



WATER-RIGHT DOCKET

Chaco Culture National Historical Park

Docket No: 2

PUEBLO BONITO AREA WATER SYSTEM

Preliminary Docket Information

00-00-0000: water docket information

W A T E R D O C K E T I N F O R M A T I O N

A R E A CHACO CANYON N M

DOCKET NO. 2

APPLICATION NO.

PERMIT NO.

CERTIFICATE NO.

TITLE OF DOCKET PUEBLO BONITO AREA WATER SYSTEM (OLD HDQTRS AREA)

PRIORITY

REMARKS:

*Chas. Brown*RIGHT-OF-WAY FOR WATER LINE

KNOW ALL MEN BY THESE PRESENTS, that _____, in consideration of One Dollar (\$1.00) to us in hand paid, and other good and valuable considerations, the receipt whereof is hereby duly acknowledged, do hereby grant, quit-claim, bargain, sell and convey unto the United States of America an easement and right of way over lands in Sections 18 and 19, Township 21 N., Range 11 W., New Mexico Principal Meridian, County of San Juan, State of New Mexico, necessary for a pipe line along the following courses and directions to-wit:

Beginning at a point on the east boundary of lot 10, section 18, forty (40) feet northerly from the southeast corner of said lot 10, thence south $79^{\circ}07'$ east, 425.15 feet; thence south $63^{\circ}03'$ east, 429.9 feet more or less to the Custodian's residence and utilities.

Said right of way is for the maintenance, construction, operation, inspection and repairing of a pipe line over lands of the grantors crossed by said survey line, and which right of way and easement shall be two and one-half ($2\frac{1}{2}$) feet wide on each side of said pipe line.

TO HAVE AND TO HOLD unto the said United States of America for the uses and purposes aforesaid so long as the said United States of America shall maintain and use the said water line on the said lands, hereby giving and granting unto the said United States of America the right of ingress and egress in, on, and across the said lands for the purpose of constructing, laying, maintaining, operating, inspecting, and repairing the said water line, and for the removal thereof, in whole, at the will of the said United States. The said grantors and their lawful successors and assigns to hold, possess, and enjoy the full use of the said lands subject to the use thereof by the said United States of America.

IN WITNESS WHEREOF, the grantors have hereunto set their hands and seals this _____ day of _____ Nineteen Hundred and Thirty-three.

Signed, Sealed and Delivered
in the Presence of:

(Seal)

(Seal)

(Seal)

CHACO CANYON NATIONAL MONUMENT # 1

Chaco Canyon National Monument, located within the Colorado River drainage basin, is characterized by gentle sloping mesas with steep-walled canyons. Chaco River, an intermittent stream, is the principal drainage which is subject to flash flooding. No springs (intermittent or perennial) exists within the Monument.

Groundwater, of limited yield of good chemical water, exists in the alluvial or valley fill with static water level varying from 12 to 69 feet below ground level. Thickness of the aquifer ranges from 0 to 40 feet along the Chaco River.

The Mesaverde formation, which underlies the recent deposits of alluvium, contains alternating layers of water bearing sandstone. These beds are interrupted with aquicludes consisting of shale. The aquifers of this group are poor in quality except for artesian water found in the Gallup sandstone.

To date 14 test wells have been drilled, 12 in the alluvium, and 2 completed in the Menefee and Gallup sandstone - see Table I and corresponding Figures 1 and 2 for record and location of all wells within Chaco Canyon National Monument.

