

Bartlett Dam  
Verde River  
Phoenix Vicinity  
Maricopa County  
Arizona

HAER No. AZ-25

# **PHOTOGRAPHS WRITTEN HISTORICAL AND DESCRIPTIVE DATA**

**By  
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Salt River Project  
Research Archives  
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Historic American Engineering Record  
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San Francisco, California 94102

HISTORIC AMERICAN ENGINEERING RECORD  
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Views AZ-25-1 through AZ-25-31 are photocopies of historic photographs. Views AZ-25-32 through AZ-25-42 were taken by Mark Durben in 1989. Views AZ-25-43 through AZ-25-70 are photographs of drawings. All original photographs and drawings are available at the Salt River Project.

AZ-25- 1 View showing contractor's camp and Bartlett Dam in the distance. In this view are included the contractor's mess hall, commissary, recreational hall, dormitories, camp hospital and workmen's cottages.

Photographer unknown, February 20, 1939.

Source: Salt River Project.

AZ-25- 2 A view of Bartlett Dam Accommodation School, with the dam and spillway in the background.

Photographer unknown, September 10, 1939.

Source: Salt River Project.

AZ-25- 3 View of "A" frame used to lift arch forms. Hook-up is for raising intrados form.

Photographer unknown, February 6, 1938.

Source: Salt River Project.

AZ-25- 4 View from left abutment, looking across dam toward right abutment.

Photographer unknown, September 4, 1938.

Source: Salt River Project.

AZ-25- 5 General View from top of mixing plant showing buttresses 6 to 10 inclusive. Not contraction joints generally filled to elevation 1650. Pumpcrete trestle is at elevation 1698.

Photographer unknown, April 21, 1938.

Source: Salt River Project.

AZ-25- 6 General view looking upstream and toward right abutment. Level part of trussed walkway is at elevation 1740. Buttresses 3 (on extreme left), 4, 5, 6 and 7 completed to elevation 1690.

Photographer unknown, May 30, 1938.

Source: Salt River Project.

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AZ-25- 7 View showing progress on assembly of slide gates and conduit. Slide gate trash rack structure.  
Photographer unknown, June 21, 1938.  
Source: Salt River Project.

AZ-25- 8 Placing concrete in right gravity abutment between elevations 1695 and 1700.  
Photographer unknown, July 19, 1938.  
Source: Salt River Project.

AZ-25- 9 View from left side. Pumpcrete pipe lines are carried on walkway. Upstream parts of buttresses are fog-sprayed to permit prompt filling of contraction joints.  
Photographer unknown, July 30, 1938.  
Source: Salt River Project.

AZ-25-10 Showing the arch forms. The intrados form is commonly lifted 3 to 4 days after pouring. Reinforcing steel is then placed and the extrados form raised to position. The operating of moving forms, placing steel and concrete for each arch lift requires, on average, eight days. Note the two lines of water pipe on the extrados form. These pipes are filled with spray nozzles which are in practically continuous operation except when work is being done on the forms.  
Photographer unknown, August 9, 1938.  
Source: Salt River Project.

AZ-25-11 A detail view of the right side of buttress 3 showing spray nozzles used to reduce concrete temperatures.  
Photographer unknown, August 19, 1938.  
Source: Salt River Project.

AZ-25-12 A detail view of the contraction joint at Station 0-10 on buttress 6 between elevations 1730 and 1760.  
Photographer unknown, August 31, 1938.  
Source: Salt River Project.

AZ-25-13 View of aggregate processing plant and aggregate deposit.  
Photographer unknown, August 31, 1938.  
Source: Salt River Project.

AZ-25-14 Looking upstream between buttresses 8 and 9, at completed outlet channel paving. Note slide gate outlet structure at upstream end of paving, and needle valve outlets at right.  
Photographer unknown, September 9, 1938.  
Source: Salt River Project.

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AZ-25-15 Looking downstream toward three 50 ft. by 50 ft. spillway gates.

Photographer unknown, September 20, 1938.

Source: Salt River Project.

AZ-25-16 Looking downstream and toward right abutment. Crown of highest arch is within 8 feet of top of dam.

Photographer unknown, September 29, 1938.

Source: Salt River Project.

AZ-25-17 View of left gravity abutment excavation showing progress of trenchant at upstream end of dam.

Photographer unknown, October 10, 1938.

Source: Salt River Project.

AZ-25-18 From left to right: H. J. Lawson; Allen Mattison; Senator Carl Hayden; Lin B. Orme; Paul Roca; and J. A. Fraps. The upstream face and spillway gates are visible in the background.

Photographer unknown, October 1938.

Source: Salt River Project.

AZ-25-19 View of concrete aggregate plant taken from sand stock pile.

Photographer unknown, October 19, 1939.

Source: Salt River Project.

AZ-25-20 Truck in aggregate tunnel.

Photographer unknown, November 9, 1939.

Source: Salt River Project.

AZ-25-21 Downstream view of Bartlett Dam.

Photographer unknown, October 31, 1938.

Source: Salt River Project.

AZ-25-22 Placing porous concrete around drains in spillway paving block adjacent to the gate structure and the left wall.

Photographer unknown, November 9, 1938.

Source: Salt River Project.

AZ-25-23 Looking upstream and toward left abutment of dam.

Note forms for left gravity abutment at upper right corner of picture. Arches 3, 4, 5, and 7 completed to elevation 1795.5 or 7.5 feet below top of parapet wall.

Photographer unknown, November 29, 1938.

Source: Salt River Project.



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AZ-25-24 Looking upstream into spillway channel and toward gate structure. Concrete in foreground is downstream face of spillway bucket. (Note wet burlap at center over retaining wall.)

Photographer unknown, December 9, 1938.

Source: Salt River Project.

AZ-25-25 View of slide gate outlet trash rack structure at base of arch 8. Note two sections of needle valve trash racks in place between arches 8 and 9.

Photographer unknown, December 20, 1938.

Source: Salt River Project.

AZ-25-26 View showing needle valve trash rack nearing completion. Arches visible in this picture are 8, 9, 10, and 11 which have been completed to springing line elevations 1700, 1744, 1766 and 1766 respectively.

Photographer unknown, January 1, 1939.

Source: Salt River Project.

AZ-25-27 View from top of spillway gate structure looking across top of dam towards left abutment. Note pumpcrete pipeline on catwalk which is used to deliver concrete to incomplete arches on left side.

Photographer unknown, January 1, 1939.

Source: Salt River Project.

AZ-25-28 View showing location of concrete mixing plant and cableway to pumpcrete gun in relation to the dam.

Photographer unknown, February 20, 1939.

Source: Salt River Project.

AZ-25-29 A close-up of completed arches adjacent to right gravity abutment. Note parapet wall and flashboard inserts on arch 2.

Photographer unknown, February 1939.

Source: Salt River Project.

AZ-25-30 Looking from left to right and showing one of the 50 ft. by 50 ft. spillway gates, hoist chain and track and roller assembly. Man is standing on counterweight.

Photographer unknown, March 9, 1939.

Source: Salt River Project.

AZ-25-31 William Bartlett.

Photographer unknown, c. late 1920s.

Source: Carl Moore.

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AZ-25-32 Downstream view of Bartlett Dam, showing spillway, spillway chute, buttresses and outlet works.  
Photographer Mark Durben, 1989.  
Source: Salt River Project.

AZ-25-33 Downstream view of Bartlett Dam from stream bed. Spillway retaining wall is at upper left.  
Photographer Mark Durben, 1989.  
Source: Salt River Project.

AZ-25-34 Spillway chute showing concrete apron and gunite used to retard erosion.  
Photographer Mark Durben, 1989.  
Source: Salt River Project.

AZ-25-35 View of upstream side of spillway. Reservoir, parapet and flashboards are a lower left, gate operating room windows are at center to upper right.  
Photographer Mark Durben, 1989.  
Source: Salt River Project.

AZ-25-36 View across downstream face of dam from west side. Flashboards are visible atop parapet wall. Irrigation release valve house is at center right.  
Photographer Mark Durben, 1989.  
Source: Salt River Project.

AZ-25-37 View of Verde River from atop Bartlett Dam.  
Photographer Mark Durben, 1989.  
Source: Salt River Project.

AZ-25-38 View of Bartlett Lake from atop Bartlett Dam.  
Photographer Mark Durben, 1989.  
Source: Salt River Project.

AZ-25-39 View of gate operating room above spillway gates. Note "USBR 1937" inscription.  
Photographer Mark Durben, 1989.  
Source: Salt River Project.

AZ-25-40 West end of spillway gate operating room showing maintenance crane above machinery.  
Photographer Mark Durben, 1989.  
Source: Salt River Project.

AZ-25-41 Irrigation water being released from valve house.  
Photographer Mark Durben, 1989.  
Source: Salt River Project.

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AZ-25-42 Interior of valve house showing lower valve. Upper valve being replaced.

Photographer Mark Durben, 1989.

Source: Salt River Project.

AZ-25-43 Bartlett Dam, Reservoir and Vicinity Map.  
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AZ-25-44 Bartlett Dam, Geologic Map and Sections.  
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AZ-25-45 Bartlett Dam, Excavation Details.  
August 19, 1939.

AZ-25-46 Bartlett Dam, Geology and Grouting.  
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AZ-25-47 Bartlett Dam, Plan, Elevations and Sections.  
April 23, 1936.

AZ-25-48 Bartlett Dam, Buttress, Plan and Sections.  
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AZ-25-49 Bartlett Dam, Buttress Dimensional Diagram.  
August 13, 1936.

AZ-25-50 Bartlett Dam, Arch and Buttress Dimensional Plan and Sections.  
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AZ-25-51 Bartlett Dam, Buttress No. 3, Construction Record.  
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AZ-25-52 Bartlett Dam, Buttress No. 4, Construction Record.  
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AZ-25-53 Bartlett Dam, Buttress No. 5, Construction Record.  
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AZ-25-58 Bartlett Dam, Right Gravity Section, Plan and Sections.  
October 8, 1937.

AZ-25-59 Bartlett Dam, Walkway and Parapet, Plan and Sections.  
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AZ-25-60 Bartlett Dam, Spillway, General Plan and Sections.  
April 23, 1936.

AZ-25-61 Bartlett Dam, Spillway Gate Structure, Superstructure.  
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AZ-25-62 Bartlett Dam, Spillway, 50 Foot by 50 Foot Regulating Gate, General Installation Assembly.  
November 16, 1936.

AZ-25-63 Bartlett Dam, Spillway, 50 Foot by 50 Foot Regulating Gate Hoist, Complete Assembly.  
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AZ-25-64 Bartlett Dam, Needle Valve House, Plans, Elevations, and Sections.  
March 26, 1937.

AZ-25-65 Bartlett Dam, Needle Valve Intake Structure, Plan, Elevation and Sections.  
October 19, 1936.

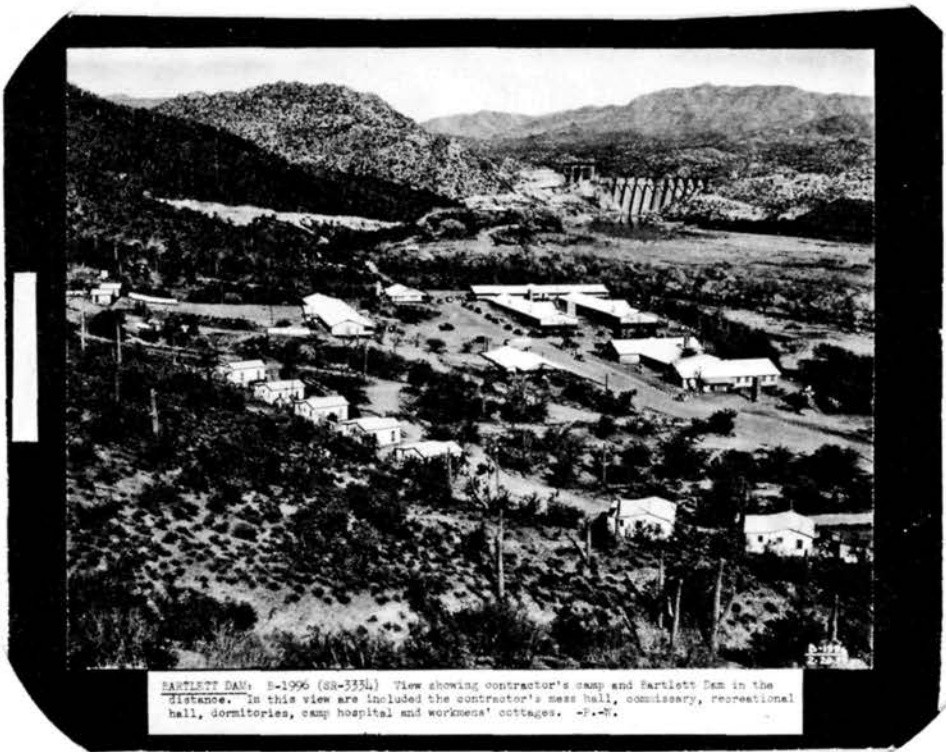
AZ-25-66 Bartlett Dam, Needle Valve Outlets, Plan and Sections.  
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AZ-25-67 Bartlett Dam, Outlet Works, 72 Inch Outlet Pipes.  
November 6, 1936.

AZ-25-68 Bartlett Dam, Slide Gate Outlets, Plan and Sections.  
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AZ-25-69 Bartlett Dam, Slide Gate Outlets, Plan and Sections.  
April 23, 1936.

AZ-25-70 Bartlett Dam, Saddle Dam, Reinforcement Details.  
November 15, 1938.

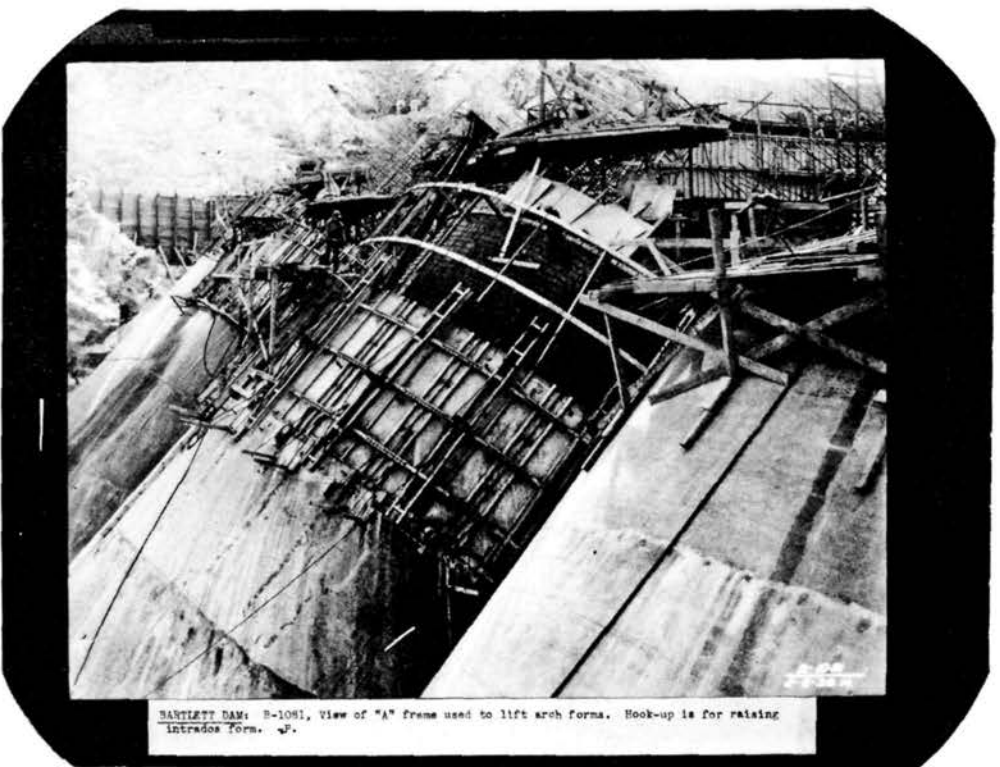


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BARTLETT DAM: B-2134 (SR-3437) A view of Bartlett Dam Accommodation School, with the dam and spillway in the background. -P.W.

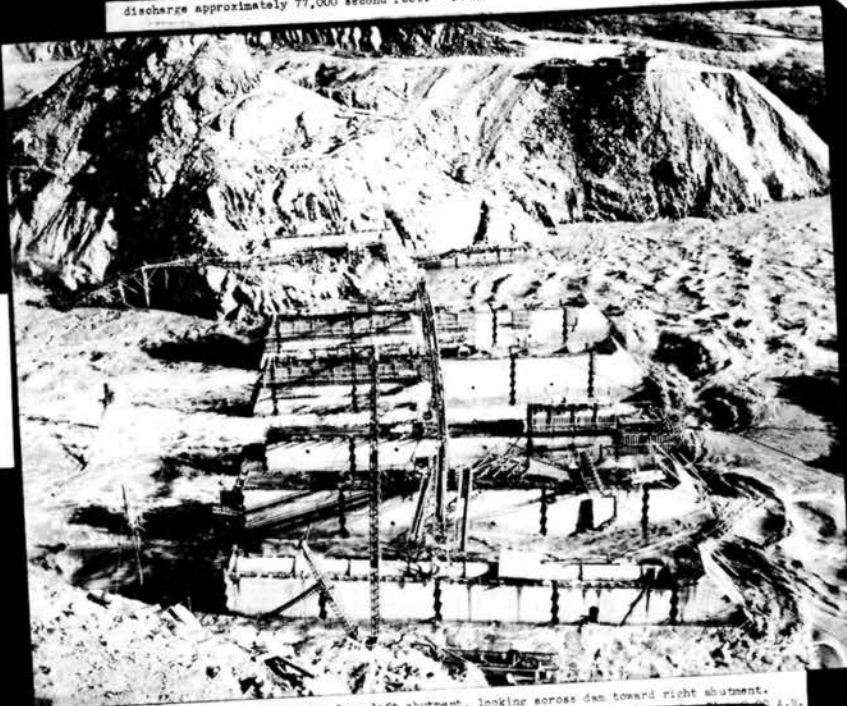
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BARTLETT DAM: B-1081, View of "A" frame used to lift arch forms. Hook-up is for raising intrados form. 4P.

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discharge approximately 77,000 second feet. -P.-W.



BARTLETT DAM: W-1126, View from left abutment, looking across dam toward right abutment. A.V.

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BARTLETT DAM: B-1211. General view from top of mixing plant showing buttresses 6 to 10 inclusive. Note contraction joints generally filled to elevation 1650. Pumpcrete trestle is at elevation 1608. -P.

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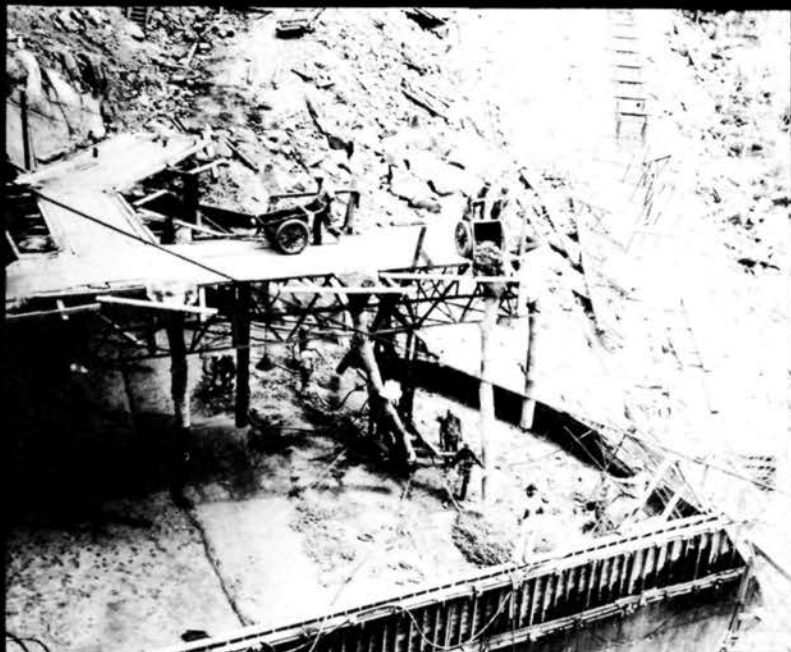
BARTLETT DAM: B-1292 (SR-3199) General view looking upstream and toward right abutment. Level part of trussed walkway is at elevation 1740. Buttresses 3 (on extreme left), 4, 5, 6 and 7 completed to elevation 1690. -P.-W.

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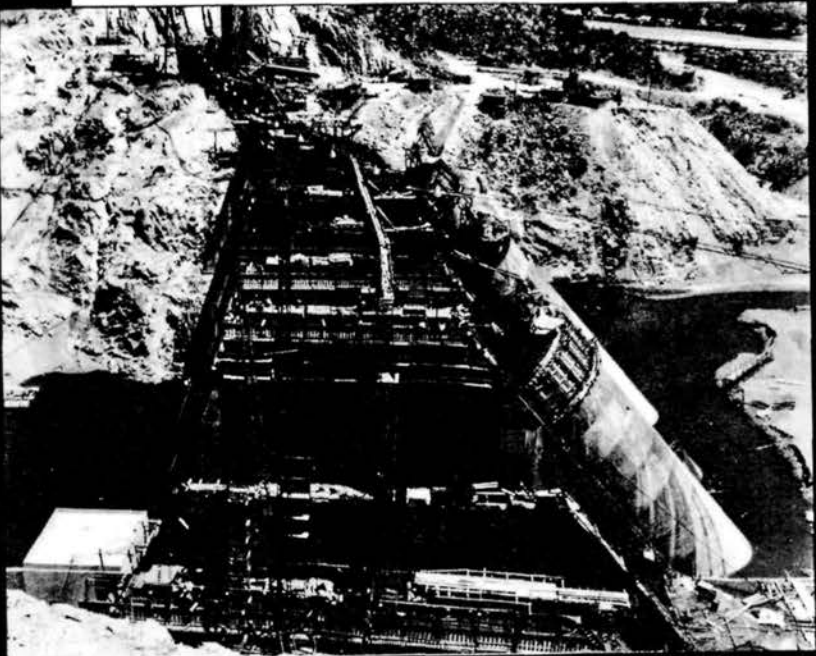
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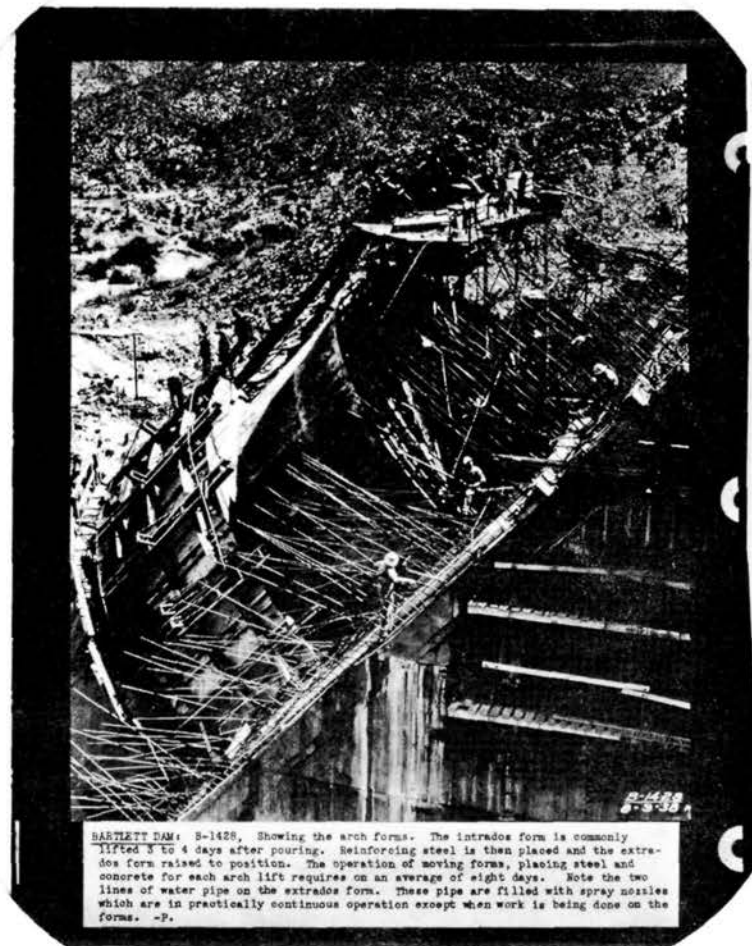
B-1320  
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BARTLETT DAM: B-1320, View showing progress on assembly of slide gates and conduit. Slide gate trash rack structure. -P.



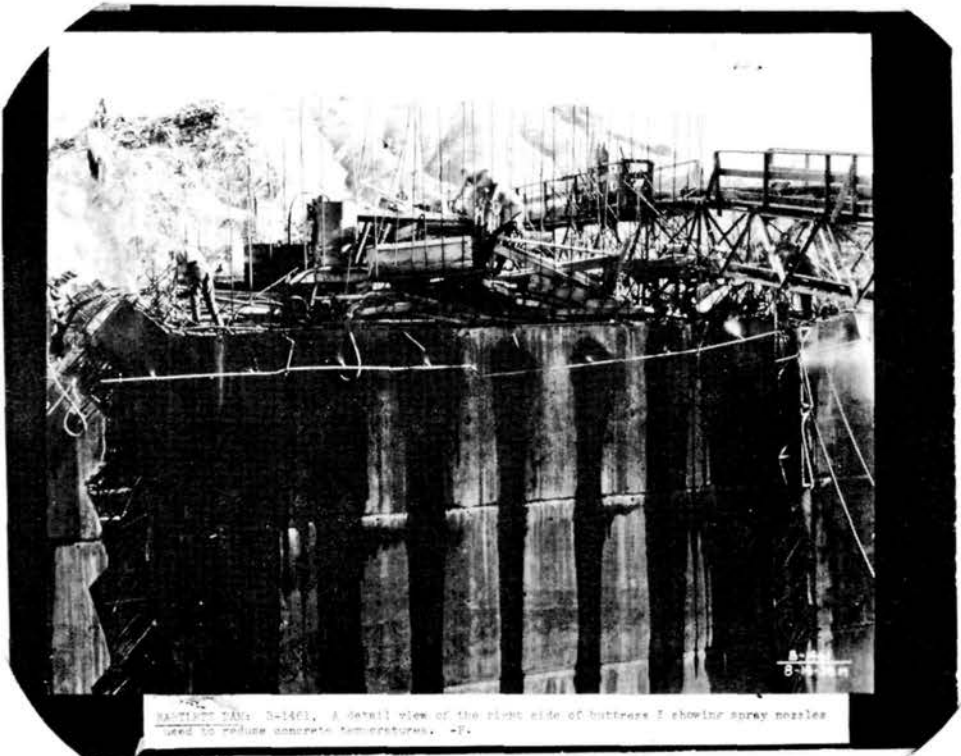
BARTLETT DAM: S-1380, Placing concrete in right gravity abutment between elevations 1695 and 1700. -P.



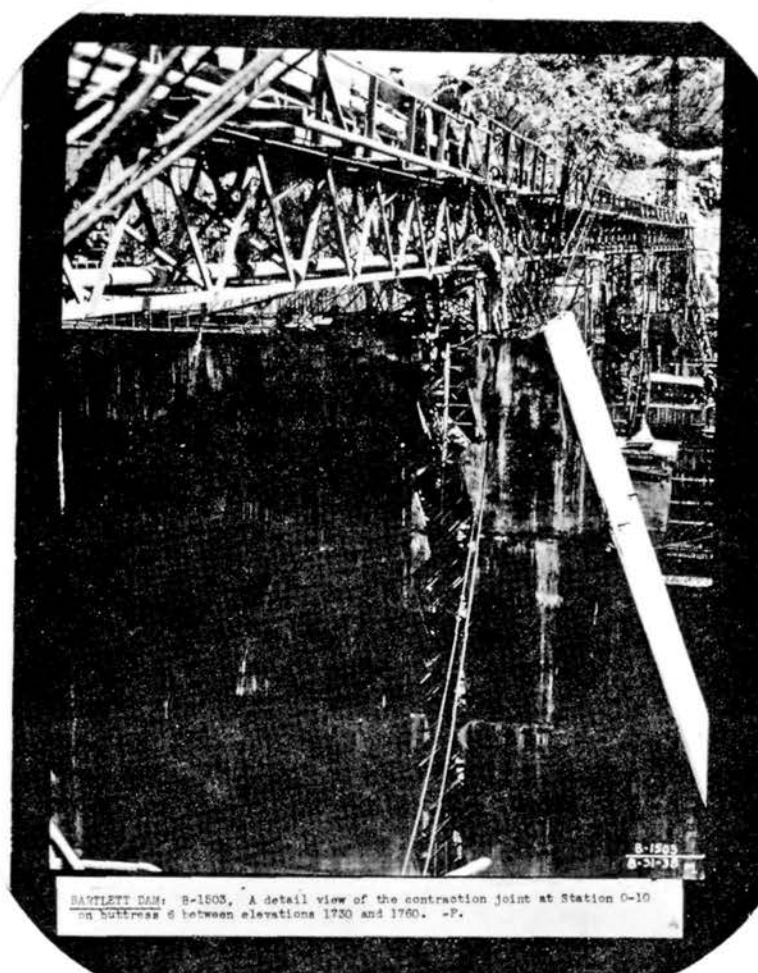
BARTLETT DAM; B-1389 (SR-3215) View from left side. Pumpcrete pipe lines are carried on walkway. Upstream parts of buttresses are fog-sprayed to permit prompt filling of contraction joints. -P.-W.



BARTLETT DAM: S-1428, Showing the arch forms. The intrados form is commonly lifted 3 to 4 days after pouring. Reinforcing steel is then placed and the extrados form raised to position. The operation of moving forms, placing steel and concrete for each arch lift requires on an average of eight days. Note the two lines of water pipe on the extrados form. These pipes are filled with spray nozzles which are in practically continuous operation except when work is being done on the forms. -P.



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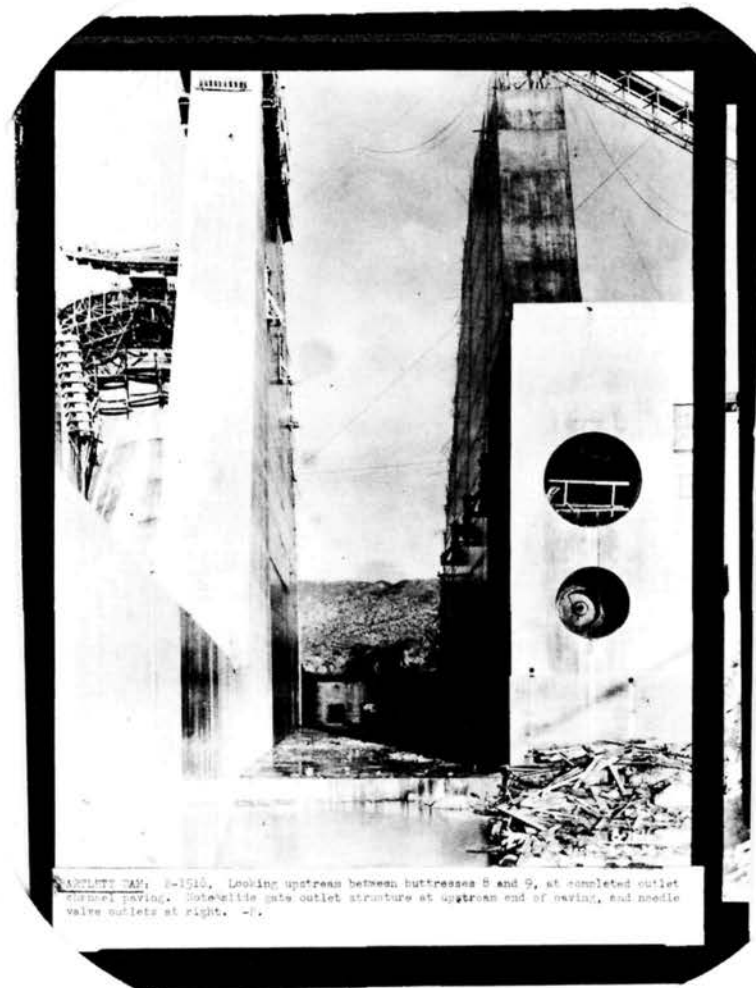
BAYLETT DAM: B-1503. A detail view of the contraction joint at Station 0-10  
on buttress 6 between elevations 1730 and 1760. -P.



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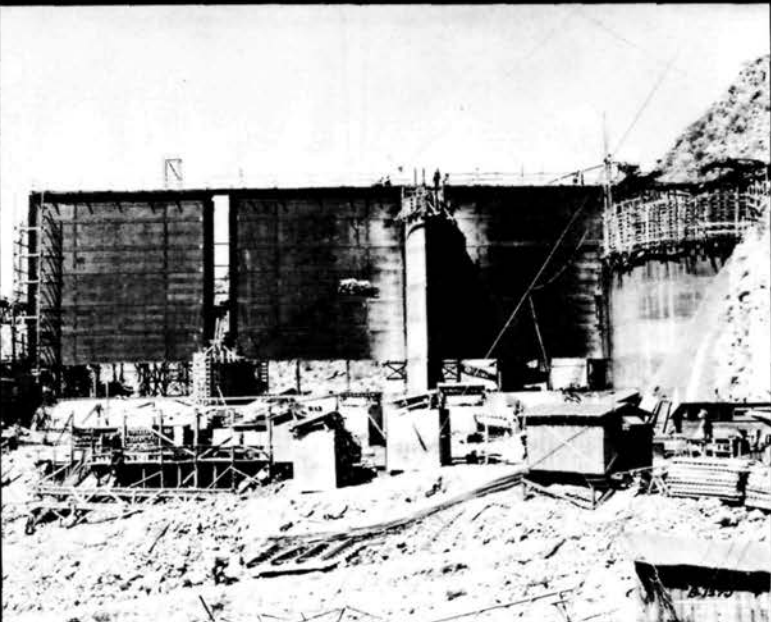


BARTLETT DAM: B-1807, View of aggregate processing plant and aggregate deposit.  
-P.



OUTLET WAY, 8-1510. Looking upstream between buttresses 8 and 9, at completed outlet channel paving. Note gate outlet structure at upstream end of paving, and needle valve outlets at right. -8.

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CASTLES DAM N-1575, Looking downstream toward three 30 ft. by 50 ft. spillway gates.

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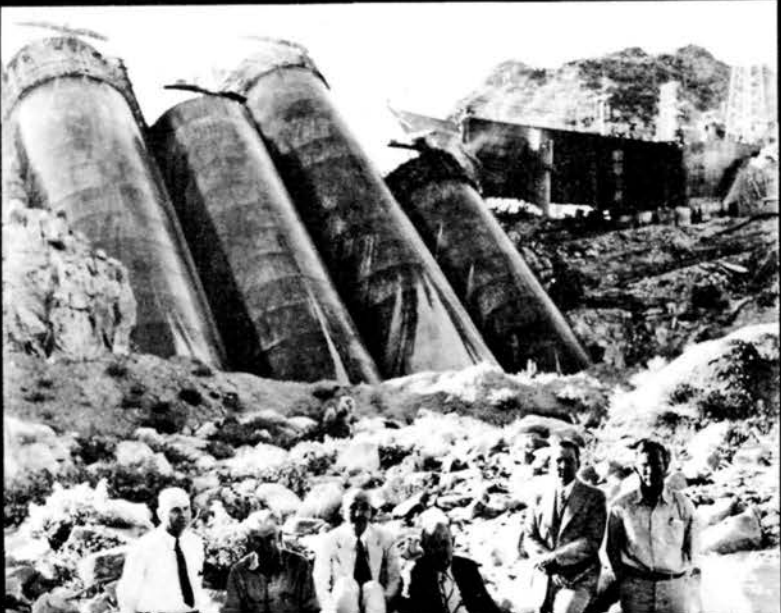
BARTLETT DAM, 6-1536, Looking downstream and toward right abutment. Crown of highest arch is within 5 feet of top of dam. -0.

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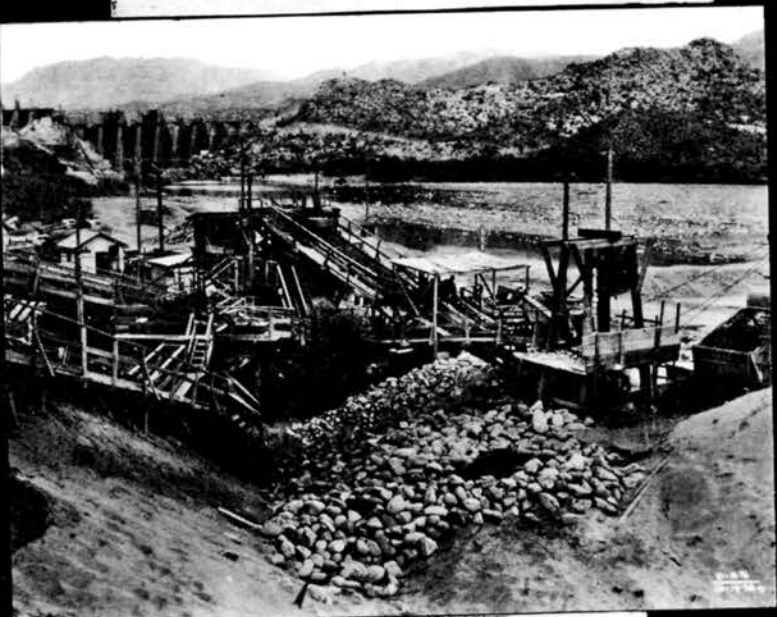
SAULT STE. MARIE DAM. 1944. View of left gravity buttress excavation showing progress of trenching at upstream end of dam. -P.

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BARTLETT DAM: 8-1951. From left to right H. J. Lawson, Allen Mattison, Senator Carl Hayden, Lin D. Crane, Paul Rosen and J. A. Frazer. -P.

