



WATER-RIGHT DOCKET

Hot Springs National Park

Docket No: 3

WELL #3

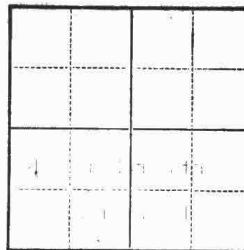
Supporting Hydro Data

03-24-1958: record of well

9-2-55
(Jan. 1927)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WATER RESOURCES BRANCH

RECORD OF WELL



Locate well on plat of section.

1. Location: State Arkansas County Garland
Nearest P. O. Hot Springs Direction from P. O. North
Distance from P. O. _____ miles; $\frac{1}{4}$ sec. _____, T. _____, R. _____
If in city, give street and number 200 Block Central Ave.
2. Owner: U. S. Dept. of Interior Address Hot Springs, Ark.
Driller: Ed. B. Mooney, Inc. Address Hot Springs, Ark.
3. Situation: Is well on upland, in valley, or on hillside? Valley
4. Elevation of top of well: _____ ft. (Above or below) the level of _____ (Sea, depot, lake, or stream)
5. Type of well: Drilled; kind of drilling rig used Cable Tool
(Dug, driven, bored, or drilled) (Solid tool, jetting, rotary, etc.)
6. Depth of well: 202 ft.; year in which well was finished 1955
Does well enter rock? Yes; if so, at what depth? 10 ft.; kind of rock Slate and slate
7. Diameter: At top 11 inches; at bottom 9 1/2 inches.
8. Principal water bed: Rock - Stratified Slate - Quartz
(Gravel, sand, clay, or rock. If rock, state kind)
Depth to principal water bed _____ ft.; thickness of bed _____ ft.
If other water supplies were found, give depth to each _____
9. Casings: Kind Well Casing; size 8"; length 176 89 ft.; between depths of 0 and 89 ft.
Kind _____; size _____; length _____ ft.; between depths of _____ and _____ ft.
Kind _____; size _____; length _____ ft.; between depths of _____ and _____ ft.
- Packers (if any): Depth at which packers were used None; kind _____
- Screen or Strainer: Was well finished with screen? No; kind of screen _____;
length of screen _____ ft.; diameter _____ inches; size of openings _____
10. Head: Does well at present overflow without pumping? No; did it overflow when new? No;
if flowing, give pressure _____ lb. per sq. inch; or height water will rise in a pipe _____ ft. above surface;
original pressure or head _____; if not flowing, give water level in well _____ ft. below surface.
11. Pump: Is the well pumped? Yes; kind of pump Turbine;
size or capacity of pump _____; kind of power _____
12. Yield: Natural flow at present (if any) _____ gallons per minute; original flow _____ gallons per minute;
well has been pumped at 150 gallons per minute continuously for 24 hours;
quantity of water ordinarily obtained from well _____ gallons per day.
13. Use: For what purpose is the water used? Coolant for heat exchanger
14. Quality of the water: Fresh - soft; is there an analysis? no contamination
(Hard or soft, fresh or salty, etc.)
15. Cost of well, not including pump: \$1,129.00 Temperature of water 54.74 ° F.
- Name of person filling blank _____
Date 3-24-58 Address D. S. Libbey, Superintendent, Hot Springs Natl. Park

(On the back of this sheet give the record of the hole through which the well passes and the depth of the hole.)