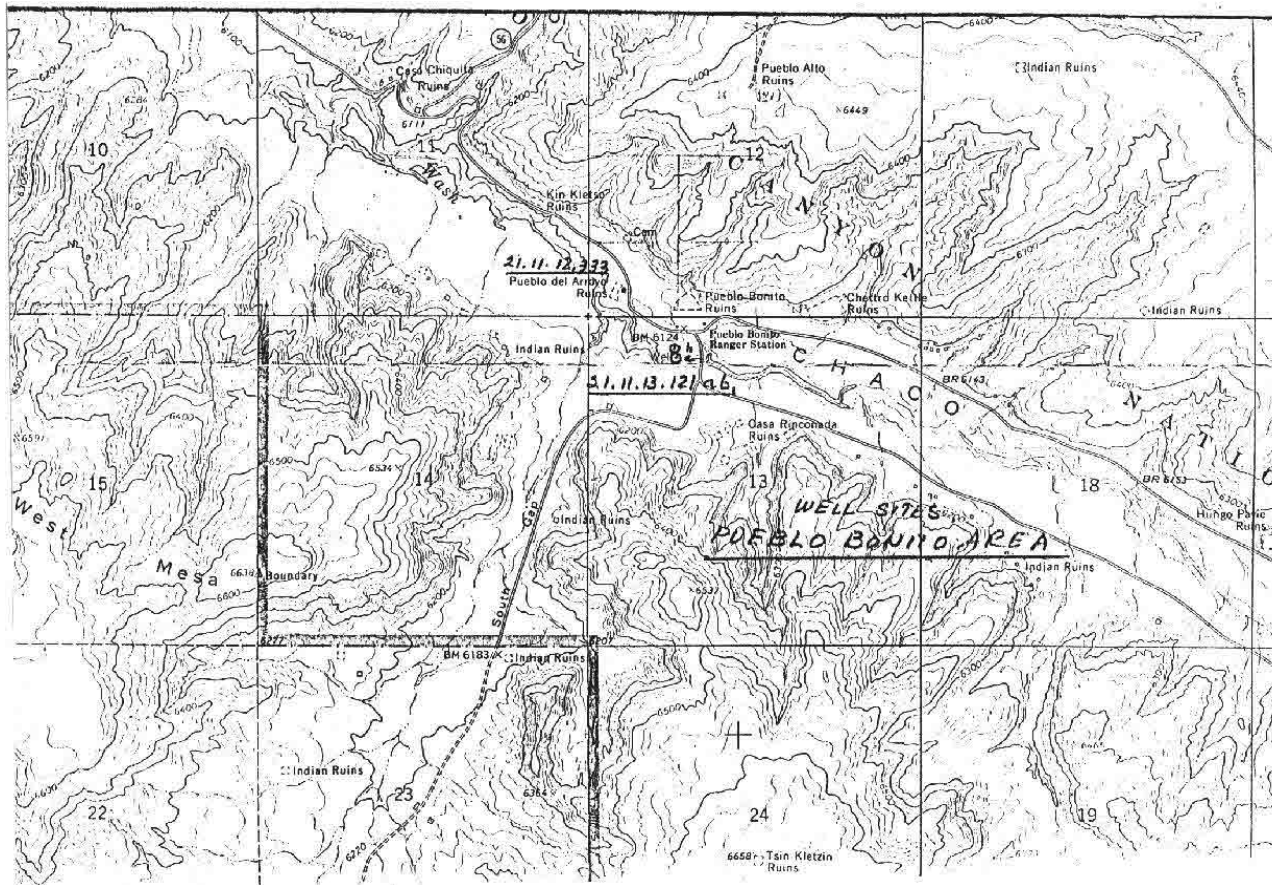
TABLE I - RECORDS OF WELLS IN CHACO CANYON NATIONAL MONUMENT

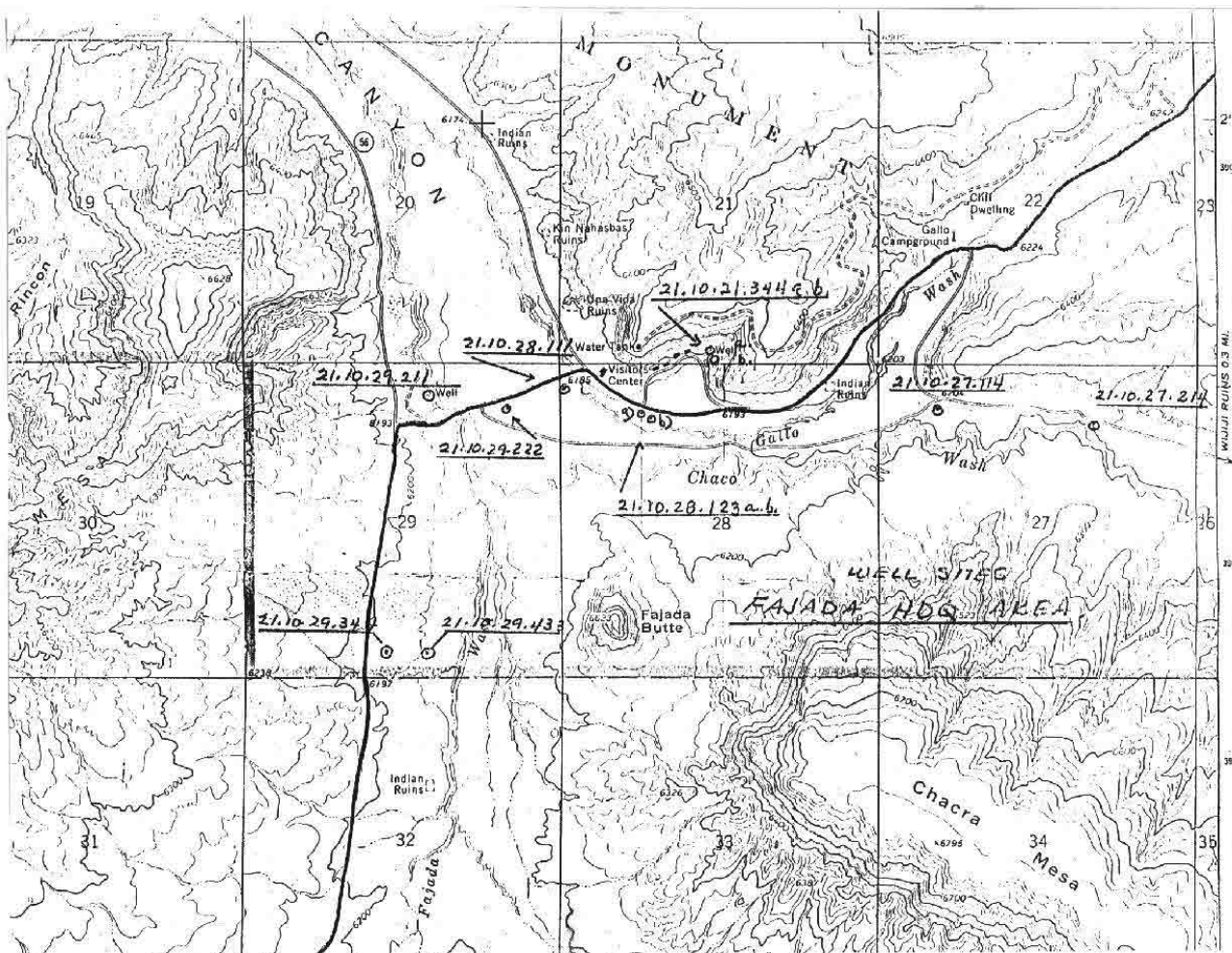
LOCATION	DATE COMPLETED	DEPTH	DIAMETER INCHES	WATER LEVEL		YIELD		USE	REMARKS
				BGL	DATE	RATE	DATE		
21:10:29:211	1940	16	144	11.96	9/14/56	6	6/56	D.	
21:11:12:333	1937	15	180	18.94	9/14/56	-	-	D.	Abandoned
21:11:13:121a	1940	20	180	-	-	-	-	-	Unused
21:11:13:121b	-	16	48	16.76	9/14/56	2-3	6/27/56	P.S.	
21:10:28:123a	1967	56	4	-	8/ 4/72	-	-	-	
21:10:28:123b	1967	58	4	42	8/ 4/72	-	-	-	
21:10:28:111	1966	96	24	55	1966	-	-	-	Plugged-Salty
21:10:29:222	1966	92	24	45	1966	50	1966	-	Plugged, Yield est.
21:10:29:344	1966	100	10	?	1966	-	1966	-	bailing
21:10:29:433	1966	200	10	-	1966	-	1966	-	Plugged
21:10:27:114	1966	100	10	-	1966	-	1966	-	Dry-Plugged
21:10:27:214	1966	100	10	-	1966	-	1966	-	Plugged
21:10:21:344a	1966	800	10	69	1966	6	1966	D.	Plugged
21:10:21:344b	1972	3111	6	+400	1972	170	1972	D.	Abandoned
									Artesian flow

