

**RIVERSIDE COUNTY FLOOD CONTROL AND  
WATER CONSERVATION DISTRICT**

**RIVERSIDE, CALIFORNIA**

**MASTER DRAINAGE PLAN  
FOR THE  
PERRIS VALLEY  
CHANNEL**

**ZONE 4**

**OCTOBER 1989**

**KENNETH L. EDWARDS**

**CHIEF ENGINEER**

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FOR  
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## SECTION I - PURPOSE

This Master Plan addresses the current and future drainage needs along the existing drainage ditch commonly called Perris Valley Channel. This ditch was constructed in the mid 1950's in order to alleviate drainage problems associated with the expanding March Air Force Base. The Riverside County Flood Control and Water Conservation District (District) owns right of way and maintains the ditch along its entire reach from the San Jacinto River to Mariposa Avenue in the City of Moreno Valley.

In its present state, the ditch can only handle flows associated with minor storm events. Only the Ramona Expressway and Nuevo Road are bridged, and all other streets have dip crossings which become impassable in nearly any storm. The extensive urbanization which has occurred in the City of Moreno Valley, along with current development pressure in Moreno Valley and the City of Perris, has necessitated preparation of this Master Plan. The plan will serve as a long term guide to the design and construction of the ultimate channel. It will also assist in the location and sizing of local drainage facilities to be constructed by developers and others within the area. When the channel is fully completed, the existing 100 year flood plain, as delineated by the Federal Emergency Management Agency, will be eliminated.

## SECTION II - SCOPE

The tributary drainage area covered by this plan consists of approximately 85 square miles with topographical relief ranging from steep foothill terrain to very mild sloping valley terrain. The scope of this Master Drainage Plan includes:

1. Determination of the quantity and points of concentration of storm runoff along the channel.
2. Investigations of alternative channel sections and types.
3. Preparation of preliminary design plans and supporting cost estimates.

The tributary drainage area is located within the City of Perris, the City of Moreno Valley and unincorporated Riverside County.

## SECTION III - GENERAL DISCUSSION

This engineering study provides a Master Plan for the channelization of storm flows into the Perris Valley Channel. The study reach begins at the confluence with the San Jacinto River near I-215 and extends north to Kitching Street Channel at Mariposa Avenue (see Figure 1).

Substantial current interest in developing property adjacent to the channel has led to increasing concerns by residents and the City of Perris in how best to convey the storm flows. For this plan, several channel alternatives were investigated ranging from fully concrete lined to unlined graded earth which could also be utilized as a greenbelt. Where feasible, the unlined graded earth channel was chosen as the recommended plan as it provides for flood protection while offering the option of developing recreational joint uses. Figure 2 shows examples of channel alternatives studies.

#### SECTION IV - CRITERIA

Perris Valley Channel is proposed to carry the 100 year storm runoff based on ultimate development. The maximum possible freeboard from existing ground was provided to facilitate side drainage. The alignment follows existing District right of way.

#### SECTION V - HYDROLOGY

Hydrology studies for the master plan are based on the Synthetic Unit Hydrograph Method described in the District's Hydrology Manual, dated April 1978.

Projected land uses for the study area were based on information provided by the City of Perris, the City of Moreno Valley and the County of Riverside Planning Departments. These ultimate land use assumptions were then used to estimate appropriate rainfall loss rates.

#### SECTION VI - EXISTING DRAINAGE FACILITIES

The District presently owns and maintains the existing drainage ditch along the entire study reach. The existing ditch can only handle storm flows from minor events. Existing bridge crossings at Nuevo Road and the Ramona Expressway are inadequate and will require replacements.

