

# HOHOKAM RESOURCE CONSERVATION & DEVELOPMENT PROJECT

## BEARDSLEY FARM IRRIGATION MEASURE

### RC&D MEASURE PLAN

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#### SPONSORED BY:

MARICOPA COUNTY MUNICIPAL  
WATER CONSERVATION DISTRICT NO. 1  
AND  
AGUA FRIA - NEW RIVER NATURAL  
RESOURCE CONSERVATION DISTRICT

HOHOKAM  
RC&D



A640.905

DEPARTMENT OF AGRICULTURE AND OTHER COOPERATING AGENCIES  
PHOENIX, ARIZONA

BEARDSLEY FARM IRRIGATION

MEASURE

RC&D MEASURE PLAN

MARICOPA COUNTY, ARIZONA

Sponsored by  
Maricopa County Municipal Water Conservation  
District No. 1  
and  
Agua Fria - New River Natural Resource  
Conservation District

Prepared with Assistance from  
U.S. Department of Agriculture  
Soil Conservation Service  
Phoenix, Arizona

June, 1977

Prepared under the Authority of Section 102 of the  
Food and Agriculture Act of 1962 (Public Law 87-703)  
and of the Soil Conservation Act of April 27, 1935,  
(16 U.S.C. 590a-f).

## PLANNING AREA AND RESOURCES

### The Planning Area

The measure area is located in north central Maricopa County approximately 12 miles southwest of Lake Pleasant in south-central Arizona. It is approximately 25 miles northwest of the rapidly expanding Phoenix metropolitan area. The measure area encompasses approximately 33,700 acres and is located in the north-central portion of the Hohokam Resource Conservation and Development Project. (See Figure 2)

The Beardsley Irrigation Canal extends 33 miles from Lake Pleasant through the Maricopa County Municipal Water Conservation District No. 1, commonly called the Maricopa Water District (See Figure 1). The Maricopa Water District is bounded on the north by the Hieroglyphic Mountains, on the west by the White Tank Mountains, and on the east by the Agua Fria River. The southern boundary is approximately 5 miles north of the Gila River. There are no cities within the Maricopa Water District although several very progressive communities are located nearby. The nationally known retirement community, Sun City, lies east of the Agua Fria River and the Maricopa Water District. Luke Air Force Base and the community of Litchfield Park are within a 10-mile radius of the District. (See Location Map and Measure Site Maps). Within the

District and the measure area, there are approximately 30,960 acres of intensively farmed, irrigated cropland served by the Beardsley Irrigation Canal, with the principal crops being alfalfa, cotton, grain, vegetable and specialty crops. Because of lack of water, approximately 30 percent of the cropland is idle during any one growing season.

The Maricopa Water District is a highly productive area farmed by very knowledgeable farmers. It is important in furnishing farm employment and agricultural products for people in Arizona. Irrigation enterprises should continue for an extended period based on A Report Upon West Central Maricopa County by the Maricopa County Planning and Zoning Department.

The climate of the measure area is dry and typical of the flat desert valley of central Arizona. The climatic conditions of Litchfield Park are representative of the District. The mean annual precipitation is 8 inches, although a record 2.71 inches of precipitation occurred on one day in September 1925. The summers are hot with a mean maximum temperature for July of 106°. The winters are mild with a mean maximum temperature for January of 66°. The record high and low temperatures are 119° in July 1958 and 16° in January 1950.

There are two separate rainfall seasons. The first occurs during the winter from November to March, when the area is subject

to storms from the Pacific Ocean. The second occurs in July, August, and part of September when the area has widespread thunderstorm activity associated with moist air moving in from the Gulf of Mexico.

The measure area lies within the Sonoran Desert section of the Basin and Range Province. This desert section slopes toward the south and is characterized by a broad, gently sloping alluvial valley. The alluvial fill consists primarily of poorly consolidated clay, silt, sand, gravel, and caliche. The thickness of the fill ranges from thousands of feet to nearly zero. The principal ground water supply is contained in the coarse, more permeable beds of alluvial fill.