D-Domestic Supply
P.S.-Public Supply

GEOHYDROLOGY OF WELL #21:10:21:344b

<u>FORMATION</u>	<u>THICKNESS FEET</u>	<u>LITHOLOGY</u>	<u>WATER BEARING CHARACTERISTICS</u>
Alluvium	20	Unconsolidated deposits of valley fill - chiefly gravel, sand, mudstone clay.	Limited quantity of good to poor quality - quantity 6 to an estimated 50 gpm.
Menefee	1730	Sandstone, claystone. Average porosity - 20% Average density - 2.25 g/cc.	Limited quantity of poor water quality. Yield 4-6 gpm.
Point Lookout	190	Sandstone. Average porosity - 17% Average density - 2.35 g/cc.	Unknown - reportedly good quality water elsewhere of limited yield.
Mancos Shale	960	Shale. Average porosity - 4% Average density - 2.60 g/cc.	No water.
Gallup Sandstone	200+	Sandstone. Average porosity - 17% Average density - 2.35 g/cc.	Artesian flow, 175 psi shut in pressure - good quality. Yield - 165 gpm.





QUALITY OF WATER REPORTS - CHEMICAL ANALYSIS
CHACO CANYON NATIONAL MONUMENT, NATIONAL PARK SERVICE

APEA CHACO CANYON NM							P-31111	P-3001		
SOURCE WELL-TEST	21:10:29:222	21:10:28:123a	21:10:29:211	21:10:12:333	21:10:13:121b	21:10:29:433	21:10:21:344b	21:10:21:344a	21:10:27:114	21:10:27:214
DATE	4/8/72	8/8/72	5/2/61	9/14/56	9/14/56		9/18/72	10/22/71		
Silica (Si O ₂)	< 1.0	8.0	10	10	10		22.1			
Iron (Fe)	2.00	1420	16	19	19		0.56			
Manganese (Mn)	0.024	30.1					< 0.01			
Calcium (Ca)	92.7	355	38	24	23		12.1			
Magnesium (Mg)	4.71	176	14	8.3	10.0		2.21			
Sodium (Na)	773	3380	210	198	118		62			
Potassium (K)	3.00	15.9	1.1				4.4			
Bicarbonate (HCO ₃)	352	0.0	370	372	296		200			
Carbonate (CO ₃)	0.2	0.0	0	0.0	0.0		0			
Sulfate (SO ₄)	1160	7235	274	198	95		577		GENERAL - BAD SALTY	
Chloride (Cl)	57.7	187	9.5	7.0	7.0		14.1			
Fluoride (F)	5.2	0.1	1.4	1.8	1.4		1.54			
Nitrate (NO ₃)	0.8	0.9	3.3	0.2	1.2	PLUGGED	0.7			
Dissolved Solids:										
Calculated			745							
Residue on evap- oration at 180°C	2194	14,203	743	653	424		1275		GENERAL - BAD SALTY	3400 ppm
Hardness as Ca CO ₃	26.7	2222	152	94	98					
Non-carbonate Hardness			0	0	0					
Percent Sodium % Na			75	82	72					
Sodium Adsorption Ratio			7.4	8.0	5.2					
Specific Conductance										
Unhos @ 25°C			1140	986	665		2600			
pH	8.5	4.3	8.0	7.9			8.1			
Torcon			0.31	-	-					

21:10:28:111 - General - Bad Salty
21:10:29:344 - General - Bad Salty

Other Supporting Information

L54-OBL

January 26, 1960

Memorandum

To: Regional Director, Region Three
Acting
From: Chief, Water Resources Section

Subject: *Docket 3* Fajada View Water System (New Headquarters Area) and Pueblo Bonito Area Water System, Chaco Canyon *Docket 2*

*WODC did not
new docket
2*

The name tab on Docket 2 should be changed from Headquarters Well No. 1 to Pueblo Bonito Area Water System (Old Headquarters Area). The attached completion report, dated May 15, 1959, should be filed in this docket.