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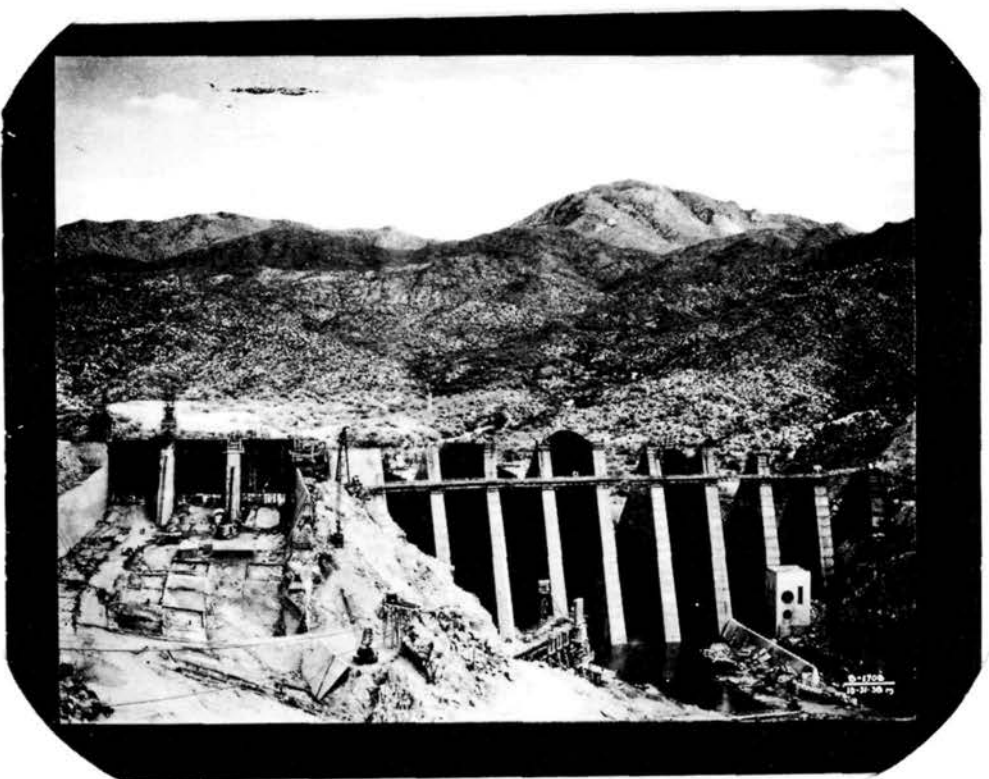


BARTLETT DAN: B-1676, View of concrete aggregate plant taken from sand stock pile.  
-P.



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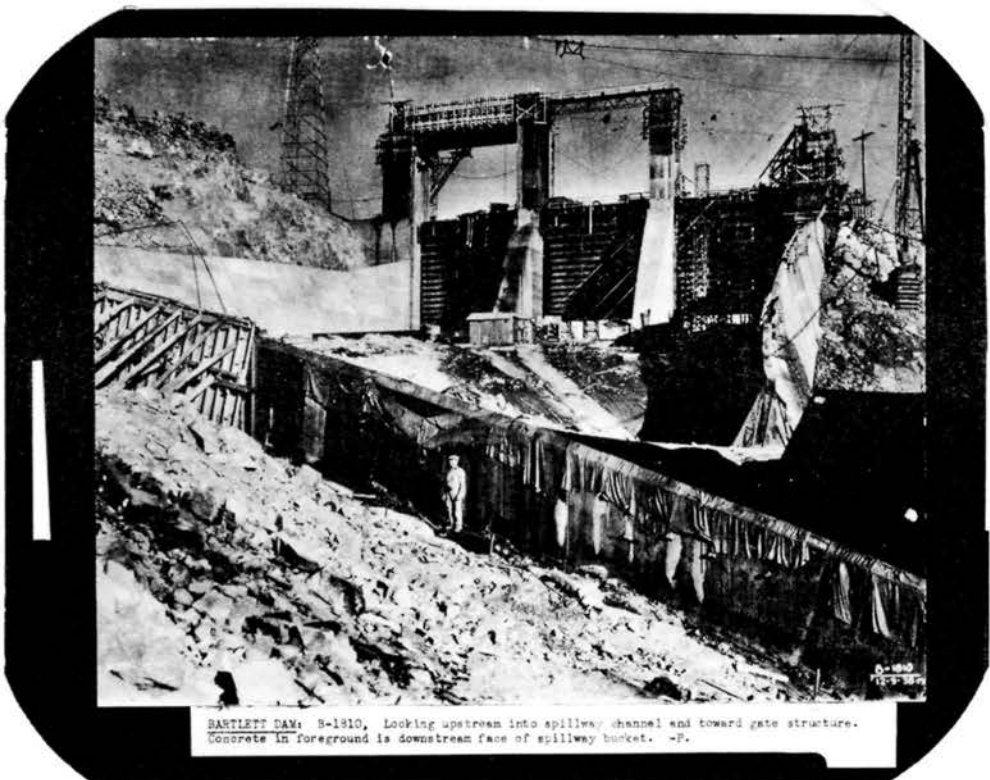
BARTLETT DAM: B-1732. Placing porous concrete around drains in spillway paving blocks adjacent to the gate structure and the left wall. -P.

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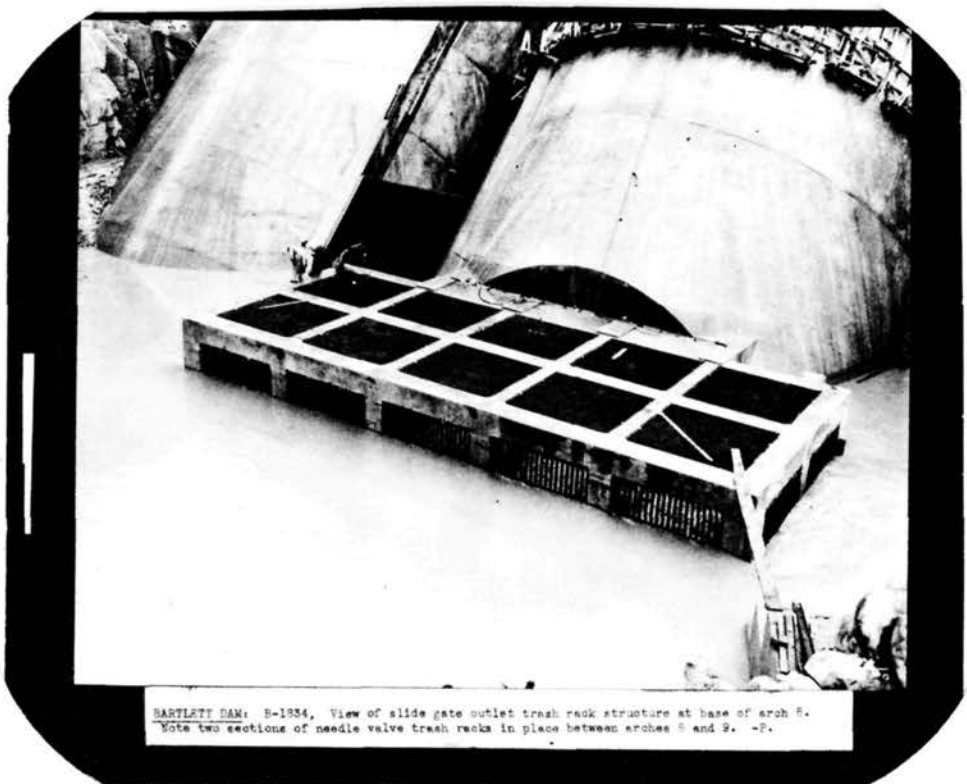
BARTLETT DAM: B-1785 (SR-3269) Looking upstream and toward left abutment of dam. Note forms for left gravity abutment at upper right corner of picture. Arches 3, 4, 5 and 7 completed to elevation 1795.5, or 7.5 feet below top of parapet wall. -P.-W.

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BARTLETT DAM: 8-1310, Looking upstream into spillway channel and toward gate structure. Concrete in foreground is downstream face of spillway bucket. -P.

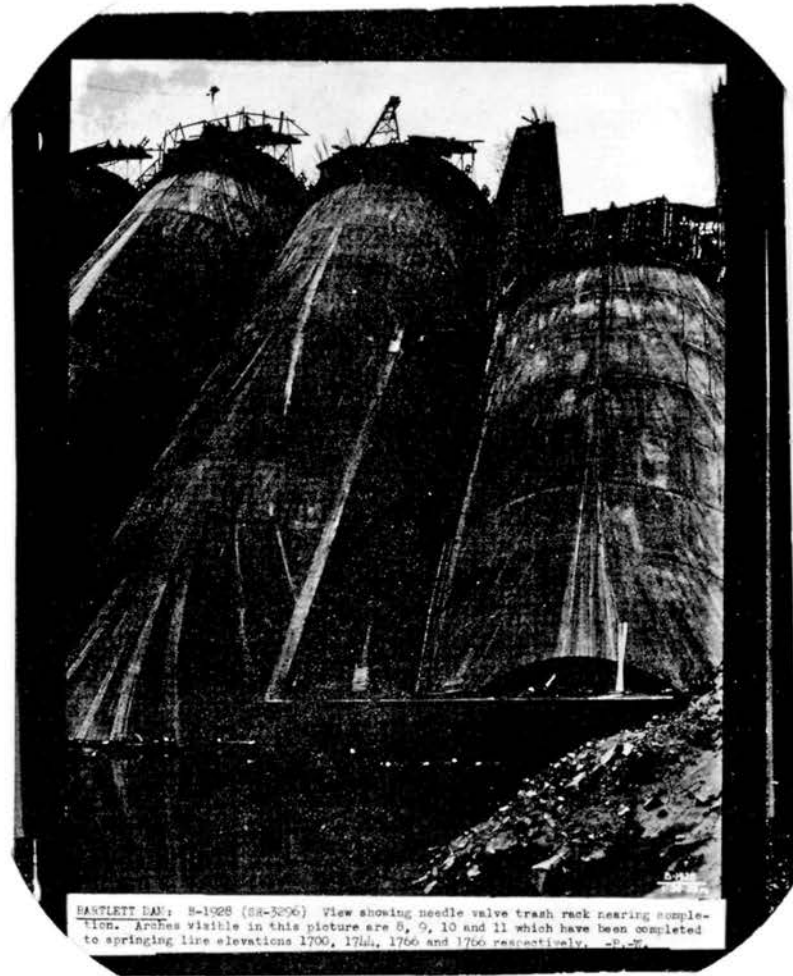
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BARTLETT DAM: B-1934. View of slide gate outlet trash rack structure at base of arch 8.  
Note two sections of needle valve trash racks in place between arches 8 and 9. -P.

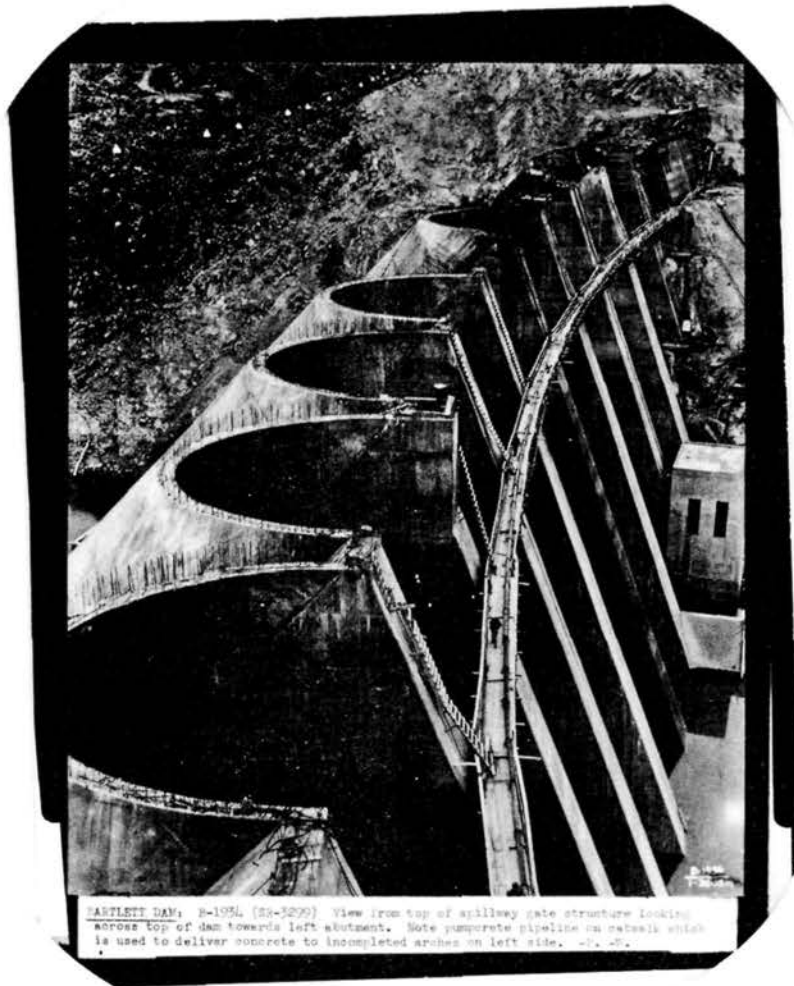
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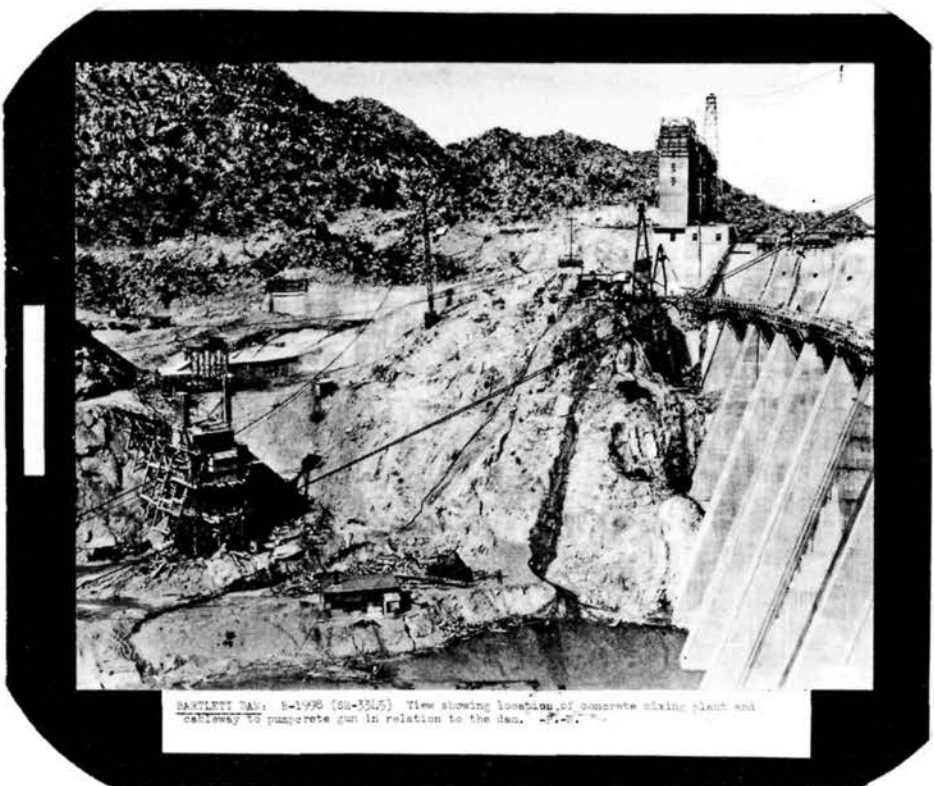


BARTLETT DAM: B-1928 (SR-3296) View showing needle valve trash rack nearing completion. Arches visible in this picture are 8, 9, 10 and 11 which have been completed to springing line elevations 1700, 1714, 1766 and 1766 respectively. -D.W.

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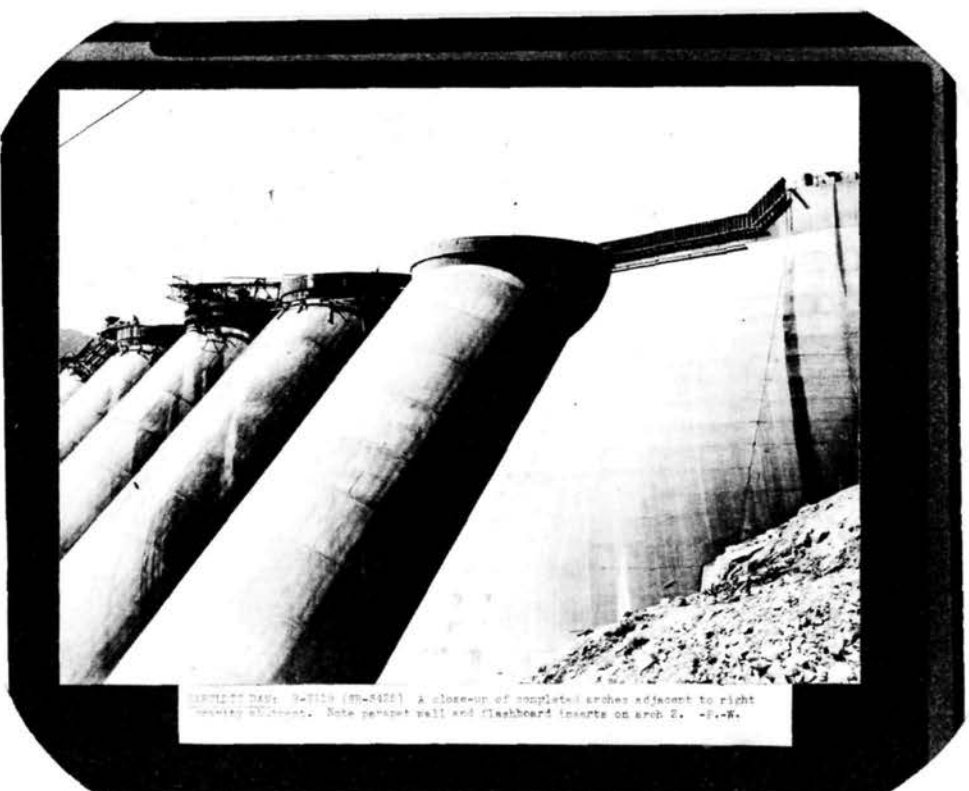
BARTLETT DAM, B-1934, (28-3299) View from top of spillway gate structure looking across top of dam towards left abutment. Note pumpcrete pipeline on catwalk which is used to deliver concrete to incomplete arches on left side. -1-27.



BARTLETT DAM: 8-1996 (SU-3245) View showing location of concrete mixing plant and  
cableway to pumpcrete gun in relation to the dam. -P.-P.

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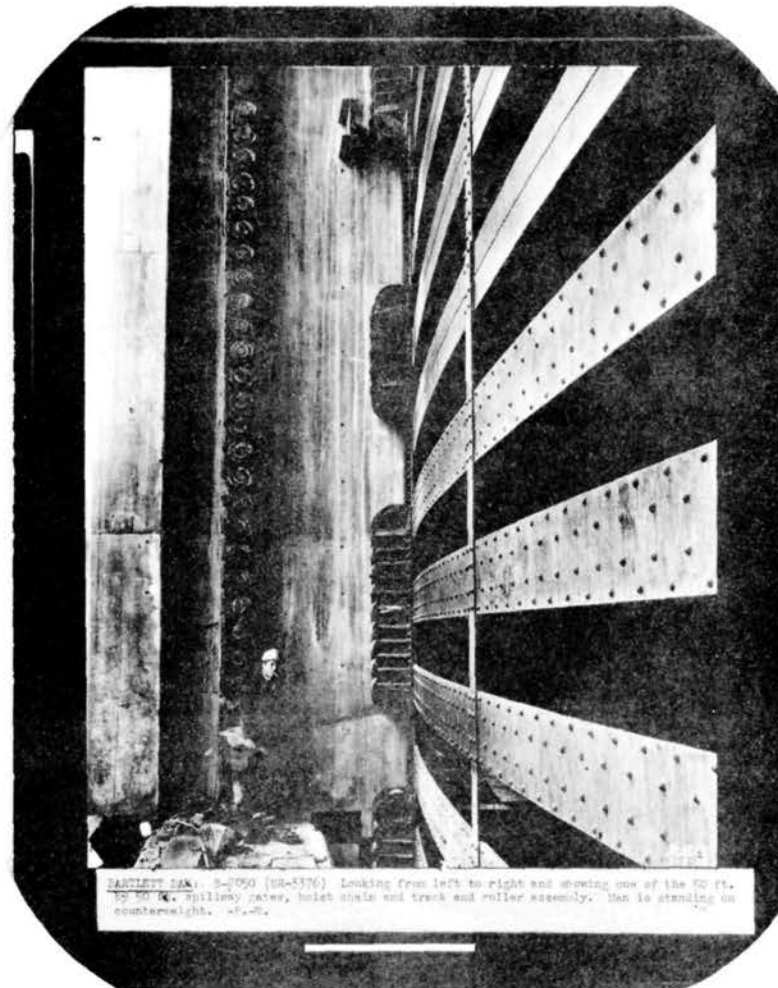




HEMPHILL DAM: 3-File (SP-1476) A close-up of completed arches adjacent to right  
mainway culvert. Note parapet wall and flashboard inserts on arch 2. -P.-R.

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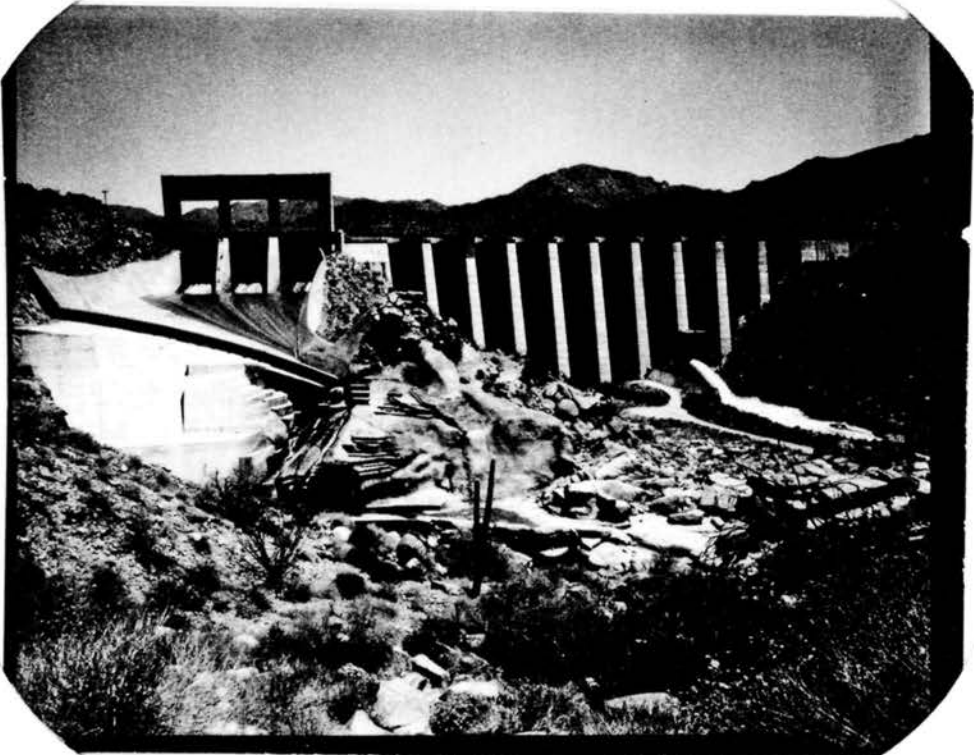


BAILETT DAM, S-2050 (SR-5376) Looking from left to right and showing one of the 50 ft. by 50 ft. spillway gates, hoist shaft and track and roller assembly. Man is standing on counterweight. A.E.C.

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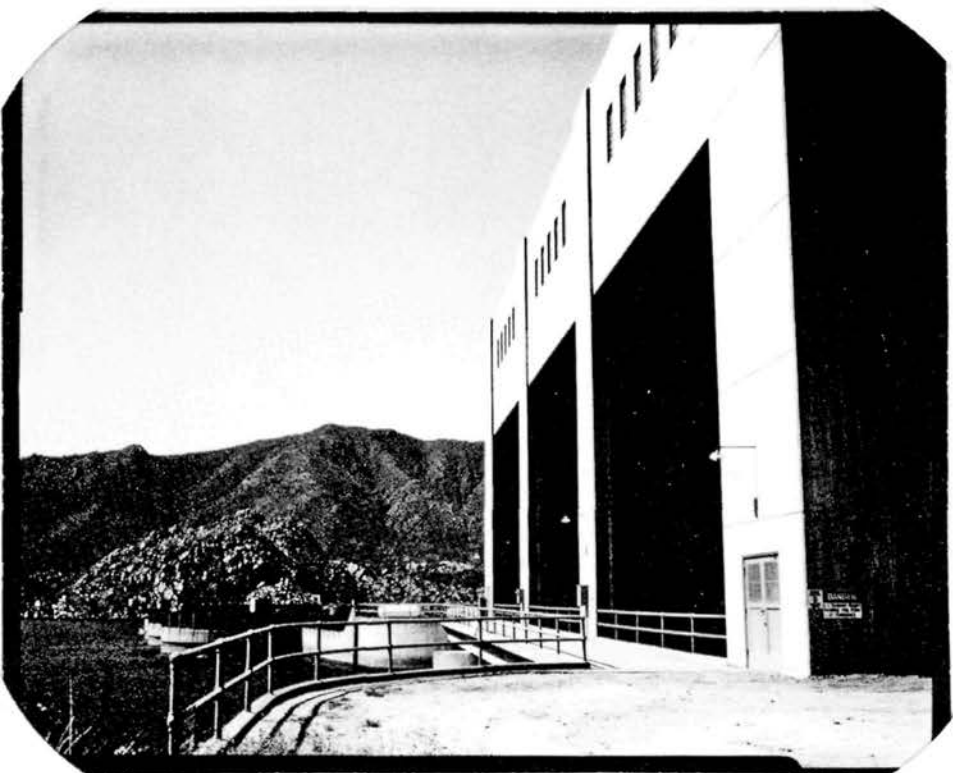
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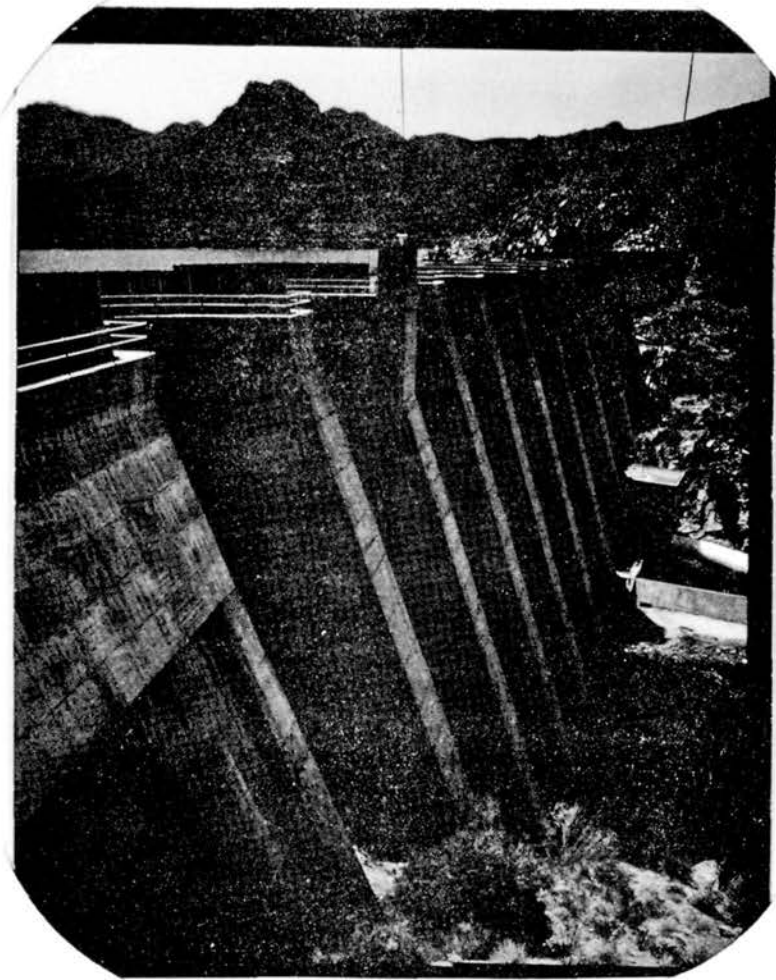


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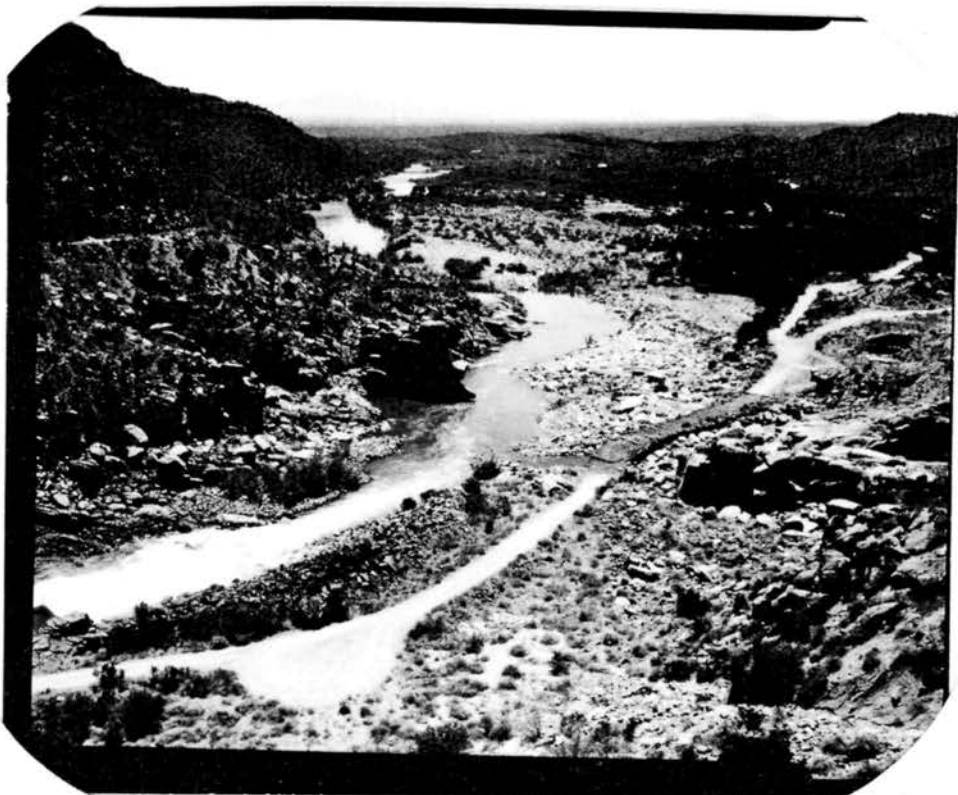
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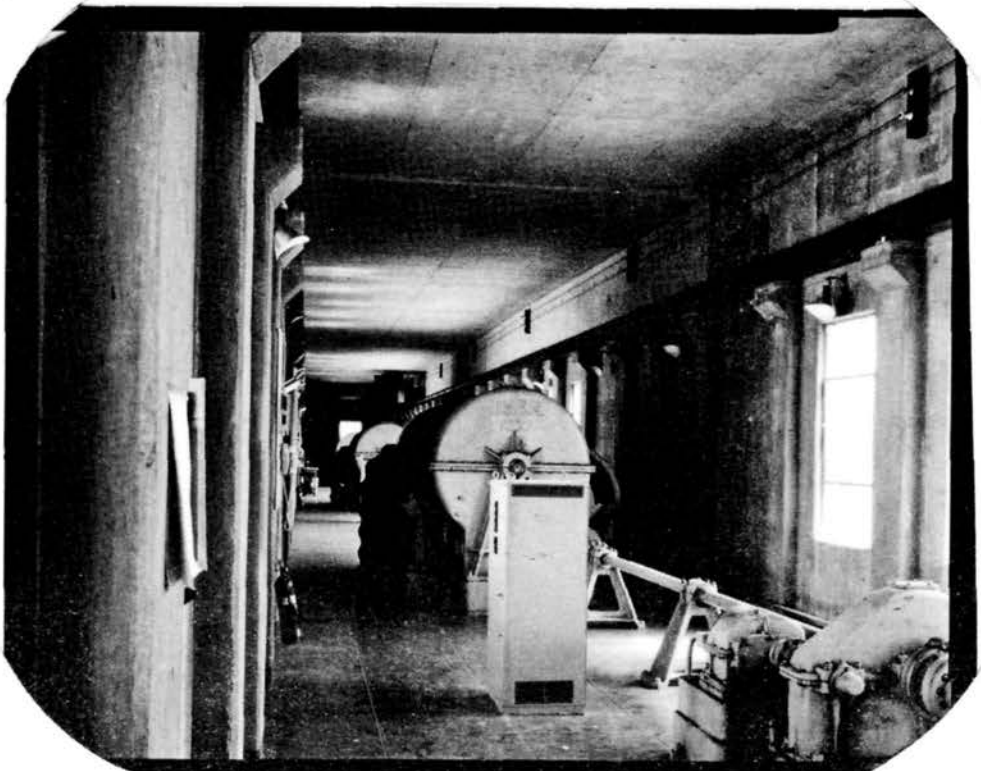


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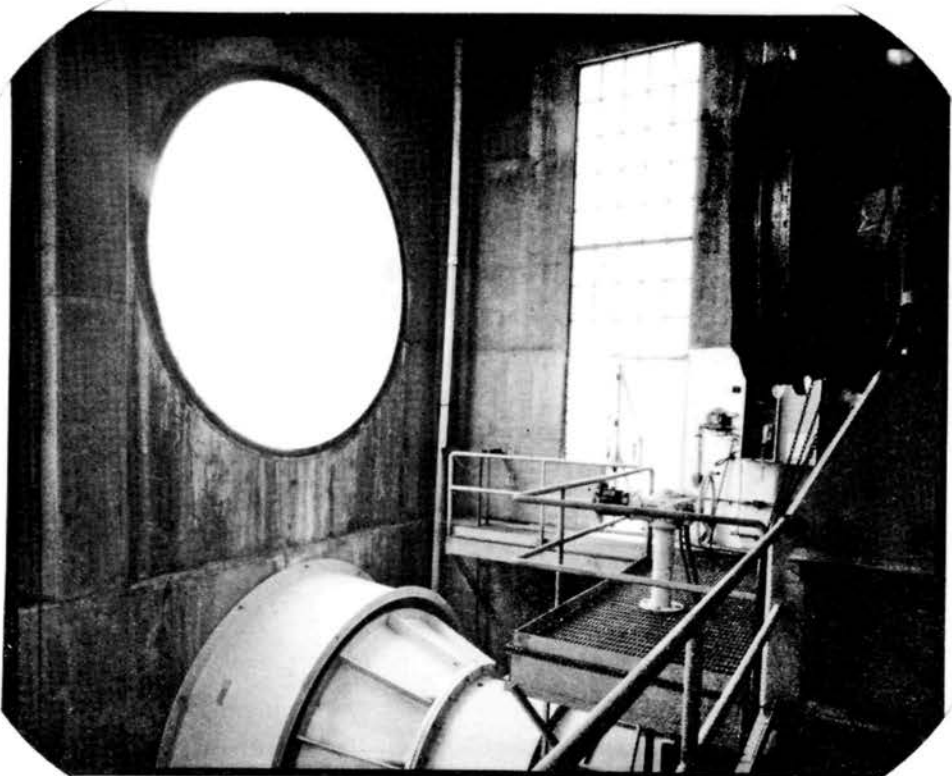
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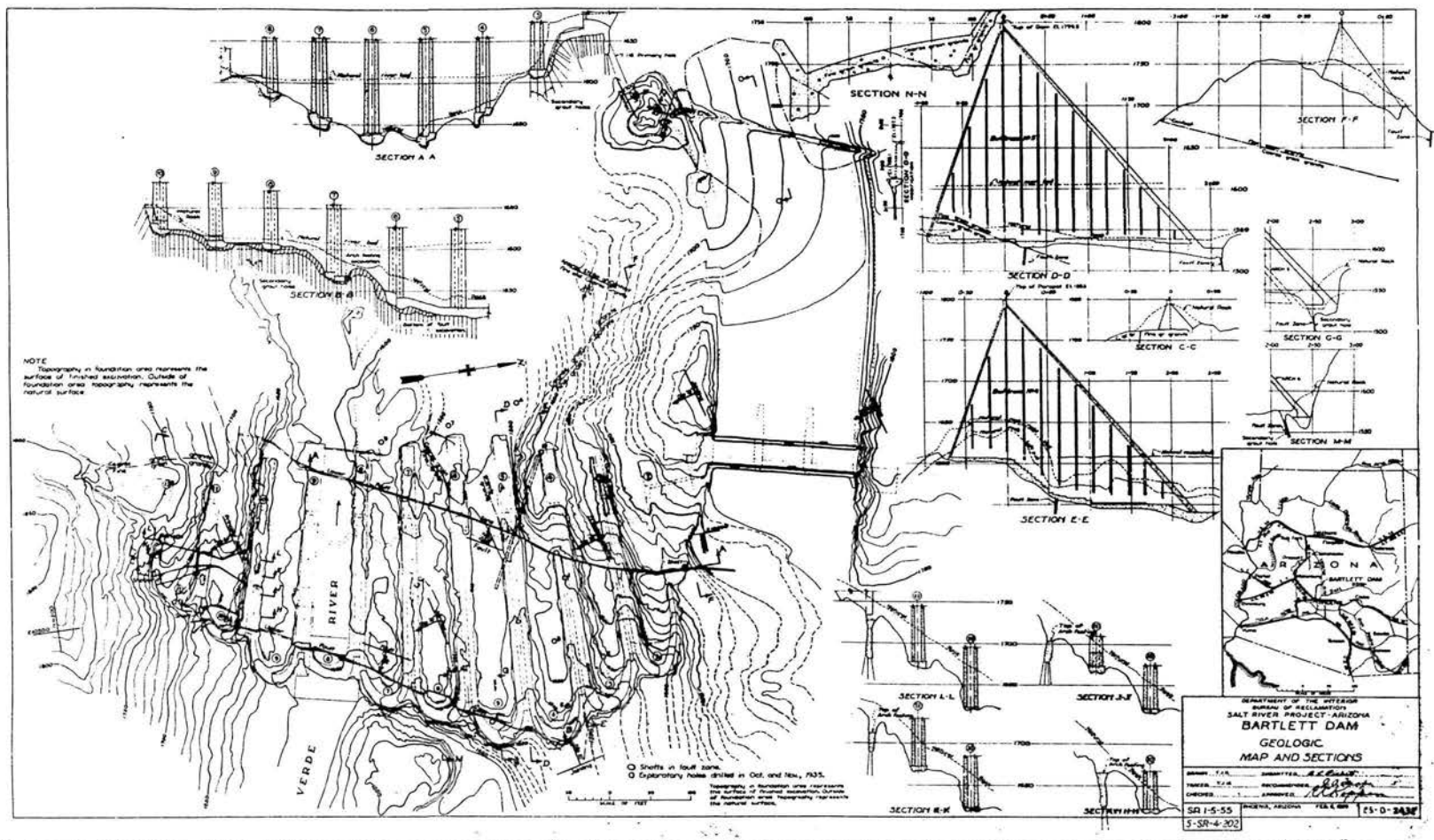