The measure area, located at an average elevation of 1030 feet (MSL), lies in a flat irrigated desert valley. Due to the low annual precipitation, supplemental irrigation is required for crop production. The sources of irrigation water are individual wells maintained by the Maricopa Water District and the Agua Fria River which drains most of the Hieroglyphic Mountains, the Bradshaw Mountains, Black Hills, Hutch Mesa and Cook's Mesa to the north of the Maricopa Water District. Another potential source of irrigation water is the Granite Reef Aqueduct (part of the Central Arizona Project ) which will be located approximately 5 miles north of the northern boundary of the Maricopa Water District.

The Maricopa Water District has applied for Central Arizona Project water. The allocations have not been established as of this date.

The Waddell Dam is constructed across the Agua Fria River just as it leaves the Hieroglyphic Mountains. Lake Pleasant which is formed by this dam, is located 12 miles northeast of the Maricopa Water District. This lake provides irrigation water to the 30,960 acres of irrigated cropland benefited by this measure.

Water is transported from Lake Pleasant to the Maricopa Water District by the Beardsley Canal. The canal flows southwest from Lake Pleasant through gravelly, sandy soils for approximately 15 miles. This 15-mile reach was lined when the project was built in 1933. From this point, it flows through gently sloping to nearly level, loamy and sandy loam soils for the remaining 18 miles. An additional 8.3 miles of the canal has been lined in prior years; 9.7 miles remain to be lined.

Twenty-three of the 25 landowners identified within the Maricopa Water District are cooperators with the Agua Fria-New River Natural Resource Conservation District (NRCD). Approximately 93 percent of the irrigated land under cooperative agreement is covered by conservation plans which emphasize efficient water use through irrigation water management practices.

### Evaluation of Resource Capabilities

The two main categories of soils within the measure area are recent alluvium or old alluvium. The recent alluvium soils include the Gilman-Estrella-Avondale, Antho-Valencia, and Carrizo-Brios-Vint associations. These are nearly level to gently sloping sandy loam soils in valley plains, alluvial fans and stream channels. Soils developed from old alluvium include the Rillito-Gunsight-Pinal, Mohall-Laveen, Ebon-Pinamt-Tremant and Casa Grande-Harqua associations. Soils in these associations are found on old valley plains and alluvial fans.

The National Park Service and the State Historical Preservation Office have been notified of the project. The State Historical Preservation Officer has provided a list of known archaeological sites with their locations to SCS. The locations have been plotted on a map and the location of the nearest site is 0.6 miles away from the measure construction site. Based on the above information, there are no known historical, archaeological or cultural values that will be affected by the proposed measure. The National Park Service and the State Historical Preservation Officer will be notified if any previously unidentified evidence of cultural values are discovered during detailed investigations or construction. The procedures in Public Law 93-291, May 24, 1974, will be followed.

Since this is a federally assisted local project, there will be no change in the existing responsibilities of any federal agency under Executive Order 11593 with respect to archaeological and historical resources.

The U.S. Fish and Wildlife Service has compiled a list of endangered and threatened wildlife as published in the Federal Register, September 26, 1975. Using this list as reference, there are no known endangered or threatened species of wildlife that will be affected by the proposed measure.

Should any plants listed on the Department of Interior's list of Endangered and Threatened Wildlife and Plants be found during construction, the salvage, removal and preservation of these plants will be conducted in accordance with Arizona State Law.

#### PLANNING OBJECTIVES AND ALTERNATIVES

##### Sponsor Objectives

The primary objective of the sponsors is to improve the efficiency of the delivery system by reducing seepage losses in the unlined section of the canal. Also, a requirement of obtaining water from the Central Arizona Project is that the distribution system be lined.

This proposed measure would meet the objectives of the Hohokam RC&D Program of Action to control seepage in canals,

laterals, ditches and ponds by lining them with concrete or other relatively impervious materials.

#### Alternative Planning Considerations

Several alternatives were considered to meet the sponsors' objectives to reduce seepage losses in the unlined section of the canal. The alternatives considered were (1) no action, (2) plan to emphasize environmental quality, and (3) plan to maximize national economic development.

#### No Action

This alternative assumes no planned project. Seepage losses occurring in the unlined section of the canal would continue. This water would be lost from the system. To provide the needed water supply, this volume will continue to be pumped from underground aquifers.