Also attached is your folder for Docket 3, Fajada View Water Supply (New Headquarters Area), which contains a copy of completion report dated May 26, 1958.

In the future, geographical locations should be used in naming water systems rather than functional names which are subject to frequent change.

In viewing Drawings NM-CHAC: 3108-A, 3123-A, 7103 and 7104, we note the existence of many wells, for which we do not have well logs, record of pump tests, or dates of first use. This information should be obtained for distribution and inclusion in the respective dockets. We suggest that Drawings NM-CHAC:7103, Fajada View (New Headquarters Area), and Drawing NM-CHAC:7104, Pueblo Bonito (Old Headquarters Area) be used as base maps on which the location of all wells be shown and numbered and date of first use indicated and also whether the well is a replacement, supplemental, test or abandoned. The first well will establish the priority for any appropriative claim which future amendment of the water laws might require for ground water.

Reference, in both dockets, should be made to the USGS report, of May 1957, by Mr. West, entitled "Possibility of Developing a Ground - Water Supply at the Chaco Canyon N.M., San Juan County, New Mexico".

SIGNED

initial
Gordon W. Robertson
Acting Chief, Water Resources Section

Attachments 2

Copy to: Superintendent, Chaco Canyon, w/identical attachments
Chief, WODC (2), w/identical attachments

Chaco Canyon National Monument

Water Right Deed 11

Headquarters Well No. 1

Report on well digging.

Completion Report of Construction Project dated May 15, 1959

Form 10-1
(Rev. 1-58)UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

REPORT 7 SPL

COMPLETION REPORT OF CONSTRUCTION PROJECT

REGION Three	AREA Chaco Canyon National Monument	CITY San Juan	STATE New Mexico
PROJECT OR JOB TITLE Water System, Pueblo Bonito Area		MASTER PLAN NO. U-9	BUILDING NO.
LOCATION IN AREA Pueblo Bonito area			
WORKING DRAWING NO. AND TITLE NM-CC-3123, Water System, Pueblo Bonito area		ACCOUNT NO. B-1	
APPROPRIATION TITLE AND SYMBOL 14x1035 Construction		DATE WORK COMPLETED Feb. 12, 1959	
CONTRACT NO. 14-10-333-449		DATE WORK STARTED Nov. 1958	
NAME OF CONTRACTOR Armstrong Plumbing and Heating Company		ADDRESS Box 236, Bloomfield, New Mexico	

COST ANALYSIS

CONSTRUCTION ITEMS	QTY	UNIT COST IN PLACE	TOTAL COST IN PLACE
Well, Steel casing & pumphouse	1	3,600.00	3,600.00
Extra depth, well casing (ft)	13	150.00	1,950.00
Filling existing well	1	100.00	100.00
Installation of pumping plant	1	2,000.00	2,000.00
2 inch plastic pipe	730	1.30	949.00
4 inch asbestos cement pipe	400	2.05	820.00
Fire hydrant and valve	1	400.00	400.00
Steel reservoir, 20,000 gallon water storage	1	3,860.00	3,860.00
Installation of chlorinator	1	650.00	650.00
Hose house installation	1	200.00	200.00
Change Order No. 1 (water line connection)	1	85.00	85.00

FIELD FINANCE OFFICE CLEARANCE:

Robert L. Giles
Robert L. Giles, Regional Accountant
July 21, 1959

TOTAL \$ 14,614.00

SUMMARY OF EXPENDITURES

PERSONAL SERVICES	EQUIPMENT	MATERIALS AND SUPPLIES
OTHER		
14,614.00	PS&S Costs: \$2,558.91 (17.51%)	17,172.91

CHANGE ORDERS

ORIGINAL CONTRACT AMOUNT	FIRST Change #1	difference in	measured quantities - deduct \$261.00
14,790.00	add \$65.00		
FINAL CONTRACT AMOUNT	FOURTH	FIFTH	SIXTH
14,614.00			

THIS PROJECT OR JOB HAS BEEN COMPLETED IN ACCORDANCE WITH
APPROVED DRAWINGS, SPECIFICATIONS, AUTHORIZED CHANGES

SUBMITTED BY (Name and title)	DATE
APPROVED BY (Name and title) <i>Charles C. Sharp</i> Charles C. Sharp, Superintendent	DATE May 15, 1959

(ATTACH NARRATIVE STATEMENT, PHOTOGRAPHS, AND "AS BUILT" DRAWINGS TO THIS FORM.)