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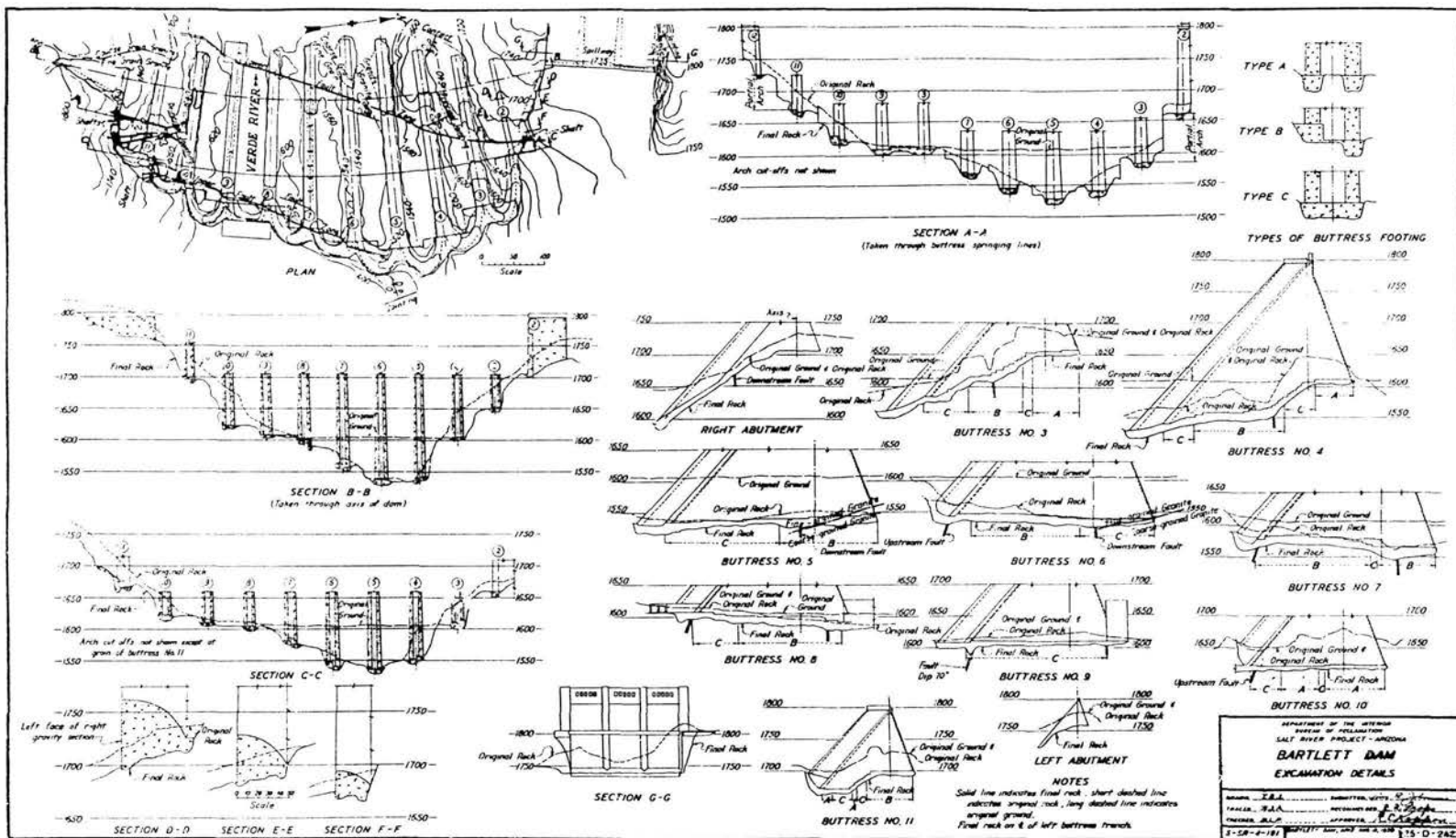


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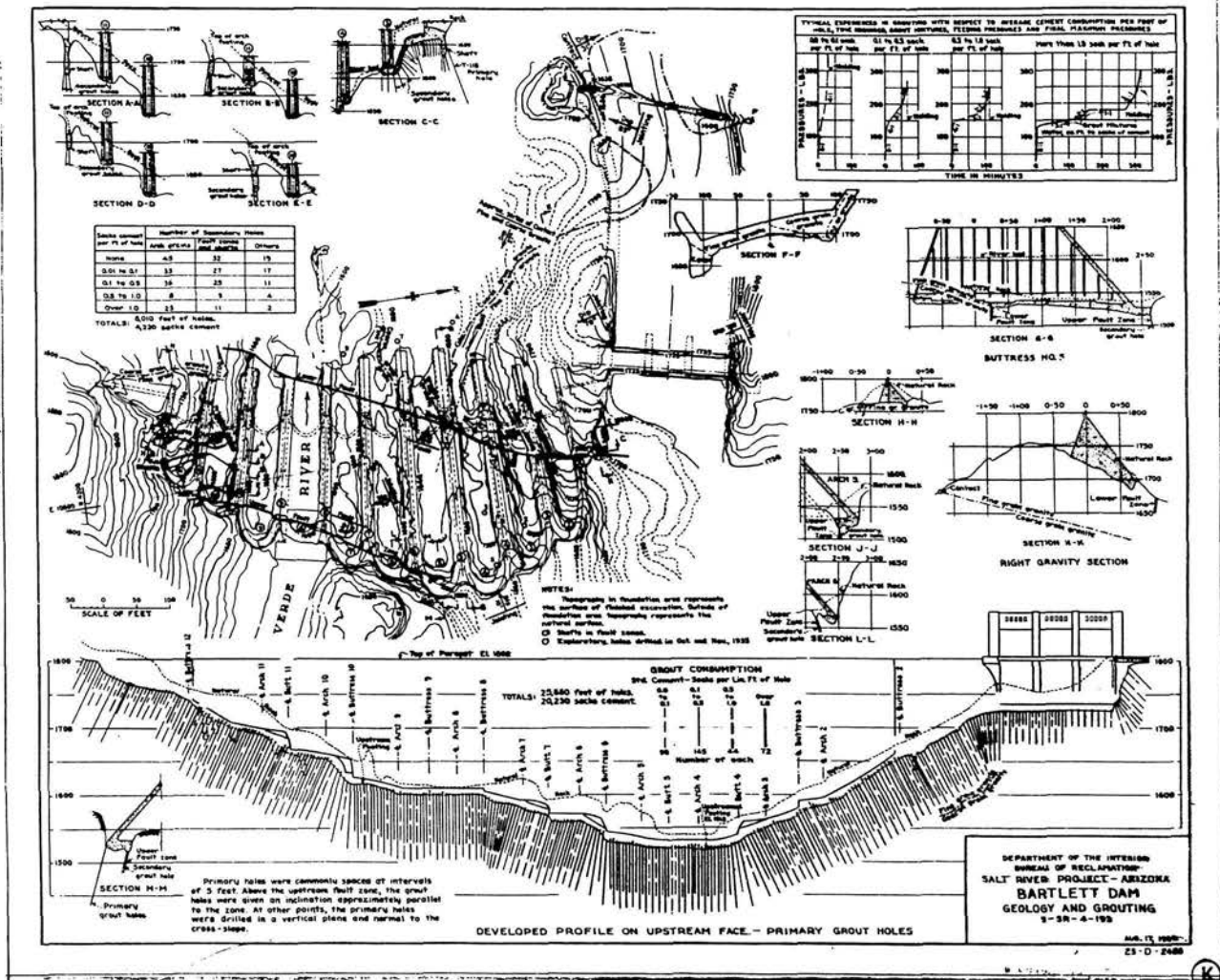


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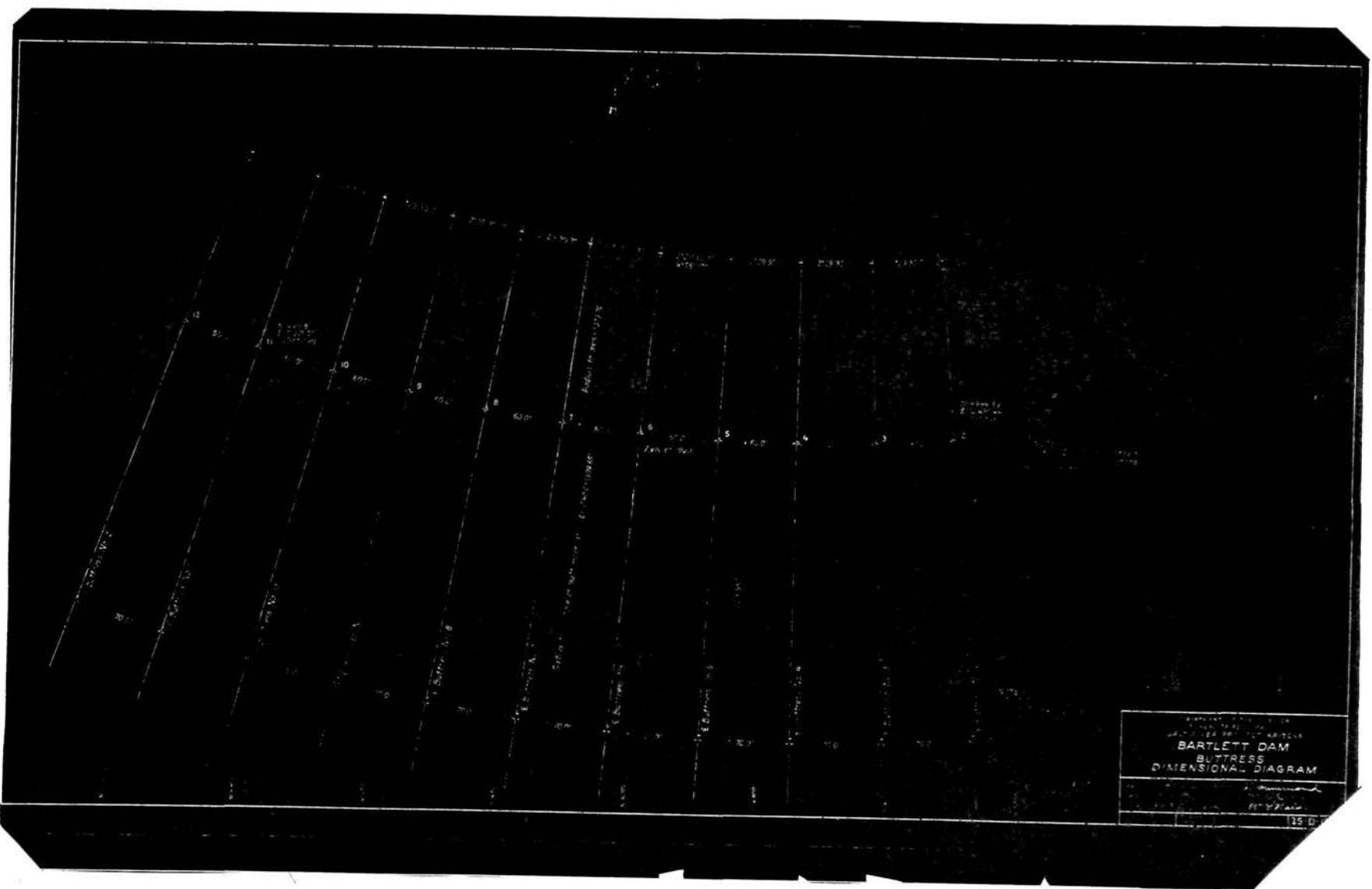
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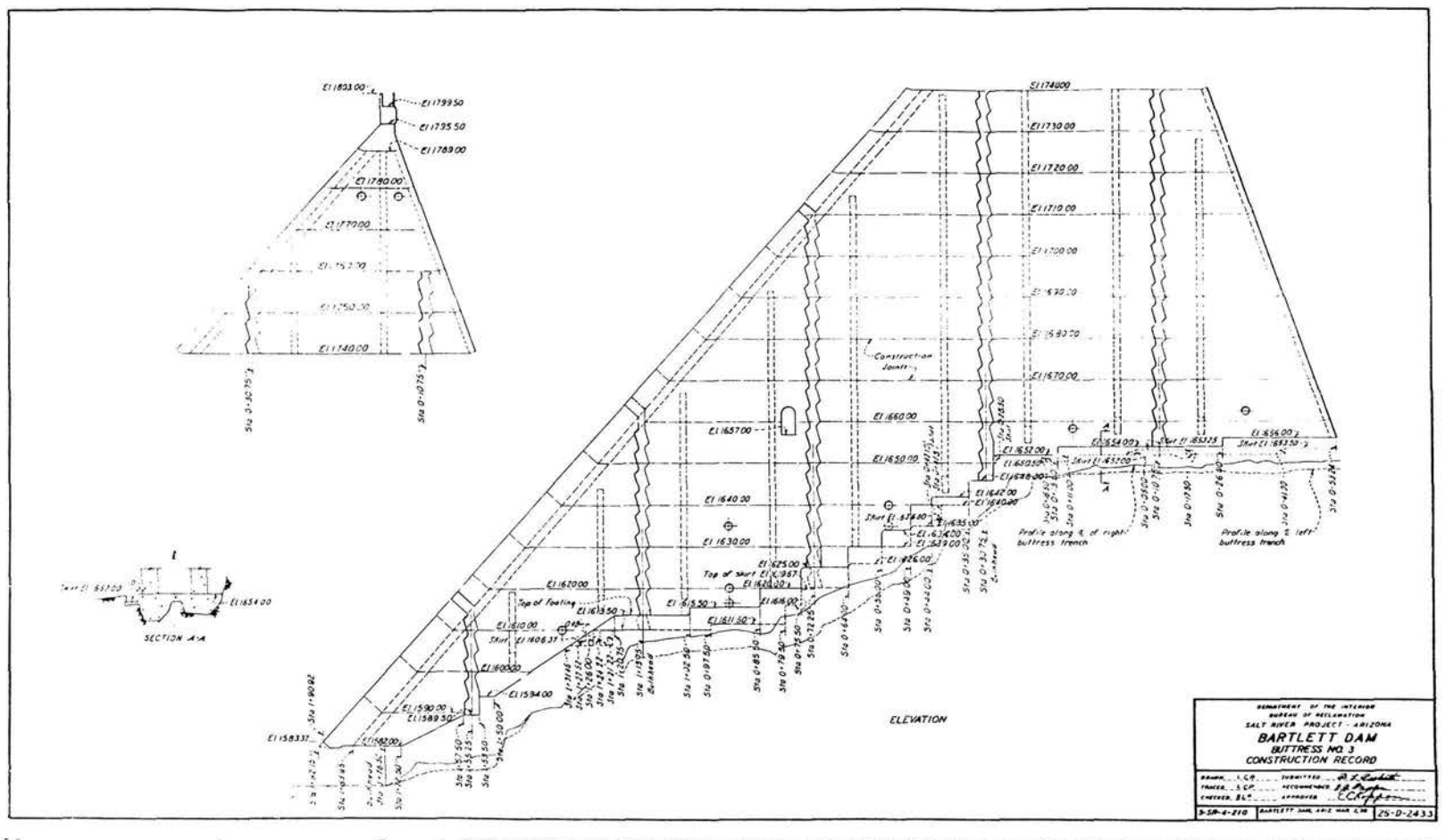




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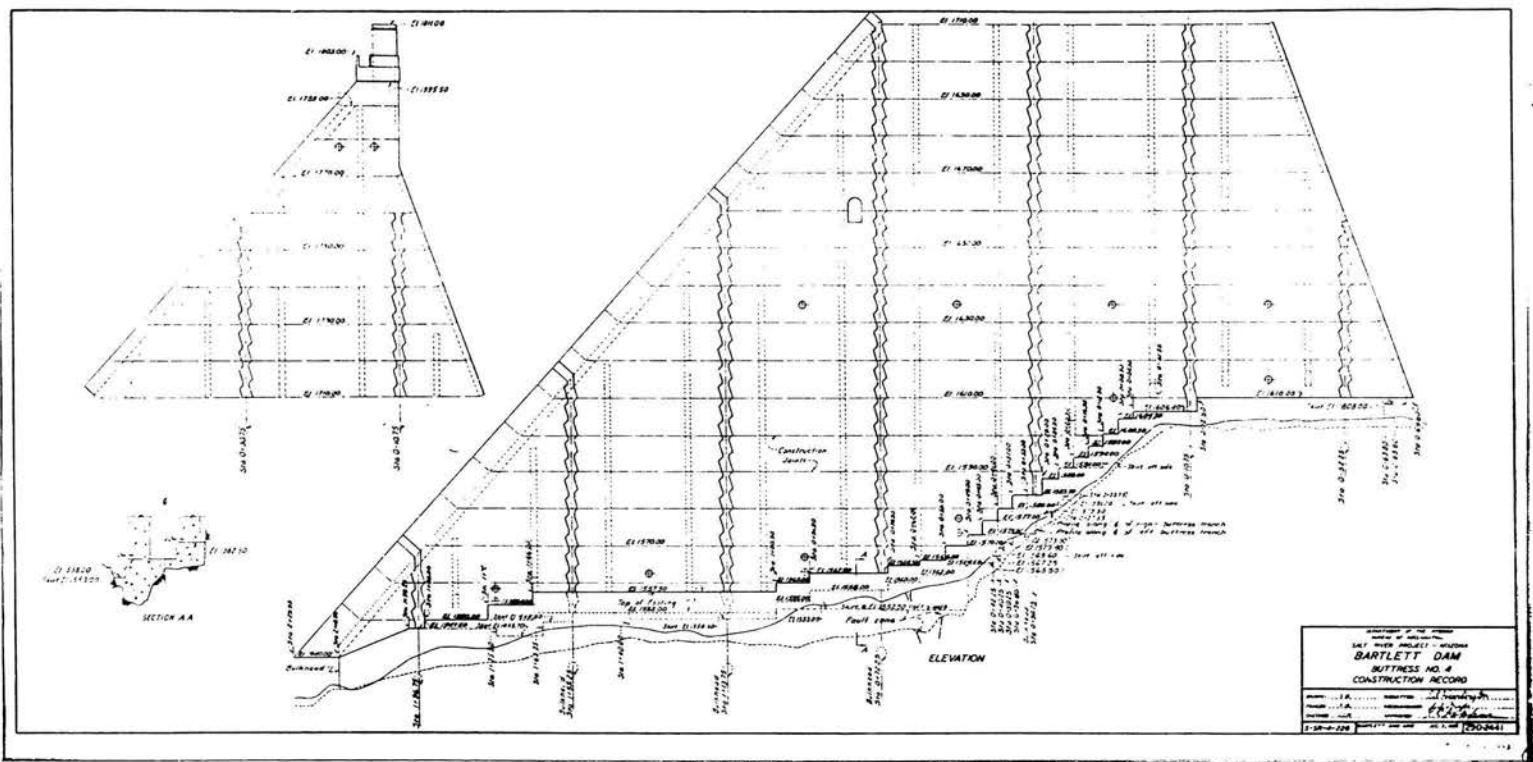






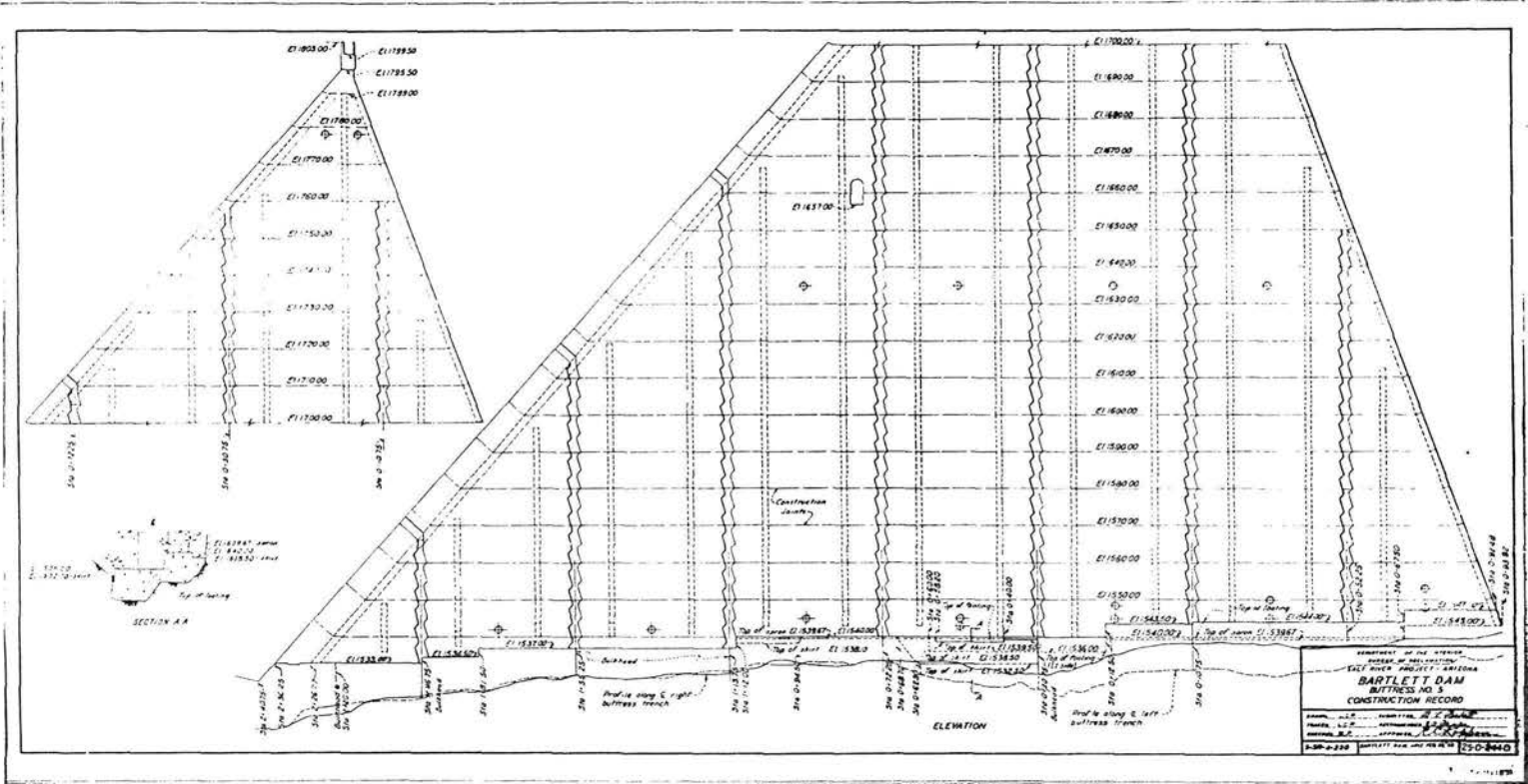
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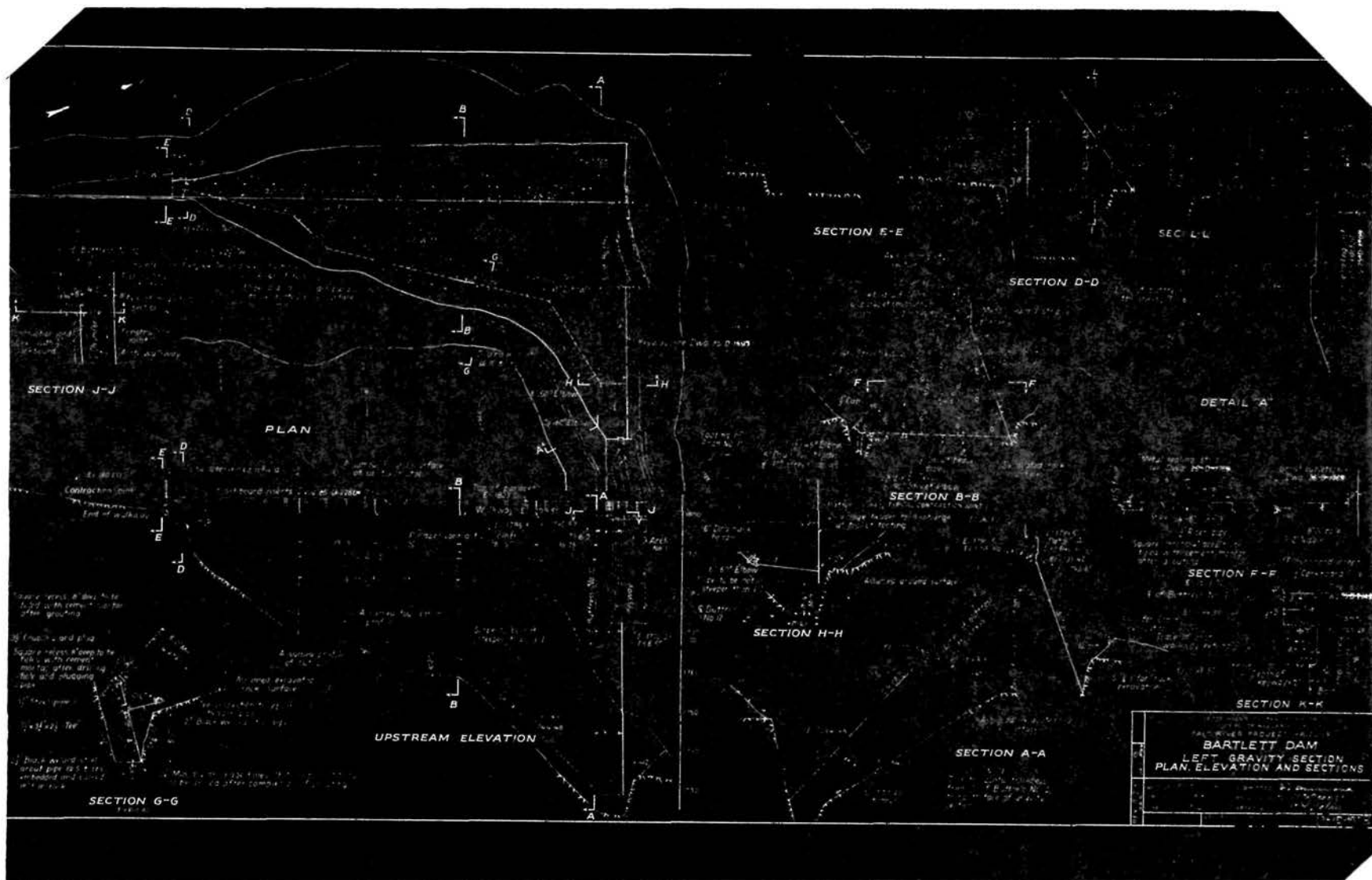


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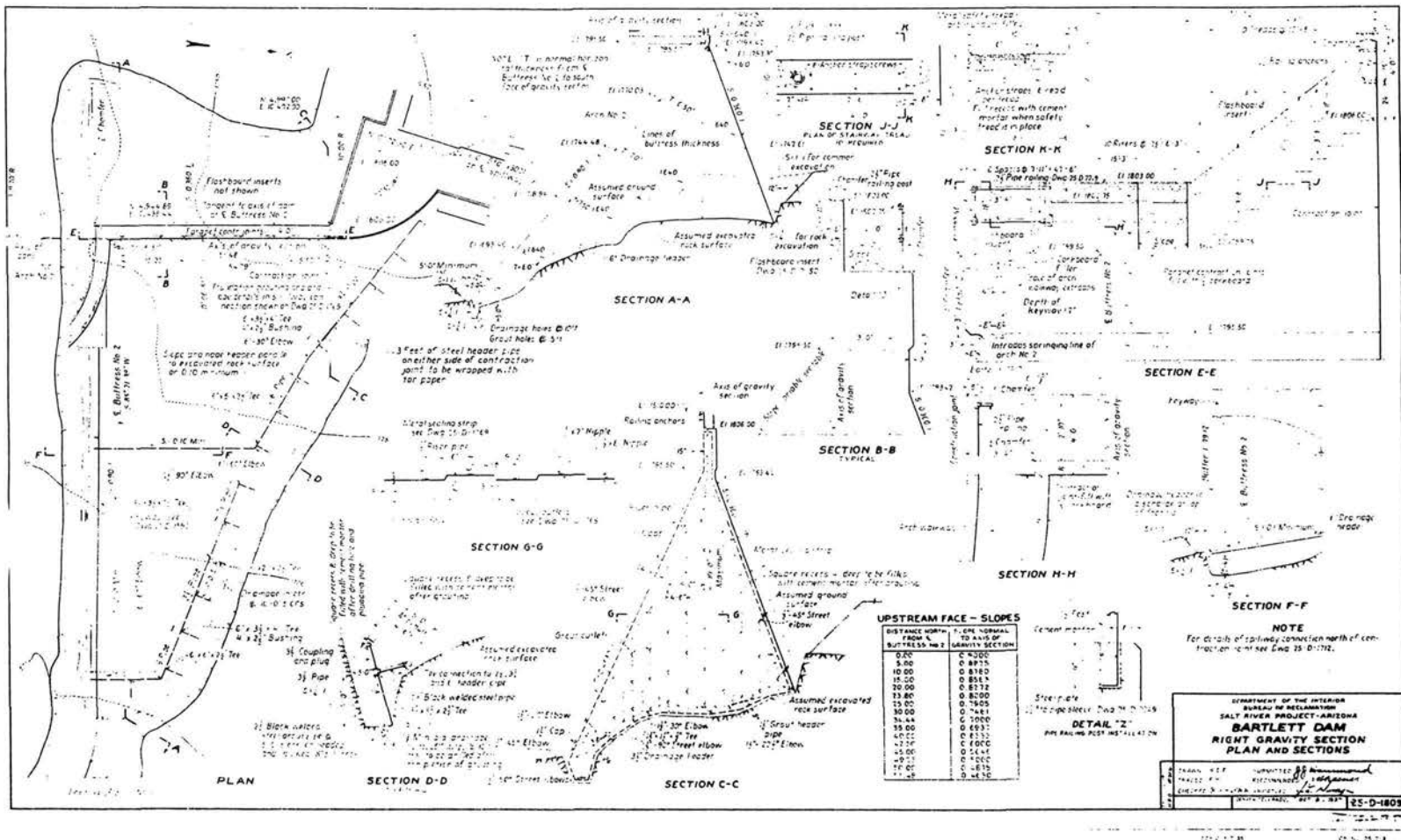




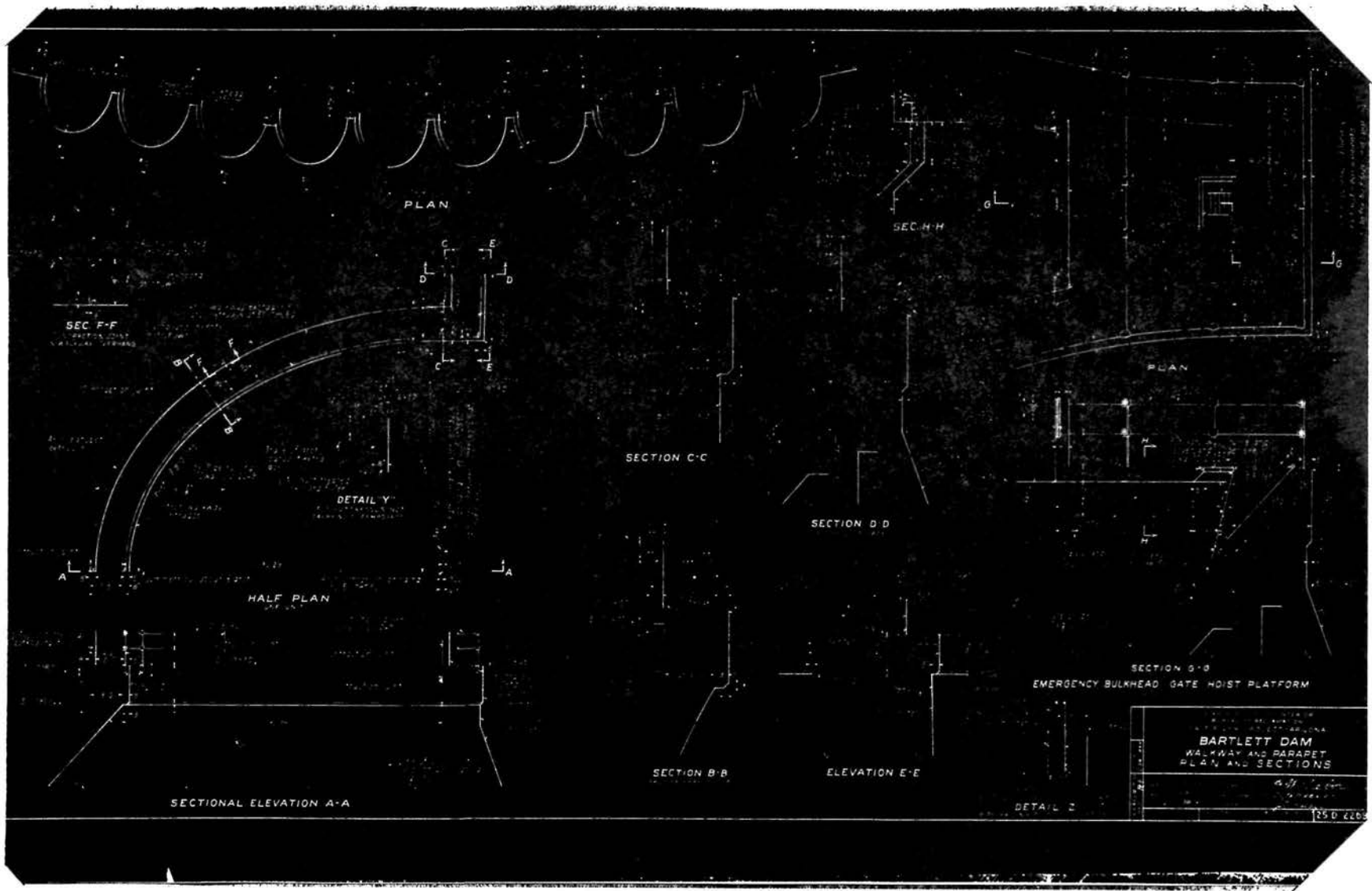
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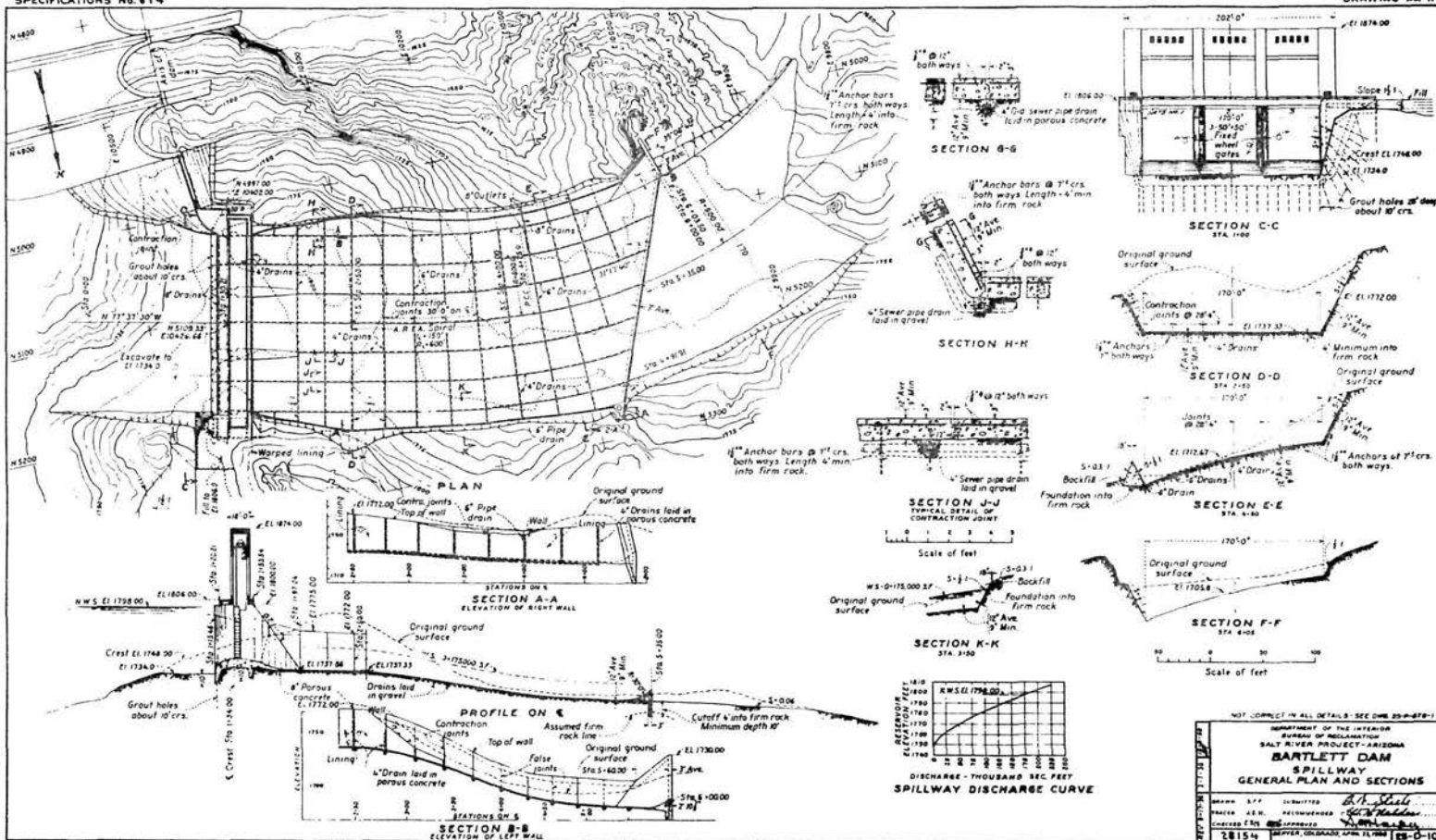