#### Environmental Quality Plan

This plan would consist of land treatment only with irrigation land leveling, irrigation ditch lining, conservation cropping system and irrigation water management being the primary practices. These practices will be utilized to reduce the amount of water applied to cropland, reduce subtle erosion on cropland, reduce sedimentation in tailwater recovery systems and/or lower lying land, and reduce chemical pollutants transported by water from point of application to other areas. This alternate plan did not satisfy all of the sponsors' objectives and was rejected.

National Economic Development Plan

This plan would consist of elements to improve the efficiency of the farm irrigation system by reducing seepage losses. These elements would include concrete lining 9.7 miles of existing canal, floodproofing by installing waterways, pipe, concrete inlet structures, and conservation land treatment. This alternative was selected for implementation with an estimated installation cost of \$1,412,500.

SELECTED PLAN

NATIONAL ECONOMIC DEVELOPMENT ACCOUNT

Beardsley Farm Irrigation Measure

RC&D Measure Plan

<u>Components</u>	<u>Measures of Effects</u> <sup>1/</sup>
Beneficial effects:	
A. The value to users of increased output of goods and services.	
1. Farm Irrigation	\$308,300
Total beneficial effects:	\$308,300
Adverse effects:	
A. The value of resources required for a plan.	
1. Farm Irrigation	
Installation	\$ 92,560
Administration	7,580
Operation and Maintenance	<u>9,000</u>
Total adverse effects:	\$109,140 <sup>2/</sup>
Net beneficial effects:	\$199,160

1/ Average annual

2/ Price base 1977 amortized for 25 years at 6 3/8 percent interest.

Selected Plan

ENVIRONMENTAL QUALITY ACCOUNT

Beardsley Farm Irrigation Measure

RC&D Measure Plan

Components

Measures of Effects

Beneficial and adverse effects:

A. Areas of natural beauty

1. Reduce unsightly oil-sprayed vegetation along canal banks.
2. Change visual quality of the landscape appearance by installing approximately 9.7 miles of concrete-lined canal.

B. Quality consideration of water, land and air resources

1. Eliminate seepage loss of an estimated 5111 acre feet of water annually.
2. Reduce possibility of canal-breakage from floodwaters by installing floodproofing measures upslope.
3. Reduce the amount of water-borne sediment transported from the unlined section of the canal.
4. Reduce frequency of dust in the air by reducing frequency of maintenance operations.
5. Reduce possibility of berm failure and resulting loss of water and water damage to adjacent land.

(Continued)

ENVIRONMENTAL QUALITY ACCOUNT (Continued)

Components

Measures of Effects

C. Biological resources and selected ecosystems

6. Reduce amount of waterborne sediment transported from cropland to tailwater recovery systems and/or lower lying land.
7. Reduce amount of waterborne chemicals transported from point of application.

1. Reduce the vigor of mesquite trees occurring intermittently along the canal banks.
2. Provide approximately 5111 acre feet of irrigation water from surface flows which will reduce the dependency on ground water.
3. Improved drainage provided by the flood-proofing measure will eliminate ponding water and reduce mosquito breeding habitat.

D. Irreversible and irretrievable commitments.

1. Labor, material and energy for construction of measure.

Selected Plan

REGIONAL DEVELOPMENT ACCOUNT  
Beardsley Farm Irrigation Measure  
RC&D Measure Plan

<u>Components</u>	<u>Measure of Effects</u> <sup>1/</sup>	
	<u>State of Arizona</u>	<u>Rest of Nation</u>
A. Income		
Beneficial effects:		
1. The value of increased output of goods and services to users residing in the region		
Farm irrigation	\$308,300	---
Total beneficial effects	\$308,300	---
Adverse effects:		
2. The value of resources contributed from within the region to achieve the outputs		
Farm irrigation		
Installation cost	\$ 47,770	\$ 44,790
Administration	690	6,890
Operation, maintenance and replacement	9,000	---
Total adverse effects:	\$ 57,460	\$ 51,680
Net beneficial effects:	\$250,840	\$-51,680
<u>1/</u> Average annual		

Selected Plan

REGIONAL DEVELOPMENT ACCOUNT  
Beardsley Farm Irrigation Measure  
RC&D Measure Plan

<u>Components</u>	<u>Measure of Effects</u>	
	<u>State of Arizona</u>	<u>Rest of Nation</u>
B. Employment		
Beneficial effects:		
1. Increase in number and types of jobs.		
Employment for project construction and operation and maintenance.	Approximately 9 man-years of skilled and semi-skilled employment will be required.	---
Adverse effects:		
2. Decrease in number and types of jobs.	---	---
Total adverse effects:	---	---
Net beneficial effects:	Approximately 9 man-years of skilled and semi-skilled employment will be required.	---