NARRATIVE SECTION, COMPLETION REPORT, WATER SYSTEM, PUEBLO BONITO AREA

ARMSTRONG PLUMBING AND HEATING COMPANY, CONTRACT NO. 14-10-333-449

CHACO CANYON NATIONAL MONUMENT

Armstrong Plumbing and Heating Company, P. O. Box 236, Bloomfield, New Mexico, was awarded the contract to construct a water system at the Pueblo Bonito area, Chaco Canyon, on October 13, 1958. Notice to proceed was issued November 3, 1958, and the contract period was November 5 through February 2, 1959. Stop Order No. 1, of January 2, 1959, suspended work for 7 days, through January 9, due to bad weather, and extended the contract period through February 9, 1959.

Change Order No. 1 of February 7 authorized the contractor to make a connection between the new 4-inch transite line and the existing 1 and 1/4 inch distribution line, for \$85.00, and allowed a 3-day extension of the contract period, through February 12, 1959.

The project was to construct a well, steel cased, 15 feet in diameter, 33 feet deep, complete with concrete curb, sheet iron pumphouse, pump, gasoline engine, 1130 feet of water line, a 20,000 gallon steel storage tank, and a 4 inch fire hydrant with hose house. This provided for a complete water supply system, to be connected to an old existing distribution system.

Work started around mid-November with site preparation for the storage tank, and the job progressed slowly due to delays in obtaining material and equipment, and to bad weather during part of the time. The well was excavated with a crawler mounted backhoe, to water bearing quicksand at the design depth. The 15 foot diameter well casing was assembled in one 20 foot section on the ground, lowered into the hole, and the remainder of the casing assembled in place using the back hoe as a hoist. A subcontractor, American Tank Co., built the 20,000 gallon storage tank on the site, and made a neat and excellent installation.

We accepted the project conditionally as of February 12, 1959, subject to correction of minor deficiencies. There was a long delay in getting the Wallace & Tiernan chlorinator. Final inspection by W. Hall, WODC, on April 1, 1959, pretty well wrapped up the job and it was recommended for final acceptance. This project resulted in a good usable water system which functions well, has greatly increased the water supply at Pueblo Bonito as well as furnishing uncontaminated water. Since the contract did not provide for painting the pumphouse, which could be seen gleaming in the sun, from Pueblo Bonito, Ranger Charles Rembrandt Wyatt painted it a well selected adobe color, and it disappeared into the background.

Charles C. Sharp
Charles C. Sharp
Superintendent

L-54

Region Three
Santa Fe, New Mexico

FEB 25 1959

Memorandum

To: Director

From: Regional Chief of Lands

Subject: Water Rights Docket No. 2, Chaco Canyon National Monument

In connection with the review of water rights dockets in Region Three, we have made an analysis of each docket.

There is attached a list of the items that appear in this docket.

When Mr. Fields and I are in the Washington Office we would like to check your docket against the contents of the attached list. If there are any additions or corrections, arrangements will be made to obtain the necessary copies in order that our docket as well as those in the field will all be in agreement.

JOHN E. KELL

John E. Kell
Regional Chief of Lands

Attachment

In duplicate

Copy to: Supt., Chaco Canyon
WODC

WESTERN OFFICE DESIGN & CONSTRUCTION	
FEB 27 1959 A.M.	
CHIEF	NI
ADMIN. ASSIST.	
PERSONNEL	1.
PLANS & PROG.	
SAFETY	
ARCHITECT	
ENGINEER	3
LAND ARCH.	
ACTION TAKEN-DATE	
None	

Chaco Canyon National Monument - Docket No. 2

1. Memorandum from Custodian to Regional Director to report on well digging dated July 23, 1947.

In reply refer to:
154

June 20, 1955

Memorandum

To: Superintendent, Chaco Canyon
From: General Superintendent
Subject: Docket 22, Well, Chaco Canyon

A copy of Mr. Dunn's memorandum of June 7 relating to the well at Chaco Canyon which was dug in 1947 indicates that a copy of the memorandum was sent to you.

