to guide the planning agency (Larimer-Weld Council of Governments), and management agencies on program direction and activities.
- . Program staffing will be as required by each separate agency once the tasks are clarified commensurate with the scope of the assignment and executed responsibilities.

- . Program funding will be on a cost-share basis with a mix of federal and/or state funds matched, at some level, by local agencies and program beneficiaries.
  - . Phase 3 will be indeterminant in time.
- 7.1.2 Minimum Local Involvement Alternative (Assumes Larimer-Weld Council of Governments and the Counties are Not Involved in a Significant Way)
- 7.1.2.1 Phase 2 Proposals
- . Appoint the State Soil Conservation Board as the planning agency and management agency.
  - . Designate the Soil Conservation Districts with assistance from Soil Conservation Service as the operating agencies.
  - . Designate the State Health Department/County Health Departments as the regulatory agencies.
  - . Appoint a technical advisory committee.
  - . Appoint a policy advisory committee.
  - . Second phase planning, testing, research and development, and demonstration work should be completed within three years sufficiently to move into Phase 3.
  - . Program funding should be from federal and/or state Agencies.
  - . Phase 3 implementation, work program and recommendations, to be developed by end of Phase 2 planning effort.

7.1.2.2 Phase 3 Proposals

- . Designate the State Soil Conservation Board as the planning agency for irrigated agriculture for the Larimer-Weld area.
- . Adopt the urban service area concept as a basis for defining management system domains.
- . Designate the State Soil Conservation Board as the management agency for all areas of the two counties except (1) inside city limits and (2) service area boundaries of qualified cities and towns.
- . Designate cities and towns as management agencies for irrigated agriculture pollution control within their city limits and/or service areas.
- . Designate the Soil Conservation Districts with assistance from the Soil Conservation Service as the operating agencies.

- . Designate State Health Department/County Health Departments as the regulatory team.
- . Appoint a policy advisory committee and a technical advisory committee for the State Soil Conservation Board with strong representation for Larimer-Weld agricultural people and people with water and agricultural expertise.
- . Program staffing to be as required by each separate agency once the tasks are clarified.
- . Program funding to be on a cost-share basis with a mix of federal and/or state funds matched (in some proportion) by local agencies and/or program beneficiaries.
- . Phase 3 will be indeterminant in time.

### 7.1.3 Discussion of Alternatives

The basic difference between the two alternative proposals is the issue of who is in charge of the continued planning activities. Local government (Council of Governments) or state government (Soil Conservation Board) are the options.

The suggestion for the Soil Conservation Board at the state level is open to considerable debate. The strongest arguments for their designation is their past experience with soil erosion BMP's, the statewide network of local organizations (83 soil districts), and their established hierarchy of people from the federal level to technical support people actually in the field. They have two field offices (Ft. Collins and Greeley) and ten districts in Larimer and Weld Counties alone. The concerns are their lack of ability to execute land use development controls, their lack of power to coordinate with the nonagricultural pollution abatement efforts, a narrow perspective with regard to soil practices versus water quality, lack of experience, knowledge and technical expertise in water quality matters, and the fact that coordination of interests at the state level is difficult at best (e.g., there will be a need for the Water Quality Control Commission, Water Conservancy Board and possibly the State Engineer to have major input into the program). Yet, someone must be made responsible if local government passes.

The gearing up to the task seems less of an effort for the State Soil Conservation Board and its support agencies than for any other state agency. Because of territorial concerns, this assignment of program responsibility, should the counties opt out, may become a political tempest. The best of several imperfect alternatives appears to be the State Soil Conservation Board. They will have to adopt a broadened philosophy, increase staff and possibly change a long-standing approach of relying

on incentives to one of mandatory enforcement in Phase 3. This could damage their excellent rapport with the individual farmer. They were not intended as a political organization, are not directly accountable to the electors, nor are they comprised of elected officials. Because of these reasons, the preferred alternative is superior. It proposes the State Soil Conservation Board, Federal Soil Conservation Service, Water Conservation Board and others as support agencies to carry out the program and to provide expertise through advisory committess on all aspects of the program with the Council of Governments and local governments up front dealing with the political aspects of the law and its implications.

## 7.2 THE "PASS-THROUGH" CONCEPT: MANAGEMENT-OPERATIONS AGENCY RELATIONSHIPS

The relationships between management agencies and operating agencies is a complex, but significantly important one.<sup>4</sup> Management agencies are responsible for the accomplishment of the assigned portions of the 208 plan, including operational functions. However, operating agencies may actually perform most of the tasks required of the management agency via an intergovernmental contract.

The reason that the distinction is so key is that management agencies must have land use powers to meet the objectives of the law and to meet the pollution abatement tasks that are assigned. Operations agencies do not need to possess land use powers so long as the responsible management agency for their area has that capacity. This distinction sets up the framework for an institutional structure that utilizes special districts, industrial and private wastewater treatment systems and soil conservation districts in an effective way, while not requiring them to perform a land use management role, or other general purpose government types of tasks, for which they possess inadequate powers.

It is expected that the intergovernmental contract would have the following key elements:

. Operating agencies would:

- Possess in their own name a NPDES permit and be responsible for conforming with its requirements.
- Be eligible for Federal grants and loans to construct wastewater facilities or structural BMP facilities called for in the 208 plan.
- Have complete control over operations and maintenance activities for districts and help the farmers develop BMP plans.

<sup>4</sup>For a more detailed description of the Management and Operation agency relationship in Phase II, refer to Appendix B.

. Management agencies would:

- Have review and approval responsibilities over any sub-basin plans not shown in the approved 208 plan.
- Make recommendations to the planning agency regarding grant priorities within the management agency boundaries.
- Be responsible for coordinating land use management decisions within the management agency boundaries.
- Implement non-point source abatement activities called for in the 208 plan.
- Assume responsibility for overall pollution abatement activities within the management agency boundaries for the assigned elements contained in the 208 plan, subject to the provisions of the contract with the operations agency.
- Cooperate with the operations agency in every way possible to carry out the provisions of the 208 plan.
- Function in a regulatory or restraining way over the operating agencies in their area only, when a clearly-demonstrated water pollution concern exists or is eminent, that would be detrimental to the area's pollution abatement program as described in the 208 plan.
- Provide political liaison with other 208 and governmental agencies who are dealing with or affecting the 208 program, e.g., the Water Quality Control Commission or the EPA.

7.3 DETAILED DESCRIPTION OF INSTITUTIONAL STRUCTURE AND TASKS:  
RECOMMENDED ALTERNATIVE

7.3.1 Phase 2 Proposals

7.3.1.1 Designate the Larimer-Weld Council of Governments  
as the Continuing Planning Agency

The primary responsibilities of the Larimer-Weld Council of Governments as the continuing planning agency will be coordination of the 208 program with other regional programs, liaison with the state and Federal governments, leadership in the continuing planning, research and demonstration effort, technical assistance to other program participants and overall program

guidance in dealing with the requirements of the law and the 208 plan; and, most importantly, setting priorities for the continuing planning, research and development, and demonstration activities of Phase 2 of the program.

Other tasks that will be required of the Larimer-Weld Council of Governments as the continuing planning agency for the agricultural pollution abatement program are as follows:

- . The annual plan amendment, updating, and recertification as required by law will be the responsibility of the Council of Governments.
- . Overall program monitoring, evaluating, and suggesting corrective actions to assure that the required aspects of the 208 plan are being carried out.
- . Assuring that the 208 pollution abatement activities required in the initial 208 plan are integrated in a meaningful way with other urban and rural pollution abatement activities of the area, such as land use, land use development controls, solid waste management, water resource planning, and air quality activities.
- . Making sure that the Larimer-Weld Area 208 agricultural pollution abatement program is properly integrated with the activities of other neighboring 208 programs in designated and non-designated areas.
- . Provide a liaison for information on 208 agricultural-related pollution abatement activities and regulations between federal, state, and local agencies with a special emphasis on creating opportunities for citizen groups and the public as a whole to be active participants in the program development and evolution.