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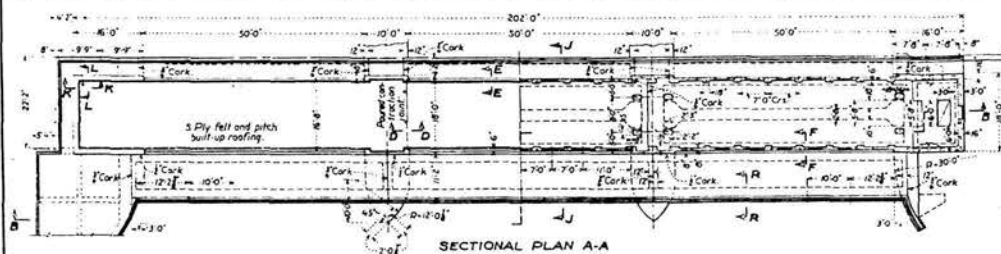
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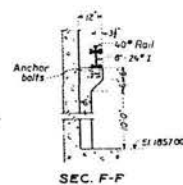


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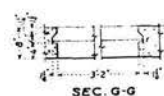




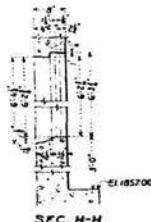
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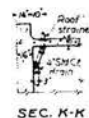
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SEC. G-G



SEC. H-H



SEC. K-K



SEC. L-L



SEC. M-M



SEC. N-N

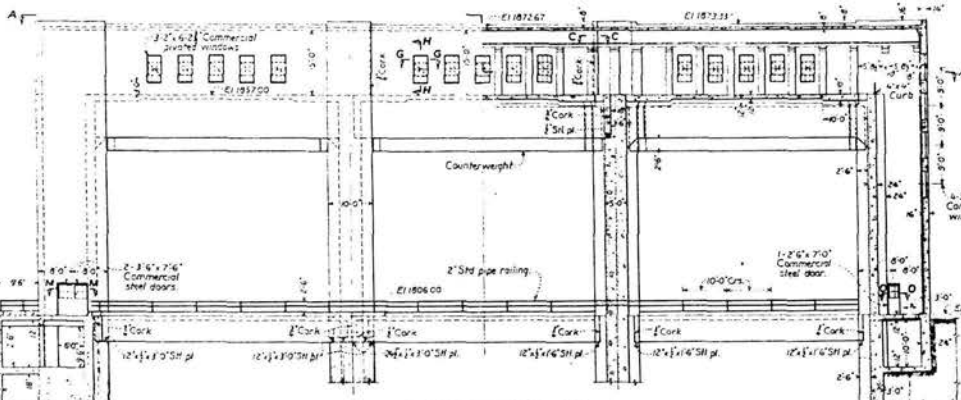


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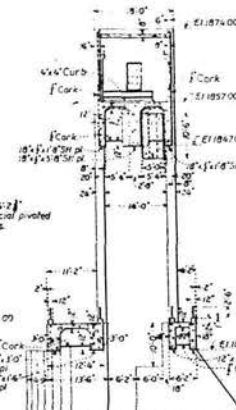


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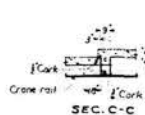
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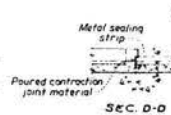
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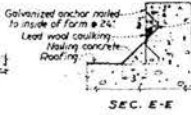
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SEC. D-D



SEC. E-E



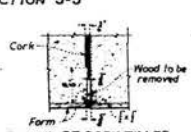
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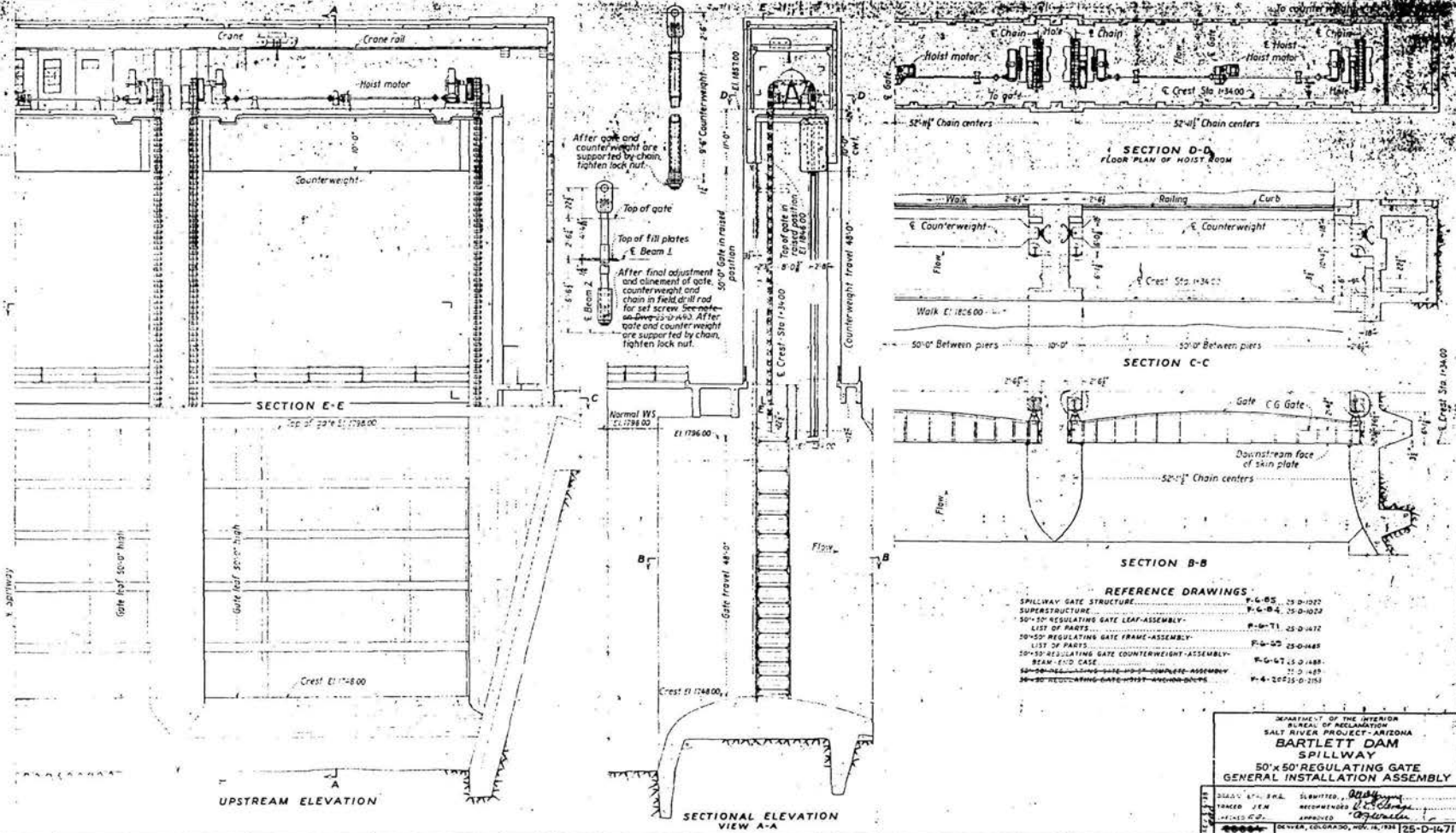


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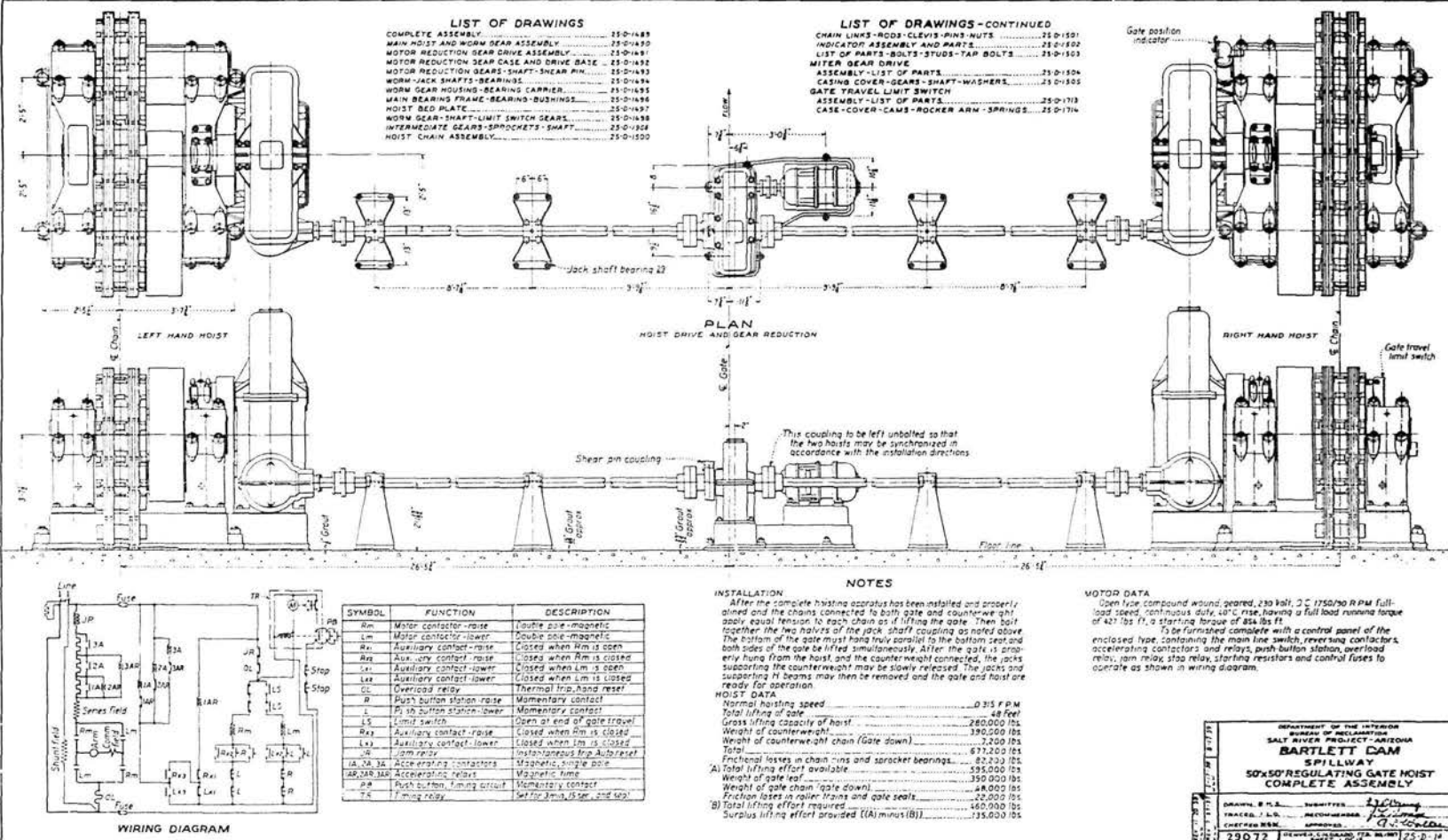
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BUREAU OF RECLAMATION  
SALT RIVER PROJECT-ARIZONA  
**BARTLETT DAM**  
SPILLWAY GATE STRUCTURE  
SUPERSTRUCTURE  
DRAWN: S.P.S. SUBMITTED: *[Signature]*  
CHECKED: S.P.S. APPROVED: *[Signature]*  
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PECIFICATIONS No. 722



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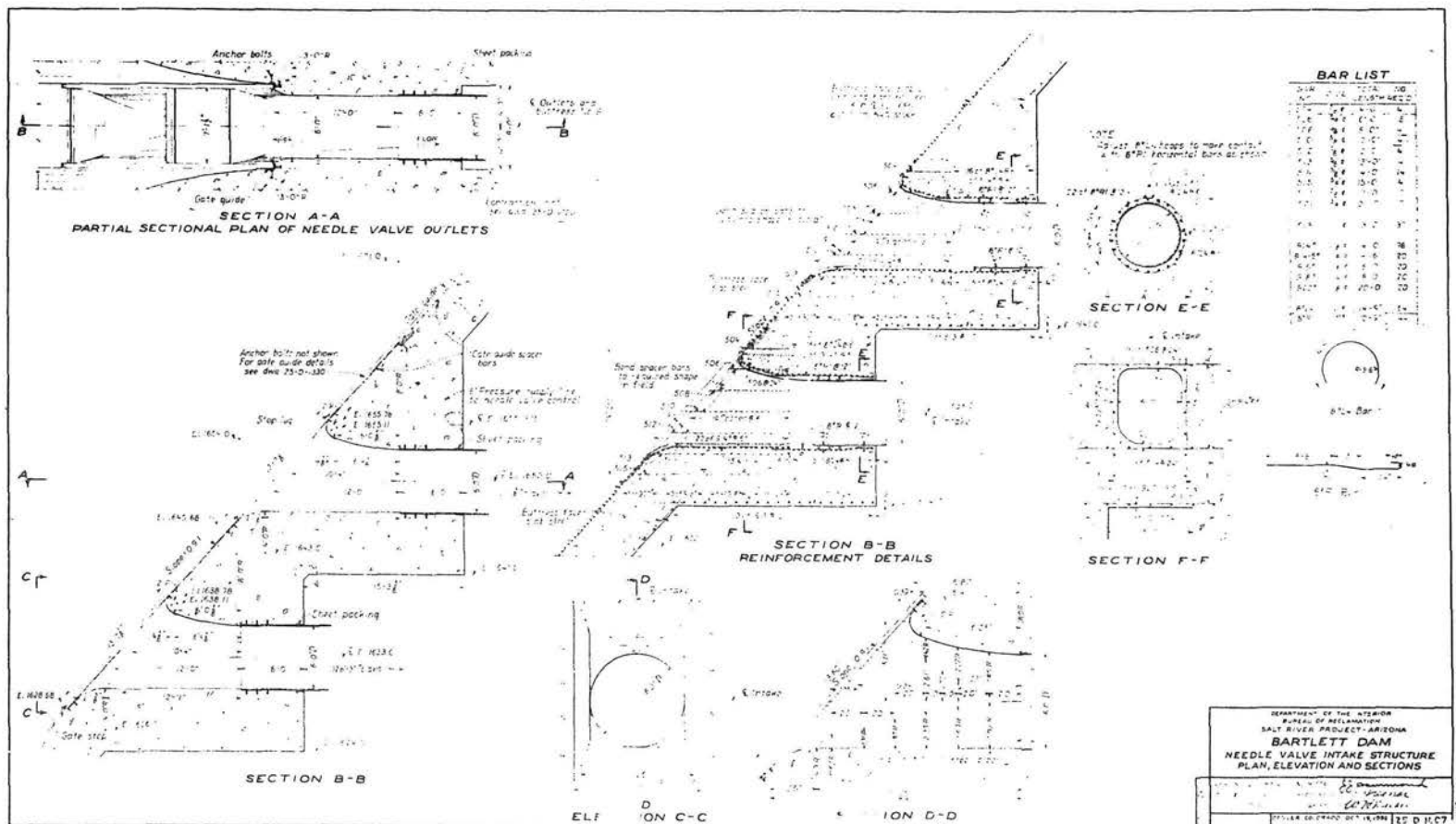
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See Index To Photographs For Caption  
HAER No. AZ-25-63

DEPARTMENT OF THE INTERIOR  
BUREAU OF RECLAMATION  
SALT RIVER PROJECT, ARIZONA  
**BARTLETT DAM**  
SPILLWAY  
50'x50' REGULATING GATE HOIST  
COMPLETE ASSEMBLY

DRAWING BY: J. L. B. CHECKED BY: J. L. B. APPROVED BY: J. L. B. DATE: 12-1-14

29072



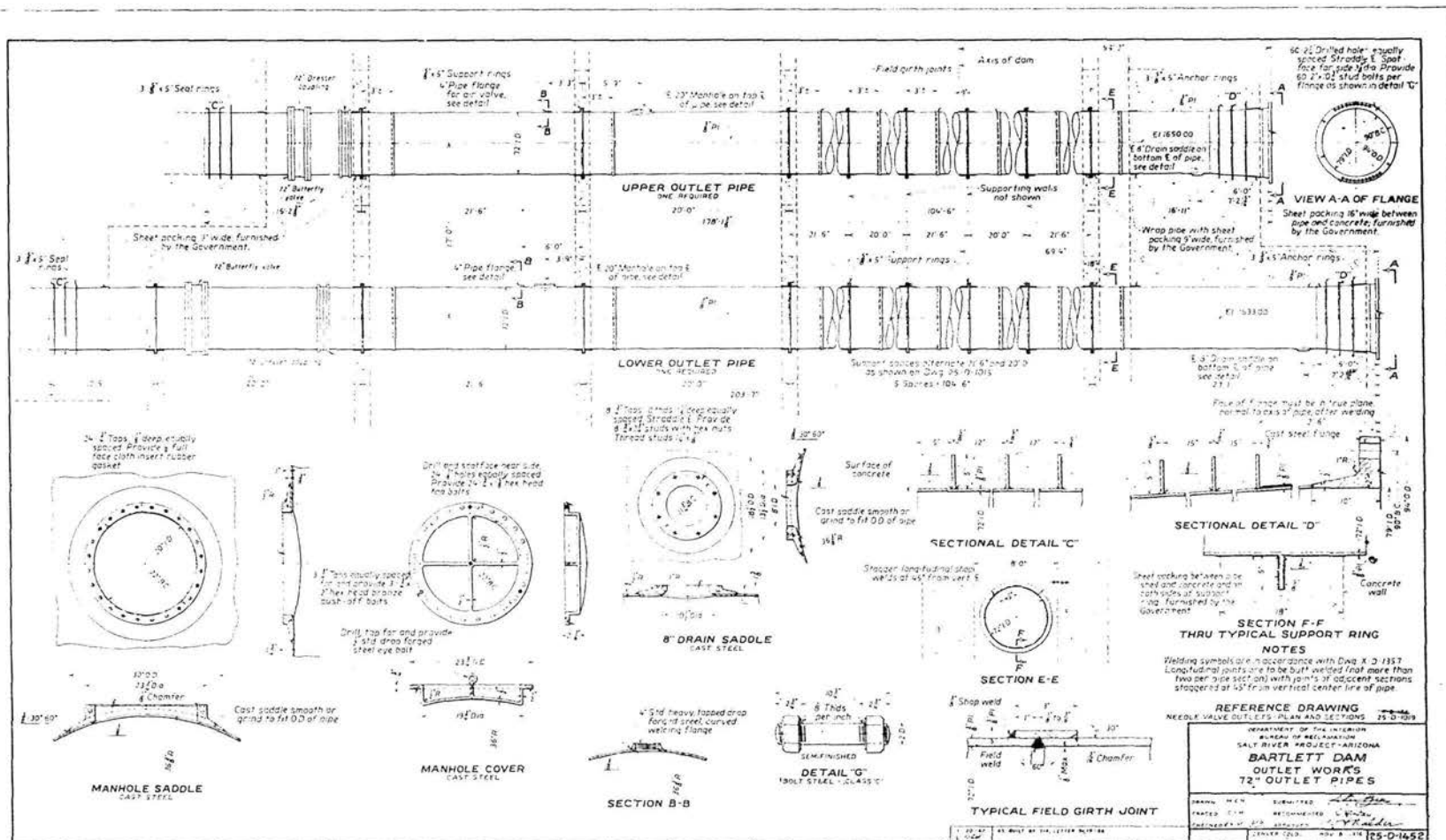


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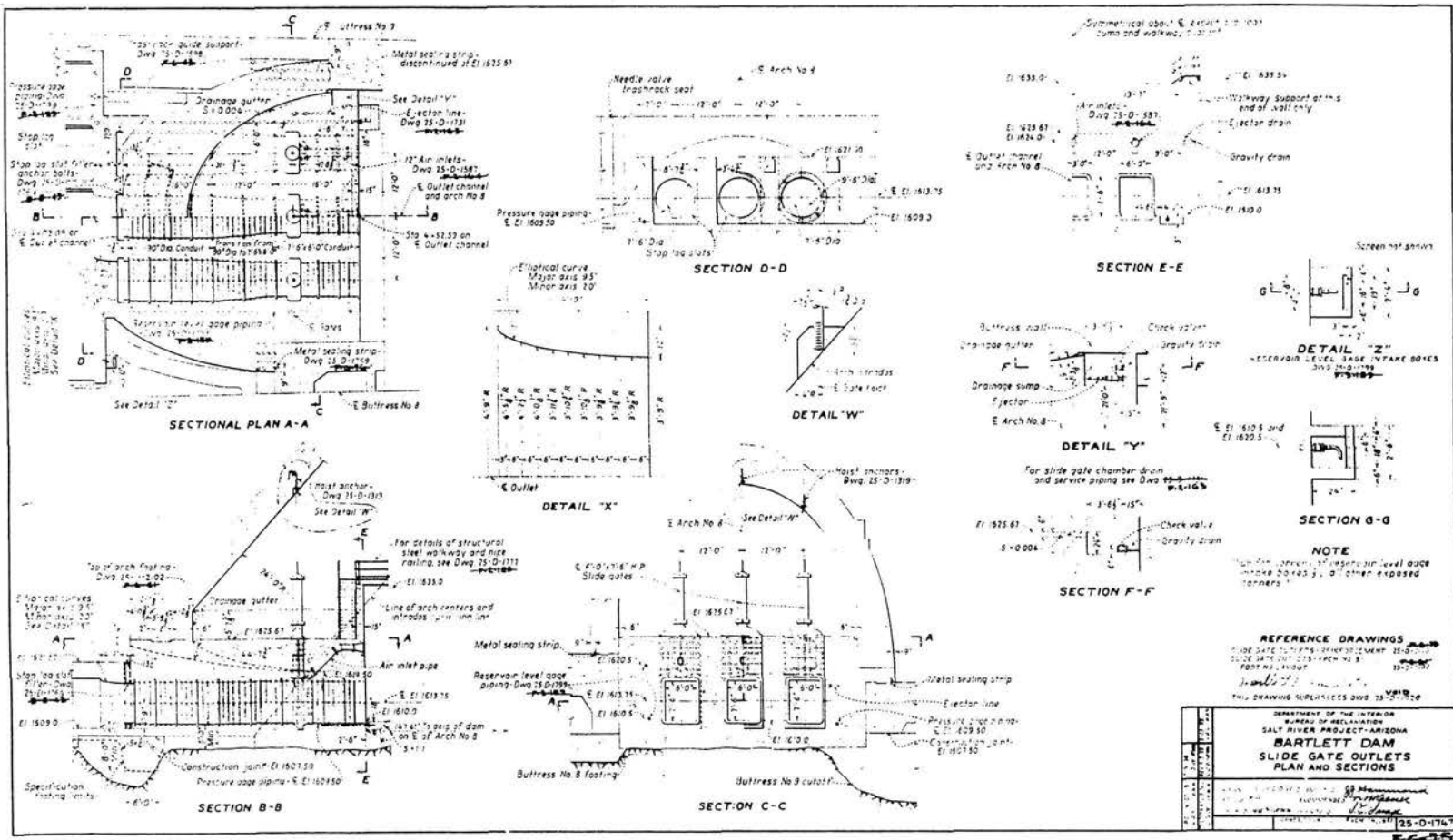


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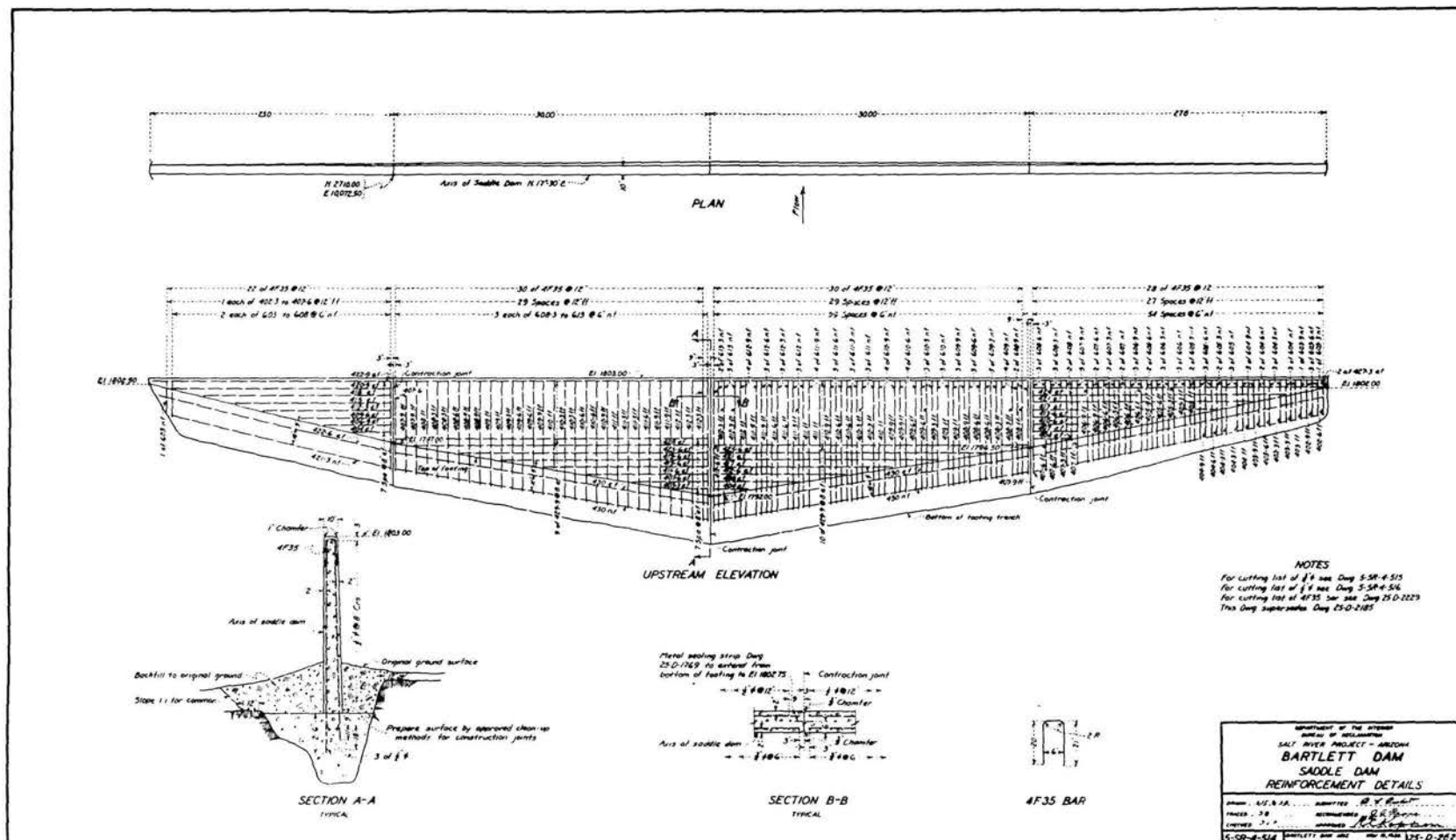
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Historic American Engineering Record  
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HAER No. AZ-25-68







Historic American Engineering Record  
 See Index To Photographs For Caption  
 HAER No. AZ-25-70

HISTORIC AMERICAN ENGINEERING RECORD

Bartlett Dam  
HAER No. AZ-25

Location: Bartlett Dam is located on the Verde River in Maricopa County, approximately 50 miles northeast of Phoenix. USGS Quad Map, "Bartlett Dam, 3651 1SW." UTM coordinates are 1448722.355E and 12276743.663N. Coordinates are in zone 12.

Date of Construction: 1935-1939.

Engineer: U.S. Bureau of Reclamation, E. C. Koppen, et al.

Present Owner: The United States.

Present Use: Bartlett Dam provides Verde River water for urban, agricultural, and Indian uses.

Significance: Bartlett Dam was the first multiple arch dam constructed by the Bureau of Reclamation. It was also the highest multiple arch dam constructed in the United States at the time of its completion.

Historian: David M. Introcaso, Corporate Information Management, Salt River Project.

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## Chapter I: Introduction

The Verde River meanders through the center of the state of Arizona. It forms at Del Rio Creek and Sullivan Lake, north of Chino Valley near Paulden in Yavapai County, and descends gradually for 175 miles through the Prescott, Coconino, and the Kaibab national forests to join the Salt River just east of the Phoenix metropolitan area in Maricopa County. From one geologic province to another the river winds, from forested mountains to desert plains, draining over 6,000 square miles of Arizona's Colorado Plateau. The river courses through wilderness areas, fertile agricultural lands, and once mineral-rich mountains. The Verde has had several names including El Rio de los Reyes (King's River), the San Francisco River, and the Bill Williams Fork. Its current name is the Spanish equivalent to a Native American word meaning "green." The river's name is derived<sup>1</sup> from the occurrence of malachite deposits along its banks.

The Verde River has sustained wandering groups of human hunters for over 8,000 years. As early as the sixth century A.D., Sinagua Indians lived in the San Francisco Peaks area near Flagstaff. After the time of the volcanic eruption that caused Sunset Crater around 1064, they gradually moved south, where they found a home in the lush Verde Valley. Here they used the river's water for farming to supplement their gathering and hunting lifestyle.<sup>2</sup>

Three centuries later, after a disastrous drought, other tribes sought refuge near the perennially flowing Verde. In the early 1300s the Wupatki, adapting the successful Hohokam model, began to carve out canals and created an extensive agricultural system. Archaeologists still dispute the cause of the decline of these ancient peoples but the Verde region

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<sup>1</sup>For an overview of the Verde's early history, see James W. Byrkit, "A Log of the Verde, The "Taming" of an Arizona River." The Journal of Arizona History 19 (Spring 1978): 31-54. See also Frank Brothers, "Valley of Haven . . . The Verde," Arizona Highways 59 (July 1983): 2-44. Will C. Barnes' Arizona Place Names, revised and enlarged by Byrd H. Granger, 9th ed. (Tucson: The University of Arizona Press, 1985), 361; Halka Chronic, Roadside Geology of Arizona (Missoula, Montana: Mountain Press Publishing Company, 1983), 165.

<sup>2</sup>Jay J. Wagoner, Early Arizona (Tucson: The University of Arizona Press, 1975), 39; Henry P. Walker and Don Bufkin, Historical Atlas of Arizona (Norman: University of Oklahoma Press, 1979), 11.

continued to be occupied by the nomadic Native Americans generally, including the Yavapai and other tribes.<sup>3</sup>

The first Europeans to visit the Verde River region were Spanish explorers. In 1583, while exploring the country west of the Zuni Pueblos, Antonio de Espejo crossed the Verde and discovered silver deposits at present-day Jerome. While his reports of mineral wealth generated some interest, it was not until 1598 that Juan de Onate, who had established colonies in New Mexico, was significantly intrigued to send Captain Marcos Farfan de los Godos on a short entrada through the Verde Valley. Farfan staked claims to mines believed to be in the Prescott area. These early explorers did not leave their mark on the Verde region, but the legends of mineral wealth encouraged adventurers centuries later.<sup>4</sup>

Although the American Southwest was then actually part of Mexico, in the 1820s and 1830s American "mountain men" trapped the rivers of Arizona - the Verde as well as the Gila, Salt, San Pedro, and the Colorado. Primarily hunting for beaver pelts, these men also had an eye for mining and general adventure. Men like the legendary James Ohio Pattie, Bill Williams, Ewing Young, and Kit Carson criss-crossed the area. To earn their pelts they traded American goods brought from the East with Mexican settlers in exchange for expensive and highly prized trapping licenses, gold nuggets, and mules. They also traded with friendly Native American tribes for supplies.<sup>5</sup>

The mountain man most closely identified with the Verde River was Pauline Weaver. Justly famous as an Indian negotiator, he died on the Verde's banks after living over thirty years in its vicinity. Born, like Ewing Young in Tennessee, he was half Cherokee. After exploring possibilities with Canada's Hudson Bay Company, he moved

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<sup>3</sup>Wagoner, Early Arizona, 40.

<sup>4</sup>Ibid., 47-68.

<sup>5</sup>Byrkit, "A Log of the Verde," 34-35. Miles E. Hill and John S. Goff, Arizona Past and Present 2nd ed. (Phoenix: Black Mountain Press, 1975), 114. For accounts of mountain men see for example, Richard Batman, American Ecclesiastes: The Stories of James Pattie (New York: Harcourt Brace Jovanovich, 1984); Daniel E. Conner, Joseph Reddeford Walker and the Arizona Adventure (Norman: University of Oklahoma Press, 1956); and David J. Weber, The Taos Trappers, The Fur Trade in the Far Southwest, 1540-1846 (Norman: University of Oklahoma Press, 1970).



south to a milder climate and became an expert on the trails, animals, minerals, and human inhabitants of the Southwest. He served as a negotiator among the Mexican, American, and the Indian populations. His diplomatic efforts allowed travellers to cross the northern Verde area unmolested for decades. In 1863 he guided the Peeples Party from Yuma to rich mining fields south of Prescott now called the Weaver District. After a lifetime of mutual friendship, Weaver fell out with the Indians in 1864. An unfortunate misunderstanding led to bloodshed, and he attached himself for security to the troops at Fort Whipple. It was at his camp near there that he died in 1867.

In 1846 the United States and Mexico went to war. Two years later the treaty of Guadalupe Hidalgo signaled the conclusion of hostilities. The treaty agreement resulted in the U.S. acquiring a huge tract of Mexican territory, including lands north of the Gila River. America's acquisition became the New Mexico Territory. This began a new phase of exploration: an American entrada into a land ostensibly unchanged by peripatetic Spanish and Mexican occupations and marginal American transience.

At war's end Americans generally considered the Southwest worthless desert, or as Mark Twain stated an "infernal damnable chaos," notable only as a hindrance in the passage from the East to California. With this view the addition of the land below the Gila - the area judged the most feasible transcontinental route - became of paramount importance. It was known as a suitable route since Captain Philip St. George Cooke traversed the area in leading the famed Mormon Battalion from Santa Fe to San Diego in 1846-1847. Despite suffering considerable hardships, Cooke's route proved the best way to reach the Pacific coast.

In June 1854 the Gadsden Purchase was ratified by Mexico and the U.S., providing the latter with lands south of the Gila River. Administratively, when Arizona came into the Union under the treaty and purchase, it did so as part of the Territory of New Mexico. The territory was divided into

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<sup>6</sup>Wagoner, Early Arizona, 253. See also Sharlot M. Hall, First Citizen of Prescott: Pauline Weaver, Trapper, and Mountain Man (Prescott, Arizona: n.p., 1932).

<sup>7</sup>For early interpretations of the Southwest as desert, see Patricia Nelson Limerick, Desert Passages, Encounters with the American Deserts (Albuquerque: University of New Mexico Press, 1985). Wagoner, Early Arizona, 268; Marshall Trimble, Arizona (New York: Doubleday and Company, 1977), 111-113.

long, horizontal counties with the capitol situated in Santa Fe. It was not until 1863 that Arizona received separate territorial delineation by President Lincoln. It was not territorial status, however, that brought American settlers to Arizona, but the discovery of gold and silver near the banks of the Verde and<sup>8</sup> other rivers in Arizona that attracted immigrants.

The new and persistent Anglo intrusion into the area was not welcomed by Native Americans dwelling in the territory. The discovery of mineral wealth and subsequent Anglo settlement led the federal government to adopt a policy of Indian eradication or removal. In December 1863, Fort Whipple was established in Chino Valley just south of the Verde's headwaters to protect miners in the newly-discovered gold fields from Tonto and Yavapai Apaches. Originally located at the confluence of Beaver Creek and the Verde was the site of Fort Lincoln, later named Camp Verde. It was staffed by regular troops in 1866. About ninety miles south of Camp Verde was Fort McDowell, established in 1865. This chain of fortifications not only protected Anglo newcomers, but eventually formed the nucleus of the reservation system<sup>9</sup> imposed on the Native American tribes in Arizona.