Jan. 1927)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WATER RESOURCES BRANCH

RECORD OF WELL

1. Location: State Arkansas County Garland
 Nearest P.O. Hot Springs Direction from P.O. North
 Distance from P.O. miles; sec. , T. , R.
 If in city, give street & no. 200 Black Central Avenue
2. Owner: U.S. Dept. of Interior Address Hot Springs, Arkansas
 Driller: Ed B. Mooney, Inc. Address Hot Springs, Arkansas
3. Situation: Is well on upland, in valley, or on hillside? Valley
4. Elevation of top of well: ft. the level of
5. Type of well: Drilled; kind of drilling rig used Cable Tool
6. Depth of well: 203 ft.; year in which well was finished March 1955
 Does well enter rock? Yes; If so, at what depth? 10 ft.; kind of rock Shale & Slate
7. Diameter: At top 11 inches; at bottom 9 1/2 inches.
8. Principal water bed: Rock - Stratified Slate - Quarts
 Depth to principal water bed ft.; thickness of bed ft.
 If other water supplies were found, give depth to each
9. Casings: Kind ID Well Casing; Size 8"; Length 161 ft.; between depths of 0 & 161
 Packers (if any): Depth at which packers were used None
 Screen or Strainer: Was well finished with screen? No
10. Head Does well at present overflow without pumping? No
 Did it overflow when new? No
11. Pump: Is the well pumped? Yes; kind of pump Turbine
12. Yield: Natural flow at present (if any) gallons per minute; original flow
 gallons per minute; well has been pumped at 85 gallons per minute
 continuously for 24 hours; quantity of water ordinarily obtained from well
224000 gallons per day.

13. Use: For what purpose is the water used? Coolant for Heat Exchange
14. Quality of the water: Fresh - Soft; is there an analysis? No contamination
Starting
15. Cost of well, not including pump: \$1,463.50 Temperature of water 69 degrees F.

Name of person filling blank D. S. Libbey, Superintendent

Date March 24, 1958 Address Hot Springs National Park, Arkansas

LOG OF WELL

Kind of Rock or Other Material	Depth, in feet		Thickness in feet	Remarks
	From	To		
<u>Earth - Broken Shale</u>	<u>0</u>	<u>10</u>		
<u>Shale or Slate</u>	<u>10</u>	<u>58</u>		<u>Some water quartz veins</u>
<u>Shale & quartz veins</u>	<u>58</u>	<u>78</u>		<u>1,500 gals. per hour</u>
<u>Hard Shale</u>	<u>78</u>	<u>95</u>		<u>Trace Iron Pyrite</u>
<u>Granite Ledge</u>	<u>95</u>	<u>108</u>		
<u>Slate - Clay Seams</u>	<u>108</u>	<u>144</u>		<u>Water stronger</u>
<u>Slate White Clay Seam</u>	<u>144</u>	<u>169</u>		<u>Thin granite seams</u>
<u>Slate - Quartz - Thin</u>	<u>169</u>	<u>203</u>		
<u>Granite Ledges</u>				<u>Well complete</u>

Other Supporting Information

NOTE TO THE FILES

HOT SPRINGS NATIONAL PARK

Arlington Lawn - Wells 1 and 2

HOSP Well No. 3

These wells are located on Arlington Lawn, at the north end of the city block which contains Bath House Row. I spoke with Jay Meredith, Utilities Foreman, about these wells. Jay is responsible for the water distribution system, its operation and maintenance.

Jay reported that about 1949 a central water cooling system was established at the park. Prior to this time each bath house had its own water cooling system. This new system acquired water by a pipeline which was laid in the Creek Arch for several hundred feet up stream. Flowing water in the Creek Arch (surface water drainage from the basin to the north) was diverted to the pipeline and flowed by gravity to a reservoir near the present cooling towers. Water was pumped, as needed, from the reservoir to the heat exchanger system. However, the water contained sediment and bits of trash which was undesirable, i.e., caused wear on the pump and build up of material within the heat exchanger pipes.

Jay started work at the park in 1972 and at that time the cooling water for the heat exchanger was obtained from the two subject wells. However, well yield did not meet the needs during peak demands. Further, Jay reports that after pumping for some time the wells produced water of increasing temperature. In an effort to increase the yield, assistance from Gary Moore was requested. Moore, a hydrologic engineer, was the Water Resources Coordinator for the Southwest Region. Jay reports that Moore had the wells cleaned out, but yield was still insufficient. (See memorandum of August 6, 1974 from Gary Moore to HOSP Superintendent as filed in Water Right Docket: HOSP 0003)

About 1974 the park tied into the City of Hot Springs water supply system to obtain the required water quantity for the heat exchanger system operation. This was accomplished by laying a 3" diameter pipeline from the city water pipeline in Central Avenue.