#### 7.3.1.2 Designate the Counties as Management Agencies for all Areas except Inside City Limits

Because the Larimer-Weld area agricultural pollution abatement program is in a status that is in need of further testing, research and development and specific demonstration studies, it is inappropriate at this point in time to designate an active management agency whose role exists primarily for program implementation purposes. However, the role can be filled by the counties to oversee whatever demonstration efforts are possible. The role is simply one of overview and coordination during this phase. Pass-through of most responsibilities is possible. The program is not ready for areawide implementation, but rather is ready for and in need of further developmental work. At the completion of Phase 2 program activities, management agency assignments should be reevaluated. Discussion of those considerations are contained in subsequent portions of this report.

7.3.1.3 Designate the Soil Conservation Districts as Operating Agencies with Support from the Soil Conservation Service and the State Soil Conservation Board

At this stage the SCD's will be responsible for carrying out the demonstration efforts and liaison with selected farmers. Priorities for demonstration efforts should be officially designated by the management and planning agencies, but with the advice of the SCD's and the consultant charged with the effort. At the end of Phase 2 this task assignment should be reevaluated.

7.3.1.4 Designate the State Health Department/County Health Departments as the Regulatory Agencies

The regulatory role for this period of Phase 2 activities for the agricultural pollution abatement program will be somewhat different and much less than what will be required when Phase 3 of the program of implementation is reached. A more rigorous regulatory posture will be required at that time, particularly for the mandatory aspects of the program.

The regulatory role for this Phase 2 program will be one primarily of assistance to the planning agency in the areas of monitoring and testing to provide data and information to complete the testing and demonstration aspects of the Phase 2 program.

The mix of program responsibilities and activities between the State Health Department and the County Health Departments will need to evolve as the program develops, but it is recommended that on a gradual basis, to permit funding transfer, the County Health Departments begin to assume a larger role and that the State Health Department assumes a smaller role with the objective of providing as much regulatory control and structure at the local level as is practical.

7.3.1.5 Appoint Technical Advisory Committee to Advise on Technical Research

The purpose of the technical advisory committee is to provide broad spectrum guidance and advice to the planning agency regarding matters relating to the technical aspects of the program development, continued research, technical demonstrations, areas selected for demonstration, funding priorities and overall technical aspects of the Phase 2 agricultural pollution abatement program.

Representation on the technical advisory committee should cover virtually all areas of program involvement who have technical interests, skills, and capabilities. The committee should not be a closed group, and its meetings and structure should be open to all those who wish to attend. Membership on the committee



should be expanded where appropriate as special interests are identified that were missed in the initial structure.

The initial committee structure should contain representatives from the following groups:

- . Local Soil Conservation Districts
- . Federal Soil Conservation Service
- . Local Water Conservation Agencies
- . State Soil Conservation Board
- . Municipal Utility Engineer
- . County Engineer
- . Agricultural Operators
- . Local Environmental Interests
- . Federal EPA
- . Agriculture Stabilization and Conservation Service
- . Federal Agricultural Research Service
- . Other representative groups as this committee shall decide are necessary as time goes on.

7.3.1.6 Appoint a Policy Advisory Committee for Overview of Program Interrelationships and Policy Matters

The Policy Advisory Committee should be a group that advises the Council of Governments on agricultural pollution matters, the 208 Law and other issues dealing with external relationships such as activities at a policy level with other 208 planning agencies and non-designated areas, state agencies and federal activities.

This policy advisory committee will be working with the Council of Governments in its efforts to gain a meeting of the minds of those in federal, state, and local governmental agencies, and farmers involved in agricultural practices and pollution control. Of particular concern will be the advisability of applying BMP's in the Larimer-Weld region, their feasibility for implementation from a resource standpoint, and the necessary institutional and financial arrangements to assure cost-effective implementation. This committee is key to coordination, understanding, and involvement of the various levels of government. It will be an effort in which the research can be transferred most effectively into the policy thinking of the state and federal level, while at the same time keeping the local effort in tune with what is originating at these levels of governments.

The policy advisory committee, like the technical advisory committee, should be an open group that welcomes contributions and input from all interested persons and agencies, and it should expand its membership as the committee sees fit as the program evolves. In the beginning the initial membership should come from the following areas of interest:

- . Department of Natural Resources
  - Soil Conservation Board
  - Water Conservation Board
  - Division of Water Resources
- . State Department of Agriculture
  - Resources Analysis Group
- . Department of Health
  - Water Quality Control Division
- . Department of Local Affairs
  - Governors Coordinator for the 208 Program
- . Colorado State University
- . Environmental Protection Agency
- . Agricultural Operators
- . Cities
- . Counties
- . Agricultural Stabilization and Conservation Service (Federal)
- . Soil Conservation Services (Federal)
- . Any other representative agency that this committee should choose to add to the list

7.3.1.7 Continuing Planning, Research and Development Work, and Demonstration Studies Will be Done Under Planning Agency Direction Via Contracts with Three Key Parties

During Phase 2, continuing planning, research and development and demonstration activities, the relationship of permanent staff to fixed term consulting contracts that has proven effective during Phase 1 planning activities, should be continued. Consulting contracts under planning agency direction with firms possessing special skills to advance and confirm BMP technology will be required. Intergovernmental Personnel Act Contracts and intergovernmental personnel loans with the Federal Soil Conservation Service, similar to what now exists between Larimer-Weld Council of Governments and Federal Soil Conservation Service for Phase 1 activities, should be considered. Direct contracts with selected Soil Conservation

Districts will also be required, particularly in the demonstration phase of BMP installation and monitoring at the sub-basin level.

#### 7.3.1.8 Planning Agency Staff Should Not Need to Exceed Three People

During Phase 2, continued planning, research and development, and demonstration activities, the staff of the planning agency should not exceed three full-time employees, including all 208 activities, not just agriculture. Experience gained through the Phase 1 planning program suggests that the planning agency staff for Phase 2 should be made up as follows:

- . Program Director
- . Technician
- . Secretary

This level of staff to provide program direction, contract administration, and overall coordination with involved agencies and advisory groups should be sufficient to carry out Phase 2 program activities.

#### 7.3.1.9 Funding for Both Planning Agency Staff and Support Activities, Plus Costs of Contract Activities To Actually Do Planning, Research and Development and Demonstration Work To Be Funded By Federal and/or State Agencies

Program funding for the Phase 2 continued problem definition, planning, testing, research and development, and demonstration program should continue to be derived from the federal government with possible supplements from the state. Indications from the limited case studies conducted so far are that there may be cost savings to the agricultural industry from some of the BMP's as well as conservation of scarce resources. Demonstration of this matter through the Phase 2 planning period to farmers and state and local officials is critical to developing a beginning for the possibility for cost-sharing activities in the Phase 3 implementation program which is to follow. Where the BMP's are viewed as soil conservation methods, the farmers will support them; but if they are proposed for their water quality benefits, it will be difficult to justify them at this stage. An understanding of what benefits do accrue as a result of the program is critical in the evolution to a different form of funding. The completion of Phase 2 activities, however, of further problem definition and solution development should be funded by the creator of the program, the federal government.

#### 7.3.1.10 Second Phase Planning, Research and Development, and Demonstration Work To Be Completed Within a Three-Year Period

Phase 2 activities consist primarily of continued testing and

refinement of elements now under study, along with planning, research, and program development on program elements that have received minimum review to date, on-the-farm demonstration of the application of BMP's for water quality purposes, confirmation of the costs of the BMP's and measuring of the effectiveness in pollution abatement terms of the BMP's. This should be completed prior to going into a full-scale implementation program.

It is believed at this point that it will take approximately an additional year to complete required testing and research activities. It will take a second year to actually put into place on the farms over a whole subbasin the BMP's for water quality purposes that are thought to be effective in reducing agricultural pollutants. And it will require at least one year of run-off monitoring to confirm the results of a theoretical planning program that is yet to be in-field tested and field documented in a results-oriented mode.