Due to mineral prospectors' strikes in and around the Verde River, the Arizona territorial capitol was located in Prescott in 1864. The most obvious location for the territorial seat was not Prescott, however, but century-old Tucson, the only Arizona community with any urban pretensions. Having been tainted by Confederate and Mexican loyalties, the Old Pueblo lost out to the mountainous wilderness outpost. This decision caused additional settlement interest in the Verde Valley. The official proclamation named Fort Whipple as Arizona's territorial capitol but it was quickly moved to Prescott, beginning a<sup>10</sup> cycle of capital cities known as "The Capitol on Wheels."

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<sup>8</sup>A thorough explanation of the ramifications of the Gadsden Purchase is offered in B. Sacks, Be It Enacted (Phoenix: The Arizona Historical Foundation, 1964).

<sup>9</sup>Wagoner, Early Arizona, 138; Richard Hinton, The Handbook of Arizona 1877, reprint (Glorietta, New Mexico: The Rio Grande Press, Inc., 1971), 313-318. Hill and Goff, Arizona Past and Present, 150; Byrkit, "The Log of the Verde," 42.

<sup>10</sup>Thomas Edwin Farish, History of Arizona, Vol. 3., (San Francisco: The Filmer Brothers Electrotpe Company, 1915), 55; Byrkit, "The Log of the Verde," 35-36. After a  
(Footnote Continued)



Mining activity in the Verde River region centered in the communities of Jerome and Clarkdale, with hundreds of claims scattered throughout the ore-laden area. During their productive years the mines produced quantities of silver, gold, zinc, and copper valued in the hundred of millions of dollars.

Since miners must eat, Anglo settlers by 1865 began to cultivate the fertile Verde Valley. They planted grains, vegetables, and fruit trees. Later, in the 1870s, cattlemen also came to the upper Verde. Among the first were the Willard Brothers who arrived in Cottonwood in 1878. In the 1880s, Verde cattlemen constructed the Cottonwood Ditch which would evolve into the Cottonwood Waterworks, the utility serving the Verde Valley today. <sup>11</sup>

The growth of communities in the area due to mining underlined and reemphasized one of the original reasons for claiming the territory: passage, and especially rail passage, to the Pacific. In 1851 Captain Lorenzo Sitgreaves crossed the territory north of the Verde River. His trek was marked more by hardship and heroism than pioneering an adequate railroad crossing. Sitgreaves' experience was followed by Lieutenant Amiel Whipple, two years later, who tried a more southerly course which crossed the Verde. Whipple wrote favorably about the advantages of the 35th parallel route he had explored. <sup>12</sup>

Lands purchased under the Gadsden Purchase, however, proved the most favorable route for a railroad crossing. The Southern Pacific began construction in California and reached Yuma in 1877 and Tucson in 1880. However, interest in rails crossing Arizona near the 35th parallel did not abate.

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(Footnote Continued)

three-year stay in Prescott, the capitol moved to Tucson in 1867, only to return to Prescott a decade later. A final move to Phoenix in 1889 was accomplished after a massive and highly effective lobbying action by boosters of that relatively young city. See Blaise Gagliano, "A Capitol on Wheels," paper presented at the Arizona Historical Convention, Phoenix, Arizona, 1974; Margaret Finnerty, "Arizona's Capitol: The Politics of Relocation," The History Forum 3 (Spring 1981).

<sup>11</sup>Byrkit, "The Log of the Verde," 41, 44.

<sup>12</sup>Wagoner, Early Arizona, 318; Byrkit, "The Log of the Verde," 35. Fort Whipple was named in honor of the lieutenant after he was killed in the Civil War in 1863.

As early as 1866 Congress granted lands to the newly-incorporated Atlantic and Pacific Railroad for the purpose of creating a rail route across northern Arizona. It was not until 1879, after consolidation with the Atchison, Topeka and Santa Fe, that construction actually commenced. The railroad was not completed until 1883. It ran north of the Verde River, linking Santa Fe<sup>13</sup> with the Pacific coast through Flagstaff and Kingman.

Early frontier and territorial experiences in and around the Verde left the river relatively undisturbed. But continued settlement and increasingly diverse and intensive commercial activities would inevitably lead to the promotion, planning, and development of the Verde. As the end of nineteenth century ended, water storage works on the the Verde, just as on all other central Arizona rivers, would become a contested dream of many.

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<sup>13</sup>Jay J. Wagoner, Arizona Territory, 1863-1912: A Political History (Tucson: The University of Arizona Press, 1970), 688.

Chapter II: Initial Efforts to Develop the Verde River,  
1889-1922

Attempts to tap the Verde River were first planned in 1889 by the Rio Verde Canal Company. Incorporated in 1892 by a group of Christian evangelists from Minneapolis, the irrigation company planned, what it termed, the "largest storage irrigation enterprise in the United States." Under President Augustus C. Sheldon's leadership, Rio Verde drafted an exceedingly ambitious project to cultivate 400,000 acres in Paradise Valley, just north of Phoenix. <sup>1</sup>

The company enthusiastically claimed in its sales literature that its irrigation project would transform Arizona, that "vast expanse of sand," and "vanquish the terror of the desert." The realization of the Verde project, the company further promised, would bring "prosperity, making a happy home amid the fields of ripening grain and orchards, while the eye's horizon would be filled with grandeur of the plain constituting to the lover of nature the perfect ideal." "Then and only then," it promised, "would the mission of the projectors of the Rio Verde Canal have been fulfilled." <sup>2</sup>

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<sup>1</sup>Verde River water was first appropriated by soldiers quartered at Fort McDowell, northeast of Phoenix, in the 1860s and 1870s. Paradise Valley supposedly received its name from Frank Conkey, Manager of the Rio Verde Canal Company, who after seeing the valley in spring bloom gave it its name. Will C. Barnes, Arizona Place Names, 190. The Rio Verde Canal Company may have been originally known as the Citrus Belt Canal Company. See, U.S. Department of the Interior, Bureau of Reclamation, "Engineering Report on Verde Project, Arizona," by R. B. Williams, August 1934, 1; "Articles of Incorporation, Rio Verde Canal Company," January 21, 1892, Arizona State Library and Archives.

<sup>2</sup>"New Arizona and the Rio Verde Canal," reprinted in pamphlet form from the San Francisco Chronicle, April 23, 1893, Arizona State Library and Archives. See also, "Profitable Investment Offered by the Rio Verde Canal Co., of Phoenix, Arizona," 1893, 1-24, Arizona State Library and Archives. Such fervent excitement over the promise of irrigation was somewhat typical during the period. See William Smyth, The Conquest of Arid America (New York: Harper and Bros., 1899). Western settlements based upon evangelical principles constitutes a subtheme in Western frontier history. For example, settlement in Glendale, Arizona, just west of Phoenix, was attempted by a Dunkard religious community. See, Peter M. Booth, "The Flawed Pioneers: The Dunkard Colony of Glendale, Arizona," paper (Footnote Continued)

Rio Verde's plans for its irrigation enterprise were drafted by the purportedly renowned engineer Donald S. Campbell. His irrigation plan, completed in 1893, called for the immediate construction of a storage dam at the Horseshoe site on the Verde River, a diversion dam downstream of it, 69 miles of canal, and hydroelectric power sites at drops along the course of the canal. Scheduled for later construction, Campbell planned additional storage dams on the Verde, Agua Fria, Hassayampa and New rivers, and on Cave Creek Wash, and a 60 mile extension of the canal system. All this he calculated at a cost of approximately \$2.6 million. Campbell estimated that through the construction of the first phase alone, approximated to cost \$1.6 million, revenues from water and power after five years would equal approximately \$2 million. Campbell concluded his report by stating that he believed the Rio Verde project to be "one of the best irrigation propositions" that he had examined.<sup>3</sup>

Rio Verde began construction even before Campbell's plans were completed. By 1892 it had excavated a 715-foot tunnel to convey water from the proposed diversion site and excavated about eighteen miles of canal, all at a cost of approximately \$50,000. Substantive progress was hoped for in 1893-1894 when President Sheldon announced that he had sold \$2.5 million in construction bonds and that Langdon and Company of Minneapolis had been hired to construct Horseshoe Dam and complete the 69 mile canal by 1897.<sup>4</sup>

Unfortunately for Sheldon and his associates the Rio Verde project never progressed after 1892. Economic and engineering realities bankrupted the project as they had other private water storage efforts in central Arizona in the late nineteenth century. Arthur Powell Davis, U.S. Geological Survey Engineer and later Reclamation Service

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(Footnote Continued)

presented at the Arizona Historical Convention, Yuma, Arizona, April 28, 1989.

<sup>3</sup>"Report of Donald W. Campbell, Supervising Engineer, on the Storage Irrigation System of the Rio Verde Canal Co., of Phoenix, Arizona," (Minneapolis: Alfred Roper, Printer, 1893), 1-24. Copy available at Water Resources Center Archives, University of California, Berkeley.

<sup>4</sup>Phoenix Daily Herald, February 19, 1895, 1:7; U.S. Department of the Interior, United States Geological Survey, Irrigation Near Phoenix, Arizona, by Arthur Powell Davis, Water Supply and Irrigation paper No. 2, (Washington D.C.: Government Printing Office, 1897), 62-64; Walter Rusinek, "Battle for the Verde River: Arizona's Other River Controversy," Journal of the Southwest 31 (1989): 225-247.

Director, understated Rio Verde's plight when he concluded in 1897, "The magnitude of the undertaking, the natural difficulties to be overcome, and the prevailing business depression combine to render its prosecution a matter of peculiar difficulty." <sup>5</sup>

A severe national economic depression between 1893 and 1897 dried up any possible construction capital for the Rio Verde project. However, the idea of reclaiming Paradise Valley was not lost with Rio Verde's insolvency. In 1898, the project was taken over by a group of Cincinnati investors under the new name, the Verde Water and Power Company. Whether Sheldon continued on with this group is unclear. Under the leadership of John G. Hudson, referred to as Reverend because of his religious demeanor, the Verde Water and Power Company planned to develop Paradise Valley by first constructing a dam at the New River site and a canal on the west side of the project to eventually tie in with the canal work begun by the Rio Verde Company on the project's east side. <sup>6</sup>

Beginning in 1901, before Verde Water and Power made any progress, the U.S. Department of the Interior withdrew an

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<sup>5</sup>Davis, Irrigation Near Phoenix, Arizona, 64. Private irrigation enterprises were planned for all water courses in central Arizona in the 1890s. See Davis, pages 62-76. For a detailed discussion concerning private efforts to develop the Agua Fria River, west of Phoenix, see David M. Introcaso, "The History of Water Storage Development on the Agua Fria River: The Construction of Waddell Dam," National Park Service, Historic American Engineering Record Report No. AZ-11, 1988, 11-21.

<sup>6</sup>In 1893 nearly 500 banks (61 national banks) and over 15,000 commercial institutions failed in the U.S. In 1894 the federal government recorded its first budget deficit since the Civil War. Economic conditions did not improve until 1897. Richard B. Morris, ed. Encyclopedia of American History, (New York: Harper and Row, 1982): 735, 748. It is unclear how Verde Water and Power acquired the Rio Verde's project whether by purchase, transfer, or merger. Binger Hermann, Commissioner, General Land Office to Ethan Allen Hitchcock, Secretary of the Interior, November 23, 1903, and Frederick H. Newell, Director of the U.S. Reclamation Service to Hitchcock, May 15, 1910, Record Group 115, National Archives, Washington D.C. Copy of letter available at the Salt River Project Research Archives. All correspondence and reports noted henceforth are on file at the Salt River Project Research Archives. Rusinek, "Battle for the Verde River," 227-228.



ever-increasing amount of acreage within the Verde and Salt River watersheds to protect forested watershed lands from sheep overgrazing. By 1908, 2.45 million acres had been withdrawn to form the Tonto Forest Reserve. These withdrawals, while protecting the watersheds, prohibited the Verde Water and Power from progressing because its dam sites were within the withdrawn area. Land withdrawals along the Salt and Verde were also precipitated by the newly-created United States Reclamation Service which was desirous of protecting dam sites for its planned Salt River Reclamation Project. The Verde Water and Power Company's Horseshoe site was withdrawn as part of the Reclamation Service's Salt River Project.

This time federal land withdrawals squashed the Verde River development. Nevertheless, for many years following, John Hudson and the company's attorney, J. K. Doolittle, continued to sell the project, apparently believing that the federal government did not have the authority to revoke what rights the Verde Water and Power Company and Rio Verde had previously secured. Like his predecessor Sheldon, Hudson pursued his mission with extreme evangelical passion.<sup>8</sup>

Hudson, described by one solicited investor as a "tall, slim cadaverous Uriah Heep sort of fellow," wrote to potential backers in 1902 that he was pursuing the Verde development

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<sup>7</sup>In 1901 the Department of the Interior temporarily withdrew approximately 460,000 acres. In 1905 and again in 1908 a total of 2.4 million acres were withdrawn. See Lisa Neily Marcus, "The Spatial and Temporal Evolution of the Tonto National Forest, Arizona," MA Thesis, Arizona State University, 1983, 64-74. See 38 Stat 388 for the Reclamation Act. The Reclamation Act was signed by President Roosevelt in 1902. Section 3 of the Reclamation Act provided for the withdrawal of lands for federal reclamation purposes. For a discussion of the selection of the Salt River Project as Arizona's first federal reclamation project, see Karen Smith, "The Campaign for Water in Central Arizona, 1890-1903," Arizona and the West 23 (Summer 1981): 127-148. Rusinek, "Battle for the Verde River," 228.

<sup>8</sup>Hudson attempted to sell the project through the late 1920s. When the Verde River Irrigation and Power District (a successor of Verde Water and Power Company) and the Salt River Project discussed developing the Verde River jointly in the late 1920s, Hudson attempted, unsuccessfully, to include Verde Water and Power as a partner in the proposed agreement. John G. Hudson to Ray Wilbur, Secretary of the Interior, April 20, 1929.

because God did not permit him "to take up any other work," and that God "gave [him] definite assurance that [his] petition [to develop Paradise Valley] was heard and would be granted - that the enterprise would be completed and the land and water rights used for the extension of His kingdom." Hudson was offering, as he wrote, "water-rights to Christian people, who [would] be glad to devote to the extension of the Lord's kingdom a goodly portion of the profits from the sale or cultivation of the land." In 1904, Hudson, writing again to investors, stated that the company had completed the "sales of water rights for 150,000 acres" as of July 1, 1904 and planned to begin construction of the Horseshoe Dam by January 1, 1905, promising to have "water service in the fall of 1905, in time to put in crops."

While Hudson solicited investors, Attorney Doolittle fought with the Interior Department over rights to the Verde. In a 1903 legal opinion Doolittle did not argue that the federal government did not have the power to take property for public use. He did argue in detail, however, that withdrawal required the government to pay just compensation for any improvements, which he cited as the tunnel and canal work previously forwarded by Rio Verde. Presumably, since the government had not paid just compensation, which Doolittle estimated at \$300,000, it had no right to adversely possess Verde Water's property. Doolittle's battle with Interior also persisted for many years. By 1917, Doolittle's exercise had become mordant and vituperative. Writing to the Secretary of the Interior Franklin Lane in February 1917, Doolittle stated that the "prosecution of the undertaking of this company has been prevented for fourteen and a half years by the machinations of a band of conspirators . . . who thought they could steal the Verde enterprise."<sup>10</sup>

The federal government had a very different view of Hudson's missionary zeal and Doolittle's legal opinion. In 1903

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<sup>9</sup>M. C. Hurd to the Reclamation Service, May 1, 1917. Solicitation addressed to "Dear Friend," written by John G. Hudson, January 1, 1904; W. J. Homer, "Sanctified Fraud," Arizona Magazine 2 (November, 1906): 8-14; Rusinek, "Battle for the Verde River," 228 and note 13.

<sup>10</sup>It does not appear that the government ever reimbursed Verde Water for improvements its predecessor made, i.e., the tunnel work and canal excavation. No direct request for reimbursement by Verde Water appears in the correspondence nor discussion of reimbursement by federal officials. J. K. Doolittle to Franklin K. Lane, February 12, 1917.

Frederick Newell, Chief Engineer of the newly-created Reclamation Service, labelled Hudson's scheme "sacrilegious," "fraudulent," and "nauseating." "One of the most execrable attempts," Newell stated, "to swindle in the name of religion." The Interior Department thought that Hudson had no valid right-of-way privileges, that he had no credible right to claim compensation for improvements, and that he could not develop the amount of stored water he claimed. Further, by forwarding his plans he was in effect defrauding investors, and, therefore, the government believed that Hudson was committing mail fraud.<sup>11</sup>

Hudson's plans to use the Verde River were abrogated, the Interior Department held, when the river was withdrawn from the public domain. The federal government aborted any private development of the Verde, it believed, in order to ensure the successful development of 250,000 acres it planned to irrigate under the Salt River Project. The Horseshoe site and desert lands in the public domain were withdrawn in the Salt River Valley because, Interior reasoned, the Verde River was a significant tributary to the Salt and because Reclamation wanted to prevent speculators from inflating Salt River Valley real estate prices while the Salt River Project was under construction. Apparently the government weighed the benefit the Salt River Project would bring to the Valley against the possibility of a private irrigation interest succeeding. Hitchcock thought the former reasons were more persuasive.<sup>12</sup>

The government concluded that compensation for previous work, for which Doolittle had argued, was unmerited because

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<sup>11</sup>F. H. Newell to B. A. Fowler, September 30, 1903; Rusinek, "Battle for the Verde River," 228. Benjamin A. Fowler, President of the Salt River Valley Water Users' Association, referred to Hudson's efforts as demonstrating an activity conducted by "religious sentimentalists, fanatics, and sacrilegious schemers." B. A. Fowler to A. P. Davis, April 3, 1907.

<sup>12</sup>The confluence of the Salt and Verde were below the SRP's Roosevelt dam site so that the SRP would not impound any Verde River Water. The leaders of the Salt River Valley lobbied strenuously for the Reclamation Services' selection of the Salt River Project. See Karen Smith, The Magnificent Experiment, Building the Salt River Reclamation Project, 1890-1917 (Tucson: University of Arizona Press, 1986): 1-25. Federal withdrawal also had a similar adverse effect on private developers of the Agua Fria. See Introcaso, "The History of Water Storage Development on the Agua Fria River," 23-36.



the tunnel work completed by Rio Verde had become by 1912 "largely filled with mud," and was therefore "useless." Government inspection also showed that the canal excavation work was only accomplished in "isolated patches," and was in "no part . . . connected with any water supply." Even if Hudson had rights to the Verde, the Interior Department argued that based upon recorded annual flows, the Verde would not provide the project sufficient water to irrigate the tract Verde Water and Power planned. For these reasons, Interior had no patience with Doolittle's legal remonstrations. After years of persistence, an exasperated Reclamation Service Director Arthur Powell Davis wrote Doolittle in 1917 that since nothing Verde Water argued supported any conclusion contrary to those recognized by Interior Department, there was "no need of further correspondence upon the subject"<sup>13</sup> and that the discussion was "therefore regarded as closed."

Because Hudson and Doolittle persisted well after federal withdrawals, the government actively sought legal remedies beginning in 1909 to resolve Verde Water and Power's complaints. In 1909 the General Land Office withdrew the company's right of way to construct a dam on New River. In 1910, the Kent Decree, which established the water rights for the majority of lands in the Salt River Valley, did not grant Hudson's company any water rights. Judge Edward Kent in 1912 further ruled in a case brought by the federal government that all rights of way for Verde Water's canal and reservoirs were forfeited to the federal government because the company had failed to make any progress on the project in five years, that amount of time given for the project to prove its claim.<sup>14</sup>

Because Interior still received numerous requests for information regarding Verde Water and Power's plans from individuals solicited by Hudson, the Interior Department also made efforts to suppress his sales efforts by asking the Cincinnati Post Office Inspector to investigate Hudson's

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<sup>13</sup>A. P. Davis to Ethan Allen Hitchcock, August 22, 1905; A. P. Davis to J. K. Doolittle, March 24, 1917.

<sup>14</sup>Patrick T. Hurley v. Charles F. Abbott, commonly known as the Kent Decree, adjudicated the water rights involving 4,800 individual claimants. Decree No. 4564, March 1, 1910. U.S. v. Rio Verde Canal Company and Verde Water and Power Company, Third Judicial Court of the Territory of Arizona, January 8, 1912. Doolittle neither appeared before the court in this case nor responded to the governments complaint. Rusinek, "Battle for the Verde River," 229.

scheme in June 1912. Unfortunately for Interior, this effort was not successful. Even though Inspector Morgan Griswold believed that it was "extremely doubtful" that Hudson would succeed, since investors in the project were free to withdraw their funds purchased for water rights from the company's trustee in New York, Hudson was not, in a strict sense, defrauding investors.<sup>15</sup>

Federal action did not dissuade Hudson and Doolittle from continuing to sell their plan. They continued to pursue their avowed goal. In fact, as late as 1929 Hudson was still claiming water rights and attempting to split the profits of plans drafted that year to develop the Verde River. Nevertheless, while Hudson and Doolittle tirelessly continued their efforts, the Salt River Valley Water Users' Association, the organization of Salt River Valley farmers pledged to repay the Salt River Project's cost, initiated plans of its own to develop the Verde River to supplement water stored behind Roosevelt Dam, which was constructed by the Reclamation Service on the Salt River.<sup>16</sup>

As initially envisioned the Salt River Project's reservoir district boundary encompassed 250,000 acres planned for irrigation. Roosevelt Dam, completed in 1911, impounded a maximum of 1.2 million acre feet of water. This amount of water was presumed sufficient to water that amount of cultivable acreage within Project's reservoir boundary. However, it was soon learned that Roosevelt's capacity would not provide enough water to irrigate a quarter million acres even with the addition of a pumped groundwater supply. As a result, in 1914 a Board of Survey was formed to delineate lands which would receive Salt River Project water. The Board had decided upon a service area substantially smaller than 250,000 acres, approximately 23,000 acres less. However, in order to meet the needs of the entire project's acreage the Board recommended that a storage dam be built on the Verde River. For these reasons the Association filed a notice of appropriation in March 1914 for Verde River water

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<sup>15</sup>"Alleged Violation Section 1617 P. L. and R. by Verde Water and Power Company, Case No. 54474-C," Morgan Griswold, Office of Inspector, Cincinnati Division, Record Group 115, National Archives; W. J. Homer, "Sanctified Fraud," 10; Rusinek, "Battle for the Verde River," 228.

<sup>16</sup>John G. Hudson to Ray Lyman Wilbur, Secretary of the Interior, April 20, 1929.

and initiated its own investigation into building a dam on the Verde in July 1914.<sup>17</sup>

Shortly before the Association filed its claim on the Verde River a new organization was created in January 1914 to contend for the Verde. In January 1914 the Paradise Verde Water Users' Association was formed by local interests. Presumably Paradise Verde's incorporation was premised on the belief that the 1914 Board of Survey's recommendation to build a dam on the Verde River meant that water from it would be used on lands north of the Salt River Project's Arizona Canal, i.e., in Paradise Valley. Nearly three years after its formation, in November 1916, Paradise Verde filed its first<sup>18</sup> claim for Verde River water with the General Land Office.

The clash of interests between the Paradise Verde and the Water Users' associations did not come until 1918. Until then, all Paradise Verde had accomplished was to file for Verde water in 1916 and to file for rights-of-way in 1917. As for the Salt River Water Users', it had, after operation and maintenance of the Salt River Project was conveyed to it in 1917, begun to prepare maps for a proposed Verde dam, reservoir, and other associated irrigation works. In January 1918 the Salt River Valley Water Users' Association

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<sup>17</sup>The 1914 notice supplemented a 1906 notice of appropriation for water filed by the United States and the Association. See chapter five, note 1. A second Board of Survey convened in 1916 and made moderate revisions to the initial Board's recommendations. "Preliminary Board Report on Limiting the Irrigable Area of Salt River Project, Arizona," December 9, 1913; "Final Report of Board of Survey - Salt River Project," August 14, 1914; "Report, Board of Survey," May 25, 1916; Minutes of the Board, Salt River Valley Water Users' Association, (hereinafter SRVWUA Minutes) Book 3, 203, 214-215, Book 4, 16-17, 51, 53. Smith, The Magnificent Experiment, 130-135.

<sup>18</sup>Articles of Incorporation of the Paradise Verde Water Users' Association, Arizona Department of Library and Archives, Corporation Commission, Incorporating Division, Defunct File No. 25806. See also U.S. Congress, Senate, Committee on Irrigation and Reclamation, To Correct Title of the Verde River Irrigation and Power District: Hearing on S. 3342, 69th Cong., 1st Sess., April 15, 1926, 64; and Rusinek, "Battle for the Verde River," 230. On the confusion concerning lands to be watered by the Board of Survey's recommendations see, I. D. O'Donnell, A. P. Davis, and F. W. Hanna to Secretary of the Interior Franklin Lane, March 17, 1914.

was asked by the Reclamation Service if it had any objection to a storage proposal Paradise Verde had submitted to Reclamation. Upon receiving the Reclamation's notice, the Water Users' Association immediately filed a protest and sent a delegation to Washington to argue its case before E. C. Bradley, Assistant to the Secretary of the Interior Franklin Lane. The Bradley hearing was the beginning of a sixteen year contest for rights to develop the Verde River.  
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Bradley attempted to mitigate the interests of the two associations by proposing that the Salt River Valley Water Users' Association construct Horseshoe Dam and that Paradise Verde be given eighteen months in which to purchase a half-interest in the project. Bradley also proposed that part of the developed water be used to satisfy Indian claims for water for 631, ten acre allotments on the Salt River Indian Reservation, east of Phoenix. Bradley's proposal, which appeared to satisfy both associations' interests, was rejected by the Salt River Association. Its Board of Governors objected to "the supplying of any lands with water service until all lands within the exterior boundaries of the Project are first given an adequate and permanent supply." The Board was unwilling to permit Verde water to go to any user before those lands were served with water that were within the Salt River Project but were exempted by the Board of Survey.  
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The failure of the Bradley proposal led both associations to pursue developing the Verde River independently. In order to take advantage of taxing authority under the Smith Act of August 1916, Paradise Verde reorganized under state irrigation districting laws and in March 1918 became the Paradise Verde Irrigation District. As an irrigation district, Paradise Verde now had the authority to tax lands in order to help finance its project. Meanwhile, in April 1918, shareholders in the Salt River Association approved a special assessment of \$5 per acre paid over five annual

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<sup>19</sup>Paradise Verde filed for water rights in November 1916 and for right-of-way clearance in August 1917. "Verde River Storage Rights: Brief Filed at Hearing Before Sub-Committee of Committee on Irrigation and Reclamation of the U.S. Senate at Phoenix, Arizona, November 27-28, 1925," 3; SRVWUA Minutes, Book 4, 210-211, 217, 239, 253.

<sup>20</sup>"Verde River Storage Rights," 3; SRVWUA Minutes, Book 4, 262, 292-293, 300.



installments to finance the construction of Horseshoe Dam which it estimated would cost \$1.5 million. <sup>21</sup>

In 1919, Bradley again attempted to resolve the conflict between the two associations. But since neither was willing to agree to a compromise, Bradley appointed Reclamation Service Engineer Homer Hamlin to investigate the engineering and economic feasibility of the Paradise Verde proposal. This was the first of what would become a long list of federal examinations assessing the economic, engineering, hydrologic, and financial feasibility of the Verde project.

Hamlin's report reached several conclusions, none of which argued in favor of the Verde developers. Hamlin wrote, "There is not a sufficient water supply available with the present known storage capacity for the development of the Paradise Verde Irrigation District." He also concluded that "the supply from the Verde River is seriously short for an area of 30,000 acres and should not be considered for the development of an independent irrigation district," even with a supplemental groundwater supply. Finally, Hamlin found that the structures planned for the Verde Project were inadequate and unsafe. He called them "grossly in error" and "nothing less than criminal." Upon reviewing Hamlin's conclusions, Secretary Lane disapproved Paradise Verde's proposed project in July 1919 and gave it six months to redraft its development plans.

Shortly after the completion of his report for Secretary Lane, Hamlin complied with a Water Users' Association request to draft a report showing how much water would be required to furnish a full supply to lands holding water rights in the Salt River Project. In this report, Hamlin concluded that "the rights of the Salt River Valley Water Users' Association, to the water which may be stored on the Verde River, are superior to all others." He also found that "flood water stored in Horseshoe and Camp Verde Reservoirs should be used to supplement the water supply for the irrigable lands in the Salt River Valley." <sup>22</sup>

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<sup>21</sup>39 Stat. 506-509. Paradise Verde also made additional filings for water rights in 1918. SRVWUA Minutes, Book 4, 251, 268.

<sup>22</sup>Hamlin's report to Secretary Lane was dated June 17, 1919. His conclusions are excerpted in, "Verde River Storage Rights," 3-5. Hamlin's report to the Water Users' Association was titled, "Report Upon the Development and Distribution of the Water Resources of Salt River Valley, Arizona," January 21, 1920.

After six months had elapsed, Lane did not review Paradise Verde's revised plan because in the spring of 1920 newly-elected President Harding replaced him with John Barton Payne. Under Payne, the Paradise Verde District received another opportunity to win federal approval. In May 1920, Payne called to his office over thirty individuals representing the Reclamation and Indian services, and the competing interests in the Verde project.<sup>23</sup>

Since Payne had no previous knowledge of the Verde issue - his first statement was, "Just what is the controversy?" - representatives from both Paradise Verde and the Salt River Project provided detailed explanations of their positions.<sup>24</sup> On behalf of Paradise Verde, Attorney William Christie stated that the Paradise Verde Irrigation District desired to construct two reservoirs, Horseshoe and Camp Verde, which would store enough water, he argued, to irrigate approximately 95,000 acres. He estimated development costs between \$10 to \$14 million. He also said that Verde District had already attracted three investors interested in funding the project. Christie argued that the Salt River Project had enough water to cover the additional 23,000 acres it claimed it was obligated to water but was without sufficient resources to do so. Christie also recognized SRP's normal flow rights to the Verde but not flood waters, which he stated were now lost downstream.<sup>25</sup>

The Salt River Water Users' Association and its supporters presented a myriad of arguments supporting their rights to the Verde. Association Attorney John L. Gust argued that the Project needed Verde River water because its current

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<sup>23</sup>"Hearing Before John Barton Payne, Secretary of the Interior on the Application of the Paradise-Verde Irrigation District For the Use of Storage and Power Sites on the Verde River in Arizona," May 17, 18, and 21, 1920. Representatives at the meeting included Reclamation Service and Indian Service officials, Senator Henry Ashurst and Senator Marcus Smith of Arizona, officials from the Arizona State Water Department, officers, attorneys, and engineers from the Paradise Verde, the Salt River Project, and the Eastern Canal Auxiliary.

<sup>24</sup>Regarding Payne's lack of knowledge concerning the Verde dispute, shortly after uttering his first comment, Payne stated, "What I am trying to find out is just the question that I have to decide." Later in the meeting, Payne asked if "Phoenix was in the Salt River." Ibid., 7, 116.

<sup>25</sup>Ibid., 10, 14-15.

supply was insufficient to water 23,000 acres of Association lands and 6,310 acres of Salt River Indian Reservation lands he felt the Association was obligated to irrigate under its 1917 conveyance agreement with the Reclamation Service. <sup>26</sup>

He held that Paradise's cost in developing the project was excessive in "proportion to the cost at which the same water can be utilized to equal advantage on this [Salt River] project." Gust argued as well that the Water Users' Association could more expeditiously fund the Verde project which he estimated the Water Users' could construct for \$3 to \$5 million. As for Verde River water rights, Gust stated that the Project had more than merely normal flow rights. It was entitled to all the flood water to which it could avail itself. Gust stated that the Association Board had already approved building a reservoir on the Verde but had not yet submitted it to its' shareholders for approval. He also held that the Water Users' had requested the Reclamation Service to construct the Verde development for several years but that the federal government "presumably did not have the means to do it." Gust warned that allowing two entities to use Verde water would "result in the worst kind of litigation." Later, he termed it, "serious litigation" and that "trouble and, to some extent, disaster" would follow from it. Gust further held it would constitute a serious departure from the federal government's original intent for the Salt River Project to have two entities operate the Salt River system. Gust argued that in the Board of Survey's final report, irrigation for unwatered tracts within the Salt River Project would be provided using pumped groundwater, water saved through canal lining, and constructing Horseshoe Dam. Gust's claim here was supported by Attorney Richard Sloan. The former Arizona territorial governor was now representing the Easter Canal Auxiliary Association, an irrigation district that used groundwater in the Valley. Sloan stated that the Verde storage project was always seen as an essential item with which to "complete and round out" the Salt River Project. <sup>27</sup>

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<sup>26</sup>Section 15 of the September 6, 1917 contract conveying operation and maintenance of the Salt River Project from the Reclamation Service to the Salt River Valley Water Users' Association stated that the Association "will in every practicable way cooperate with the Secretary of Interior in . . . providing for water rights for 631 Salt River Indian allotments of 10 acres each." This acreage total was provided under Section 2 of the Act of Congress of May 19, 1916, 39 Stat., 130.

<sup>27</sup>Ibid., 19-30, 41, 50, 57-58, 69, 77, 122, 127.

After hearing from the Association, Secretary Payne apparently became irritated with the Water Users' argument that deciding in favor of the Association would simply be continuing the Interior Department's policy. Payne stated, "I don't care three brass buttons about that. You say we are in partnership with you. Yes; but we are also in partnership with every other person or group of persons who want water." "We decline to be regarded as discriminating."<sup>28</sup>

Other individuals who presented evidence were Alfred Sieboth, engineer for the Arizona State Water Department and two consulting engineers for Paradise Verde. Sieboth offered two points, both in favor of the Paradise District. Sieboth did not see litigation as an inevitability because, he stated, the Tempe Canal Company operated within the Salt River Project without any legal difficulty. Sieboth also argued that allowing Paradise District to develop the Verde would provide the "greatest good to the greatest number." This he reasoned since Paradise Verde's lands would be closer to the point of water diversion and thus would allow for more efficient use of developed water.<sup>29</sup>

Paradise Verde's consulting engineers, A. L. Harris and Fred Noetzli, presented their conclusions next. Unlike Hamlin's conclusion, Harris' studies showed that from 1905 to 1919, there was enough water to irrigate the District's approximately 90,000 acres. Citing the Association's own 1919 Drainage Report, Noetzli argued that less than half the water diverted at the Salt River Granite Reef Diversion Dam ever reached the Association shareholders' lands. It was lost through canal seepage. Another thirty percent, Noetzli claimed, again citing the Association's report, was wasted through over-irrigation. This information, compounded by the Association's known high groundwater problem, led Noetzli to conclude that the Association had "plenty of water available which is just wasted - wasted," and "it is absolutely incomprehensible if they [the Association] claim that they are in danger of not having enough water." Noetzli believed that the Project could develop an additional 400,000 to 500,000 acre feet of water by simply applying scientific methods of irrigation, i.e.<sup>30</sup> expanding its groundwater pumping and lining its canals.

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<sup>28</sup>Ibid., 78.

<sup>29</sup>Ibid., 80-85.

<sup>30</sup>Ibid., 85-89, 132-135.



Payne admitted that he was "impressed" with the information Harris and Noetzli presented. He quickly accepted Noetzli's statement that the Salt River Project had a considerable amount of water which did not reach its shareholders' acreage. Payne stated,

It goes without saying that the object of this department is that all of the water possibly available shall be used, and that no company, organization, or group of people can be allowed to monopolize the water to the exclusion of other people. The controlling thought, therefore, is to permit the use of the water to the largest possible extent; and the only question is how this can be done.

Consequently, Payne ordered that Paradise and the Association reach an arrangement based on the assumption that the Association would be given the right to meet its water demand by developing additional stored water on the Salt River, groundwater pumping, and canal lining so that Paradise could develop the Verde River for its use. Payne gave Association President Reid the ultimatum that "unless you can come to some agreement that will protect the interests of all, then there is nothing for me to do but to grant<sup>31</sup> their [Paradise Verde] application and let them try it."

Payne adjourned the meeting and three days later, on May 21, Paradise Verde and the Salt River Association meet with him to outline the principles of an agreement they apparently had reached. Generally, the agreement permitted the Paradise Verde District to construct dams at Horseshoe and Camp Verde on the Verde River and also other reservoirs on New River, Skunk Creek, and Cave Creek north of Phoenix. The District had three years to obtain the necessary funds to begin construction. The agreement also gave the Association the authority to take over the the Verde project provided that the Association give Paradise Verde proportional representation on its board. As for addressing the 6,310 acres of Indian lands, no conclusions were reached. Paradise Verde and the Association did not consider them. Association President Reid admitted that he had not read the 1917 contract which made provision for water for the Indian allotments.<sup>32</sup>

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<sup>31</sup>Ibid., 139-146.

<sup>32</sup>Ibid., 150-167. "Agreement: USA, Paradise Verde Irrigation District and Salt River Valley Water Users"  
(Footnote Continued)

The agreement reached under Payne's directive was never approved by the Association's ten Board of Governors. Association leadership believed that the terms were not negotiated but dictated by Payne and Paradise Verde and were therefore unacceptable to it. The Association refused to accept Paradise Verde's claim to the Verde River regardless of Payne's approval and the provision allowing the Association to acquire Paradise Verde's development.

While Christie and the other Paradise Valley representatives left Washington to forward their engineering, and financial plans, and while Gust and the other Association leaders considered what options, if any, they had to dispute Payne's decision, the City of Phoenix ignored the intentions of both associations and tapped the Verde River for its use.