William Werrell
Hydrologist, Water Resources Division, NPS
October 30, 1986

*4th. Book #2
File
HOSP*

L54

AUG -6 1974

Memorandum

To: Superintendent, HOSP
From: Hydraulic Engineer, Water Resources, PSN-SWR
Subject: Trip Report - HOSP, June 17-19, 1974

PURPOSE: To test pump Cooler Well ^{#3} ~~#1~~ before and after acidizing the well.

ATTENDEES: Richard Rougemont, Engineering Aid, SWR
Garland Moore, Hydraulic Engineer, SWR

ACCOMPLISHMENTS

1. Cooler well ^{#3} ~~#1~~ was test pumped on June 18, 1974. Drawdown and recovery data collected (see attached).
2. Acidized well with 140 lb. of VOP Johnson Nu-Well tablets. Circulated well fluid and allowed to remain in well for 15 hours.
3. Test pumped well after acidizing on June 19, 1974. Drawdown and recovery data collected (see attached).

INTERPRETATION OF TEST RESULTS

Physical Data of Well:

Depth: 203 Feet (BGL)
Diameter: 8" ID
Casing Depth: 0-161 Feet
Perforations: 40-161 Feet (1/2" x 4")
Date Drilled: 10-30 March 1955
Temperature: 25°C (June 18-19, 1974)

RESULTS

The operation proved successful in increasing the production rate of the

well by at least 0.3 gpm/ft. of drawdown. Previous work by contractors and/or the park staff may have removed considerable amount of mud, etc. from the well prior to acidizing operation. It may well be that greater well efficiency can be realized if the acid solution were allowed to set in the well for a full 24-hour period.

The temperature of the water was measured at 25°C after it had flowed through 20 ft. of 2" pipe and 30 ft. of fire hose. The reading was considerably lower (7°C) than reported by the U. S. Geological Survey. On continuous pumping we may expect the water temperature to rise as it short-circuits the hot-springs-flow system. An alternative solution to cooling the hot-springs water for bathers is a must to protect and insure continued flow of the springs.

HOT WATER IS GOOD

SIGNED

Garland Moore

Enclosures

cc:
Chief of Maintenance, MRM-WASO, Attn: Vic Berte'
Chief of Maintenance, SWR
✓PSN-SWR

GMoore:ba 8/5/74

Standard Form 38 Prescribed by General Services Administration, Nov. 1949 Edition		INVITATION, BID, AND AWARD (SUPPLY CONTRACT)		CONTRACT NO. dated June 10, 1955	PAGE NO. 1	NUMBER OF PAGES 1
ISSUED BY Department of the Interior National Park Service Hot Springs National Park		ADDRESS Hot Springs National Park Arkansas				

INVITATION FOR BIDS					
DATE ISSUED May 26, 1955			INVITATION NO. 19-7		
Sealed bids in <u>quadruplicate</u> . SUBJECT TO THE TERMS AND CONDITIONS OF THIS INVITATION, ITS SCHEDULE AND THE ATTACHED GENERAL PROVISIONS, will be received at the above office until <u>10:00</u> o'clock <u>a.m.</u> , <u>CS</u> Time <u>June 10, 1955</u> (date), and at that time publicly opened, for furnishing the following supplies or services, at the time specified in the Schedule, for delivery f. o. b. <u>Hot Springs National Park, Arkansas</u> <i>General information and instructions to bidders are contained in the terms and conditions on the reverse hereof.</i>					
SCHEDULE					
ITEM NO.	SUPPLIES OR SERVICES	QUANTITY (Number of units)	UNIT	UNIT PRICE	AMOUNT
1.	Drilling water well, est. 200 lin. feet	200	1 ft.	4.40	880.00
2.	Furnishing and installing eight-inch well casing, est. 150 lin. feet	150	1 ft.	3.00	450.00
Award for both items will be made to one contractor. Bid guarantee will be required with each bid in the amount of twenty-five (25) per cent of the amount bid. The successful bidder will be required to furnish performance bonds on Government Standard Form, in the amount of fifty (50) per cent of the contract price. Telephone 700 for appointment for on-site inspection of work to be performed.					