Selected Plan

REGIONAL DEVELOPMENT ACCOUNT  
Beardsley Farm Irrigation Measure  
RC&D Measure Plan

<u>Components</u>	<u>Measure of Effects</u>	
	<u>State of Arizona</u>	<u>Rest of Nation</u>
C. Population Distribution		
Beneficial and adverse effects:		
1. Population distribution within the region	Create approximately 9 man-years of employment within the Hohokam RC&D Project area.	---
D. Regional Economic Base and Stability		
Beneficial effects:	The measure will provide for additional crop production which will contribute to further economic development of the area.	---
Adverse effects:	---	---

Selected Plan

SOCIAL WELL-BEING ACCOUNT

Beardsley Farm Irrigation Measure

RC&D Measure Plan

Measure of Effects

Components

State of  
Arizona

Rest of  
Nation

Beneficial and  
adverse effects:

A. Real Income Distribution

Create approximately  
9 man-years of em-  
ployment within the  
Hohokam RC&D Project  
area. ---

B. Life, Health and Safety

Provide for improved  
economic conditions  
with increased crop-  
land production and  
increased farm income. ---

C. Educational, Cultural  
and Recreational

## Summary Comparison Between the NED-Selected Plan and the EQ Plan

Due to the nature of the two alternatives a tabular summary was not considered to be practical and the following narrative comparison was developed.

The EQ plan is identical to the land treatment program of the NED-selected plan, and the effects of the land treatment are the same for both plans. All of the evaluated monetary beneficial effects shown in the display system are attributable to the canal lining and would not be realized if the EQ plan had been selected. Also, selection of the EQ plan would eliminate all of the EQ effects, except items B.6 and B.7 of the environmental quality account and all effects shown in the regional and social well-being accounts.

### Plan Selection

The national economic development plan is the selected plan.

### INSTALLATION OF SELECTED PLAN

#### What Will Be Installed

The proposed measures to be installed include both land treatment and structural measures. The planned land treatment measures include irrigation land leveling, irrigation ditch and canal lining, conservation cropping systems and irrigation water management. These measures will make possible efficient on-farm application of irrigation water provided by the structural measures. No RC&D

funds will be used to install land treatment measures. The land treatment shown on Table 1 reflects units that will be treated during the 5-year project installation period using on-going programs. Provisions for necessary land treatment measures on the remaining acres in the project area will be included in conservation plans developed with the benefited landowners as cooperators of the Agua Fria-New River Natural Resource Conservation District. The monetary benefits claimed in this measure are not contingent upon installation of land treatment measures.

The Beardsley Canal was built many years ago under tight engineering control. The existing canal berms have sufficient compaction to withstand the loads placed upon them by the concrete lining. Selected sections of the canal bottom will be removed and new material placed and compacted. An existing concrete section, approximately 1,200 feet in length, will be removed and replaced. The existing canal berms will be shaped to a slope of 1.25:1, and the canal bottom will be brought to design grade. After the canal has been properly shaped, a 2 1/2-inch thick concrete lining will be placed in the canal. The canal to be lined will be approximately 6 feet in depth, and the bottom width will vary from 18 feet to 20 feet. Existing turnout and head control structures will be used. No new control structures for regulating or controlling the direction or rate of flow will be needed.

Floodproofing the section of the canal to be lined will consist of reshaping approximately 6 miles of waterways and replacing pipe and concrete inlet structures. Existing notched sections to unload the canal at predetermined locations will remain. At three locations where major washes are intersected by the canal, there are concrete siphons installed under the wash. Capacity over these siphons is sufficient to pass a 25-year frequency event.

#### Installation Costs

The costs shown in this plan are preliminary estimates. Final determination of costs to be borne by each party will be the actual costs incurred in the installation of the measure. The total installation costs include the costs for construction, engineering services, project administration, and land rights. RC&D funds will be used to pay 50 percent of the construction cost, all engineering services, and administrative costs incurred by the Service. The sponsors will be responsible for 50 percent of construction costs, all administrative costs which they incur, and all needed land and water rights. Cost estimates are shown in Tables 1 and 2.