It may be that the three-year time period is an inappropriate period for completing the research and development and program benefits confirmation to provide the setting for moving on into an implementation program. If that be the case, program implementation could begin at a different time period. The key issue, however, is that program implementation should not occur in an aggressive full-scale manner until Phase 2 planning, demonstration, and monitoring activities are complete, regardless of whether it is two, three, or four years. The concept of funding massive BMP implementation programs for water quality purposes prior to understanding the cost effectiveness and benefits of these programs as an end in itself is inappropriate and is not a part of the Larimer-Weld area 208 plan. Application of BMP's as part of conservation plans if money is made available through the Department of Agriculture or some other federal or state agency is recognized as desirable as long as the experimental nature of such applications is clearly understood by funder and user. False expectations can thus be avoided.

#### 7.3.1.11 Phase 3 Implementation, Work Program and Recommendations, To Be Developed by End of Phase 2 Planning Effort

One of the key responsibilities for the planning agency during the Phase 2 continued planning and demonstration period will be to end the Phase 2 time period with a detailed work program and activity recommendation package that will be a program guide for the initial implementation aspects of the Phase 3 implementation program.

The future work program activities and recommendations that will come at the end of the Phase 2 planning program will be the road map for guiding the initiation of Phase 3 activities. This work program will perform a function similar to that being performed by the initial 208 plan, namely setting the direction for the succeeding efforts.

### 7.3.2 Phase 3 Proposals

#### 7.3.2.1 Designate the Larimer-Weld Council of Governments As the Continuing Planning Agency

The responsibilities of the planning agency during Phase 3 activities are similar to those that it was assigned during Phase 2, but with a change in emphasis. The planning agency would continue to be the responsible party for:

- . The continued development and refinement of the area-wide planning program for pollution abatement;
- . The annual amending and updating of the 208 plan;
- . Coordination with the state and federal agencies involved with water quality or water resource programs;
- . Continued overview of the planning, testing, research and development, and demonstration activities;
- . Coordination with other 208 designated and non-designated programs;
- . Technical assistance to the management agencies;
- . Setting of regional priorities for expenditures in the region;
- . Monitoring and evaluation of the management agencies' implementation progress;
- . Coordination of the 208 agricultural abatement efforts with other pollution control efforts to assure proper sequence of actions and effectiveness of expenditures;
- . Integration of the agricultural efforts with the municipal and industrial efforts as well as the other non-point source efforts;
- . Providing an educational and informational forum for the various affected parties from local interest groups and citizens to state and federal agencies;
- . Assuming the maximum opportunities for farmers areawide to become aware of and utilize the appropriate BMP's that are being provided by the management agencies; and
- . Assist in the development of funding programs at a scale capable of achieving the plan goals.

At this juncture in the program, the planning agency should have pursued the creation of a River Basin agency as a regional arm of the Water Quality Control Commission. The purpose is

to provide a decentralized administration of the 208 program to a meaningful and logical subarea of the state. Composition of the basin governing board could primarily come from the basin thus increasing sensitivity to basin issues. The Water Quality Control Commission would remain as the policy setting body for the entire state. But much of the administrative detail could be delegated with the overview of actions and right of appeal remaining at the state level. The Phase 3 accomplishments will depend to some degree on a more responsive state organization than presently exists. The River Basin concept is a step in this direction.

#### 7.3.2.2 Adopt the Service Area Concept as Basis for Defining Management System Domains

The service area concept being proposed here is the same as the service area concept being proposed for non-agricultural pollution abatement activities. The concept is one of assigning management agency responsibilities to cities and towns to carry out the management agency responsibilities of the 208 plan in their service area.

The service area concept relies upon the powers of general purpose local governments for implementing the 208 plan in areas of urban activities. There is a need to apply the land use and police powers to achieve the plan goals. These powers at the local level rest only with general purpose governments, i.e., counties and unincorporated communities.

Because of the need to integrate all aspects of the 208 water quality activities, the continuing planning agency function for agricultural pollution abatement activities needs to work very closely with the agency that handles continuing planning activities for other forms of stream pollutants covered under the 208 program.

#### 7.3.2.3 Designate the Counties As the Management Agency For All Areas of Larimer-Weld Counties Except (1) City Limits of Incorporated Communities and (2) Service Area Boundaries of Qualified Cities and Towns

The task of the counties as the management agency for agricultural pollution abatement activities that will require careful handling will be that of interrelating agricultural pollution abatement activities in the rural areas with those of their urban partners (towns, cities) who are the management agencies for agricultural pollution abatement activities within their own city limits or service areas. It is not expected that this will be a major problem because of the limited amount of agricultural activities that exist within city limits or city service area boundaries, but there are some areas that fall into this category, and interrelationship between the county and the local government will need to be developed.

#### 7.3.2.4 Designate Cities and Towns As Management Agencies

Consistent with the service area concept, general purpose local governments will be designed as the program management agencies to be responsible for 208 program implementation in their area of domain.

In some small communities the management agency designation will apply only to that town or city's city limits, and all areas outside of that boundary will be assigned to the county. For other cities, particularly the larger communities, the community service area boundary will be the limitation for the area of domain rather than the city limits and the county will be assigned management responsibility beyond the service area boundary.

Intergovernmental contracts will be required between the county and cities where service areas are involved to assure the rational handling of the transition from present uses to ultimate uses.

The management agencies, in most cases, that apply to irrigated agriculture areas will be passing through directly to the operating agencies many of the management agency powers needed to carry out the 208 plan. Since there will only be a limited amount of irrigated agriculture that lies either within the city limits of towns or cities or within the service area limits of the qualified communities, the major portion of the pass-through activities will occur from the county. They will be passing through responsibilities as described in this plan to the operating agency who will actually carry out the hands-on activities of implementing BMP programs and working directly with the on-farm operators who will be actually carrying out the BMP's.

#### 7.3.2.5 Designate Soil Conservation Districts As Operating Agencies, With a Significant Support Role for the Federal Soil Conservation Service and the State Soil Conservation Board

Larimer-Weld Area Soil Conservation Districts will be assigned the responsibility of the operating agency in carrying out the task of agricultural pollution abatement in the irrigated agriculture areas of the two counties. Most of the powers, functions and responsibilities of the management agency in the area will be passed through by contract to the Soil Conservation Districts, to provide technical assistance for program implementation activities of BMP application for irrigated agriculture pollution abatement.

This recommendation evolved because of not only the nature of the agricultural industry itself, but because of the nature of the BMP program that will be utilized to abate pollution in irrigated agriculture areas. The BMP program that suggests a hands-on, on-

the-farm approach to pollution abatement fits in very nicely with the soil conservation programs that are now effectively being used in Larimer-Weld Counties. These programs generally revolve around a conservation plan concept. (See Section 3.3). This concept is an approach the Soil Conservation Districts, the farm operators, and their technical advisory partner, the Federal Soil Conservation Service, have been using effectively for conservation reasons for years. This program of utilizing conservation plans, initially developed for soil conservation and preservation purposes, can be expanded to include the concept of water pollution abatement activities. The purpose is to integrate the water pollution features of the BMP program and the soil conservation features that already exist as a part of the conservation plan.

Each farm unit will ultimately need to have a conservation plan that not only specifies soil conservation programs that apply for their specific setting, but also identifies and prescribes a phased program of implementation for appropriate BMP's that are found to be cost effective for water pollution abatement activities in each farm unit's specific setting.

#### 7.3.2.6 Designate the State Health Department/County Health Departments As the Regulatory Team

The regulatory function falls into two major subcategories, the first being the administration of the 402 permit program for all point discharges. This responsibility is now assigned by law to the State Water Quality Control Agency. As a practical matter, this means that the state, in conjunction with its operating partner and subordinate, the County Health Department, will be the responsible regulatory agency.

