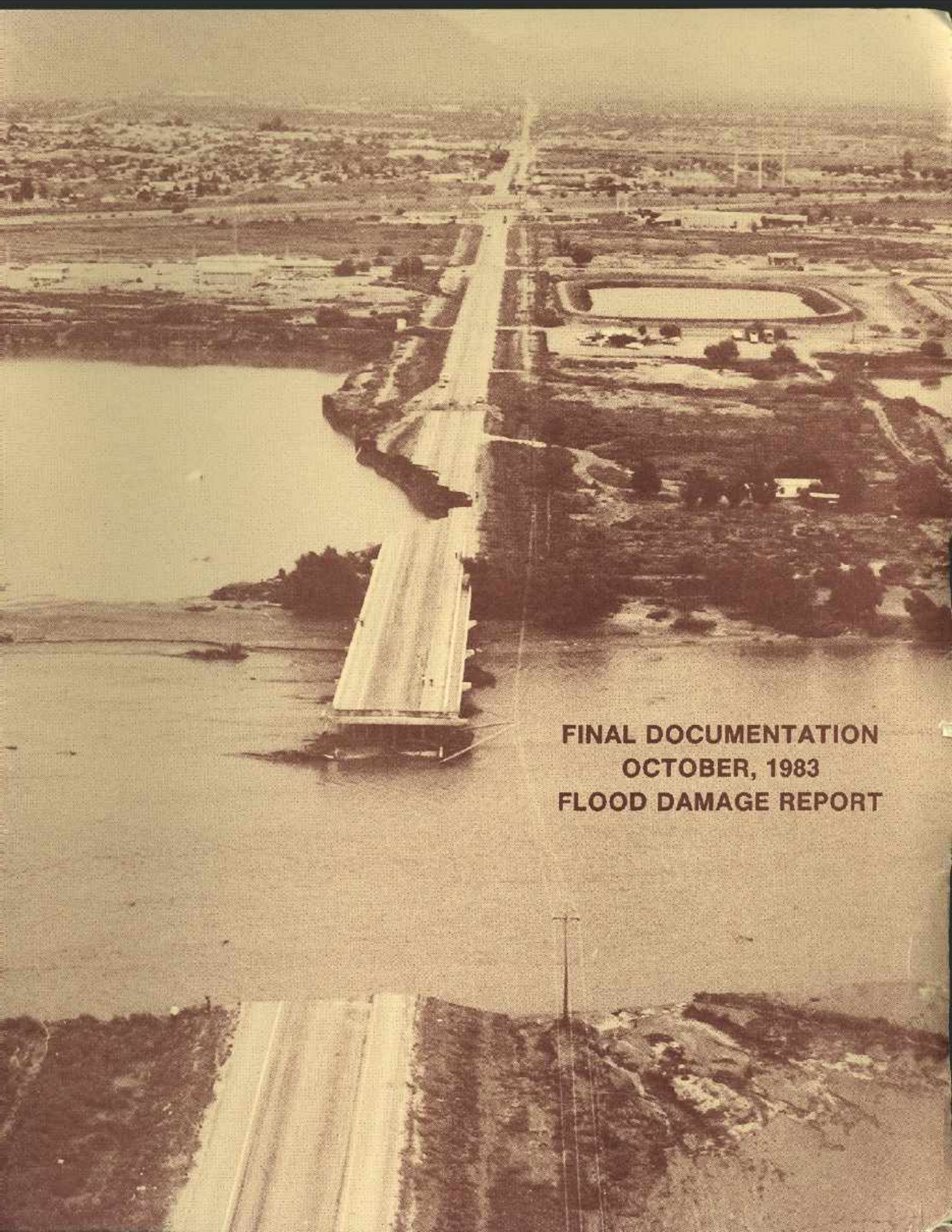

FINAL DOCUMENTATION
OCTOBER, 1983
FLOOD DAMAGE REPORT

Pima County Department of Transportation

and

Flood Control District

Pima County Board of Supervisors/Board of Directors

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50002

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Introduction

Beginning September 29th and continuing through October 2, 1983, flooding occurred in watersheds, affecting Pima County and Southern Arizona. This flooding caused severe erosion damage, as well as, overbank flooding damage on the Santa Cruz River, Rillito River, Pantano Wash, Tanque Verde Creek, Agua Caliente Wash, Pima Canyon Wash, Canada del Oro Wash, and many of the tributary watersheds to the major river system. The estimated flood peaks for the major river system are shown in the following table:

OCTOBER 1983 FLOOD

PIMA COUNTY DEPARTMENT OF TRANSPORTATION

AND FLOOD CONTROL DISTRICT

PEAK FLOOD FLOW ESTIMATES

RIVER	QUANTITY (cfs)	RETURN PERIOD
Santa Cruz at Green Valley	45,000	100 yr
Santa Cruz at Tucson	52,700	100+ yr (100 yr = 30,000)
Santa Cruz at Marana	65,000	100+ yr (100 yr = 40,000)
Rillito	29,700	50 yr
Tanque Verde	20,000	50 yr
Pantano	15,000	25 yr
Canada del Oro	10,000	10 yr

Massive flood damages occurred to public facilities from this flood event. Public damages included washed out bridges, damaged flood control works, washed out and damaged arterial highways, collector and local roadways, and damaged or destroyed utilities, such as sewer, water, electric and gas lines, as well as, damaged sanitary landfills.

50007

Early estimates by the Federal Emergency Management Agency indicate that in the Santa Cruz River Basin, 154 residential units were destroyed, 160 suffered major damage, and 222 received minor damage. Furthermore, an estimated 19 businesses had major damage, while 22 incurred minor damage. More tragically, 13 lives were lost, 221 people were injured and 11 were hospitalized in Arizona, with most victims in Pima and Pinal Counties. Included in the fatalities were two helicopter crew members from the Arizona Department of Public Safety, killed while performing rescue activities. Although the total number of people rescued is unknown, the Picture Rocks Fire District and Rural Metro Fire Department, with the assistance of the Department of Public Safety and the Army National Guard, estimate approximately 400 were evacuated for medical or personal safety reasons. Pima County Search and Rescue estimates that they were involved in 200 rescues during the early stages of the storm.

The American Red Cross reported that in the 16 emergency shelters set up throughout Arizona, 5,852 people were given emergency shelter. Through mid-December, 11,440 people received some type of assistance. In addition, the Tucson office of the Salvation Army housed about 40 to 45 families temporarily.

In areas isolated by the flood, as well as at temporary shelters, the main concern became that of sustaining victims by providing for their physical and emergency care needs. Food and medical suppplies for hundreds of families were air-dropped into isolated areas. Over 23 tons of flood, as well as clothing, furnishings, bedding, and personal items were distributed in the early days and weeks of the flood disaster.

During the height of flooding, 35 to 42 major bridges were closed. Fifteen bridges suffered sufficient damage to remain closed to traffic from a few days to a few weeks. Four bridges remain closed awaiting major repair or replacement. After the flood there were 170,000 vehicle trips traveling over a damaged bridge or approach each day in eastern Pima County. Because of the temporary nature of repairs made to date, the potential for additional damage to nineteen bridges is very high during any additional flooding.

During the flood, severe damage occurred to sanitary sewer interceptor lines ranging in size from 27 inches to 15 inches. Over 8,000 feet of sewer main was washed out, resulting in a discharge of 1.5 million gallons of sewage per day into the river system. Minor damage also occurred to the Green Valley and Marana wastewater treatment facilities.

Sanitary landfills were also damaged by flood waters. The Ina Road landfill was the most severely damaged; however, damage also occurred or the potential for damage was high at over a half dozen other abandoned landfill sites.

The water distribution system was also damaged during the flood. Water transmission mains ranging in size from 36 inches to 8 inches were washed out. Many households were temporarily without water service because of flood damage. Several well sites and well fields were also damaged by flood waters and erosion.

Public and private damage from the flood was high. The cost to repair the damage will also be high. Funding for damage repair will come from a variety of federal, state and local sources with the majority of funds coming from local sources.

50005

General Public Facility Damage and Private Property

Santa Cruz River

By far the greatest flood damage occurred within the Santa Cruz River Basin. Flood damage was extensive from the Amado Road Bridge immediately south of the County line to beyond the Trico Road Bridge on the north Pima County line. The most severe damages on the Santa Cruz River occurred downstream of the Canada del Oro Wash and Rillito River confluences. Property damage along the Rillito River was extensive and caused by bank erosion rather than flood water inundation. The flow in the Rillito River came primarily from the Tanque Verde Creek where floodwater inundated the flood plain and caused property damages and severely reduced access. Flows within the Pantano Wash and Canada del Oro Wash were of a much reduced magnitude but did contribute to overall flood volumes and flood/erosion damage.

The following pages list a general location and description of the damage to the bridge/highway crossings, flood control works, sewer and water works and private property and of the utilities along the major watercourses.

The list is not intended to be a complete list of all flood damages, but is a general list of the larger damage sites and damage categories.

50006

Santa Cruz River

Bridges/Highway Crossings

Location	Damage Description
Continental Road	Erosion damage to west abutment and approach road.
Sahuarita Road	Erosion damage to west approach road and west abutment undermined.
Pima Mine Road	Extensive debris accumulation on bridge with one pier undermined.
I-19	Erosion damage to north abutment; structural damage to bridge.
Sixth Street Extension (San Xavier Loop) Road	Bridge washed out and extensive erosion damage to south approach.
Valencia Road	Erosion damage to west bridge abutment and piers.
Drexel Road	Highway crossing washed out.
Irvington Road	Erosion and settlement of west approach.
Ajo Way	Scour/erosion at northwest corner.
29th Street	Scour/erosion at northwest corner.
22nd Street	Damage to abutment protection, southwest corner.
Grant Road	Minor erosion at abutments.
El Camino del Cerro	Southwest side spur dike breached.
Sunset Road	Bridge washed out
Ina Road	Severe erosion damage to both bridge approaches.

Bridges/Highway Crossings Continued

Location	Damage Description
Cortaro Road	Bridge washed out.
Avra Valley Road	Erosion damage to bridge approach; structural damage to bridge.
Sanders Road	Erosion damage to bridge approach.
Trico-Marana Road	Erosion damage to east approach.
Trico Road	Bridge clogged by debris and sediment.
Trico Road at Brawley Wash	Severe erosion damage to bridge approaches.
Flood Control Works	
Green Valley to Sahuarita	Extensive flooding and debris damage to natural channel.
Valencia Road to Ajo	Severe bank erosion.
Grant Road to Avra Valley Road	Overbank flooding and channel meandering; bank erosion exposed landfill cell.
Marana	Severe flood damage from flood waters and extensive sediment deposition.
Private Property and Utilities	
Green Valley	Minimal flooding of residential properties.
Upstream of Ajo Way	Loss of homes and property due to severe erosion.
Vicinity of Cottonwood Lane	Loss of homes and property due to severe erosion.
Downstream of Grant Road	Extensive damage to residential, commercial, and industrial development.
Puerta del Norte	Approximately 75 residences were severely damaged from mud and water flow in excess of 4 feet.
Cortaro	Severe stream meandering and erosion destroyed approximately 20 residences.
Rillito	Massive flooding of residences and business from flow depths of 2 to 4 feet.
Marana	Massive flooding and damages to residences, businesses and agricultural crops. Major area of evacuation.
Green Valley to Marana	Major utility damage to electric and telephone lines, water and sewer pipelines, and gas pipelines.

S0002

Sewer Works/Solid Waste Facilities

Green Valley Trunk Sewer	Up to 4000 feet of the 2 inch diameter system washed out
Green Valley Wastewater Treatment Facility	Flood water entered site inundating treatment ponds, eroding bank protection and washing out fence.
Michigan Street and Kostka Street	Sanitary sewer manhole and segments of an 8 inch diameter sewer pipe were washed out.
Southwest Interceptor (near 22nd Street)	33 inch diameter southwest interceptor exposed and undercut.
Ina Road Landfill	700 feet of bank protection washed out, and water eroded several thousand cubic feet of old landfill.
Tangerine Road Sanitary Landfill	Fencing and entrance road damaged.
La Puerta del Norte WWTF Effluent Line	Evaporation pond was damaged and parts of effluent line between treatment plant and the pond were washed out.
Marana Wastewater Treatment Facility	Erosion/breakthrough of the pond berms washing out almost all of the site's fencing, erosion of entrance roadway, mud/debris in the ponds.

Water Works

Drexel Road Road erosion.	400 feet of 8 inch pipe was washed out with Drexel
Santa Cruz Well from bank Field Transmission Lines, 12" and 24" (SC-1,9,22,23,25,26)	Damage to 12 inch and 24 inch pipe; loss of 1,200 feet erosion in excess of 250 feet.
Michigan and Kostka out with	36 inch main and parts of 8 inch pipe were washed whole intersection total 400 feet.
Ajo Way	Minor damage to 8 inch distribution system.
29th Street	8 inch distribution system was exposed.

Santa Cruz River Continued

Water Works Continued

Location	Damage Description
Alameda	Less than 50 feet of 10 inch pipe was washed out
Ina Road	Total 850 feet of 12 inch piping on both bridge approaches was washed out.
Cortaro Road	16 inch pipe located in the damaged bridge and eroded east approach was damaged – total 600 feet

Rillito River

Bridges/Highway Crossings

I-10 Frontage Road	Erosion damage to north abutment
Southern Pacific Railroad	Erosion damage to spur dike and north abutment.
El Camino de la Tierra	Dip crossing washed out.
Flowing Wells	Upstream failure of rock rip rap protection.
First Avenue	Erosion damage to north approach.
Campbell Avenue	Erosion damage to south abutment.
Dodge Boulevard	Erosion damage to north abutment and approach; structural damage to bridge.
Swan Road	Erosion damage to north approach.

Flood Control Works

Peglar Wash Channel and culvert at El Camino de la Tierra	Channel configuration destroyed; box culvert filled with sediment and debris.
Upstream of Flowing Wells Road	Bank protection damage
Vicinity of Country Club Road.	Bank protection damage.
Vicinity of Swan Road	Extensive loss of bank protection
Craycroft Road to I-10	Major utility damage to electric and telephone lines, and water, sewer and gas pipelines.

Private Property and Utilities

Pueblo Pebbles Sand and Gravel	Sand and gravel pit flooded.
Residential area in vicinity of Peglar Wash	Minor residential property damage.
First Avenue	Structural damage and loss of residential and commercial buildings.
Vicinity of Allen Road	Flooding in overbank area; flood damage to residential properties

50010

Rillito River

Private Property and Utilities Continued

Country Club Road to Swan Road	Power lines located within river damaged.
Prince Road to Country Club	Structural damage and loss of residential buildings.

Sewer Works

Rillito Interceptor near Swan Road and Rillito Wash	3000 feet of 18 inch diameter trunk system washed out.
North Rillito Interceptor near Lulu Walker School	Manhole on the north Rillito Interceptor 39 inches was exposed, and whole lane (I-10 to Craycroft) was endangered.
Flowing Wells Road	Concrete encased 10 inch diameter sewer was undermined and damaged.

Water Works

Camino de la Tierra	Loss of a few hundred feet of 8 inch diameter water pipe
First Avenue	Loss of 100 feet of 8 inch diameter water pipe with eroded bridge approach.
Country Club and Prince	Loss of 500 feet of 8 inch diameter water pipe with eroded land.
Dodge Boulevard	150 feet of 8 inch diameter water pipe was washed out with eroded north bridge approach.
Columbus Road	36 inch and 12 inch diameter water pipes were washed out.
Swan Road	Loss of 75 feet of 8 inch diameter water pipe with eroded north bridge abutment.

50011

Tanque Verde Wash

Bridge/Highway Crossings

Location	Damage Description
Tanque Verde Loop Road	Bridge approaches washed out; structural damage to bridge.
Houghton Road	Dip crossing washed out.
Wentworth Road	Dip crossing washed out.

Flood Control Works

-NONE-

(No significant flood control works exist along Tanque Verde Creek)

Private Property and Utilities

Vicinity of Woodland Road	Flooded residential structures; exposed utility lines.
Agua Caliente Wash upstream of Tanque Verde Road	Flooding to residential subdivision.
49er's Country Club	Flooded residential structures.

Sewer Works

Pantano Road	Two manholes on the Tanque Verde. 24 inches of interceptor were exposed.
Forty Niner's Trunk Sewer	500 feet of 27 inch sanitary trunk sewer was washed washed out.
Woodland Road	1200 feet of 8 inch and 12 inch main pipe damaged.

Water Works

Tanque Verde Loop	30 feet of 24 inch diameter water pipe were washed out.
Soldiers Trail and Agua Caliente Wash	8 inch diameter pipe was broken at road crossing.

Pantano Wash

Bridge/Highway Crossings

Location	Damage Description
Speedway Boulevard	Erosion damage to west abutment.
22nd Street	Erosion damage to upstream of bridge.
Golf Links Road	Erosion damage at east abutment.
Harrison Road	Dip crossing washed out.
Colossal Cave Road	Dip crossing washed out.

Flood Control Works

Kennison Lake and Channel	Erosion damage to flood control facilities and roadway crossings.
Upstream of Speedway Boulevard	Erosion damage to bank protection.

Private Property and Utilities

Downstream of Tanque Verde Road.	Erosion damage to east bank endangering homes.
Apartments upstream of Speedway Boulevard.	Structural damage to residential dwellings
Mobile Home Park vicinity of Escalante	Loss of mobile homes, flooding to residential structures.

Sewer Works

Sahuaro Pressure Main at Glenn Street	Portion of the pressure main system from the sewage lift station was washed out.
Pantano Interceptor (south of Speedway)	Manhole was exposed.
Lincoln Ridge Sewer System	800 feet of 12 inch and 16 inch sewer pipe was exposed and partially damaged. One manhole was washed out.
Hearthstone Hills Trunk Sewer at Beachwood Street and Creek Street.	100 feet of 12 inch diameter trunk sewer was exposed exposed and washed out.

Pantano Wash Continued

Water Works

Location	Damage Description
Sarnoff Drive	12 inch diameter pipe was damaged
Golf Links and Camino Seco	Several hundred feet of 8 inch diameter water pipe was washed out with eroded river bank.

Canada del Oro Wash

Bridge/Highway Crossings

Location	Damage Description
Magee Road	Detour roadway for bridge construction site washed out.
La Cholla Boulevard	Dip crossing washed out.
Overton Road	Dip crossing washed out.
La Canada Drive	Detour roadway for bridge construction site washed out.
Lambert	Dip crossing washed out.
First Avenue	Dip crossing washed out.
U.S. 89	Erosion damage to south abutment and approach.
Vicinity of Catalina	Dip crossings washed out at local roads.

Flood Control Works

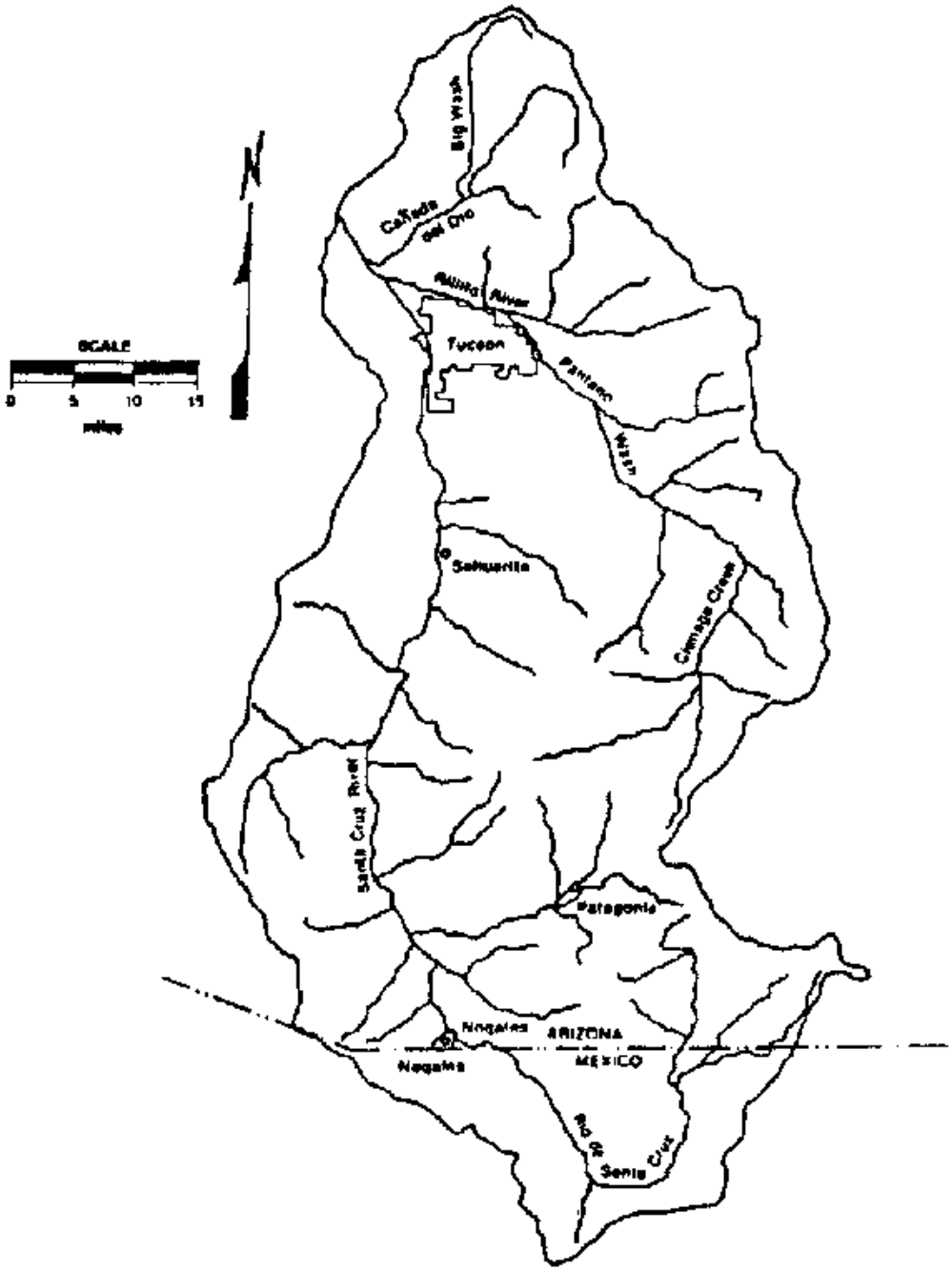
Oro Valley	Erosion damage to dike.

Private Property and Utilities

Upstream of Magee Road	Erosion damage to interceptor sewer.

Sewer Works

CDO Interceptor near Tucson National Golf Course Sites	30 inch diameter interceptor sewer was exposed and joints of ductile iron pipe were separated.
CDO Interceptor near La Cholla Boulevard.	One manhole was damaged and second endangered.



S00 16

EXHIBIT 1

Pima County Arizona
General Map

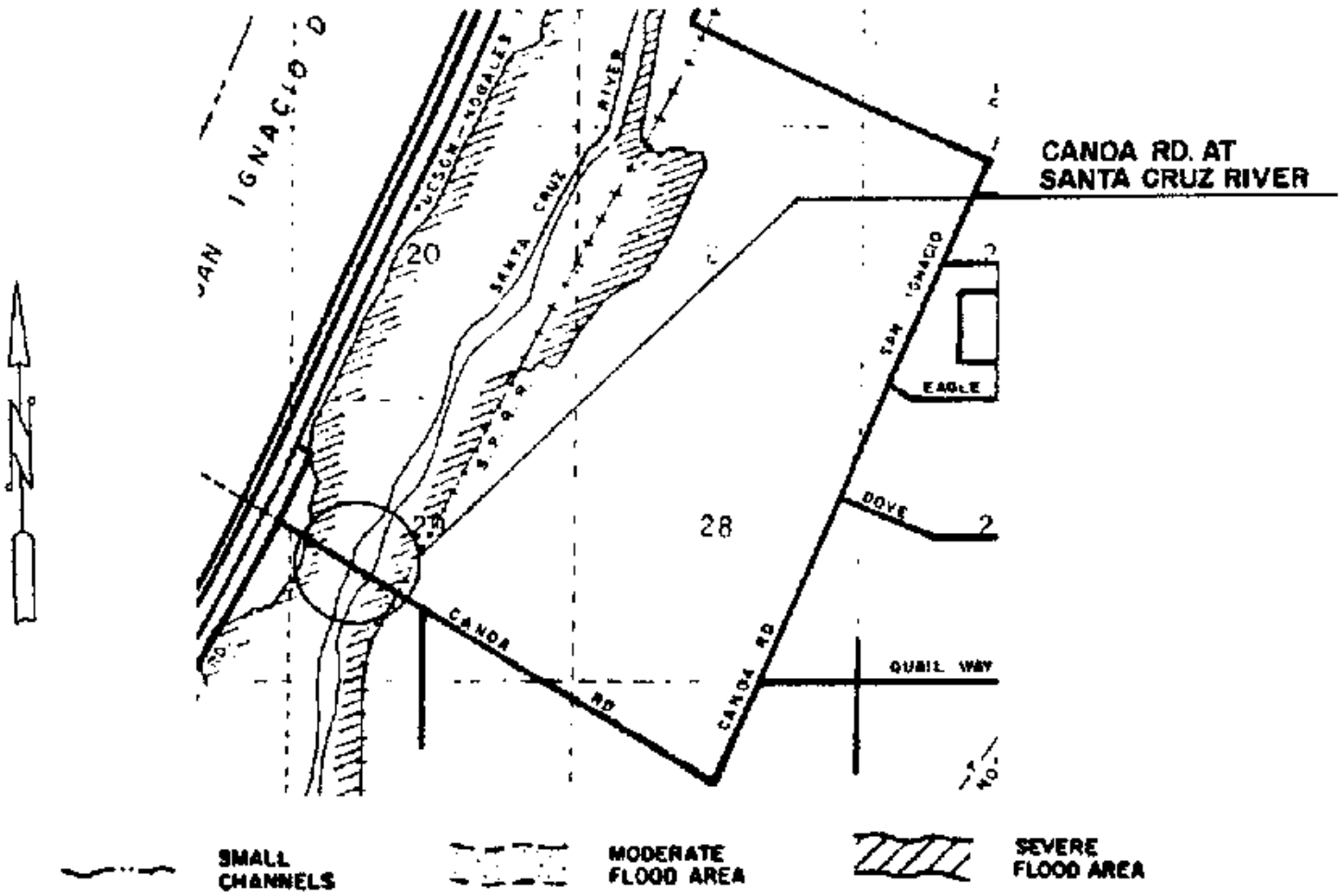
Site Specific Damage

The following sheets provide site specific examples of flood control and transportation facilities that sustained significant flood damage. These sheets contain a general location map and a description of the damage incurred.

These descriptions are intended to document flood damages incurred due to the October, 1983, flood. These examples are not intended to be a complete identification of all damage sites.

CANOA RD. , SANTA CRUZ RIVER

AT GRADE CROSSING



Damage Description:

The at grade crossing was washed out.

CANOA ROAD,
SANTA CRUZ RIVER

LOOKING EAST

LOOKING EAST

S0019

CANOA ROAD,
SANTA CRUZ RIVER
NOVEMBER 2, 1982

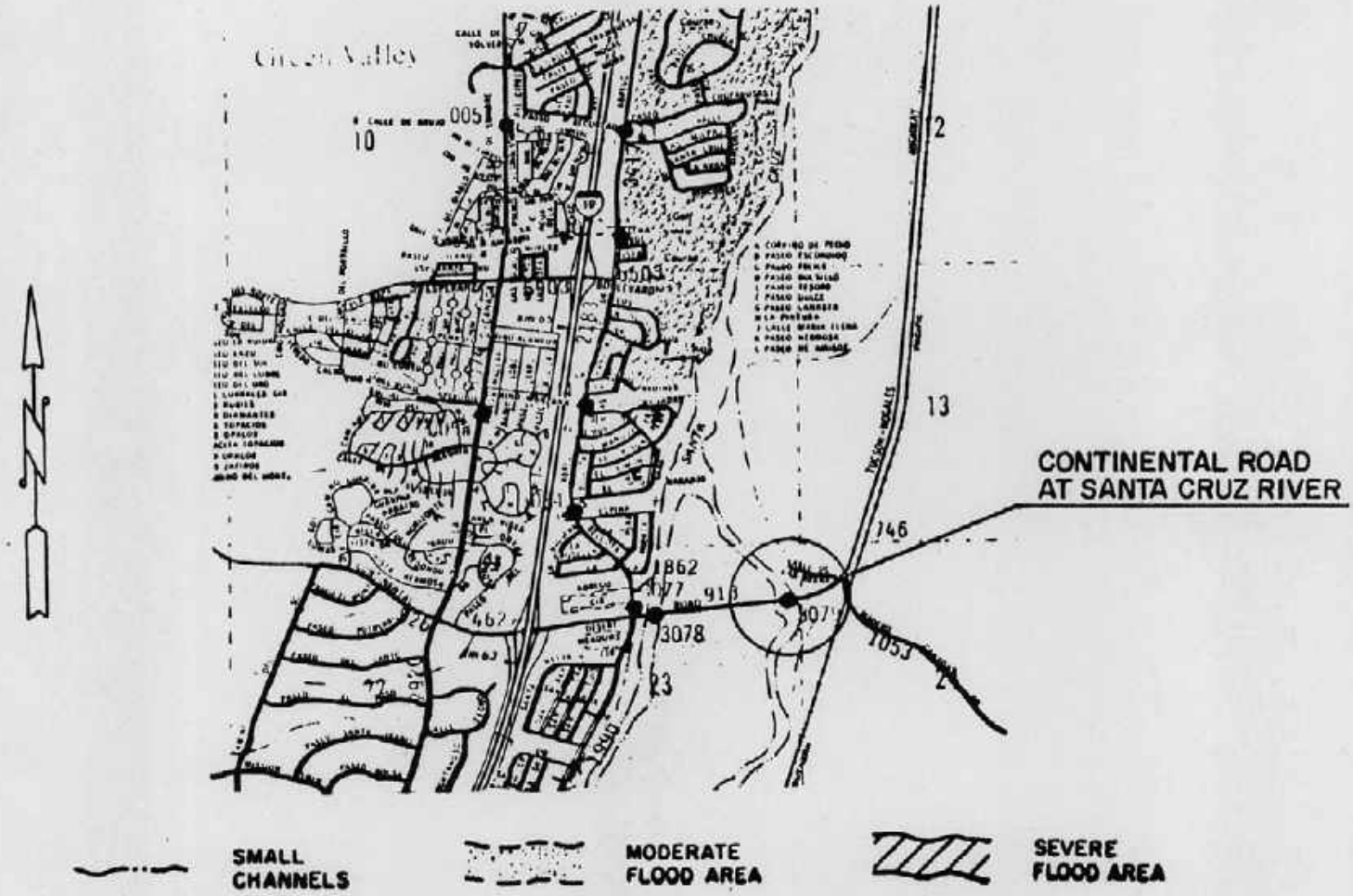
S0020

CANOA ROAD,
SANTA CRUZ RIVER
OCTOBER 3, 1983

S0021

CONTINENTAL RD., SANTA CRUZ RIVER

BRIDGE

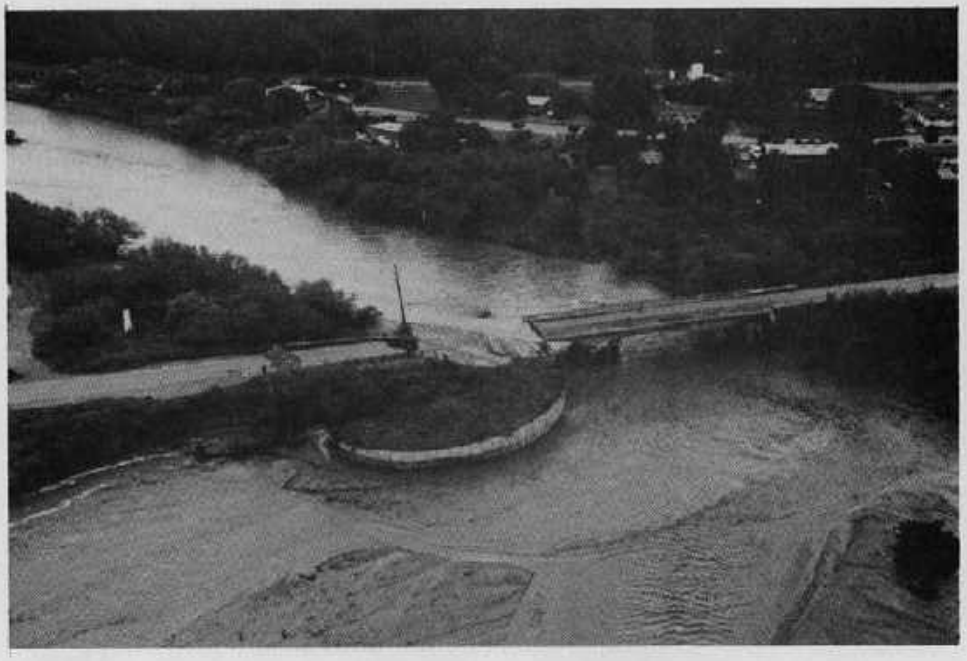


Damage Description:

The damage to the bridge consisted of washing out of the west abutment bank protection, the abutment bridge seat, and approximately 100 feet of roadway embankment.

S0022

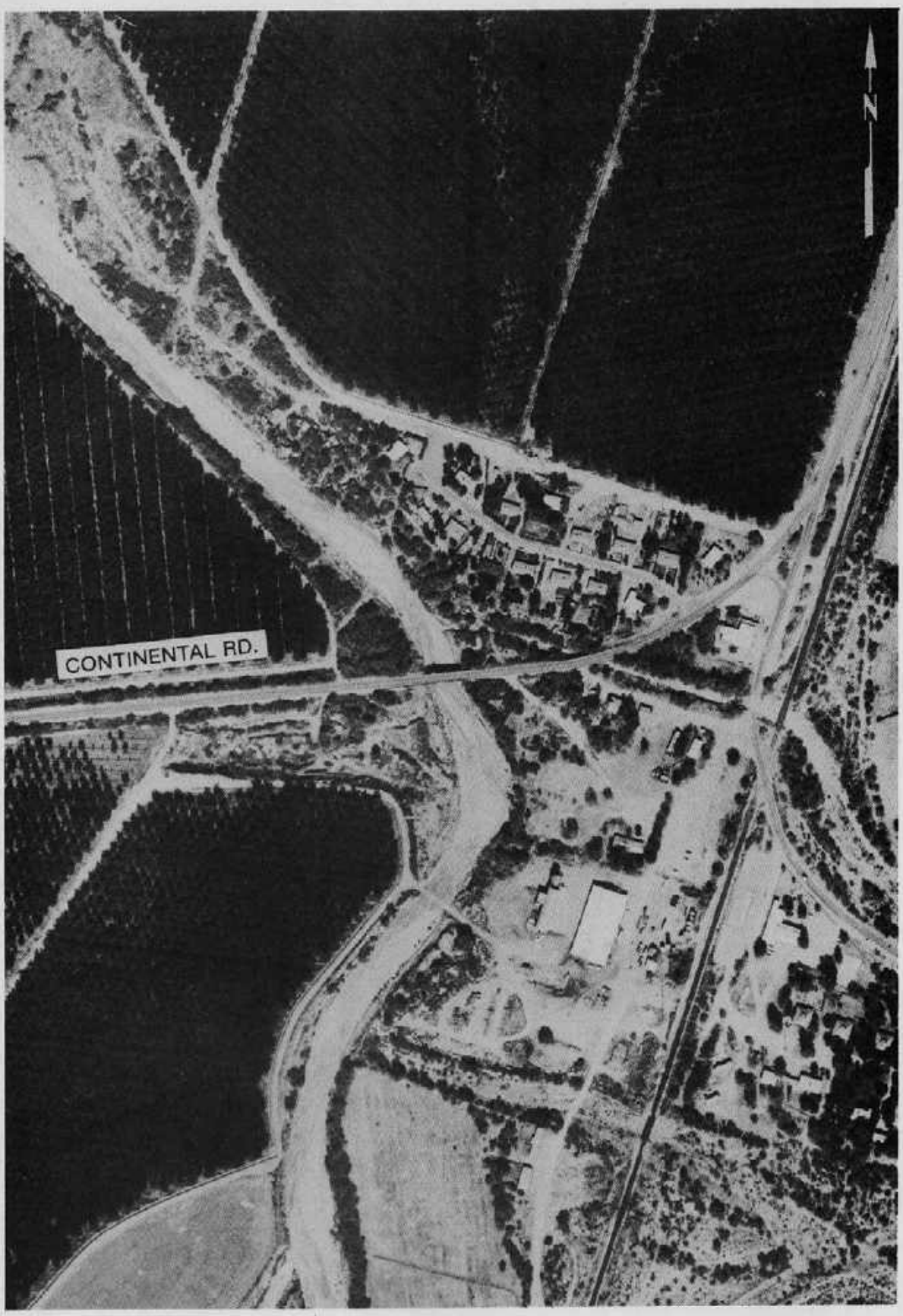
CONTINENTAL ROAD,
SANTA CRUZ RIVER



LOOKING NORTH

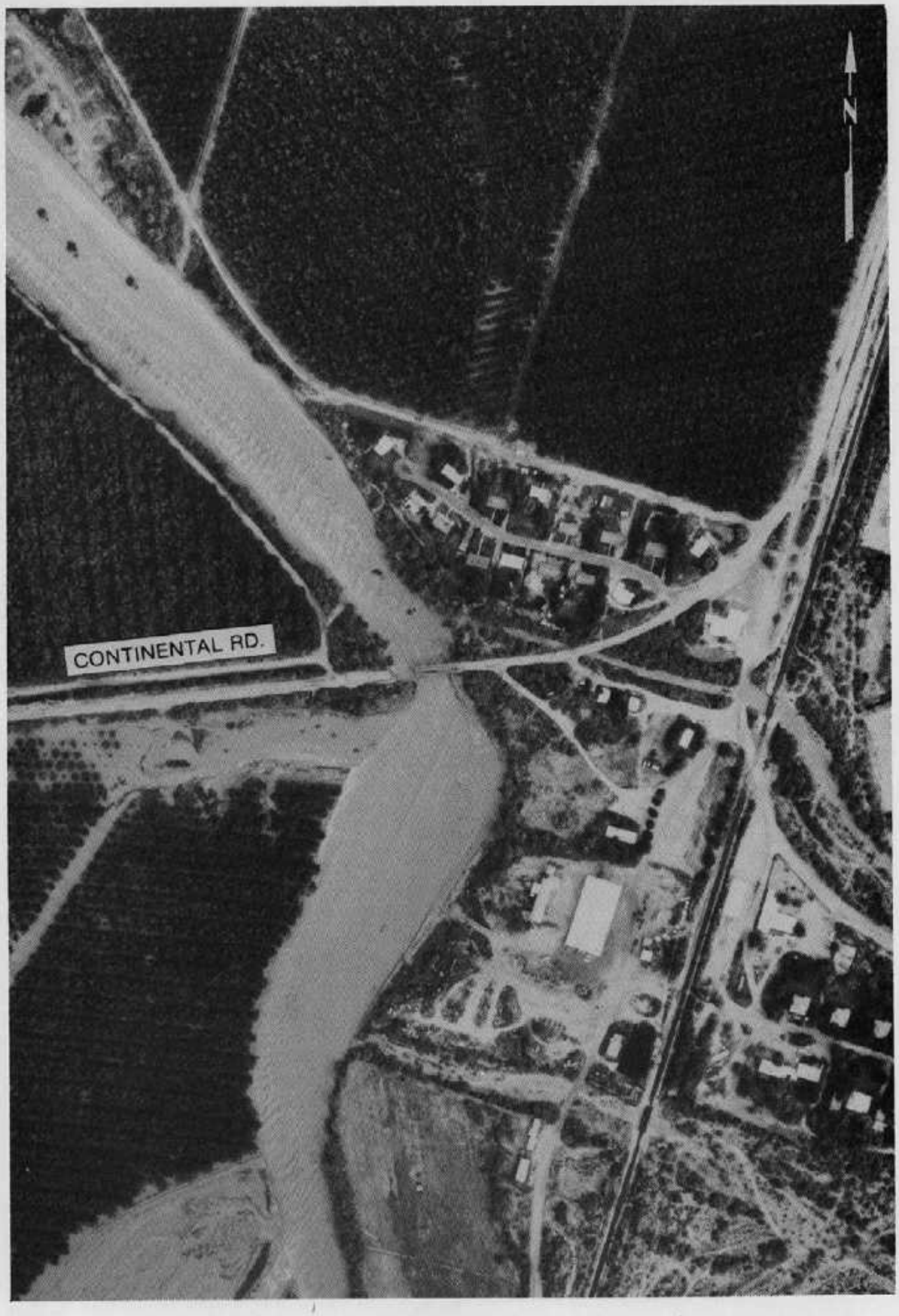
LOOKING SOUTH

S0023



CONTINENTAL ROAD,
SANTA CRUZ RIVER
NOVEMBER 2, 1982

S0024

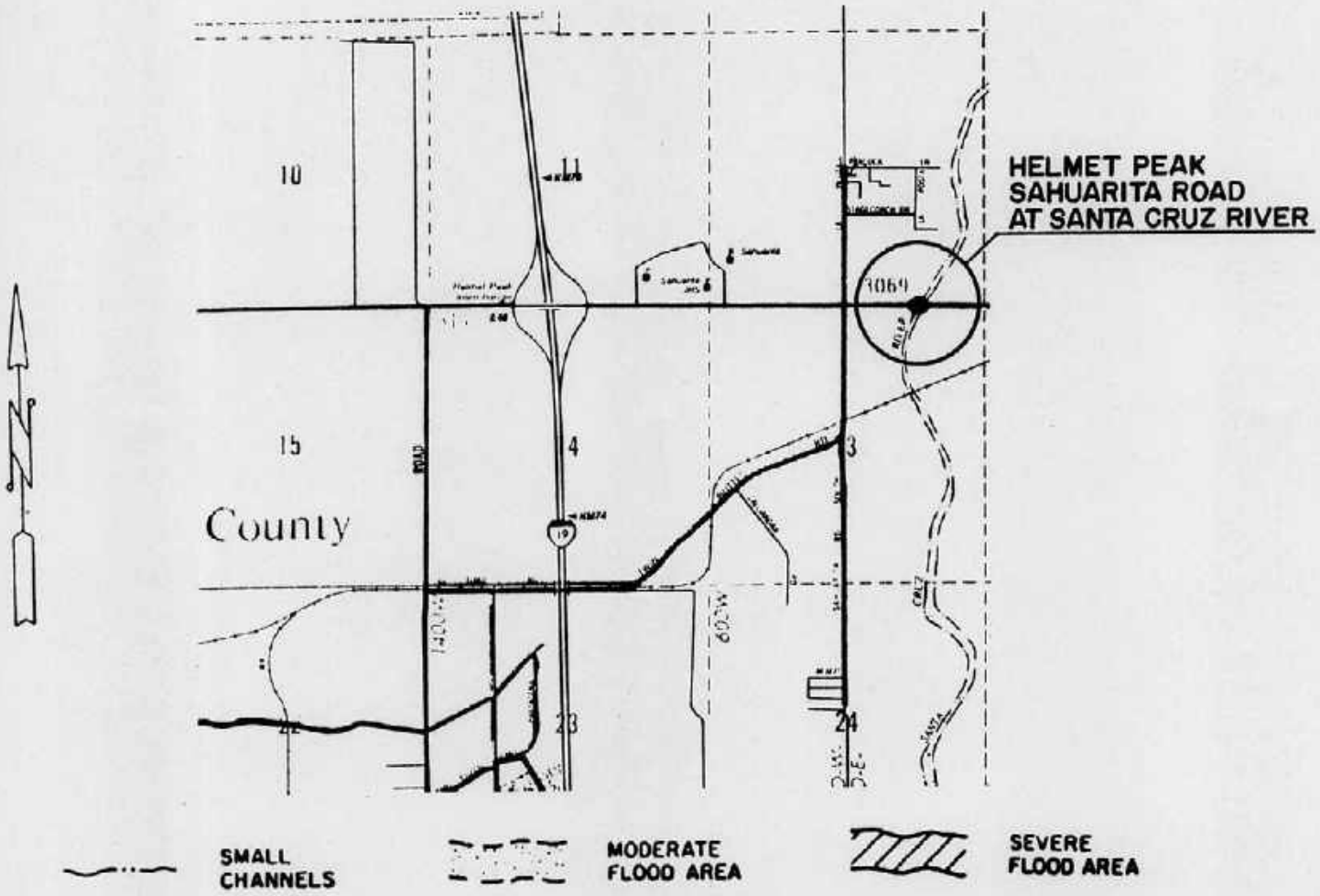


CONTINENTAL ROAD,
SANTA CRUZ RIVER
OCTOBER 3, 1983

- S0025

HELMET PEAK-SAHUARITA RD., SANTA CRUZ RIVER

BRIDGE



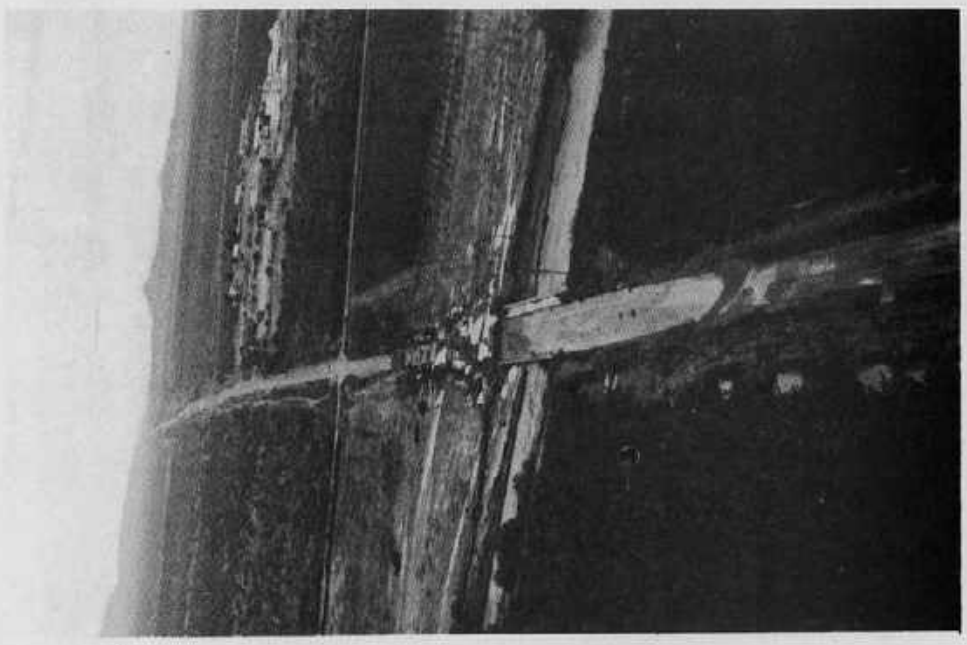
Damage Description:

The damage to the bridge consisted of undercutting of the west abutment footing and washing out of the west abutment approach fill.

50026

HELMET PEAK—
SAHUARITA ROAD,
SANTA CRUZ RIVER

LOOKING NORTH



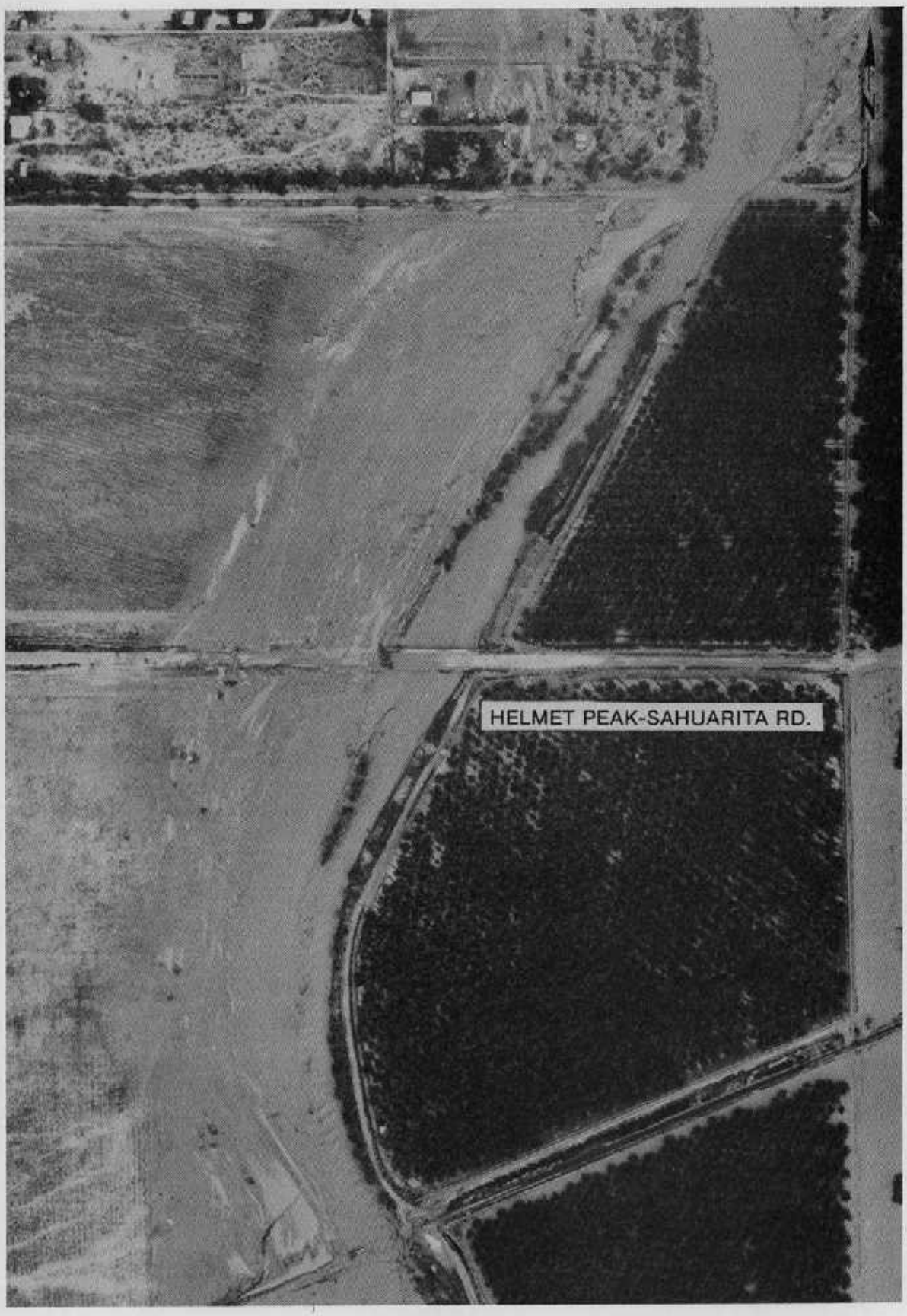
LOOKING WEST

LOOKING EAST

S0027

HELMET PEAK—SAHUARITA ROAD,
SANTA CRUZ RIVER
NOVEMBER 2, 1982

S0028

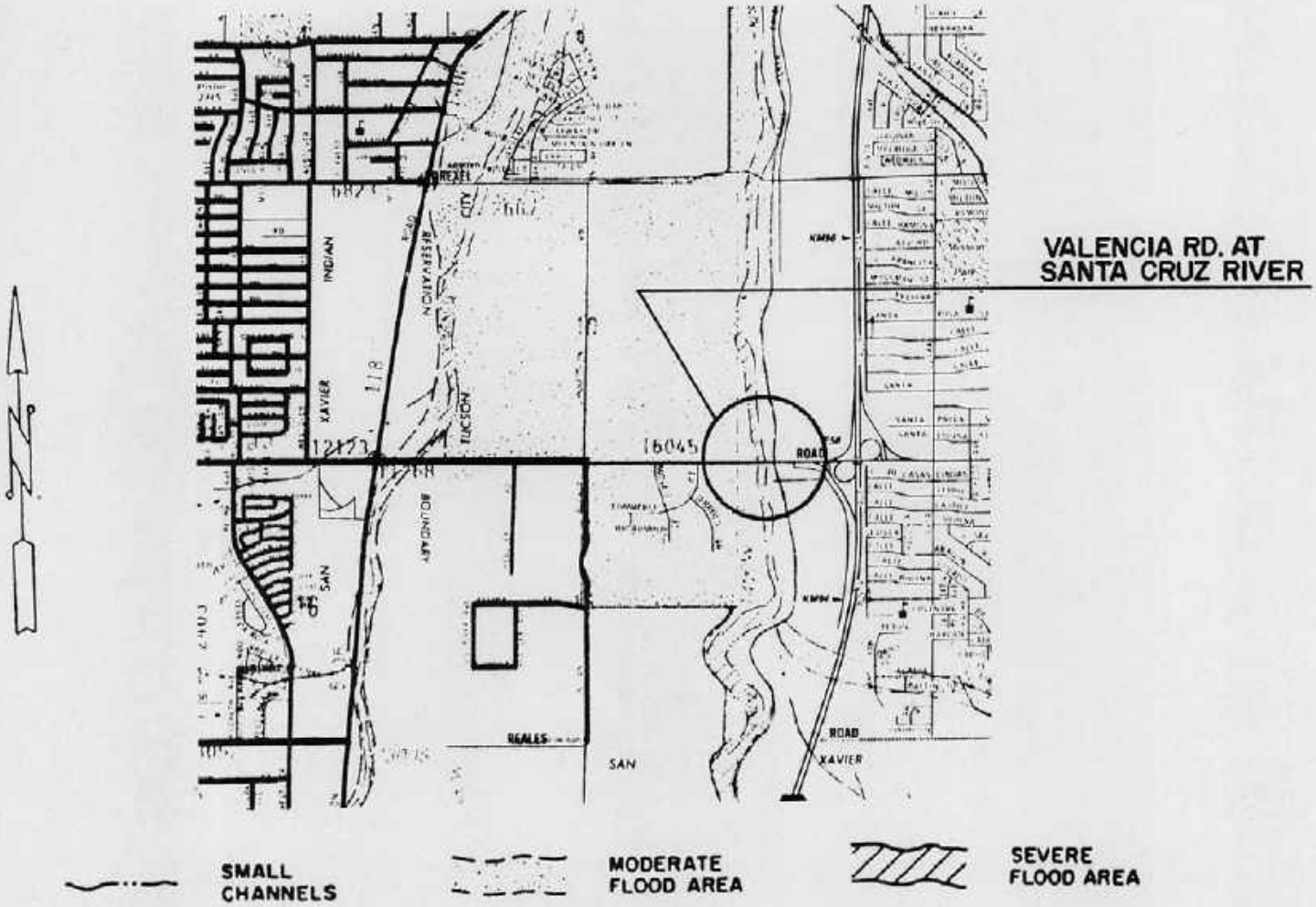


HELMET PEAK—SAHUARITA ROAD,
SANTA CRUZ RIVER
OCTOBER 3, 1983

S0029

VALENCIA RD., SANTA CRUZ RIVER

BRIDGE



Damage Description:

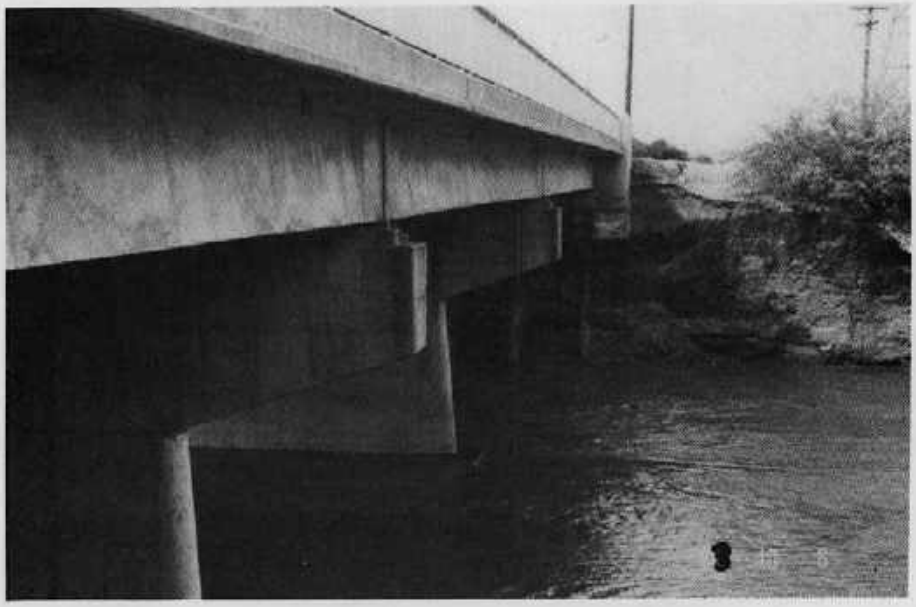
The damage to the bridge consisted of the loss of bank protection and the exposing of the piling at the west abutment.