The cost of installing land treatment measures on individual ownership units, estimated to be \$168,800, will be paid by the landowners with possible cost sharing under the Agricultural Stabilization and Conservation Program. The Soil Conservation Service will provide technical assistance.

The total installation cost for structural measures is estimated to be \$1,235,600 of which \$637,700 will be borne by RC&D funds and \$597,900 will be borne by the Maricopa Water District. Construction costs are estimated to be \$850,400, technical assistance is estimated to be \$127,500, and administration is estimated to be \$93,500. The value of land rights is estimated to be \$164,200.

#### Method of Financing

Federal assistance for carrying out the planned works of improvement described in the measure plan will be provided from appropriations to the Resource Conservation and Development Program. Responsibility for other costs will be borne by the Maricopa Water District which is financially able to furnish their share of the cost of this measure.

#### Land and Water Rights

The Beardsley Canal has been in existence for many years and the Maricopa Water District has all the necessary easements and rights-of-way to install this measure.

#### Contracting and Procurement

Construction costs will be shared equally between RC&D funds and Maricopa Water District funds. Materials are estimated to comprise more than 50% of the total construction cost. Thus, RC&D funds will be used to purchase materials for construction.

Maricopa Water District funds will be used to purchase the remainder of the materials. In addition, the Water District will provide all equipment and labor necessary to perform the work. "Performance of work" methods of installing the works of improvement will be followed.

The SCS will develop the detailed construction plans, and inspect construction. The Maricopa Water District will perform the construction using these plans.

RC&D funds will be used to pay for all engineering and technical assistance and administration costs incurred by the Service. The sponsors will bear all administrative costs which they incur, provide all needed land rights and provide labor and equipment to perform their share of the project installation.

#### OPERATION AND MAINTENANCE

The Maricopa Water District will be responsible for the operation and maintenance of the improvements installed. An operation and maintenance agreement will be entered into between the Maricopa Water District and the Soil Conservation Service setting forth operation and maintenance requirements prior to the execution of a project or engineering services agreement. The estimated annual cost of operation and maintenance is \$9,000. Operation and maintenance work will normally include such actions as repairing and maintaining canal berms or embankments to prevent the earth

from sloughing away from the concrete lining, repair of fractures and other damage to the lining and structures, general maintenance of gates, drops, checks, turnouts and other structures to maintain good working order of the delivery system.

Inspection of the improvements will be made annually by the Maricopa Water District and the Soil Conservation Service for a period of three years. Annual inspections after the third year will be made by the Maricopa Water District. Inspection reports will be supplied by the Soil Conservation Service annually. Upon request, the Agua Fria-New River Natural Resource Conservation District will provide technical assistance for needed maintenance work.

#### UNIFORM RELOCATION ASSISTANCE AND REAL PROPERTY ACQUISITION ACT

The measure sponsor assures that comparable replacement dwellings will be available for individuals and persons displaced from dwellings, and will provide relocation assistance advisory services and relocation assistance, make the relocation payments to displaced persons, and otherwise comply with the real property acquisition policies contained in the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Public Law 91-646, 84 Stat. 1894) effective as of January 2, 1971, and the Regulations issued by the Secretary of Agriculture pursuant thereto.

The costs of relocation payments will be shared by the measure sponsors and the Service as follows:

<u>Measure Sponsor</u> (Percent)	<u>Service</u> (Percent)	<u>Estimated Relocation Payment Costs</u> (Dollars)
54.9	45.1	\$0 <u>1/</u>

1/ Investigation has disclosed that under present conditions the RC&D measure will not result in the displacement of any persons, business or farm operation. However, if relocations become necessary, relocation payments will be cost shared in accordance with the percentage shown.

#### MUTUALLY AGREEABLE PLAN

Through a request of the Maricopa County Municipal Water Conservation District No. 1 and the Agua Fria-New River Natural Resource Conservation District (called sponsors) and the cooperative efforts of the sponsors and the Soil Conservation Service (called SCS) this mutually agreeable RC&D measure plan has been completed. This RC&D measure has been adopted by the Hohokam Resource Conservation and Development Council and included in the project plan as a means to accomplishing objectives for the project.