The second category of regulatory activities deals with various forms of land use and land management controls. It is because of these activities that general purpose local governments, who are virtually the sole possessors of these powers (the state has the powers but traditionally resists using them at the local level), need to be involved in the regulatory activities to carry out these requirements. Some of these activities may not be directly and totally controlled by the 208 program, even though they will have significant impact on the area's ability to achieve movement towards clean water goals. It is for this reason that the strong involvement of general purpose local governments is recommended. This second category of regulatory activities reinforces the concept that water quality activities are so deeply tied to many of the activities of the general purpose local governments that the marriage into the 208 program is an absolute necessity for implementation success. To attempt to deal with these activities in a vacuum of a water quality program alone is not responsible. The tie to general purpose local governments is the necessary link to assure program implementation. Regulator activities in this category that need to be considered are the following:



- . Zoning
- . Flood Plain Zoning and Regulations
- . Environmental Performance Standards
- . Subdivision Regulations
- . Planned Unit Developments
- . Housing Codes
- . Building Codes
- . Construction Permits
- . Hillside Development Requirements
- . Drainage Regulations
- . Grading Regulations
- . Soil Erosion and Sediment Control Ordinances
- . Solid Waste Control Ordinances
- . Septic Tank Ordinances
- . Taxation Policies

It is expected that, in time, various forces, such as the cost of facilities, the advancement of technology and the reduction of streams' abilities to absorb expanding amounts of pollutants, will place a greater emphasis on the utilization of, land use and land management regulatory techniques to reduce pollution quantities and characteristics rather than, or maybe in addition to, the standard regulatory powers that will be vested in the State and County Health Department team.

As with other institutional functions, the regulatory tie is a complex matter. It is really beyond the scope of any one level of government or agency to completely handle by itself. It is for this reason that even though the regulatory agency assignment is being placed with the State Health Department and the County Health Department team that the regulatory structure itself will need to incorporate into and make an integral part thereof, the powers of general purpose local governments to affect regulations that will play a significant role in abating pollutants.

The Water Quality Control Commission as the principal regulatory agency would continue to perform its function of setting state-wide water quality goals and policies, setting water quality control standards, designating stream classifications and setting

the standards for discharge permits. In order to improve local communication and facilitate administration of the state's wastewater control program, the concept of River Basin agencies has been proposed which would be created under the control and direction of the Water Quality Control Commission. These agencies would provide for the separation of policy and administration, as well as bringing the Water Quality Control program closer to the people, which is one of the basic goals of the program.

If the River Basin Agency was created, they would receive delegated responsibilities to administer water quality control policies and functions within the basin, i.e, stream classifications, review of local government regulations for individual disposal systems, coordination of priority requests within the basin for the various 208 agencies, and for review of the progress toward implementation of the basin 208 plan. District engineers from the state would be reassigned to the River Basin Agencies to provide staff. These agencies as the administrative and operational arm of the Water Quality Control Commission would provide an administrative agency in the field, geographically structured by river basin boundaries to administer the hands-on water quality task of the state. The task of the State Water Quality Control Division of the State Health Department would remain basically as it is, as the operational arm of the Water Quality Control Commission, and would provide staff overview for the river basin agencies.

County Health Departments, who would have the role of the monitoring and enforcement agency for the Health Department with regard to the wastewater discharges and stream quality, would have tasks expanded to cover laboratory testing and monitoring in the basins, as well as the tasks they now possess.

Cities and counties who would not actually be assigned regulatory tasks in the institutional structure would nevertheless play an important part in the successful implementation of the 208 plan because of their ability to apply land use controls and land management activities within their area. These powers would be brought to bear on the program, more as a function of management agency responsibility than as a regulatory agency task, but would nevertheless play a key function in the program.

#### 7.3.2.7 Appoint Policy Advisory Committee and Technical Advisory Committee to Guide the Planning Agency on Program Direction and Activities

The technical and policy advisory committees created in Phase 2 of the agricultural pollution abatement program would be left in place as advisory committees through Phase 3 of the 208 program. It is expected that through the three-year Phase 2 program there will be some changes in the membership structure that was originally recommended, and as the program moves from one of primarily planning and demonstration, to that of implementation, further alterations will be appropriate. It is, therefore, the intention of the plan section to accommodate those modifications as they occur through

time to alter the committee membership as necessary to deal with the tasks at hand. It is believed that an effective program nucleus is prescribed in the committee structure of the Phase 2 committee membership. That structure with modifications will serve effectively in Phase 3 committee structuring. Because the planning agency is composed of elected officials, that aspect of the law concerning the policy advisory committee appears moot.

#### 7.3.2.8 Program Staffing Will Be As Required By Each Separate Agency Once the Tasks Are Clarified

Since the implementation staffing is so directly a function of what the implementation program will be, and since that program is not clearly defined at this stage because the planning activities are not complete, it is impossible at this point to describe in detail what the staffing structure should be. The assumption at this point is that the staffing structure that evolves through the Phase 2 planning and demonstration activities will serve reasonably well as a starting point for the staff in Phase 3 implementation activities. From that point, it will need to be modified consistent with the task at hand, and with the responsibilities that are assigned to each agency.

#### 7.3.2.9 Program Funding Will Be On a Cost-Share Basis, With a Mix of Federal and/or State Funds Matched At Some Level By Local Agencies, and Program Beneficiaries

Program funding that was logically assigned as an area of responsibility of the program creator, the federal government, during the planning and demonstration phases (Phase 2) will presumably evolve in the implementation phases to the point where the concept of cost-sharing with local agencies and local benefactors will be introduced.

The belief is that, as the planning phases of the program are completed, and as we move into implementation activities for program elements that are cost effective, it will be possible to identify who the program benefactors are and attempt to make an equitable assignment in general terms to the benefiting groups. It is further expected that the water quality program will not only produce water quality benefits to our nation as a whole, but that benefits will be developed and demonstrated that accrue to local agencies and individuals. If the facts warrant and the program demonstrates, benefactors themselves would be candidates to provide a cost-shared portion of the program cost consistent with the benefits that accrue.

This cost-sharing concept, which is only a conceptual recommendation at this time, will need to be evaluated with great care as the program evolves from planning and demonstration to implementation. It will require a great deal of additional work by all members of the institutional team before the concept can evolve to a firm program with fixed numbers and details.

#### 7.3.2.10 Phase 3 Will Be Indeterminate In Time

Because the extent of the implementation task is undefined at this

stage and because funding sources and timing remain unclear, it is the assumption that Phase 3 implementation activities will be a continuing program, very much like the program now in place for facility grants to municipal agencies to expand and upgrade sewage treatment facilities. A recommendation on this consideration will be more appropriate at the end of Phase 2 activities.

#### 7.4 DETAILED DESCRIPTION OF INSTITUTIONAL STRUCTURE AND TASKS: MINIMUM LOCAL INVOLVEMENT ALTERNATIVE

##### 7.4.1 Phase 2 Proposals

##### 7.4.1.1 Appoint the State Soil Conservation Board As the Planning Agency and Management Agency

The primary responsibilities of the State Soil Conservation Board as the continuing planning and management agency will be coordination of the 208 program with other regional programs, liaison with the state and federal governments, leadership in the continuing planning, research and demonstration effort, technical assistance to other program participants and overall program guidance in dealing with the requirements of the law and the 208 plan; most importantly, setting priorities for the continuing planning, research and development and demonstration activities of Phase 2 of the program.

Other tasks that will be required of the State Soil Conservation Board as the continuing planning and management agency for the agricultural pollution abatement program are as follows:

- . The annual plan amendment, updating, and recertification as required by law will be the responsibility of the State Soil Conservation Board.
- . Overall program monitoring, evaluating and suggesting corrective actions to assure that the required aspects of the 208 plan are being carried out.
- . Assuring that the 208 pollution abatement activities required in the initial 208 plan are integrated in a meaningful way with other urban and rural pollution abatement activities of the area, such as land use, land use development controls, solid waste management, water resource planning, and air quality activities.
- . Making sure that the Larimer-Weld Area 208 agricultural pollution abatement program is properly integrated with the activities of other neighboring 208 programs in designated and nondesignated areas.
- . Provide a liaison for information on 208 agricultural-related pollution abatement activities and regulations between federal, state, and local agencies with a special emphasis on creating opportunities for citizen groups and the public as a whole to be active participants in

the program development and evolution.