50030

VALENCIA ROAD,
SANTA CRUZ RIVER

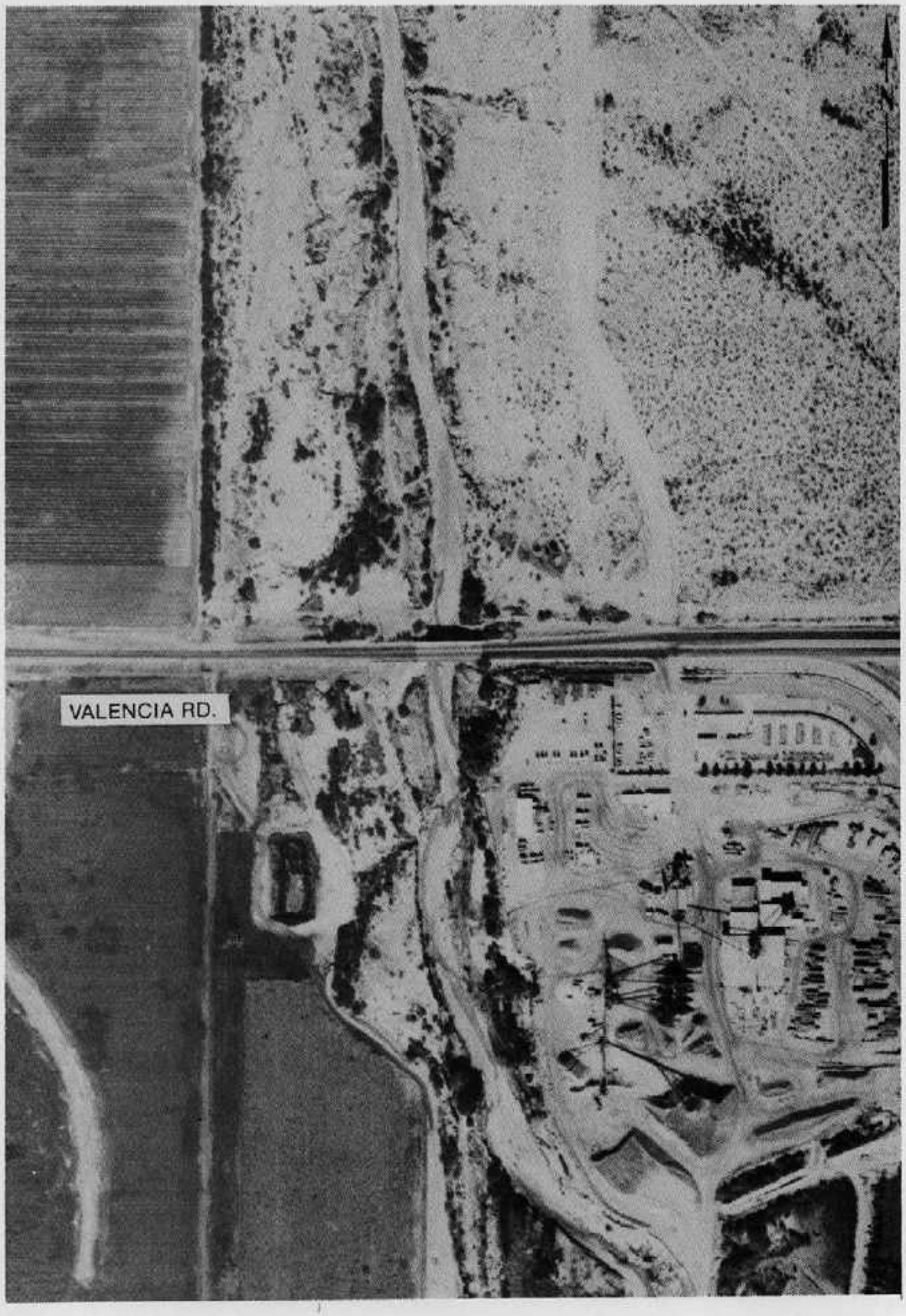
LOOKING NORTHWEST

LOOKING SOUTH



LOOKING WEST

50031



VALENCIA ROAD,
SANTA CRUZ RIVER
NOVEMBER 2, 1982

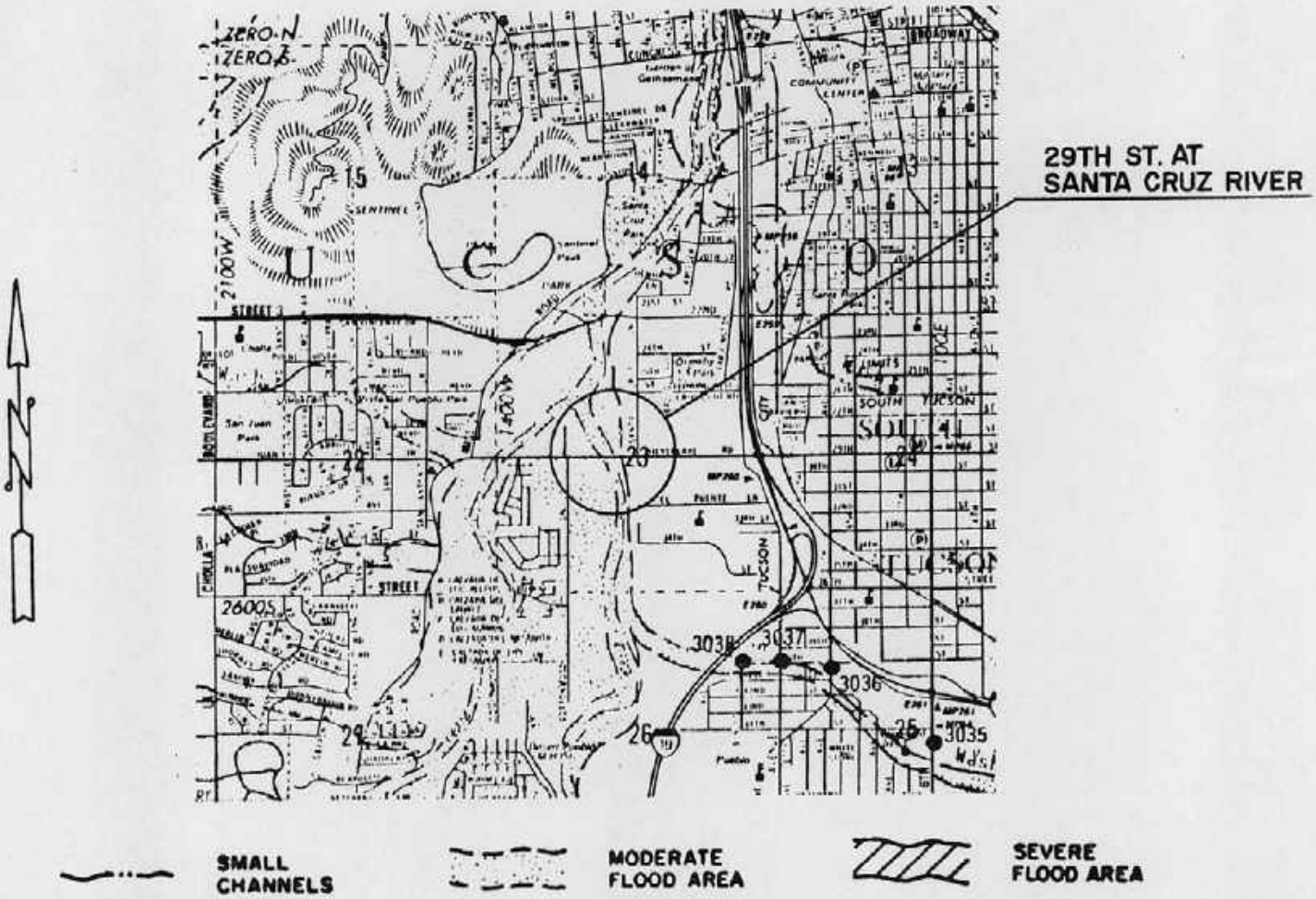
S0032

VALENCIA ROAD,
SANTA CRUZ RIVER
OCTOBER 3, 1983

S0088

29TH ST., SANTA CRUZ RIVER

BRIDGE



Damage Description:

Both the east and west bridge abutments suffered erosion damage.

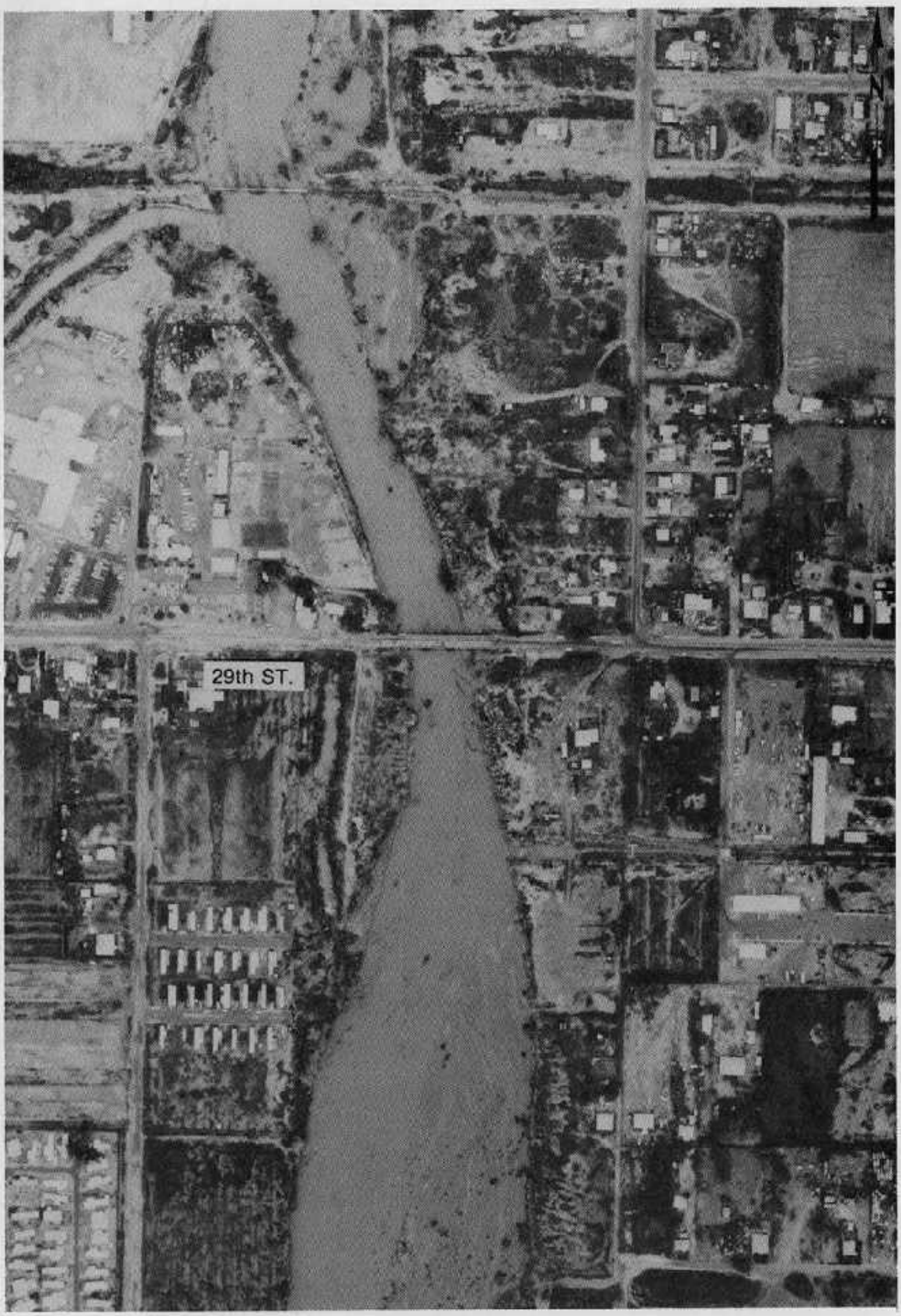
S0034

LOOKING SOUTHWEST

S0035

29TH STREET,
SANTA CRUZ RIVER
NOVEMBER 2, 1982

S0036



29TH STREET,
SANTA CRUZ RIVER
OCTOBER 3, 1983

50037

22ND ST., SANTA CRUZ RIVER

BRIDGE

SMALL CHANNELS

MODERATE FLOOD AREA

SEVERE FLOOD AREA

Damage Description:

The Santa Cruz River eroded a large section of natural bank upstream of the west abutment, and disrupted some segments of the bank on the west channel.

50038

22ND STREET,
SANTA CRUZ RIVER
NOVEMBER 2, 1982

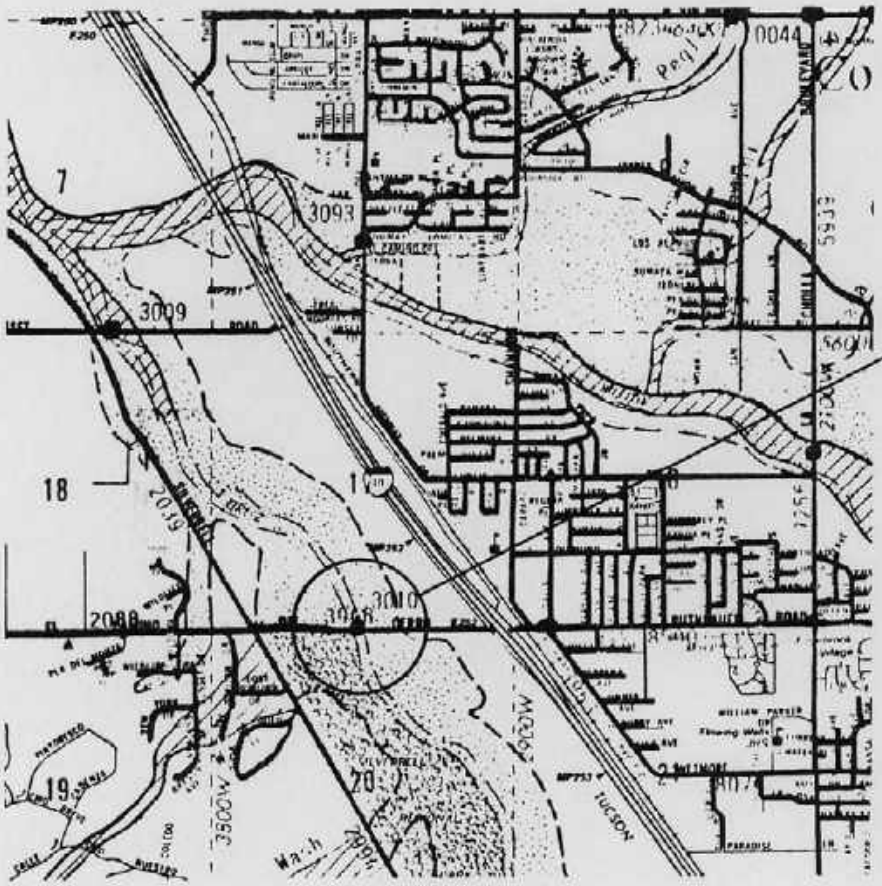
S0035

22ND STREET,
SANTA CRUZ RIVER
OCTOBER 3, 1983

S0040

EL CAMINO DEL CERRO, SANTA CRUZ RIVER

BRIDGE



SMALL CHANNELS

MODERATE FLOOD AREA

SEVERE FLOOD AREA

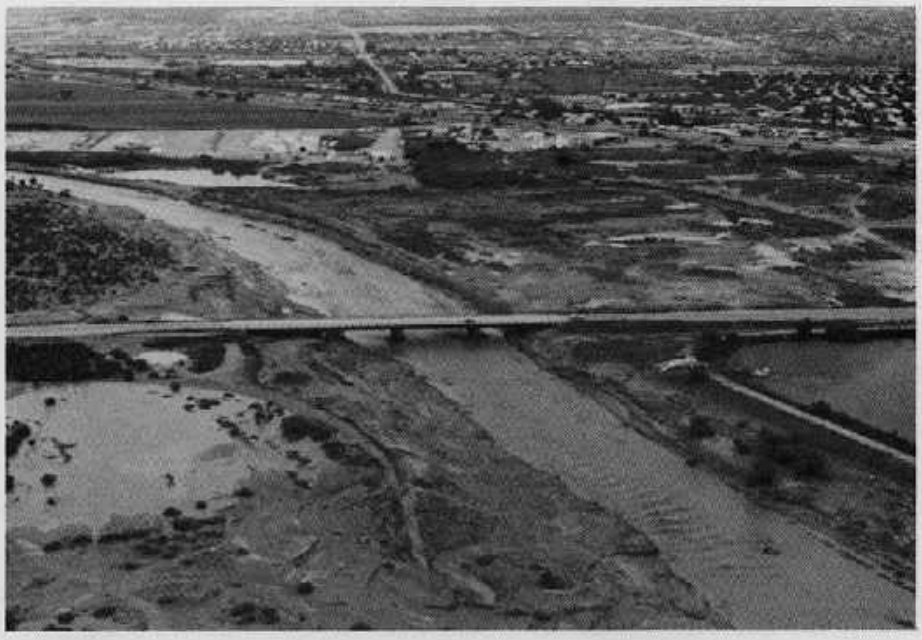
Damage Description:

The west spur dike to the bridge was damaged.

S0041

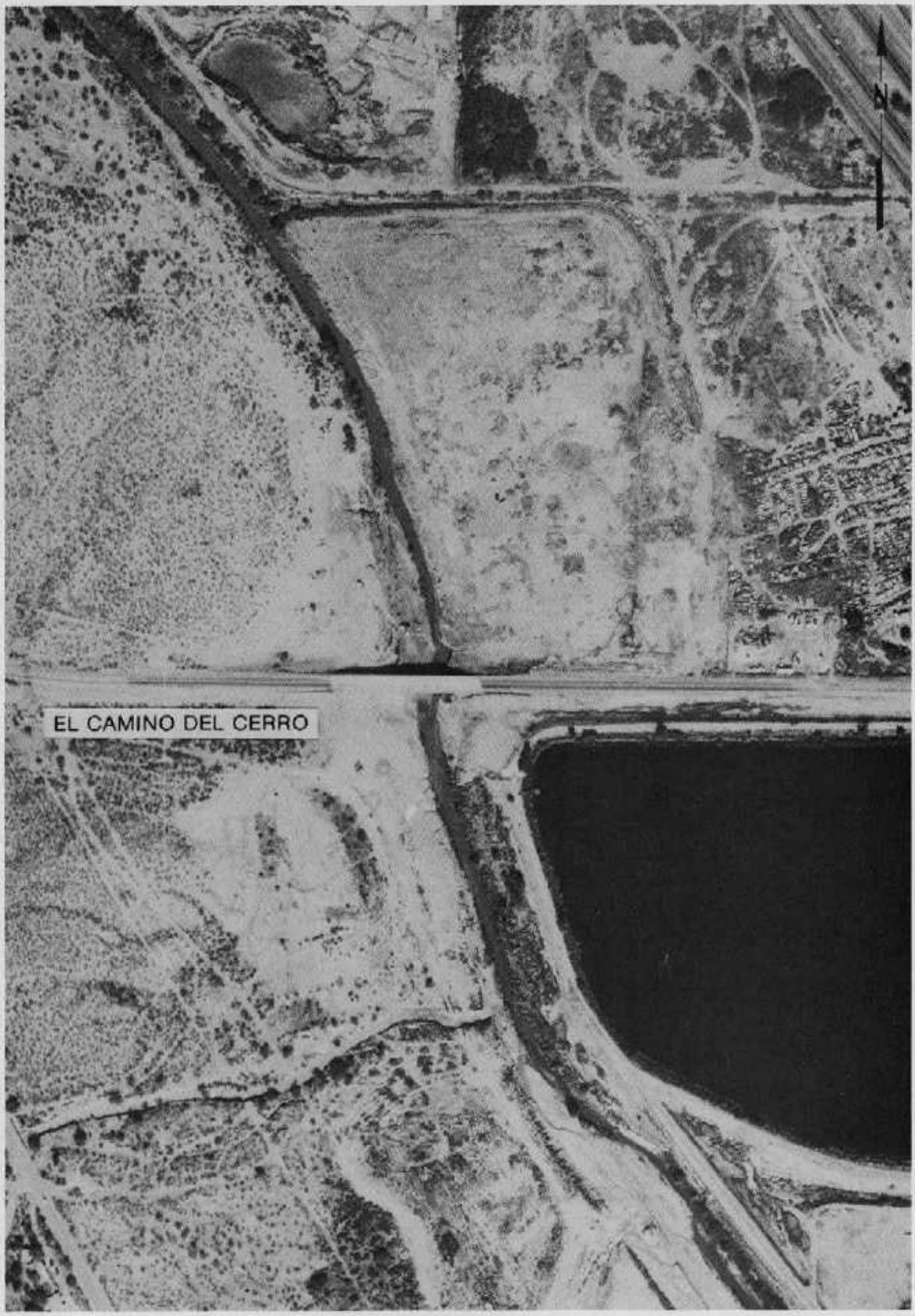
EL CAMINO DEL CERRO,
SANTA CRUZ RIVER

LOOKING EAST



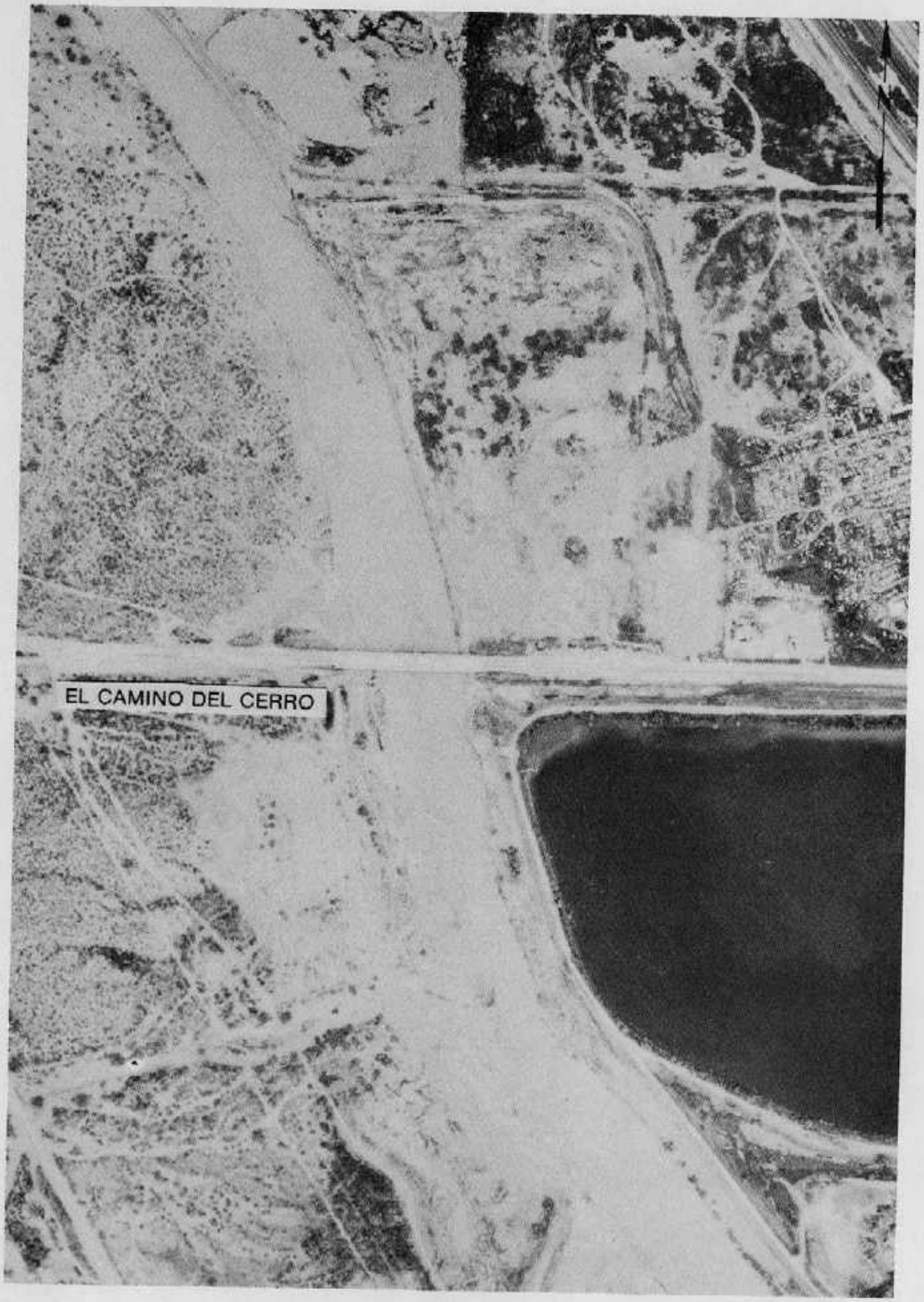
LOOKING NORTH

500 42



EL CAMINO DEL CERRO,
SANTA CRUZ RIVER
NOVEMBER 12, 1982

S0043

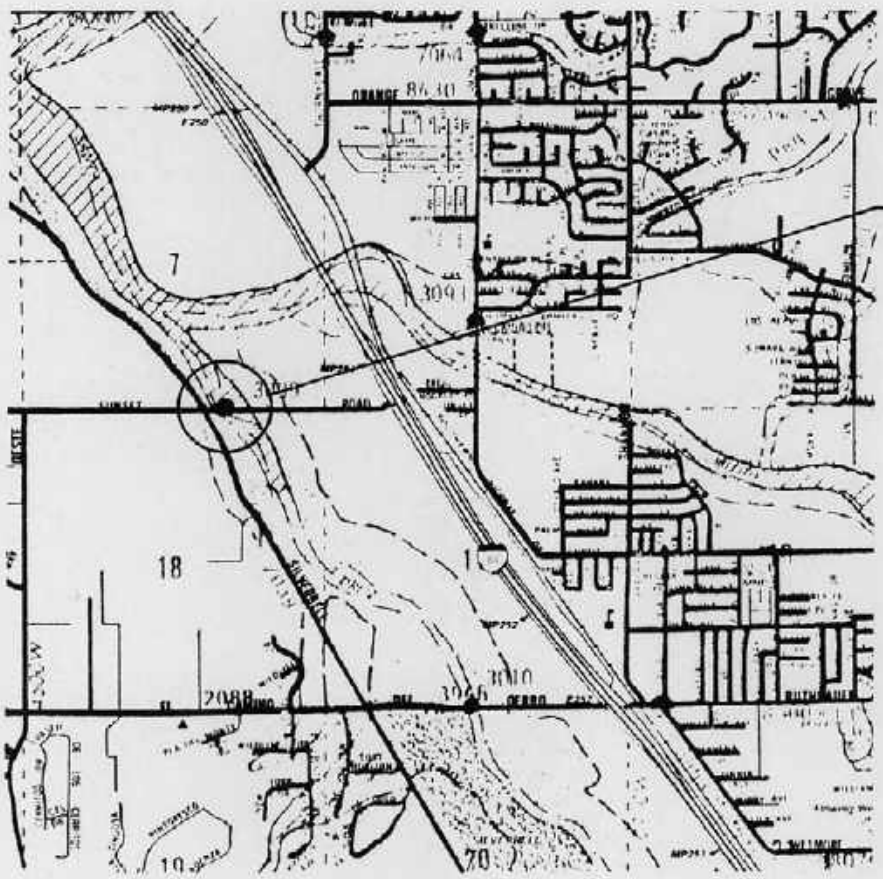


EL CAMINO DEL CERRO,
SANTA CRUZ RIVER
OCTOBER 3, 1983

-50044

SUNSET RD., SANTA CRUZ RIVER

BRIDGE



SMALL CHANNELS

MODERATE FLOOD AREA

SEVERE FLOOD AREA

Damage Description:

The bridge was totally destroyed due to the flood. There was severe sedimentation on approach roadways.

S0045

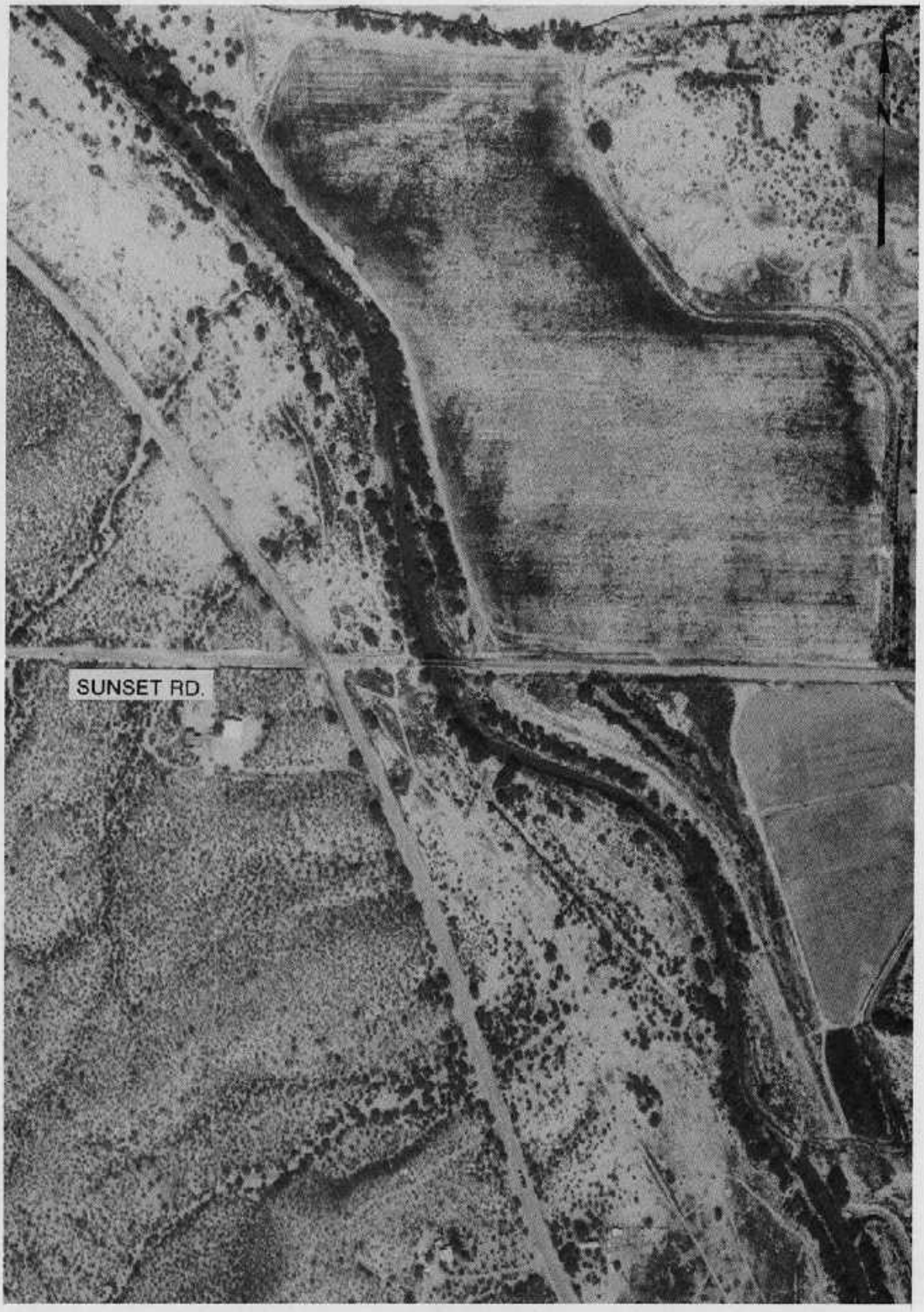
SUNSET ROAD,
SANTA CRUZ RIVER

LOOKING SOUTH

LOOKING EAST

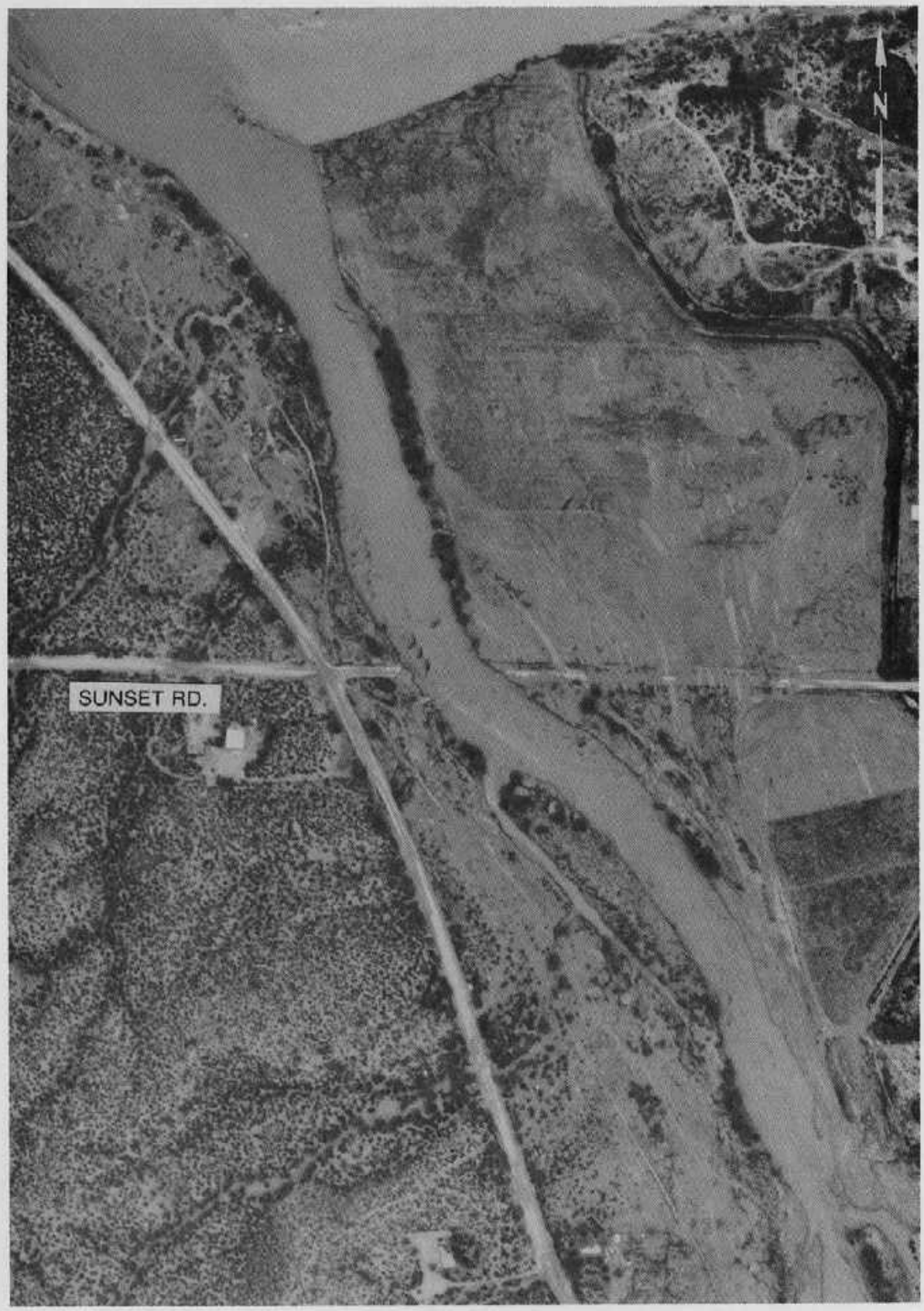
LOOKING EAST

S0046



SUNSET ROAD,
SANTA CRUZ RIVER
NOVEMBER 12, 1982

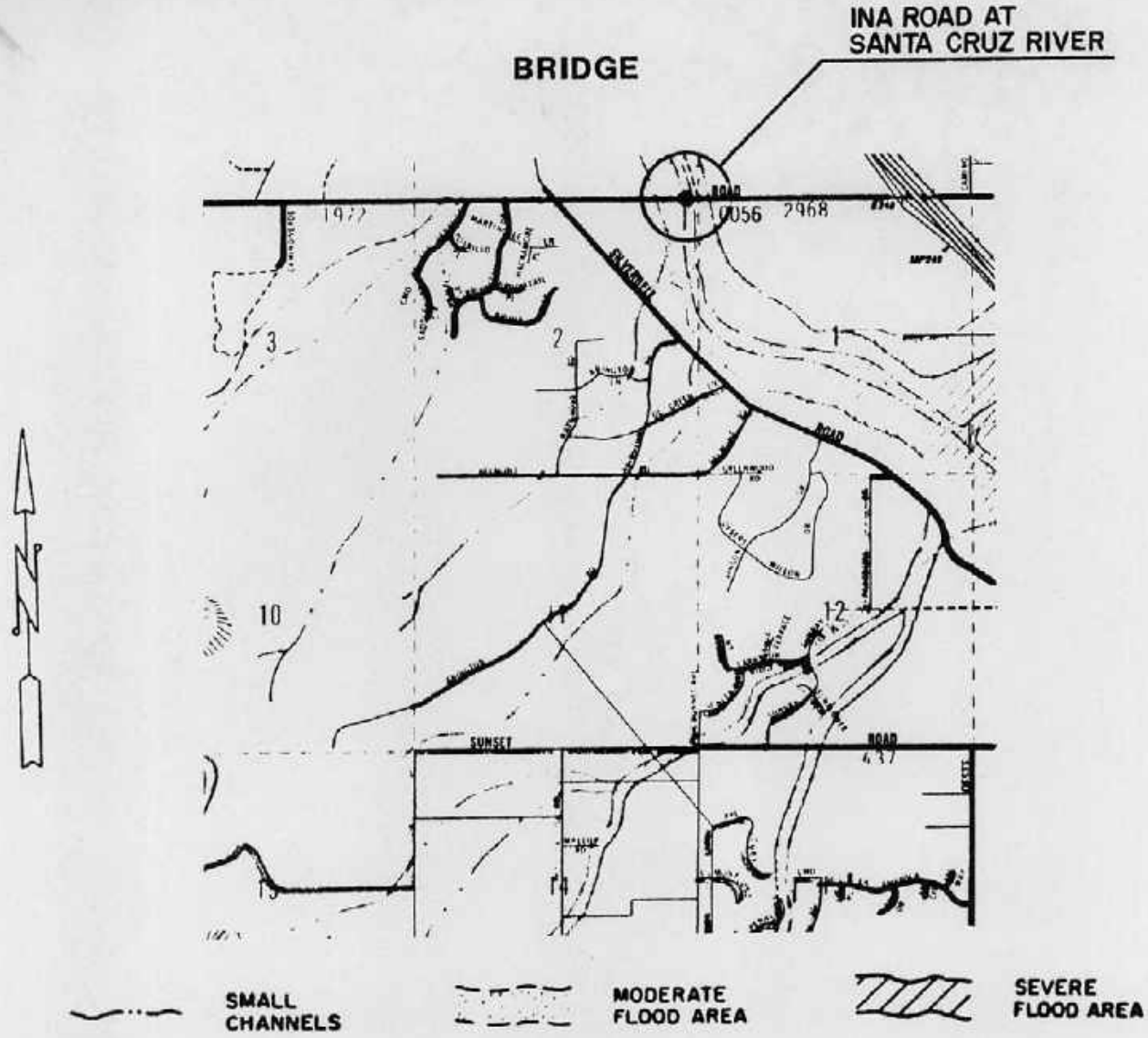
S0047



SUNSET ROAD,
SANTA CRUZ RIVER
OCTOBER 3, 1983

50048

INA ROAD, SANTA CRUZ RIVER



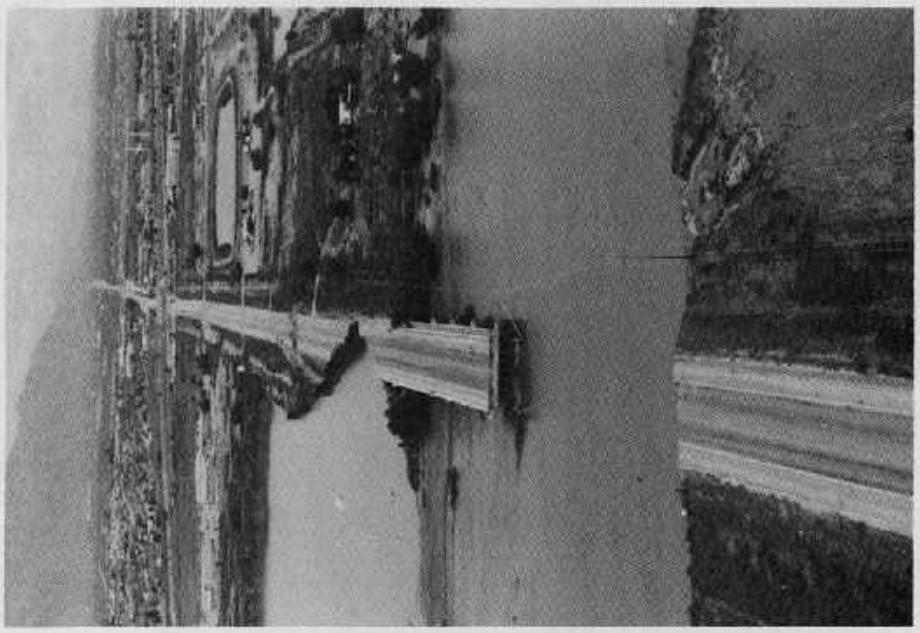
Damage Description:

The damage to the bridge included the failure of the west abutment as a result of erosion to the west bank; the breaking off of the south wing wall and support pile; the settling of the southwest corner of the west abutment; and loss of portions of the east and west approaches.

S0049

INA ROAD,
SANTA CRUZ RIVER

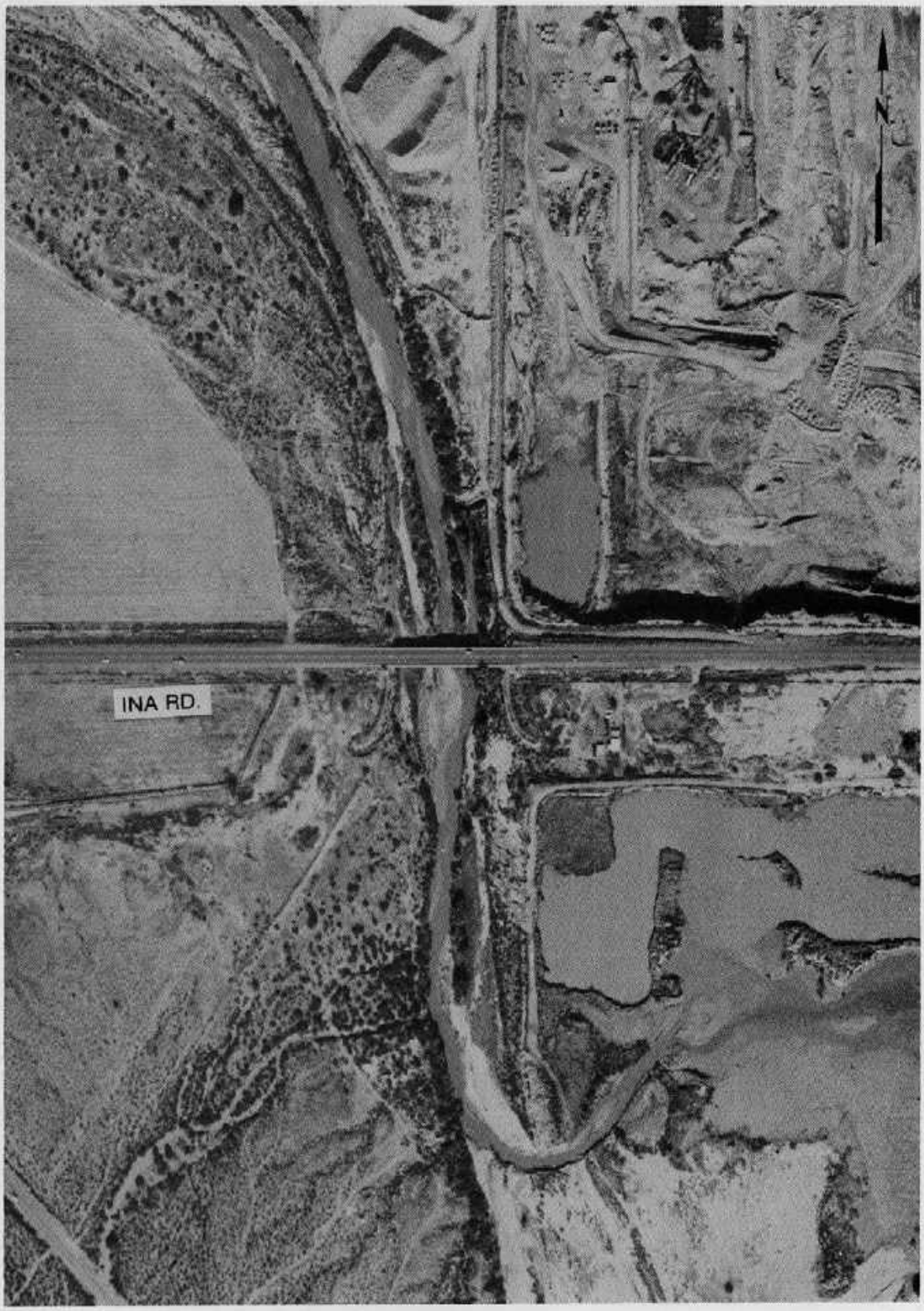
LOOKING NORTHWEST



LOOKING EAST

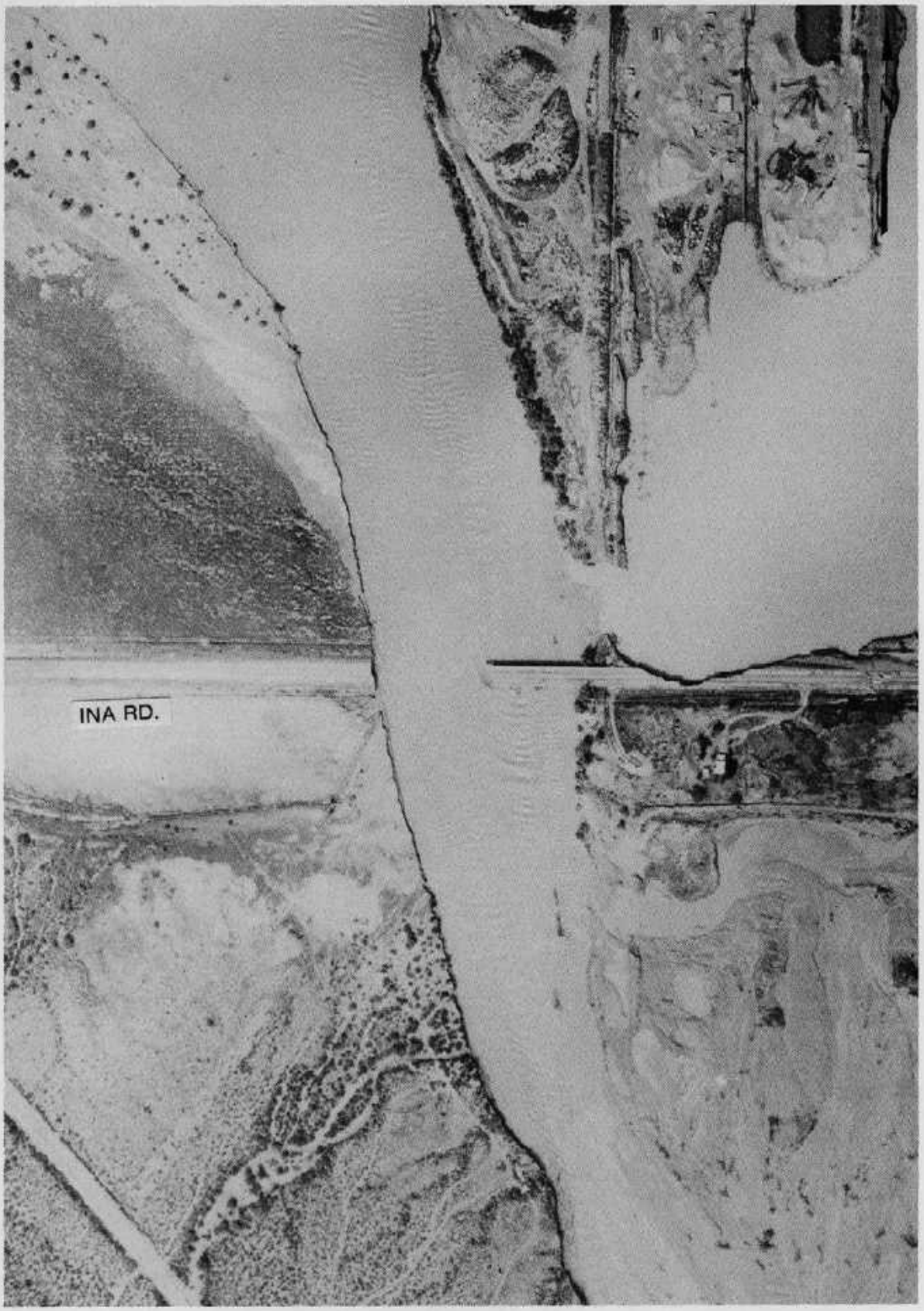
LOOKING EAST

30050



INA ROAD,
SANTA CRUZ RIVER
DECEMBER 4, 1982

S0057

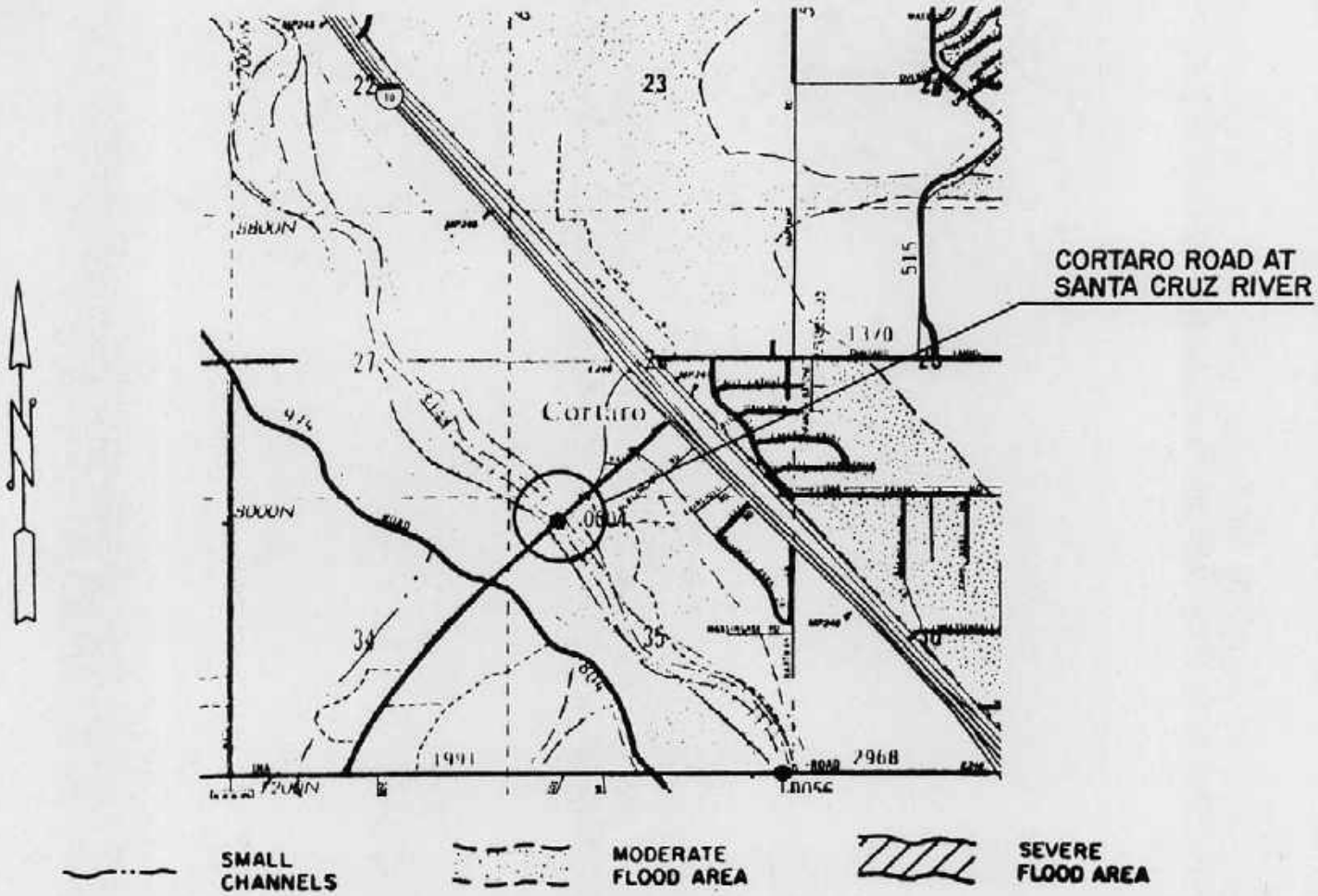


INA ROAD,
SANTA CRUZ RIVER
OCTOBER 3, 1983

S0052

CORTARO RD., SANTA CRUZ RIVER

BRIDGE

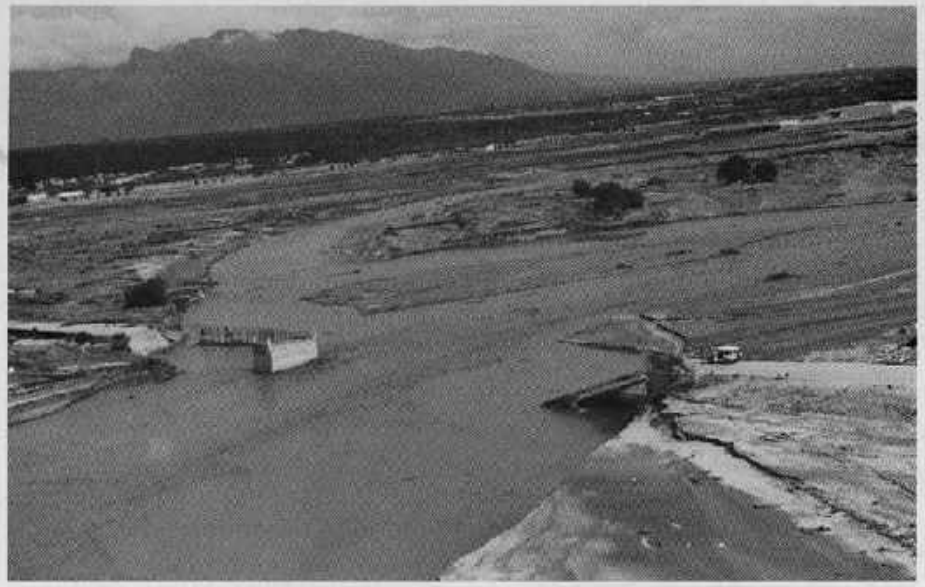


Damage Description:

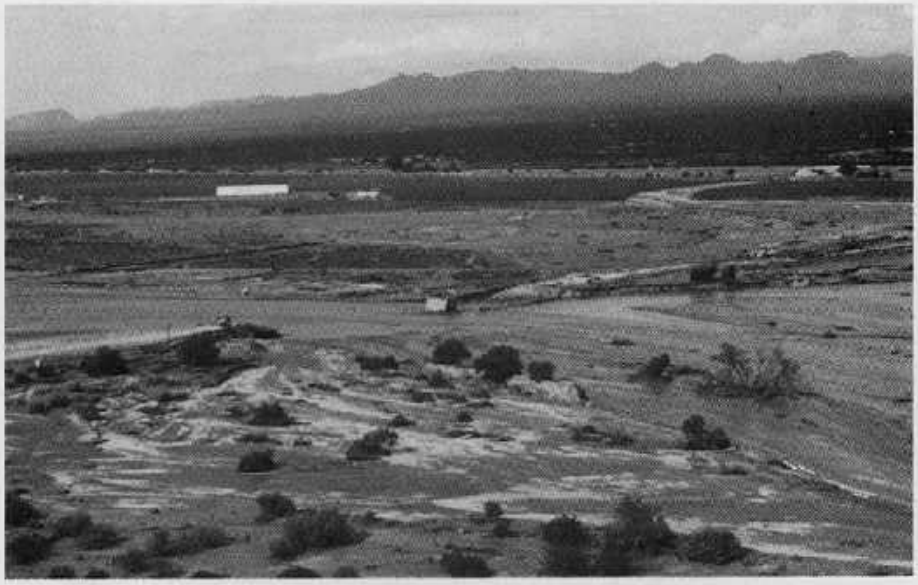
The bridge was totally destroyed due to the flood.