BID		DATE June 10 - 1955
In compliance with the above, the undersigned offers and agrees, if this Bid be accepted within <u>60</u> calendar days (60 calendar days unless a different period be inserted by the bidder) from the date of the opening, to furnish any or all of the items upon which prices are quoted, at the price set opposite each item, delivered at the designated point(s) and within the time specified in the Schedule of the Invitation for Bids. Discounts will be allowed for prompt payment as follows: <u>None</u> percent, 10 calendar days; <u>None</u> percent, 20 calendar days; <u>None</u> percent, 30 calendar days.		
BIDDER REPRESENTS: (1) That the aggregate number of employees of the bidder and its affiliates is ☐ 500 or more, ☒ less than 500. (2) That he is a ☒ regular dealer in, ☐ manufacturer of, the supplies bid upon. (3) That he ☐ has, ☒ has not, employed or retained a company or person (other than a full-time employee) to solicit or secure this contract, and agrees to furnish information relating thereto as requested by the contracting officer.		
INDICATE WHETHER ☒ INDIVIDUAL; ☐ PARTNERSHIP; ☐ CORPORATION, INCORPORATED IN THE STATE OF		
NAME AND ADDRESS OF BIDDER (Street, city, zone, and State. Type or print) ESTATE OF ED. B. MOONEY, Deceased 214 Broadway Hot Springs, Ark.	SIGNATURE AND TITLE OF PERSON AUTHORIZED TO SIGN THIS BID (Type or print name and title under signature) ESTATE OF ED. B. MOONEY, Deceased (Signed) by Joe Mooney Executor	

AWARD		DATE June 10, 1955
ACCEPTED AS TO ITEMS NUMBERED 1 and 2	MAXIMUM AMOUNT \$ 1,660.50	UNITED STATES OF AMERICA BY (S. S.) D. S. Liseby
INVOICE FOR PAYMENT SHOULD BE MAILED TO The Superintendent Hot Springs National Park Arkansas		D. S. Liseby, Superintendent CONTRACTING OFFICER ACCOUNTING AND APPROPRIATION DATA 4LX1055 - 330(333.1) - 07
PAYMENT WILL BE MADE BY		

Standard Form 33 Prescribed by General Services Administration, Nov. 1949 Edition		INVITATION, BID, AND AWARD (SUPPLY CONTRACT)		CONTRACT NO. _____ ORDER NO. (If any) _____	PAGE NO. 1 NUMBER OF PAGES _____
ISSUED BY Department of the Interior National Park Service Hot Springs National Park			ADDRESS Hot Springs National Park Arkansas		

INVITATION FOR BIDS					
DATE ISSUED June 28, 1955			INVITATION NO. ~~1949~~		
Sealed bids in <u>quadruplicate</u> , SUBJECT TO THE TERMS AND CONDITIONS OF THIS INVITATION, ITS SCHEDULE AND THE ATTACHED GENERAL PROVISIONS, will be received at the above office until 10:00 o'clock <u>am.</u> , <u>central</u> Time June 28, 1955 (date), and at that time publicly opened, for furnishing the following supplies or services, at the time specified in the Schedule, for delivery f. o. b. <u>Hot Springs National Park, Arkansas</u> <i>General information and instructions to bidders are contained in the terms and conditions on the reverse hereof.</i>					
SCHEDULE					
ITEM NO.	SUPPLIES OR SERVICES	QUANTITY (Number of units)	UNIT	UNIT PRICE	AMOUNT
	~~Pump (as described on page 3 of this bid form)~~ ~~Bids must be sealed and marked for identification as follows:~~ ~~On the pump, mark for identification 1949, 6/28/1955~~				