- Coordinate with other state agencies who affect or are affected by the water quality program implementation (e.g., State Engineer, Water Conservation Board or the Water Quality Control Commission).

7.4.1.2 Designate the Soil Conservation Districts As the Operating Agencies With Support From the Soil Conservation Service.

At this stage, the Soil Conservation Districts will be responsible for carrying out the demonstration efforts and liaison with selected farmers. Priorities for demonstration efforts should be officially designated by the management and planning agencies, but with the advice of the Soil Conservation Districts and the consultant charged with the effort. At the end of Phase 2, this task assignment should be reevaluated.

7.4.1.3 Designate the State Health Department/County Health Departments As the Regulatory Agencies

The regulatory role for this period of Phase 2 activities for the agricultural pollution abatement program will be somewhat different and much less than what will be required when Phase 3 of the program of implementation is reached. A more rigorous regulatory posture will be required at that time, particularly for the mandatory aspects of the program.

The regulatory role for this Phase 2 program will be one primarily of assistance to the planning agency in the areas of monitoring and testing to provide data and information to complete the testing and demonstration aspects of the Phase 2 program.

The mix of program responsibilities and activities between the State Health Department and the County Health Departments will need to evolve as the program develops, but it is recommended that on a gradual basis, to permit funding transfer, the County Health Departments begin to assume a larger role and that the State Health Department assume a smaller role with the objective of providing as much regulatory control and structure at the local level as is practical.

7.4.1.4 Appoint a Technical Advisory Committee

The purpose of the technical advisory committee is to provide broad spectrum guidance and advice to the planning agency regarding matters relating to the technical aspects of the program development, continued research, technical demonstrations, funding priorities, and overall technical aspects of the Phase 2 agricultural pollution abatement program.

Representation on the technical advisory committee should cover

virtually all areas of program involvement who have technical interests, skills and capabilities. The committee should not be a closed group, and its meetings and structure should be open to all those who wish to come. Membership on the committee should be expanded where appropriate as special interests are identified that were missed in the initial structure.

The initial committee structure should contain representatives from the following groups:

- . Local Soil Conservation Districts
- . Local Agriculture Stabilization and Conservation Service
- . Federal Soil Conservation Service
- . Federal Agriculture Research Service
- . Local Water Conservation Agencies
- . Municipal Utility Engineer
- . County Engineer
- . Agricultural Operators
- . Environmental Interests
- . Federal EPA
- . Other representative groups as this committee shall decide are necessary as time goes on.

#### 7.4.1.5 Appoint Policy Advisory Committee

The Policy Advisory Committee should be a group that advises the State Soil Conservation Board on agricultural pollution matters, the 208 Law and other issues dealing with external relationships such as activities at a policy level with other 208 agencies and nondesignated areas, state agencies and federal activities.

This policy advisory committee will be working with the State Soil Conservation Board in its efforts to gain a meeting of the minds of those in federal, state, and local governmental agencies and farmers involved in agricultural practices and pollution control. Of particular concern will be the advisability of applying BMP's in the Larimer-Weld region, their feasibility for implementation from a resource standpoint, and the necessary institutional and financial arrangements to assure cost-effective implementation. This committee is key to coordination, understanding, and involvement of the various levels of government. It will be an effort in which the research can be transferred most effectively into the policy thinking of the state and federal level, while at the same time keeping the local effort in tune

with what is originating at these levels of government.

The policy advisory committee, like the technical advisory committee, should be an open group that welcomes contributions and input from all interested persons and agencies, and it should expand its membership as the committee sees fit as the program evolves. In the beginning, the initial membership on the committee should come from the following areas of interest:

- . Larimer-Weld Council of Governments
- . State Department of Agriculture
  - Resources Analysis Group
- . Department of Health
- . Department of Local Affairs
  - Governors Coordinator for the 208 Program
- . Colorado State University
- . Environmental Protection Agency
- . Agricultural Operators
- . Cities
- . Counties
- . Agriculture Research Service (Federal)
- . Soil Conservation Services (Federal)
- . Agriculture Stabilization and Conservation Service (Federal)
- . Any other representative agency that this committee should choose to add to the list

7.4.1.6 Second Phase Planning, Testing, Research and Development, and Demonstration Work Should Be Completed Within a Three-Year Period

Phase 2 activities consist primarily of continued testing and refinement of elements now under study, along with planning, research and program development on program elements that have received minimum review to date, on-the-farm demonstration of the application of BMP's for water quality purposes, confirmation of the costs of the BMP's, and measuring the effectiveness in pollution abatement terms of the BMP's. This should be completed prior to going into a full-scale implementation program.

It is believed at this point that it will take approximately an additional year to complete required testing and research activities. It will take a second year to actually put into place on the farms the BMP's for water quality purposes that are thought to be effective in reducing agricultural pollutants. And it will require at least one year of run-off monitoring to confirm the results of a theoretical planning program that is yet to be in-field tested and field documented in a results-oriented mode.

It may be that the three-year time period is an inappropriate period for completing the research and development and program benefits confirmation to provide the setting for moving on into an implementation program. If that be the case, program implementation should not occur in an aggressive, full-scale manner until Phase 2 planning, demonstration, and monitoring activities are complete, regardless of whether it is two, three, or four years. The concept of funding massive BMP implementation programs for water quality purposes prior to understanding the cost effectiveness and benefits of these programs is inappropriate and is not a part of the Larimer-Weld Area 208 plan. Limited application of BMP's as part of conservation plans if money is made available through the Department of Agriculture is recognized as desirable as long as the experimental nature of such applications is clearly understood by funder and user. False expectations can thus be avoided.

#### 7.4.1.7 Program Funding Should Be From Federal and/or State Agencies

Program funding for the Phase 2 continued problem definition, planning, testing, research and development, and demonstration program should continue to be derived from the federal government with possible supplements from the state. Indications from the limited case studies conducted so far are that there may be cost savings to the agricultural industry from some of the BMP's as well as conservation of scarce resources. Demonstration of this matter through the Phase 2 planning period to farmers and state and local officials is critical to developing a beginning for the possibility for cost-sharing activities in the Phase 3 implementation program which is to follow. Where the BMP's are viewed as soil conservation methods, the farmers will support them; but if they are proposed for their water quality benefits, it will be difficult to justify them at this stage. An understanding of what benefits do accrue as a result of the program is critical in the evolution to a different form of funding. The completion of Phase 2 activities, however, of further problem definition and solution development should be funded by the creator of the program, the federal government.

#### 7.4.1.8 Phase 3 Implementation, Work Program, and Recommendations, To Be Developed By End of Phase 2 Planning Effort

One of the key responsibilities for the planning agency during



the Phase 2 continued planning and demonstration period will be to end the Phase 2 time period with a detailed work program and activity recommendation package that will be a program guide for the initial implementation aspects of Phase 3 implementation work.

The future work program activities and recommendations that will come at the end of the Phase 2 planning program will be the road map for guiding the initiation of Phase 3 activities. This work program will perform a function similar to that being performed by the initial 208 plan, namely setting the direction for the succeeding efforts.

#### 7.4.2 Phase 3 Proposals

##### 7.4.2.1 Designate the State Soil Conservation Board As the Continuing Planning Agency

The responsibilities of the planning agency during Phase 3 activities are similar to those that it was assigned during Phase 2, but with a change in emphasis. The planning agency would continue to be the responsible party for:

- . The coordination with the Municipal and Industrial Planning Agency in the Larimer-Weld 208 area.
- . The continued development and refinement of the area-wide planning program for pollution abatement.
- . The annual amending and updating of the 208 plan.
- . Coordination with the state and federal agencies involved with water quality or water resource programs.
- . Continued overview of the planning, testing, research and development, and demonstration activities.
- . Coordination with other 208 designated and nondesignated programs.
- . Technical assistance to the management agencies.
- . Setting of regional priorities for expenditures in the region.
- . Monitoring and evaluation of the management agencies' implementation progress.
- . Coordination of the 208 agricultural abatement efforts with other pollution control efforts to assure proper sequence of actions and effectiveness of expenditures.
- . Integration of the agricultural efforts with the municipal and industrial efforts as well as the other non-point source efforts.