S0053

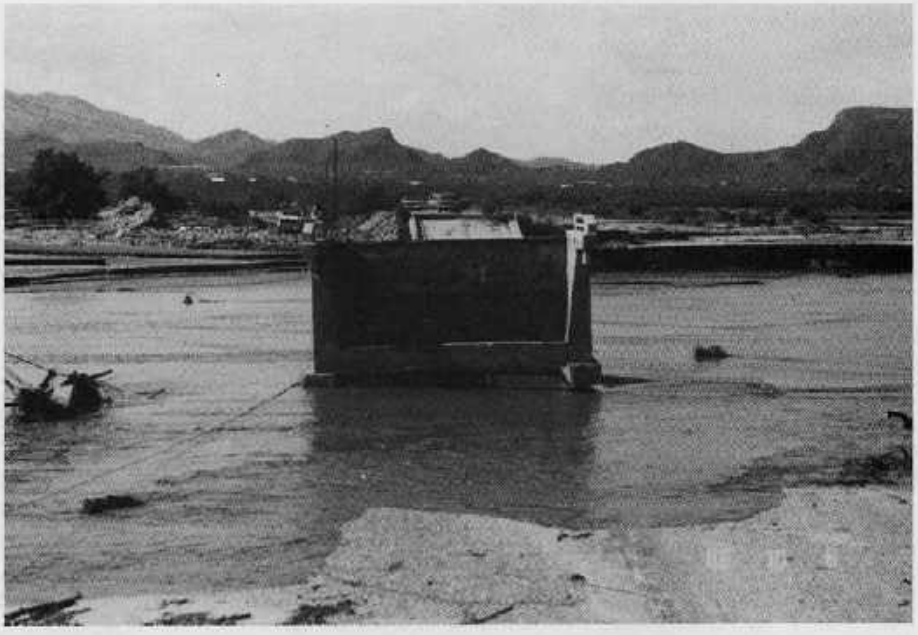
CORTARO ROAD,
SANTA CRUZ RIVER



LOOKING SOUTHEAST

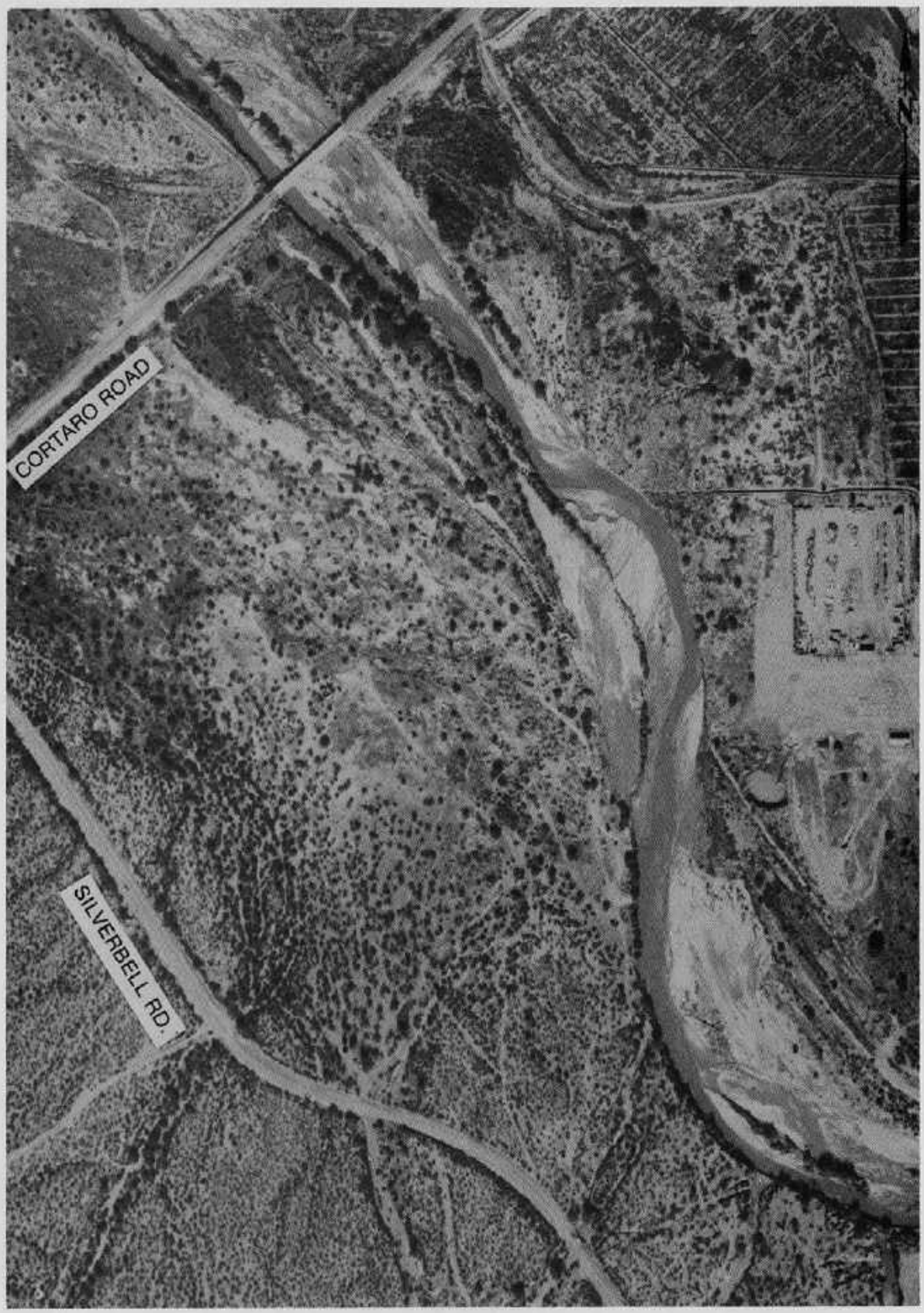


LOOKING NORTHEAST



LOOKING SOUTHWEST

S0054



CORTARO ROAD,
SANTA CRUZ RIVER
DECEMBER 4, 1982

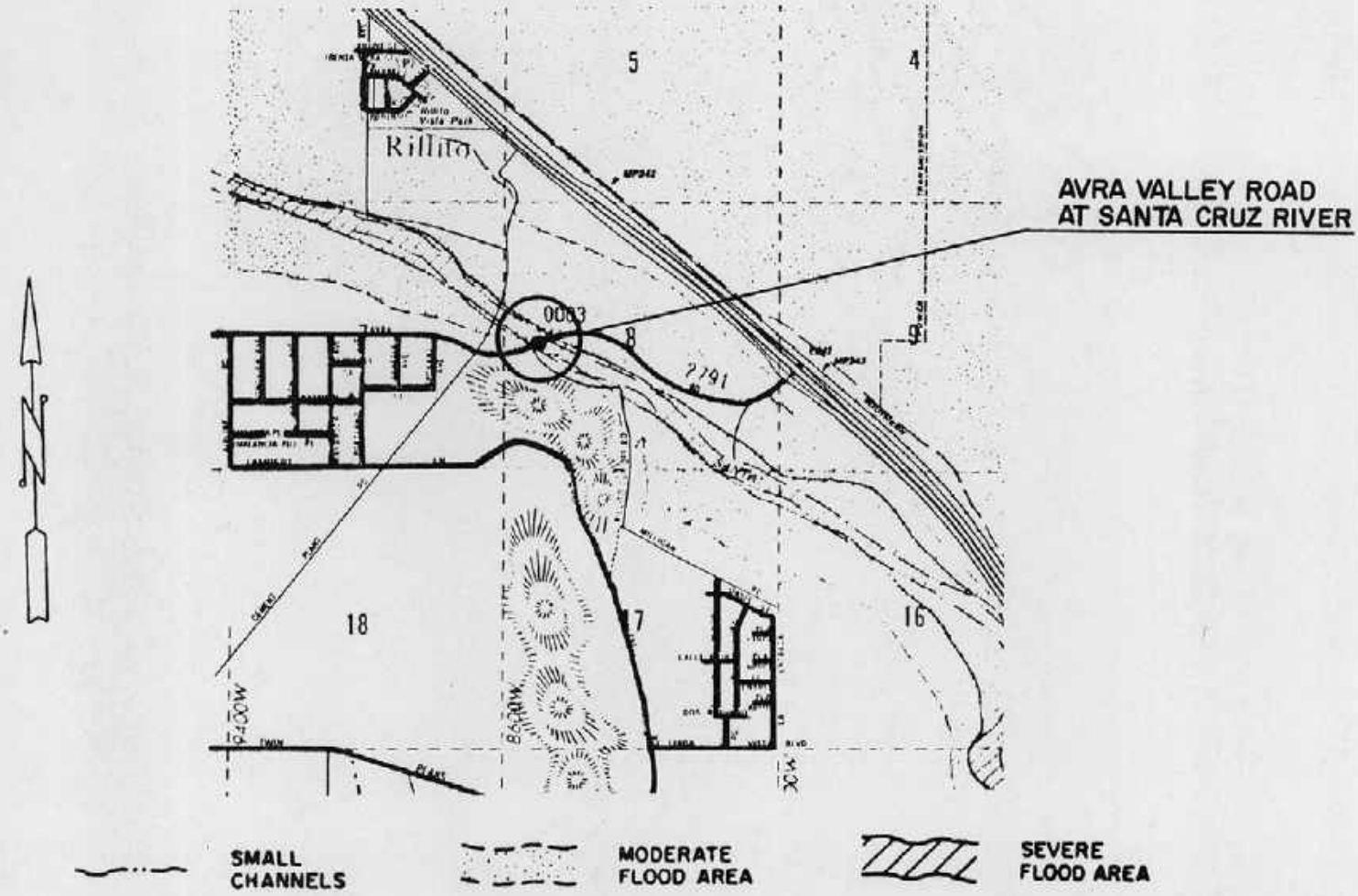
S0055

CORTARO ROAD,
SANTA CRUZ RIVER
OCTOBER 3, 1983

S005519

AVRA VALLEY RD., SANTA CRUZ RIVER

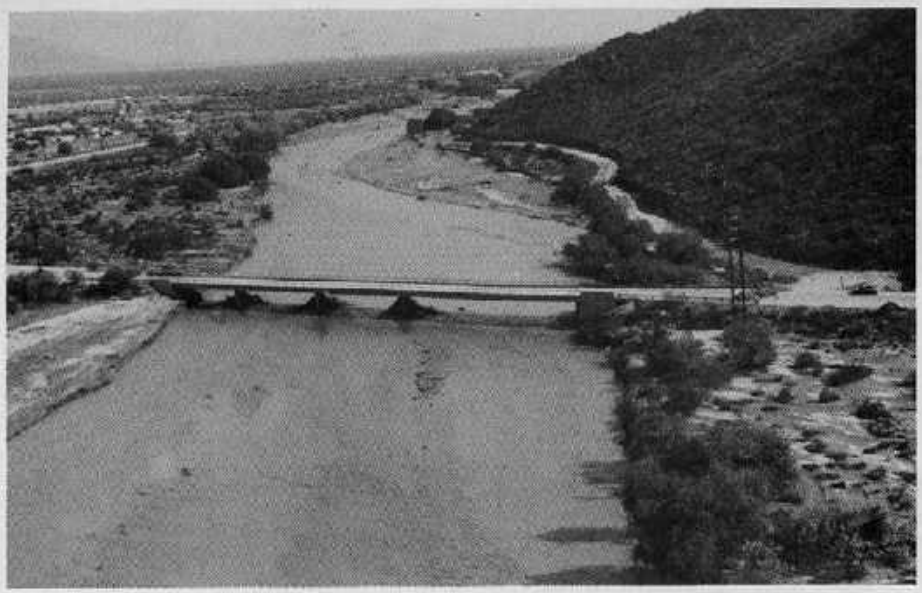
BRIDGE



Damage Description:

The damage to the bridge consisted of the loss of Pier No. 1 and scouring under the west abutment footing.

S0056



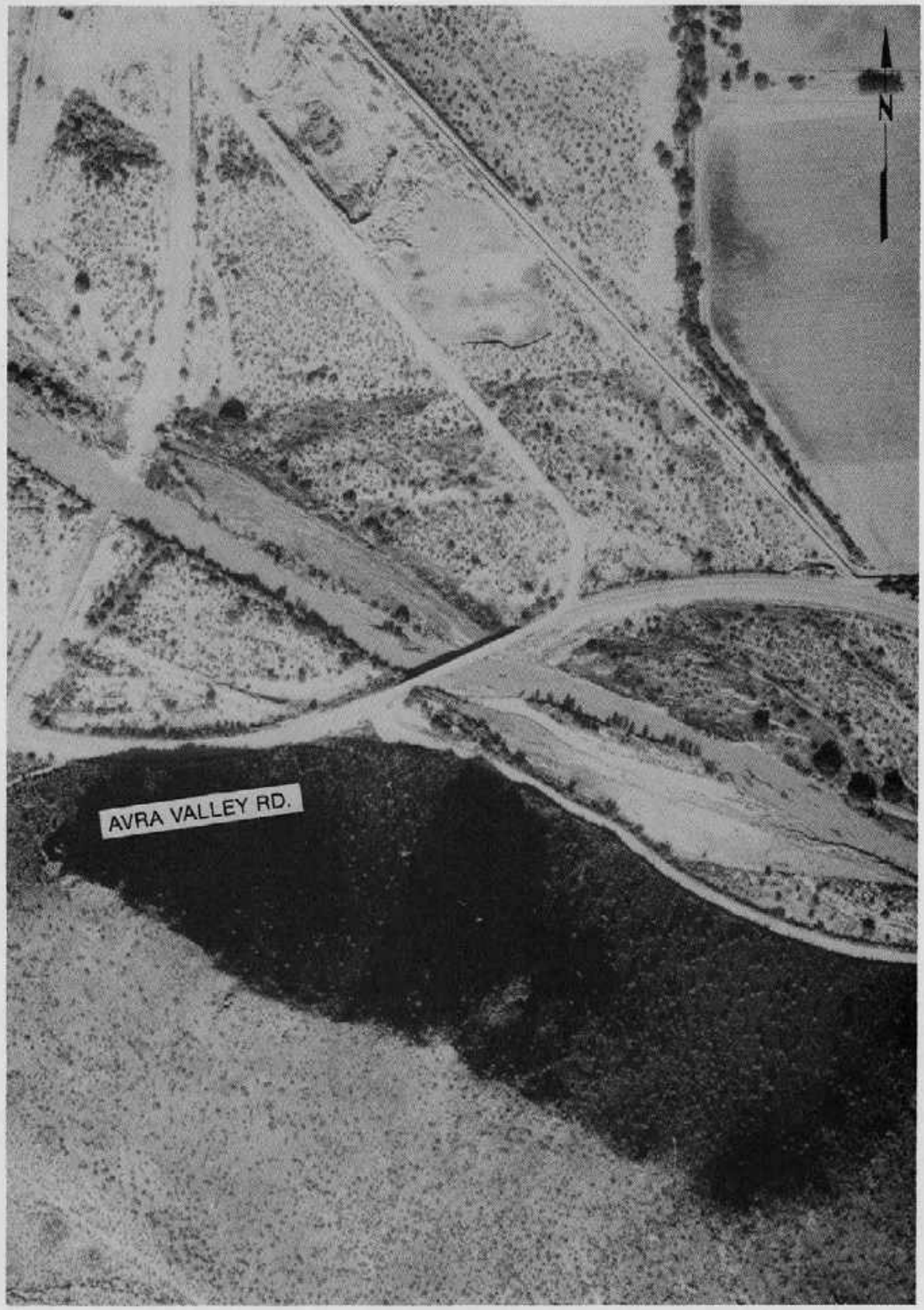
AVRA VALLEY ROAD,
SANTA CRUZ RIVER

LOOKING SOUTHEAST

LOOKING SOUTHEAST

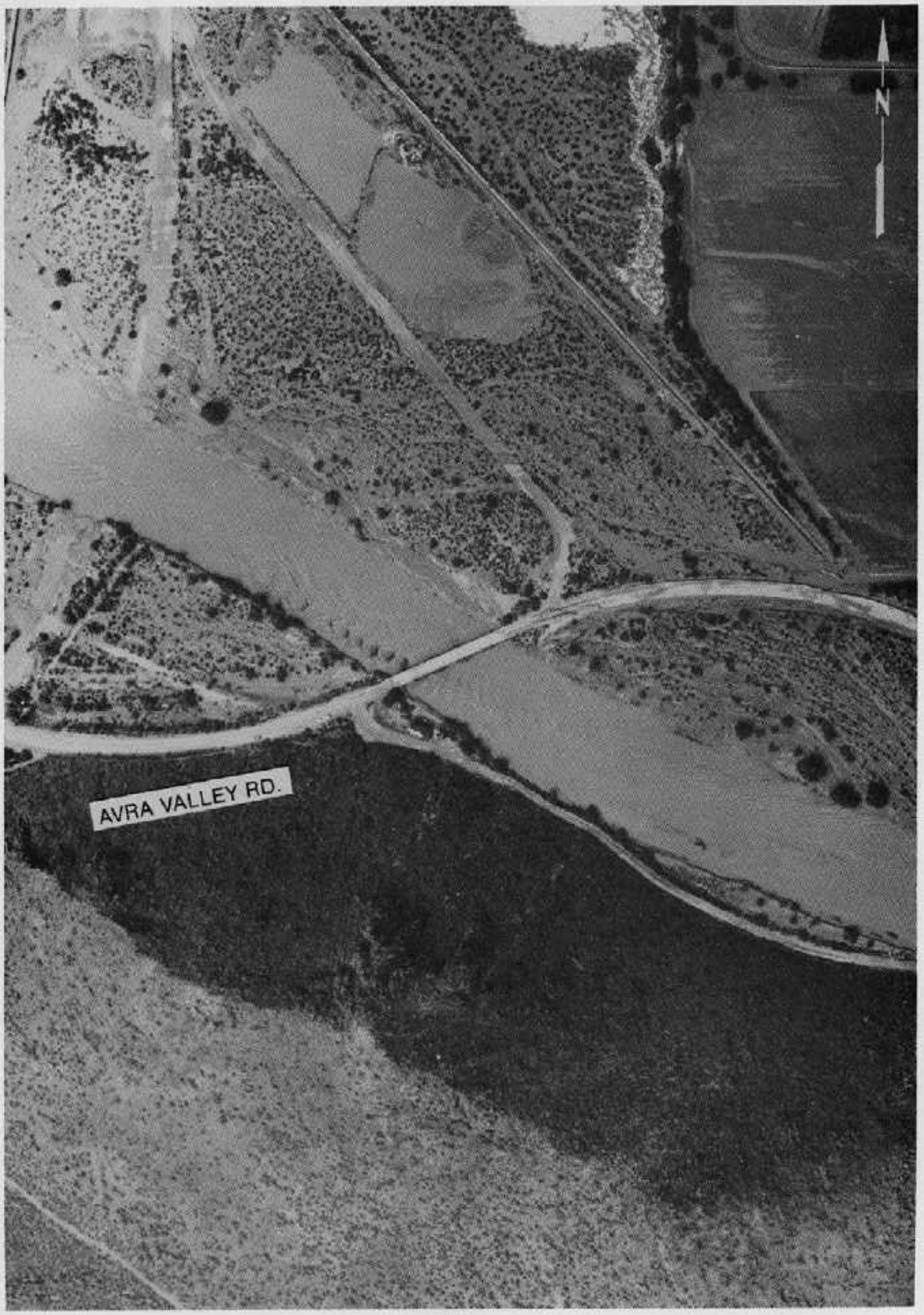
LOOKING EAST

S0057



AVRA VALLEY ROAD,
SANTA CRUZ RIVER
DECEMBER 16, 1982

S0058

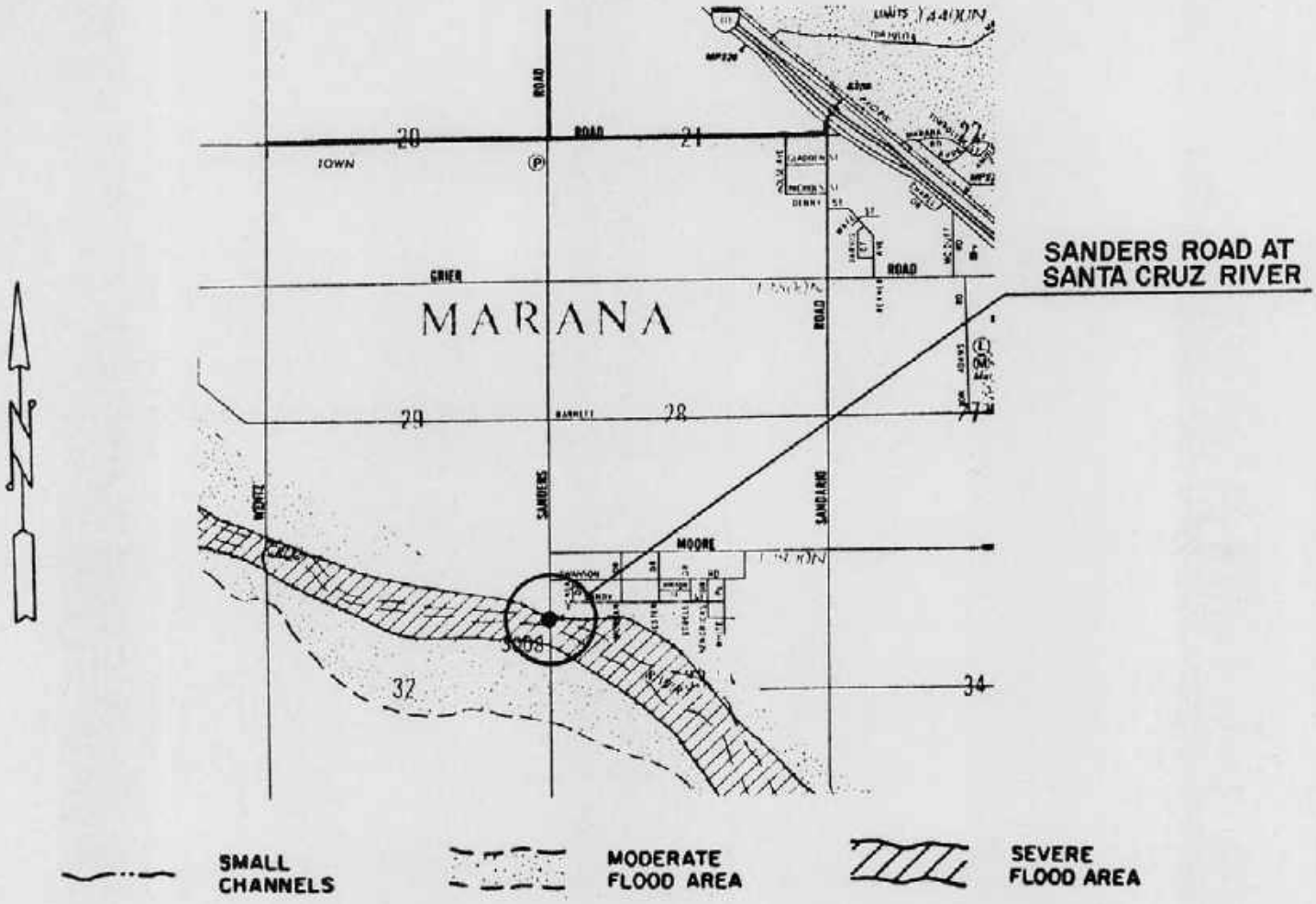


AVRA VALLEY ROAD,
SANTA CRUZ RIVER
OCTOBER 3, 1983

S0059

SANDERS RD., SANTA CRUZ RIVER

BRIDGE



Damage Description:

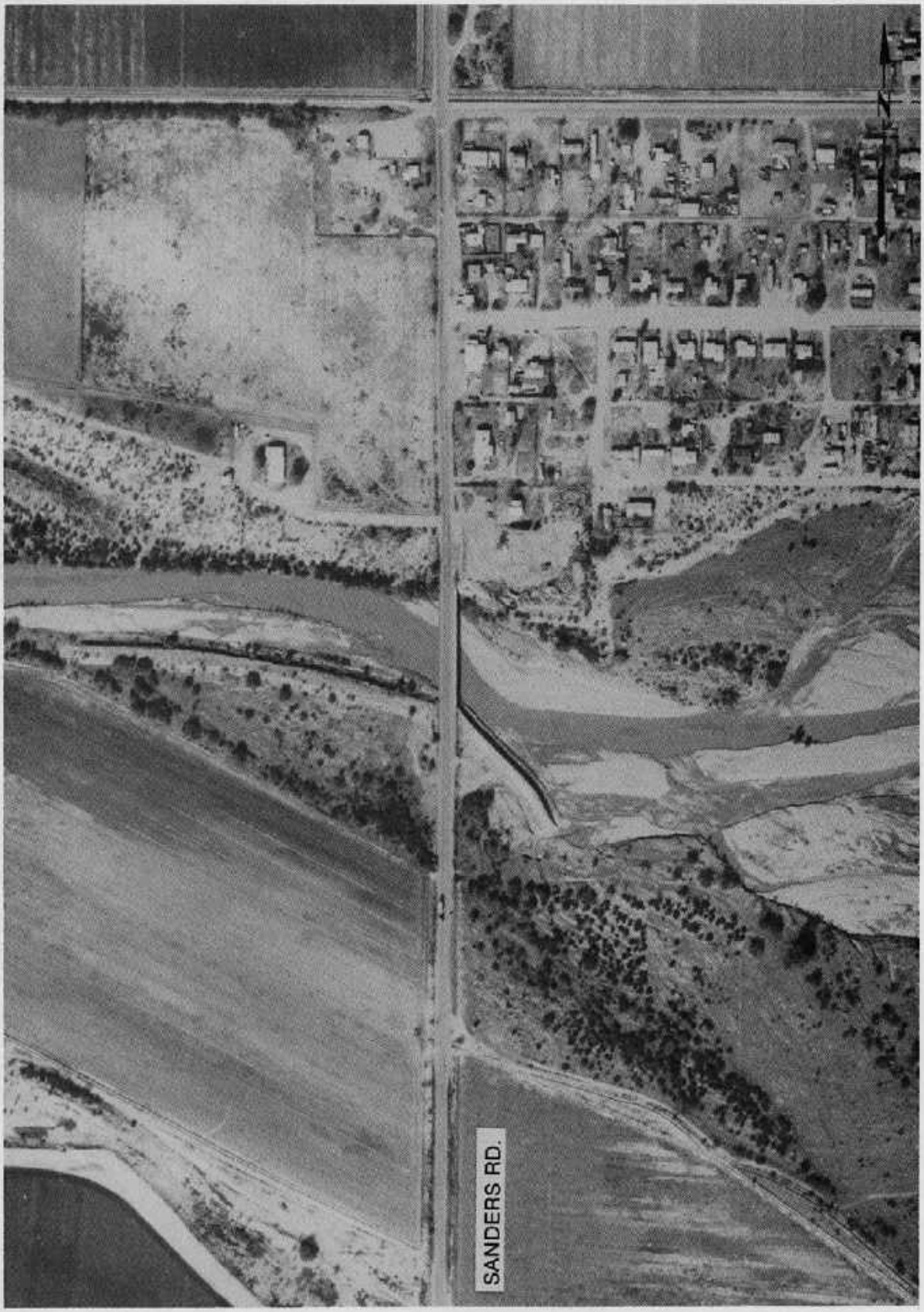
South roadway approach was washed out and erosion of the north Santa Cruz bank threatened developed property.

S0060

LOOKING SOUTHEAST

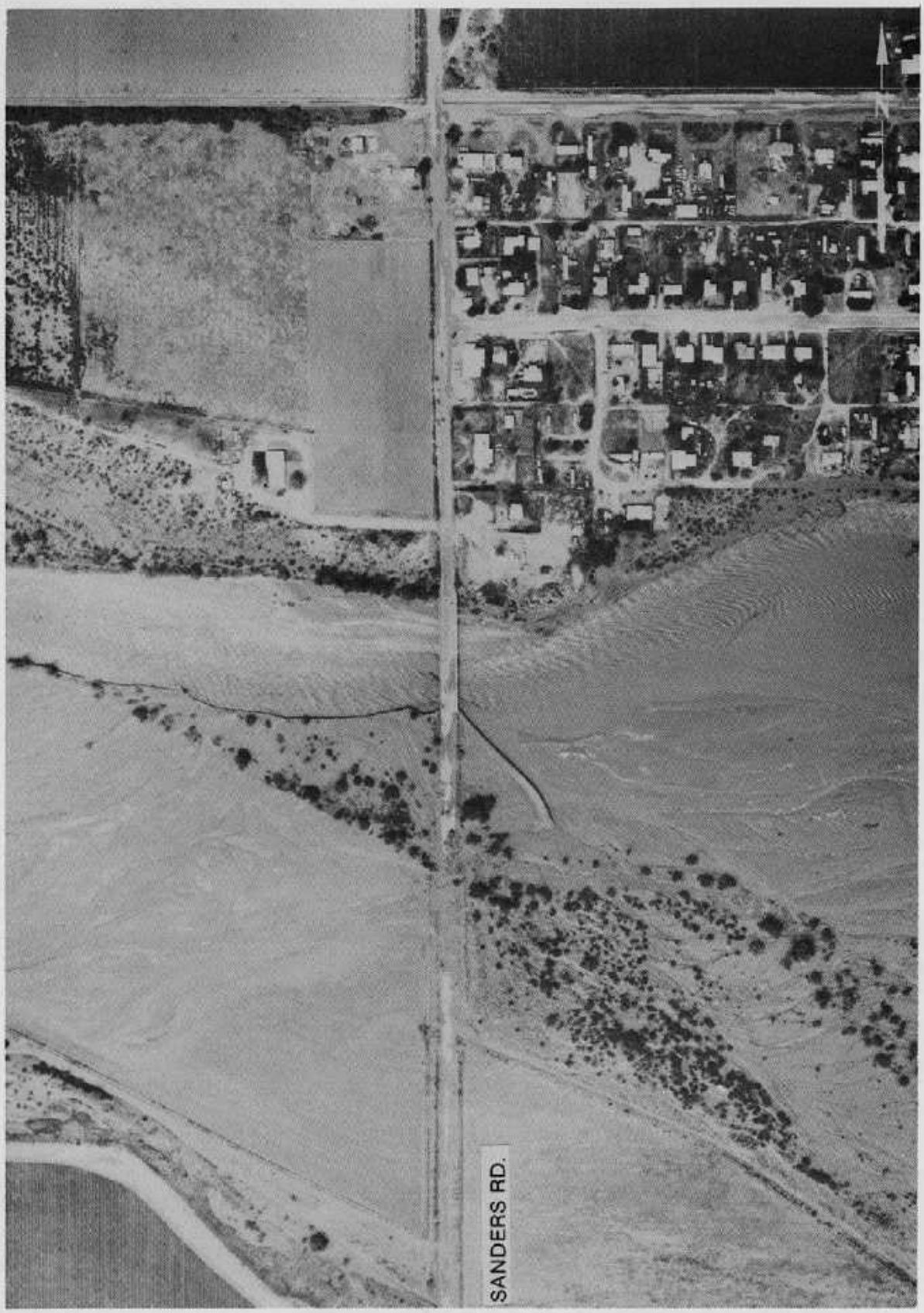
LOOKING WEST

S0061



SANDERS ROAD,
SANTA CRUZ RIVER
DECEMBER 16, 1982

SQ062

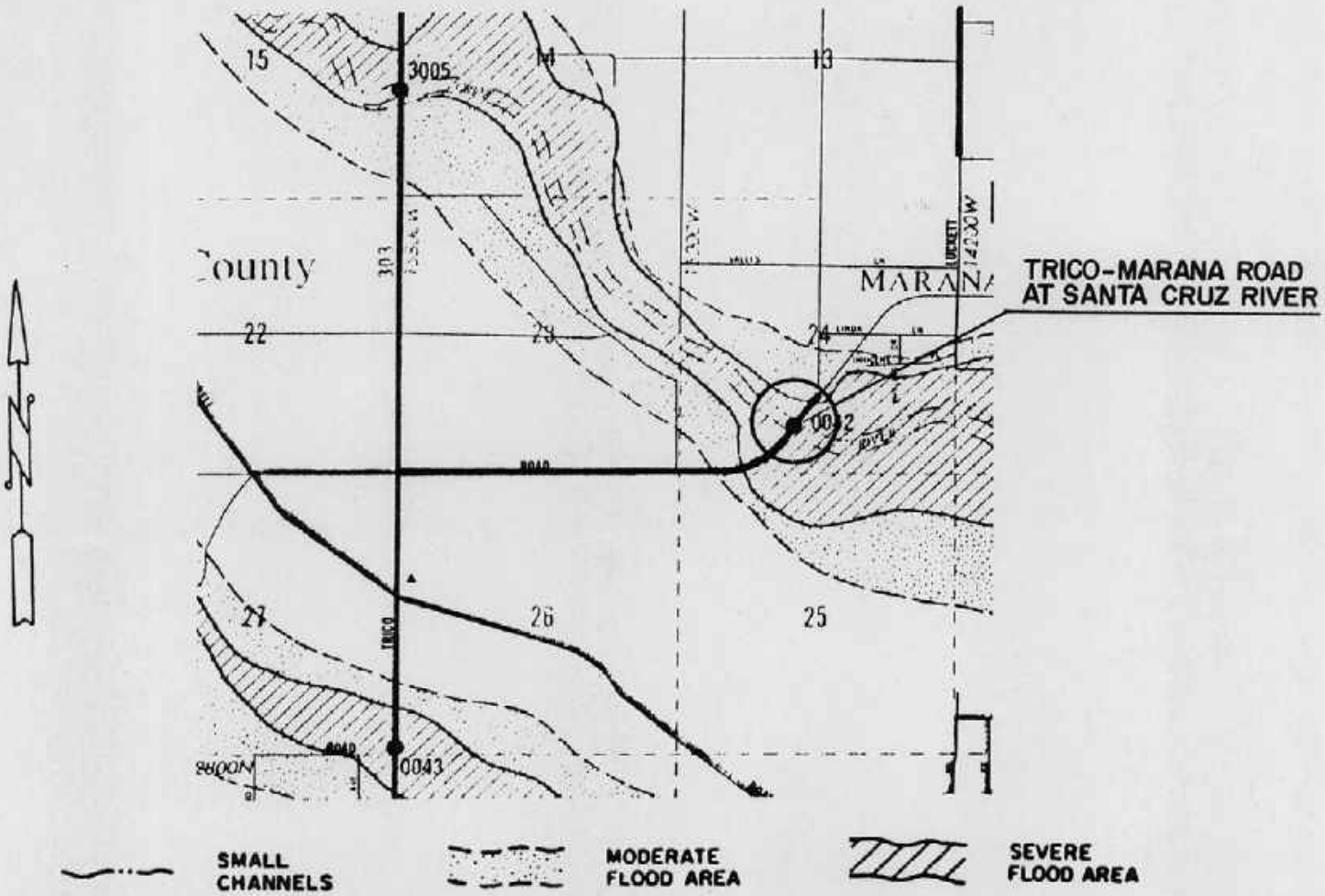


SANDERS ROAD,
SANTA CRUZ RIVER
OCTOBER 3, 1983

S0063

TRICO-MARANA RD., SANTA CRUZ RIVER

BRIDGE

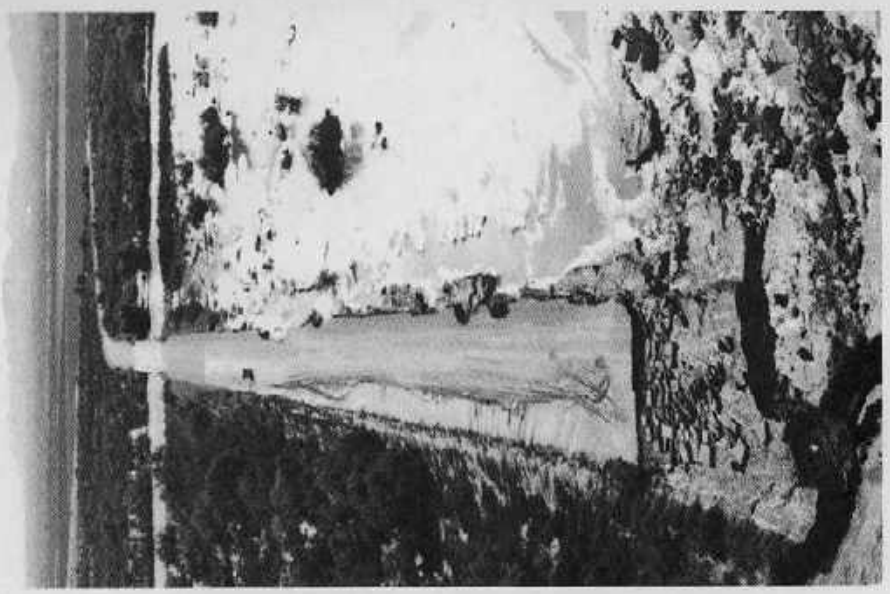


Damage Description:

The damage to the bridge consists of severe erosion to bridge approaches caused by overbank flooding.

S0064

TRICO—MARANA ROAD,
SANTA CRUZ RIVER

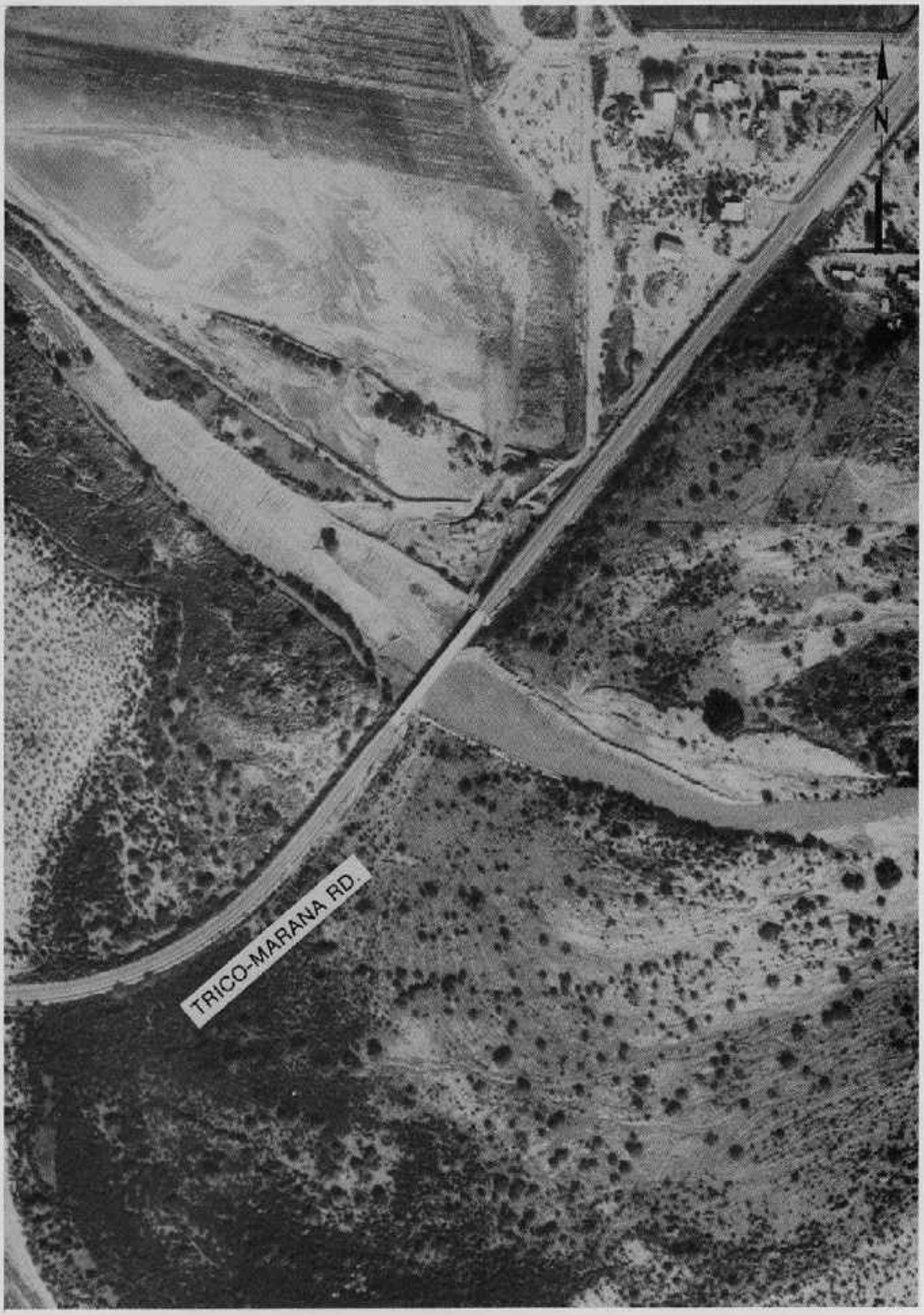


LOOKING SOUTHWEST

LOOKING SOUTHWEST

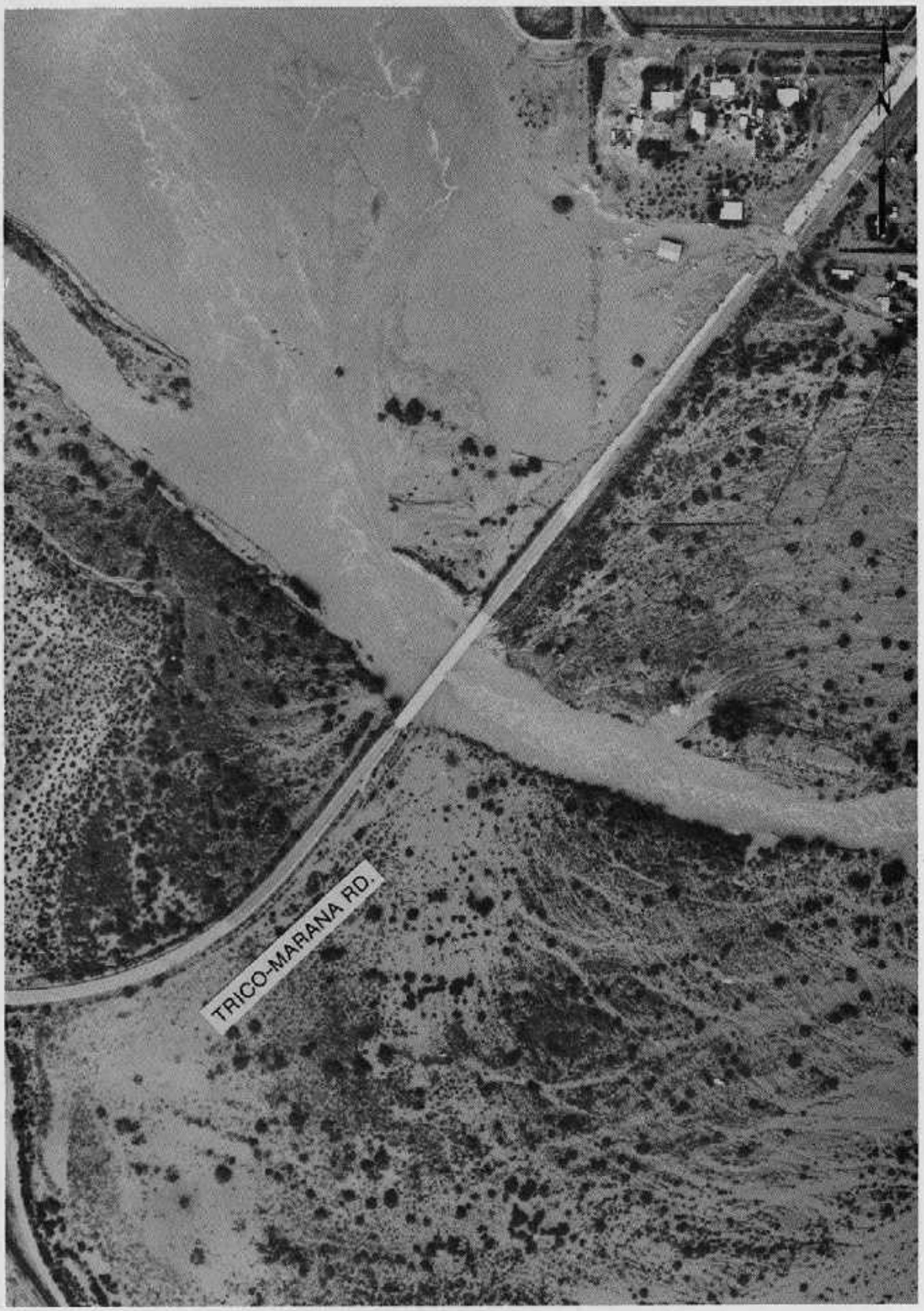
LOOKING NORTHEAST

S0065



TRICO—MARANA ROAD,
SANTA CRUZ RIVER
NOVEMBER 21, 1982

S0066

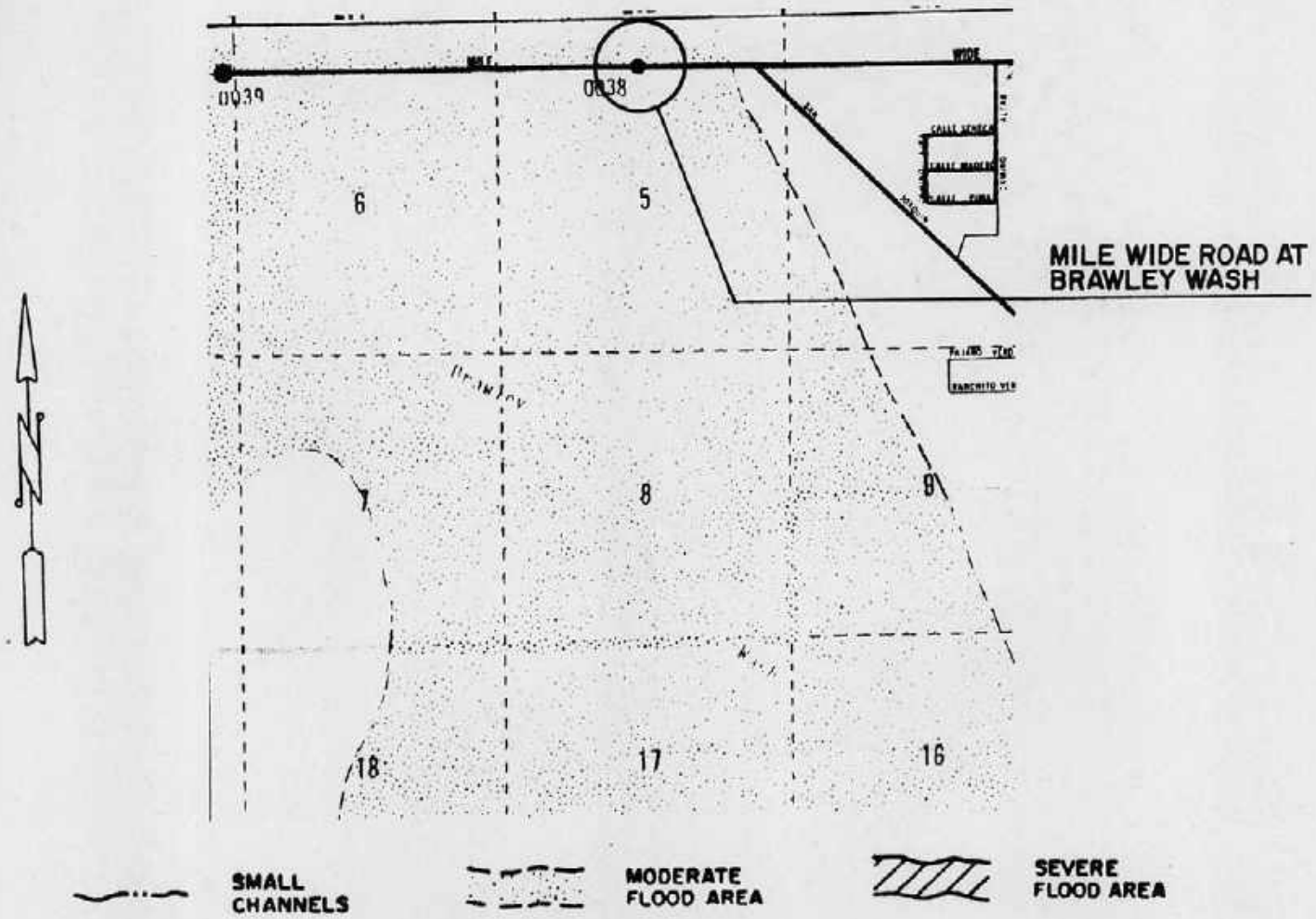


TRICO—MARANA ROAD,
SANTA CRUZ RIVER
OCTOBER 3, 1983

50067

MILE WIDE RD., BRAWLEY WASH

BRIDGE

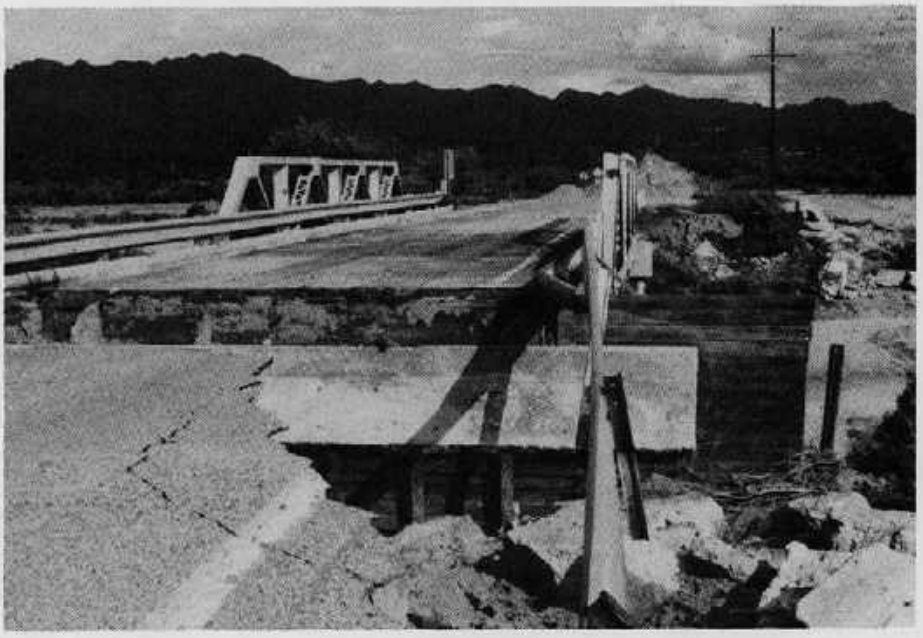


Damage Description:

The Brawley Wash overflowed its banks, causing heavy buildup of debris, and washed out the bridge approaches.

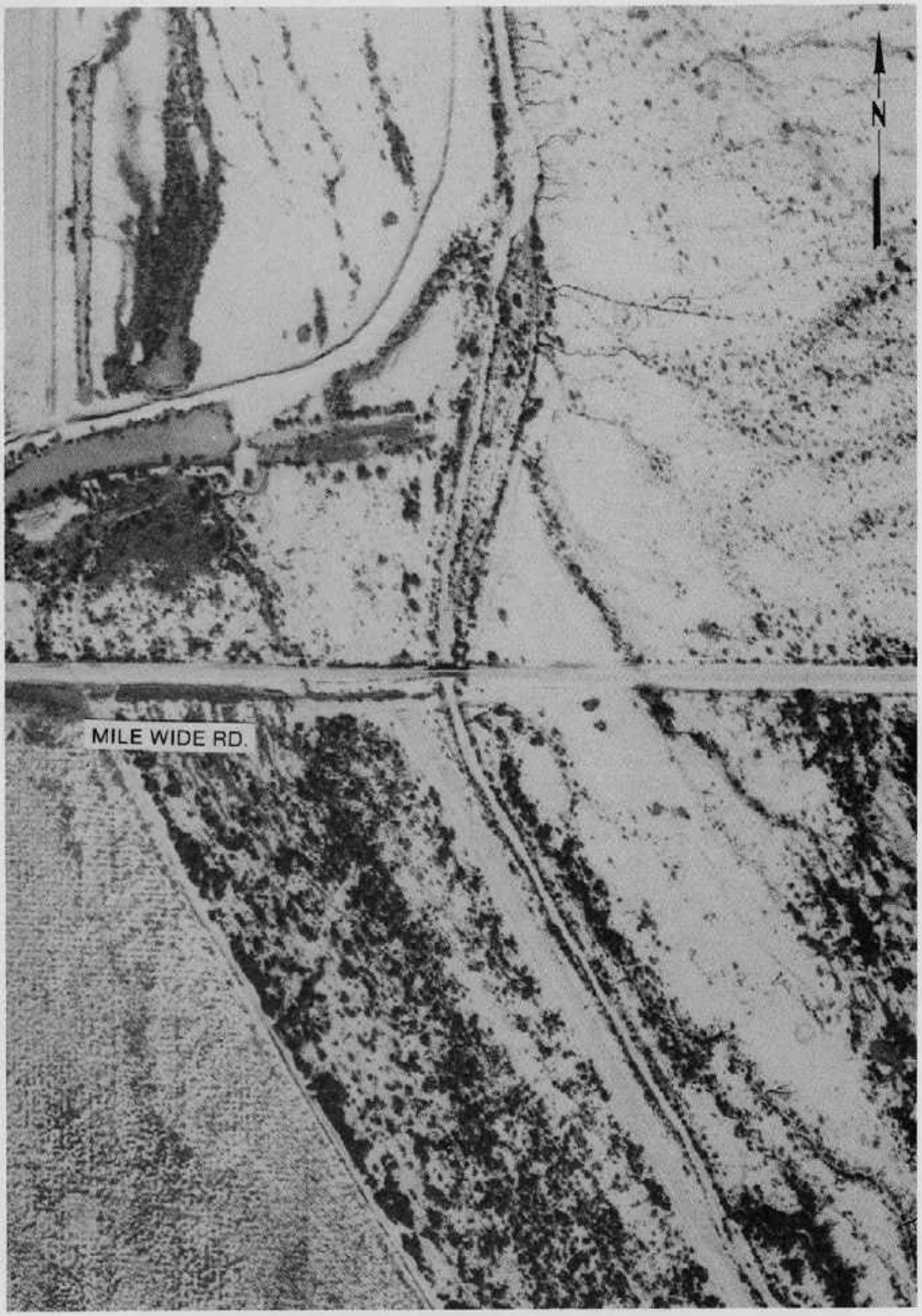
50068

MILE WIDE ROAD,
BRAWLEY WASH



LOOKING EAST

50069

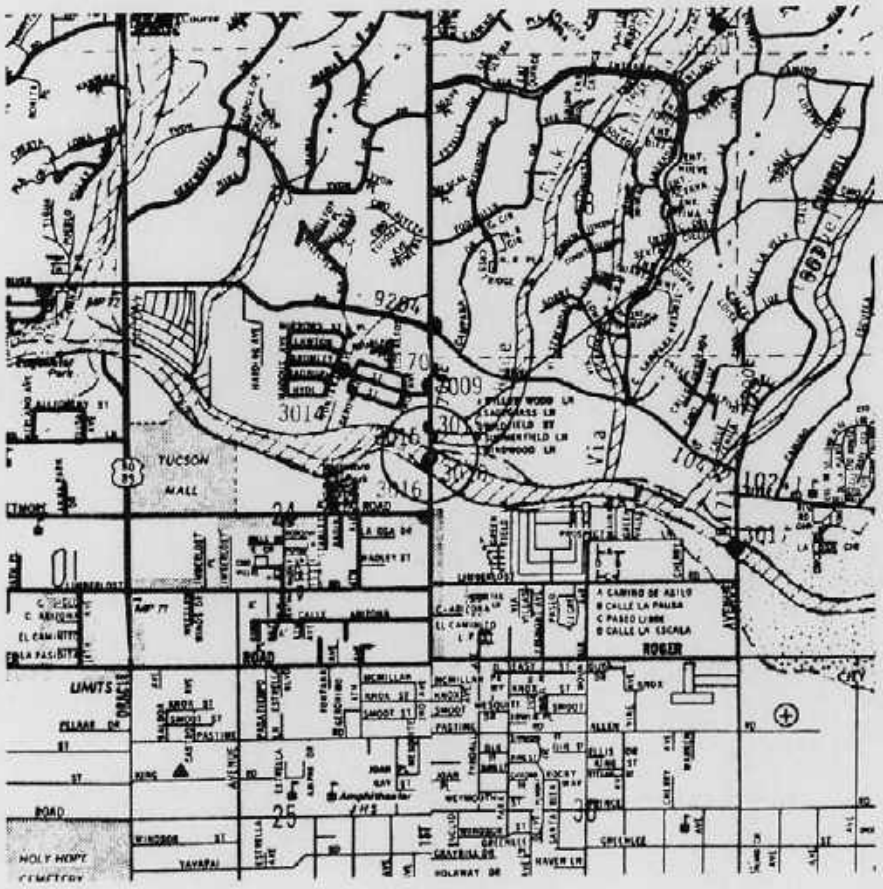


MILE WIDE ROAD,
BRAWLEY WASH
DECEMBER 18, 1982

S0070

FIRST AVE, RILLITO RIVER

BRIDGE



SMALL CHANNELS

MODERATE FLOOD AREA

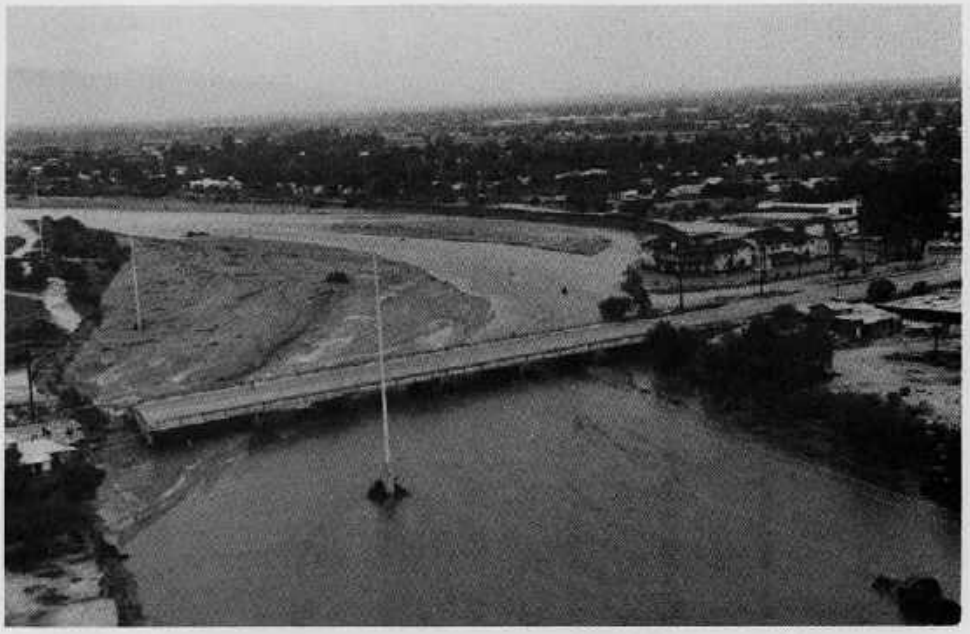
SEVERE FLOOD AREA

Damage Description:

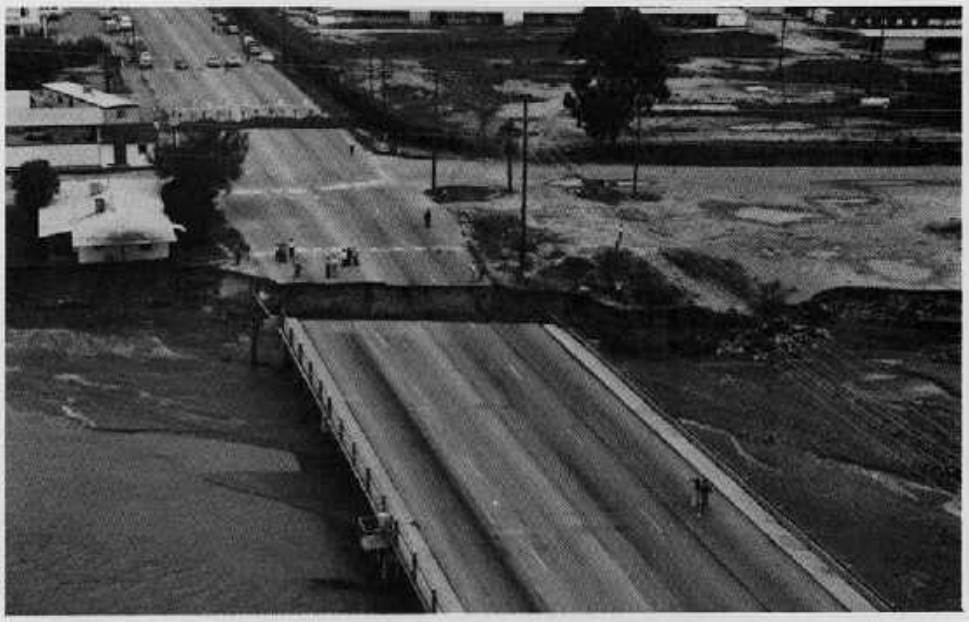
The damage to the bridge consisted of the north approach being washed out, exposing the abutment piling, and damage to the south abutment bank protection. In addition, 1300 feet of bank protection was lost on the south bank upstream of the bridge.