Between 1890 and 1920 the City of Phoenix's population had grown nearly ten-fold from 3,100 residents to almost 30,000. In 1920 Phoenix was Arizona's largest urban center. To sustain the City's increasing population and its commercial activities, Phoenix wanted to substantially upgrade its water works. Prior to 1907 the city's water was provided by private interests, first the Phoenix Water Works and then the Phoenix Water Company. Both companies supplied the city using groundwater. In 1907 Phoenix citizens approved a \$300,000 bond, half of which was used to buy the Phoenix Water Company, the other half to improve its system. It soon became obvious, however, that the existing groundwater well system, regardless of improvements made to it, would neither continue to service the city nor provide sufficient water to meet expected continuing growth.<sup>33</sup>

Engineering investigations conducted by the City beginning in 1906 concluded that Verde River water conveyed through a

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(Footnote Continued)

Association," May 21, 1920, 1-11. A supplemental agreement to this was signed between Interior and Paradise on May 25, 1920. Frank Reid was unaware of the Indian water allocation likely because he had been President of the Association for only ten days before the hearing.

<sup>33</sup>Luckingham, Phoenix, 48, 78; Geoffrey P. Mawn, "Phoenix, Arizona: Central City of the Southwest, 1870-1920," 324 ff; "Verde River Water Project of the City of Phoenix, Arizona," Library, City of Phoenix, nd., 1-45; Karen L. Smith, "From Town to City: A History of Phoenix, 1870-1912," MA Thesis, University of California, Santa Barbara, 1978, 168-169; Kenneth MacNichol, "Phoenix - The Growing City," Arizona 11 (September 1912): 8-9; "Verde River Project of the City of Phoenix," City of Phoenix, Department of Water and Sewers, c. May 1922.

gravity pipe system would provide the City's best answer to its water question. However, no physical progress was made until 1919 when the City's water system had become a serious problem. That year, city voters approved a \$1.3 million bond and a gravity system was under construction in 1920. The City's claim to Verde water was justified by assuming the normal flow rights of townsite and decreed lands which were receiving water through the City's system and not the Salt River Project. In 1922, the river intake works, twenty-eight miles of wood stave pipeline, 2.5 miles of concrete pipe, a reservoir site and a chlorination plant were all completed. The system provided Phoenix with 6 million gallons of water per day.<sup>34</sup>

Phoenix's development of the Verde and Payne's approval of Paradise did not resolve the Verde River dispute. After over thirty years of planning a water storage dam on the Verde was no closer to becoming a reality. Despite Payne's ruling, the Paradise Valley interests would continue to struggle to finance their plan and the Water Users' Association would continue to object. It would take another fourteen years before the matter was ultimately settled.

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<sup>34</sup>"\$2,500,000 Gravity Water Supply Project," Fire and Water Engineering 78 (July 29, 1925): 203-204, 220, 222-223; Frank A. Jefferson, "The New Water-Supply of Phoenix, Arizona," The American City Magazine (May 1925): 535-537. In 1931 the Verde supply line was rebuilt. The wood stave pipe was replaced with concrete pipe which supplied the city with a maximum of thirty million gallons of water per day.

### Chapter III: The District Versus the Association, 1920-1934

Under the 1920 Payne agreement, Paradise Verde had three years to acquire the necessary financing and to begin construction of the Verde River project. Between 1920 and 1923 the District claimed it spent approximately \$225,000 completing engineering and hydrologic studies, and financial estimates. The District also purchased from the Water Users' Association engineering information it had on Horseshoe Dam. In late 1922 it obtained the necessary approval from the State Certification Board to market its construction bonds. The District also contributed money to a consortium of financiers to construct a flood control dam in 1923 on Cave Creek Wash north of Phoenix. However, despite all this activity the District did not, by 1923, sell its construction bonds nor make any construction progress.

Because the District had not initiated construction after three years, it was forced to apply to Secretary Payne's successor, Albert B. Fall, for an extension of the May 1920 contracts. The Paradise Verde Irrigation District requested the following: that it be given three more years to obtain financing; that it be permitted to increase its district lands to 110,000 acres; that it not be required to have its construction work approved and supervised by the Secretary; and that title to the dams constructed on the Verde not remain with the federal government. Because of these requests, Secretary Fall convened another meeting of all parties, including the Salt River Valley Water Users' Association, in February 1923.

The District presented to Fall evidence attesting to its planning efforts over the three year period. President Michael argued that the District was progressing with the Verde development but that three years was not sufficient time for it to succeed completely. Association President Frank Reid offered to undertake the development of the Verde project for the benefit of the Paradise Valley residents. Reid's proposal was not considered by Fall because Fall did not believe it was an option as long as the May 1920 contracts remained in force. After hearing the evidence,

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<sup>1</sup>The Association sold to the District its Horseshoe Dam information for \$8,400. The District paid half to receive the information and would pay the second half upon construction. Whether the District spent as much as \$225,000 is debatable. It was in its interest to show that it spent an appreciable amount of money in order to prove due diligence in pursuing its construction plans. Rusinek, "Battle for the Verde River," 232.



Secretary Fall denied the District's request for an acreage increase but granted it six and nine month extensions to show that it was able to finance its project at a cost of \$17 million. Fall also ruled that title to the Verde storage works would not be retained by the United States government.<sup>2</sup>

In the summer of 1923 the Paradise Verde Irrigation District renamed its organization. Its new name, the Verde River Irrigation and Power District (VRIPD), more accurately reflected the dual nature of its proposed plans, i.e., the development of water storage and creation of hydroelectric power. One month after the District was renamed, District members, in August, approved a bond issue for \$23 million to construct the Verde project. The additional \$6 million was the estimated expense to construct the project's hydroelectric facilities.<sup>3</sup>

The six and nine month extensions Fall granted quickly expired. In October, District President Michael found himself again in Washington petitioning a new Secretary of the Interior. In March 1923, one month after Fall made his ruling, he was replaced by Hubert Work. On October 25, Secretary Work granted the District an extension until February 1925. Work's decision was based upon information presented to him by two construction companies, Foley Brothers and D. A. Foley and Company, both of Minnesota. Representatives from the Foley companies testified that if the Verde River project proved engineeringly feasible, the companies would assist in the sale of the District's construction bonds and construct the project.<sup>4</sup>

Despite Work's extension, thirteen months passed and the Verde River District had still not sold its bonds. The District's inability to obtain financing was due primarily to agricultural conditions. From 1921 to 1933 the national farming economy was persistently depressed. From 1920 to

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<sup>2</sup>See U.S. Senate, Committee on Irrigation and Reclamation, Hearings Before a Subcommittee of the Committee on Irrigation and Reclamation, The Application of the Verde River Irrigation and Power District for the Use of the Power Sites on the Verde River, Arizona. (Washington: Government Printing Office, 1926): 208 ff.

<sup>3</sup>Ibid., 209. There are no extant records of the Verde River District. After a lengthy search, no office records of the Verde River Irrigation and Power District were located.

<sup>4</sup>Ibid.

1921 the post-war agricultural depression caused the wholesale price index for farm products to drop dramatically. This was disastrous for Salt River Valley farmers. The index rose only slightly by 1923. Consequently, national brokerage and bond houses were very reluctant to finance irrigation projects. Private developers of the Agua Fria River had the same problem at this time selling their bonds to build Pleasant (Waddell) Dam. Agricultural conditions even caused the federal government to reevaluate its reclamation policies.<sup>5</sup>

Because the Verde District appeared unable to develop the the Verde independently, Secretary Work called representatives from the District and the Association to his office. Work believed that a successful water storage project on the Verde would not be realized unless both the District and the Association were to agree to a plan. Work suggested that both organizations meet for three days in Washington to resolve their differences - which they did. At the end of the three day period, it appeared that another agreement was finally reached between the two. The terms of the settlement were never printed because immediately after the parties adjourned representatives from the District decided to reconsider their consent to the agreement. Hearing this, a frustrated Secretary Work denied the Verde River District any further extensions.<sup>6</sup>

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<sup>5</sup>Morris, Encyclopedia of American History, 694. From 1920 to 1921 the wholesale price index for farm products dropped from 211 to 121. It rose to 138 by 1923. Salt River Valley farmers suffered acutely in the post-war agricultural depression because their acreage was predominantly planted in cotton. After the war, the cotton market plunged precipitously. Cotton seed, for example, fell from a per acre value of \$21 in 1917 to \$4.50 in 1920. See Introcaso, "Mormon Flat Dam," 28. For the problems incurred in selling bonds to develop the Agua Fria project see, Introcaso, "The History of Water Storage Development on the Agua Fria River," 57-60. See also Rusinek, "Battle for the Verde River," 232-233. For a discussion of Reclamation's financial, engineering, farm policy, and legislative problems see the series of nine articles published in Engineering News-Record in 1923 (Vol. 91). All were collectively titled, "Federal Land Reclamation: A National Problem."

<sup>6</sup>"Before the Secretary of the Interior, Hearing In Re Application of the Verde River Irrigation and Power District for Extension of Time for the Construction of Proposed Works for the Irrigation of the Paradise-Verde Valley, Arizona, and For the Production of Power," January 15, 1925.

However, one month later, Secretary Work reconsidered his ruling and gave the District sixty more days to work out an agreement with the Water Users' Association. Meetings were held and correspondence passed between parties. Nevertheless, by April no agreement could be reached. Another extension of twenty-one days was granted which was followed immediately by another six month extension. This last extension, Work's fourth, to December 1925, was made pending a full hearing before the Senate Committee on Irrigation which was to convene in Phoenix sometime in the summer or fall of 1925.

The committee that met in Phoenix was actually the Subcommittee of the Senate Committee on Irrigation. It was paneled by Senator Ralph H. Cameron and Senator Henry F. Ashurst, both of Arizona, and Nevada Senator Tasker L. Oddie. The committee heard evidence on November 27 and 28, 1925. Representatives from the Verde River District, the Water Users' Association, the Phoenix Chamber of Commerce, and the Deer Valley Protective Association were present as well as consulting engineers and other individuals.<sup>8</sup>

The District was represented by Attorney S. H. Hayes, Engineer John Bailhache, who had been formerly chief hydrographer for the Salt River Valley Association, and President Michael. The District argued generally: that the Association only had normal flow rights to the Verde and the District had flood water rights; that there was sufficient flood water for the District to develop over 100,000 acres in Paradise Valley; and that the Association was actively attempting to undermine the District's plans.

Attorney Hayes attempted to show that the Association's recent policies were undertaken to expropriate all the waters of the Verde for the Salt River Project and for the Association's enhancement. Hayes pointed out that the Association had recently entered into various agreements to provide water to non-Association lands, i.e., the Carrick Mangham Project, the Eastern Auxiliary Project, the Inspiration Copper Company, and the Gillespie Project. Hayes stated, "these contracts are designed to embarrass the District in asserting its right to the use of [Verde] water." They were, Hayes claimed, "thorns in the side of

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<sup>7</sup>"Verde River Storage Rights," 8-10.

<sup>8</sup>Hearings Before a Subcommittee of the Committee on Irrigation and Reclamation. See note 2. Evidence presented at the hearing was extensively detailed and at times very complex. The transcript runs almost three hundred pages. The major arguments are only summarized.



the district," and that, "These acts . . . reflect the fallacy of the position . . . on the part of the association. . . to demonstrate to the Secretary an insufficient supply of water for the Association lands." The Association's actions were resulting, Hayes stated in a "mischievous purpose of attempting to create a demand for Verde River water rather than a wholesome purpose of wise conservation."<sup>9</sup>

Engineer Bailhache stated that his studies of the Verde's water supply, which were corroborated by several consulting engineering firms, left him to conclude that there was sufficient water to irrigate 102,000 acres in Paradise Valley with the same duty of water as that used on the Salt River Project. He also found that the power developed by the District's works would make the project affordable because hydroelectric revenues would result in sufficient income to carry most if not all<sup>10</sup> of the District's annual irrigation and power charges.

The extensions granted to the District were, President Michael claimed, "valueless" considering the effort in which the District was engaged. Michael stated that the District was "entitled to an unhampered extension of time for financing of a<sup>11</sup> duration in keeping with the magnitude of the undertaking."

The Association was represented by Attorney John L. Gust, President Frank Reid, and General Superintendent and Chief Engineer Charles C. Cragin. The Association basically held that its agreements with other irrigation projects were necessary in order to relieve certain waterlogged Project lands that were suffering from poor drainage and a resultant high water table. The Association also believed that the District had no rights to the Verde, that it was not able to finance the project, and that it could not develop enough water to irrigate close to 100,000 acres.

Although he did not cite any particular contractual provision, Gust asserted that when the Salt River Project was conveyed to the Association in 1917 by the Reclamation

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<sup>9</sup>Ibid., 3-33.

<sup>10</sup>Ibid., 29-47. Engineering firms which reviewed Bailhache's work are listed on page 35. Duty of water refers to that amount of water required to mature a crop. The Association generally apportioned a duty of water of 4.5 acre feet per acre.

<sup>11</sup>Ibid., 50-56.

Service, the Association was given "the right to construct the reservoir upon the Verde River or elsewhere for the purpose of completing the Project." Concerning the District's rights to the Verde, Reid put it more bluntly. He told the District, "You haven't got any rights." "You have never used a drop of water, [and therefore] there is nothing to arbitrate but rights which the Association have put to beneficial use." Hayes did not appreciate Reid's legal opinion. "The Association has no right, Hayes stated, "to voice these . . . threats to this committee . . . . I want to say . . . it is the rankest subterfuge when a question of this sort is raised before this committee." <sup>12</sup>

The Association also refuted the District's claim that it had been undermining the District's efforts since 1918. "I wish to state here," Reid noted, "and I will try to make it my last unpleasant statement, that in my entire experience never did I hear the truth so twisted and turned to show something different from what it is." Reid again pointed to the fact that the Association had offered to construct the project for the benefit of the District. The offer included, however, that the Association manage the project on behalf of the District. Whether it had water rights or not, the Association also claimed that the District had not a chance of selling its construction bonds. Gust stated, "I think that I am absolutely in accord with the truth when I stated today that the Paradise-Verde is further away from construction . . . than it was in 1916." Reid echoed Gust, stating, "They haven't today got one possible chance of any responsible financial house taking hold and underwriting these bonds for that district." <sup>13</sup>

The Association's position was supported by representatives from the Phoenix Chamber of Commerce and others. The Chamber had appointed a committee to investigate the Verde project; E. S. Clarke was its representative at the hearing. Clarke "deplored" the fact that the District had spent "a large portion of the time" at the hearing in "accusation and indictment against" the Association. After defending the Association's importance to the Valley by stating in part, "Take the Salt River Valley Water Users' Association out of the Salt River Valley and you have nothing left," Clarke presented the Chamber's conclusions. The committee found that the District would never obtain financing for \$2 million, much less \$23 million, he stated. This, he said, was because of "the legal situation that is attending its [the District's] water rights," and "the controversy that

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<sup>12</sup>Ibid., 121.

<sup>13</sup>Ibid., 71 ff.

must arise by this [its] opposition rather than cooperation," with the Association. Clarke concluded by stating, "I say without any fear of results or consequences that the Paradise-Verde will never be financed and developed until it goes hand in hand with the Salt River Valley Association, and that is what it ought to do." <sup>14</sup>

C. H. Tinker from the Deer Valley Protective Association also testified on behalf of the Association. He submitted a petition with 302 signatures of individuals residing in Deer Valley, located west of Paradise Valley, claiming support for the Association's development of the Verde project. These signatures purportedly represented 44,000 acres within the Paradise Verde District's service territory. The District argued, however, that many of the signatories did not own land in the District's service area and that the acreage total was grossly inflated. <sup>15</sup>

Before the hearing was adjourned, Cameron, Ashurst, and Oddie heard from other individuals supporting the Association. Also permitted to give testimony was J. K. Doolittle, the attorney who was still representing the interests of the long-defunct Verde Water and Power Company. The subcommittee even permitted a heated discussion between Cragin and Bailhache concerning Verde River hydrography. <sup>16</sup>

The subcommittee reached several conclusions. Because of the District's history and its already "heavy indebtedness," the senators believed that the District did not "inspire confidence in possible bond buyers." They also found that if the District intended to irrigate over 100,000 acres, "immediate and protracted litigation with the Salt River project [would] result." These two factors combined with the now estimated \$23 million cost to construct the project left the District's chances for success, the senators concluded, to be "so remote as to be negligible." Finally, the senators commented that "we are unanimous and positive in the belief that the business and agricultural community will be benefitted much sooner and to a greater extent by the adoption of the Salt River Project program" to construct the Verde project. <sup>17</sup>

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<sup>14</sup>Ibid., 141-151.

<sup>15</sup>Ibid., 151-156.

<sup>16</sup>Ibid., 130 ff. Doolittle's testimony is at pages 179-191.

<sup>17</sup>Ibid., 205-206.

The subcommittee's findings were felt two months later in January 1926 when Secretary Work reaffirmed his order of a year previous. The Verde River Irrigation and Power District was now without title to the public lands it needed to construct its project. It was without extension. And, it was apparently without any recourse.

In keeping with their predecessors, Michael, Hayes, Bailhache, and other District members were not deterred. A week after the Secretary issued his opinion, on January 25, 1926, the District appealed, once again, for reconsideration. This effort was immediately rejected. The District then filed suit in District of Columbia petitioning that the Secretary be enjoined from carrying out his ruling. This failed. The District then solicited Arizona Senator Cameron to pass federal legislation which would set aside Work's decision and enact rights or "correct title" to the Verde District. Cameron convened the Committee on Irrigation and Reclamation in April to hear further testimony from the District. District President Michael, District Secretary William Bartlett (see image AZ-25-31), and the District's Washington Attorney, William Prentiss, appeared before the Committee. Again, the District's representatives restated that the Verde project had ample water to merit the project's construction, and that the Salt River Project's campaign against the District's efforts had frustrated its success. Unfortunately, Cameron's efforts on behalf of the District also failed. <sup>18</sup>

It now became obvious to Michael and the others that the only way the Verde project was going to succeed was through a cooperative agreement with the Water Users' Association. In 1927 and in 1928 the District, the Association, and the Bureau of Reclamation worked out a lengthy contract which would provide for the construction of the Verde project. Among other provisions the contract stipulated that the Association, the District, and the Bureau would collectively determine the amount of acreage available for irrigation under the proposed project. (Based upon a report authored by the Association's Cragin, the three parties agreed in 1929 that 84,000 acres could be irrigated.) The agreement also stated that part of the water developed from the project would be used to irrigate the 6,310 acres on the Salt River Indian Reservation that the federal government, with the cooperation of the Association, still needed to water. The proposed agreement exempted the Association from

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<sup>18</sup>U.S. Senate, Committee on Irrigation and Reclamation, To Correct Title of the Verde River Irrigation and Power District: Hearing on S. 3342. April 15, 1926, (Washington D.C.: Government Printing Office, 1926.)



any financial obligation in funding the project. It conveyed operation and maintenance of the project to the Association and it specified that both projects would be operated to the collective benefit of both projects' shareholders.<sup>19</sup>

After ten years of disagreement it appeared that the Verde project would finally come to fruition. Verde Attorney Rawghlie Stanford was confident that the agreement would succeed when he stated, "it is difficult to see how anything could arise that might delay development." The Associated Arizona Producer, the Association's house organ, announced on July 15 that the agreement was on "a sound foundation" and had "every member of the community pulling for it." Even Association Attorney Gust urged passage stating that the Verde was going to be developed and that the Association better get on the "band-wagon" while the "getting was good." On June 19, 1928, Secretary Work, the District, and the Association Board of Governors signed the contract. Six months, later on December 10, Verde District voters approved the agreement.<sup>20</sup> All that was left was for Association approval.

The vote by Association shareholders did not come for another year. Reid and Cragin delayed the vote for two

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<sup>19</sup>"Agreement Between the Salt River Valley Water Users' Association, the Verde River Irrigation and Power District, and the United States of America," June 19, 1928. The contract is thirty pages. Reprinted in the July 15, 1928 issue of The Associated Arizona Producer at pages 9-11. "'Verde Contract' Signed June 19th" The Associated Arizona Producer 7 (July 1, 1928): 5. See also Rusinek, "Battle for the Verde River," 233-234. The amount of acreage irrigable under the Verde project was computed by Cragin in an exhaustive report. See, Charles C. Cragin, "Report on Determination of the Area of Land in the Verde River Irrigation and Power District For Which An Adequate Water Supply Can Be Made Available at Reasonable Cost," March 4, 1929.

<sup>20</sup>"Verde Contract" Signed June 19th," The Associated Arizona Producer 7 (July 1, 1928): 5; "Verde Development," The Associated Arizona Producer 7 (July 15, 1928): 5; Rusinek, "Battle for the Verde River," 233. Gust's comments were reported in an article clipping (no publisher, no date) contained in a Verde River file in Box 201-89, Records Management, Salt River Project. The Association Board of Governors approved the agreement unanimously on June 18, 1928. The Association Council passed the agreement with only three dissenting votes.

reasons. They did not want to conduct a vote until after "a thorough investigation" of the Verde had been conducted, that is, after Cragin completed his study. As Cragin stated, they wanted to give the Association shareholders a "a clear idea" of what they were voting on. More significantly, they delayed the vote because they feared the contract would not pass under current drought conditions. The Association's reservoirs were the lowest they had been since 1925. In fact, Roosevelt Reservoir went dry in the summer of 1928. <sup>21</sup>

When the vote finally came on December 17, 1929, Association shareholders rejected the agreement by a narrow margin of seven to six. Shareholder disapproval of the Verde agreement was likely due to two factors. It appears that Association leadership did not actively sell the Verde contract to its shareholders as it had the construction of the hydroelectric dams it had built on the Salt River through the 1920s (Mormon Flat, Horse Mesa and Stewart Mountain, see Appendix I). Charles Cragin did not conduct public meetings throughout the Valley to convince Association shareholders to vote for the Verde agreement. Also, 1929 was another drought year. This did not cause Project shareholders to view favorably an agreement to store Verde water for other irrigators. These factors, combined with the residual sentiment that all the water of the Verde belonged to the Salt River Project, contributed to the shareholders' rejection of the agreement. <sup>22</sup>

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<sup>21</sup>"Water Users to Complete Verde River Investigation Before Voting on Contract," The Associated Arizona Producer, 7 (August 15, 1928): 4; "History of the Salt River Project for the Period October 1, 1928 to September 30, 1929," Chapters III and IV, "Irrigation Division and Hydrography, 1928-1929," "Extreme Low Water in Reservoirs," 9. Verde River runoff for the two year period 1927-1929 was approximately 700,000 acre feet. For the two years previous, 1925-1927, it was approximately 1,335,000 acre feet.

<sup>22</sup>The vote was 70,937 to 59,169. "History of the Salt River Project for the Period October 1, 1928 to September 30, 1929," "Annual Report of the General Superintendent and Chief Engineer," 1. There are no notices in The Associated Arizona Producer announcing public meetings in regard to the Verde contract. No promotional advertisements appeared in The Producer nor any editorials regarding the contract. Regarding selling the Association power dams see, Introcaso, "Mormon Flat Dam," 37-40, 62. In his annual report for 1929-1930, Cragin wrote, "In spite of the continued drought  
(Footnote Continued)

Upon the Association's rejection of the tripartite agreement the Verde District refiled their right-of-way application to a new Secretary of the Interior, Ray Lyman Wilbur. The Association immediately protested. In January 1930 Secretary Wilbur informed Association President Reid that no decision would be made concerning the Verde River until he gave the matter a full hearing. Upon receiving this message, the Association prepared their arguments for yet another round in Washington.<sup>23</sup>

Before Cragin was able to complete another exhaustive engineering report concerning the Verde, Secretary Wilbur notified newly-elected Association President John H. Dobson on June 23 that he had submitted to the District terms under which the District's application for reservoir sites would be granted. The Secretary gave the District five years to develop the project. Before the Association could make a substantive objection, the District agreed to the Secretary's terms on June 30. Wilbur's reversal was based on the Association's uncooperative behavior in rejecting the 1928 agreement and Wilbur's interest in providing Indian lands with water. Wilbur wrote,

It is a definite fact that the Association has been afforded ample time to reach a legitimate agreement on the Paradise Verde situation. It has also cost the Verde District continual delay in negotiating as to cooperative agreements, as well as delay to the Government, in the matter of developing lands for the Indians.

Ten days later Wilbur told Dobson bluntly, "further delay upon the Verde District is unwarranted." Of course, Dobson and Cragin still pleaded that Wilbur give the Association a hearing. Wilbur refused. Association Attorney Gust thought the Association now had three options left: do nothing;

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(Footnote Continued)

and consequent unpropitious [sic] outlook, in response to a considerable sentiment among Verde District landowners, the Board of Governors of the Association set the election for approval of the [Verde] Contract . . . . It is not surprising that the proposition was defeated." History of the Salt River Project for the Period October 1, 1929 to September 30, 1930, "Annual Report of General Superintendent and Chief Engineer," 17. Regarding reservoir conditions see page 19.

<sup>23</sup>"History for the Period October 1, 1929 to September 30, 1930," "Annual Report of the General Superintendent," 17-18.



compromise; or challenge the District's water rights. The Association's Board decided upon the last option.<sup>24</sup>

In the contest for the Verde River, the District's 1930 victory did not prove final. Economic conditions following the October 1929 market crash gave the District no chance of selling its construction bonds. The Depression ruined the bond market. Despite Wilbur's approval and newly-created federal financing for the Verde development, the District's problems would ultimately remain unrelieved.

Because private investment was no longer an option after 1930, federal funding became the only way to finance the project. To obtain federal funds the Verde development became touted by its new president, Burt Clingan, as an effort to fulfill the federal government's obligation to provide water to the Salt River Indians and as a work relief project. To obtain federal funding, Senator Ashurst, Senator Carl Hayden, Governor Benjamin B. Moeur, and later, Representative Isabella S. Greenway, all became significantly involved in forwarding the District's project.<sup>25</sup>

On behalf of the Verde District, Senator Ashurst first attempted to solicit the Bureau of Reclamation for funding for the project. None was available. Next, Ashurst attempted to acquire a \$5 million loan from President Hoover's newly-created Reconstruction Finance Cooperation in

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<sup>24</sup>Ibid. On April 22, 1930, two weeks before he took office, Dobson also solicited Wilbur to delay his decision until the Association could "present its case." See also, Dobson to Wilbur, June 9, 1930. Wilbur to Dobson, June 23, 1930 and July 3, 1930. Rusinek, "Battle for the Verde River," 235-238. Wilbur was unwilling to address rights to the Verde River which the Association had always maintained it possessed. He stated that this was a matter for the state courts to decide. Telegram, Dobson to Wilbur, June 30, 1930 and July 2, 1930. Gust to Cragin, July 3, 1930.

<sup>25</sup>Rusinek, "Battle for the Verde River," 237-238. Greenway became Arizona's House Representative when Congressman Lewis Douglas vacated the office to become Roosevelt's Federal Budget Director in the summer of 1933. Douglas, because of his conservative fiscal beliefs (he argued for a balanced budget), did not last long in Roosevelt's administration. He resigned in September 1934. See Lewis W. Douglas, The Liberal Tradition, A Free People and a Free Economy (New York: D. Van Nostrand Company, 1935).

1932. This effort did not succeed either. Shortly after President Hoover was beaten by Franklin Roosevelt on November 8, Ashurst and Hayden met with the President Roosevelt to solicit him for federal support. But before federal funds could be made available for the Verde construction, another study was ordered.<sup>26</sup>

Reclamation Commissioner Elwood Mead appointed Bureau engineers Porter Preston and George O. Stanford to conduct the study. In July 1933 Preston and Stanford reached their conclusions. They forwarded their report to Mead on July 31. Preston and Stanford found that water for the Verde project could be developed from two reservoirs on the Verde, from flood water stored on Cave Creek and New River, and from pumping underground water. Additional water could be developed by lining the Salt River Project canals. Although Wilbur's plan did not include power development, Preston considered hydroelectric development. Preston concluded that the project be constructed as a federal reclamation project but only if hydroelectric power production was included to defray costs. Preston recommended that reservoirs be constructed at Camp Verde, Horseshoe, and New River, that a diversion dam be built at the Bartlett site, that a dike be constructed on Skunk Creek, and that a canal, called the McDowell-Paradise Canal, be dug traversing the Paradise Valley lands. Preston believed that all these

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<sup>26</sup> Although Ashurst led the attack in pursuing federal funds, Hayden, Greenway, and Moeur all supported him. Moeur was probably the most vigorous in soliciting federal officials. For example, on July 2, 1933 he wrote Secretary of the Interior Harold L. Ickes, "You are in full appreciation of your grave responsibility and of the fact that quite possibly the prosperity of the world, and unquestionably that of our own country, lies in your hands. With Jehovah as your guide you will not fail." The Reconstruction Finance Corporation was created in 1932. Rusinek stated that Hoover was unwilling to provide Arizona with RFC funds because his "relations with Arizona had soured during the battle over the Colorado River." Rusinek, "Battle for the Verde River," 239. Letter, Moeur to Harold L. Ickes, July 22, 1933. The correspondence among Roosevelt, Ashurst, Hayden, Greenway, Moeur, Harold Ickes, (Roosevelt's Secretary of the Interior), Elwood Mead, the District, the Association, and others for the period January 1933 to January 1935 is appreciable. Only a selected number of letters and telegrams are cited here. Telegram, Moeur to Ickes, July 7, 1933; Telegram, Moeur to Roosevelt, July 8, 1933; Telegram, Greenway to Roosevelt, July 9, 1933; Letter, Moeur to Ickes, July 22, 1933.

features including power development could irrigate 94,200 acres. (See Appendix II.)<sup>27</sup>

The District celebrated the Preston and Stanford report. The Association did not. It vehemently protested the Bureau's findings on the same grounds under which it had always criticized the District. It was claimed by the District that the Association was so upset by the report that its attorney, Grieg Scott, even attempted to undermine the project's construction as a work relief project by desperately arguing in Washington that Arizona, in the darkest year of the Depression, did not have an unemployment problem.<sup>28</sup>

Mead fully expected the Association's protest. He requested that Preston return to Phoenix from Denver to determine: the "attitude of the Salt River Project;" what action has been taken by the state regarding granting the District water rights; and what prior claims to Verde water needed to be considered. Mead also instructed Preston to work with William W. Lane, Chairman of the Arizona State Public Works Advisory Board, and Howard S. Reed, Public Works Engineer for Arizona and New Mexico. Both were already in Phoenix. Finally, Mead told Preston, "I do not believe it necessary or desirable to hold any public meetings. A conference with the authorities of the Salt River Project will be all that will be required."<sup>29</sup>

Whether Mead changed his mind is not known, but three days after he wrote Preston, on August 28, 1933, a public hearing concerning the Verde project began in Phoenix. The meeting was held at the Association's office.

The first day of the meeting was scheduled exclusively for the Association to allow its leaders to voice their opposition. When the meeting began, it quickly became

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<sup>27</sup>Porter J. Preston and George O. Stanford to Elwood Mead, July 31, 1933.

<sup>28</sup>Telegram, Bert Clingan to Moeur, August 15, 1933; Telegram, Moeur to Hugh Johnson, Chairman, Public Works Board, August 15, 1933; Telegram, Moeur to Hayden, August 30, 1933; Telegram, Moeur to Ashurst, August 30, 1933. Arizona's unemployment level in 1933 was nineteen percent. Nationally, unemployment was greatest in 1933.

<sup>29</sup>Elwood Mead to Porter J. Preston, August 16, 1933. Mead's letter was reprinted in the Arizona Republic on page one of the August 23, 1933 issue under the story title, "Water Users, Verde Parley Will be Held."

apparent that there was disagreement among Association representatives concerning the Verde development. Not all opposed the District's plans. This was because in the spring of 1933 the Association had undergone major changes in its leadership. President Dobson had been replaced by George W. Mickle and Mickle, in a tumultuous turnover, replaced all Association office holders, including ostensibly firing Charles Cragin who Mickle replaced with Harry J. Lawson. The attitudes of the new Association leaders did not agree with those of the previous officers. Consequently, Mickle adjourned Association members into executive session for the remainder of the day to resolve the dissension among the Association representatives.<sup>30</sup>

The following day Association officials reconvened with Preston and his associates. Soon after the meeting began, Mickle, again, had to request "thirty minutes," as Preston said, to "decide their action among themselves." Six hours later, Mickle and the other Association leaders returned to the committee with two conflicting resolutions. The first stated that the Association Board and Council opposed the development of the Verde River by the District. The second resolution stated that the Association would form a committee of six to negotiate an agreement with the District for the protection of the Association's rights to the Verde. These actions, Preston stated, obviously showed that the "officials of the . . . Association are not unanimous in their opposition to the Verde development."<sup>31</sup>

Association members finally presented their collective position on August 31 when Association Attorney Scott questioned seven representatives before the committee. Interestingly, President Mickel was not asked to give testimony. Instead, former President Dobson, Association Vice President Lin B. Orme (see image AZ-25-18), and others, gave evidence against the development. Again the argument given was based on, as Scott said, "one reason only . . . that there is not sufficient water available for the lands that are now in cultivation." Association representatives

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<sup>30</sup>Concerning Mickle's house cleaning, see Introcaso, "Mormon Flat Dam," 114-129.

<sup>31</sup>"Report of Special Board Hearing Protest of Salt River Valley Water Users' Association Against Development of Verde River Project by Verde River Irrigation and Power District, Hearings Held at Phoenix, Arizona, August 28 to September 2, 1933, Inclusive," Porter J. Preston, W. W. Land, and Howard S. Reed, September 9, 1933, 2-5, 12. The first resolution passed by a vote of 18 to 7, and the second by a vote of 13 to 12.



also warned that if the Verde project were "put into effect" the results "would be disastrous to this [Salt River] project and every landowner in it." Harry Lawson stated the development would be a "crime against prosperity." Other interests, the Association argued, also needed to be considered, especially the outlying groundwater users, before a decision could be made. <sup>32</sup>

Preston, Lane, and Reed heard next from the District's Attorney L. M. Laney and J. B. Bowers, a member of the District's Board of Directors. Bowers stated that the District was not assuming to "take any of the waters from the Verde river belonging to the Salt River Project." It was simply attempting, Bowers said, to exercise its "definite right to the flood and unappropriated waters of the Verde River." The committee heard from the Phoenix Chamber of Commerce, which now supported the District's plans. It also heard objections to the project from: the Buckeye District; the Arlington Canal Company; the Gillespie Land and Water Company; the Roosevelt Water Conservation District; the Roosevelt Irrigation District; <sup>33</sup> the City of Phoenix; and the Southwest Cotton Company.

As for the three questions that Mead had originally asked Preston to investigate, Preston found that: the Association's opposition was obviously mixed; the state had consistently approved the District's development plans; and as for rights to the Verde, Preston seemed to say that if the Association believed it had rights to the Verde, why had it not followed through on any of its plans to develop the river. <sup>34</sup>

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<sup>32</sup>"Water Users' Heads Oppose Verde Project," Arizona Republic, September 29, 1933. See also Memo, Grieg Scott to Henry M. Waite, Deputy Administrator of Public Works, August 16, 1933.

<sup>33</sup>"Water Users' Board Gives Verde Position," Arizona Republic, August 20, 1933; "Verde Position Given by Project Director," Arizona Republic, August 21, 1933. See also, "Hearings On Verde Arranged," Arizona Republic, August 19, 1933; "Water Users' Head Opposes Verde Project Before U.S. Engineer," Arizona Republic, August 29, 1933; and "Water Users' Group Votes Opposition to Verde River Project," Arizona Republic, August 30, 1933. See also Rusinek, "Battle for the Verde River," 241. John Bailhache did not appear on behalf of the District. He was killed in a car accident in November 1931.

<sup>34</sup>Ibid., 15-28.

After examining all the reports evaluating the Verde's water supply, particularly Cragin's 1929 report and the duty of water requirement, the Preston committee recommended that the construction of the Verde plan be undertaken to relieve unemployment and that the project be constructed by the Bureau of Reclamation. Preston wrote, "there is an entirely adequate supply for the Verde River Irrigation and Power District." As for the Association's complaints, Preston was unsympathetic. He concluded that the Association had yet to propose a plan of developing the Verde. And if it had, it "would seem rather questionable if its shareholders would vote to develop the Verde considering the considerable debt they were already under due to the Association's original construction costs, yet largely outstanding, and costs incurred from its 1920s hydroelectric expansion plan." <sup>35</sup>

The Association's obvious lack of internal consensus did not impress Preston and the others. Consequently, its request for a thirty day extension to prepare additional evidence was denied. Roosevelt's Secretary of the Interior, Harold L. Ickes, was pressured to make a decision because Arizona's political leaders were now leaning heavily on the issue. On October 12 Governor Moeur and other District supporters visited President Roosevelt in Washington to win his approval. Governor Moeur also undertook an extensive written campaign. For example, writing to H. M. Waite, Deputy Administrator of the Federal Emergency Administration of Public Works, Governor Moeur solicited for project funding because, he pleaded, "the unemployment situation in Arizona is now pitiful." Congresswoman Greenway wired President Roosevelt also arguing that the work was needed to relieve "desperate unemployment." <sup>36</sup>

About two months after the Phoenix hearing, on November 3, Ickes announced that the Public Works Administration would provide a loan of \$18,912,000 to the Bureau of Reclamation to construct the project. Initially, \$4 million would be

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<sup>35</sup>Ibid., 29-45. Preston concluded that 89,500 acres could be developed.

<sup>36</sup>Letter, Burt Clingan to Governor Moeur, October 26, 1933; Telegram, J. E. Gavin to Carl Hayden, September 4, 1933; Letter, Moeur to H. M. Waite, September 8, 1933; Letter, Moeur to Ickes, September 13, 1933; Letter, Ickes to Moeur, September 22, 1933; Telegram, Greenway to Roosevelt, September 26, 1933.

made available to begin the work. The District apparently won again and it again celebrated.<sup>37</sup>

While the Bureau was establishing a field office in Phoenix and beginning its surveys and studies in the winter of 1933-1934, the Association continued to protest, now louder and more vigorously than ever. Responding in part to Preston's criticism, it began developing plans for its construction of a dam at the Bartlett site, the dam site furthest downstream. The Association also filed another suit against the Verde River Irrigation and Power District and the federal government. The Association was joined in litigation by the Buckeye Irrigation Company and the Arlington Canal Company, both outlying irrigation districts dependent upon the Salt River.