In checking our files here, we find no evidence as to who dug the well in 1947 but believe it was done by Gordon Vivian. A drawing submitted by Mr. Conn in 1951 shows existing wells as follows:

No. of wells at Chaco - 1/18/51

Chaco Well No. 1	Located 100' S.W. of old Trading Post
University Well No. 1	Located 200' south of campground on N. side of Chaco Wash
University Well #2	Located 60' S.E. University Well No. 1
New Concrete Pipe Well	Approximately 1000' S.E. Hdqtrs. and office building
Old C.C.C. Well	Located approximately 700' west of road crossing on Chaco Wash. S.W. of new headquarters

Our records also show one well dug by a crew under the supervision of Mr. Conn, which was completed in 1952.

We would appreciate having more complete data on all wells now in use at Chaco Canyon so that we can reply to Mr. Dunn's memorandum of June 7.

We are sorry to bother you with this detail but our records here are not complete, especially as to who dug the wells, when they were dug, and how many are now in use.

John M. Davis

John M. Davis
General Superintendent

HMR:imb

In reply refer to:
L54-L

[Handwritten signature and initials]

June 7, 1955

Memorandum

To: Regional Director, Region Three

From: Chief, Water Resources Section

Subject: Docket 22, Well, Chaco Canyon

We are distributing Docket 2, covering the well in use at Chaco Canyon in 1947, to you, the Monument, and Southwest National Monument Headquarters, with copies of this memorandum. The docket was prepared as Deed 11 in 1947 and not distributed because incomplete.

It will be appreciated if a statement is made for all four dockets, to indicate who dug the well, the year it was dug, and whether it is the one still in use. Our records also show proposals for four test wells and construction in 1950 and 1953 with another project scheduled for about 1958. The various sources and construction should be explained as they relate to this docket and the need for its revision to cover all sources.

No docket will be made for the Western Office of Design and Construction until our records are more complete.

SIGNED

A. van V. Dunn
Chief, Water Resources Section

Attachment

Copy to: Superintendent, Chaco Canyon, with attachment
Southwest National Monument Headquarters, with attachment
Western Office of Design and Construction



UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

Chaco Canyon

NATIONAL MONUMENT

Bloomfield, New Mexico

July 23,

19 47

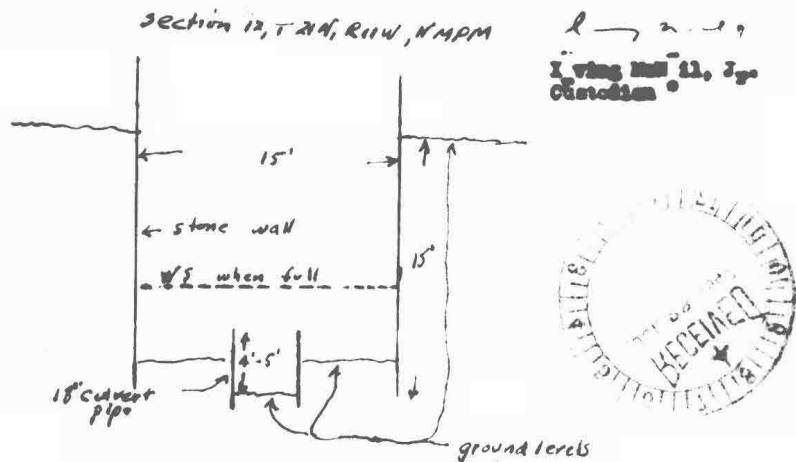
MEMORANDUM for the Regional Director, Region Three,
National Park Service.