S0071

FIRST AVENUE,
RILLITO RIVER

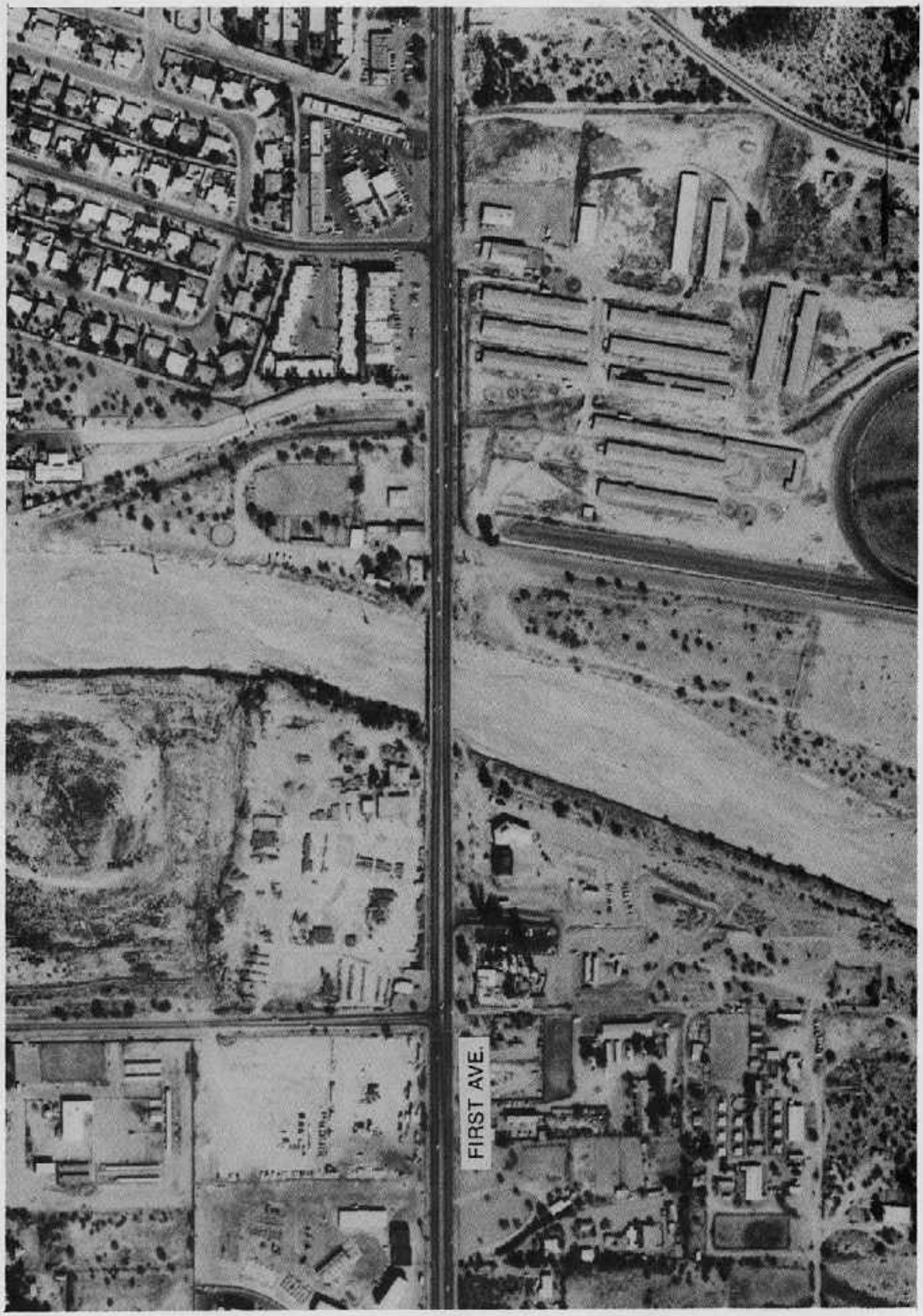


LOOKING EAST



LOOKING NORTH

S0072



FIRST AVENUE,
RILLITO RIVER
NOVEMBER 2, 1982

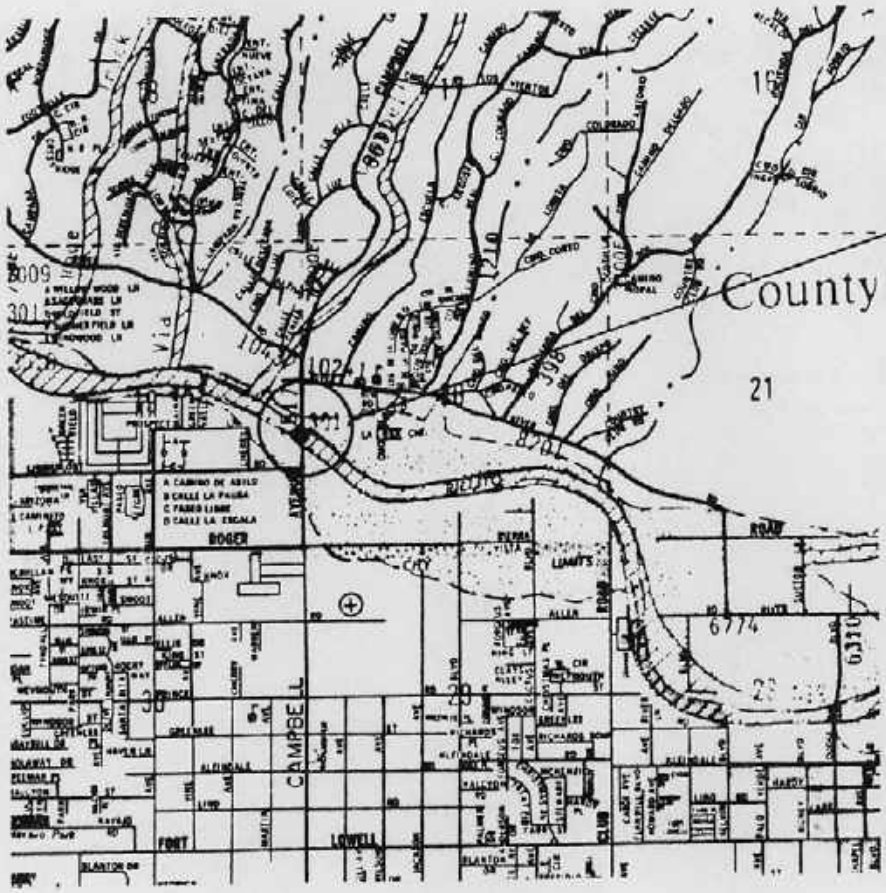
S0073

S0074

FIRST AVENUE,
RILLITO RIVER
OCTOBER 3, 1983

CAMPBELL AVE., RILLITO RIVER

BRIDGE



SMALL CHANNELS

MODERATE FLOOD AREA

SEVERE FLOOD AREA

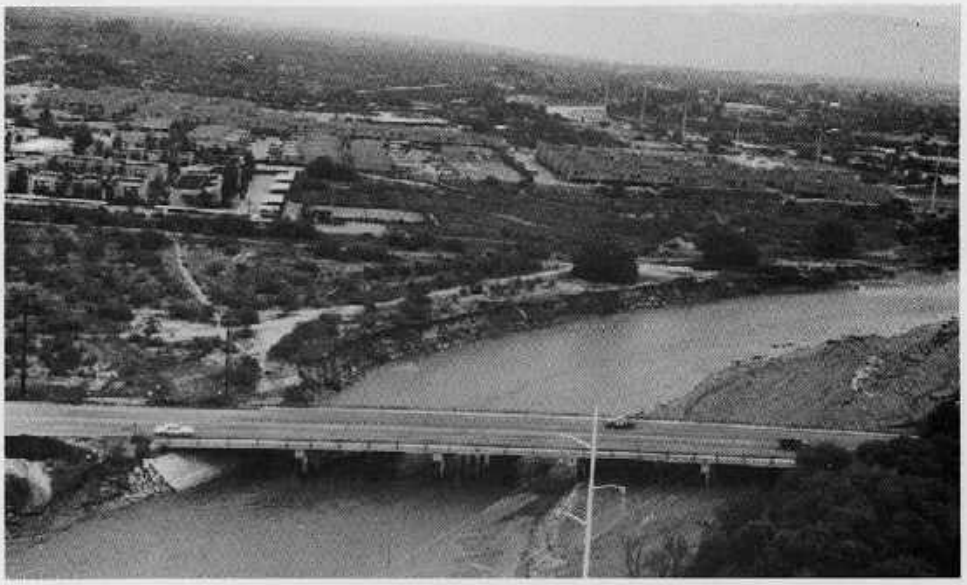
Damage Description:

The north abutment bank protection was damaged, and there was serious cutting of the north channel bank.

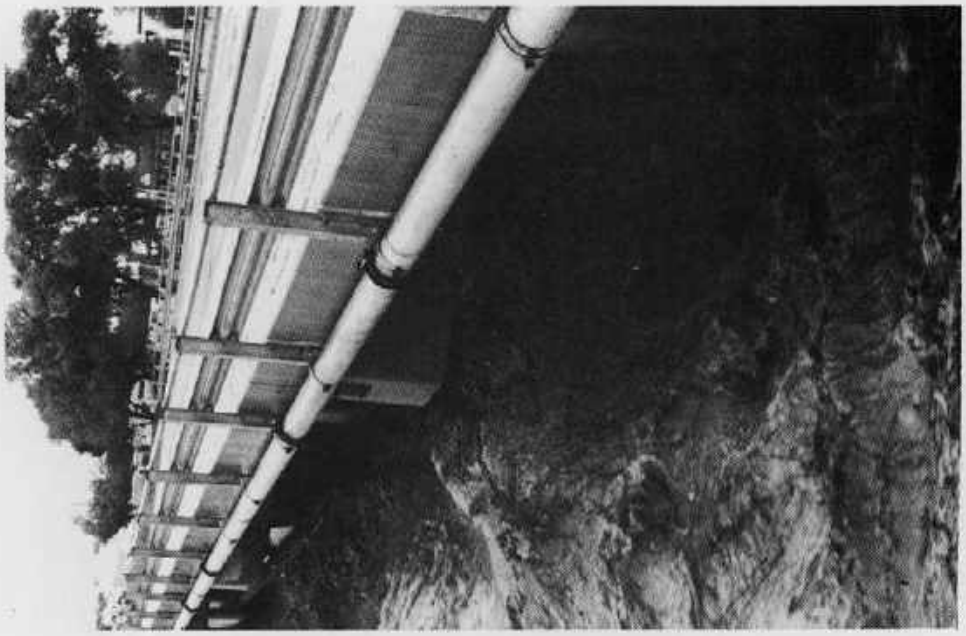
S0075

CAMPBELL AVENUE,
RILLITO RIVER

LOOKING NORTH



LOOKING EAST

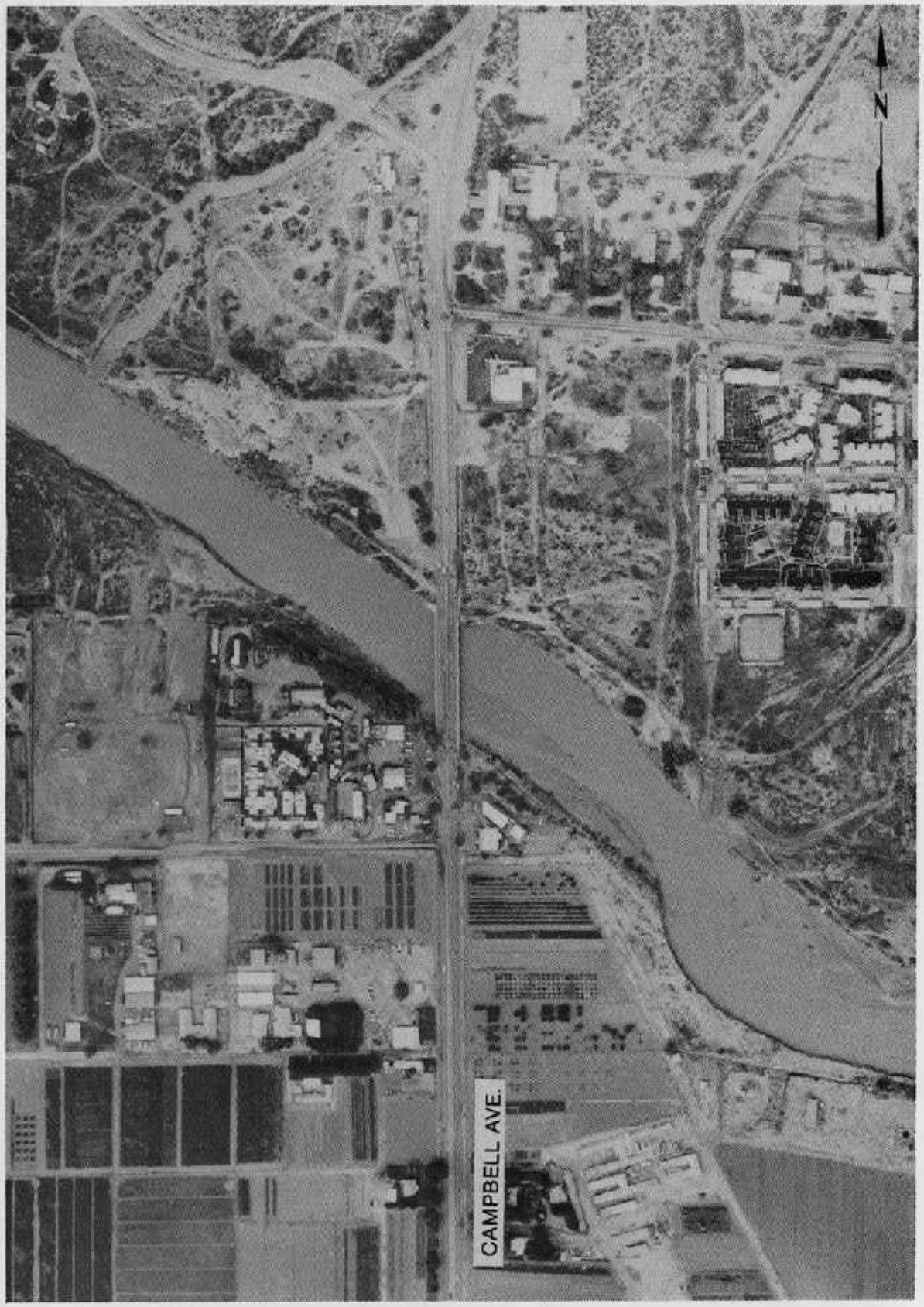


LOOKING SOUTH

S0076

S0077

CAMPBELL AVENUE,
RILLITO RIVER
NOVEMBER 2, 1982

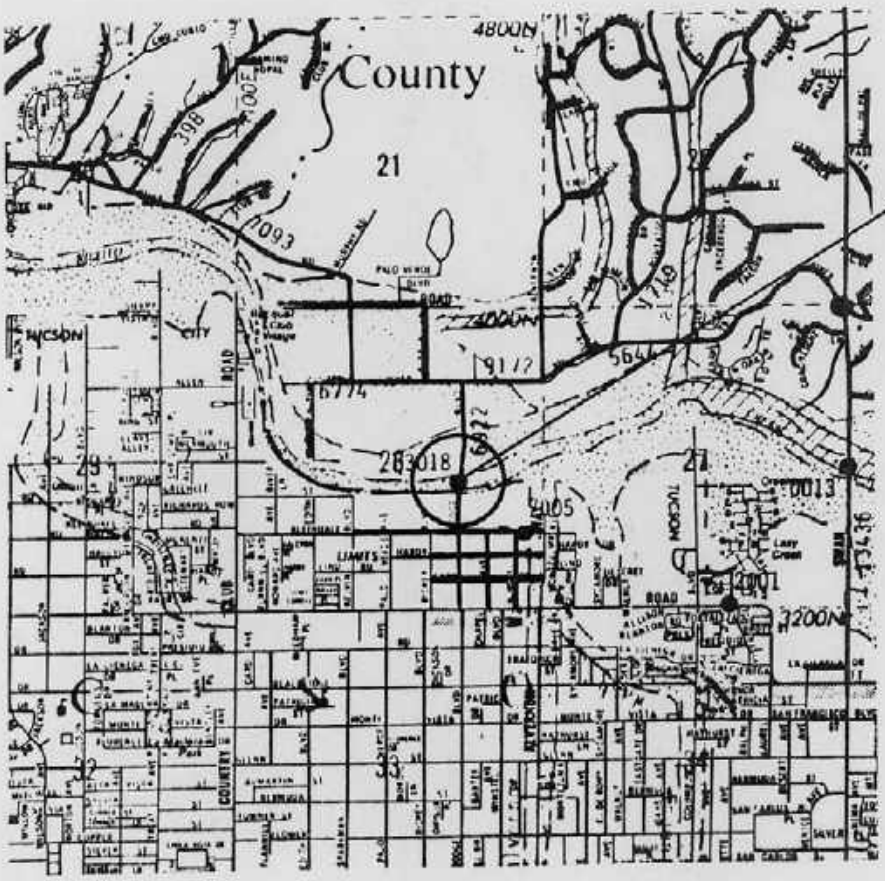


CAMPBELL AVENUE,
RILLITO RIVER
OCTOBER 3, 1983

50078

DODGE BLVD., RILLITO RIVER

BRIDGE



SMALL CHANNELS

MODERATE FLOOD AREA

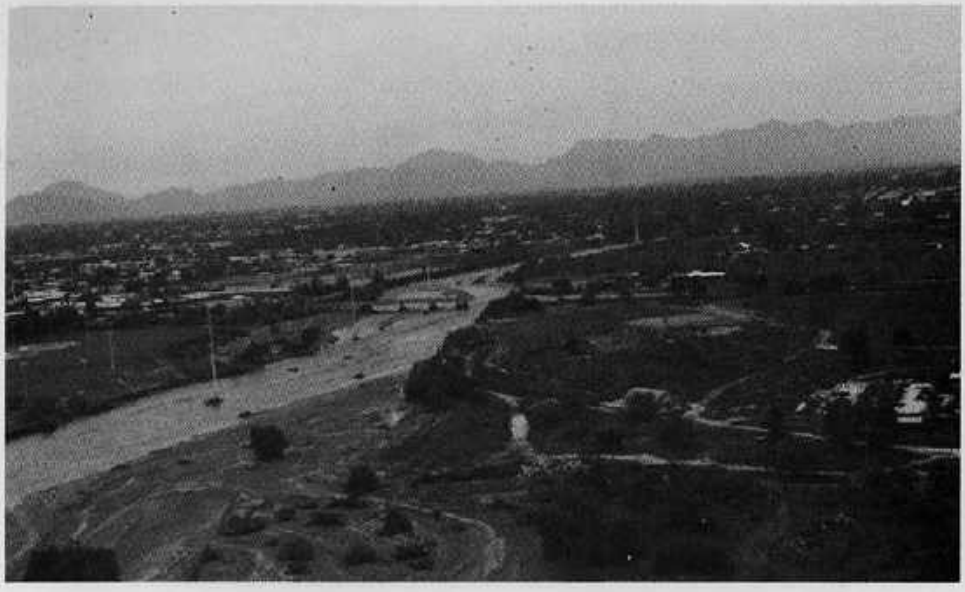
SEVERE FLOOD AREA

Damage Description:

Damage to the bridge consisted of the north approach embankment being washed out, exposing the abutment piling.

50079

DODGE BOULEVARD,
RILLITO RIVER



LOOKING WEST

LOOKING EAST

LOOKING SOUTH

50080

DODGE BOULEVARD,
RILLITO RIVER
NOVEMBER 4, 1982

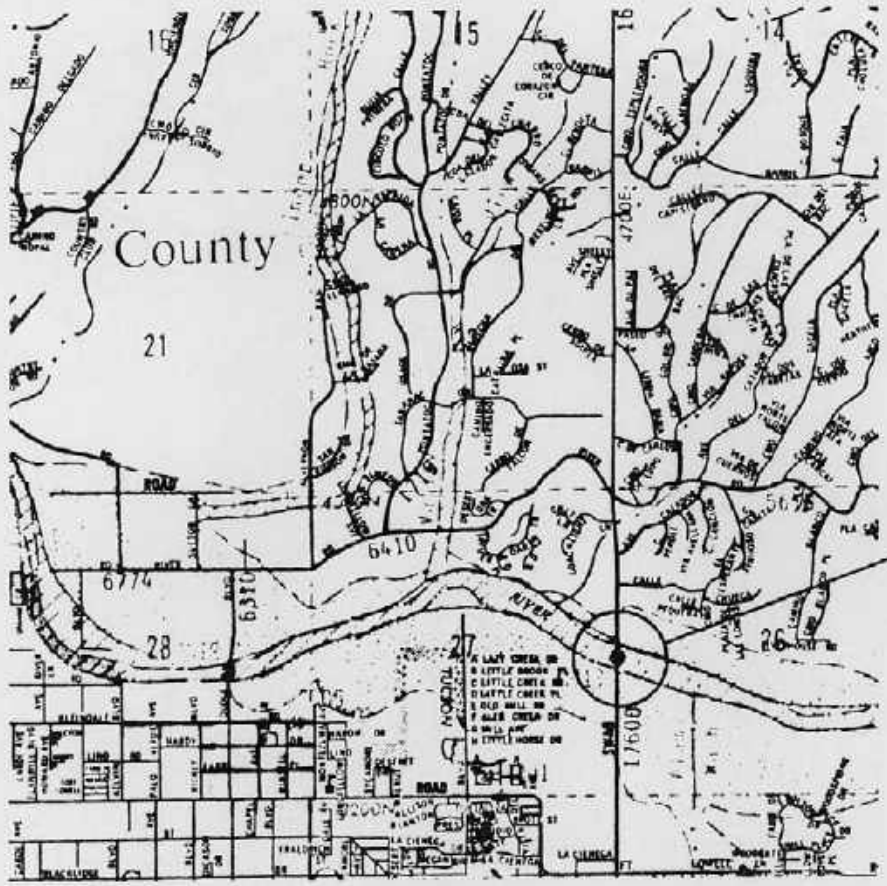
S0081

DODGE BOULEVARD,
RILLITO RIVER
OCTOBER 3, 1983

S0082

SWAN RD., RILLITO RIVER

BRIDGE



SMALL CHANNELS

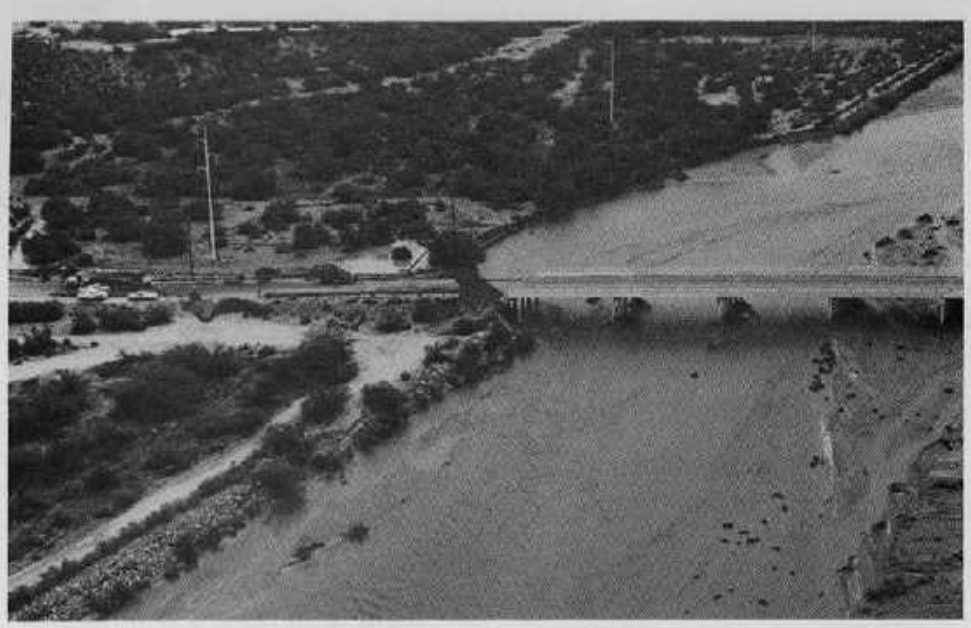
MODERATE FLOOD AREA

SEVERE FLOOD AREA

Damage Description:

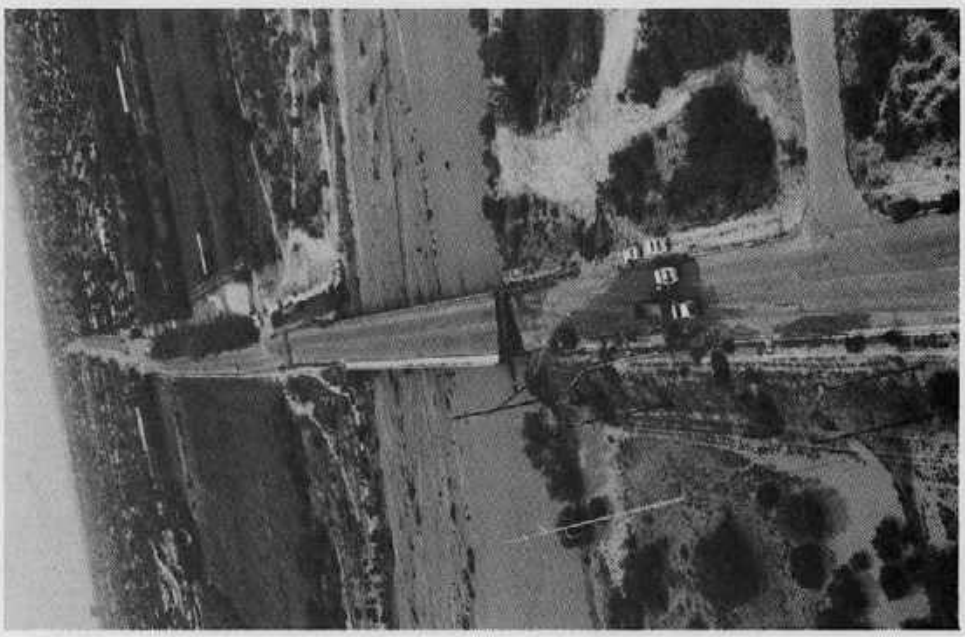
The north approach embankment washed out, exposing the abutment piling. In addition, 3500 feet of bank protection upstream of the bridge was lost.

50083



SWAN ROAD,
RILLITO RIVER

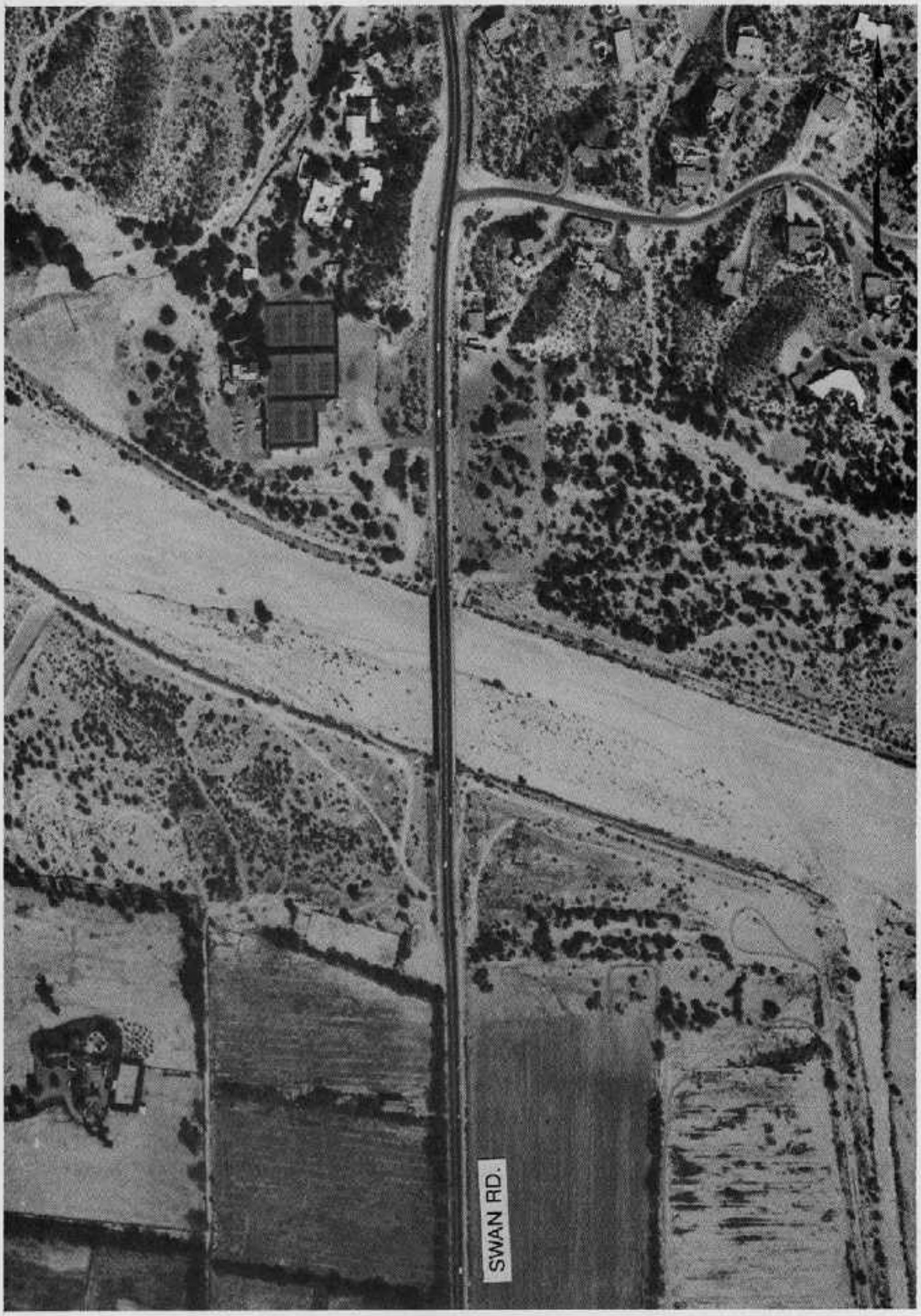
LOOKING EAST



LOOKING SOUTH

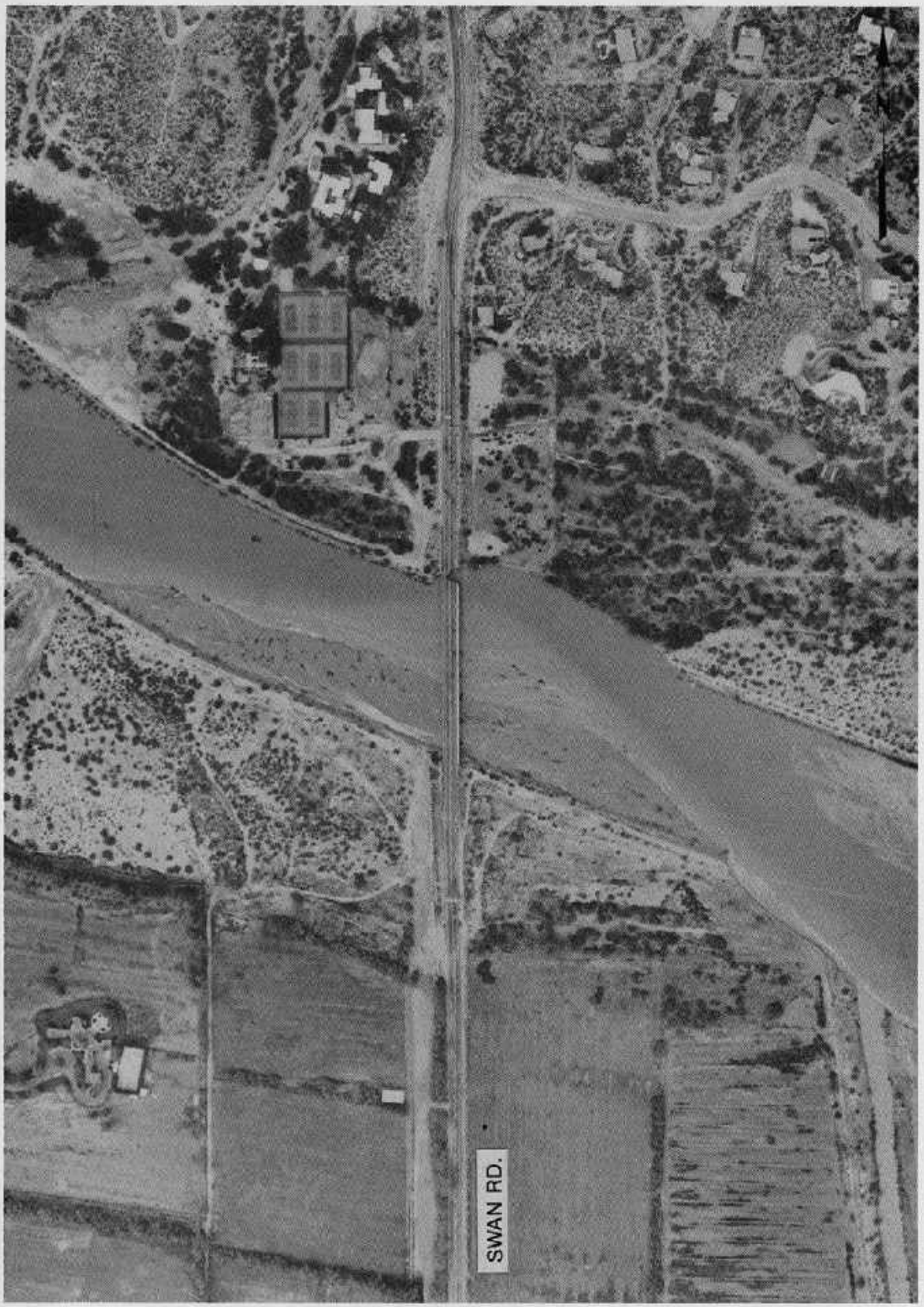
LOOKING SOUTH

50084



SWAN ROAD,
RILLITO RIVER
NOVEMBER 4, 1982

S0085

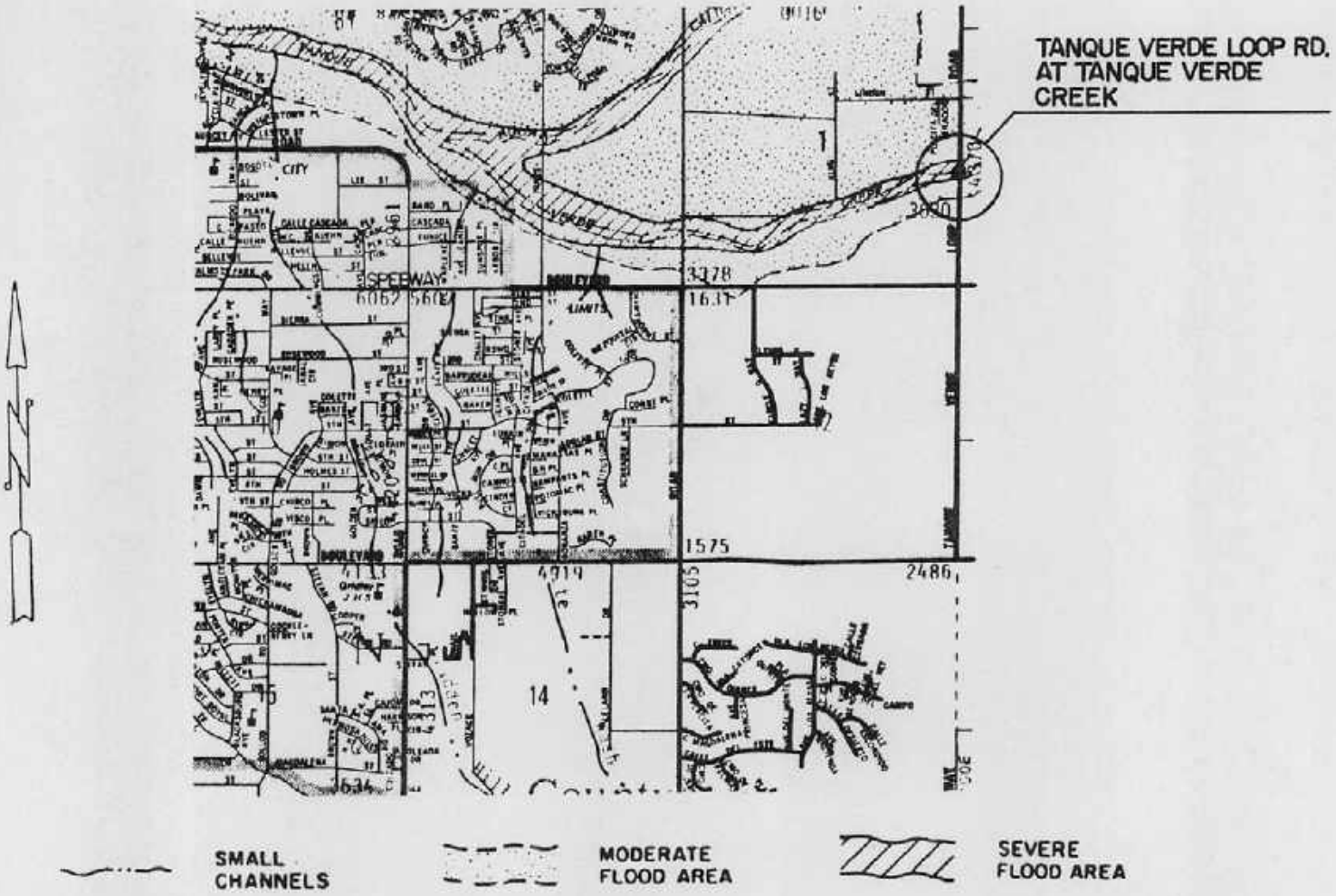


SWAN ROAD,
RILLITO RIVER
OCTOBER 3, 1983

50086

TANQUE VERDE LOOP, TANQUE VERDE CREEK

BRIDGE



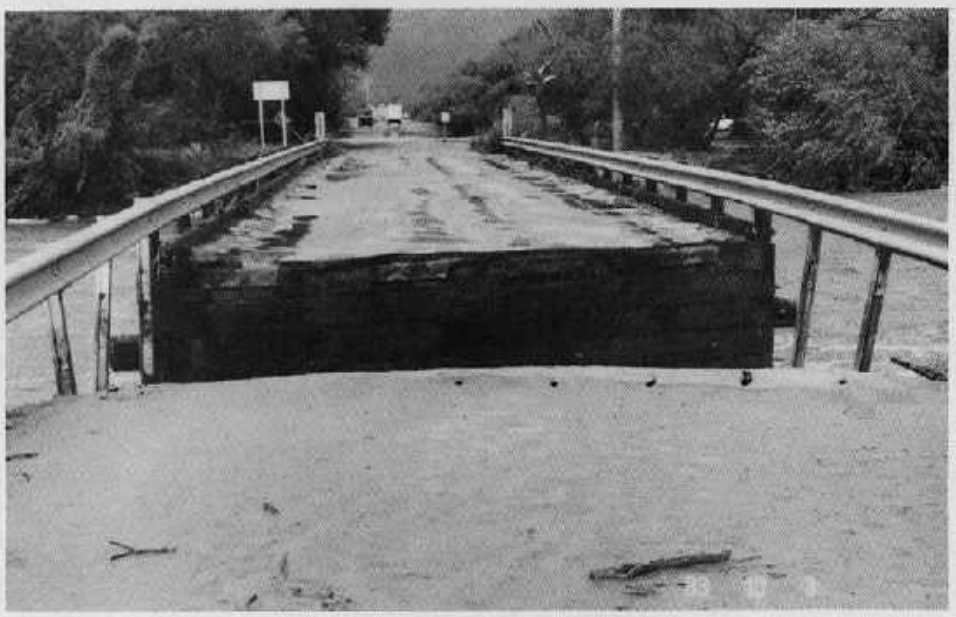
Damage Description:

The damage to the bridge consisted of failure of the south embankment and bridge wing walls. Additional cracking was noticed in the wooden support beams.

50087

TANQUE VERDE LOOP ROAD,
TANQUE VERDE CREEK

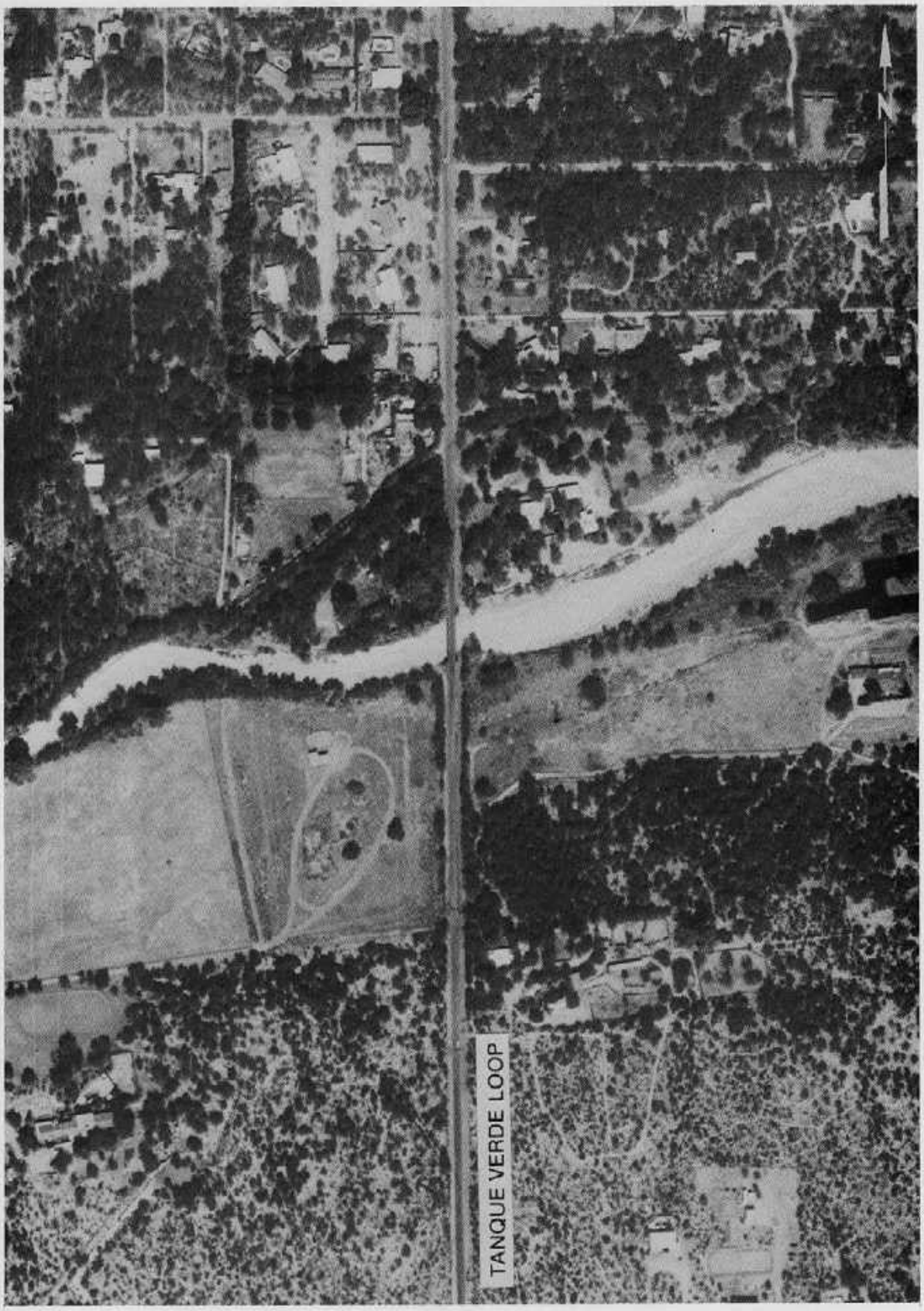
LOOKING SOUTHWEST



LOOKING NORTH

LOOKING NORTHEAST

S0088



TANQUE VERDE LOOP ROAD,
TANQUE VERDE CREEK
NOVEMBER 4, 1982

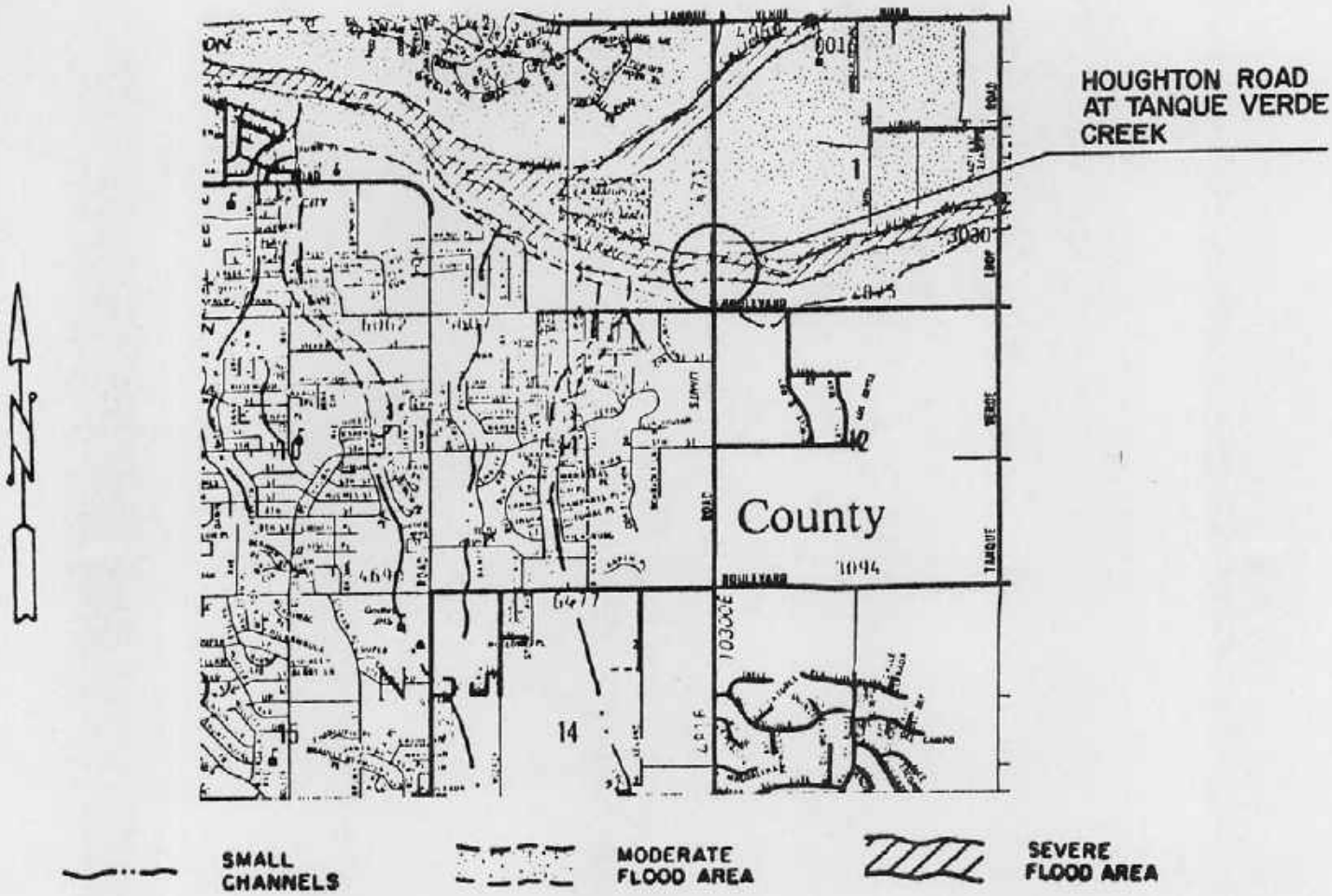
S0089

TANQUE VERDE LOOP ROAD,
TANQUE VERDE CREEK
OCTOBER 3, 1983

S0090

HOUGHTON ROAD, TANQUE VERDE CREEK

AT GRADE CROSSING



Damage Description:

The paved at grade crossing was washed out.