#### AGREEMENT REQUIRED TO OBLIGATE FUNDS

This is not a fund-obligating document. Financial and other assistance to be furnished by SCS in carrying out the work in this plan is contingent on the appropriation of funds for this purpose.

A separate agreement will be entered into between the SCS and the sponsors before either party initiates work involving funds of

the other party. Such agreement will set forth in detail the financial and working arrangements and other conditions that are applicable to the specific improvements to be installed.

COMPLIANCE WITH CIVIL RIGHTS ACT

The program conducted will be in compliance with all requirements respecting nondiscrimination as contained in the Civil Rights Act of 1964, as amended, and the regulations of the Secretary of Agriculture (7 CFR Sec. 15.1-15.12), which provide that no person in the United States shall, on the grounds of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any program or activity receiving federal financial assistance from the Department of Agriculture or any agency thereof.

NO MEMBER OF CONGRESS TO BENEFIT

No member of or delegate to Congress, or resident commissioner, shall be admitted to any share or part of this agreement, or to any benefit that may arise therefrom; but this provision shall not be construed to extend to this agreement if made with a corporation for its general benefit.

This plan may be amended, revised, or terminated only by mutual agreement of the parties hereto, except for cause.

Maricopa County Municipal Water  
Conservation District No. 1

By \_\_\_\_\_ Date \_\_\_\_\_

Title \_\_\_\_\_

Authorized by a resolution of the Maricopa County Municipal Water  
Conservation District No. 1 at a meeting held on \_\_\_\_\_  
Date \_\_\_\_\_

Agua Fria-New River Natural Resource  
Conservation District

By \_\_\_\_\_ Date \_\_\_\_\_

Title \_\_\_\_\_

Authorized by a resolution of the Agua Fria-New River Natural  
Resource Conservation District meeting held on \_\_\_\_\_  
Date \_\_\_\_\_

SOIL CONSERVATION SERVICE  
UNITED STATES DEPARTMENT OF AGRICULTURE

By \_\_\_\_\_  
State Conservationist

Date \_\_\_\_\_

Table 1 - Estimated Cost

Beardsley Farm Irrigation Measure

RC&D Measure Plan

Cost Item	Unit	Number	Estimated Cost (Dollars) <sup>1/</sup>				Total
			RC&D Funds		Other Funds		
			Non-Federal Land	Total	Non-Federal Land	Total	
<u>Land Treatment</u> <sup>2/</sup>							
Cropland							
Land Leveling Conservation	Acs.	800			100,000	100,000	100,000
Cropping System	Acs.	3,200			12,800	12,800	12,800
Irrigation Water Management	Acs.	1,600			3,200	3,200	3,200
Irrigation Ditch	Ft.	26,400			52,800	52,800	52,800
Technical Assistance					8,100	8,100	8,100
<u>Total Land Treatment</u>					176,900	176,900	176,900
<u>Construction</u> <sup>3/</sup>							
Canal Lining	Ft.	51,100	404,800	404,800	404,800	404,800	809,600
Associated Water Control Structures	No.	6	20,400	20,400	20,400	20,400	40,800
<u>Engineering and Other Technical Assistance</u>			127,500	127,500	0	0	127,500
<u>Administration</u>			85,000	85,000	8,500	8,500	93,500
<u>Land Rights</u>							
<u>Water Rights</u>					164,200	164,200	164,200
<u>Total Installation and Construction</u>			637,700	637,700	597,900	597,900	1,235,600
<u>TOTAL COSTS</u>			637,700	637,700	774,800	774,800	1,412,500

<sup>1/</sup> Price base 1977 <sup>2/</sup> Includes only units estimated to be installed during project installations period.

<sup>3/</sup> Includes cost of canal lining and associated water control structures.

Table 1A - STATUS OF PROJECT MEASURE WORKS OF IMPROVEMENT  
 (At time of measure plan preparation)

Beardsley Farm Irrigation Measure

RC&D Measure Plan

<u>MEASURES</u>	<u>UNIT</u>	<u>APPLIED TO DATE</u>	<u>TOTAL COST (DOLLARS)<sup>1/</sup></u>
<u>Land Treatment</u>			
Non-Federal land			
Irrigation land leveling	Ac.	10,000	875,000
Irrigation field ditch	Ft.	242,000	484,000
Conservation cropping system	Ac.	6,500	26,000
Irrigation water management	Ac.	12,500	25,000
<b>TOTAL</b>	<b>xxx</b>	<b>xxx</b>	<b>1,410,000</b>