- . Providing an educational and informational forum for the various affected parties from local interest groups and citizens to state and federal agencies.
- . Assuming the maximum opportunities for farmers areawide to become aware of and utilize the appropriate BMP's which are being provided by the management agencies.
- . Assist in the development of funding programs at a scale capable of achieving the plan goals.
- . Coordination with other state agencies who have an interest in water quality (State Water Conservation Board, State Engineer, Department of Local Affairs, Water Quality Control Commission, etc.)

At this juncture in the program, the planning agency should pursue the creation of a River Basin agency as a required arm of the Water Quality Control Commission. The purpose is to provide a decentralized administration of the 208 program to a meaningful and logical subarea of the state. Composition of the basin governing board could primarily come from the basin, thus increasing sensitivity to basin issues. The Water Quality Control Commission would review as the policy setting body for the entire state. But much of the administrative detail could be delegated with the overview of actions and right of appeal remaining at the state level. The Phase 3 accomplishments will depend to some degree on a more responsive state organization. The River Basin Concept is a step in this direction.

#### 7.4.2.2 Adopt the Service Area Concept As Basis for Defining Management System Domains

The service area concept being proposed here is the same as the service area concept being proposed for nonagricultural pollution abatement activities. The concept is one of assigning management agency responsibility to cities and towns to carry out the management agency responsibilities of the 208 plan in their service areas.

The service area concept relies upon the powers of general purpose local governments for implementing the 208 plan in areas of urban activities. There is a need to apply the land use and police powers to achieve the plan goals. These powers at the local level rest only with general purpose governments, i.e., counties and incorporated communities.

Because of the need to integrate all aspects of 208 water quality activities, the continuing planning agency function for agricultural pollution abatement activities needs to work very closely with the agency that handles continuing planning activities for other forms of stream pollutants covered under the 208 plan.

7.4.2.3 Designate the State Soil Conservation Board As the Management Agency for All of Larimer-Weld Counties Except (1) Inside City Limits of Incorporated Communities and (2) Service Area Boundaries of Qualified Cities and Towns

The State Soil Conservation Board does not possess all of the institutional powers and capabilities that are required under the law, nor do they possess some of the powers and capabilities that will be necessary to carry out the agricultural pollution abatement program. The principal powers that are missing are land use and land management powers (the police powers). The State Soil Conservation Board can exert influence with these powers either through intergovernmental contracts with those local agencies that possess these powers (cities and counties) or the state can exert them and delegate them to the State Soil Conservation Board. This is highly unlikely. State zoning is most likely to be delegated to a state land use agency of some sort.

It is assumed that while the program is evolving through the Phase 2 period, which is primarily a testing period, the issue of where and how to develop the additional powers and capabilities for the State Soil Conservation Board as a management agency will be resolved.

While the State Soil Conservation Board possesses inadequate powers and perspective at the present time for management agency tasks, it does possess, with only minor modification, the capabilities to carry out the task of the planning agency, which it is also assigned in this insitutional alternative. It could be, as the program evolves through Phase 2, where management agency assignments are not required for agricultural pollution abatement activities, that a reassessment of the decision to assign management agency responsibility to the State Soil Conservation Board for Phase 3 will occur. If it was to be decided at a later date that the State Soil Conservation Board was to remain as the planning agency for agricultural pollution abatement activities, but not to be assigned the task of management agency, then the need for legislative changes to the State Soil Conservation Board or complex intergovernment contract between the State Soil Conservation Board and other agencies might not be necessary. This scenario might occur if the counties decide during Phase 2 that they would be willing to assume the management agency tasks. This would be a desirable decision.

The other task of the State Soil Conservation Board as the management agency for agricultural pollution abatement activities that will require careful handling will be that of interrelating agricultural pollution abatement activities in the rural areas with those of their urban partners (towns, cities) who are the management agencies for agricultural pollution abatement activities within their own city limits or service areas. It is not expected

that this will be a major problem because of the limited amount of agricultural activities that exist within city limits or city service area boundaries, but there are some areas that fall in this category and interrelationship between the State Soil Conservation Board and the local governments will need to be developed.

#### 7.4.2.4 Designate Cities and Towns as Management Agencies

Consistent with the service area concept, general purpose local governments will be designated as the program management agencies to be responsible for 208 program implementation in their area of domain.

In some small communities, the management agency designation will apply only to that town or city's city limits, and all areas outside of that boundary will be assigned to the State Soil Conservation Board. In other cities, particularly in larger communities, the community service area boundary will be the limitation for designation for area of domain rather than city limits and the State Soil Conservation Board will be assigned management responsibility beyond the service area boundary.

Intergovernmental contracts will be required between the county and cities where service areas are included to assure the rational handling of the transition from present uses to ultimate uses.

The management agencies, in most cases, that apply to irrigated agriculture areas will be passing through directly to the operating agency many of the management agency powers needed to carry out the 208 plan. Since there will only be a limited amount of irrigated agriculture that lies either within the city limits of towns or cities or within the service area limits of the qualified communities, the major portion of the pass-through activities will occur from the State Soil Conservation Board, which is the management agency, in the outlying areas of the county. They will be passing through responsibilities as described in this plan to the operating agency who will actually carry out the hands-on activities of implementing BMP programs and working directly with the on-farm operators who will be actually carrying out the BMP's.

#### 7.4.2.5 Designate Soil Conservation Districts As Operating Agencies, With a Significant Advisory Role for the Federal Soil Conservation Service

Larimer-Weld Area Soil Conservation District will be assigned the responsibility of the operating agency in carrying out the task of agricultural pollution abatement in the irrigated agriculture areas of the two counties. Most of the powers, functions, and responsibilities of the management agency in the area will be passed through by contract to the Soil Conservation Districts to provide technical assistance for program implementation activities of BMP application for irrigated agriculture pollution abatement.

This recommendation evolved because of not only the nature of the agricultural industry itself, but because of the nature of the BMP program that will be utilized to abate pollution in irrigated agriculture areas. The BMP program that suggests a hands-on, on-the-farm approach to pollution abatement fits in very nicely with the Soil Conservation programs that are now effectively being used in Larimer-Weld Counties. These programs generally revolve around a conservation plan (see Appendix) concept. This concept is an approach the Soil Conservation Districts, the farm operators, and their technical advisory partner, the Federal Soil Conservation Service, have been using effectively for soil conservation reasons for years. This program of utilizing conservation plans initially developed for soil conservation and preservation purposes can be expanded to include the concept of the water pollution abatement activities that are being developed via the BMP program. The purpose is to integrate the water pollution features of the BMP program into the soil conservation features that already exist as a part of the conservation plan.

Each farm unit will ultimately need to have a conservation plan that not only specifies soil conservation programs that apply for their specific setting, but also identifies and prescribes a phased program of implementation for appropriate BMP's that are found to be cost effective for water pollution abatement activities in each farm unit's specific setting.

#### 7.4.2.6 Designate State Health Department/County Health Departments as the Regulatory Team

The regulatory function falls into two major subcategories, the first being the administration of the 402 permit program for all point discharges. This responsibility is now assigned by law to the State Water Quality Control Agency. As a practical matter, this means that the State, in conjunction with its operating partner and subordinate, the County Health Department, will be the responsible regulatory agency.