50091

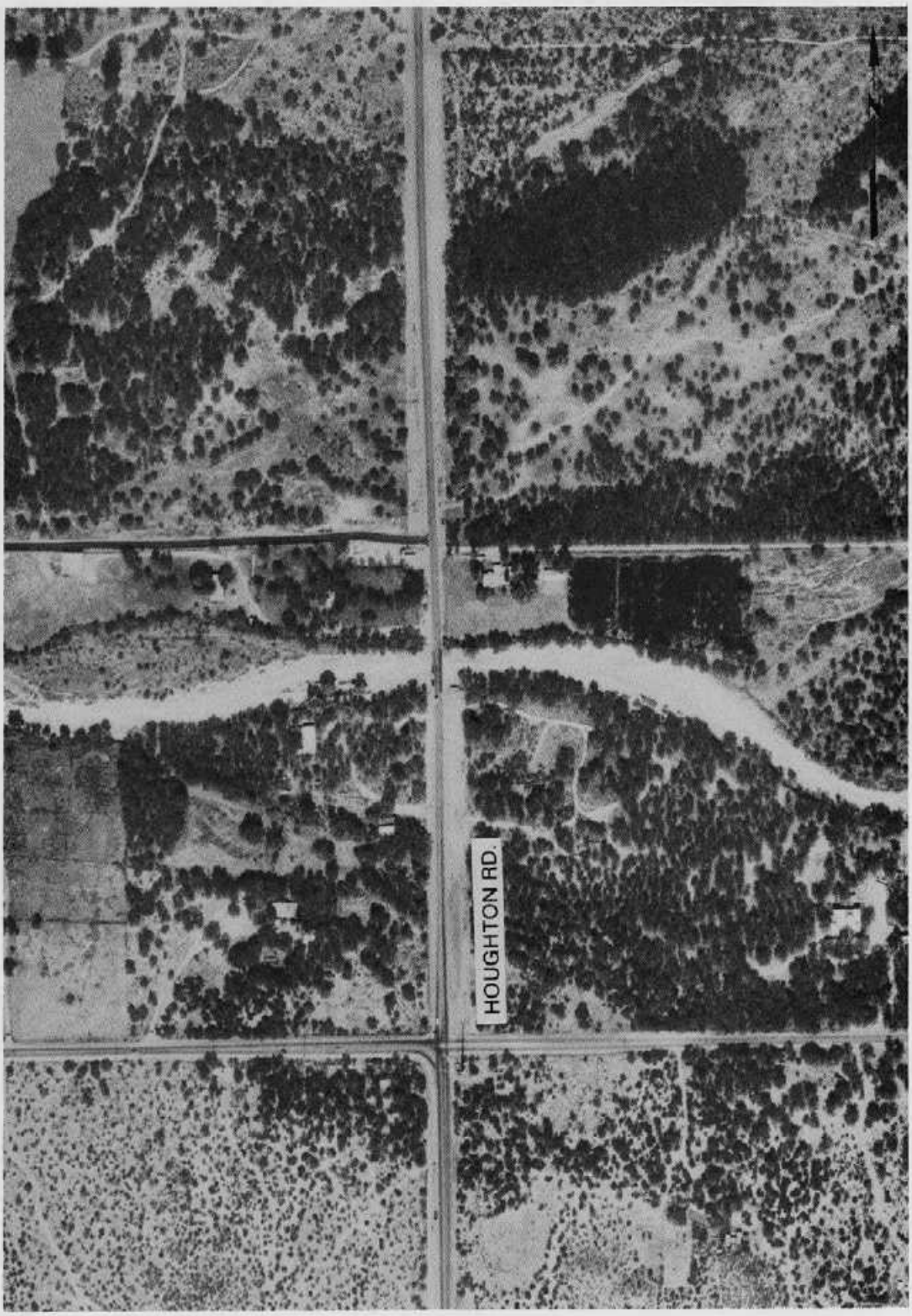
HOUGHTON ROAD,
TANQUE VERDE CREEK

LOOKING NORTH

LOOKING NORTH

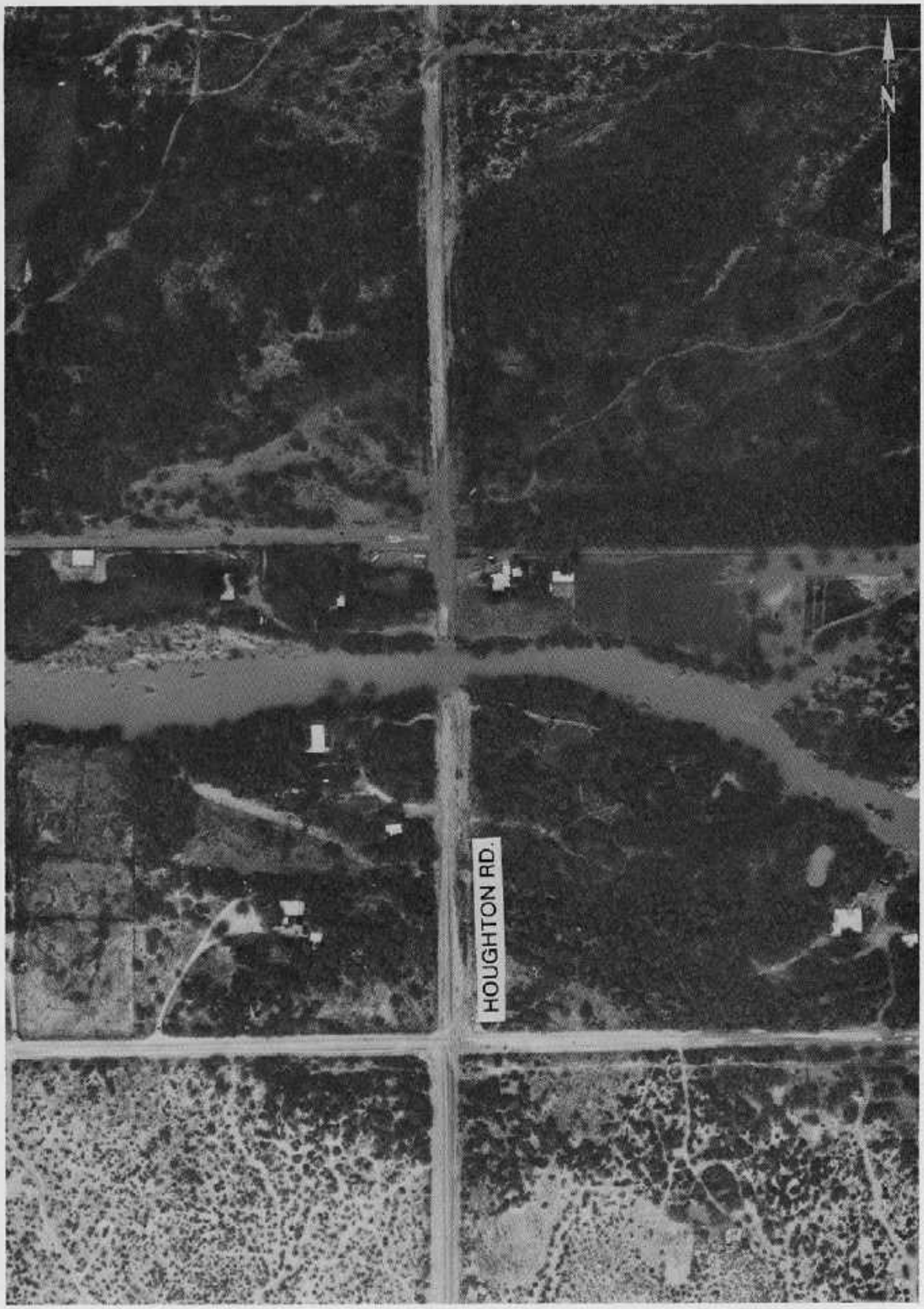
LOOKING NORTH

S0092



HOUGHTON ROAD,
TANQUE VERDE CREEK
NOVEMBER 4, 1982

S0093

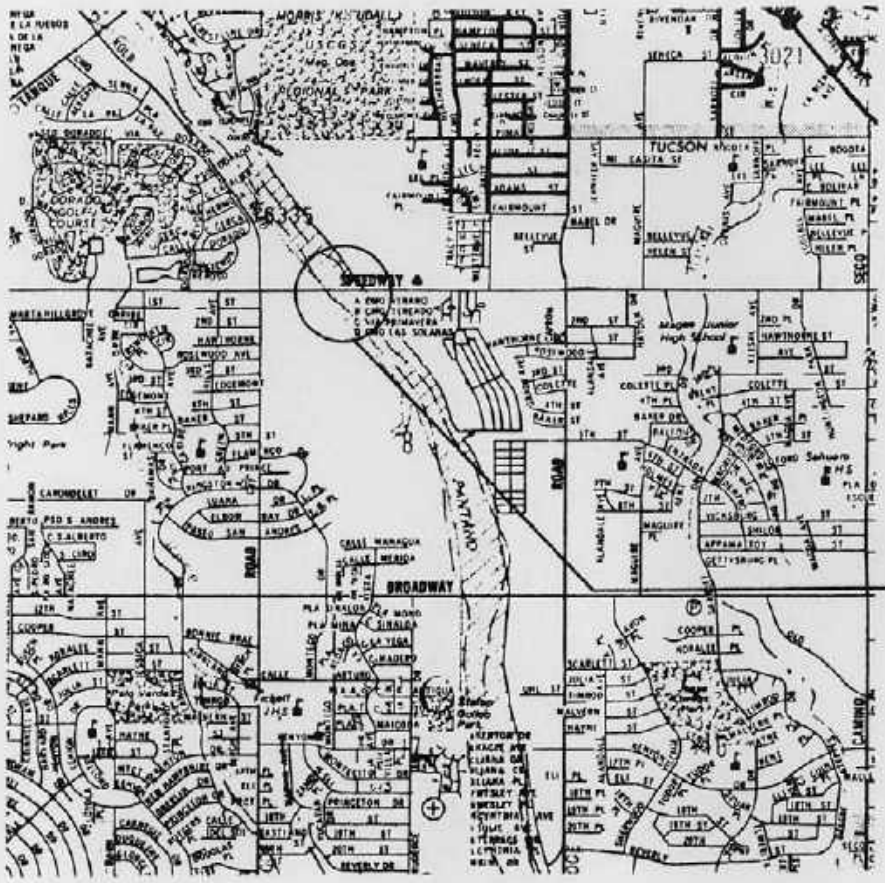


HOUGHTON ROAD,
TANQUE VERDE CREEK
OCTOBER 3, 1983

S0099

SPEEDWAY BLVD., PANTANO WASH

BRIDGE



SPEEDWAY BLVD. AT PANTANO WASH

SMALL CHANNELS

MODERATE FLOOD AREA

SEVERE FLOOD AREA

Damage Description:

The Pantano Wash meandered upstream of Speedway Boulevard, affecting an apartment complex on the east side and the west bridge approach. There was 400 feet of erosion to the west bank, and the west abutment was undermined.

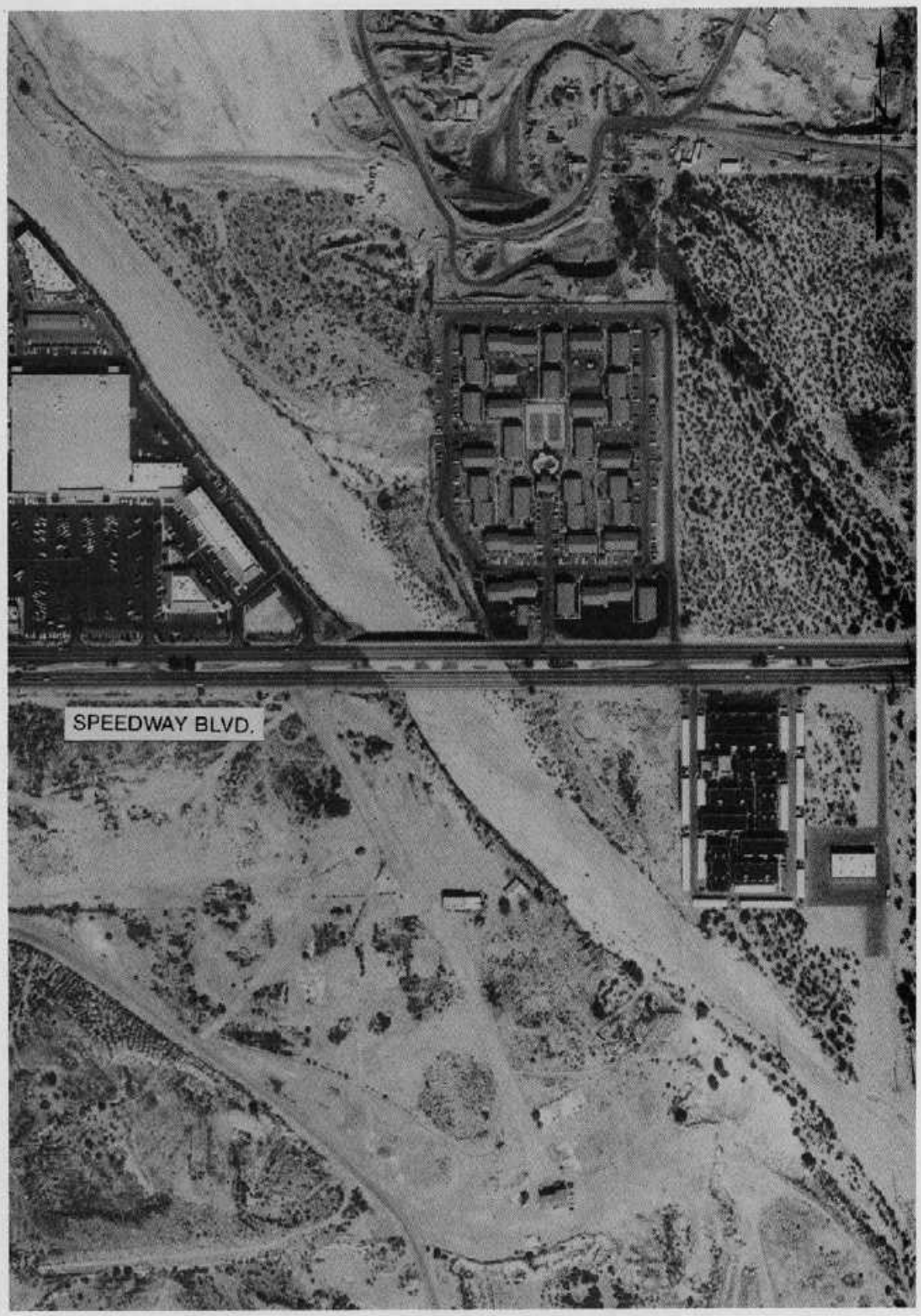
50095

SPEEDWAY BOULEVARD,
PANTANO WASH

LOOKING WEST

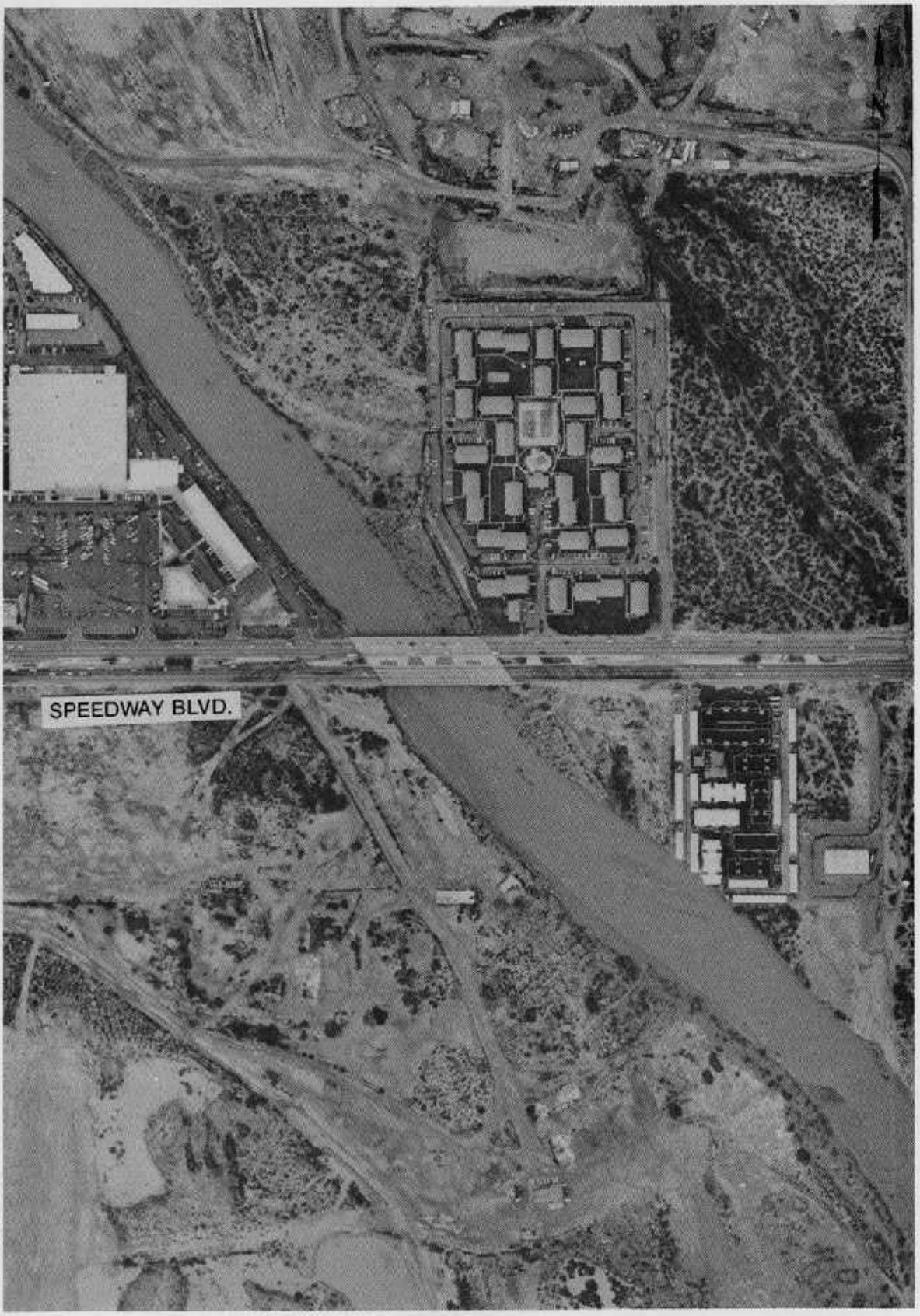
LOOKING NORTHWEST

S0096



SPEEDWAY BOULEVARD,
PANTANO WASH
NOVEMBER 4, 1982

S0097

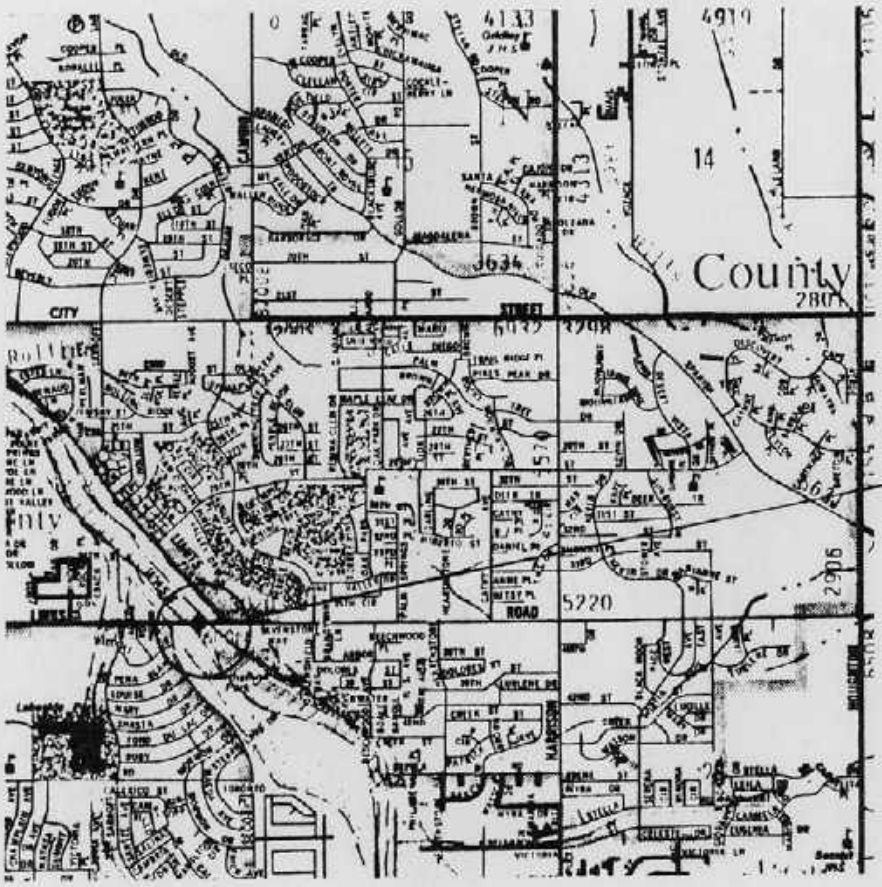


SPEEDWAY BOULEVARD,
PANTANO WASH
OCTOBER 3, 1982

S0098

GOLF LINKS RD., PANTANO WASH

BRIDGE



SMALL CHANNELS

MODERATE FLOOD AREA

SEVERE FLOOD AREA

Damage Description:

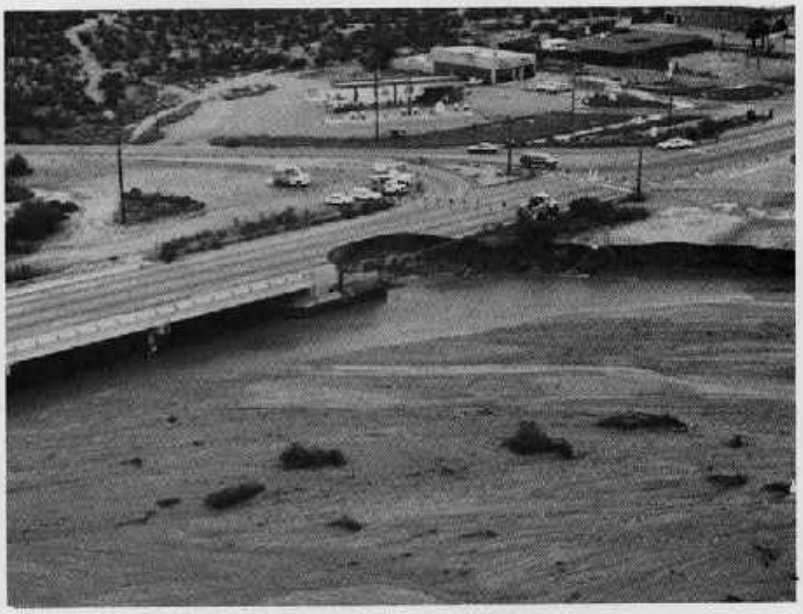
There was severe erosion along the channel banks and overall widening of the river; 50 feet of the eastbound travel lanes were lost on the east approach. There was also abutment erosion and debris and sediment deposition.

500 99

GOLF LINKS ROAD,
PANTANO WASH

LOOKING SOUTHWEST

LOOKING NORTH

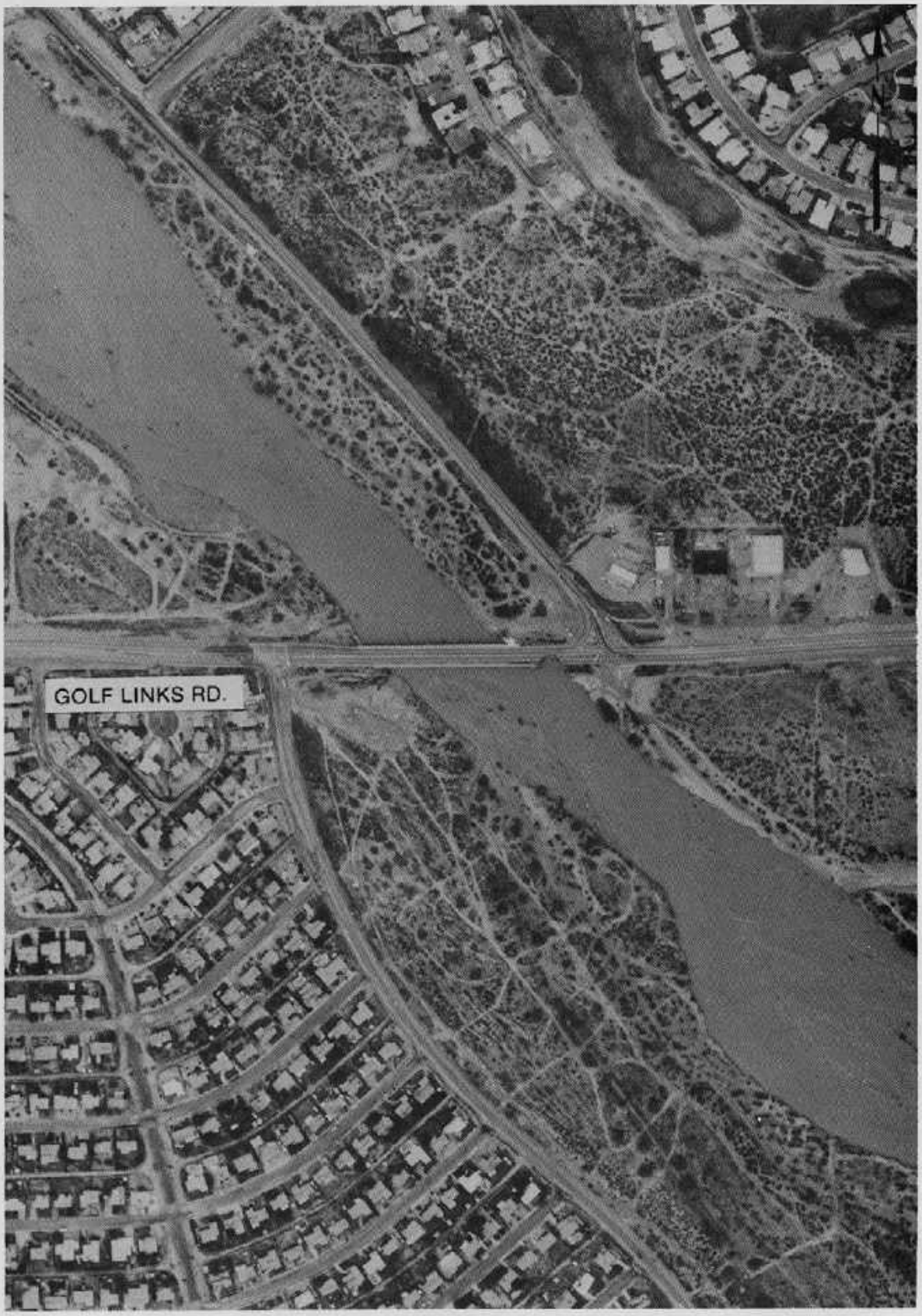


LOOKING NORTHEAST

50100

GOLF LINKS ROAD,
PANTANO WASH
NOVEMBER 4, 1982

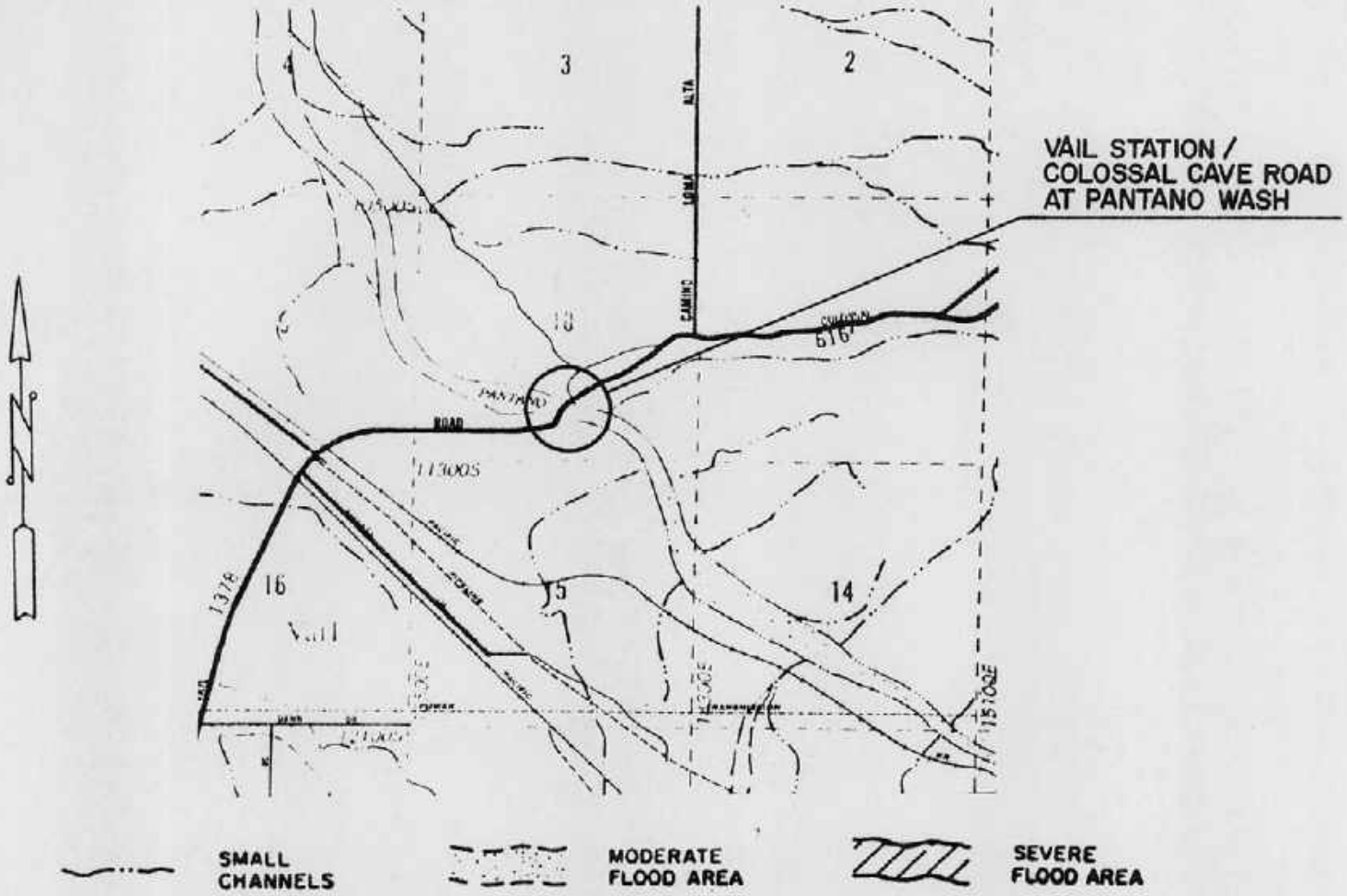
50101



GOLF LINKS ROAD,
PANTANO WASH
OCTOBER 3, 1983

VAIL STATION/COLOSSAL CAVE, PANTANO WASH

AT GRADE CROSSING



Damage Description:

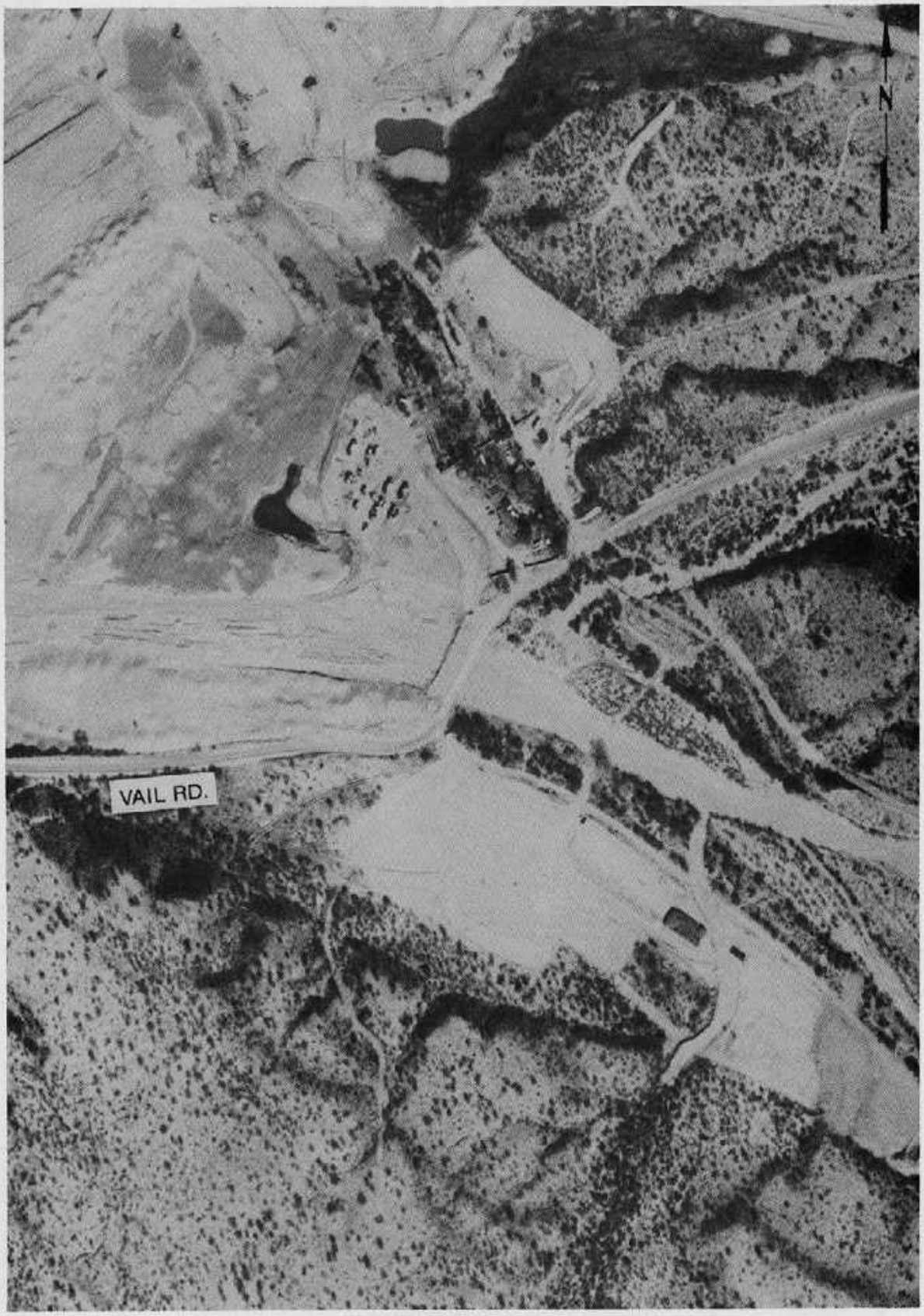
The concrete at grade crossing was washed out.

VAIL STATION/COLOSSAL CAVE ROAD, PANTANO WASH

LOOKING SOUTHEAST

LOOKING NORTHWEST

LOOKING NORTHEAST

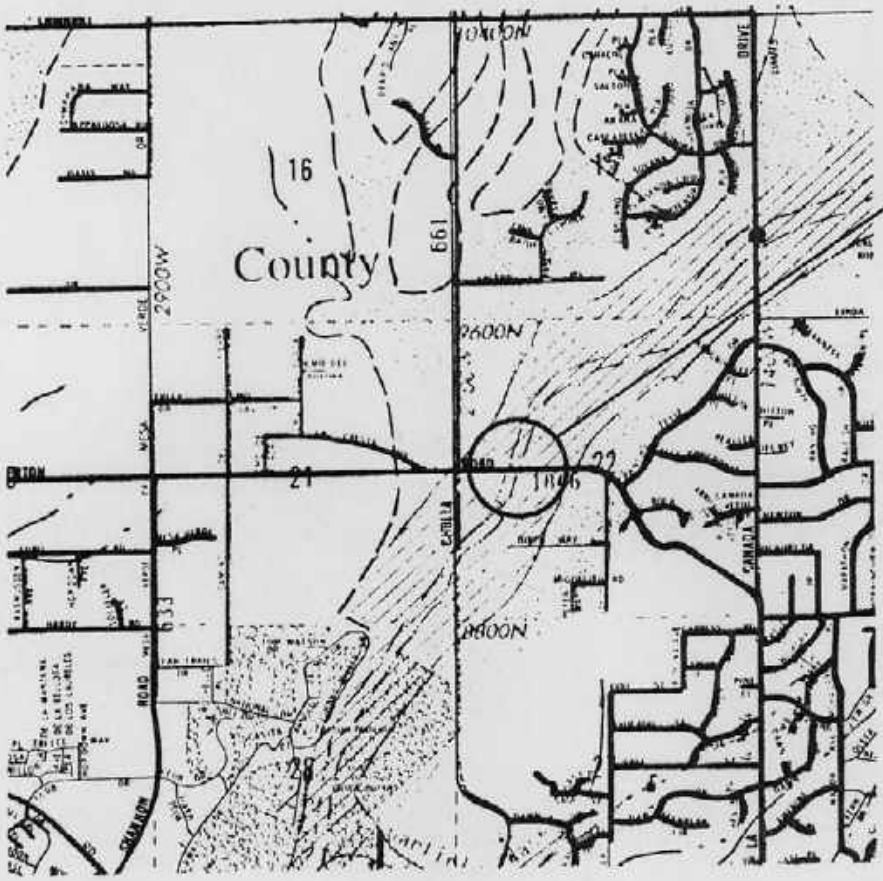


VAIL STATION/COLOSSAL
CAVE ROAD, PANTANO WASH
DECEMBER 17, 1982

VAIL STATION/COLOSSAL
CAVE ROAD, PANTANO WASH
OCTOBER 3, 1983

OVERTON RD., CANADA DEL ORO WASH

AT GRADE CROSSING



SMALL CHANNELS

MODERATE FLOOD AREA

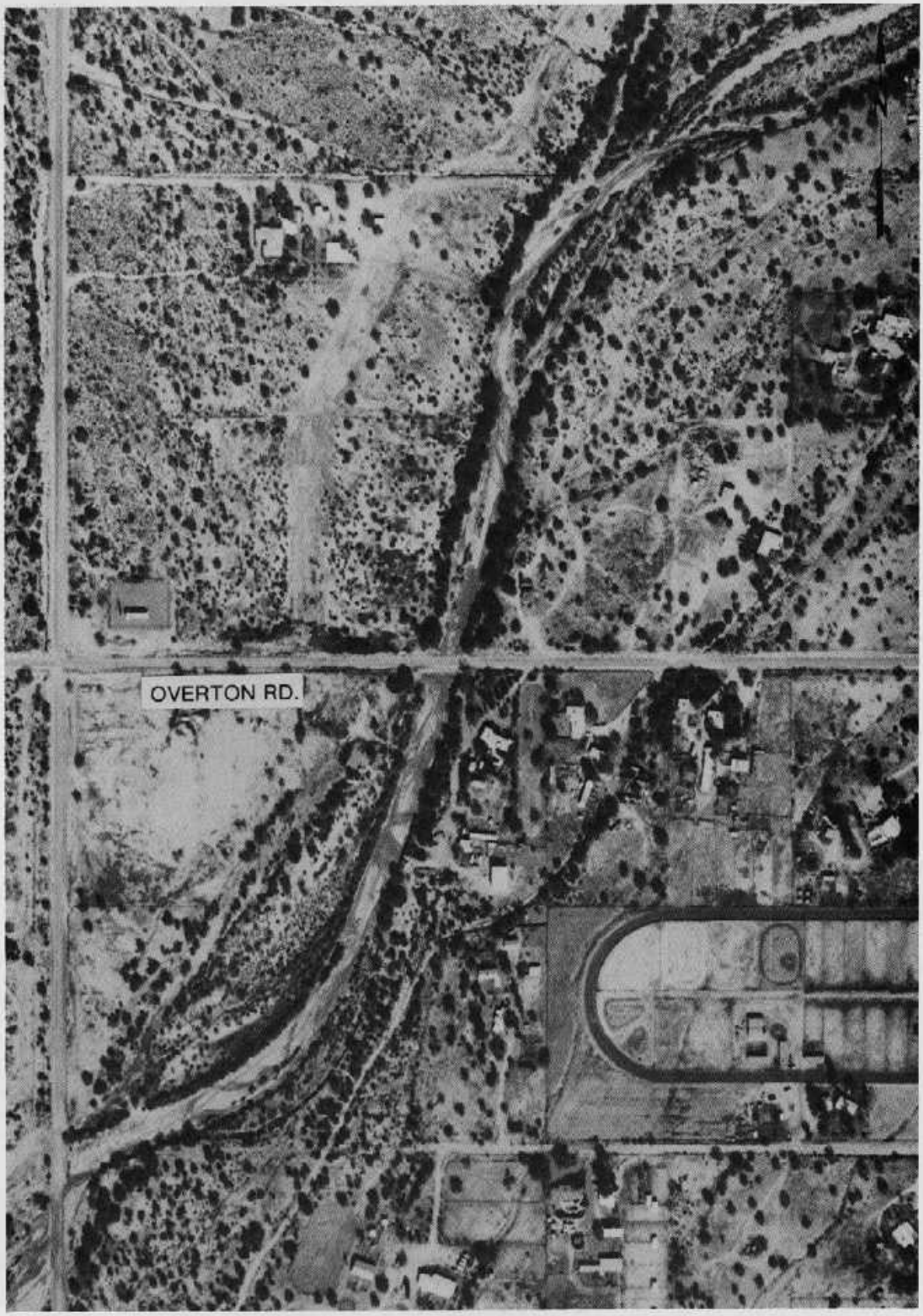
SEVERE FLOOD AREA

Damage Description:

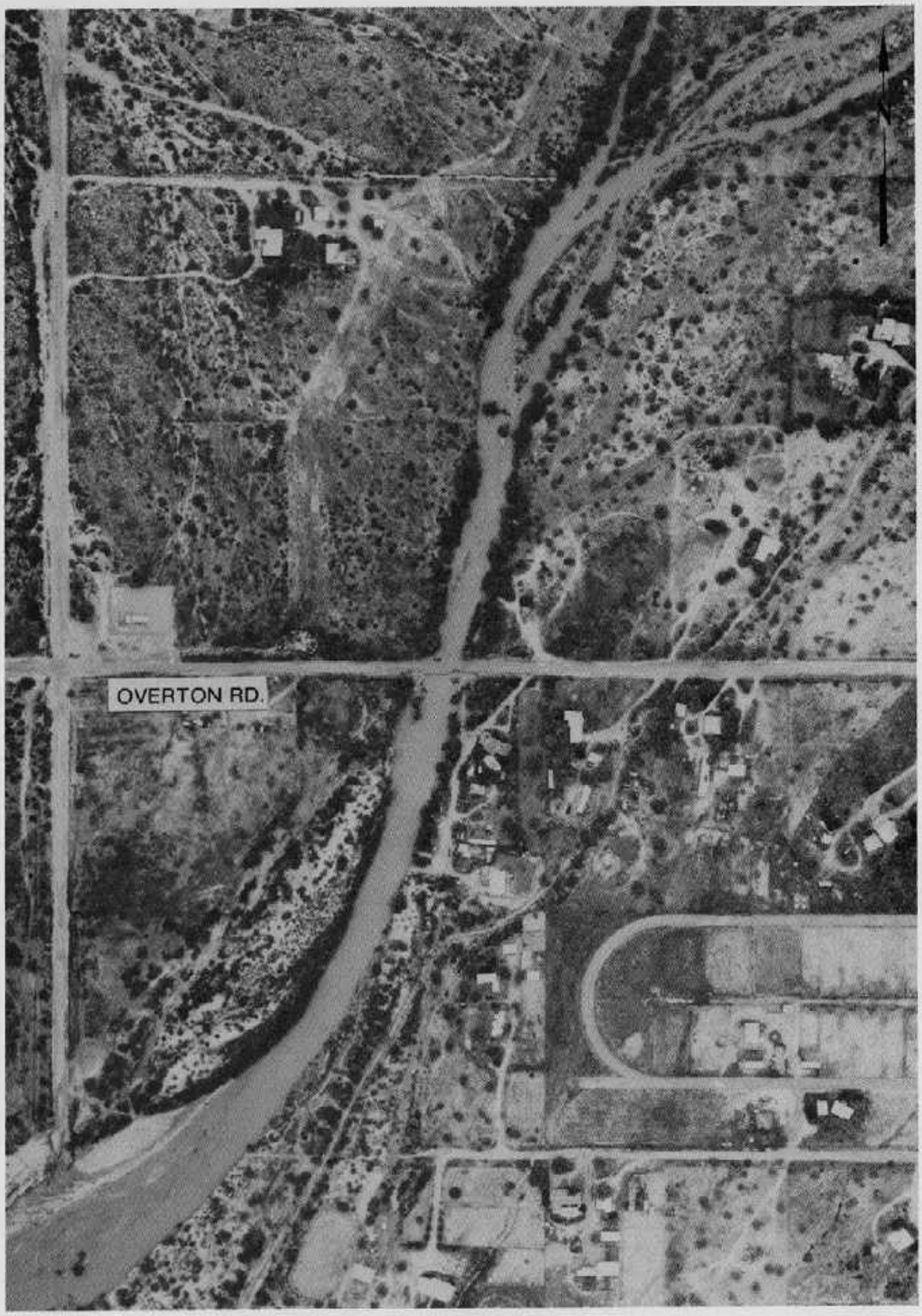
The paved at grade crossing and grade control washed out.

LOOKING NORTH

LOOKING WEST



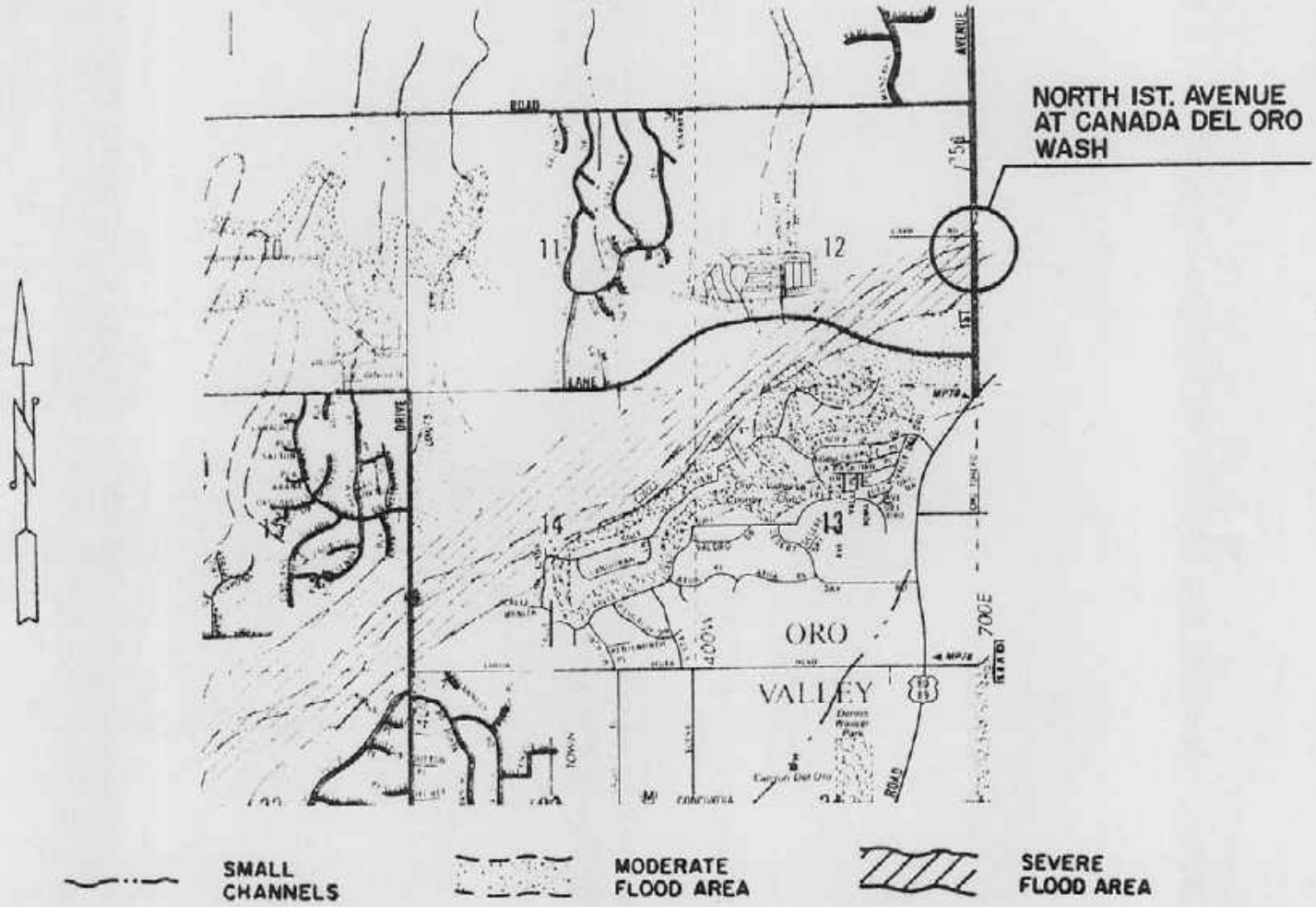
OVERTON ROAD,
CANADA DEL ORO WASH
DECEMBER 4, 1982



OVERTON ROAD,
CANADA DEL ORO WASH
OCTOBER 3, 1983

NORTH FIRST AVE., CANADA DEL ORO WASH

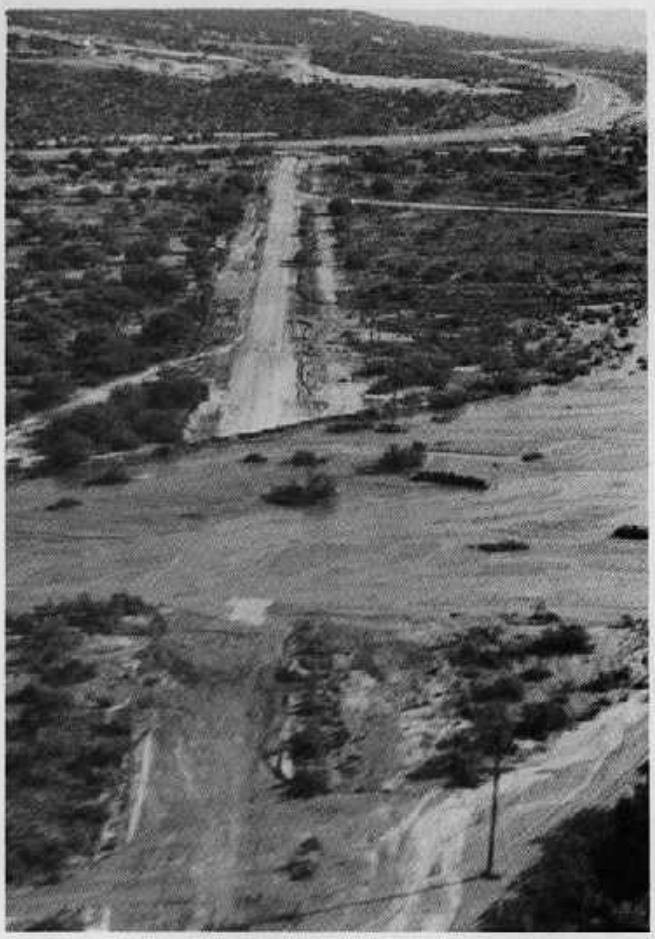
AT GRADE CROSSING



Damage Description:

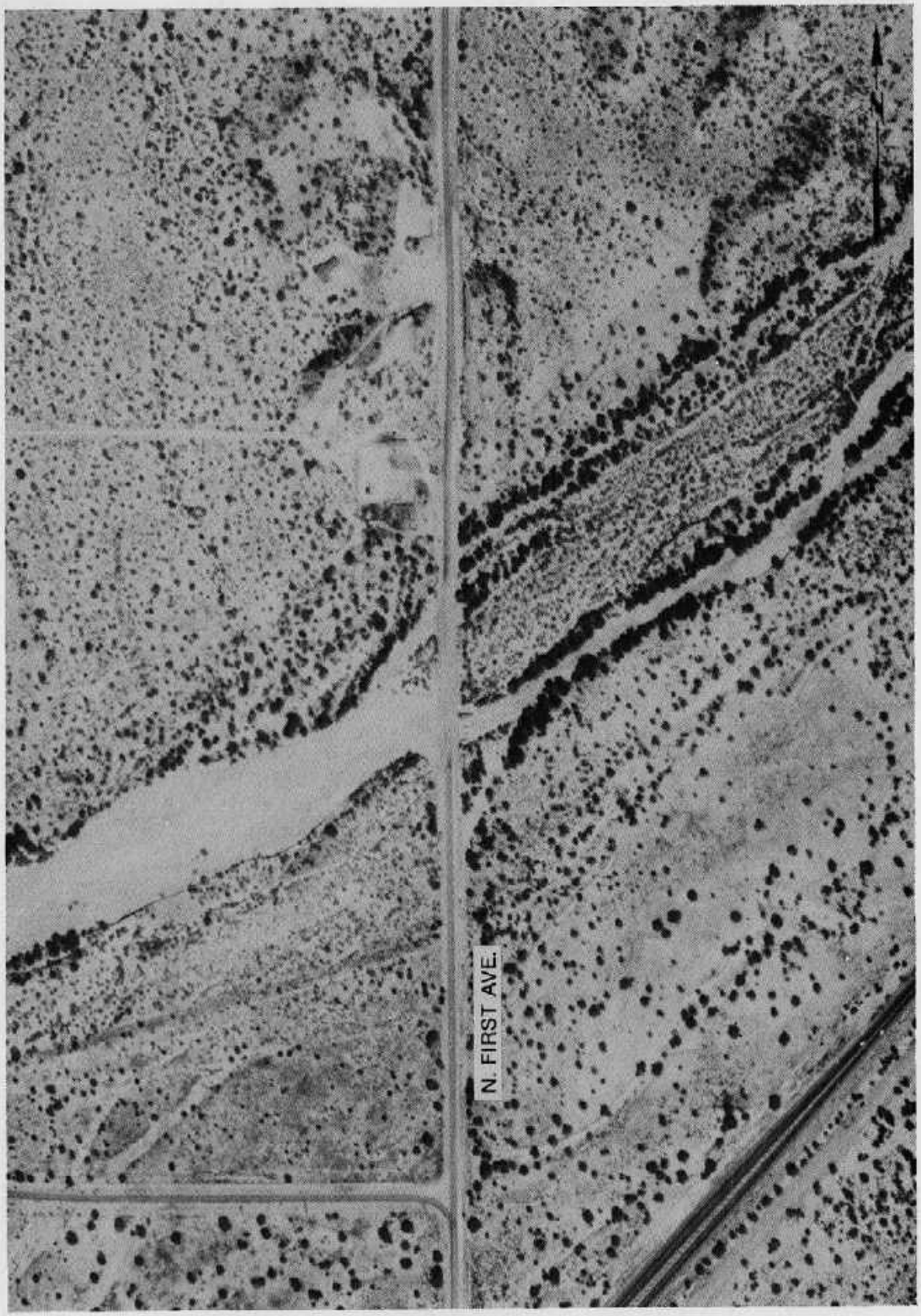
The paved at grade crossing and grade control structure washed out.