Petitioning Governor Moeur, Buckeye Secretary C. A. Narramore complained,

We have fought this [Verde] project strenuously and while we realize that ours may be a losing fight, we are still strongly convinced that every bit of influence that is thrown in favor of this project is a direct slap in the face of the pioneer farmers of this County.

Narramore was offended to watch "our life's work become of little or no value because of the encroachments of wild-cat promotion schemes." Also filing suit were the Foley construction companies who claimed that their agreements with the Verde District were still valid and that the Bureau was obligated to recognize them. Adding to the legal complaints were engineering difficulties discovered by the Bureau. Bureau engineers rejected the original dam site at Camp Verde for technical reasons. In addition, residents in that community did not welcome the thought of having their<sup>38</sup> lands inundated despite receiving financial compensation.

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<sup>37</sup>PWA Press Release, No. 268. See also Rusinek, "Battle for the Verde River," 242-243. As Rusinek stated the project was expected to create two to seven thousand new jobs. It was, the Arizona Republic reported, another "milestone in the development of Arizona's irrigated empire."

<sup>38</sup>Telegram, Lawson to Scott, October 10, 1933; C. A. Narramore to Governor Moeur, October 5, 1933; "Protest, of Buckeye Irrigation Company and Arlington Canal Company, Submitted to the Board of Engineers in Washington, D.C. in Connection with Verde River Irrigation and Power District's (Footnote Continued)



These legal and technical problems did not derail the Verde project. Similar difficulties had existed almost continuously since the 1890s. Other factors, however, began to undermine the project's development. First, Arizona's electrical market was collapsing due to the demise of the mining industry. Second, the argument that farm prices would only recover if acreage production was strictly regulated ran counter to the Bureau's development of additional cultivated acreage. Third, a prevailing drought in central Arizona began to weaken the validity of all Verde River water supply studies, including Preston's and Stanford's report.

Always the state's and the Association's largest electrical customers, central Arizona's mining industry dropped production from \$155 million in 1929 to \$23 million in 1934 due to the failed national economy. Association kilowatt hours sold to the mines dropped from ninety million kilowatt hours in 1930-1931 to twenty-three million kilowatt hours in 1933-1934. Because of the decrease in power receipts and significantly lowered crop values the Association also failed to meet its repayment obligations during this period. If the Association could not sell its power or finance its debt, it was likely the District could not either. In a letter dated November 9, 1933, Lawson told Mead that if the Association, with a per acre debt of \$70, could barely remain solvent, how could the Verde project, with an expected debt of \$200 per acre, succeed. Lawson told Mead that not only would the development of the Verde project fail but it would also cause the Association to become "another insolvent irrigated [sic] project." <sup>40</sup>

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(Footnote Continued)

Application for Development Loan," nd., 1-8. Mead to Greenway, February 14, 1934; Rusinek, "Battle for the Verde River," 243.

<sup>39</sup>Copper mining and refining were heavily dependent on electricity and water due to electrolytic processing and froth flotation. See Rodman Paul, "Mining Metal," in Howard R. Lamar, ed., The Reader's Encyclopedia of the American West (New York: Crowell, 1977); Thomas Rickard, Concentration by Flotation (New York: John Wiley: 1921); and Thomas Rickard, A History of American Mining (New York: McGraw-Hill, 1932).

<sup>40</sup>Introcaso, "Mormon Flat Dam," 84-86 and notes 10-12. Association crop values also fell from \$25 million in 1925 to \$9.6 million in 1932. Lawson to Mead, November 9, 1933. For a good quantitative analysis of the economic effects of the Depression on Phoenix see, Jay Edward Niebur, "The

(Footnote Continued)

On October 5, 1933, one month before Ickes authorized the District's loan, Secretary of Agriculture Henry A. Wallace criticized the development of additional acreage under the Verde project. In a response to Governor Moeur's request to support the project, Wallace wrote succinctly,

I wish to say that my attitude on such matters must be governed by my view of the national needs, and that I am unalterably opposed to the approval of any irrigation project until a way has been found to off-set the extension of any agricultural acreage by a corresponding decrease in agricultural acreage.

The Association was well aware of Wallace's position and exploited it through a mass mailing campaign. The Association also invited Wallace to Phoenix for a guided tour which won his further support. After his Phoenix visit, Wallace wrote Secretary Ickes questioning the Verde project, calling it "one of the strongest smelling." President Roosevelt also knew that Agriculture and Reclamation policies differed. Writing to former Arizona Governor George Hunt, Roosevelt stated,

There are . . . a number of extremely controversial questions involved in the Verde Project. The matter of bringing new lands under irrigation at the time when the Federal Government is engaged in removing lands from cultivation elsewhere<sup>41</sup> is a primary consideration in this case.

Accompanying the miserable electrical market and the incongruous federal land policies was the persistent drought. Since 1927 central Arizona suffered from below

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(Footnote Continued)

Social and Economic Effect of the Great Depression on Phoenix, Arizona, 1929-1934," MA Thesis, Arizona State University, 1966.

<sup>41</sup>Letter, Henry A. Wallace to Governor Moeur, October 5, 1933; Rusinek, "Battle for the Verde River," 244; Roosevelt to Governor Hunt, nd. The Association also successfully solicited the support of American Farm Bureau which wrote the Public Works Administration condemning the Verde development. See Harry Lawson to Edward A. O'Neal, President, American Farm Bureau Federation, October 26, 1933, and Chester Gray to Harry Lawson, November 2, 1933. See also, Murray R. Benedict, Farm Policies of the United States, 1790-1950, A Study of Their Origins and Development (New York: Twentieth Century Fund, 1953), 283 ff.

average annual precipitation. By the spring of 1934 the Association reservoirs were all over eighty percent empty. By 1934 groundwater was being pumped at the maximum possible rate. The state was experiencing the worst drought in over forty years.<sup>42</sup>

These factors, combined with the Association's relentless campaign led Mead to question the ultimate success of the Verde project. All this added up to another investigation. This time Commissioner Mead requested that Bureau Engineer E. B. Debler make a report.<sup>43</sup>

On June 7, 1934, Debler forwarded his findings. He noted that the feasibility studies examined the available water supply for the Verde District using hydrologic records only going up to 1928. Debler examined the project using water records up to 1933. He concluded that groundwater pumping, although initially conducted to dewater poorly drained areas, had added a significant amount of acreage dependent upon the Salt River Project. Debler found that the Salt River Project was now better able to handle excess Verde River water because of the three additional dams it constructed on the Salt River in the 1920s. The Association could now use, Debler calculated, three-fourths of the Verde's annual flow. Debler noted the increase in the water demand due to the planting of winter forage and grain crops. Debler also recognized the need to meet demands made by users below the Salt River Project. All these factors, he concluded, meant that the Verde project could develop only approximately 50,000 acres at a cost of \$472 per acre, or \$310 more per acre than the Public Works Administration estimated. The project, Debler concluded, was, therefore, "not feasible." If the project was developed, Debler recommended that Bartlett Dam be constructed "with the maximum capacity for which the site is adapted." "After the project has been operated 10 to 15 years, he concluded, "a

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<sup>42</sup>"History of the Salt River Project for the Period October 1, 1933 to September 30, 1934," "Annual Report and Financial Statement," 3. See also Richard Sloan and Grieg Scott to Nathan R. Margold, Solicitor's Department, Interior Department, December 12, 1933, 1-9. Rusinek, "Battle for the Verde River," 245.

<sup>43</sup>Regarding the Association's campaign against the District's development, see for example, "Memo In Re: Verde River Irrigation and Power District and the Salt River Valley Water Users' Association," Greig Scott to Nathan R. Margold, Solicitor's Department, Secretary of the Interior, December 12, 1933, 1-15.

further determination can be made of the desirability of storage construction at the Camp Verde site." <sup>44</sup>

After reading Debler's report, Mead no longer supported the Verde project. On June 11, he wrote Congresswoman Greenway, "From this [the Debler report] it appears that from 1928 to the present time there has been a period of extremely low runoff which seems to require a revision of the plans for the development of the Verde project." Debler's report and Mead's opinion were reinforced by another Reclamation study completed in August. In a very lengthy and detailed work, Reclamation Construction Engineer R. B. Williams estimated that the Verde project would now cost \$25 million, approximately \$11 million more than the Public Works Administration originally calculated. Williams also estimated that only 51,000 acres could be irrigated under the project. He concluded that the cost of the project was "at such a high figure as to be beyond the ability of the land to repay." Mead's acceptance of the Debler report and Williams endorsement <sup>45</sup> doomed the Verde River Irrigation and Power District.

The eleventh-hour Debler report gave the Association new hope. The Association acted quickly under its new president, Lin B. Orme. Orme had replaced Mickle in May 1934 by running on a platform Orme described as one "of uncompromising opposition to the Verde development." Even before becoming president, Orme played a large role in managing the Association's Verde campaign. It was Orme, not Mickle, who testified at the Preston hearing. As president, Orme immediately requested federal funding to construct Bartlett Dam for the Association's benefit and to reconstruct and repair the spillways on all four Salt River dams. As he told Association Attorney Northcutt Ely, "In this turmoil over the Verde we must not overlook our refinancing, but crowd it all we can." Orme argued that the spillway work was necessary because federal engineers had concluded in the summer of 1933 that all four of the Association's spillways were unsafe and presented a "menace." Orme argued further that the work would still

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<sup>44</sup>"Memorandum to Chief Engineer," E. B. Debler, June 7, 1934. Debler stated in other correspondence that the cost of the project would be \$700 per acre. Rusinek, "Battle For the Verde River," 245.

<sup>45</sup>Mead to Greenway, June 11, 1934. R. B. Williams, "Engineering Report on Verde Project, Arizona," August 1934, 1-131. See also, "History for the Period October 1, 1933 to September 30, 1934," Chapter 13, "Litigation and Legal," 4.



keep federal funds in the state and would still provide employment for out-of-work Arizonans.<sup>46</sup>

Orme also sent Lawson and the Association's entire Board of Governors to meet with Commissioner Mead, and engineers Debler and Williams. Lawson told Attorney Scott after the meeting that he "stressed particularly the over development of acreage and the ultimate ruin resulting therefrom." Lawson also said that he "laid it on pretty heavy about Preston . . . taking Cragin's report as gospel and showing how Cragin was in error." Lawson also presented a report by Association Consulting Engineer Raymond Hill which had been recently prepared at Orme's request. Hill's findings showed that there was insufficient water to develop 25,000 acres. Indicating how intent the Association had become, Lawson also told Scott, "Hill and Debler got into an argument," and Williams criticized the Association because "we had panned the one Reclamation engineer [Debler] who was leaning backwards in our favor."<sup>47</sup>

While the Association capitalized on the Debler and Williams reports, Arizona's elected officials quickly adapted to the changing federal position. Representative Greenway now solicited President Roosevelt to support the construction of

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<sup>46</sup>Debler's report was issued the same month the Bureau had originally hoped to issue construction bids when it first began work on the Verde project in November 1933. Orme to Ely, August 24, 1934. Lin B. Orme to Henry A. Wallace, May 30, 1934. "Application for Allotment by the Federal Emergency Administration for Public Works to the Bureau of Reclamation, Department of the Interior for Salt River Project in Arizona," October 3, 1934. Regarding spillway problems on the Salt River dams see, "Report on Inspection of Horse Mesa, Mormon Flat, and Stewart Mountain Developments by Wm. S. Cone, July 21, 1933," 1-10; E. B. Debler and H. J. Tebow, "Spillway Requirements, Salt River Project Dams," December 28, 1934; "Increasing Spillway Capacities at Four Large Dams on the Salt River." Western Construction News 13 (November 1937): 453-456; and Introcaso, "Mormon Flat Dam," 86-89. The spillway inspections were the result of concern for dam safety after St. Francis Dam in California failed in 1928 killing approximately 400 people. See also, Orme to Greenway, July 5, 1934.

<sup>47</sup>Harry Lawson to Grieg Scott, July 10, 1934; Raymond Hill, "Analysis of Official Reports Pertaining to Water Supply Available to the Verde River Irrigation and Power District," July 1934, 1-31. See also, Memo, Hill to Mead, September 15, 1934, 1-14.

Bartlett Dam for the Water Users' Association. Senator Hayden stated he, Senator Ashurst, and Mrs. Greenway were in Congress to "secure authorizations" only. "We do not . . . determine the adequacy of the water supply," he said, and that "political pressure should never be applied to affect an engineering result." Therefore, he was waiting to receive direction from Commissioner Mead as to who should benefit from the Verde project. Governor Moeur wired Mead telling him that he was prepared to go to Washington to "urge that in the event of cancellation of the Verde allotment those funds should be used primarily for the construction of a dam<sup>48</sup>. . . for the benefit of . . . the Salt River Valley."

On October 4, 1934 Secretary Ickes rescinded the District's loan. Ickes based his decision on the Debler report, the current conditions of Arizona's electrical market, and on the conclusion that the Verde project would not be able to meet the Public Works requirement that repayment of the loan be made "within a reasonable time." The press release which announced the reversal quoted a report authored by Debler, Williams, Senior Reclamation Engineer B. W. Steele, and L. N. McClellan, Reclamation Chief Electrical Engineer. It stated,

the total cost of the project has increased about \$10,000,000 and that while the total cost of irrigation works has increased about 100 percent, the per acre cost is approximately three times that originally estimated. The area for which there is an available water supply has been reduced by approximately one-third. The resulting estimated construction cost of \$472 per acre is extremely high, and even though the annual charges per acre are credited with anticipated returns from power sales and carriage of Indian water, they still remain, in our opinion, at such a high figure as to be beyond the ability of the land to repay. An uncertainty will exist as to water supply until all rights to the use of the Verde River are fully adjudicated.<sup>49</sup>

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<sup>48</sup>Hayden to J. E. Gavin, September 23, 1934; Telegram, Moeur to Mead, September 12, 1934; Rusinek, "Battle for the Verde River," 245-246.

<sup>49</sup>Federal Emergency Administration of Public Works, Release No. 1004. See also headline, "U.S. Quits Verde Project," and "Huge Loan Rescinded By Board," and "Water Users Ask Loan to Build Verde Dam," Arizona Republic, October 4, 1934, 1.

Ickes broke the news to District President Clingan in a terse, three paragraph letter. "After an exhaustive investigation extending over several months," Ickes wrote, "the Bureau of Reclamation has reached the conclusion that the Verde project is not feasible and that its construction should not be undertaken by the United States." The next day Ickes justified his decision by telling Senator Hayden that, "In view of the highly unfavorable report submitted to me by the Bureau of Reclamation, we had no other option. I could not conscientiously permit this allocation to remain outstanding." <sup>50</sup>

Having lost before, District officers immediately appealed. Perturbed by Ickes reversal, Clingan protested mightily. Clingan complained that the District was neither granted "the courtesy of an interview" before the Secretary made his decision, nor had the Secretary "the ordinary decency generally accorded those who are condemned of discussing their case before passing sentence." Ickes responded on October 15 stating that the District could present "any facts in answer to the [Debler, et al.] engineering report." Clingan also appealed to the President. Stating that "self-preservation impels this letter," Clingan condemned "certain power interests" for opposing the District's plans, and felt that desert entrymen and homesteaders who had "fought and literally bled to retain" their land were "betrayed" by the Interior Department. Clingan and District representatives also filed several lawsuits against the Interior Department, the Bureau of Reclamation, the Water Users' Association, the Arizona State Attorney General, and others. It even sought relief through the state legislature. These efforts and others took several years to resolve, but all failed ultimately. Ickes' decision was the last made concerning the development of the Verde. The Association had ultimately won. Bartlett Dam would be built

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<sup>50</sup> Ickes to Clingan, October 4, 1934. In his letter Ickes specifically cited the R. B. Williams report. Ickes to Hayden, October 5, 1934. See also Harold L. Ickes, "Thought for the Morrow," Collier's 94 (December 8, 1934): 21, 32. In this article, Ickes defended his decision by writing, "we rescinded the allocation when the Bureau . . . reported that the cost was too high to justify the development. I cite this fact because it refutes reckless statements that we have not given sufficient thought to engineering and financial factors in selecting reclamation projects." Ickes responded in Collier's because earlier that year an unfavorable assesement of the Bureau was published in the periodical. See Owen P. White, "Spare that Desert!" Collier's 94 (June 16, 1934): 10-11, 57-59. Some suggested White's article was placed by the Association.



by the Bureau of Reclamation for the Association's Salt River Project. <sup>51</sup>

When the news became known locally, District residents protested. They hung Moeur, Greenway, and Ickes in effigy in what would remain the Paradise Valley desert. Clingan criticized Greenway calling her Arizona's "pseudo Congressman" and referred to Moeur's final performance as "acrobatic." He was quoted as stating, "Everyman has his Judas Iscariot, or his Brutus, or his Moeur and Greenway." Local newspapers condemned the act. The Arizona Republic called it a "deplorable affair" while the Glendale paper, The Glendale News, printed the headline, "Unborn Babe Stabbed in the Back." Only long-time Verde District Secretary William Bartlett took the news stoically. He seemed to know that the fight for the Verde was finally over. On October 5, 1934, the day after Ickes' made his decision, Bartlett wrote one sentence in his diary, "Not much doing, everybody down hearted and how." <sup>52</sup>

When the Water Users' Association received the news from Washington, President Orme immediately congratulated Ickes and Mead for the "courageous stand" they took. Orme also said, "we are not unmindful of the political pressure that must have been brought upon you to go ahead with the building of the works of the Verde District without regard to the consequences that must ultimately follow." Nevertheless, what Ashurst termed the most active question

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<sup>51</sup>Ickes to Clingan, October 15, 1934; Clingan to Roosevelt, October 5, 1934. Another chapter could be written documenting the District's effort to reverse Ickes' October 4, 1934 ruling. District representatives battled for many years, well beyond the completion of Bartlett Dam in 1939, to win the right to build on the Verde River. In fact, William Bartlett represented the Verde River Irrigation District into the 1950s.

<sup>52</sup>Clingan to Roosevelt, October 5, 1934; "Effigies Burned in Desert," Arizona Republic, October 15, 1934, 1; "The Initial Crowd Was Too Large," Arizona Republic, October 15, 1934, Sec. 2, 6. Diary of William Bartlett, October 5, 1934. A copy of the diary was obtained from Bartlett's stepson, Carl Moore.

which had arisen in Arizona's history had been finally resolved.<sup>53</sup>

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<sup>53</sup>Orme to Mead, October 5, 1934; Ashurst to the Public Works Administration, September 1933. Ashurst described the controversy as "the most active question which has arisen . . . in the state . . . for 59 years." Carl Hayden Papers, Box 611/28, Arizona Collection, Arizona State University.

#### Chapter IV: The Construction of Bartlett Dam

Bartlett Dam was the fifth and last multiple arch dam built in central Arizona. It was ironic that Bartlett would be constructed as a multiple arch since the last dam built of this type was attacked by the Association.<sup>1</sup> Nevertheless, the design was selected by the Bureau of Reclamation and the Association for the same reason as the Maricopa Water District and other multiple arch users. It offered financial incentives. Because the design used substantially less concrete than more traditional structures - the buttresses were hollow and both the buttresses and arches were relatively thin - savings both in material and freighting costs resulted. A multiple arch dam also required more labor to construct because of the sophisticated forms used to form its concrete components, but because of Depression-era unemployment, the requirement for additional labor was advantageous.<sup>2</sup>

Bartlett Dam was originally designed by the Association's California consulting engineer, Raymond Hill. The final design was completed under the supervision of Bureau of Reclamation Construction Engineer Edward C. Koppen. Bartlett was the first major multiple arch dam built by the Bureau and would be the highest multiple arch built in the United States. The design was influenced by the Verde

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<sup>1</sup>Gillespie Dam on the Gila River was built in 1921, Cave Creek on Cave Wash was built in 1923, Coolidge Dam, a multiple dome dam was finished in 1928. Waddell Dam was completed in 1927. For a discussion on the opposition to Pleasant (Waddell) Dam see, Introcaso, "The History of Water Storage Development on the Agua Fria River," 65-93. It is also somewhat ironic that the Association kept the name Bartlett considering the structure's pre-construction history.

<sup>2</sup>Dam site topography also determines design type. The Bartlett site offered a narrow "U" shape which could accommodate a multiple arch design. For a complete discussion of the multiple arch design see, James Legas, "Concrete Buttress Dams" in Eric B. Kollgaard and Wallace L. Chadwick, eds., Development of Dam Engineering in the United States (New York: Pergamon Press, 1988): 533-670. For a history of the development of the multiple arch dam see, Donald C. Jackson, "A History of Water in the American West: John S. Eastwood and "The Ultimate Dam" (1908-1924)" Ph.D. dissertation, University of Pennsylvania, 1986. See also, Fred Noetzli, "Multiple-Arch Dams" in Edward Wegmann, The Design and Construction of Dams 8th ed., (New York: John Wiley and Sons, 1927): 439-536.

District's consulting engineer, Fred Noetzli, who was a leading multiple arch theoretician; he had contributed to the Pleasant Dam (Waddell Dam) design built on the Agua Fria River. It was also designed according to the theories developed by Frederick Vogt and Herman Shorer.<sup>3</sup>

Bartlett included three features that were unprecedented by-products of Noetzli's work. The dam's arches were designed as cylindrical full half-circles using the elastic theory and taking into account rib shortening, shear, and bending. The dam was planned to curve upstream to better fit the topography. The buttresses were built with contraction joints, eighteen inch sawtooth openings, which were filled after the heat of setting had been dissipated. This was done to avoid the cracking problems experienced at Pleasant (Waddell) Dam. Each buttress also included, at forty-one foot vertical intervals, two eighteen-inch stiffener walls between sides. These factors, added to the structure's record height, made the design work particularly complex. Koppen stated that "an extraordinary amount of preliminary study was necessary before the actual lay-out drawings for construction could be prepared."<sup>4</sup>

Design work for Bartlett was completed in the spring of 1936. Hydroelectric development was not included probably because the contract allowance could not provide for it and, more certainly, because it was unwarranted due to the Association's 1920s hydroelectric expansion program and the depressed status of the power market. Bids for construction

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<sup>3</sup>Kollgaard and Chadwick, The Development of Dam Engineering in the United States, 658, 662; Assisting Koppen were: J. L. Savage; C. P. Berkey; R. F. Herdman; W. F. Durand; Joseph Jacobs; and Charles H. Paul. "History of the Salt River Project for the Period, January 1, 1938 to December 31, 1938," 50; E. C. Koppen, "Building Bartlett Dam," The Reclamation Era (November 1939): 309-311; Frederick Vogt, "Economic Design of Buttresses of High Dams and of Cellular Gravity Dams," Transactions of the Royal Norwegian Society of Sciences, No. 40 (December 30, 1929): Herman Shorer, "The Buttresses Dam of Uniform Strength," Transactions of the American Society of Civil Engineers 96 (1932): 666.

<sup>4</sup>Koppen, "Building Bartlett Dam," 309-311; Kollgaard and Chadwick, The Development of Dam Engineering in the United States, 550-551. The sawtooth joints are visible in the color photograph of Bartlett Dam on page 533 in Kollgaard and Chadwick. Each arch required twelve to twenty drawings. The ties between the buttress walls were chiefly the modifications made to Pleasant Dam in the 1930s.

of the dam were printed immediately after the design work was completed and on May 16, 1936 the bids were opened in Phoenix. Eight proposals were received. The lowest bidder was Barrett, Hilp and Macco Corporation of Clearwater, California which tendered a bid of \$2,228,272. On August 12, the California contractors were awarded the contract under the specification that it complete the work in 1,000 days, or by May 9, 1939.<sup>5</sup>

The California contractors arrived in Arizona in July 1936. Their first efforts consisted of road work and establishing a camp. By September the contractors had built two miles of roads around the dam site. By the end of August they had erected a permanent camp and had hired its work force. The camp accommodated two hundred men and fifteen families who were housed in three sixty-men dormitories, one twenty-men dormitory, and fifteen two- and three-person residences. In addition to the contractors' camp, the Bureau of Reclamation erected its quarters which consisted an office, concrete laboratory, a warehouse, garage, and shop building. Government engineers and supervisors were housed in a twelve-room dormitory, one six-room house, five four-room houses, and four two-room houses. Both the office and dormitory were fitted with heating and cooling systems. The government camp was completed by the end of 1936. In 1937 government forces expanded their camp to include three additional two-room residences, and a sixteen-man dormitory.<sup>6</sup> The government installed its own phone system to Phoenix.

Preliminary work on Bartlett Dam was begun by the Association two months before the contract for its construction was signed. To access the site, which is located about fifty miles northeast of Phoenix and twenty miles above the confluence of the Salt and Verde rivers, the Association in September 1935 began building a seventeen-

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<sup>5</sup>"Salt River Project, Arizona, Project-History, 1935-1936," contained in "History of the Salt River Project for the Period January 1, 1936 to December 31, 1936," 51; "History of the Salt River Project for the Period October 1, 1934 to December 31, 1935," Chapter II, "Engineering," 5-6; Introcaso, "Mormon Flat Dam," 89-90 and note 20.

<sup>6</sup>"Project-History, 1935-1936," 52-55. For an organization chart of the Bureau's work force see, page 65. "Salt River Project, Arizona, Project History, 1937," contained in "History of the Salt River Project for the Period January 1, 1937 to December 31, 1937," 78. Fire destroyed the government's warehouse, garage, and shop on October 31, 1936. These facilities were rebuilt by the contractor, Del E. Webb.



mile road to the dam site from an Association work camp closer to the Valley. The work was completed three months later in December. While the contractors were forwarding their preliminary activities, the Association also erected a 16.75 mile transmission line to the dam site. This was completed in September. Power conveyed to the dam site was provided by the Association.

Initial preconstruction work began in late August 1936 with the preparation of the canyon walls. This work was immediately followed by excavation of the spillway channel and the foundations for the gravity sections. The geology at the dam site was examined by Consulting Geologist F. L. Ransome. Ransome found that the dam's foundation consisted generally of fine-grain granite. His report concluded that "The foundation rock is entirely adequate for the structures [including the spillway] proposed, or for considerably higher ones." Although joints in the bedrock were "abundant," Ransome stated, they did "not constitute an objectionable feature."

By the end of 1936 stripping the abutments and exposing the bedrock was nearly complete as well as cleaning the arch and buttress foundations. In uncovering the bedrock two faults were found, one upstream along the footings of the arches and one downstream, 170 feet away, running roughly parallel to the upstream fault. These did not cause much concern other than the possible undue seepage they might cause. Spoil from all excavation work was used to form the cofferdams to protect the excavation work. A total of 61,700 cubic yards of earth and rock were excavated from the spillway and 44,000 cubic yards of spoil were removed from the stream bed in 1936. Also completed by the end of the year was an aggregate processing plant and the concrete mixing plant which were built one mile below the dam site and to the right of the construction site. By the end of the year the contractors had completed an estimated 8.3 percent of the total construction effort.

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<sup>7</sup>"Project History, 1935-1936," 52. The Association delivered 25 cycle power. Since lighting required 60 cycle frequency, two converters were installed at the dam.

<sup>8</sup>F. L. Ransome, "Report on a Geological Reconnaissance of Camp Creek and Bartlett Dam Sites on the Verde River, Arizona." June 7, 1934. See also, Koppen, "Building Bartlett Dam," 308-309.

<sup>9</sup>"Project History, 1937," 70; Koppen, "Building Bartlett Dam," 312.



Generally described, Bartlett Dam was planned to rise 286.5 feet above its granite foundation or 198 feet above stream bed elevation. The dam was slightly curved in plan, its axis had a radius of 1,379.7 feet. The dam consisted of nine hollow buttresses, eleven arches and a short gravity section at each end of the dam. Associated with Bartlett was a saddle dam built in a depression one-half mile south of the dam.

Bartlett's buttresses were planned sixty feet apart on centers with a net arch span of forty-eight feet. Since the dam curves, the buttresses were not parallel but diverged from one another at an angle of two degrees, thirty minutes. Circular holes were left in top of the buttress walls to aid in the uniform distribution of temperature as the concrete cured. The thickness of the concrete arches and the buttress walls varied from seven feet at the base to 2.34 feet at the crest. The arch intrado was a cylinder with a central angle of 180 degrees. The extrado was a cone. Arch nine and ten were partial arches due to the steepness of the canyon abutment. The dam's crest length was approximately 800 feet which does not include the spillway crest.

Storage regulation was controlled by three Stoney gates, fifty feet by fifty feet in size constructed in the right abutment of the dam. Each gate weighed 200 tons and was operated by hoists powered by 7.5 horsepower motors which lifted the gates at about four inches per minute. The spillway was a curved, heavily banked, concrete lined channel 170 feet wide and 550 feet long with a rated discharge capacity of 175,000 cubic feet per second (cfs). The lower end of the spillway chute was elevated to reduce or retard erosion when water was released. The spillway channel below the spillway chute was protected with cyclopean masonry. River outlet works consisted of three electrically operated slide gates at the base of arch eight. These measured seven foot by six foot, six inch. A steel trash rack was located on the upstream side of the river outlet intake. Irrigation releases were made through sixty-six inch needle valves. Two were located near the foot of the left abutment in front of buttress nine at levels twenty-eight and forty-five feet above the stream bed. These also had a trash rack<sup>10</sup> located on the upstream side and an emergency bulkhead.

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<sup>10</sup>Articles detailing the Bartlett Dam's features which were published at the time of the dam's construction are: "Building the Highest Multiple Arch Dam," International Engineer (March 1938); "Verde River Flood," Engineering News Record, 120 (May 5, 1938); "Highest Multiple Arch Dam,"

Actual construction of the dam began in 1937 but did not proceed as rapidly as anticipated because of drought-ending floods. The winter of 1936-1937 left an appreciable amount of snow on the Verde watershed. When warm rain fell in the beginning of February, the river crested at 62,500 cubic feet per second (cfs) on February 7, 1937, which was the greatest flow ever recorded on the Verde. Subsequent floods of 30,000 cfs and 32,000 cfs occurred on February 15 and March 17 respectively. For a river which normally flowed at under 500 cfs, these floods were obviously extraordinary and caused the contractors appreciable hardship. A good part of 1937 was consequently devoted to drying out and excavating the buttresses and arches and building, and rebuilding the cofferdams. (See images AZ-25-1 through AZ-25-30, drawings AZ-25-43 through AZ-25-70, and Appendix III.)<sup>11</sup>

River diversion prior to flooding was accomplished using two cofferdams. Both were partially destroyed in February and had to be rebuilt. Second and third diversion efforts were undertaken by building cofferdams from upstream and downstream islands to the right abutment and carrying the river through six-foot steel pipes. This involved erecting a cofferdam from an upstream island to the right abutment. Subsequent to these efforts, yet another attempt was made to pass water over the top of the latest earth dam using a channel lined with sacks of earth. This idea failed and the part of the dam site was flooded once again. Channelization was again undertaken, this time successfully.

Intermittent flood water caused the contractors difficulty in dewatering excavated areas below stream bed elevation. The contractors used up to nine pumps to accomplish this task but these proved insufficient. Relief was finally obtained when the Association provided the contractors with

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(Footnote Continued)

Engineering News Record 121 (July 7, 1938); and W. A. Dexheimer, "Construction of World's Highest Multiple Arch Dam," 28 The Reclamation Era (August 1938): 158-162; and E. C. Koppen, "Building Bartlett Dam," 29 The Reclamation Era (November 1939): 308-314. Technical data on the dam is presented in, Kollgaard and Chadwick, Development of Dam Engineering in the United States, 656-657. See also information in, "SRVWUA - Construction - Bartlett Dam - Storage on Verde River," Box G-116, Leedshill Herkenhoff Engineering Firm, San Francisco, California. Leedshill is the descendent firm of Raymond Hill and his brother, Louis C. Hill.

<sup>11</sup>"Project History, 1937," 70-71. The Verde was known at the time to be Arizona's most unpredictable and dangerous river because of great fluctuations in its flow rate.

several deep well turbines. Lining the porous cofferdams with clay blankets also helped to control the river.<sup>12</sup>

When not attempting to regulate the river, the contractors' work force proceeded to excavate all the buttresses, trim the spillway sidewalls, and remove overburden and fractured or fissured rock from the abutment down to the top of the cut-off trenches and buttress footing trenches. Concrete was first poured for Bartlett Dam on February 5, 1937, but because of flooding problems concrete placement proceeded slowly. By the end of the year, the dam had not yet reached stream bed elevation. Only a disappointing 51,000 cubic yards of concrete had<sup>13</sup> been placed, only 38 percent of the work was complete.

Coincident to concrete placement, grout and drain holes were drilled by the subcontractor, Diamond Drill Contracting Company of Spokane, Washington. Grouting work was conducted to firm up the dam's foundation by filling bedrock joints. Grouting was done primarily beneath the upstream face of the dam but also to the sides of the canyon, the arch groins, and to the fault zones. Drainage holes were located in the gravity sections to relieve entrapped seepage. Although Diamond was contracted to fill the grout holes, the work was taken over by the prime contractors. Grouting was completed the following year. A total of 351 holes were drilled to a total length of 25,680 feet. Grout fill consumed over 20,000 sacks of cement. Secondary grouting required drilling 302 holes, a total length of 8,010 feet, requiring 4,220 sacks of cement.<sup>14</sup>

Construction in 1938 was significantly more successful despite another massive flood on March 4 which peaked at 108,000 cfs. The spring flood did not cause any significant damage because all of the arches but one, arch 2, were above the stream bed. Other than suffering another delay, two to eight weeks depending on the part of work, the contractors lost no monies, having insured themselves for flood damage. The rest of the year was spent placing concrete to heighten the buttresses and arches. By December 1938 the contractors

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<sup>12</sup>Ibid., 71-72.

<sup>13</sup>Ibid., 70, 72-75. The contractors had hoped to complete half of the work before the end of 1937.

<sup>14</sup>"Salt River Project, Arizona, Project History 1938," contained in "History of the Salt River Project for the Period January 1, 1938 to December 31, 1938," 48-49; E. C. Koppen, "Bartlett Dam, Pressure Grouting Foundations," July 7, 1937.

had poured 122,446 cubic yards with only an estimated 7,720 cubic yards remaining to complete the dam.<sup>15</sup>

Having been delayed several times due to flooding, the contractors were interested in ways to quicken their work. The contract specified that the right arches be built to crest elevation and then the forms moved to form the five left arches. The contract also specified that the contractor could not pour concrete if the temperature exceeded 95 degrees Fahrenheit. With these requirements work would not be completed until 1940.

The contractors could expedite their work if they could pour concrete for consecutive or adjacent arches instead of working either side of the dam. Alternating pours among the arches was done to provide a good bond between sections and to avoid shrinkage cracks. The Bureau, however, agreed to modify the construction requirements when it designed, with the contractors' assistance, a fog spray which artificially cooled the freshly poured concrete. The successful use of mist with wet burlap permitted the contractors to build adjacent arches, the only requirement being that the intermediate arches be kept two weeks behind alternate arches. The fog spray also allowed the contractors to pour the contraction joints in the buttresses twelve to eighteen days after pouring the buttress concrete instead of waiting ninety days as the contract had specified.<sup>16</sup>

Aggregate for concrete was excavated from the river bed below the dam. Material was loaded by a dragline into a three-yard truck which then dumped it into a hopper, which in turn fed a conveyor belt. Material was then moved through a grizzly, sized, and washed. A novel method was devised to deliver processed rock from the aggregate to the mixing plant. Screened and washed aggregate was piled atop a tunnel which was constructed using steel forms obtained from a previous project. Trucks then drove through the tunnel and received aggregate through openings cut in the steel forms. Concrete was prepared at the batch and mixing plant on the right side of the river about one hundred yards below the dam site. Mixed in a two-yard Smith machine, it was distributed in two ways: in two-yard buckets hauled by truck to a traveling crane, or through eight-inch pumpcrete lines from the mixer to the hoppers where it was distributed

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<sup>15</sup>"Salt River Project, Arizona, Project History 1938," 45-46. The contractors received \$148,000 in flood insurance compensation for the March 1938 incident.

<sup>16</sup>"Salt River Project, Arizona, Project History 1938," 46-47; Koppen, "Building Bartlett Dam," 312-313.



by buggies. Concrete for the higher elevations and spillway work was delivered to a point on the right side of the dam by buckets moving on a inclined cableway. From there it was pumped to the exact location. A maximum of fifty cubic yards of concrete could be poured per hour using these techniques. All concrete was vibrated when placed. Cement was shipped by rail to Phoenix and trucked to the site. Two thousand barrels could be stored on site and another one thousand barrels at the rail head in Phoenix. <sup>17</sup>

Monitoring and inspecting the concrete was performed by an inspector at the processing plant, another at the batch and mixing plant, and a third at the point of placement. Grading and slump tests were regularly performed and the water-cement ratio was observed at all mixing operations. Concrete placing was done only under the supervision of an inspector. Survey parties also supervised checking layout, cross-sectioning, and all timber and steel forms. Grouting required observation and tests were conducted to determine the vertical shrinkage of concrete in the buttresses. Inspectors also oversaw the fabrication and installation <sup>18</sup> of steel reinforcement, structural steel, and excavation.

Forms for the buttress and arch work were steel except for those used at the lower elevations of the buttresses and some arch work. There, timber was used. Timber was also used to form the gravity sections and parts of the spillway. Steel forms were used predominately because they could be more easily aligned and because they gave a leveled, smooth, and attractive finish. The forms were sized to lift the arch sections fifteen feet along the sloping face of the dam or approximately eleven feet vertically. The arches had no contraction joints. The buttress forms raised the buttress sections in ten foot lifts. The gravity sections were built in five foot lifts and the spillway side walls and gate structure were built in ten foot lifts. Some of the forms were of enormous weight; the arch forms weighed 26 and 38 tons for the extrados and intrados respectively. They were

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<sup>17</sup>"Salt River Project, Arizona, Project History 1938," 47; Koppen, "Building Bartlett Dam," 313-314. For a description of the "pumpcrete" pump see, Dexheimer, "Construction of World's Highest Multiple Arch Dam," 159-160. Some aggregate may have been obtained from above the dam site early in the construction process.