The second category of regulatory activities deals with various forms of land use and land management controls. It is because of these activities that general purpose local governments, who are virtually the sole possessors of these powers (the state has them, but traditionally resists using them at the local level) need to be involved in the regulatory activities to carry out these requirements. Some of these activities may not be directly and totally controlled by the 208 program, even though they will have significant impact on the area's ability to achieve movement towards clean water goals. It is for this reason that the strong involvement of general purpose local governments is recommended. This second category of regulatory activities reinforces the concept that water quality activities are so deeply tied to many of the activities of the general purpose local governments that the marriage into the 208 program is an absolute necessity for implementation success. To attempt to deal with these activities in the vacuum of a water quality program alone is not

responsible. The tie to general purpose local governments is the necessary link to assure program implementation. Regulator activities in this category that need to be considered are the following:

- . Zoning
- . Flood Plain Zoning and Regulations
- . Environmental Performance Standards
- . Subdivision Regulations
- . Planned Unit Developments
- . Housing Codes
- . Building Codes
- . Construction Permits
- . Hillside Development Requirements
- . Drainage Regulations
- . Grading Regulations
- . Soil Erosion and Sediment Control Ordinances
- . Solid Waste Control Ordinances
- . Septic Tank Ordinances
- . Taxation Policies
- . Public Investment Policies

It is expected that in time various forces, such as the cost of facilities, the advancement of technology, and the reduction of streams' abilities to absorb expanding amounts of pollutants, will place a greater emphasis on the utilization of land use and land use management regulatory techniques to reduce pollution quantities and characteristics rather than, or maybe in addition to, the standard regulatory powers that will be vested in the State and County Health Departments.

As with other institutional functions, the regulatory tie is a complex matter. It is really beyond the scope of any one level of government or agency to completely handle by itself. It is for this reason that even though the regulatory agency assignment is being placed with the State Health Department and the County Health Department team that the regulatory structure itself will need to incorporate into and make an integral part thereof, the powers of general purpose local governments to

effect regulation that will play a significant role in abating pollutants.

The Water Quality Control Commission as the principal regulatory agency would continue to perform its function of setting state-wide water quality goals and policies, setting water quality control standards, designating stream classifications and setting the standards for discharge permits. In order to improve local communication and facilitate administration of the state's wastewater control program, the concept of River Basin agencies has been proposed which would be created under the control and direction of the Water Quality Control Commission. These agencies would provide for the separation of policy and administration, as well as bringing the Water Quality Control program closer to the people, which is one of the basic goals of the program.

If the River Basin Agency was created, they would receive delegated responsibilities to administer water quality control policies and functions within the basin, i.e., stream classifications, review of point source permit requests, review of underground discharges, review of local government regulations for individual disposal systems, coordination of priority requests within the basin for the various 208 agencies and for review of the progress toward implementation of the basin 208 plan. District engineers from the state would be reassigned to the River Basin Agencies to provide staff. These agencies as the administrative and operational arm of the Water Quality Control Commission would provide an administrative agency in the field, geographically structured by river basin boundaries to administer the hands-on water quality task of the state. The task of the State Water Quality Control Division of the State Health Department would remain basically as it is, as the operational arm of the Water Quality Control Commission, and would provide staff overview for the river basin agencies.

County Health Departments, who would have the role of the monitoring and enforcement agency for the Health Department with regard to the wastewater discharges and stream quality, would have tasks expanded to cover laboratory testing and monitoring in the basins, as well as the tasks they now possess.

Cities and counties who would not actually be assigned regulatory tasks in the institutional structure would nevertheless play an important part in the successful implementation of the 208 plan because of their ability to apply land use controls and land management activities within their area. These powers would be brought to bear on the program, more as a function of management agency responsibility than as a regulatory agency task, but would nevertheless play a key function in the program.

7.4.2.7 Appoint a Policy Advisory Committee and a Technical Advisory Committee To Advise the Planning Agency on Program Direction and Activities

The technical and policy advisory committees created in Phase

2 of the agricultural pollution abatement program would be left in place as advisory committees through Phase 2 of the 208 program. It is expected that through the three-year Phase 2 program there will be some changes in the membership structure that was originally recommended, and as the program moves from one of primarily planning and demonstration to that of implementation, further alterations will be appropriate. It is, therefore, the intention of this plan section to accommodate those modifications as they occur through time to alter the committee membership as necessary to deal with the tasks at hand. It is believed that an effective program nucleus is prescribed in the committee structure of the Phase 2 committee membership. That structure, with modifications, will serve effectively in Phase 3 committee structuring. In particular, greater representation of local elected officials will be necessary to meet the letter of the law.

#### 7.4.2.8 Program Staffing Will Be As Required By Each Separate Agency Once the Tasks Are Clarified

Since the implementation staffing is so directly a function of what the implementation program will be, and since that program is not clearly defined at this stage because the planning activities are not complete, it is impossible at this point to describe in detail what the staffing structure should be. The assumption at this point is that the staffing structure that evolves through the Phase 2 planning and demonstration activities will serve reasonably well as a starting point for the staff in Phase 3 implementation activities. From that point, it will need to be modified consistent with the task at hand, and with the responsibilities that are assigned to each agency.

#### 7.4.2.9 Program Funding Will Be on a Cost-Share Basis, With a Mix of Federal and/or State Funds Matched At Some Level By Local Agencies, and Program Beneficiaries

Program funding that was logically assigned as an area responsibility of the program creator, the federal government, during the planning and demonstration phases (Phase 2) will presumably evolve in the implementation phases to the point where the concept of cost-sharing with local agencies and local beneficiaries will be introduced.

The belief is that, as the planning phases of the program are complete and as we move into implementation activities for program elements that are cost-effective, it will be possible to identify who the program beneficiaries are and attempt to make an equitable assignment in general terms to the benefiting groups. It is further expected that the water quality program will not only produce water quality benefits to our nation as a whole, but that benefits will be developed and demonstrated that accrue to local agencies and individuals. If the facts warrant and the program demonstrates, beneficiaries themselves would be candidates to provide a cost-shared portion of the program consistent with the benefits that accrue.



This cost-sharing concept, which is only a conceptual recommendation at this time, will need to be evaluated with great care as the program evolves from planning and demonstration to implementation. It will require a great deal of additional work by all members of the institutional team before the concepts can evolve to a firm program with fixed numbers and details.

#### 7.4.2.10 Phase 3 Will Be Indeterminate In Time

Because the extent of the implementation task is undefined at this stage, and because funding sources and timing remain unclear, it is the assumption that Phase 3 implementation activities will be a continuing program, very much like the program now in place for facility grants to municipal agencies to expand and upgrade sewage treatment facilities. A recommendation on this consideration will be more appropriate at the end of Phase 2 activities.

APPENDIX A

The 208 Plan Amendment Process

## THE 208 PLAN AMENDMENT PROCESS

Federal law requires that 208 plans be updated annually and recertified through the same process that the original 208 plan utilized. That process includes, in addition to staff, advisory committees, involved agencies and citizen input, the following three formal steps:

1. Approval and certification by the governing board of the planning agency (i.e., probably Larimer-Weld C.O.G.).
2. Approval and certification by the State of Colorado. The Governor makes the decision after receiving recommendations from the Water Quality Control Commission on technical aspects of the plan and from his staff and advisory committees on other policy aspects of each 208 plan.
3. The Federal Government through its regional E.P.A. Office decides upon final plan approval after receiving the recommendation from the Governor.

This process must be repeated on an annual basis to stay in conformance with the renewal law.

The Areawide Continuing Planning Agency has the responsibility of seeing that the process is initiated in a timely fashion at the regional level. Whatever effort is required in both draftings, the revisions for consideration by the local decision-making bodies, staying involved with the review and approval process, and to assure clear understanding of what is being proposed is the planning agency's responsibility.

The planning agency is not only responsible to see that the logistics of annual plan update are performed, but they are also responsible to coordinate and approve, if appropriate, any plan modifications requested by the management agencies in the planning region. Amendments or modifications may result from changing regional values or new opportunities. Plan

modification requests may come from other sources that would require planning agency action but they would first have to be reviewed by the management agency responsible for the specific geographic area identified in the institutional portion of the 208 plan. The planning agency would coordinate between management areas while each management agency would be responsible for coordination and weighing of impacts within their own management area.