NORTH FIRST AVENUE,
CANADA DEL ORO WASH

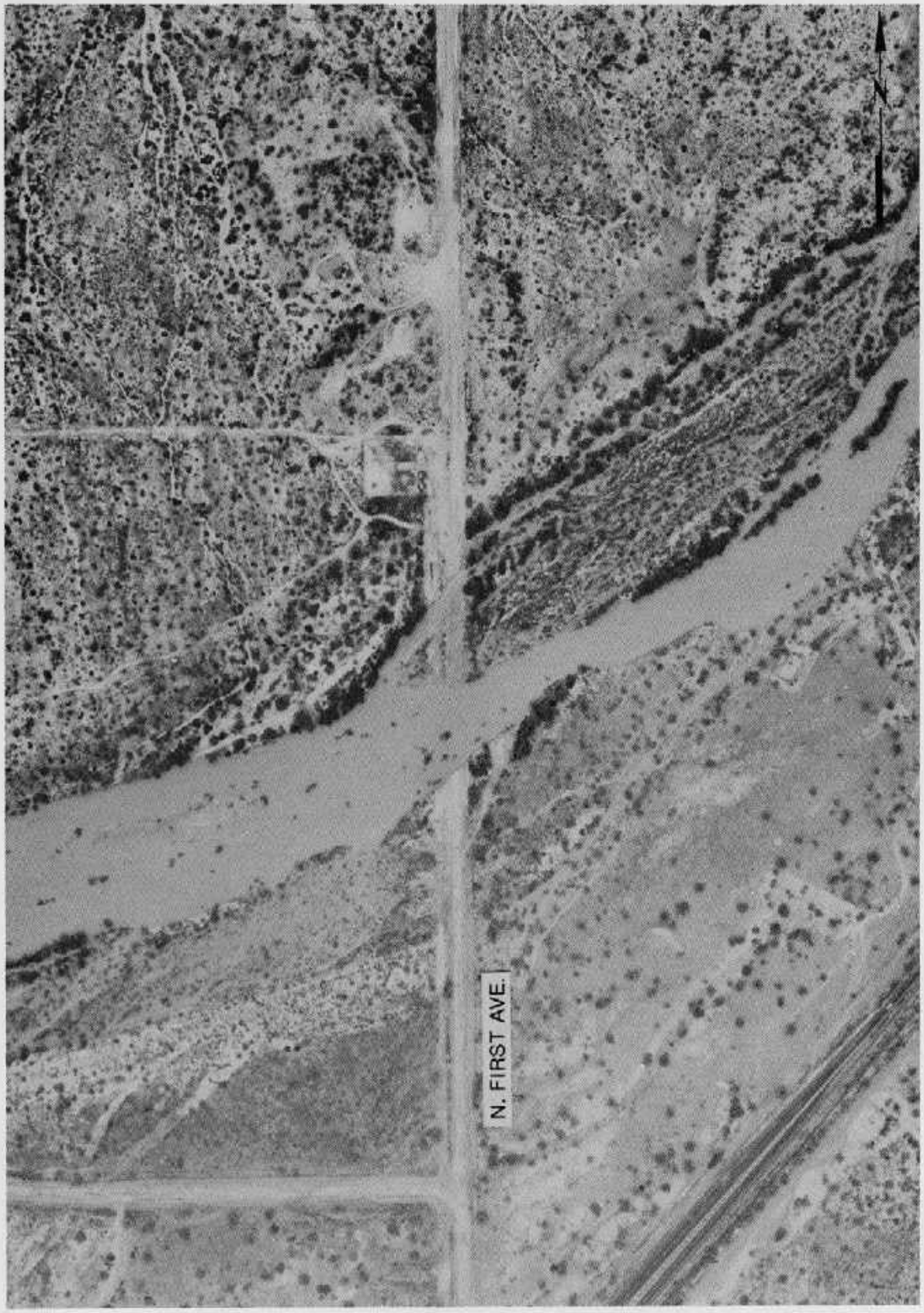


LOOKING SOUTH

LOOKING WEST



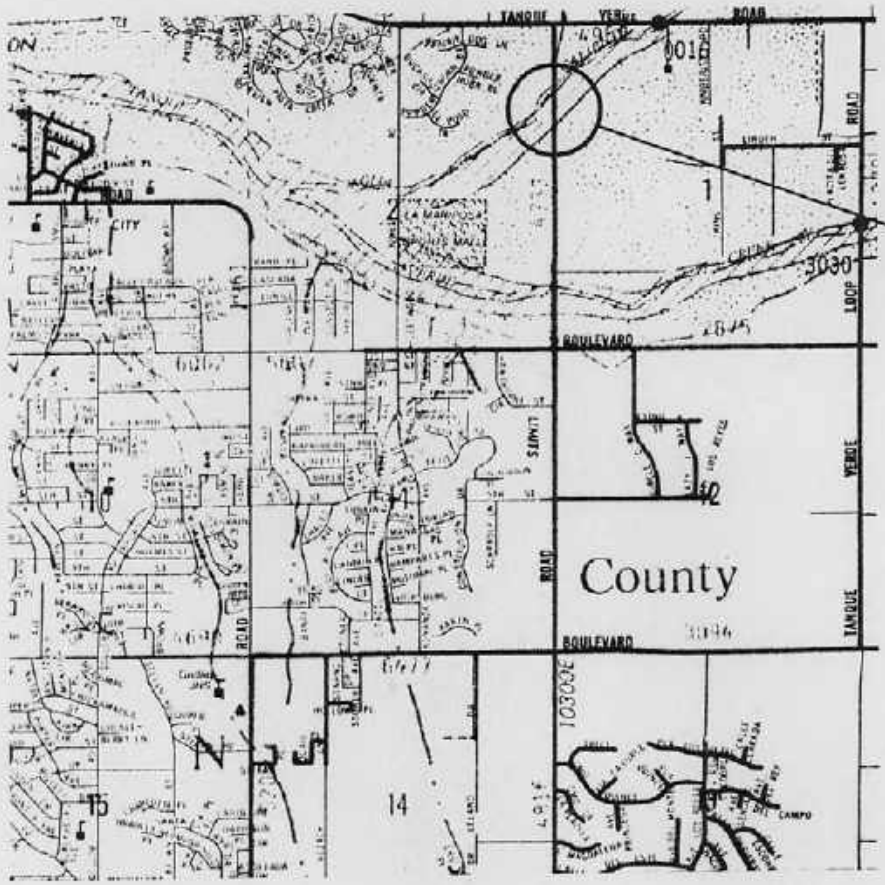
NORTH FIRST AVENUE,
CANADA DEL ORO WASH
NOVEMBER 2, 1982



NORTH FIRST AVENUE,
CANADA DEL ORO WASH
OCTOBER 3, 1983

HOUGHTON RD., AGUA CALIENTE WASH

AT GRADE CROSSING



SMALL CHANNELS

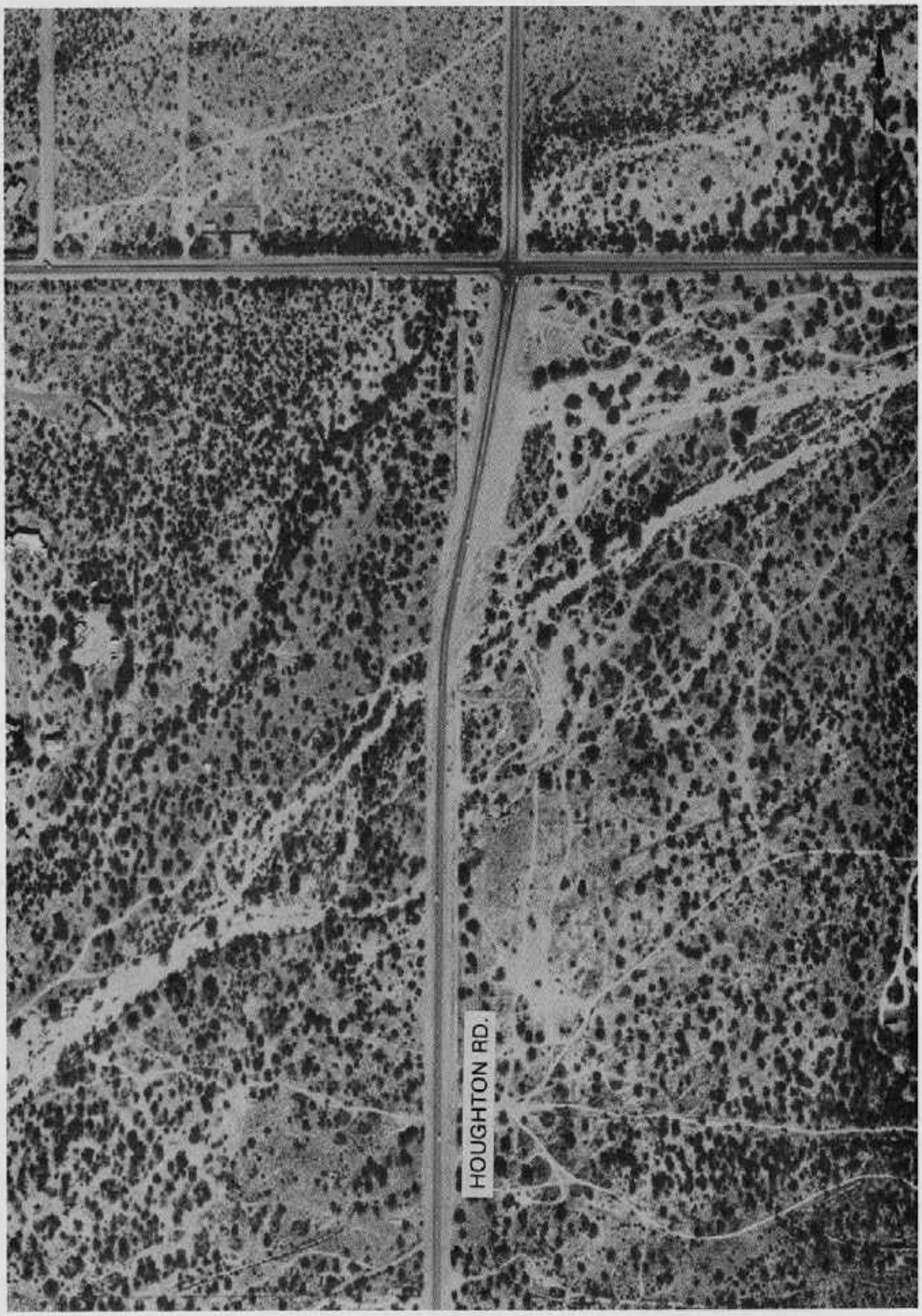
MODERATE FLOOD AREA

SEVERE FLOOD AREA

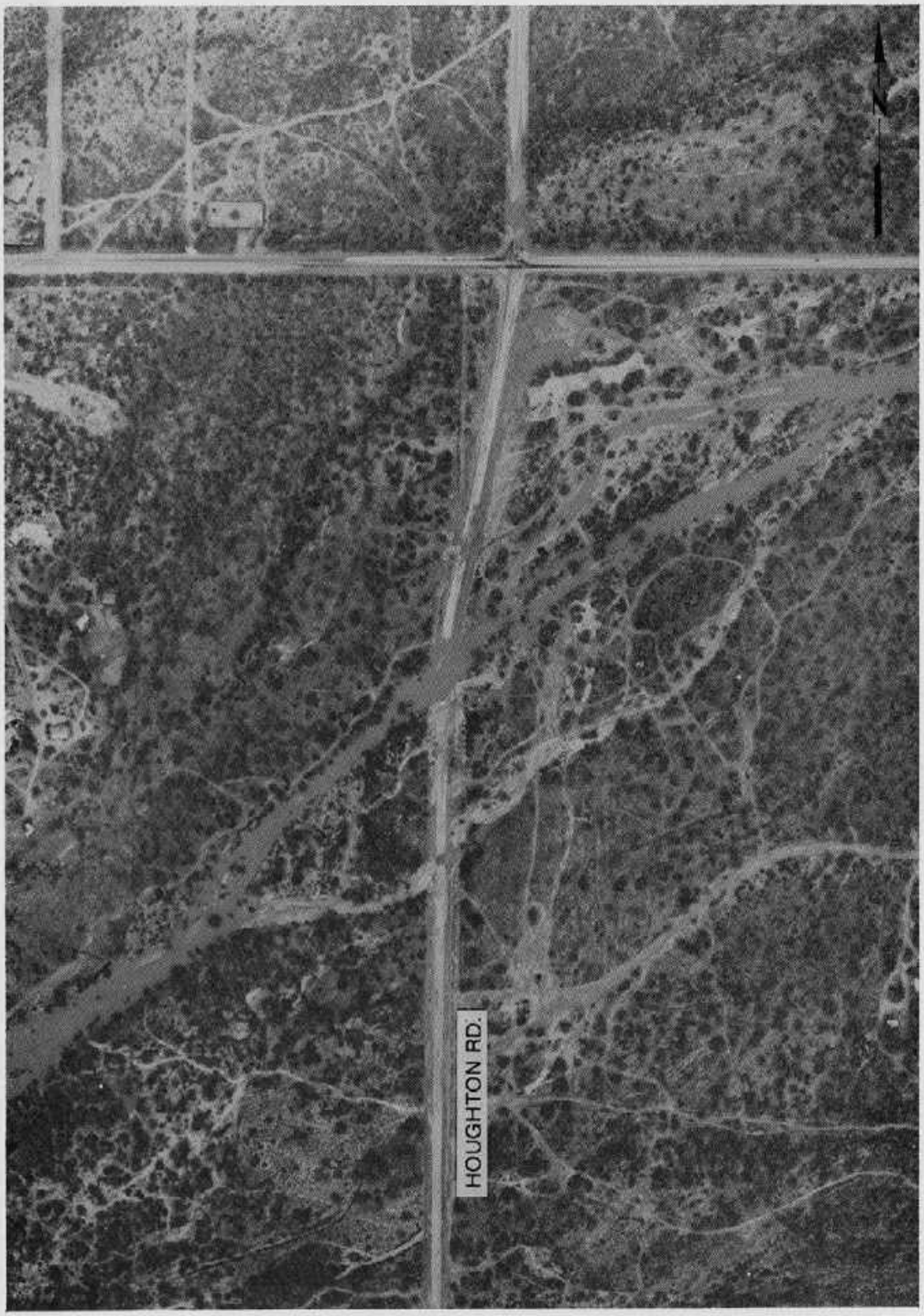
Damage Description:

The paved at grade crossing was washed out.

LOOKING NORTH



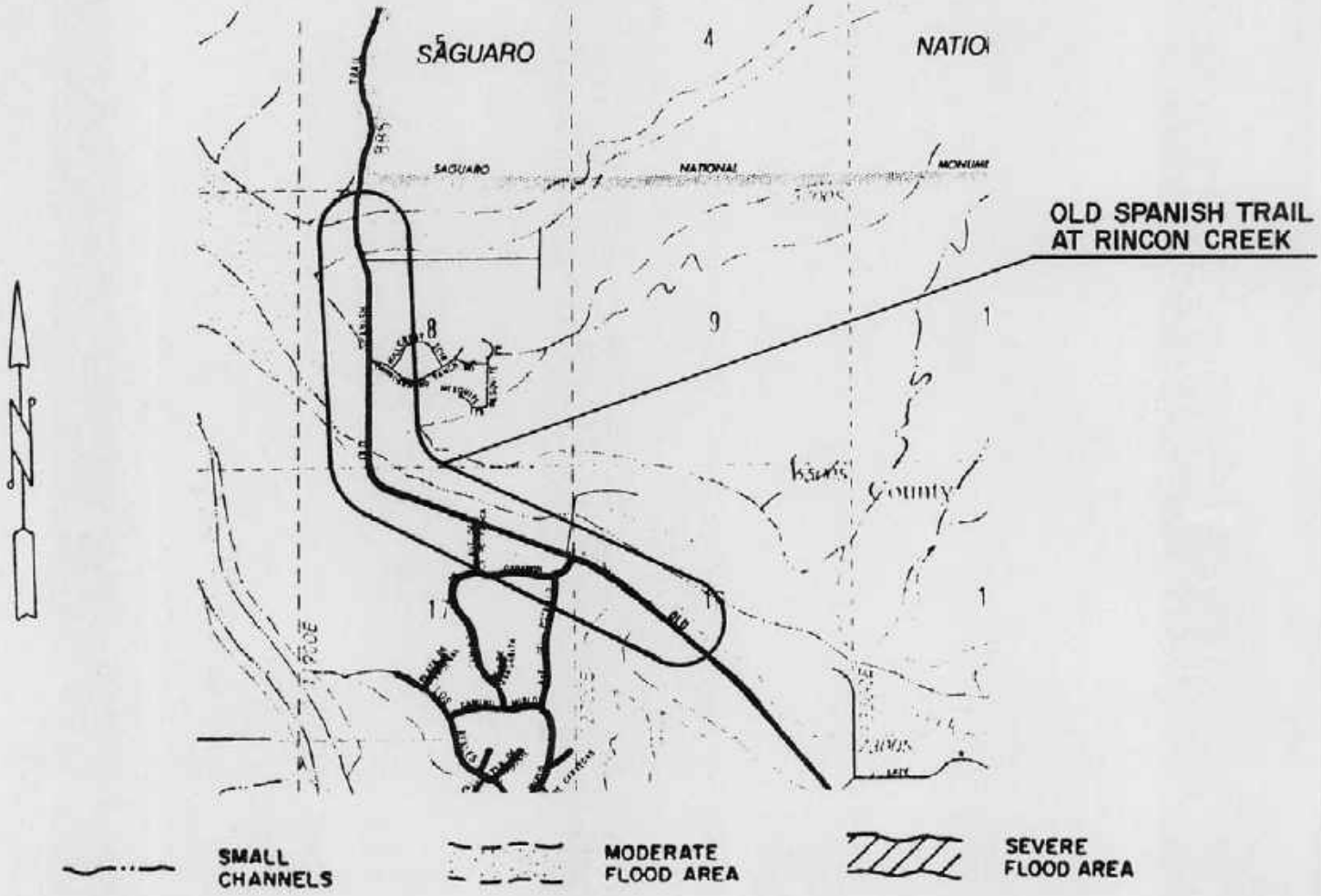
HOUGHTON ROAD,
AGUA CALIENTE WASH
NOVEMBER 4, 1982



HOUGHTON ROAD,
AGUA CALIENTE WASH
OCTOBER 3, 1983

OLD SPANISH TRAIL, RINCON CREEK

AT GRADE CROSSING



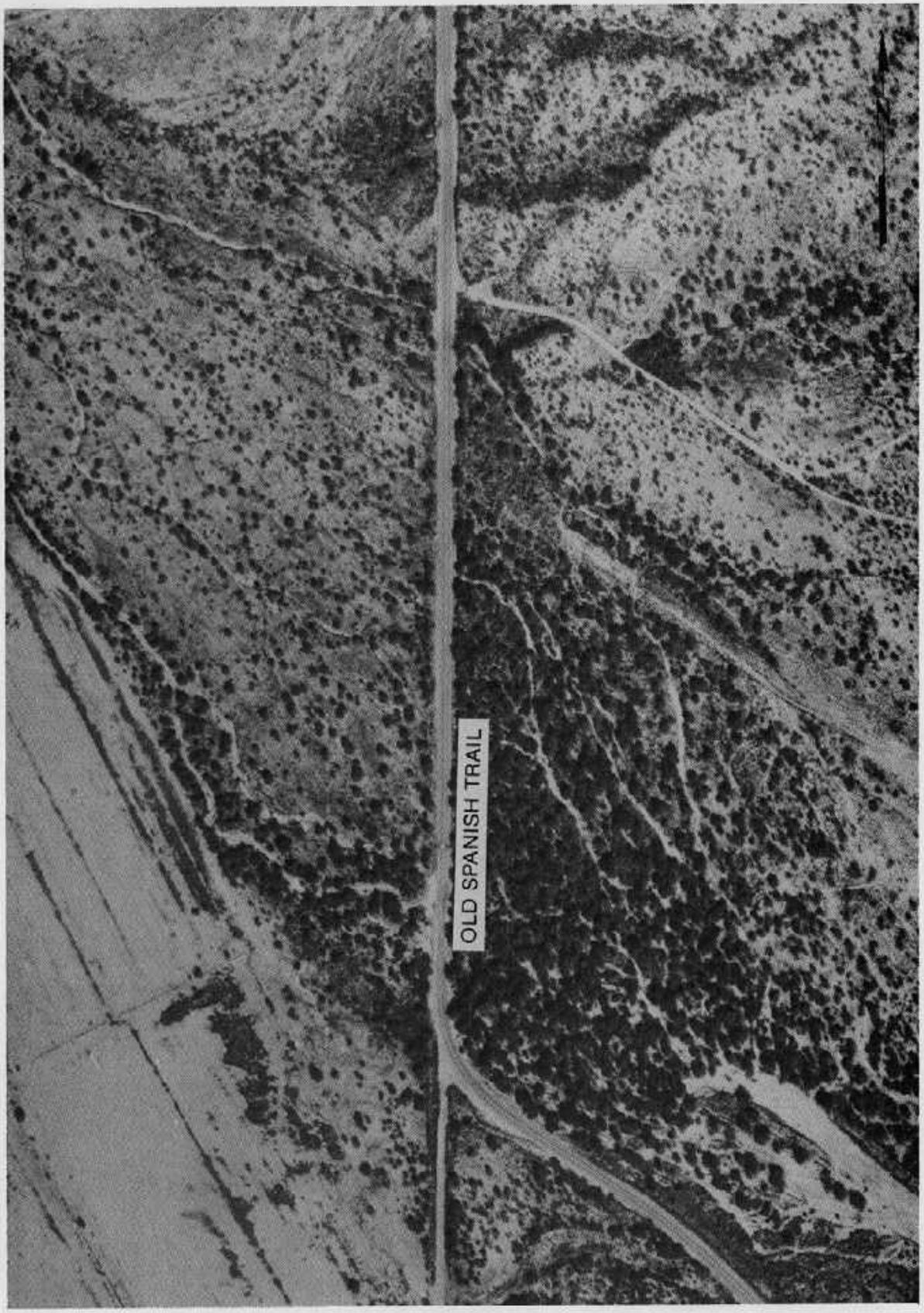
Damage Description:

Rincon Creek flooding caused severe erosion and washed out at grade crossings on Old Spanish Trail and Camino Loma Alta.

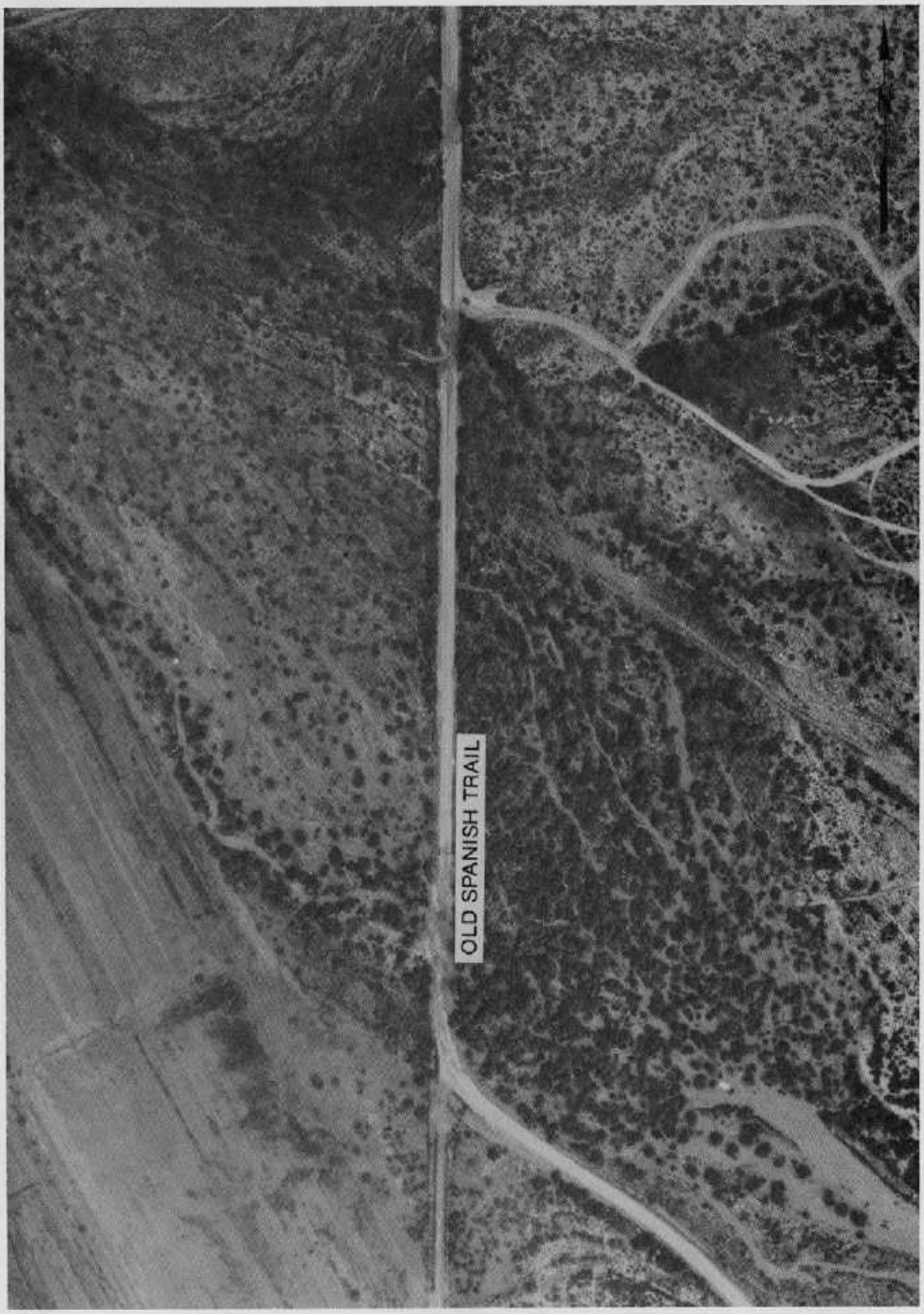
OLD SPANISH TRAIL,
RINCON CREEK

LOOKING EAST

LOOKING SOUTH

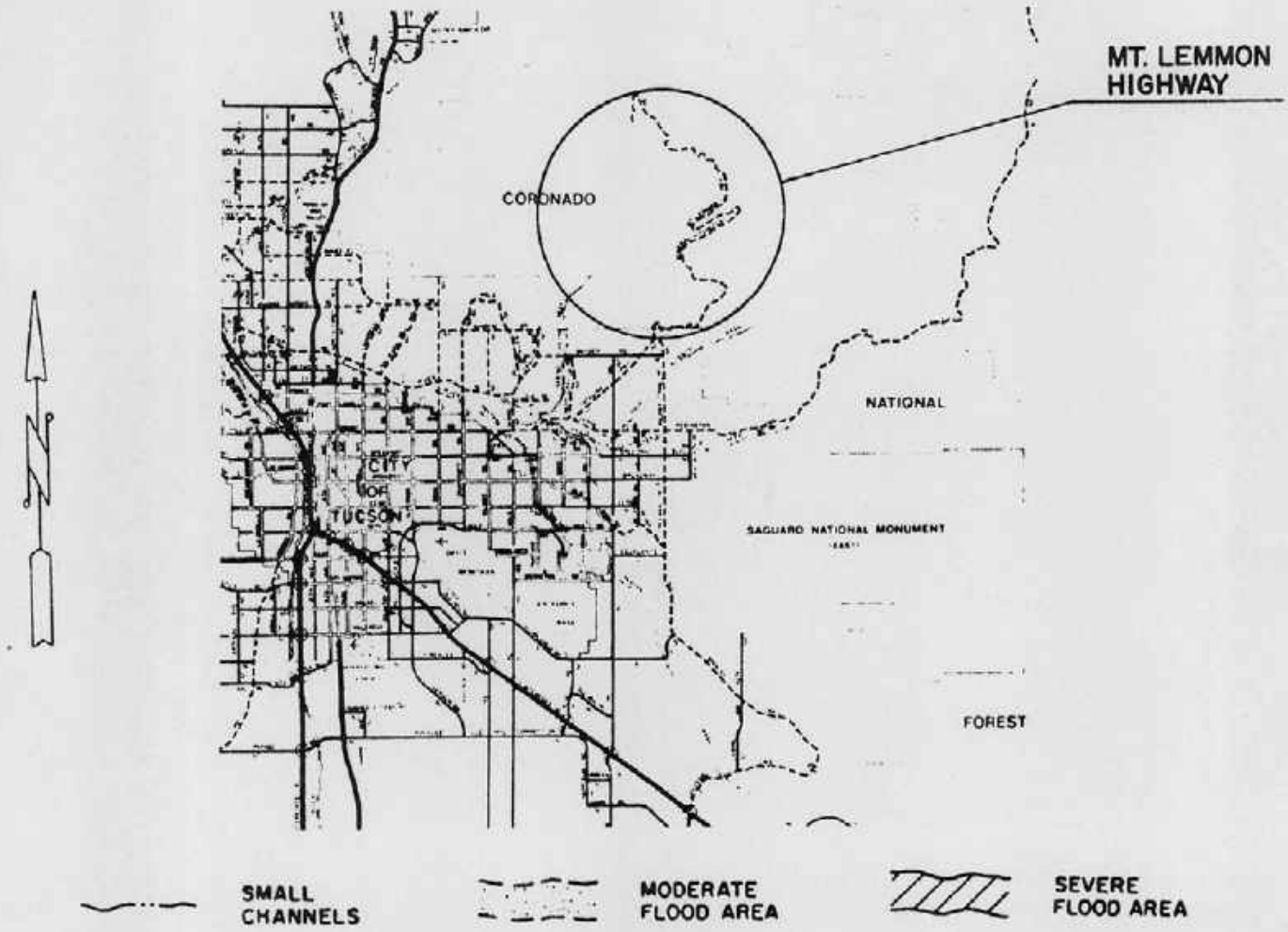


OLD SPANISH TRAIL,
RINCON CREEK
DECEMBER 17, 1982



OLD SPANISH TRAIL,
RINCON CREEK
OCTOBER 4, 1983

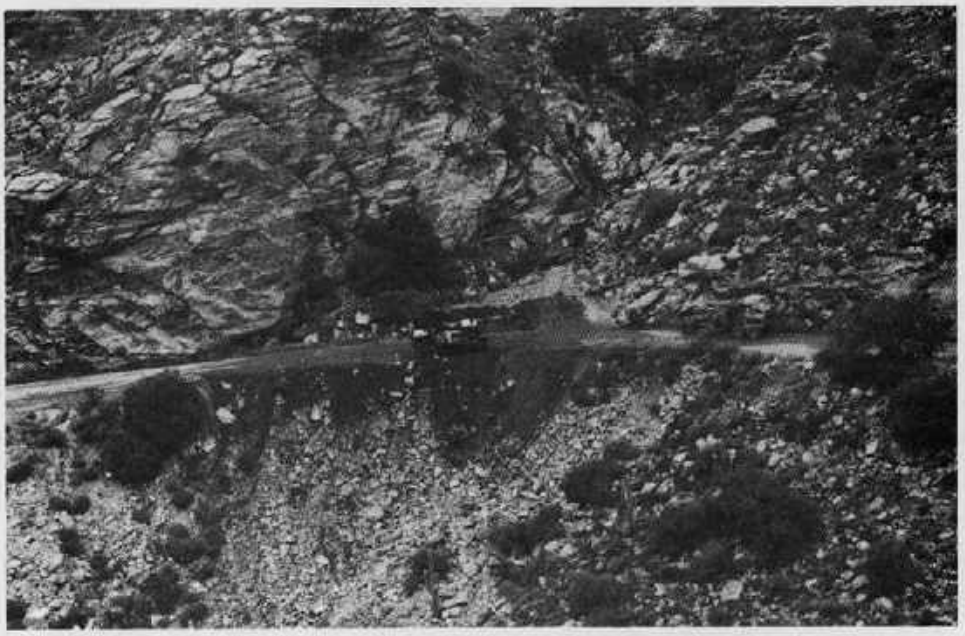
MOUNT LEMMON HIGHWAY

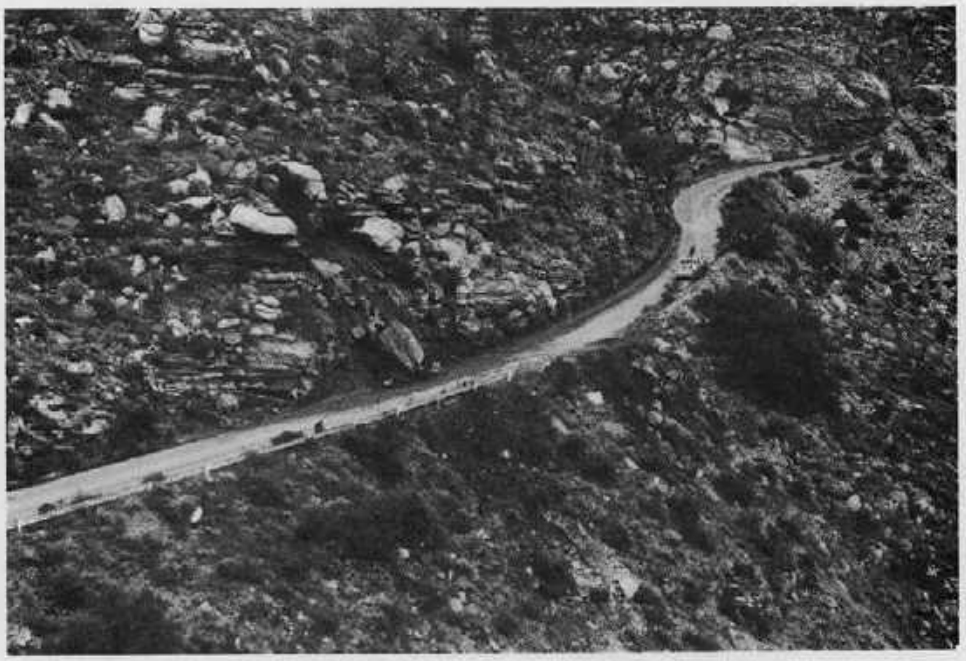


Damage Description:

There were numerous rock slides and washed out sections of roadway from Milepost 4 to Milepost 19.

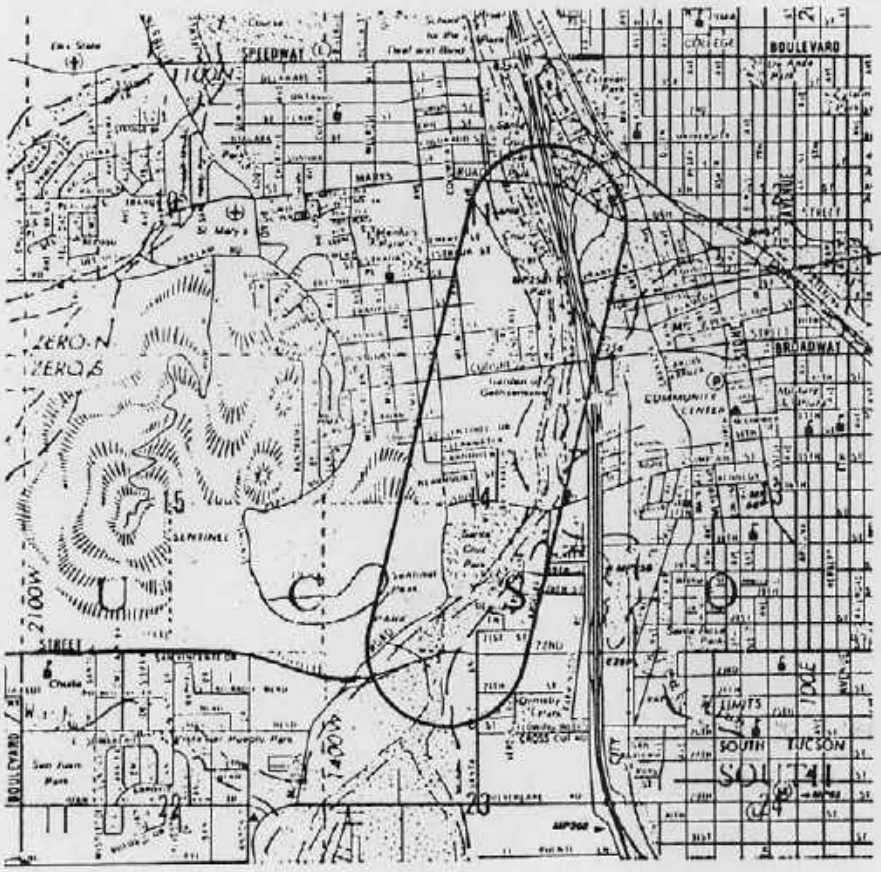
SINGLE
LANE





SANTA CRUZ RIVER, RIO NUEVO

FLOOD CONTROL WORK



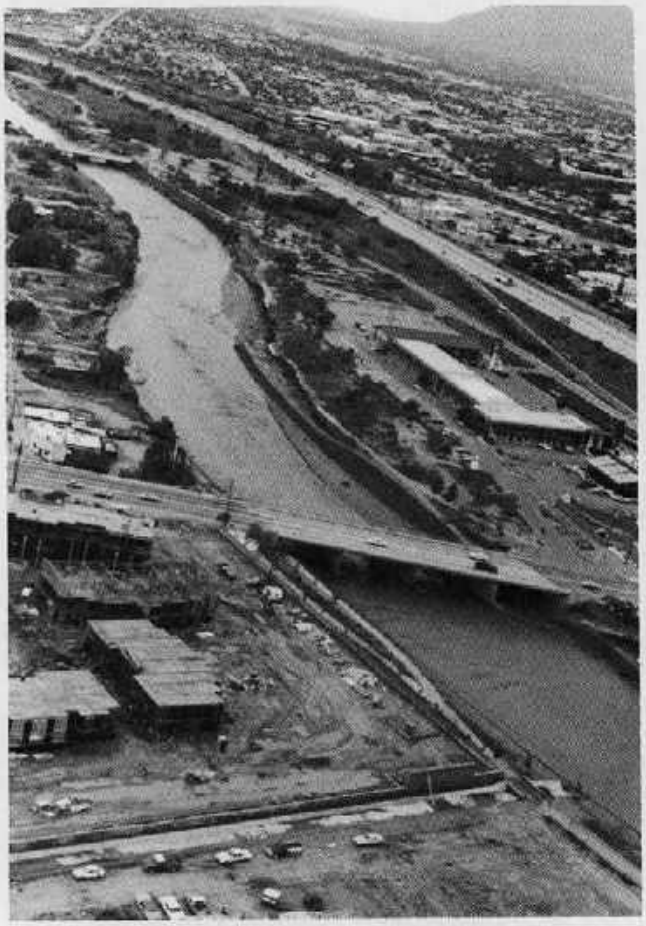
SMALL CHANNELS

MODERATE FLOOD AREA

SEVERE FLOOD AREA

Damage Description:

Severe channel meandering and bank erosion occurred.

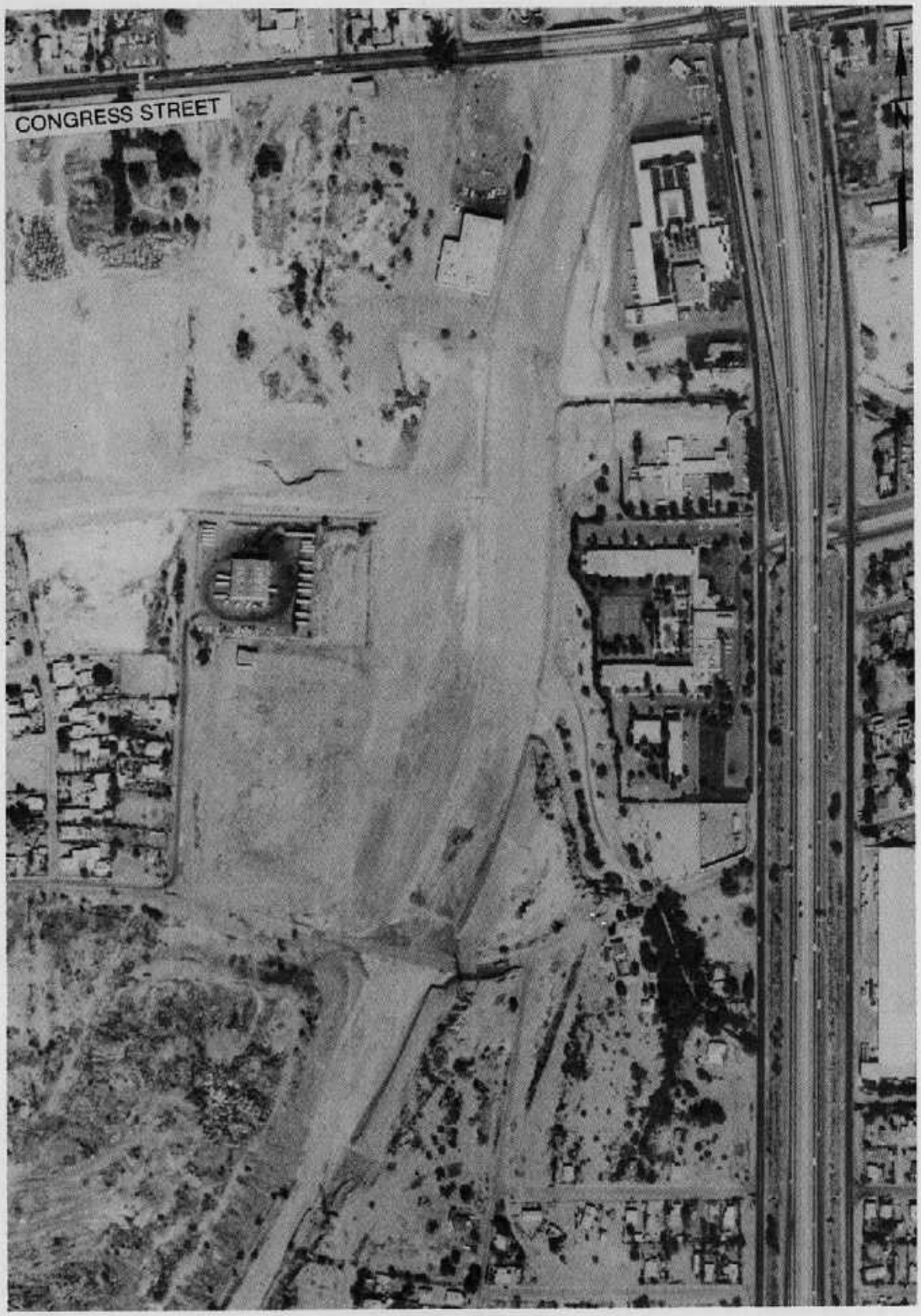


LOOKING NORTH

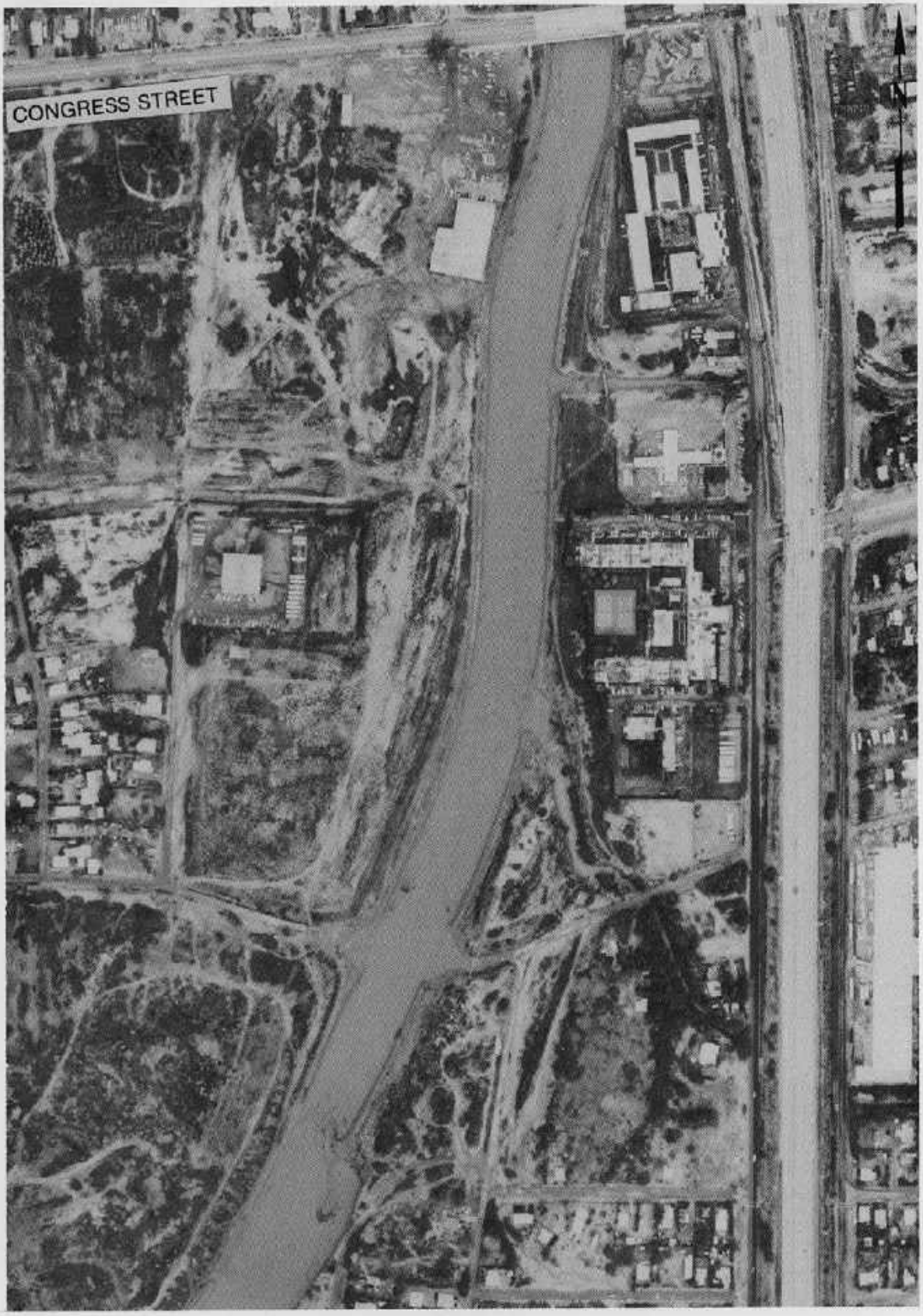
LOOKING EAST

SANTA CRUZ RIVER,
RIO NUEVO PROJECT
NOVEMBER 2, 1982

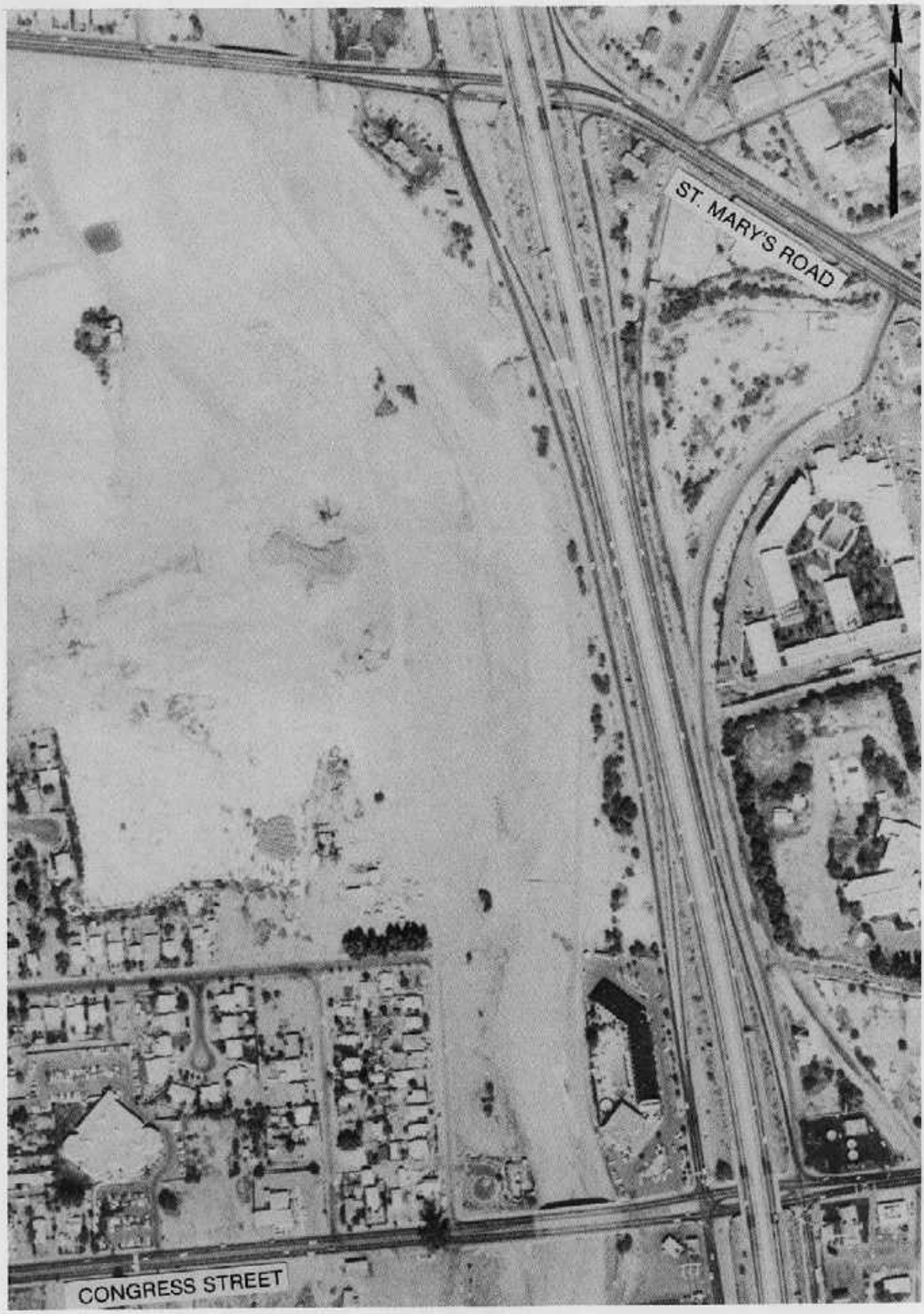
SANTA CRUZ RIVER,
RIO NUEVO PROJECT
OCTOBER 3, 1983



SANTA CRUZ RIVER,
RIO NUEVO PROJECT
NOVEMBER 2, 1982



SANTA CRUZ RIVER,
RIO NUEVO PROJECT
OCTOBER 3, 1983

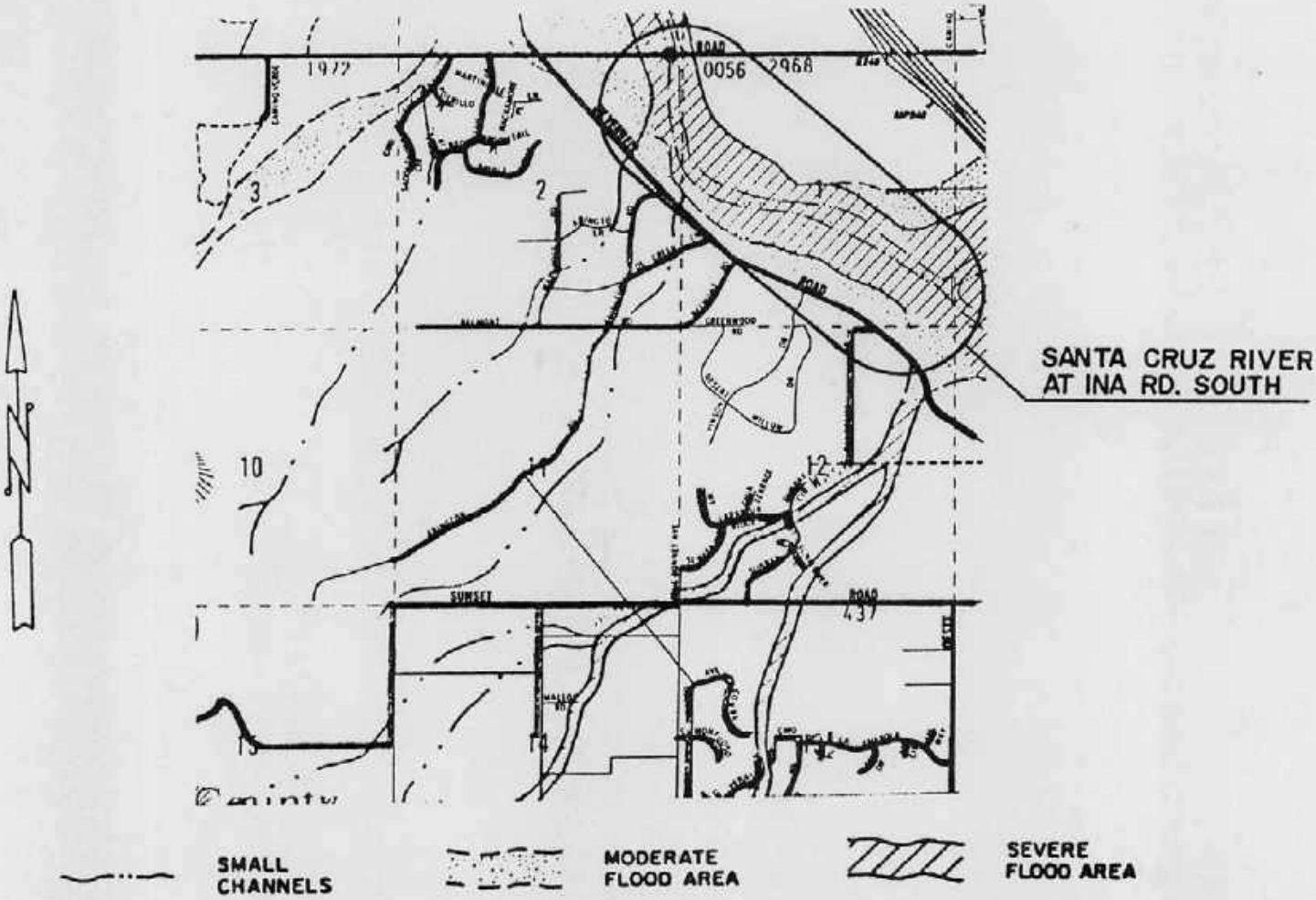


SANTA CRUZ RIVER,
RIO NUEVO PROJECT
NOVEMBER 2, 1982

SANTA CRUZ RIVER,
RIO NUEVO PROJECT
OCTOBER 3, 1983

SANTA CRUZ RIVER, INA RD. SOUTH

FLOOD CONTROL WORK



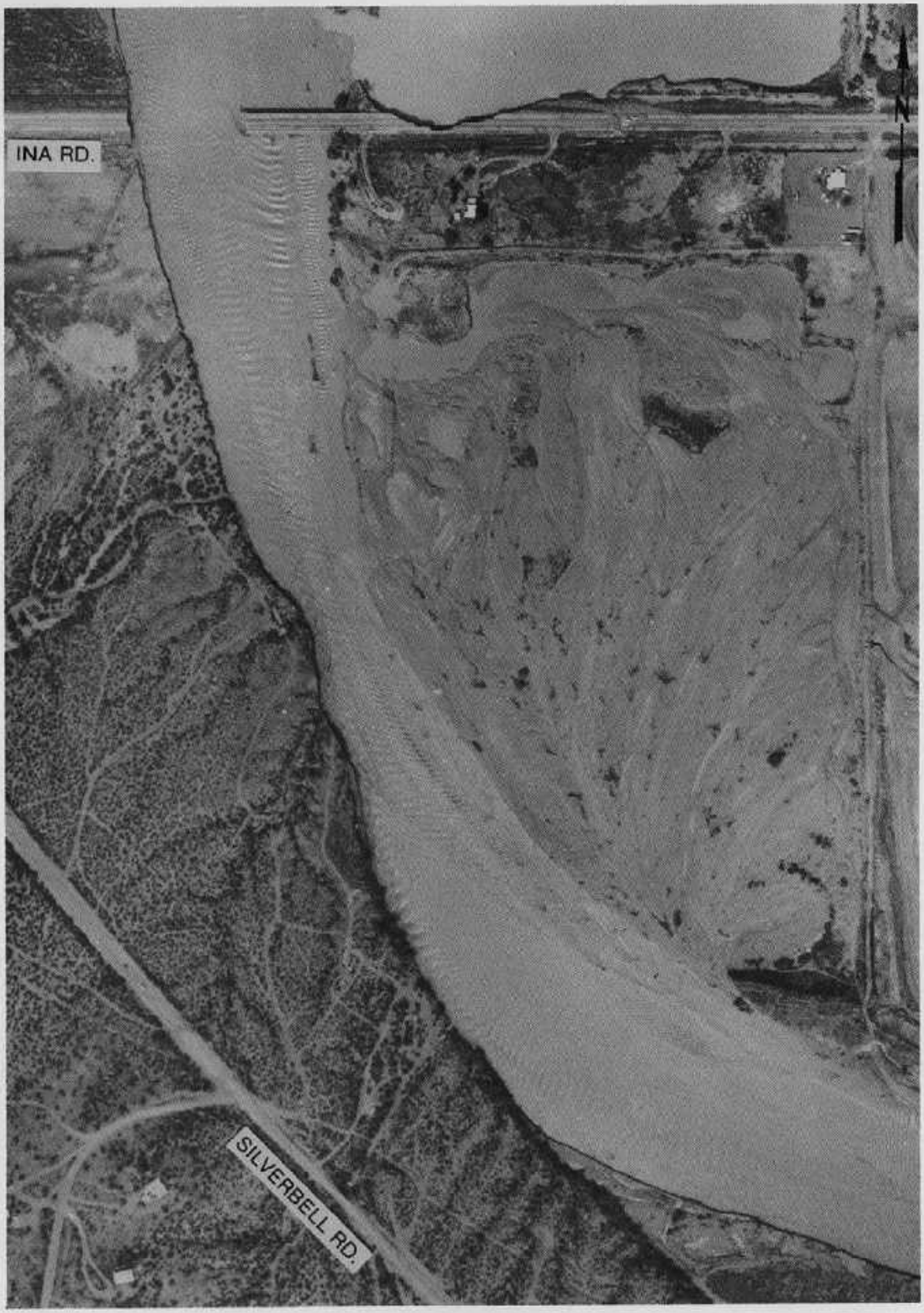
Damage Description:

The channel meandered and cut a new course at this location.

SANTA CRUZ RIVER,
INA ROAD SOUTH
DECEMBER 4, 1982

SANTA CRUZ RIVER,
INA ROAD SOUTH
OCTOBER 3, 1983

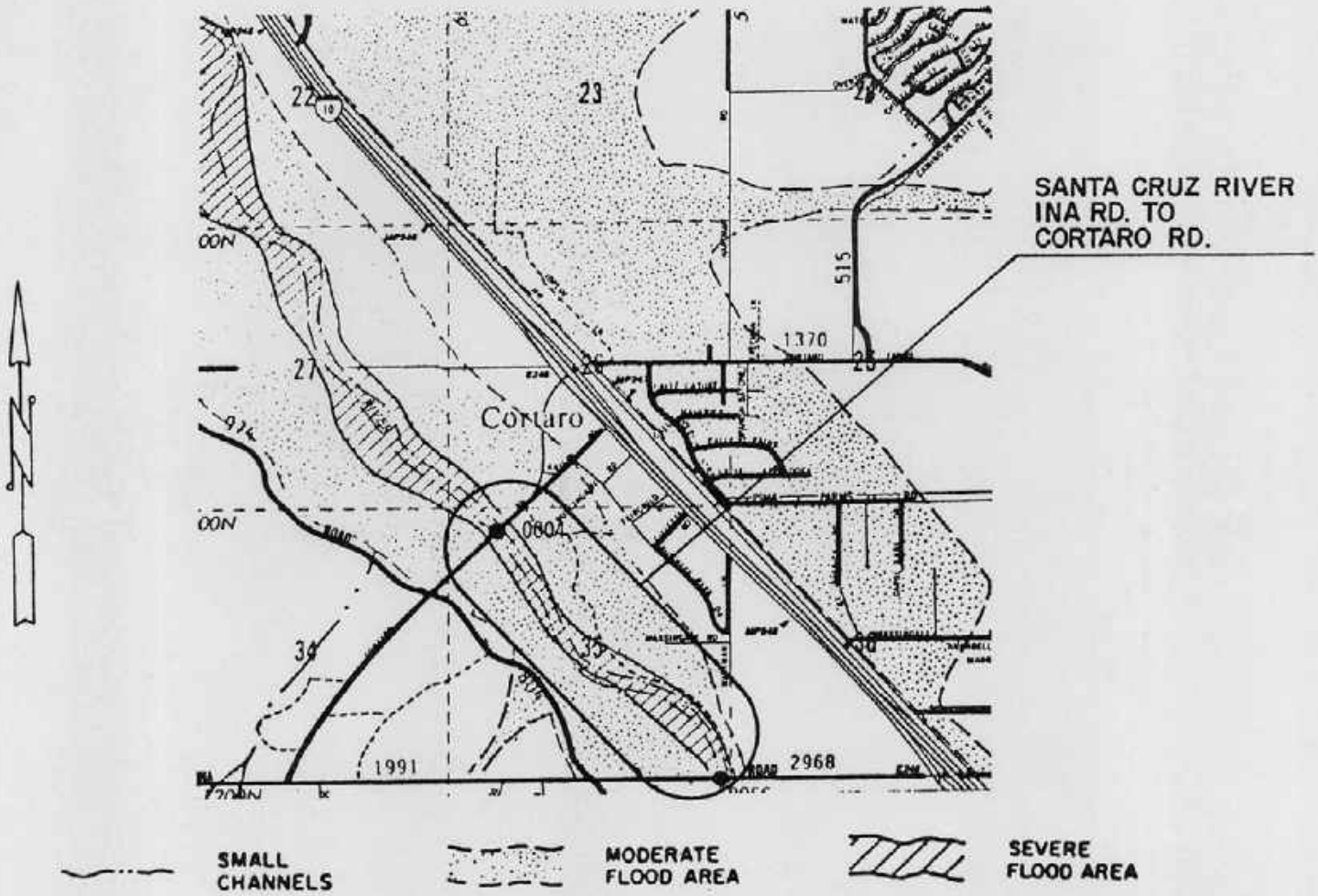
SANTA CRUZ RIVER,
INA ROAD SOUTH
DECEMBER 4, 1982



SANTA CRUZ RIVER,
INA ROAD SOUTH
OCTOBER 3, 1983

SANTA CRUZ RIVER, INA RD. TO CORTARO RD.