<sup>1/</sup> Price base 1977 prices

June 1977

Table 2 - Distribution of Estimated Cost

Beardsley Farm Irrigation Measure

RC&D Measure Plan

(Dollars) 1/

Item	Installation Cost-RC&D Funds			Installation Cost-Other Funds			Total Installation Cost
	Construction	Technical Assistance	Total RC&D	Construction	Land Rights	Total Other	
Canal Lining	404,800	121,400	526,200	404,800	164,200	569,000	1,095,200
Associated Water Control Structures	20,400	6,100	26,500	20,400		20,400	46,900
Subtotal	425,200	127,500	552,700	425,200	164,200	589,400	1,142,100
Administration	xxx	xxx	85,000	xxx	xxx	8,500	93,500
GRAND TOTAL	425,200	127,500	637,700	425,200	164,200	597,900	1,235,600

1/ Price base: 1977

2/ Represents value of land within right-of-way at current prices.

June 1977

Table 3A - Structure Data

Concrete Canal

Beardsley Farm Irrigation Measure

RC&D Measure Plan

Reach <sup>1/</sup>	Capacity(CFS)		Hydraulic Grade Ft/Ft	Canal Dimensions						"N" Values	Velocities Ft/Sec.	Type of <sup>4/</sup> Improvement
	Req'd Design			Bottom (Ft)	Depth (Ft)	Side Slope	Freeboard (Ft)	Area <sup>2/</sup>	Wetted Perimeter <sup>3/</sup>			
600-951	415	422	0.00018	20.0	6.0	1.25:1	1.0	125.0	34.14	0.014	3.38	L
951-1111	370	383	0.00018	18.0	6.0	1.25:1	1.0	115.0	32.14	0.014	3.33	L

<sup>1/</sup> All reaches = 00

<sup>2/</sup> Area below hydraulic gradient

<sup>3/</sup> Wetted perimeter below hydraulic gradient

<sup>4/</sup> C & S - Clearing and snagging

CE - Channel enlargement'

L - Lined channel

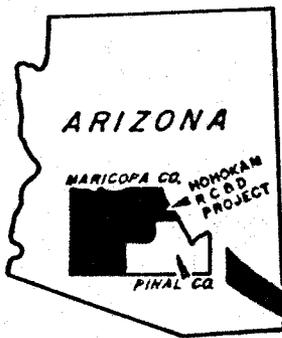
June 1977

Beardsley Farm Irrigation Measure

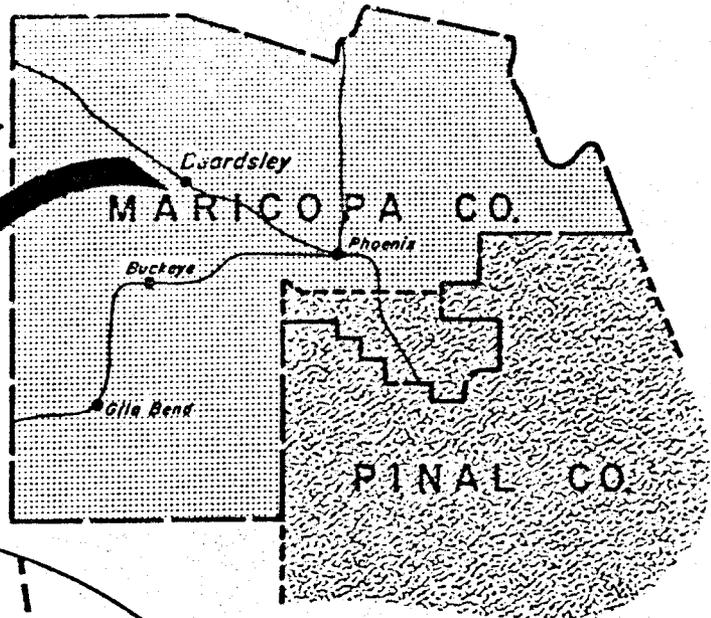
RC&D Measure Plan

Installation costs for each fiscal year during the installation period are as follows:

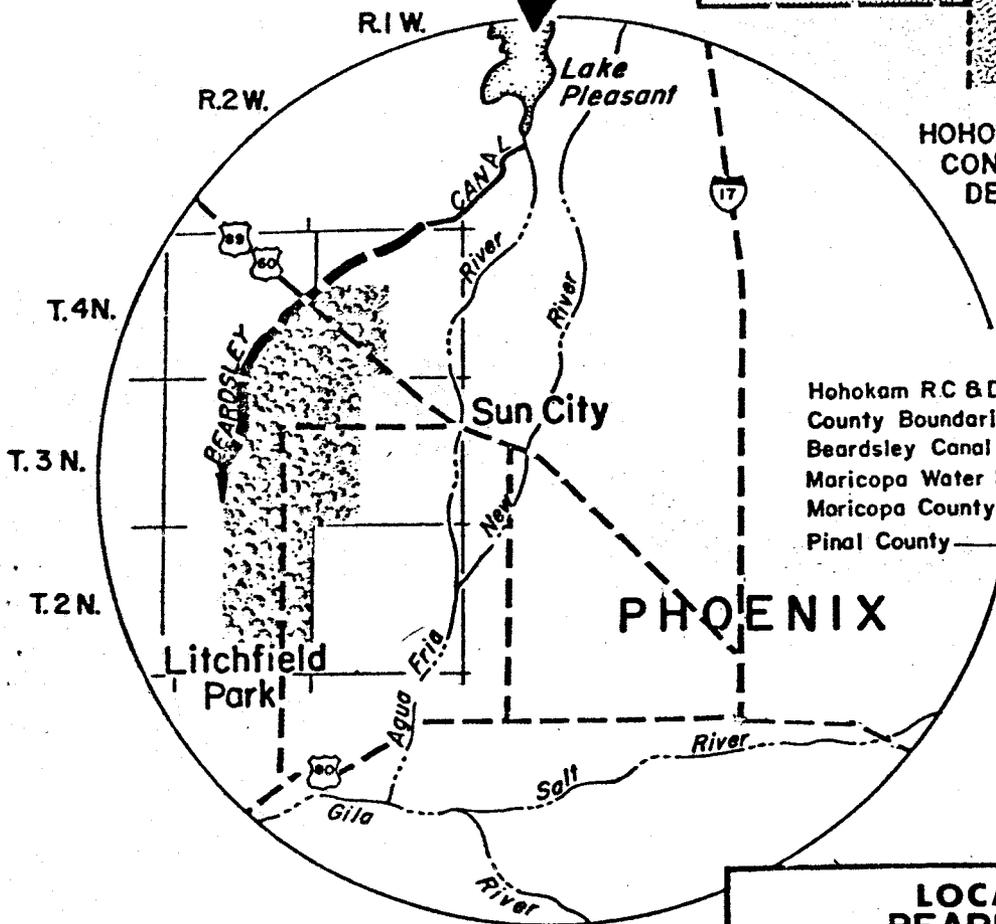
Fiscal Year	Reach All + 100	RC&D Funds		Total
		Structural Measures	Other Funds Structural Measures	
1st Year	983-1111	148,800	142,500	291,300
2nd Year	933-983 600-662	133,200	126,700	259,900
3rd Year	662-755	111,600	105,800	217,400
4th Year	755-850	114,000	108,100	222,100
5th Year	850-933	130,100	114,800	244,900
TOTAL		637,700	597,900	1,235,600



LOCATION MAP



HOHOKAM RESOURCE CONSERVATION AND DEVELOPMENT PROJECT



• LEGEND •

- Hohokam RC & D Boundary
- County Boundaries
- Beardsley Canal Lining (proposed)
- Maricopa Water District (irrigated cropland)
- Maricopa County
- Pinal County

**LOCATION MAP  
BEARDSLEY FARM  
IRRIGATION MEASURE**

MARICOPA COUNTY ARIZONA

U. S. DEPARTMENT OF AGRICULTURE  
SOIL CONSERVATION SERVICE

FIGURE 1



MAP SOURCE:  
ARIZONA DEPT. OF  
TRANSPORTATION

**MEASURE SITE MAP**  
**BEARDSLEY FARM**  
**IRRIGATION MEASURE**  
**MARICOPA COUNTY ARIZONA**  
**U. S. DEPARTMENT OF AGRICULTURE**  
**SOIL CONSERVATION SERVICE**