<sup>18</sup>"Salt River Project, Arizona, Project History, 1938," 50-51; "Part III, "Inspection of Aggregate and Concrete Production," June 29, 1937; E. N. Vidal, "Test of Concrete Mixing Plant at Bartlett Dam, Salt River Project, and Inspection of Aggregate and Concrete Production," June 1937.

operated on rails attached to either the side or face slab of the adjacent buttresses. The forms were raised by hand hoists in connection with an "A" frame erected atop the arch concrete. The buttress forms were raised from a ten-ton cableway above which spanned 1,140 feet across the canyon. The forms for both the buttresses and arches were moved upstream and downstream initially by drift lines attached to a tractor and later by two shorter cables running parallel to the main cableway which carried the drift lines under separate hoists. <sup>19</sup>

Steel reinforcement was given to all sections except the gravity sections and footings. The arches received both circumferential and longitudinal steel at both faces. The buttress received reinforcement both diagonally and vertically at the outer faces only. <sup>20</sup>

Bartlett Dam was completed in May 1939, in time for Barrett, Hilp and Macco to meet their one thousand day deadline. The dam cost approximately \$270,000 less than estimated. The structure's innovative design, the use of fog mist to pour lifts in extreme temperature, and the use of low-heat cement resulted in a nearly flawless monolithic structure. Standing completed, Bartlett Dam was made up of 181,500 cubic yards of concrete, 6.7 million pounds of reinforced steel, and 2.76 million pounds of structural steel. Construction required the excavation of 482,000 cubic yards of earth and rock and the drilling of almost 34,000 linear feet of grout holes. The reservoir which formed behind the dam, called Bartlett Lake, stored approximately 180,000 acre feet over 2,815 acres of surface area. In October 1939 the Bureau of Reclamation turned over operation and maintenance of Bartlett Dam to the Association. (See images AZ-25-31 through AZ-25-42.) <sup>21</sup>

The operation of Bartlett Dam was provided for under the June 3, 1935 contract signed between the United States and the Association. Because the Association had agreed under its 1917 contract with the U.S. that it would cooperate in providing water for 6,310 acres for the Salt River Pima Indians, twenty percent of the dam's construction cost was

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<sup>19</sup>"Salt River Project, Arizona, Project History, 1938," 48; Koppen, "Building Bartlett Dam," 313; Dexheimer, "Construction of World's Highest Multiple Arch Dam," 158.

<sup>20</sup>Koppen, "Building Bartlett Dam," 311.

<sup>21</sup>Ibid., 312; "History of the Salt River Project for the Period January 1, 1939 to December 31, 1939," Chapter II, "Engineering," 2-6.



paid for by the federal government to provide that percentage of the dam's storage capacity for the Salt River Indian Reservation just northeast of Phoenix. The Association agreed to pay the remaining eighty percent, and operate and maintain the dam. Provisions apportioning the water behind the dam were complex. Generally, the bottom five percent of the dam's capacity was reserved for the Association for regulation of the Verde. The amount above five percent was considered developed water. The Salt River Reservation was allotted one-fifth of all developed water, or a maximum of 60,000 acre feet. However, deliveries of water to the Reservation would be limited to 20,000 acre feet in each calendar year. The contract also provided for water credits and for exchange water for the Reservation. On November 26, 1935, three months after the Bureau awarded the construction contract, the Association signed yet another agreement with the U.S., this time agreeing to Bartlett Dam's construction schedule and the improvements to its Salt River dams. <sup>22</sup>

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<sup>22</sup>"Agreement Between the United States and the Salt River Valley Water Users' Association Verde River Storage Works," June 3, 1935. "Contract Between the United States and Salt River Valley Water Users Association, 26 November 1935." The June 1935 contract's fourteen articles are only briefly summarized here. The Association shareholders approved the November contract on December 27, 1935.

## Chapter V: Conclusion

The Salt River Valley Water Users' Association always assumed it was the Salt River Project's right to develop the Verde River. Since it was a tributary of the Salt River, Association leadership believed the Verde was no different than Tonto Creek, which feeds the Salt just above Roosevelt Dam. The Salt River Project's diversion works at Granite Reef were built below the confluence of the two rivers which furthered their view that it was an intimate part of the Salt River system. Even though the Reclamation Service had never engineered a storage dam on the Verde for the Project, the Interior Department did withdraw the Verde for public entry for the purpose of creating the Salt River Project, and both the United States and the Association filed for surplus Salt and Verde River water in 1906, one year prior to the<sup>1</sup> construction of the Project's Granite Reef Dam in 1907.

Even before the Association took over operation and maintenance of the Salt River Project in 1917, Association President John P. Orme filed for rights to the Verde's Horseshoe dam site in 1914. The two boards of survey recommended that the Verde be developed to insure a safe supply of water for lands under the Project. In 1918, Walter Elliot, Association General Superintendent and Chief Engineer, submitted to the Association Board of Governors plans for constructing a dam at Horseshoe which included cost estimates. The Board accepted Elliot's report and passed a five dollar per acre assessment in April 1918 to fund Horseshoe's construction. The assessment was not collected, however, probably because although 1918 was a dry year, 1919 brought appreciable runoff and war-time profits and labor shortages made the large-scale construction project unlikely.<sup>2</sup>

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<sup>1</sup>Notices of Appropriation, Maricopa County Recorder, Canal Book 2, 155-156, February 8, 1906.

<sup>2</sup>"The Annual Report of Salt River Project for the Irrigation Year October 1, 1918 to September 30, 1919," 8, 32. Elliot, in his report to the Board stated, "The Board of Governors and Council are very much alive to the need for further development of water. There are three sources from which the Project can receive an additional supply of water. First, in order of value to the Project, is storage on the Verde River." The annual flow of the Salt River in 1919 exceeded the combined flow for the years 1917 and 1918. See also, Greig Scott to Henry M. Waite, Deputy Administrator of Public Works, August 16, 1933.

After the World War I the Association, under the leadership of Frank Reid and Charles Cragin, emphasized the further development of the Salt River for primarily hydroelectric benefits. These men focused on power development because they were fearful that without expanding the Association's hydroelectric capacity, its power receipts would be jeopardized by future competitors. In Cragin's 1922 report on developing hydroelectric facilities on the Salt, the Verde River was seen only as a site for storing Salt River water through a power canal constructed from a proposed dam at Stewart Mountain on the Salt River. The lone storage site identified in the Cragin report on the Verde was the McDowell dam site but Cragin concluded that the "cost of this reservoir would be more than its use would warrant, under present conditions." Cragin made no mention of constructing a dam at Horseshoe.<sup>3</sup>

As the 1920s progressed other internal issues began to preoccupy Association management beyond the construction of three Salt River dams. Beginning in 1925 opposition to Reid and Cragin's hydroelectric expansion program developed, due primarily to questions concerning Association finances and electrical power contracts. Criticism against Reid and Cragin's program was led by a group called the "Committee of Petitioners." Their complaints were crystallized when H. T. Cory, was sent by Interior Department Secretary Work to investigate the Salt River Project in 1927. Although Cory's conclusions were mixed, they provided enough criticism to fuel Reid and Cragin's opponents. Sentiment against Reid and Cragin, weighted by the Cory report, led the Committee of Petitioners to work towards the defeat of the Verde agreement, if for no other reason than to oppose Reid and Cragin. In a brochure titled, "The Verde Contract, Salt River Valley Farmers Must Decide," the Committee argued that Association farmers had been misled by Association management and it was now time for "farmers . . . to do their own thinking," particularly since, "Cory . . . has publicly seen<sup>4</sup> fit to question their [Reid and Cragin's] statements."

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<sup>3</sup>Charles C. Cragin, F. J. O'Hara, and H. J. Lawson, "Report on Proposed Additional Hydro-Electric Power Development of the Salt River," February 1922, 33. Concerning the Association's position on hydroelectric expansion see, Introcaso, "Mormon Flat Dam," 14-19.

<sup>4</sup>Regarding the Cory report see, Introcaso, "Mormon Flat Dam," 114-129. Brochure, "The Verde Contract, Salt River Valley Farmers Must Decide," nd. 1-4. See also the brochure by E. C. Rewick, "Do You Favor the Contract Between the  
(Footnote Continued)

Internal division eroded Reid and Cragin's authority and contributed to the Association's failure to approve the Verde agreement in December 1929. Shareholder disapproval of the Verde agreement also represented a vote of no confidence for Reid. In May 1930, five months after the Verde vote, Reid resigned as president. Under President John Dobson, the Association protested Secretary of the Interior Wilbur's approval of the Verde District. This was based upon the shareholders disapproval of the Verde agreement.<sup>5</sup>

The Association's position relative to the Verde District was modified again in May 1932, when Dobson was replaced by George Mickle as president. Although Mickle was unwilling to acquiesce completely to the District, shortly after taking office he urged Association leadership to reach an agreement with the Verde River District. Mickle asked for an agreement because, as he stated, "not a single Secretary of the Interior has seen fit to recognize the application of the Association for these [Verde] rights." Acting upon Mickle's recommendation the Association Board of Governors passed a resolution, by a six to four vote, requesting the District prove that there was surplus water available for use in Paradise Valley. The Board also requested that a federal board of engineers demonstrate that a surplus existed. The Association Council passed a resolution that showed clearer intent. It stated that three members from both the Board and Council would negotiate an agreement with the District which recognized the Association's rights to the Verde.<sup>6</sup>

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Verde Irrigation and Power District and Salt River Valley Water Users' Association, WHY?" December 3, 1929, 1-4. Even Association attorney Richard E. Sloan opposed the Verde agreement. See Pamphlet, Sloan to John Dobson, November 27, 1929, 1-22.

<sup>5</sup>Shareholders also did not approve the sale of bonds in March 1928 to construct Stewart Mountain Dam, the last dam built under Cragin's hydroelectric expansion program. The bonds were approved after a second vote held two months later in May 1928. The initial disapproval of Stewart Mountain's construction lends further evidence to the demise of Reid and Cragin's authority. See Introcaso, "Mormon Flat Dam," 122.

<sup>6</sup>"Statement of G. W. Mickle, President, Salt River Valley Water Users' Association," nd. Salt River Valley Water Users' Association, Extract From Minutes of Board of  
(Footnote Continued)



When Lin Orme became president in May 1934 the Association's position changed once again. Shortly after his election, Orme wrote Cory, who had just become Assistant Director of the Reclamation Service, that he felt "very deeply the responsibility . . . to protect the water supply of this [Salt River] Project, threatened now by the Verde development." Again, Orme's campaign, as he stated to Cory, was based on a "platform of uncompromising opposition to the Verde development." Under Orme, the Board passed a resolution that Orme stated would re-affirm the Association's stand "of uncompromising opposition to the diversion of any waters of the Verde River by the proposed Verde Irrigation District." Orme's opposition to the District's development of the Verde River was so intense that he hired an armed guard to live at the Bartlett dam site.

Clearly, the Association's position on the Verde changed repeatedly. Besides leadership's inability to address the Verde issue, and address it consistently over time, other factors explain the Association's behavior. Chief among its preoccupations was its financial commitment to Cragin's hydroelectric expansion program. Regardless of federal approval or disapproval, the Association was not in a position to pursue building a dam on the Verde through the 1920s and beyond. The cost of the hydroelectric expansion program was \$12.5 million. Added to its initial repayment obligation for Roosevelt Dam, the Association's debt was well over \$20 million. The Project was, therefore, already heavily in debt. The Association's debt worsened when the copper industry, its expectant major hydroelectric revenue source, failed immediately after the expansion program was completed. The Association could not realistically consider another major capital expense.

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(Footnote Continued)

Governors, June 5, 1933. Salt River Valley Water Users' Association, Extract From Minutes of the Council, May 31, 1933.

<sup>7</sup>Orme stated further, "My opponent [Mickle], in the later days of the campaign, receded from his platform of friendliness to the Verde and stated he was also opposed to the development." Lin B. Orme to H. T. Cory, May 21, 1934; Lin B. Orme to Henry A. Wallace, May 30, 1934. The Association employed John Jacob to guard the Bartlett Dam site. Presumably his role was to protect the site from construction field work. Jacob became a construction foreman during the erection of Bartlett and later a damtender for the Project. Interview with John Huber, January 17, 1989.

To assess the District's and its four predecessors' roles is difficult since records of these organizations do not exist. That these private entities failed to develop the Verde River, however, is not surprising. Private irrigation enterprises had a high mortality rate in Arizona, particularly when attempting to construct expensive, large-scale water storage projects. The development of all four central Arizona rivers was planned by private organizations at some time and all failed except for the Maricopa Water District's efforts on the Agua Fria River. But even Maricopa's success was ultimately achieved only after it secured a federal Reconstruction Finance Corporation loan which enabled it to recover from bankruptcy. The problem Rio Verde and all its successors experienced was their inability to accumulate sufficient capital to construct a project. The primary reason for this failure was the Association's tact of threatening litigation each time the Paradise Valley developers claimed they were nearing construction. Senator Hayden explained it succinctly in April 1930 when he wrote, "capital is proverbially timid . . . whenever the bond buyers were informed that an attempt to proceed with construction would inevitably lead to a law suit . . . respecting appropriations of water."

What can be said about the Verde organizations, and what was exceptional about them, was their persistence. They were nothing if not resilient. This was due primarily to the tenacity of their leaders. Hudson's and Doolittle's efforts on behalf of the Verde Water and Power Company were particularly fanatical. William Bartlett's diaries state that Paradise Verde President Michael pursued avowedly Verde project funding and spent a significant amount of time in Washington trying to persuade various Interior secretaries to approve the project. Even after Secretary Ickes rescinded the District's loan, their efforts persisted for many years. Beyond litigation efforts, which all failed, they succeeded in having the state pass legislation that would extend their state water permit if they again received federal funding. The District also continued to hold regular board meetings at least through 1944.

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<sup>8</sup>The only record found for any of these organizations, other than incorporation papers, were the minutes of the Verde River Irrigation and Power District for the period 1935 through 1944. These were obtained from Carl Moore. Carl Hayden to G. N. Baker, April 28, 1930.

<sup>9</sup>Arizona State Legislature, Senate Bill No. 5, Chapter 10, Eleventh Legislature, Third Special Session, December  
(Footnote Continued)



State government, its elected officials, local organizations, and many consulting engineers were also players in the Verde's development. Collectively, their role in determining the outcome was relatively marginal. Beyond its approval through the certification board, state government had no authority and showed little interest in the development of the Verde. State officials and Arizona's congressional delegation were not significantly involved until the early 1930s. In an arena so completely controlled by federal authority, they did little more than to lend their support, and that, capriciously. Other organizations, such as the Phoenix Chamber of Commerce, were ineffective. The Chamber's credibility was in disrepute. It had altered its position on the Verde development at least once, and perhaps more importantly, some of its members had been involved in a criminal land fraud case in the early 1930s involving lands in Arizona and California.<sup>10</sup>

The numerous consulting engineers were the most persistent players throughout the Verde's development history. From Donald Campbell to Eugene Debler, their work framed the issue and gave it definition. But in spite of the engineering profession's increasing status in the twentieth century, their influence was limited. Hayden's comment that "political pressure should never . . . affect an engineering result" or decision was nonsense and only constituted his reposturing. Orme was more truthful when he stated, albeit disingenuously, that he was not "unmindful" of the amount of political pressure involved. Generally, the engineers served the interests of organizations which employed them which may may explain the divisiveness of opinion among them concerning the viability of the Verde to support an independent irrigation project.<sup>11</sup>

The federal government's role in the outcome of the Verde's development was, of course, the most critical. It decided

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14, 1934; "Verde Bill Becomes Law," Arizona Republic, December 14, 1934.

<sup>10</sup>The case referred to concerned the land investment company named Romola Farms. See for example, "Romola President Given Twelve Years in Prison, Hursh Flayed and Fined \$4,200, Fourteen Others Convicted of Fraud in Land Enterprise." Los Angeles Times, June 24, 1931, Part 2, 1.

<sup>11</sup>The role of the engineering profession in the Verde development was very similar to the role it played in the controversy surrounding the Agua Fria development. See Introcaso, "The History of Water Storage Development on the Agua Fria River," 65-93.

the issue. Why the national government remained involved in the Verde after it completed the Salt River Project in 1911 is readily understood. Reclamation officials were careful not to return the Verde to the public domain and to public entry because the river contributed to the success of their Project. After the Reclamation Service conveyed operation and maintenance of the Salt River Project to the Association in 1917, it continued to hold a paternal attitude towards the Project despite Interior Secretary Payne's statement in 1920 that he declined "to be regarded as discriminating" and despite occasional disagreements with the Association. This sentiment increased through the history of the Verde conflict. Reclamation increasingly pointed to the Salt River Project as its greatest accomplishment and most successful project when its program came under pronounced national criticism beginning in the 1910s. Reclamation was hesitant to do anything that might jeopardize the Salt River Project's success. <sup>12</sup>

Other factors also explain why the federal government ultimately awarded the Verde River to the Association in 1934. Although Reclamation Commissioner Mead requested the Debler report and although Mead's position on the Verde affair was undoubtedly important, it was Secretary Ickes who made the final decision to rescind the Public Works loan. It was Harold Ickes who headed the Public Works Administration. When he became administrator of the PWA in July 1933 Ickes was very conscious of keeping the PWA free of corruption and political influence. He was also very conservative in evaluating the economic feasibility and credit worthiness of communities and organizations applying for PWA funds. In allocating PWA monies he was called stingy, overcautious, and slow. Roosevelt's Secretary of Labor, Frances Perkins referred to his approach as "punctilious," with a "fussy scrutiny [for] detail." Ickes explained his approach by stating

I slaved away over endless mountains of documents, contracts and letters, refusing to sign anything that I had not personally

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<sup>12</sup>The Association and Reclamation Service did not always agree on how the Association scheduled making its repayments for the construction of Roosevelt Dam. The Reclamation Service, because of chronic cost overruns, among other reasons, came under repeated criticism beginning in the 1910s. In 1924, the Reclamation Service changed its name to the Bureau of Reclamation and its mission in an effort to re-create itself. The Salt River Project has continually been cited by federal officials as the national government's best effort in western reclamation.

read, lest one day it should arise to haunt me in the steam of another Teapot . . . . I tried to compensate for my caution by working an average of fourteen hours a day. I read and signed in triplicate every Public Works contract - thousands of them . . . . I never asked for large sums to be dissipated in blindman's bluff fashion, through state and local administrators . . . . I am willing to pay the price of my newest derisive characterization of 'medicine-dropper spender.'

In the first six months of its life, Ickes approved only \$110 million of the \$3.3 billion in PWA funds.<sup>13</sup>

Because of Ickes' approach, his examination of the evidence concerning the Verde development as presented by Reclamation led him to no other conclusion. For Ickes, this was simply a business decision. The Debler report showed the District's development would cost \$472 per acre. The benefactors of the Verde project would have to repay the government for the construction of it at four percent interest in no longer than thirty years. For the amount of acreage cultivated, the likelihood of repayment, Ickes concluded, was simply not possible. Ickes explained his decision matter-of-factly in his 1935 book, Back to Work, The Story of PWA. He wrote, "We approved an important project for the Verde River in Arizona, but we rescinded the allocation when the Bureau of Reclamation reported that the cost was too high to warrant the expenditure."<sup>14</sup>

Ickes could rightfully claim that he carefully scrutinized all proposed PWA projects and succeeded in not allowing his program to become undermined by graft. However uncorrupted

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<sup>13</sup>Graham White and John Maze, Harold Ickes of the New Deal, His Private Life and Public Career (Cambridge, Harvard University Press, 1985), 107-116. Ickes' titled his autobiography, "The Autobiography of a Curmudgeon." The work was published in 1943.

<sup>14</sup>Harold L. Ickes, Back to Work, The Story of PWA (New York: Macmillian Company, 1935), 116. Ickes makes no mention of his two Verde decisions in his diaries. This was probably because in comparison to other projects, such as allocating \$80 million on November 2, 1933 for the Pennsylvania Railroad to complete electrification of its line from Wilmington to Washington, the Verde was less significant. See Harold L. Ickes, The Secret Diary of Harold L. Ickes, The First Thousand Days, 1933-1936 (New York: Simon and Schuster, 1953), 115-116, 199-202.

his decision might have been, it was not made apart from events and actions which preceded it. In a sense, Ickes never resolved the Verde controversy. He only affirmed previous events and actions which framed the controversy at a certain point in time. It was a certain mix of circumstances which led Ickes' to his decision. Electrical market conditions, national farm policy, and drought were circumstantial factors. These factors, in addition to Orme's maneuvering, precipitated Mead's request for another investigation. Had not the Debler report been written, Ickes might not have reexamined the Verde development.

Although it is difficult to calculate precisely how affective Orme's lobbying efforts were in 1933-1934, they should not go unappreciated. Orme seemed to understand best the Association's elite position in the community. With the exception of the mining industry, the Salt River Project was the most politically powerful organization in the state. The Project dominated Valley commerce. In 1929, its lands comprised only four percent of Maricopa County. Yet these lands represented over eighty percent of the county's total assessed value. The Salt River Project was the reason for the success of central Arizona. Not until Orme's presidency did the Association use its status in the community to its political advantage.<sup>15</sup>

Had Reid and Cragin, particularly Cragin, pursued the Verde for the Association as fervently as he forwarded his hydroelectric expansion on the Salt, the Verde matter probably would have been settled in the early 1920s. Also, had internal division not caused the Association to alter its position on the Verde at least four times, it would have been more effective sooner. Orme, with the tenacity to match his bulldog-like frame, refused to accept his predecessor's assessment that the Association had no chance of winning the Verde. Instead he moved vigorously to influence Cory, Mead, Wallace, Ickes, and other federal officials as well as Hayden, Greenway and Ashurst, and any others who would listen. Association Attorney Greig Scott agreed with Orme's efforts, telling him, "I think we have made a mistake heretofore in not pestering the life out of our representatives and other public officials on this matter." Orme's efforts undoubtedly contributed to Mead's request for the Debler report. Orme also produced another engineering study (Hill's ) to support Debler's conclusions. He then masterfully exploited the "hazardous condition" of

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<sup>15</sup>Niebur, "The Social and Economic Effect of the Great Depression on Phoenix, Arizona, 1929-1934," 2.



the Project's three new Salt River dams to further his attempt to win federal funding. <sup>16</sup>

What decided the development of the Verde was, therefore, not the determination of any engineering report. No report could provide uncontestable conclusions. The question was not whether the Verde's hydrologic record showed that there was sufficient water for a certain acceptable number of acres or whether, as Noetzli showed, the Association "wasted" over half its water supply. It was not the federal government meeting its obligation to provide water to the Salt River Indians. Meeting Indian water demands in central Arizona never took precedence. It was not the Depression which preempted the issue, causing federal efforts to build Bartlett Dam to provide emergency work relief. Nor was it settled by judicial decree, because no party was truly interested in risking their future to a court order. Finally, the Verde's development was not the eventual or inevitable product of environmental necessity - the historical necessity of central Arizona's need for an ever-increasing water supply.

Bartlett Dam was built because the Salt River Valley Water Users' Association proved more politically powerful than the Verde River Irrigation and Power District. In an environment that needs to be more built than given, winning the Verde meant much to the Association because it was already an integral part of the Salt River Project. Wristing the Verde from the District gave the Association the last unregulated river in the region. By winning the Verde the Association would maintain, enhance, and preclude other interests from challenging its elite status. Winning the Verde meant cementing the Association's position as the preeminent water authority in central Arizona.

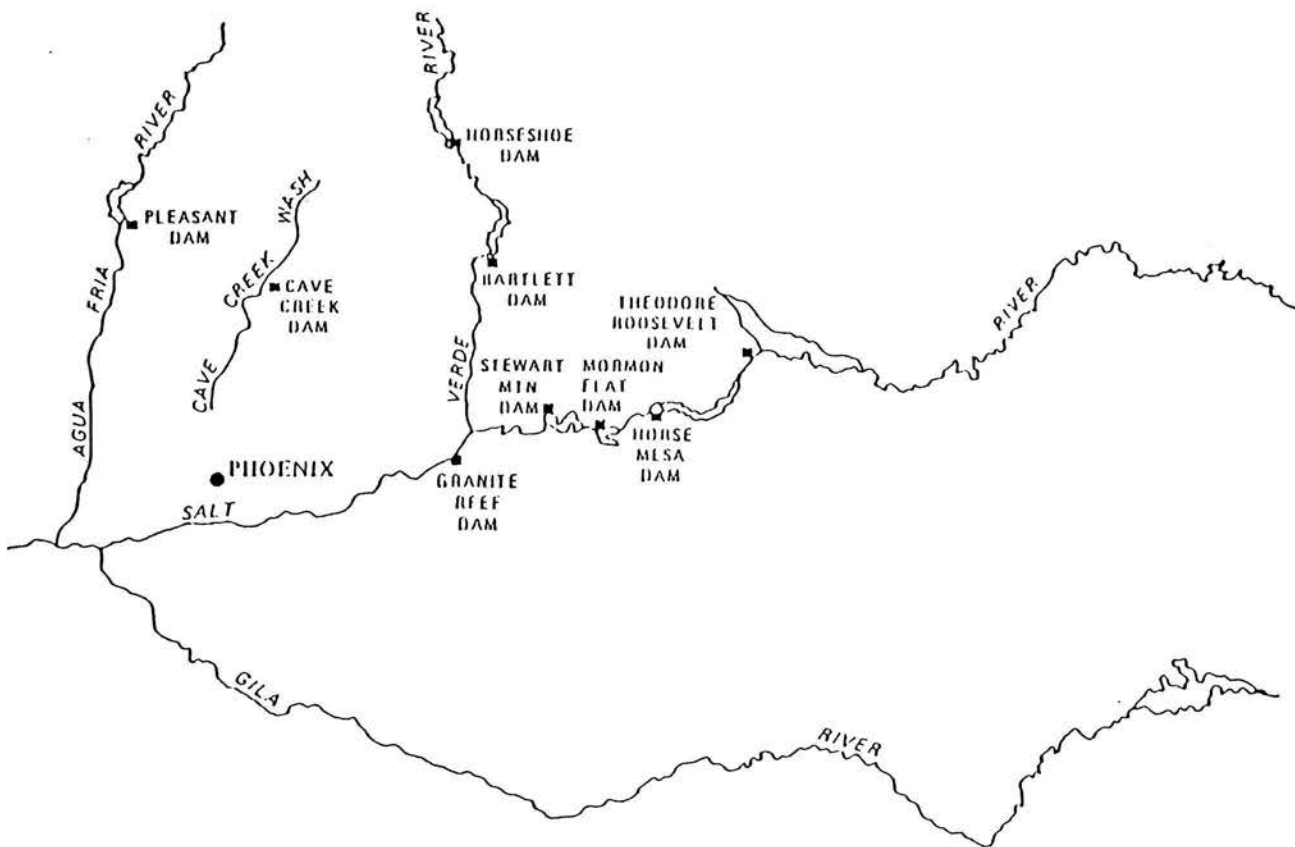
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<sup>16</sup>Grieg Scott to Lin Orme, June 25, June 27, July 2, July 5, and July 7, 1934, and Lin Orme to Northcutt Ely, June 28, 1934.

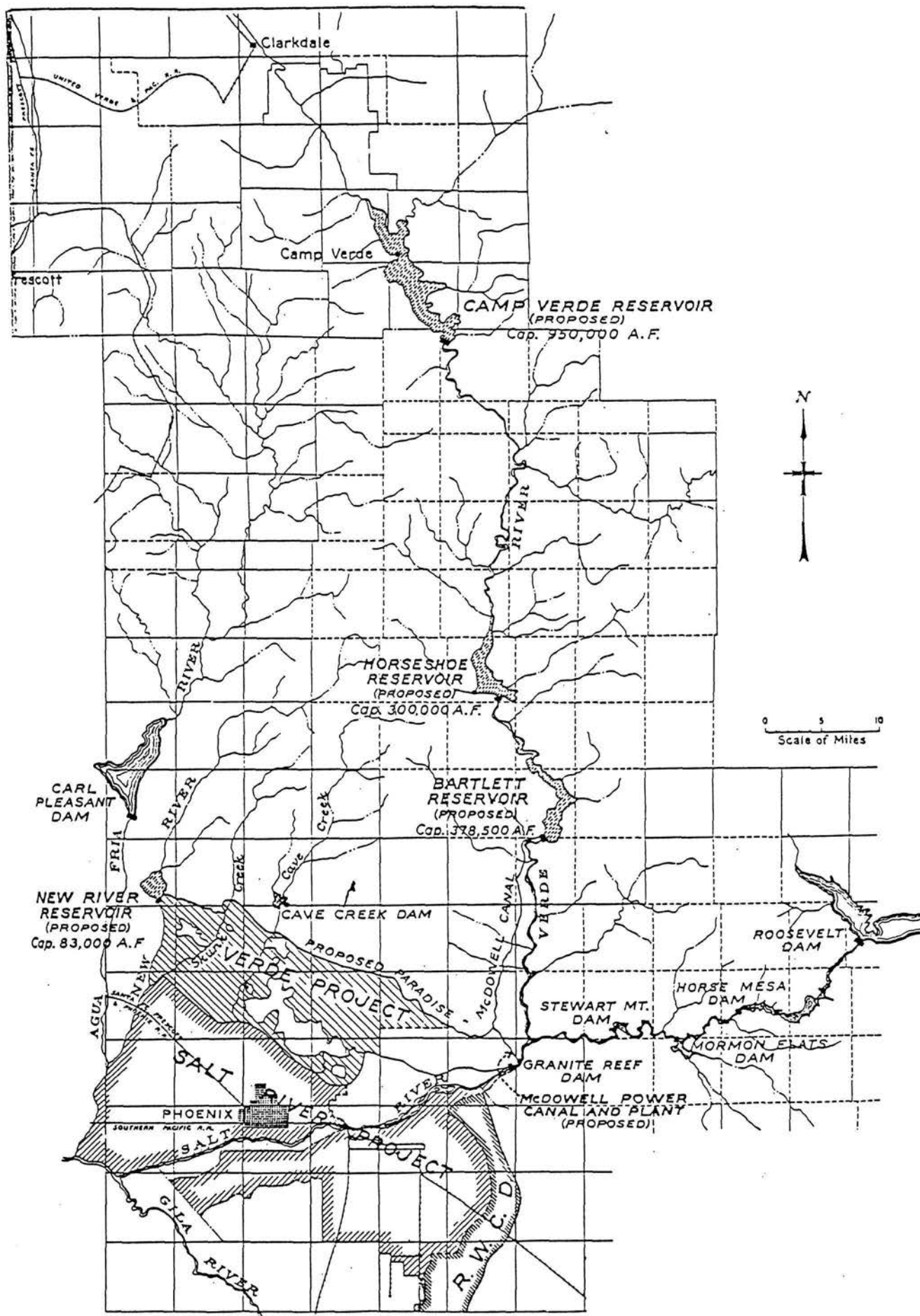
Bartlett Dam  
HAER No. AZ-25  
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APPENDIX I  
Bartlett Dam shown in relation to other  
dams in the Phoenix Valley.





APPENDIX II  
General Map of the Verde Project.  
(Source: U.S. Department of the Interior,  
Bureau of Reclamation, August 28, 1934.)

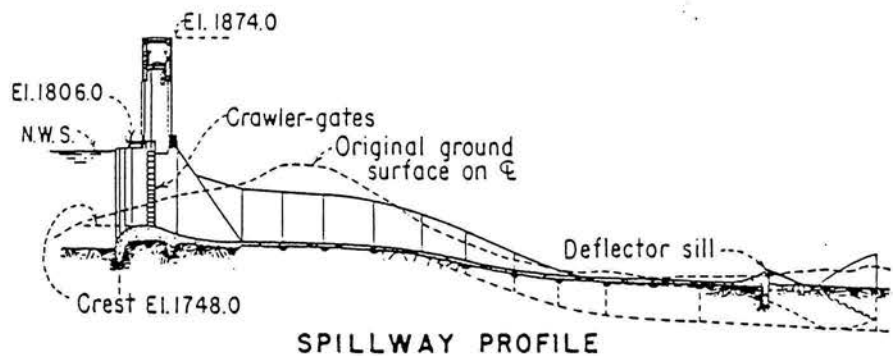
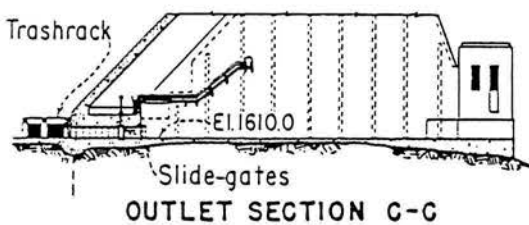
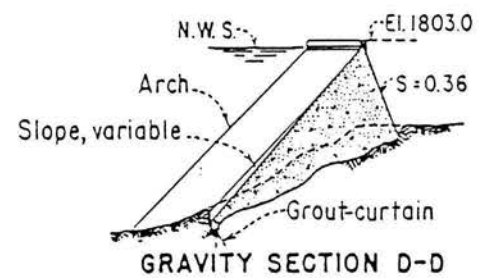
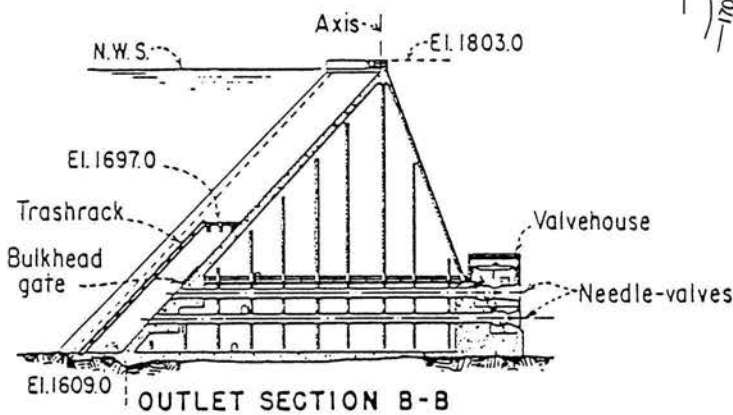
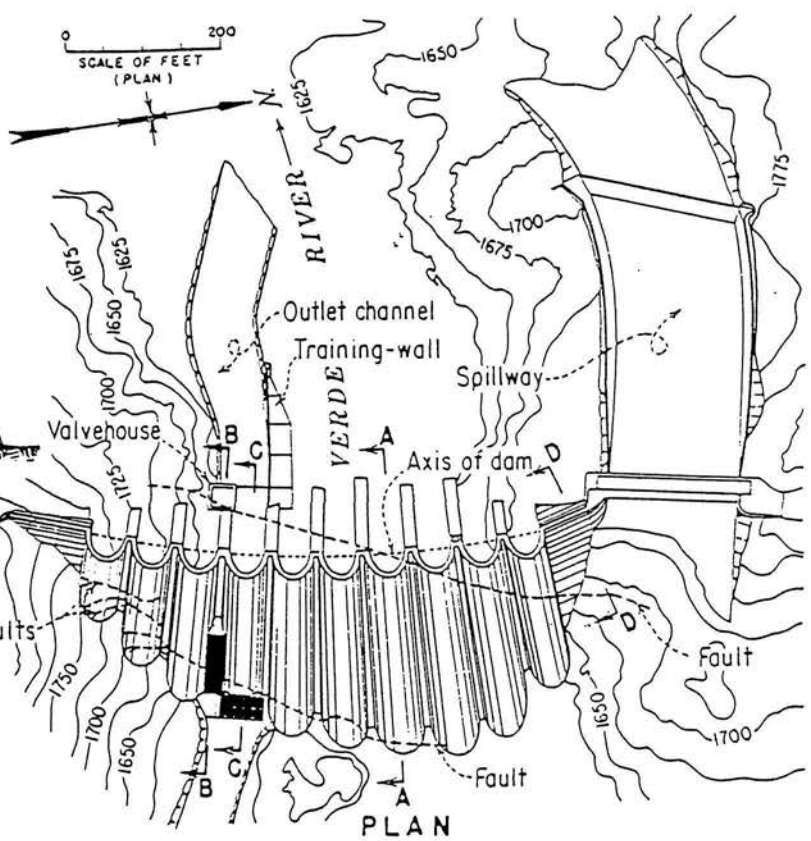
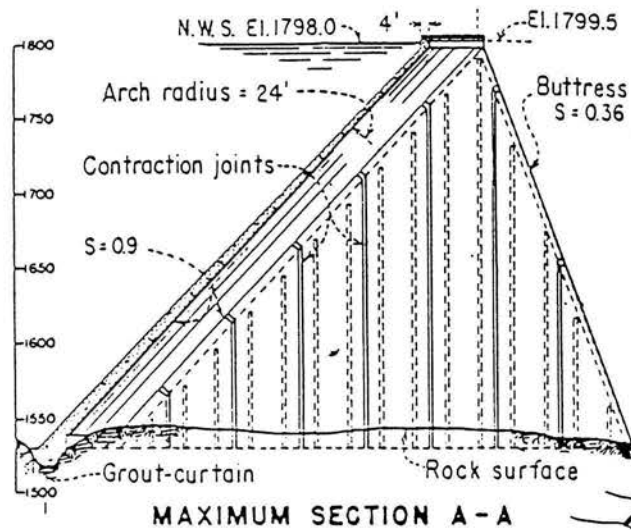


APPENDIX III

Bartlett Dam, Plan and Sections.

(Source: U.S. Department of the Interior. Water  
and Power Resources Service, Project Data, 1981.

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SCALE OF FEET  
(SECTIONS)

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