FLOOD CONTROL WORK



Damage Description:

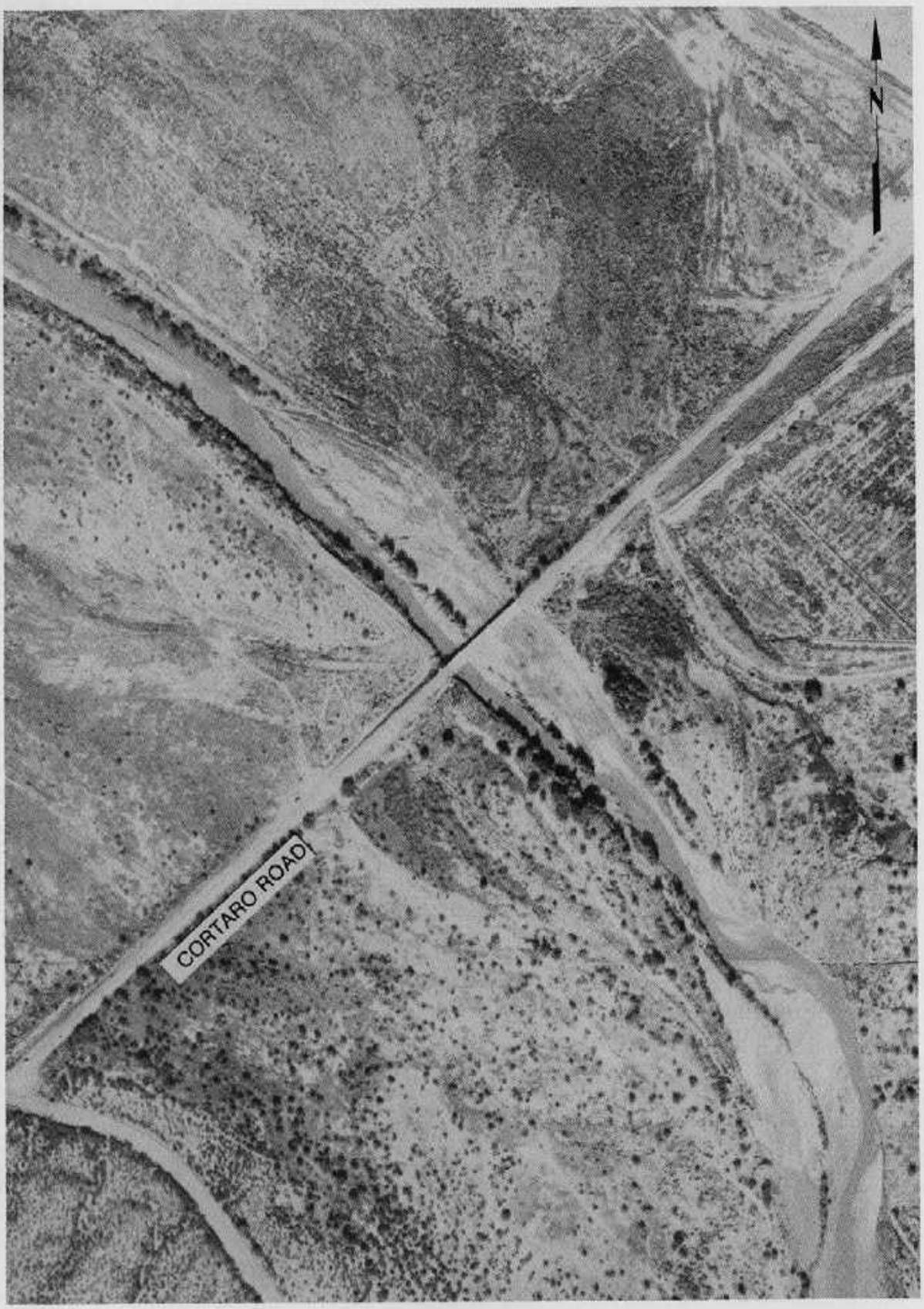
Major channel meandering and flooding took place downstream of the confluence of the Santa Cruz River, with the Rillito River and Canada del Oro Wash. Major damages occurred where new stream channels formed.

SANTA CRUZ RIVER,
INA ROAD NORTH
DECEMBER 4, 1982

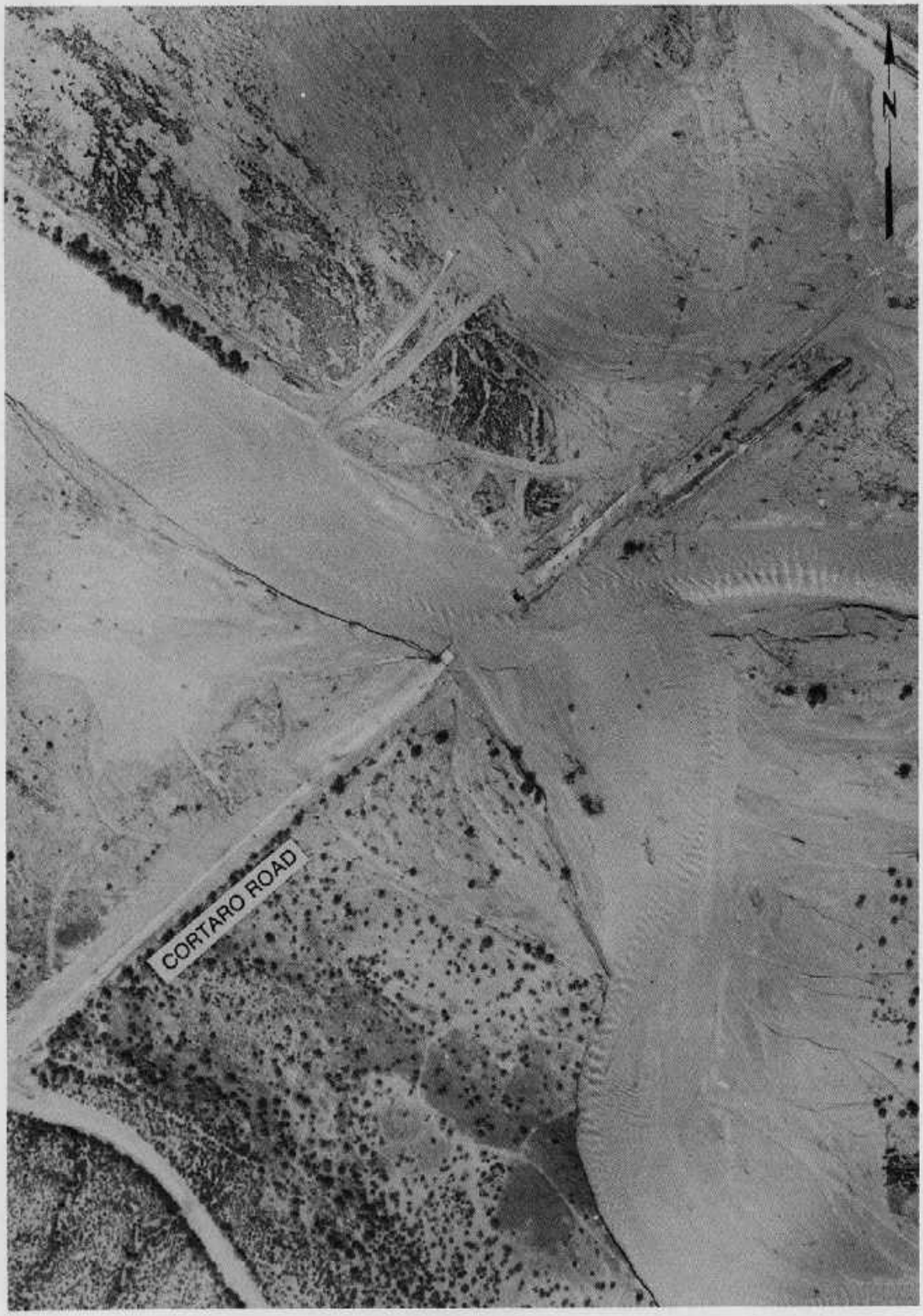
SANTA CRUZ RIVER,
INA ROAD NORTH
OCTOBER 3, 1983

SANTA CRUZ RIVER,
INA ROAD NORTH
DECEMBER 4, 1982

SANTA CRUZ RIVER,
INA ROAD NORTH
OCTOBER 3, 1983



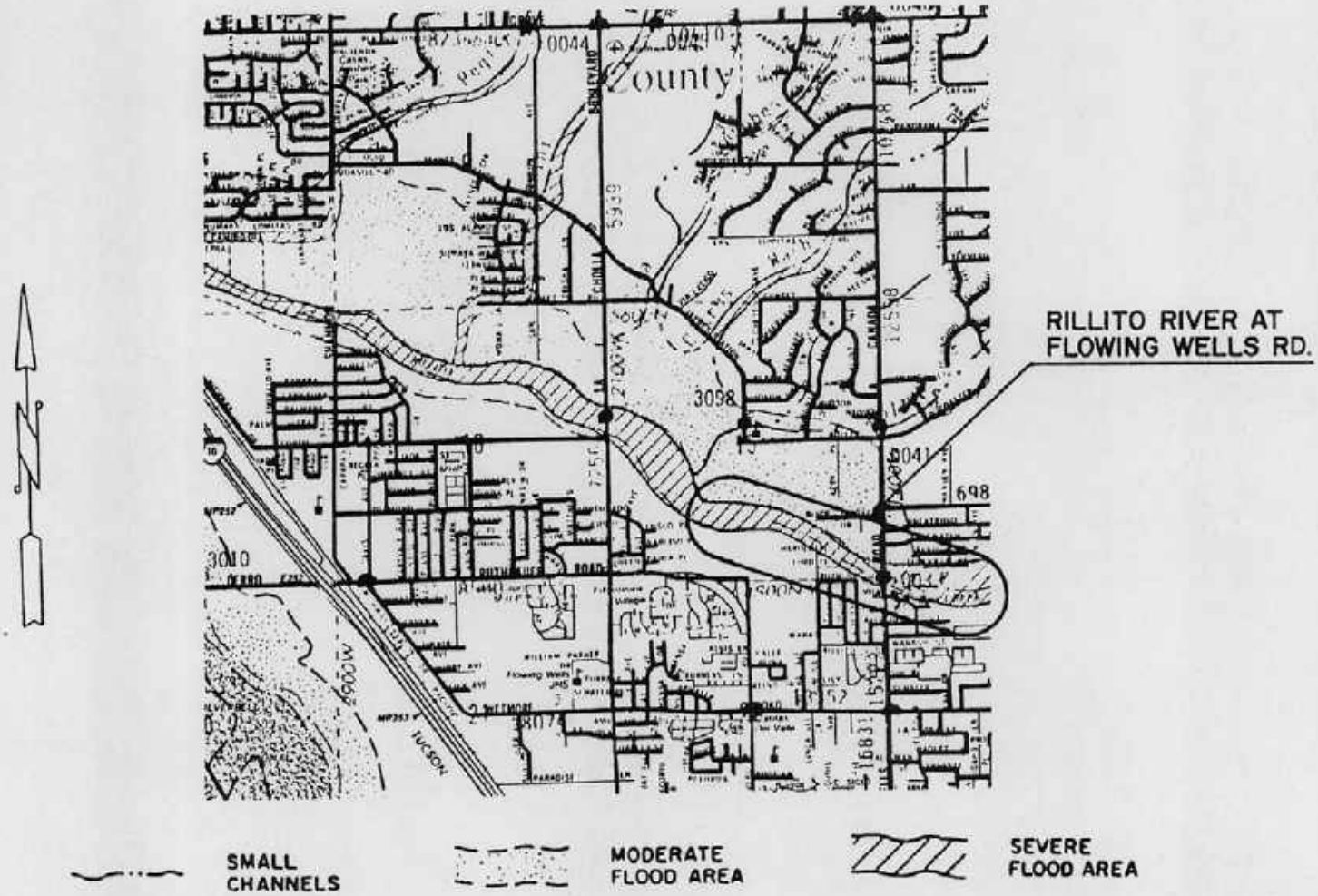
SANTA CRUZ RIVER,
INA ROAD NORTH
DECEMBER 4, 1982



SANTA CRUZ RIVER,
INA ROAD NORTH
OCTOBER 3, 1983

RILLITO RIVER, FLOWING WELLS RD.

FLOOD CONTROL WORK

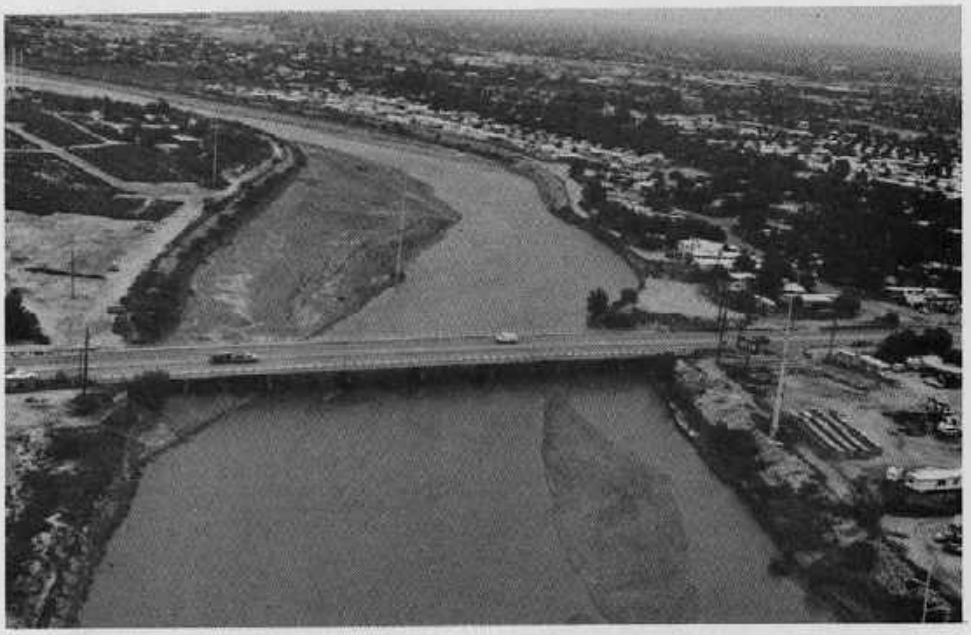


Damage Description:

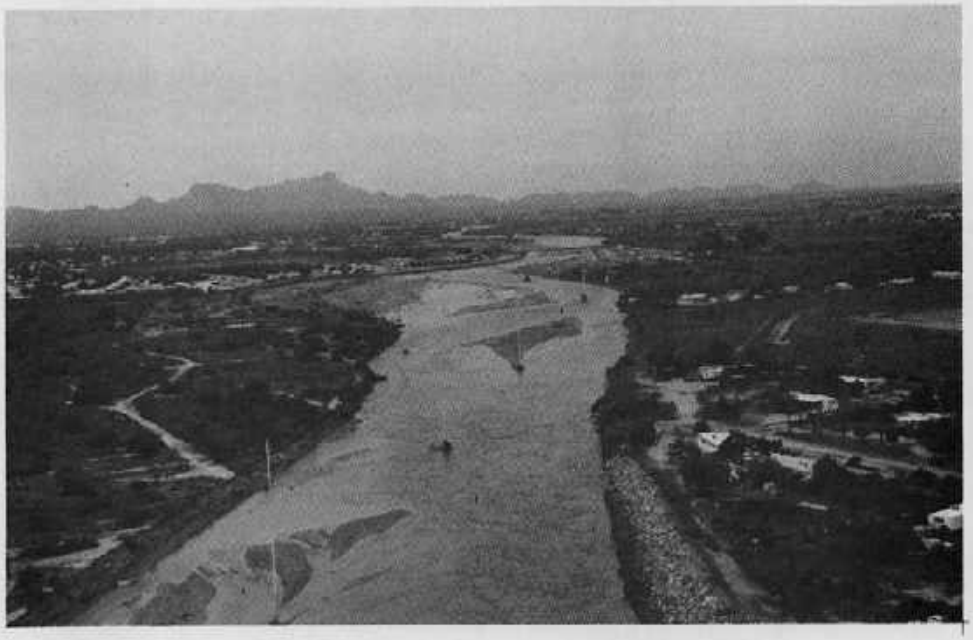
Floodwaters in the Rillito River destroyed 800 feet of dumped rock rip rap bank protection.

RILLITO RIVER,
FLOWING WELLS ROAD

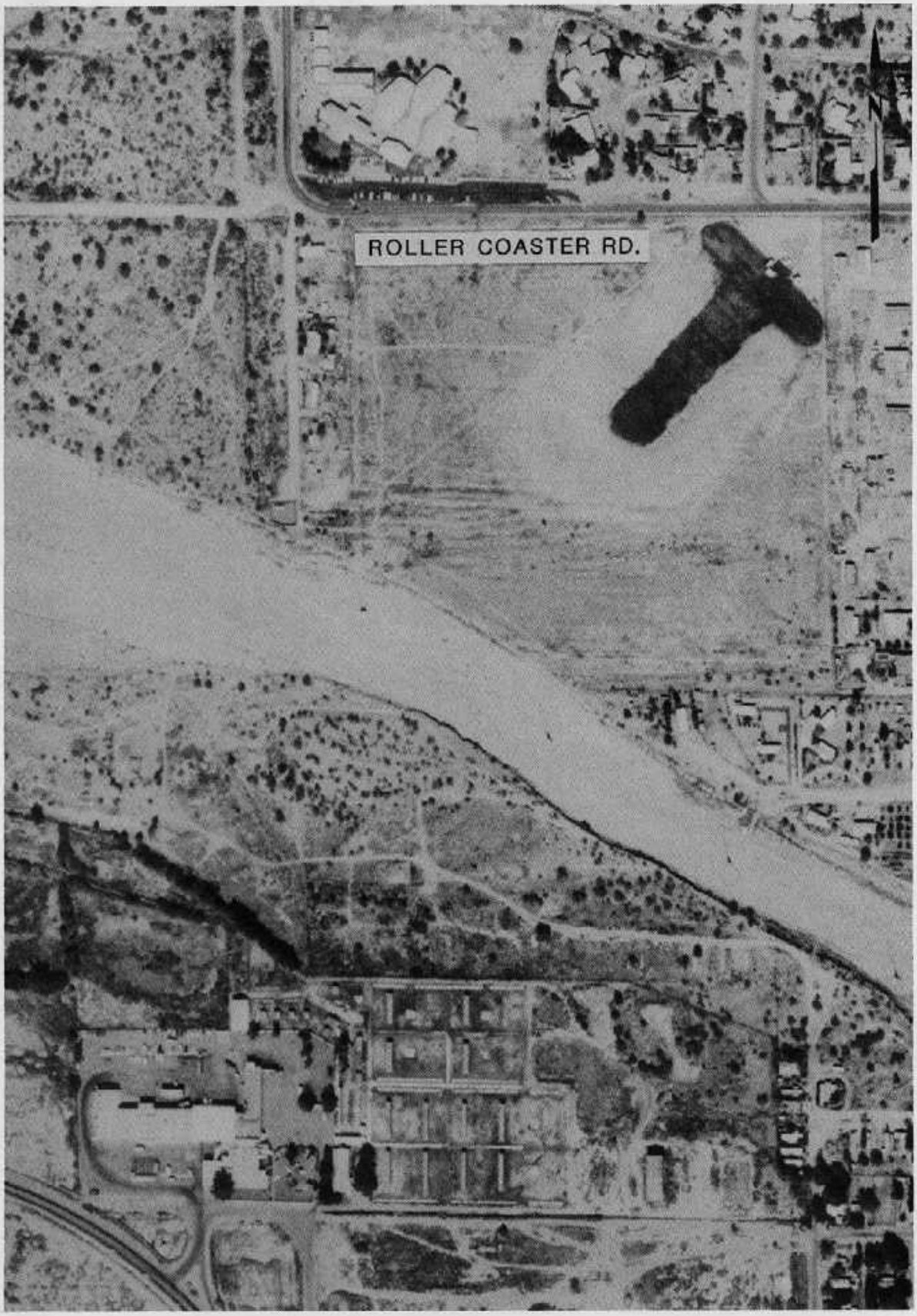
LOOKING SOUTHEAST



LOOKING EAST

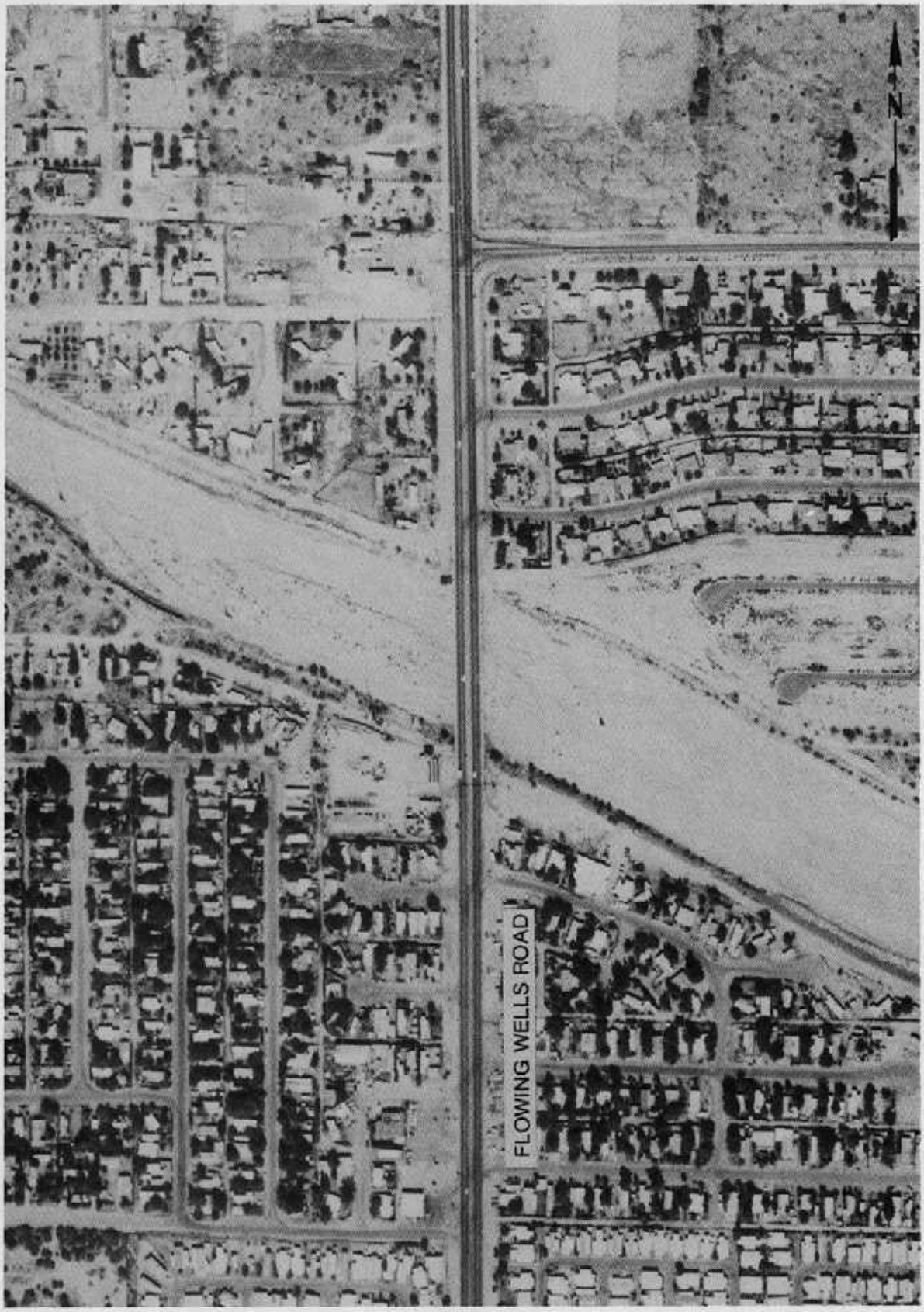


LOOKING WEST



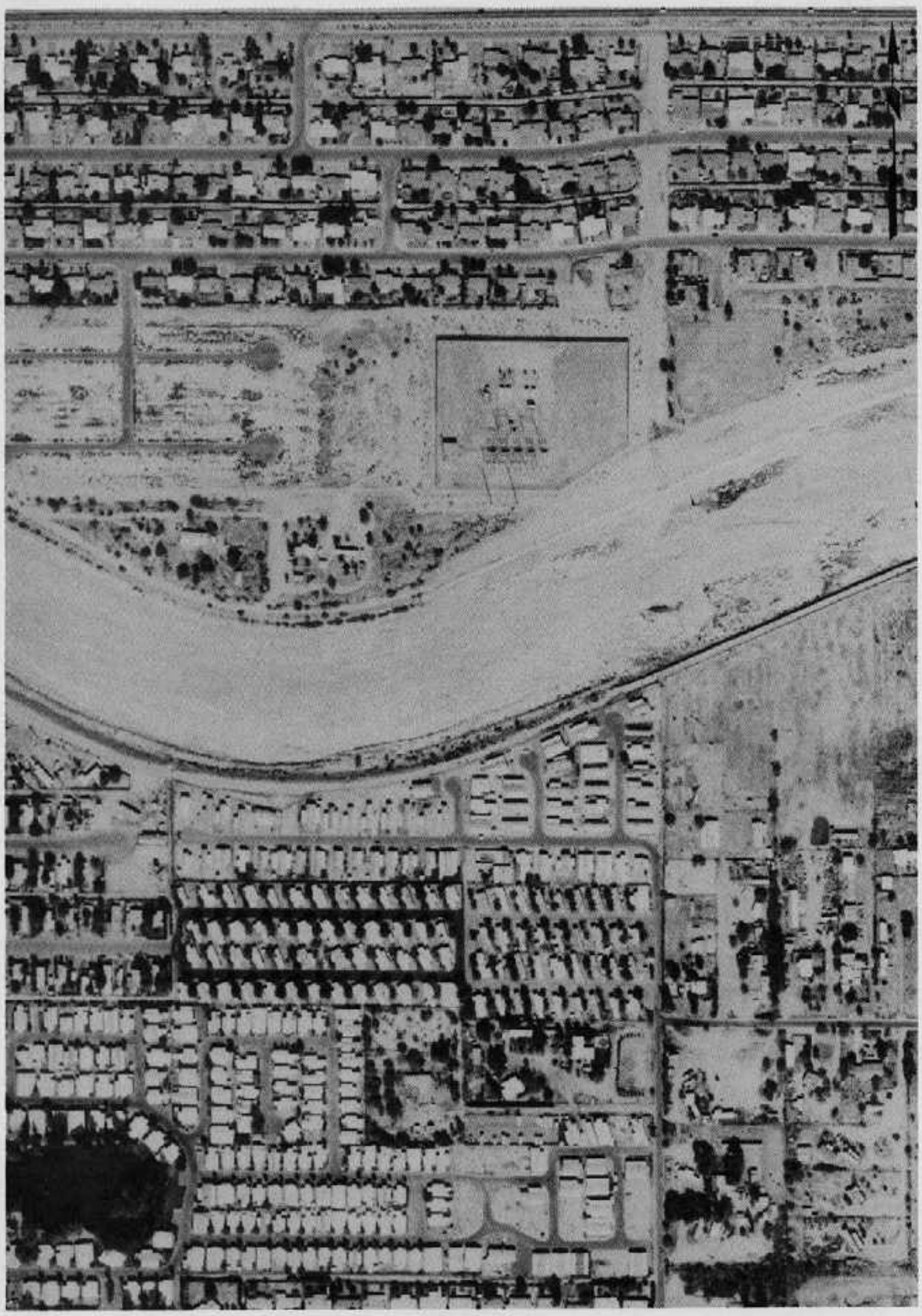
RILLITO RIVER,
FLOWING WELLS ROAD
NOVEMBER 2, 1982

RILLITO RIVER,
FLOWING WELLS ROAD
OCTOBER 3, 1983

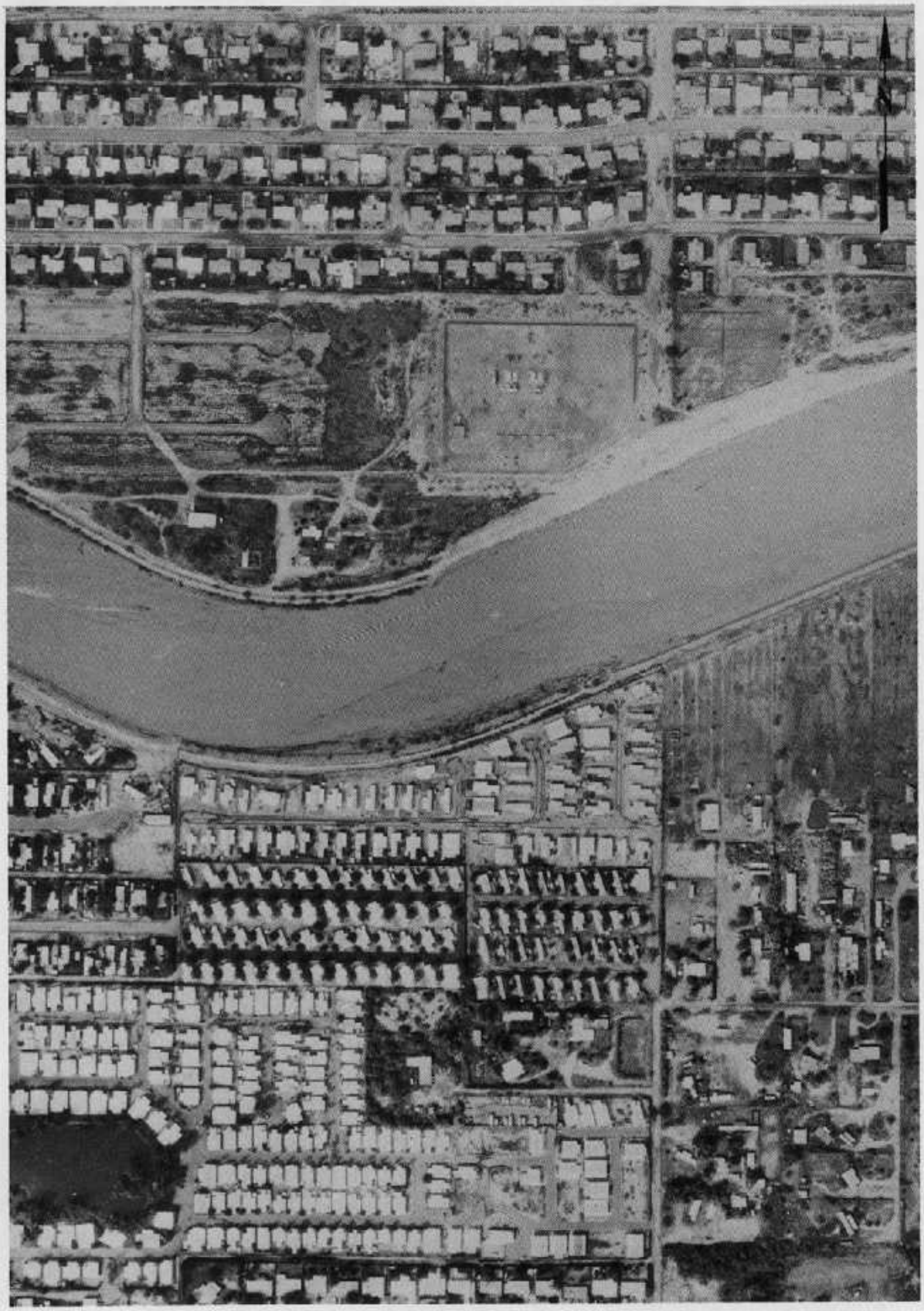


RILLITO RIVER,
FLOWING WELLS ROAD
NOVEMBER 2, 1982

RILLITO RIVER,
FLOWING WELLS ROAD
OCTOBER 3, 1983



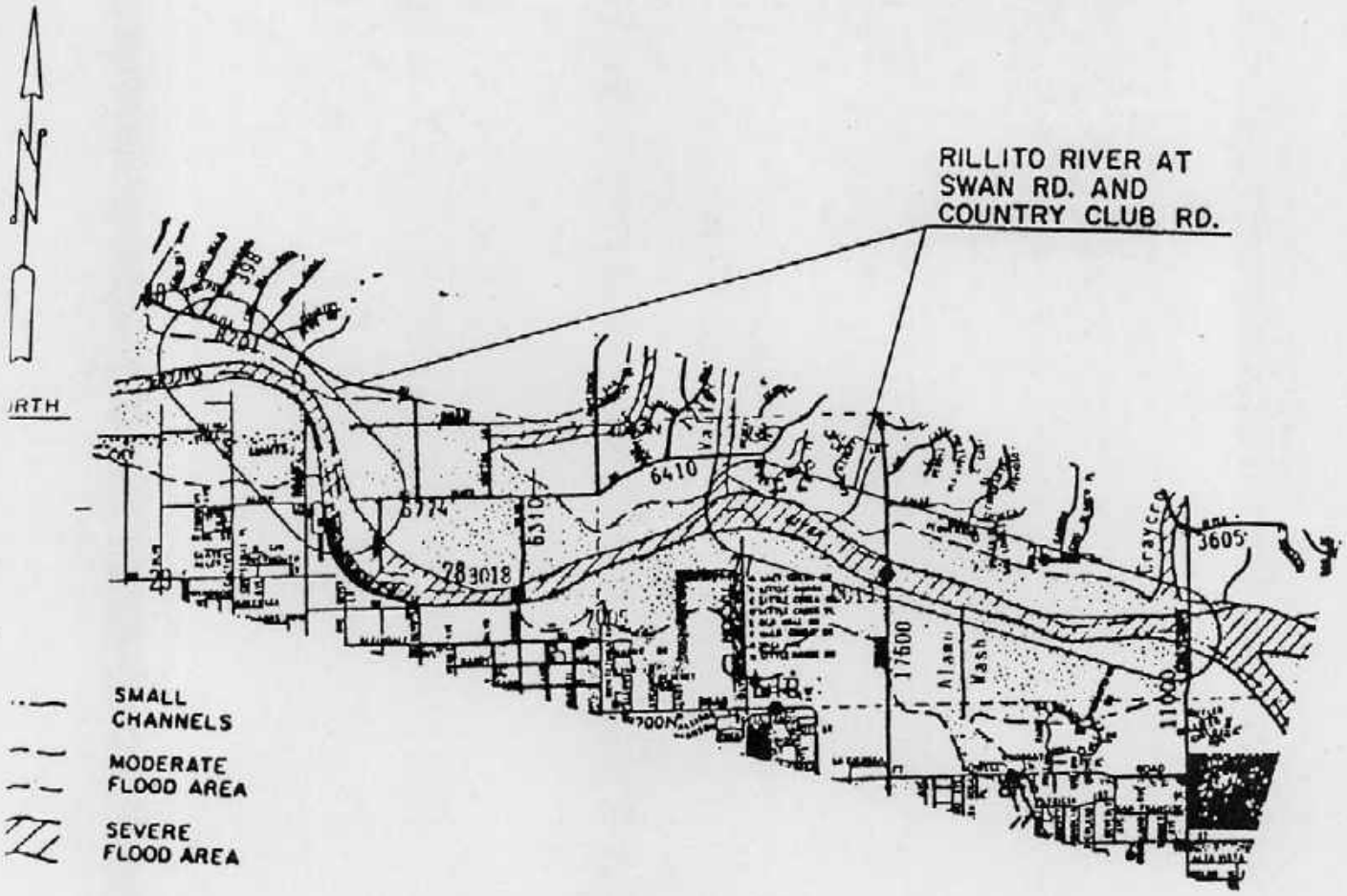
RILLITO RIVER,
FLOWING WELLS ROAD
NOVEMBER 2, 1982



RILLITO RIVER,
FLOWING WELLS ROAD
OCTOBER 3, 1983

RILLITO RIVER, SWAN RD. & COUNTRY CLUB RD.

FLOOD CONTROL WORK



Damage Description:

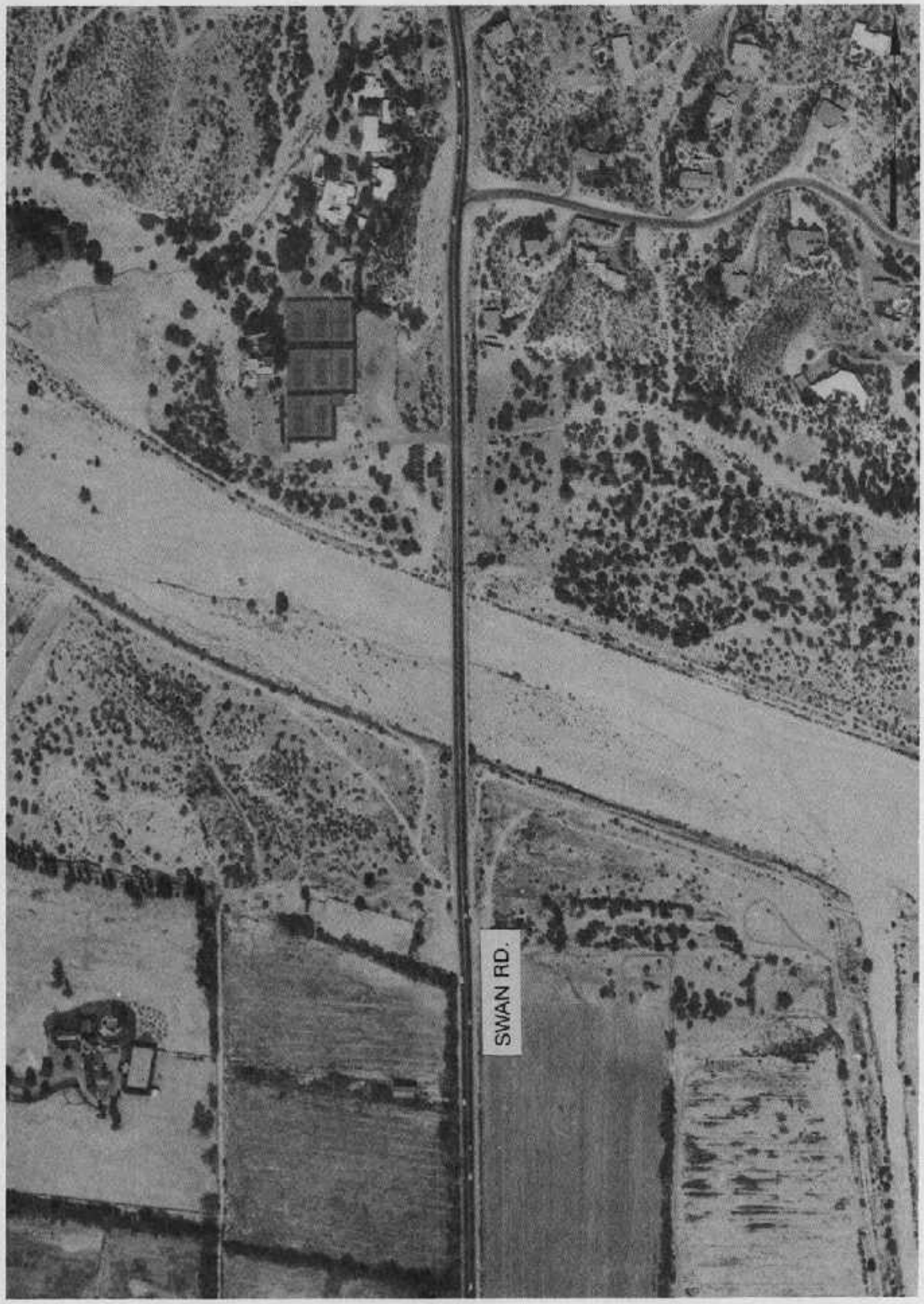
Floodwater in the Rillito River destroyed 800 feet of rack rip rap bank protection.