#### SECTION VII - RECOMMENDED PLAN

The recommended plan consists of a fully incised channel from the San Jacinto River to the upper terminus at Mariposa Avenue. Downstream of the Ramona Expressway, the channel is proposed as an unlined graded earth section with flat 12:1 sideslopes and a 250-foot bottom width. Because flow velocities are low, the channel may be grass lined and maintained as a park in this reach linking the San Jacinto River corridor with the Lake Perris recreational area. The City of Perris would be responsible for the installation and maintenance of turf, landscaping, trails and other such joint use facilities. Upstream of the Ramona Expressway, where velocities are higher, a conventional type channel is proposed with concrete sideslopes and a soft bottom. Figure 3 shows typical sections for the recommended plan. All weather road crossings have been included in the Master Plan at six locations, Nuevo Road, Orange Avenue, Placentia Avenue, Rider Avenue, Ramona Expressway and Oleander Avenue.

#### SECTION VIII - ALTERNATIVE STUDIES

In developing the proposed Master Plan, a number of alternatives were developed and studied for their hydraulic and economic feasibility. Three types of channels were studied. These were a fully concrete lined trapezoidal channel, a trapezoidal channel with concrete side slopes and a soft bottom, and a graded earth lined channel which could be grass lined and used jointly as a park. The lowering of one and/or both Metropolitan Water District's Aqueducts was also investigated. The fully concrete lined channel proved to be the most costly, and the soft bottom channel with concrete sides was the least costly. The graded earth lined channel with joint use capability was selected as the best overall solution downstream of the Ramona Expressway where flow velocities are low.

SECTION IX - ESTIMATED COSTS

The Master Plan facilities proposed herein, provide a composite of the best features of all of the alternatives studied. The recommended plan provides the most economical solution for flood control which is consistent with the planning goals of the City of Perris.

Cost estimates were developed for the District from current construction cost data. All unit prices were adjusted to reflect present 1989 cost levels and are shown in Table IX-1, "Cost Summary". Bridge structures were included in the construction costs. Not included in the estimate are irrigation, landscaping and other installation and joint maintenance costs associated with potential recreational use of the unlined channel. These costs would be the responsibility of the City of Perris or a park authority.

Perris Valley  
Storm Drain No. 1

Table I  
Cost Summary

Perris Valley Master Drainage Plan

Facility	Construction Cost	31% Engineering of Administration	Right of Way	Master Plan Cost
Reach 1 (D/S of Ramona Expressway)	\$4,396,400	\$1,362,880	\$4,026,610	\$9,785,890
Reach 2 U/S of Ramona Expressway)	3,414,610	1,058,530	189,780	4,662,920
Nuevo Road Bridge	1,687,510	523,130	-----	2,210,640
Orange Avenue Bridge	1,513,380	469,150	-----	1,982,530
Placentia Avenue Bridge	1,321,890	409,790	-----	1,731,680
Rider Street Bridge	1,592,130	493,560	-----	2,085,690
Ramona Expressway Bridge	1,804,960	559,540	-----	2,364,500
Oleander Avenue Bridge	752,400	233,240	-----	985,640
MWD Aqueduct Relocation	<u>3,000,000</u>	<u>-----</u>	<u>-----</u>	<u>3,000,000</u>
Total	\$19,483,280	\$5,109,820	\$4,216,390	\$28,809,490

## SECTION X - CONCLUSIONS

Based on the studies and investigations made for this report, it is concluded that:

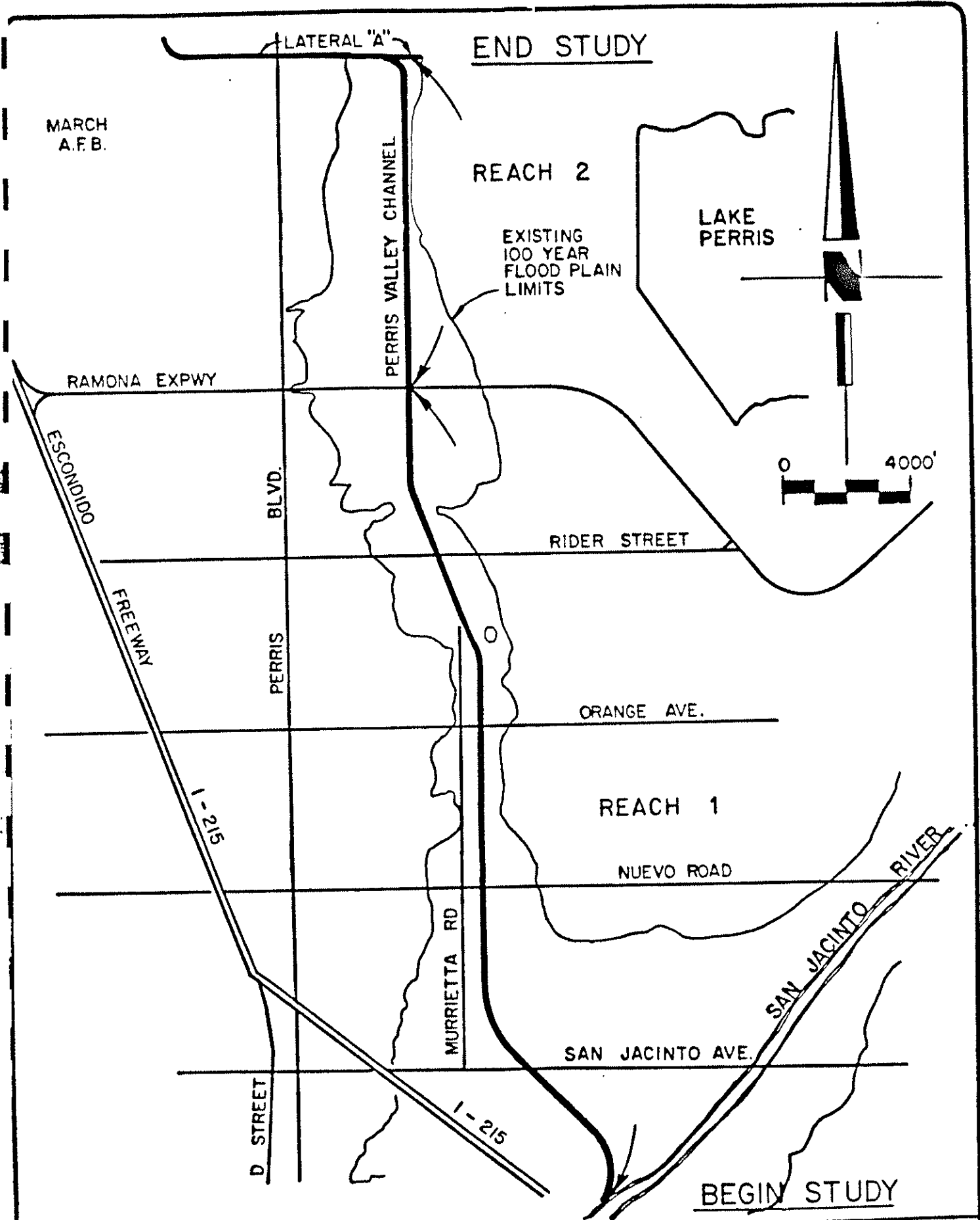
1. The Perris Valley area has suffered flooding problems in the past, and the damages incurred are expected to increase as much of the area converts from predominately agricultural uses to industrial and residential uses.
2. A drainage system is required to safely convey storm runoff through the area to the San Jacinto River and provide for orderly development.
3. The total cost of the recommended improvements, including right-of-way, engineering, contingencies, and administration is estimated to be \$28,809,490.00.

## SECTION XI - RECOMMENDATIONS

It is recommended that:

1. The Master Plan for the Perris Valley Storm Channel, as set forth herein, be adopted by the Perris City Council and the Riverside County Flood Control and Water Conservation District's Board of Supervisors.
2. The Master Plan, as set forth herein, be used as a guide for all future developments in the study area and that such developments be required to conform to the plan to the extent possible.
3. The right-of-way required for the plan be protected from encroachment.

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RIVERSIDE COUNTY FLOOD CONTROL  
AND  
WATER CONSERVATION DISTRICT

PERRIS VALLEY STORM CHANNEL  
STUDY LIMITS

FIGURE  
1