As a guide to understanding how the plan amendment process would work, a multi-phased sequence of events is outlined in the following pages as a suggested framework for the first year's plan recertification process. Modifications to the procedure are obviously possible. The system should remain flexible until all of the "bugs" can be worked out. The annual update process will be more difficult in the first few years, while some pieces of the overall 208 program are being gradually fit into place as a part of the plan. This includes many plan elements that are not now in the implementation portion of the plan because planning activities are still incomplete (e.g., the agricultural or non-point urban pollution activities). In later years the plan modification process will become a bit more mechanical. The planning agency should always expect the process to attract a lot of attention because of the issues of (1) setting priorities for funding among the region's many agencies, and (2) because of plan amendment requirements before any new discharge permit can be approved may focus attention on regional issues.

Plan amendment considerations may also be driven by considerations from the regulatory agency. As the program begins to evolve and mature, the need to tighten regulatory requirements in response to mandatory implementation aspects of the law could well dictate plan modifications to force compliance.

The ultimate point of the plan modification process is:

208 plan update is an annual process that is the responsibility of the planning agency. Whether the specific need for plan modification comes

from a management agency, the regulatory agency, the plan itself, changes in federal law, legal action, citizens groups, etc., the planning agency will be required to deal with these issues in a rational and timely fashion and see that the recertification process is ultimately consummated.

To guide the first year's plan review and updating process, the following sequence of events is suggested:

1. At a point in time not later than the end of the sixth month of the current plan year, the planning agency should notify in writing all management and regulatory agencies that the plan review and recertification process has begun. The notification letter should raise any issues or plan modification needs that the planning agency is aware of and ask each agency, as appropriate, to consider such issues along with any issues they choose to raise from their own point of view. Precisely what is open to modification should be identified (e.g., service area boundaries, discharge permits, funding priorities, implementation techniques, land use plan, technical aspects, regulatory concerns, etc.). The plan will be documented in report form, all of which is subject to reevaluation on key issues and updates made possible because of new data availability or changes in the law should be finished by the planning agency and the management agencies. (See Exhibit 1 attached.)

The planning agency should include in its notification, particularly to the management agencies, a summary report of the status of the current year's facility priority and grant funding requests to the State/ E.P.A. as an indication of how the year's funding requests have progressed and therefore, any considerations appropriate that might guide next year's funding priority and grant request list.

2. At a point in time not later than the end of the eighth month of the current plan year, the management agencies shall submit to the planning agency their requests for next year's plan modifications along with their funding requests and priority lists for all agencies within their management agency (M.A.).

Each M.A. will have the responsibility of seeing to it that the operating agencies within their M.A. boundaries are given ample opportunity to develop requests for their facility planning. The M.A. will then have the task of coordinating the operating agency requests within their boundaries along with the needs of the M.A. itself, reviewing the requests and explaining to the operating agencies the recommendations they will make to the planning agency. A composite package that represents all of the concerns of the M.A., funding priorities and recommendations for plan modifications should be submitted to the planning agency for review and consideration.

3. At a point in time not later than the end of the eighth month of the current plan year, the regulatory agency shall submit to the planning agency its requests for plan modifications for the coming year.

Their requests should be based upon the regulatory experiences of the past year and their perception of the regulatory and general program needs for the upcoming year.

4. At a point in time not later than the tenth month of the current plan year, the planning agency shall complete its staff and advisory committee review of all plan amendment requests including grant and priority listings and make written recommendations in suitable form to meet plan amendment requirements to the planning agencies' governing boards. Prior to this submittal, joint meetings with the management agencies should be held to achieve understanding, if not consensus.

5. At a point in time not later than the eleventh months of the current plan year, the planning agency governing board shall hold a public hearing to consider all plan amendment requests and considerations.
6. At a point in time not later than the end of the twelfth month of the current plan year, the planning agency governing board shall adopt and recertify a 208 plan for the next year and submit it to the State for review and adoption.

See Table 1 for a flow chart of this plan amendment process.

EXHIBIT 1

(Planning Agency Letterhead)

NOTIFICATION OF BEGINNING OF  
ANNUAL PLAN AMENDMENT PROCESS

Addressed to:

- (1) All Management Agencies
- (2) Regulatory Agencies
- (3) Other Concerned Agencies  
and Groups

Please be advised that the Larimer-Weld 208 plan amendment and recertification process is now underway.

The enclosed plan amendment calendar describes the key events and time deadlines of the process. Your particular attention is called to the deadline for submittal of plan amendment requests. This year that deadline is \_\_\_\_\_, 1979.

We will be in further personal contact with all management and regulatory agencies to assure full coordination of plan amendment requests.

Further notifications will be sent out when the final dates for advisory committee review and formal plan adoption public hearings are set.

Please contact this office if further information is needed on any aspect of the plan amendment process.

Respectfully,

208 Planning Agency Director  
Larimer-Weld Council of Governments

Enclosure





## APPENDIX B

### DETAILS OF RELATIONSHIPS BETWEEN MANAGEMENT AGENCY AND OPERATIONS AGENCY FOR PHASE II AGRICULTURAL POLLUTION IMPLEMENTATION ACTIVITIES

A good relationship between Larimer and Weld Counties as the Management Agencies and the local Soil Conservation Districts of the two counties as Operation Agencies is critical. The success or failure of Phase II implementation activities will depend in a significant way on how the activities of these two key parties function. Others have important roles, but none will play a role any more important than that of the implementation team.

The Soil Conservation Districts as the Operation Agencies will not only play the role of the "hands on" people who actually see that appropriate BMP's get put in place in the field in a proper program sequence, but they also will be involved in a significant advisory role to the Planning Agency who has overall responsibility for putting together the total pollution abatement program for the area.

The Counties as Management Agencies for Phase II of the Agricultural Pollution Abatement Program will have direct policy involvement. The bulk of the detailed program activities, however, will be developed by the Planning Agency staff and incorporated into the intergovernmental agreement between the counties and the Soil Conservation Districts. This agreement will in effect "pass through" (see pp. 71 and 72 for other details) many of the Management Agency tasks to the Operations Agencies (Soil Conservation Districts) to implement the program. During Phase II of the implementation program, it is expected that the Planning Agency staff will function also as staff for the Management Agency for this specific R&D program for agriculture.

The intergovernmental agreement between the Management Agencies and the Soil Conservation Districts will spell out in detail what is expected of each party and how the implementation program is to be carried out. Items such as assignment of specific responsibilities, financing, timetables, reporting, and monitoring mechanisms will all be spelled out in the agreement. Included also in the agreement will be general directions from the Planning Agency that describes the BMP selection and priority processes that should be followed. This direction results from the technical work done to date under the current 208 program. Specific care will be exercised in the agreement to recognize the research and demonstration aspects of the Phase II implementation program so that adequate latitude is left for the operating team to adjust and modify their activities in a reasonable way as the program evolves. This is a learning phase. The agreement that guides this activity must be cognizant of the special requirements that might arise as an R&D and demonstration program evolves.

The Soil Conservation Districts (Operation Agencies) must be able to negotiate with various farmers within the subbasins to find ones who are willing and capable of participating. Having selected the farms to demonstrate and monitor the BMP's, the Soil Conservation Districts might negotiate for construction of BMP's if that is integral. They will monitor and report results to the management agency and planning agency. They will be asked to identify issues (technical, legal, political, and financial). In essence, they are the implementors. They must have flexibility to operate.

The Management Agency at this stage is in an education mode. It provides an opportunity for the county commissioners to be made aware of what is involved without having to commit staff or budget. They are fed information from the Planning Agency who should be responsible for developing the program and compiling the results and from the Operating Agencies who are actually carrying out the effort. The Management Agency has control over the Planning Agency by virtue of the County Commissioner's role on the COG Governing Board.

The Management Agencies also have control over the Operating Agencies by virtue of the pass-through concept. While having control they use the existing developed expertise of the entire 208 Implementation Team to design and carry out the program and can await the results from Phase II in determining whether they see a need to change this approach in Phase III.