LOOKING NORTHWEST

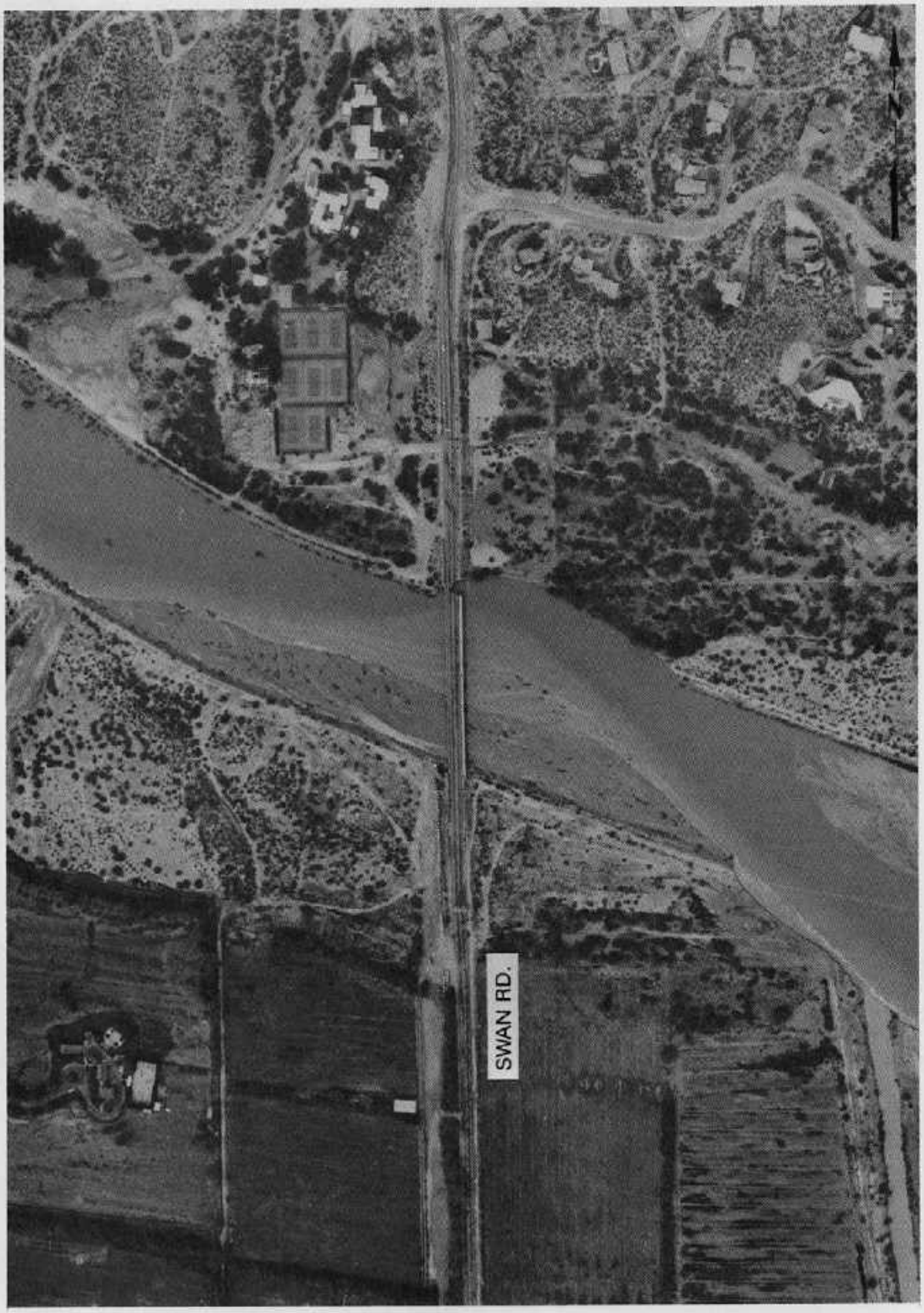
LOOKING WEST

RILLITO RIVER,
SWAN ROAD & COUNTRY CLUB ROAD
NOVEMBER 4, 1982

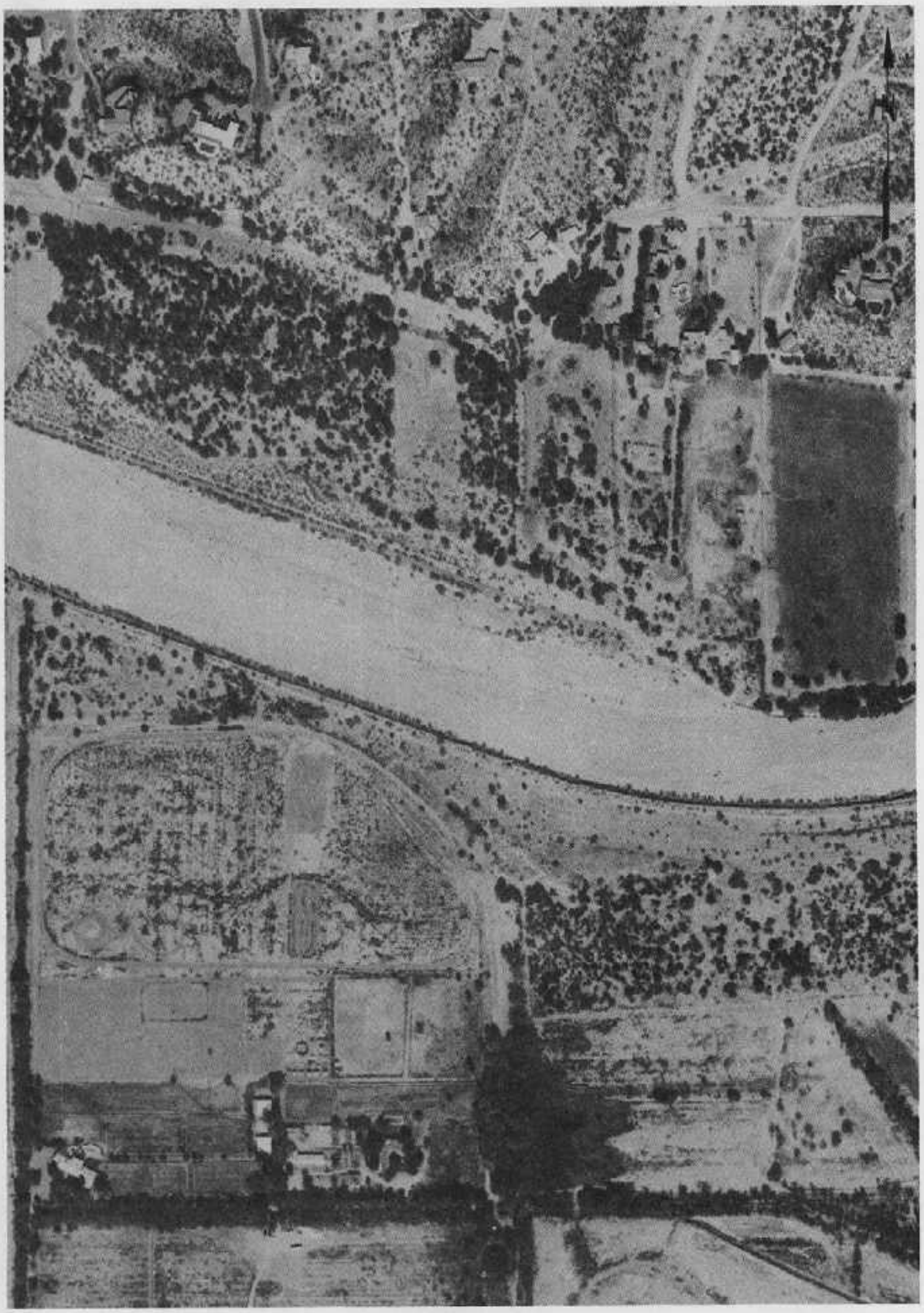
RILLITO RIVER,
SWAN ROAD & COUNTRY CLUB ROAD
OCTOBER 3, 1983



RILLITO RIVER,
SWAN ROAD & COUNRTY CLUB ROAD
NOVEMBER 4, 1982

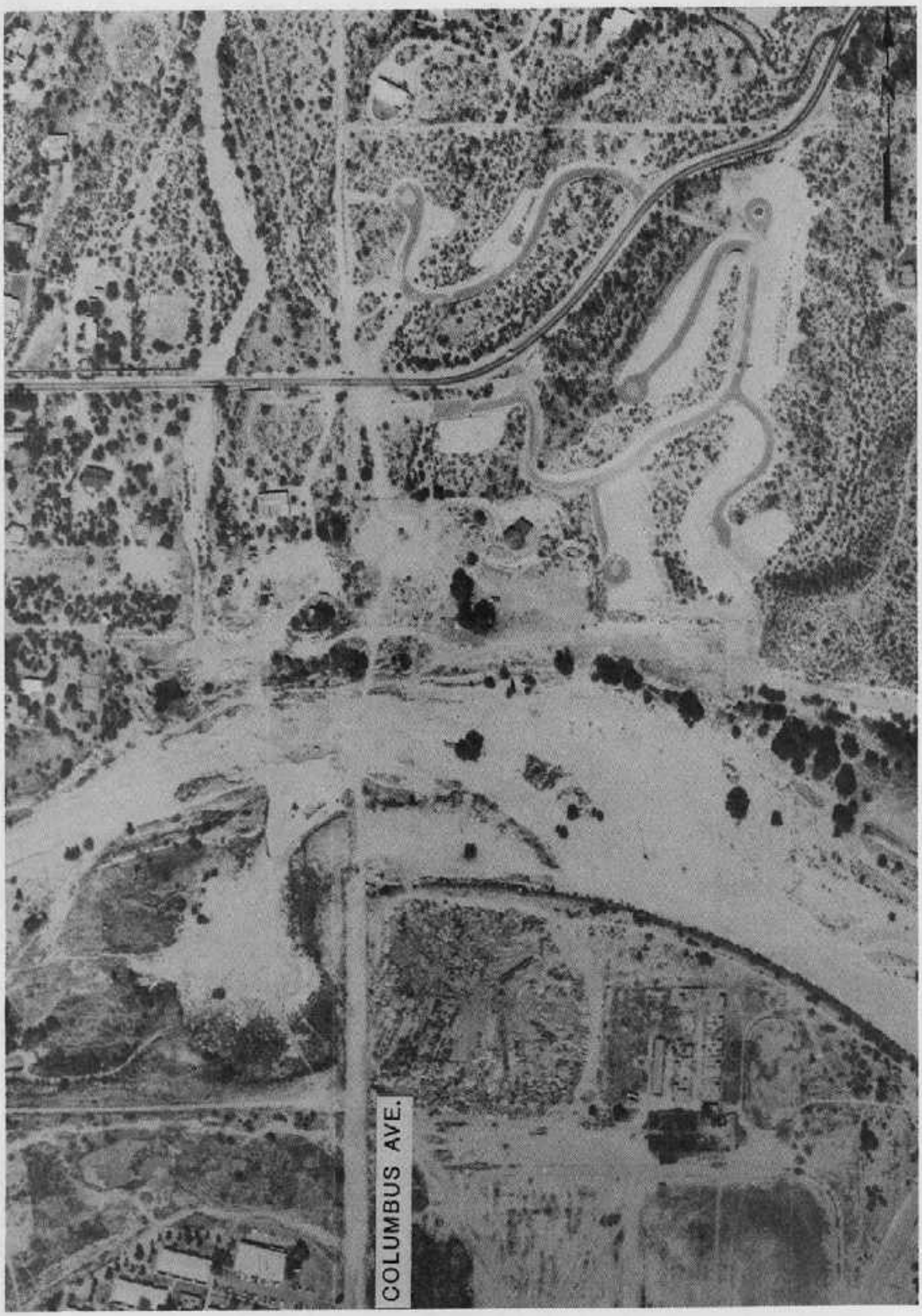


RILLITO RIVER,
SWAN ROAD & COUNTRY CLUB ROAD
OCTOBER 3, 1983

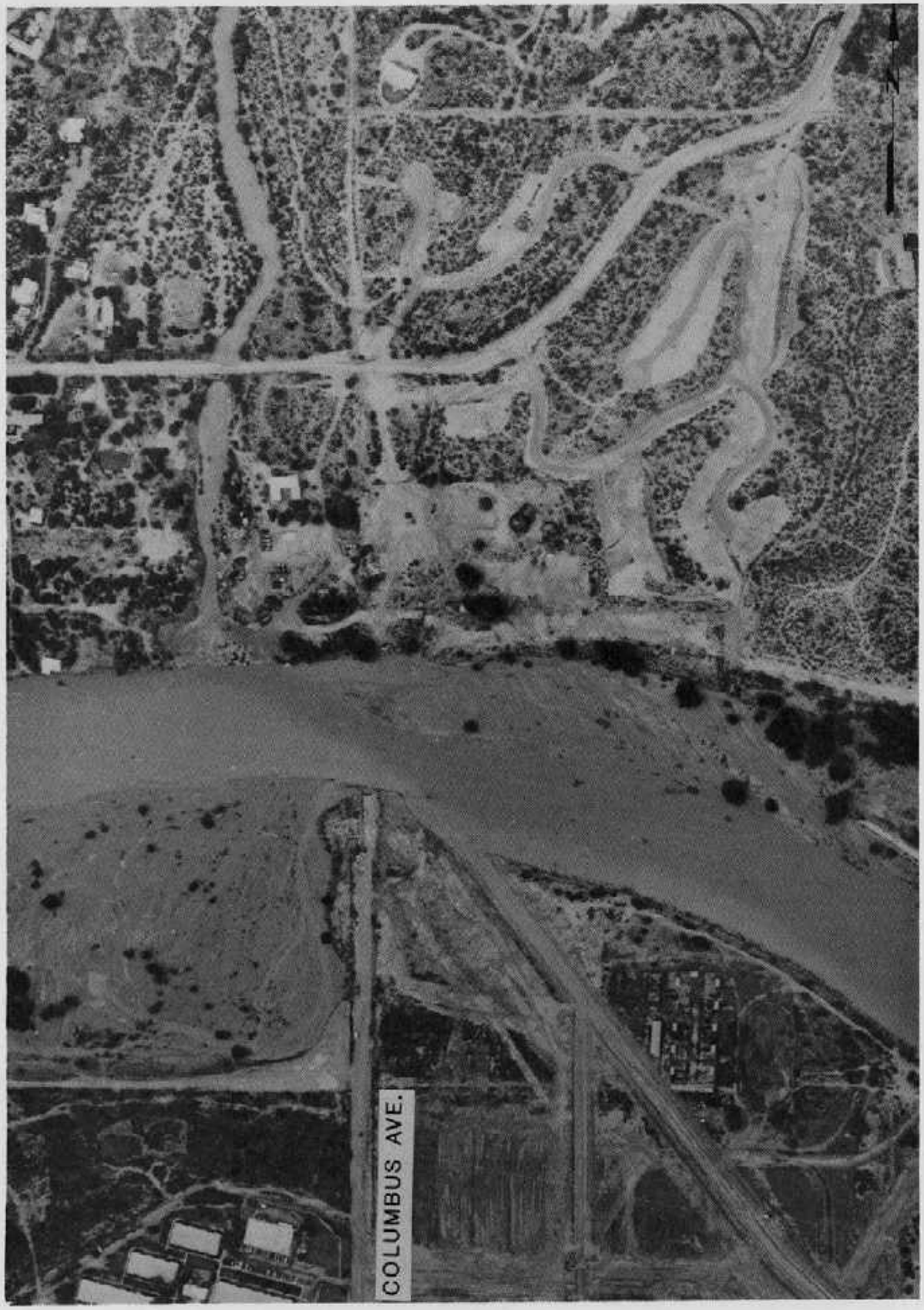


RILLITO RIVER,
SWAN ROAD & COUNTRY CLUB ROAD
NOVEMBER 4, 1982

RILLITO RIVER,
SWAN ROAD & COUNTRY CLUB ROAD
OCTOBER 3, 1983



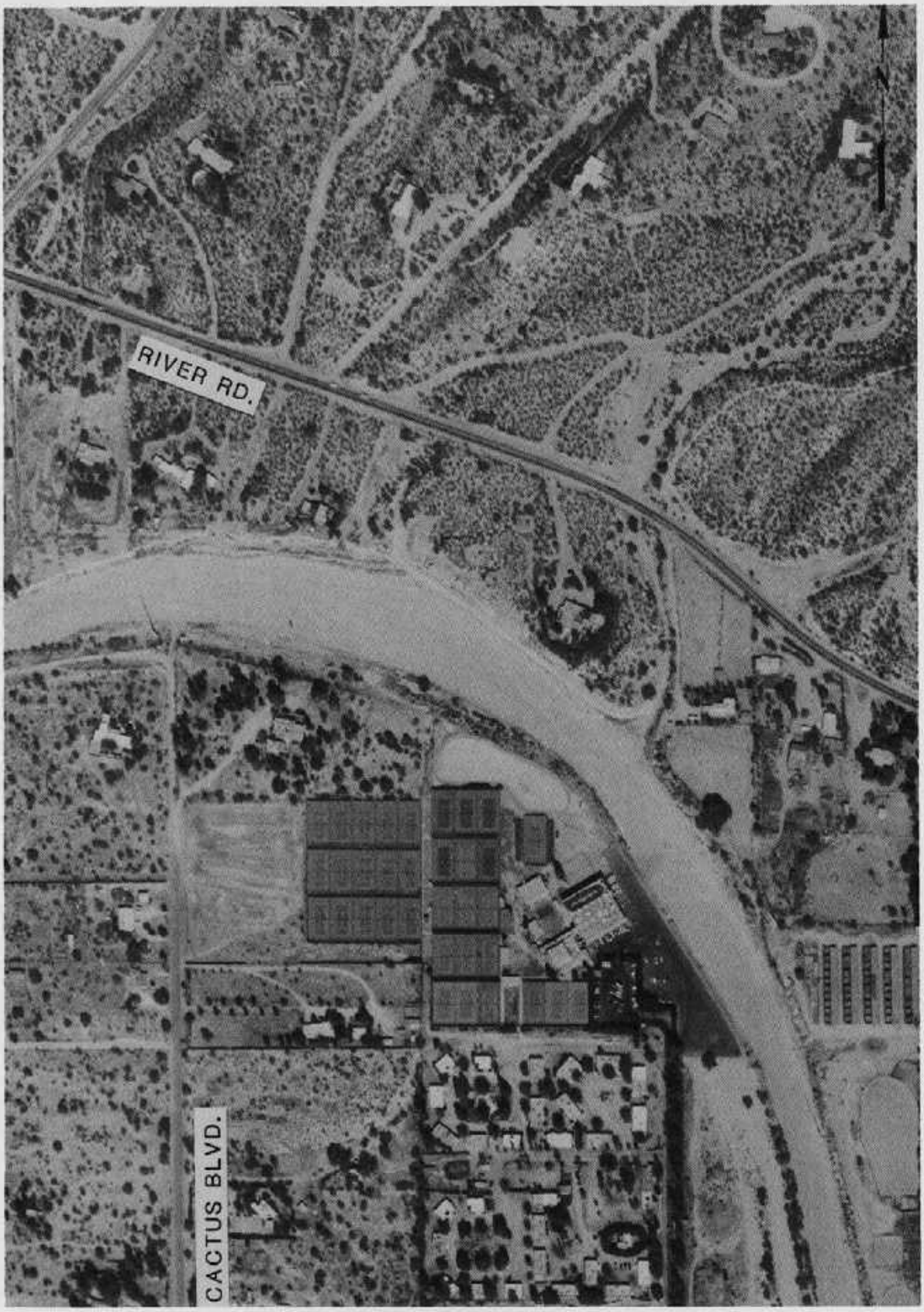
RILLITO RIVER,
SWAN ROAD & COUNTRY CLUB ROAD
NOVEMBER 4, 1982



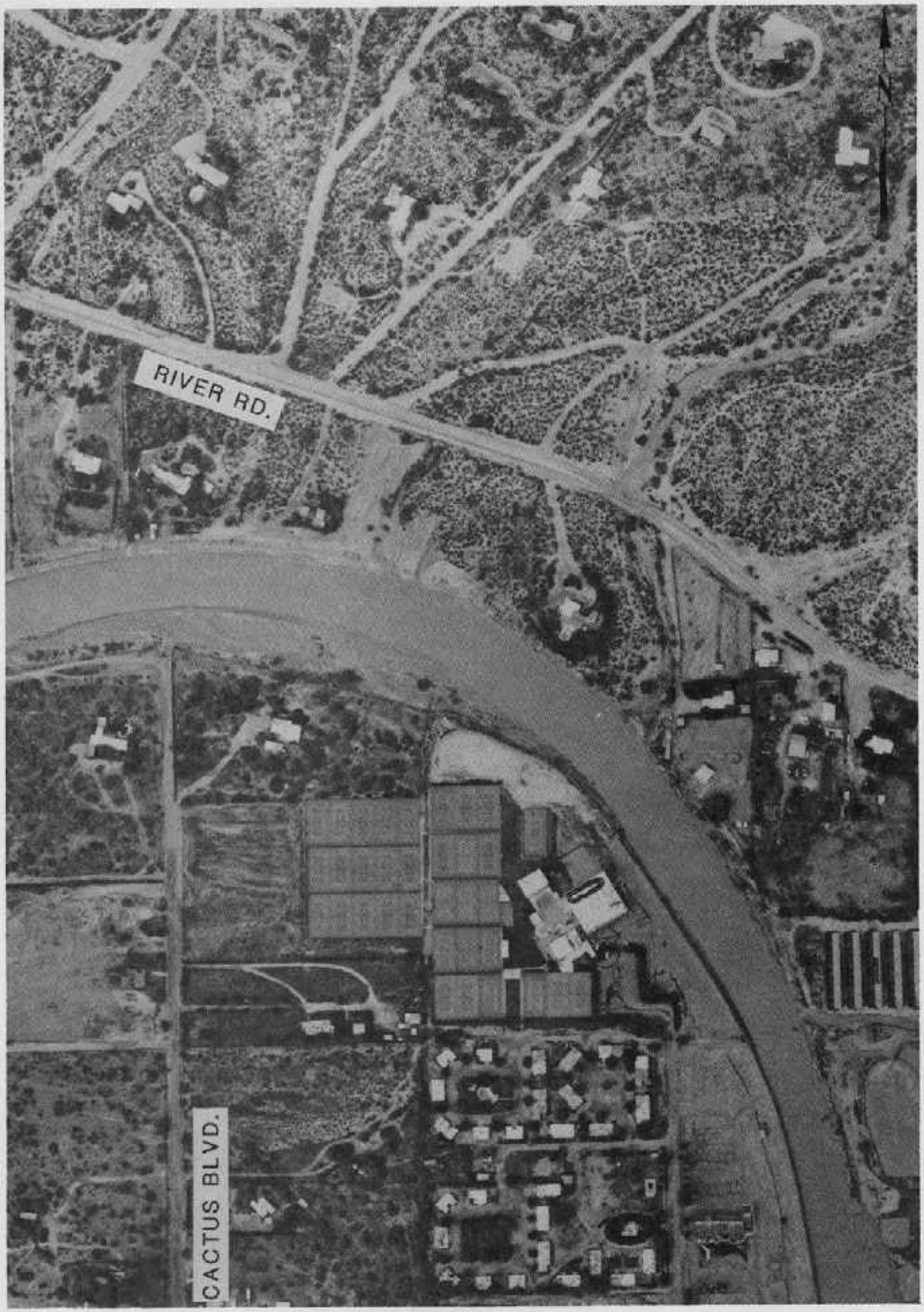
RILLITO RIVER,
SWAN ROAD & COUNTRY CLUB ROAD
OCTOBER 3, 1983

RILLITO RIVER,
SWAN ROAD & COUNTRY CLUB ROAD
NOVEMBER 4, 1982

RILLITO RIVER,
SWAN ROAD & COUNTRY CLUB ROAD
OCTOBER 3, 1983



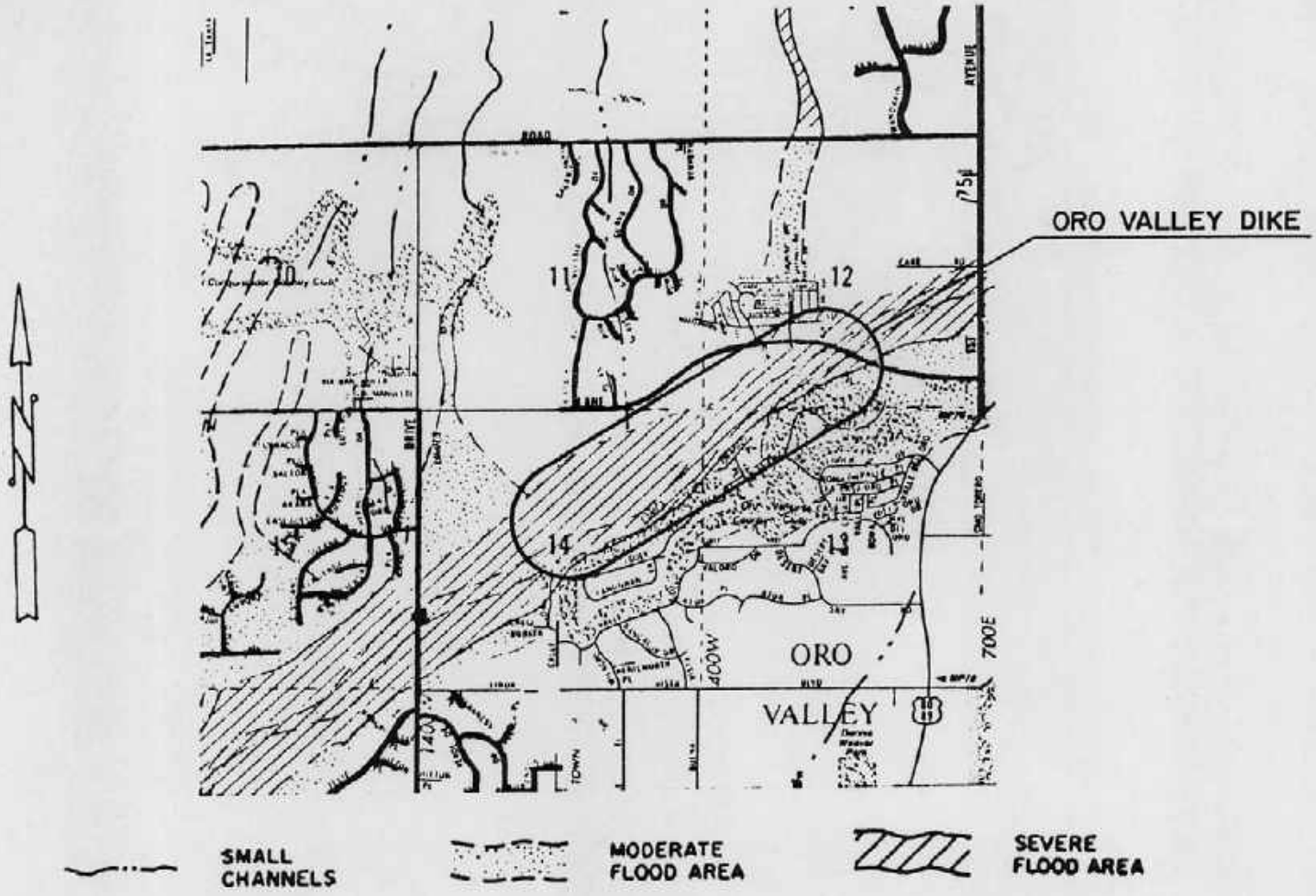
RILLITO RIVER,
SWAN ROAD & COUNTRY CLUB ROAD -
NOVEMBER 4, 1982



RILLITO RIVER,
SWAN ROAD & COUNTRY CLUB ROAD
OCTOBER 3, 1983

ORO VALLEY DIKE

FLOOD CONTROL WORK



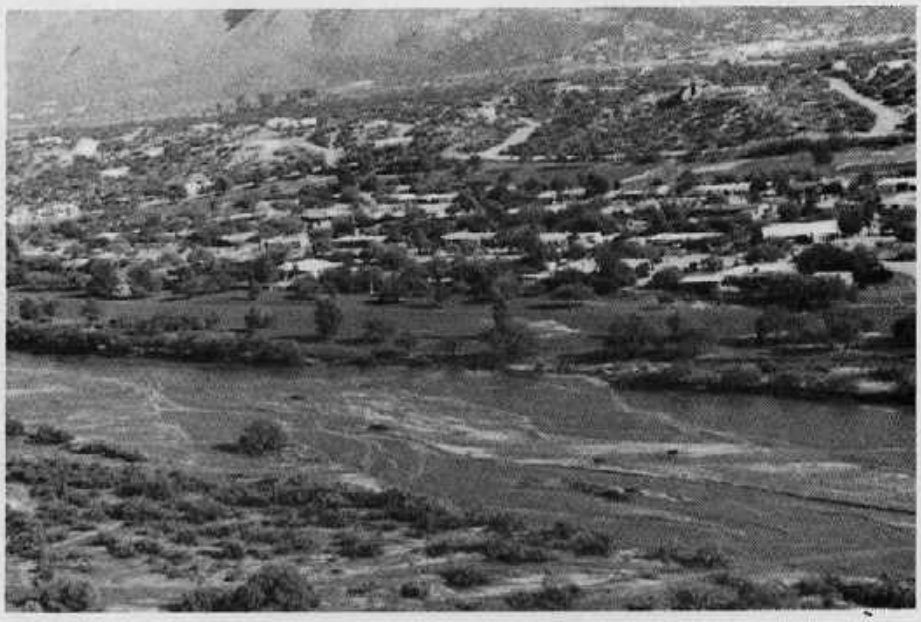
Damage Description:

Flow on the Canada del Oro Wash severely eroded an earthen dike protecting Oro Valley Country Club. There was also channel widening and erosion.

ORO VALLEY DIKE

LOOKING EAST

LOOKING EAST



LOOKING EAST

ORO VALLEY DIKE

LOOKING WEST

LOOKING WEST

LOOKING WEST

ORO VALLEY DIKE
NOVEMBER 2, 1982

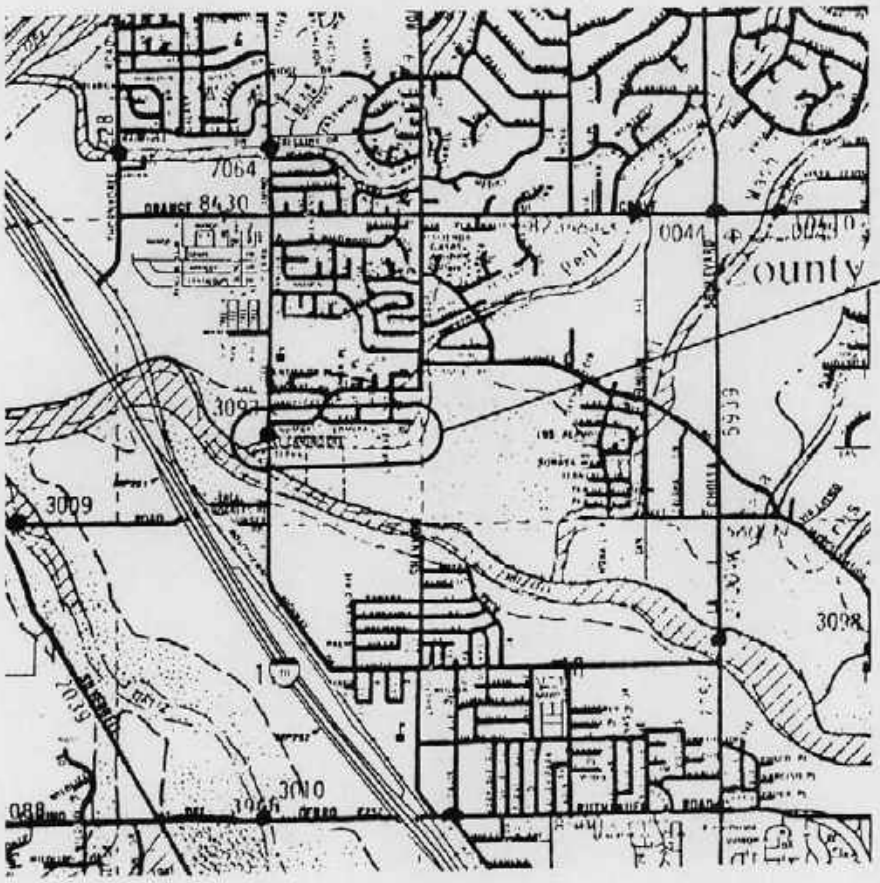
ORO VALLEY DIKE
OCTOBER 3, 1983

ORO VALLEY DIKE
NOVEMBER 2, 1982

ORO VALLEY DIKE
OCTOBER 3, 1983

PEGLER WASH

FLOOD CONTROL WORK



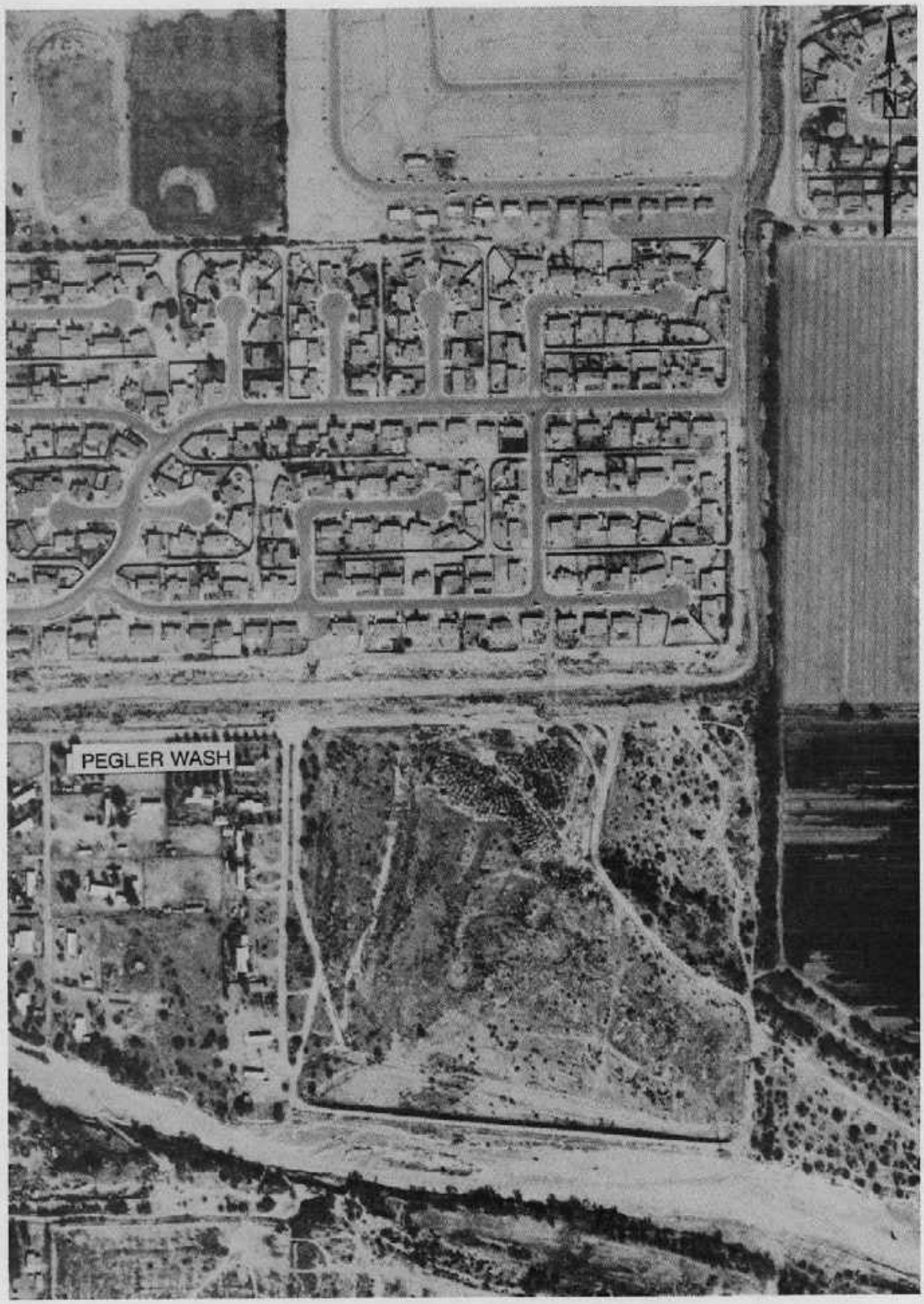
SMALL CHANNELS

MODERATE FLOOD AREA

SEVERE FLOOD AREA

Damage Description:

Approximately one-third of the flow in the Rillito River broke through the north bank and overflowed into the Pegler Wash channel. There was damage from debris and sedimentation, and the channel and bank protection was destroyed.



PEGLER WASH
NOVEMBER 12, 1982

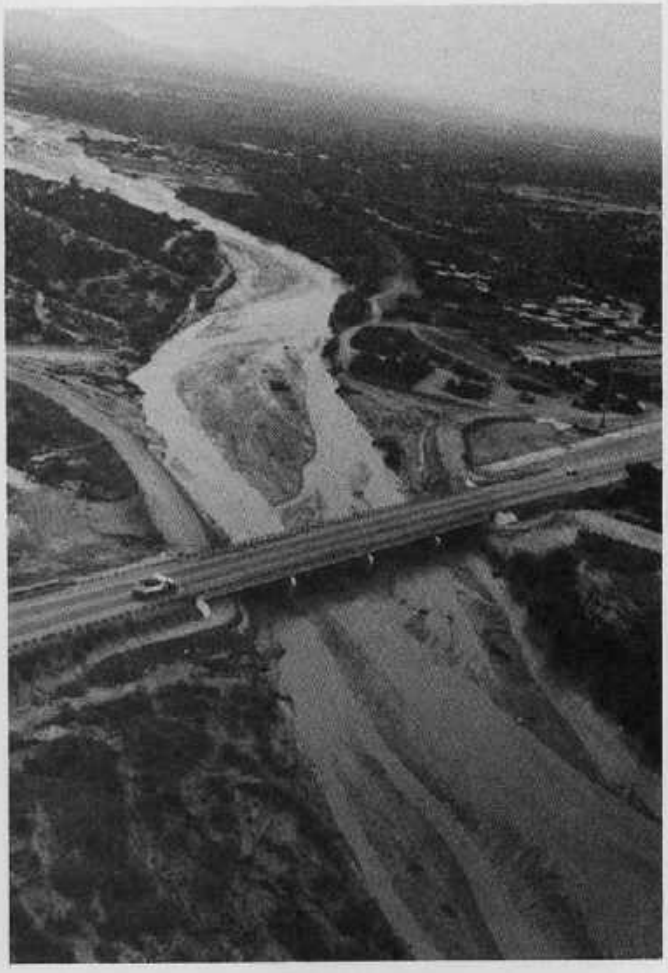
PEGLER WASH
OCTOBER 3, 1983

GENERAL FLOOD DAMAGE PHOTOGRAPHS

General Damage Photography

The following general flood damage photographs will show areas which have been damaged, but not previously identified in this report. These damages may be either to the public improvements or private property. The photographs are not intended to identity all damage locations, however, they are for the purpose of demonstrating the general extent of erosion damage and overbank flooding damage.

River Locations



Pantano Wash

Houghton Road Bridge looking east on the Pantano - Severe bank erosion has occurred east of the bridge soil cement spur dike approaches.

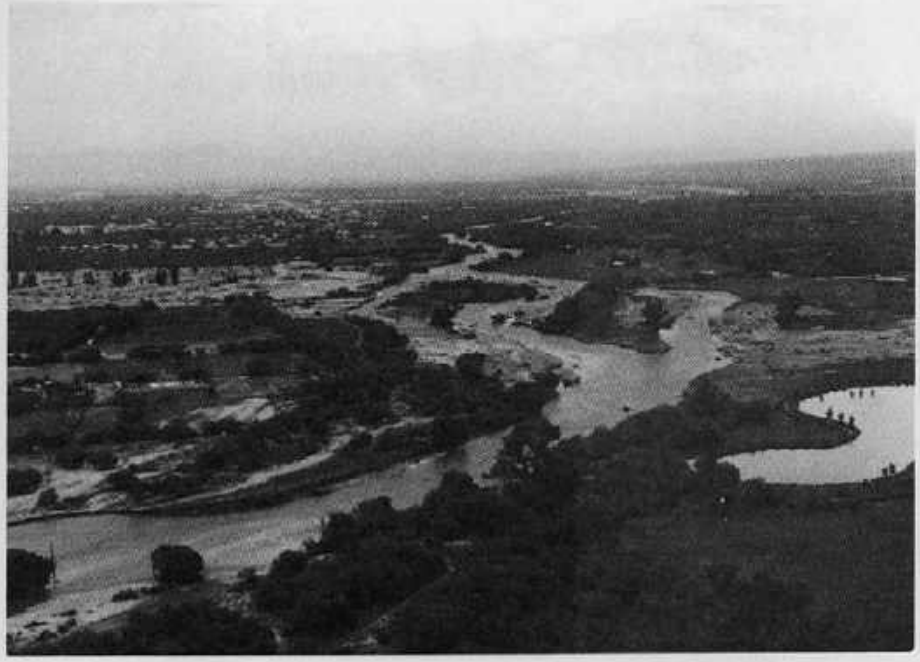
Pantano Wash

Looking southeast downstream of the Tanque Verde Bridge over the Pantano Wash - extreme bank erosion has occurred adjacent to private property and the Tucson Country Club.

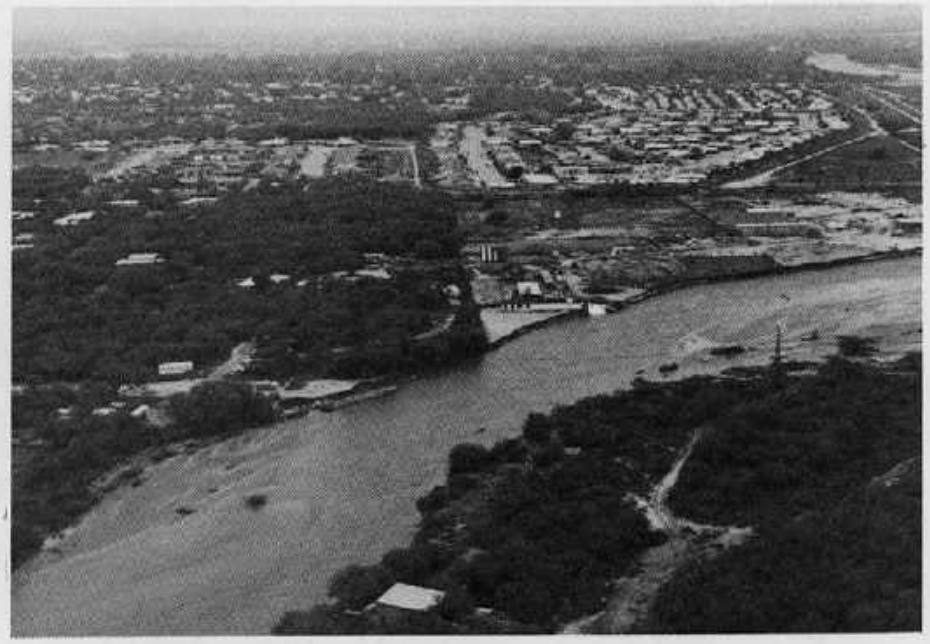
Looking northwest downstream of the Tanque Verde Road Bridge - soil cement bank protection remains in place.

Pantano Wash

Looking northwest at the Wilmot Road alignment - Sand and gravel excavations have been filled in with sediment.

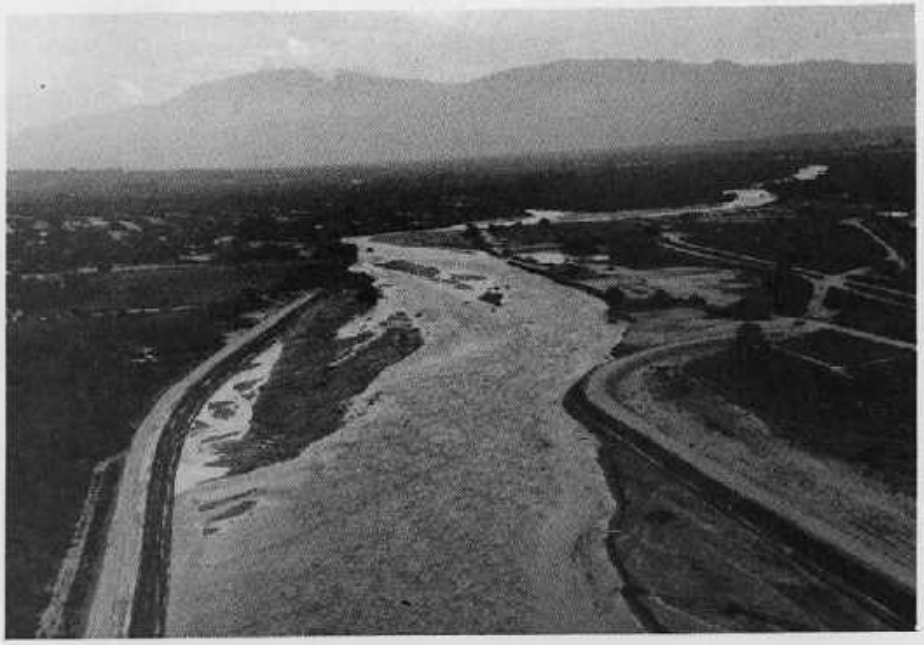


Looking northwest in the vicinity of the Lakes at Castlerock development - overbank flooding has caused deposition of silt, sand and debris.



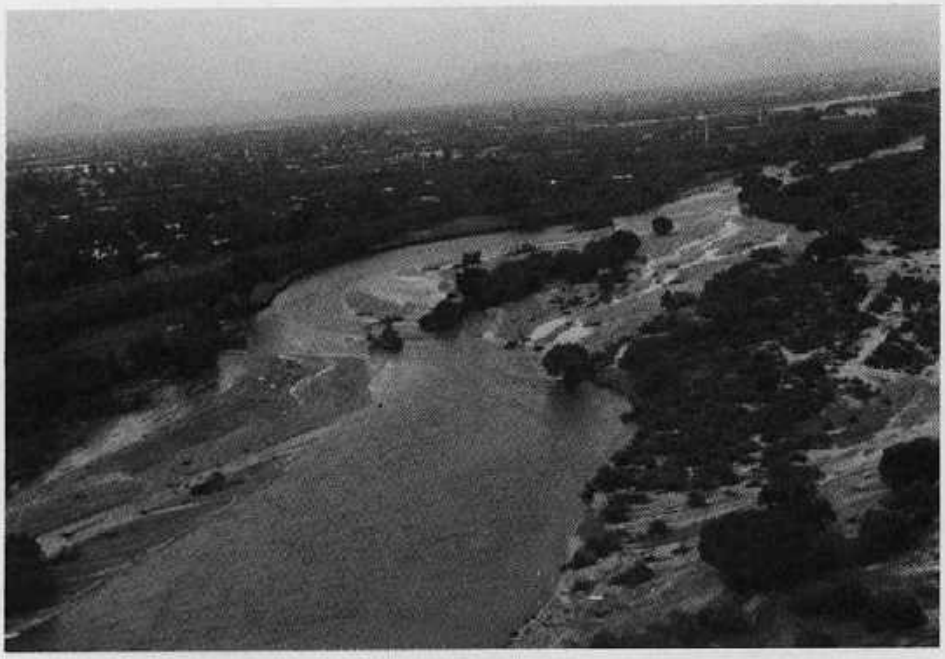
Looking northwest at the Pantano Road alignment. Severe bank erosion has occurred on the west side of the Tanque Verde Wash.

Downstream of the junction of the Sabino Creek and Tanque Verde Wash - severe north bank erosion has occurred, causing destruction of sanitary sewer interceptor.



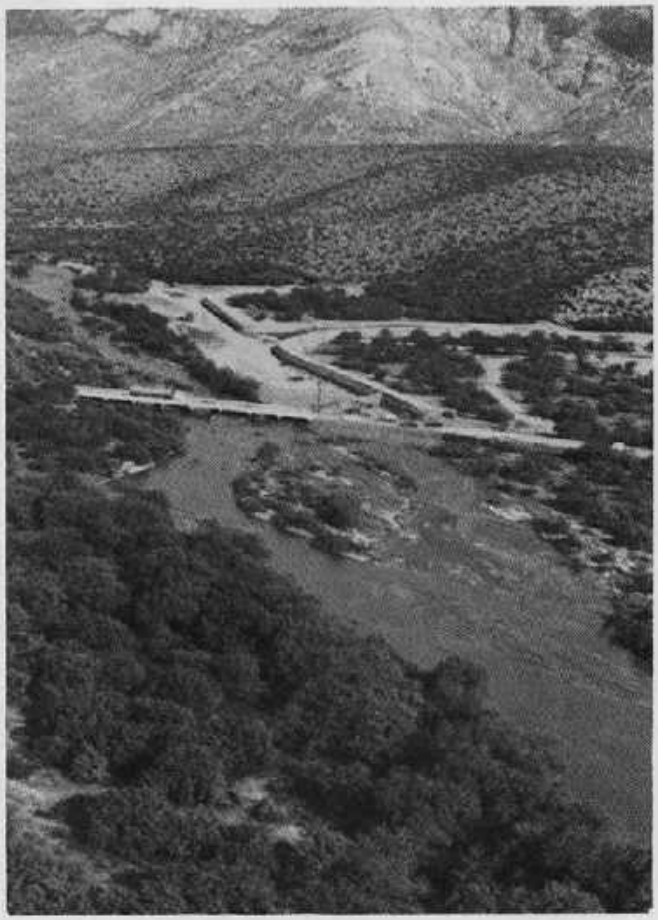
Looking east upstream of the Sabino Canyon Road Bridge - severe south bank erosion has occurred upstream of the soil cement bank stabilization.

Tanque Verde Wash



Looking west at the Tucson Country Club golf course - severe erosion has occurred to the golf course.

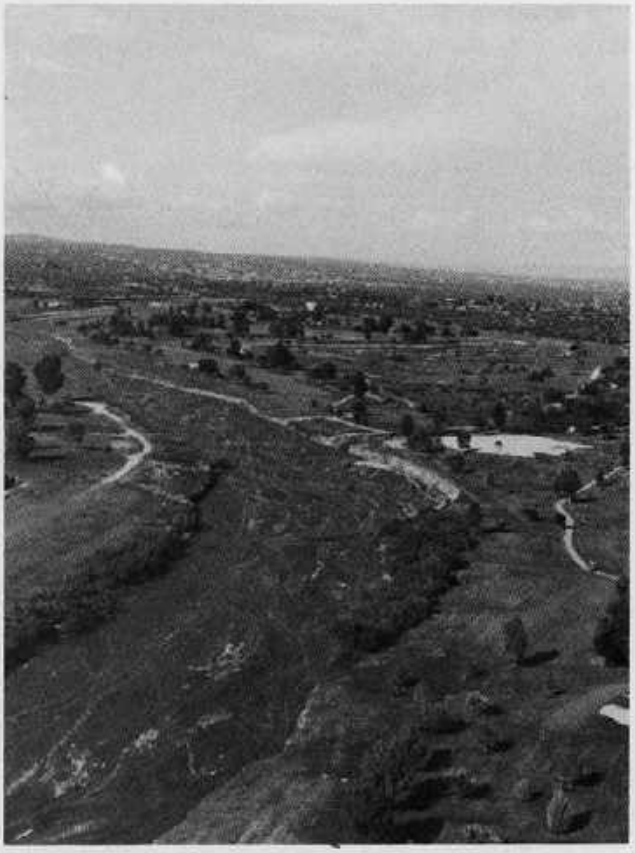
Canada del Oro Wash



Looking east at US 89

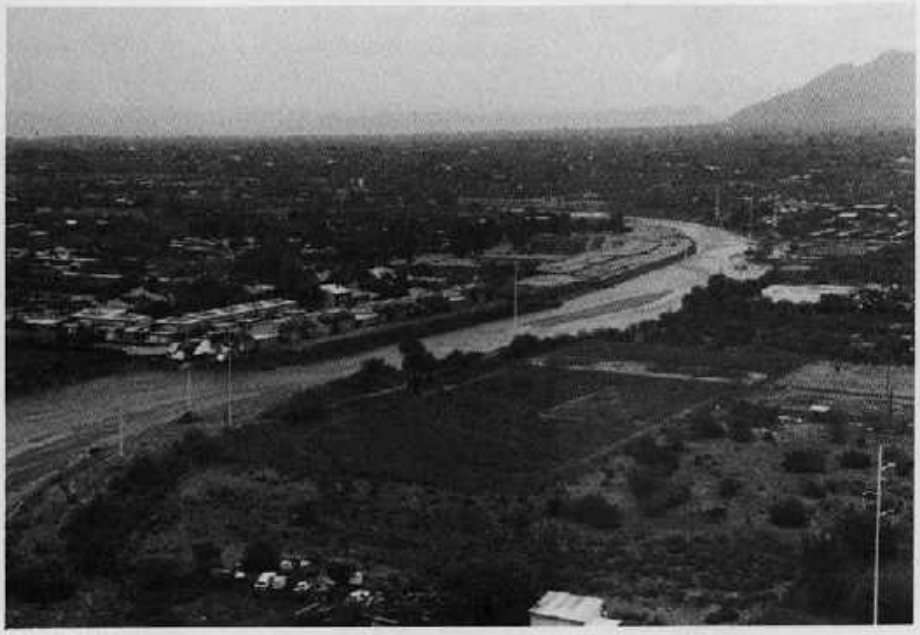
Looking north at US 89

Looking at the north end of the Tucson National Golf Club

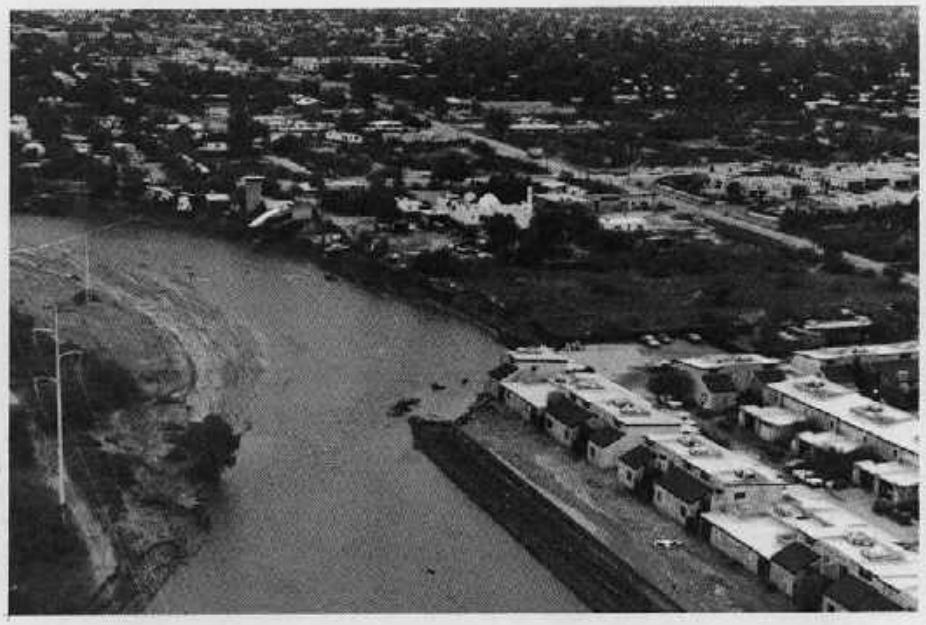


Looking at the middle of the Tucson National Golf Club

Looking southwest at the Thornydale and Ina Road Bridges



Looking at the bend in the Rillito River in the vicinity of Country Club Road. Major bank erosion and minor erosion to the soil cement bank stabilization.



Looking south at the beginning of the bend in the Rillito River. Note the severe bank erosion and minor erosion to the soil cement bank stabilization.

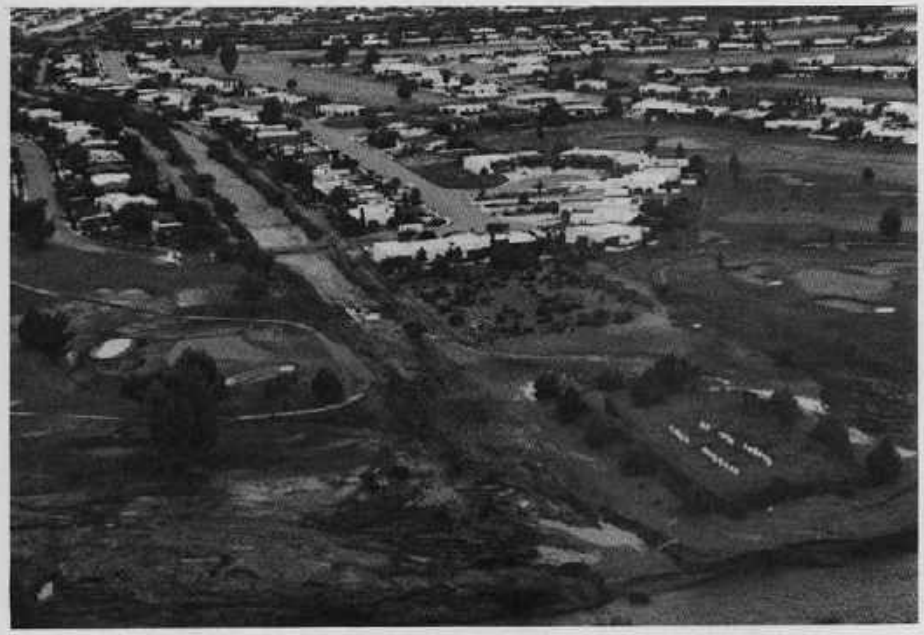
Another photograph of the severe damage in the Rillito River bend area. This photograph is looking northwest at the Prince Road alignment.

Looking northwest downstream of the La Cholla Boulevard Bridge - severe bank erosion has caused a mobile home to collapse into the Rillito River.

Rillito River

Looking northwest at the La Cholla Boulevard crossing of the Rillito River.

Looking at the Rillito River at the junction of the Southern Pacific Railroad and Interstate 10 - Notice severe damage to wing dikes constructed to protect the SPRR.



Looking west towards Green Valley adjacent to the Santa Cruz River. Several homes in the Green Valley area suffered flood damage. Extreme erosion occurred along the Santa Cruz River and overbank flooding which caused major damage to the Green Valley Golf Course

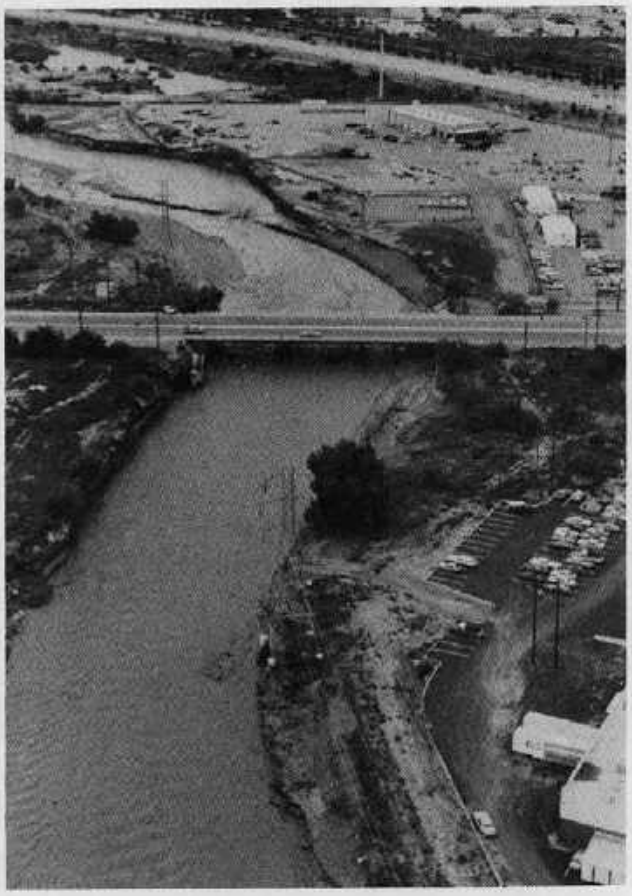
Looking at the Green Valley wastewater treatment plant. Overbank flooding of Santa Cruz caused major damage to the Green Valley treatment plant.

Looking at Interstate 19 north span of the north bound interstate bridge has collapsed. In addition, the Mission Road Bridge west approach has been removed.

Looking at the LaMar subdivision area. Residential houses were lost to the erosion of the east bank of the Santa Cruz River.

Looking at the Santa Cruz River immediately donwstream of the 22nd Street Bridge. Severe bank erosion has occurred adjacent to the Pima County Work release Corrections Facility.

Looking at the Santa Cruz River adjacent to Mission Road. Severe bank erosion has occurred along the east side of the Santa Cruz River immediately upstream of the Rio Nuevo Flood Control Project.



Looking downstream on the Santa Cruz River at Grant Road. Severe bank erosion has occurred upstream of the Grant Road Bridge on the west bank and downstream of the Grant Road Bridge on the east bank.

Looking at the Santa Cruz River upstream of the Silverbell Golf Course. Severe bank erosion has occurred on the Santa Cruz River. Several residential homes were lost due to this erosion.

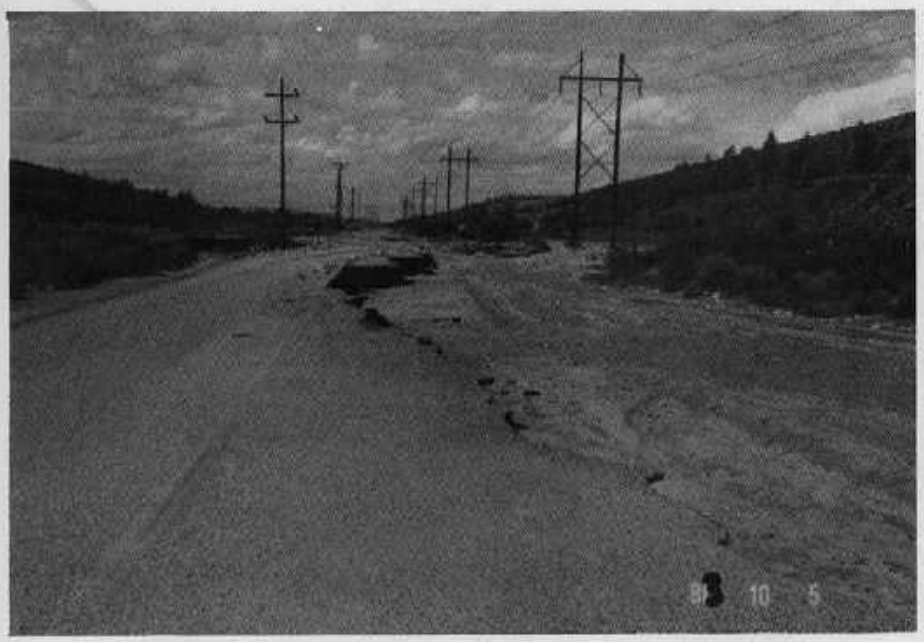
Looking at the Peppertree Ranch Industrial Park on the Santa Cruz River. Severe bank erosion, channel meandering and overbank flow has caused major damage in this area.

General Damage Photography

Road Locations

Looking east along Sunrise Drive, west of Sabino Canyon Road. The Ventana Canyon Wash overflowed the roadway section, causing severe downstream erosion, loss of one-half lane of pavement and associated erosion protection.

Helmet Peak Road at La Canada Drive, looking east toward Interstate 10, Severe upstream erosion deposited two to three feet of rock, silt, and debris on this portion of La Canada Drive.



Helmet Peak Road between Mission and Interstate 10, showing severe lateral erosion of drainage ditch lying north of Helmit Peak Road, severe undercutting erosion of the pavement section and shoulder. The drainageway at this location meandered 100 to 200 feet from its original location.

Looking along Tangerine Road, just east of Tangerine Regional Landfill. Severe overbank flood erosion damage occurred to Tangerine Road.

Silverbell Road north of Ina Road. Overbank flood waters of the Santa Cruz River caused severe erosion damage to Silverbell Road.

Silverbell Road north of Ina Road. Overbank flood waters of Santa Cruz River caused severe erosion damage to Silverbell Road.

Silverbell Road at Five Bridges showing severe erosion damage to the roadway and bridge structures caused by the Brawley Wash.

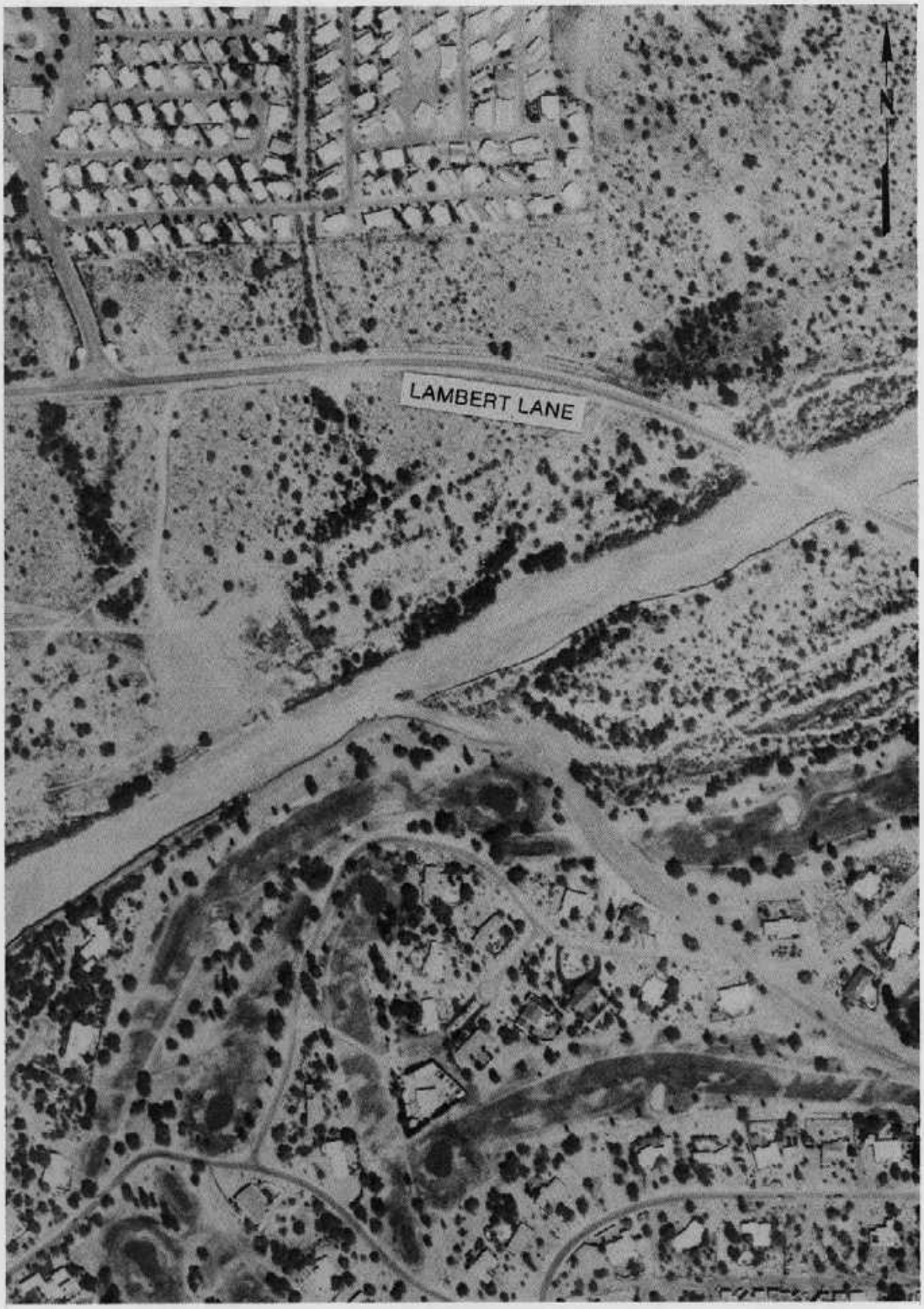
Silverbell Road at Five Bridges, showing severe erosion damage to the roadway bridge structures caused by the Brawley Wash.

Pima Mine Road Bridge, looking at the east abutment of the railroad bridge immediately upstream of Pima Mine Road.

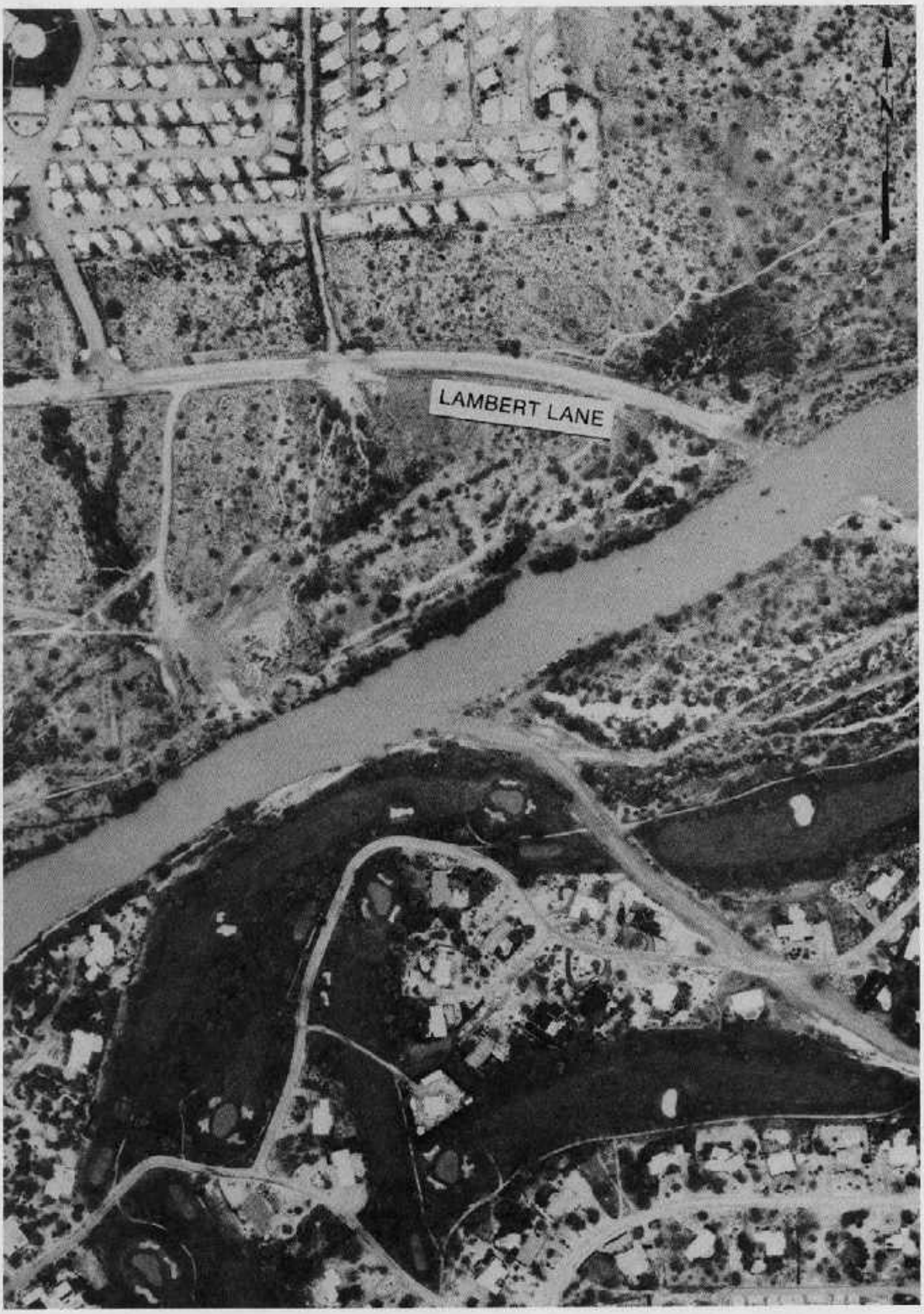
Pima Mine Road Bridge, looking east showing the debris accumulation on the railroad bridge.

SANTA CRUZ RIVER AND
CANADA DEL ORO WASH CONFLUENCE
NOVEMBER 4, 1982

SANTA CRUZ RIVER AND
CANADA DEL ORO WASH CONFLUENCE
OCTOBER 3, 1983



LAMBERT LANE,
CANADA DEL ORO WASH
NOVEMBER 2, 1982



LAMBERT LANE,
CANADA DEL ORO WASH
OCTOBER 3, 1983

EL CAMINO DE LA TIERRA
NOVEMBER 12, 1982

EL CAMINO DE LA TIERRA
OCTOBER 3, 1983