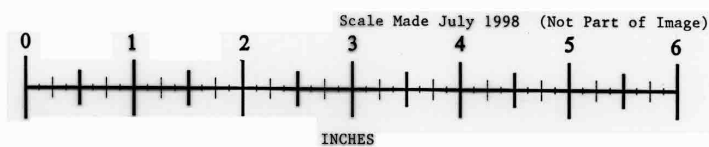
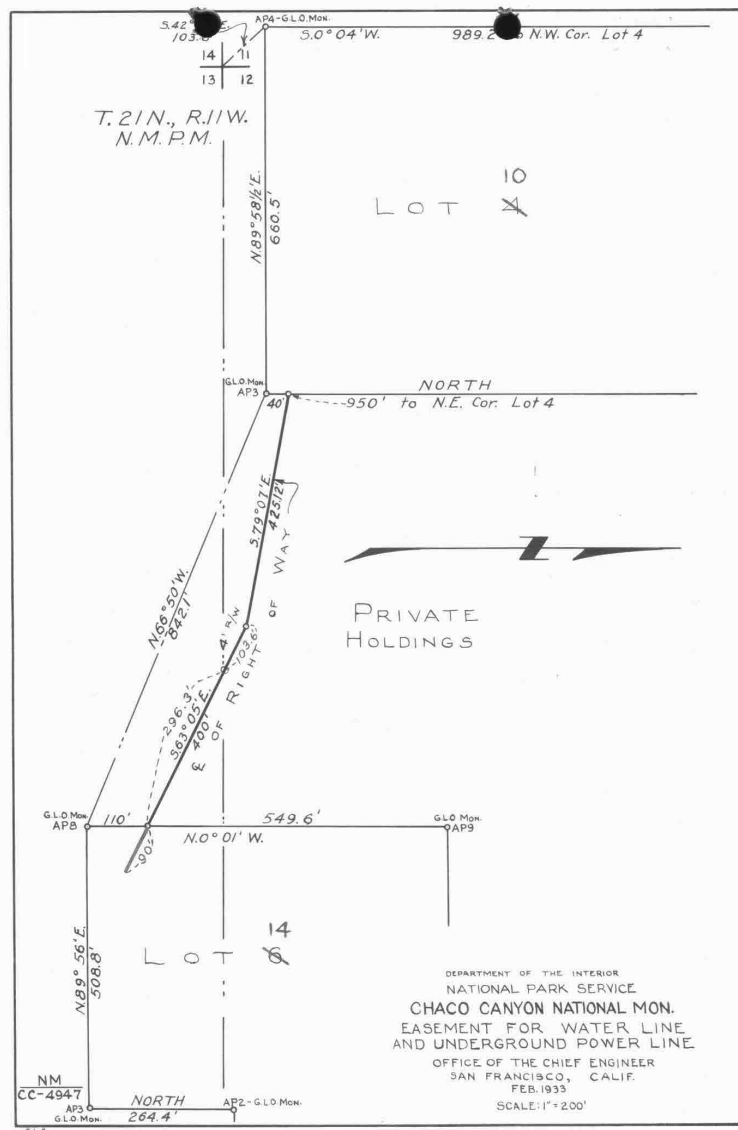
Reference is made to the memorandum from Regional Engineer Lassiter, which requests information about the water well here at Chaco Canyon National Monument for the Water Rights Division.

The well is a shallow, dug one. There is a rock wall enclosure with a roof over it. The roof is flush with the ground. The enclosure is approximately 15 feet in diameter and 15 feet deep. Inside the rock enclosure is a corrugated pipe culvert which is estimated at 5 feet long and 4 feet in diameter, which is set on end. The water is pumped from within the culvert, which is used as a casing. The depth of the water is estimated, when the well is full, at 4 feet.

The suction line is 12 feet long. The water is pumped, from the pump, 65 feet up and through at least 2200 feet of pipe.

The pump is a Red Jacket 0-500 with a capacity of 500 gallons per hour at this elevation which is a little over 6000 feet. The pump is powered by a Briggs and Stratton gasoline engine of 12 horse power, at 2600 to 3600 revolutions per minute.





Docket Information

Number of Documents in Docket 19

Documents Dated from 7/23/1947 to 1/26/1960

Docket Compiled: 2/3/2011