BID		DATE June 30 1955
In compliance with the above, the undersigned offers and agrees, if this Bid be accepted within <u>30</u> calendar days (60 calendar days unless a different period be inserted by the bidder) from the date of the opening, to furnish any or all of the items upon which prices are quoted, at the price set opposite each item, delivered at the designated point(s) and within the time specified in the Schedule of the Invitation for Bids. Discounts will be allowed for prompt payment as follows: None percent, 10 calendar days; None percent, 20 calendar days; None percent, 30 calendar days.		
BIDDER REPRESENTS: (1) That the aggregate number of employees of the bidder and its affiliates is ☐ 500 or more, ☒ less than 500. (2) That he is a ☒ regular dealer in, ☐ manufacturer of, the supplies bid upon. (3) That he ☐ has, ☒ has not, employed or retained a company or person (other than a full-time employee) to solicit or secure this contract, and agrees to furnish information relating thereto as requested by the contracting officer.		
INDICATE WHETHER ☐ INDIVIDUAL; ☐ PARTNERSHIP; ☒ CORPORATION, INCORPORATED IN THE STATE OF <u>Arkansas</u>		
NAME AND ADDRESS OF BIDDER (Street, city, zone, and State. Type or print) Ed. B. Mooney Inc. 214 Broadway Hot Springs Ark.	SIGNATURE AND TITLE OF PERSON AUTHORIZED TO SIGN THIS BID (Type or print name and title under signature) (Sgd.) J. B. McNamee Secy. Treas.	

AWARD		DATE June 30, 1955
ACCEPTED AS TO ITEMS NUMBERED 1	AMOUNT 1,725.00	UNITED STATES OF AMERICA BY (Sgd.) D. S. Wiley
INVOICE FOR PAYMENT SHOULD BE MAILED TO _____		CONTRACTING OFFICER _____
PAYMENT WILL BE MADE BY _____		ACCOUNTING AND APPROPRIATION DATA _____

415-

Standard Form 98 Prescribed by General Services Administration, Nov. 1949 Edition		CONTRACT, ORDER, OR INVITATION NO. (As applicable) 19-9		PAGE NO. 3	
CONTINUATION SHEET (SUPPLY CONTRACT)					
ITEM NO.	SUPPLIES OR SERVICES	QUANTITY (Number of units)	UNIT	UNIT PRICE	AMOUNT
1.	Motor Driven Deep Well Turbine Pump to deliver two hundred (200) g.p.m. against t.d.h. of three hundred (300) feet at thirty-five hundred (3,500) r.p.m. described as follows: One twenty (20)-horsepower, three (3)-phase, sixty (60)-cycle, four hundred forty (440)-volt, thirty-five hundred (3,500) r.p.m. vertical hollow shaft weather proof motor with N.R.R.; one twelve (12) x four (4) discharge head bushed for three (3) inch discharge pipe; one hundred seventy-five (175) feet of four (4) inch x one (1) inch water lubricated discharge column; one five (5) stage six (6) inch M.C. turbine pump bowl; one four (4) inch suction strainer; Fairbanks Morse or equal. f.o.b. Hot Springs National Park, Arkansas, installed in well designated by the Contracting Officer, with twenty-four (24) hour period of testing.				\$1,725.00
2.	ALTERNATE: Above described pump in Item 1 without installation or testing The use of the name of a manufacturer or of any special brand in describing an item does not restrict bidders to that manufacturer's product or to the specific brand named. This method is used merely to indicate the particular type, design, character, or quality of the article desired. Bids will be considered on the products of other manufacturers and on other brands provided they conform to these general requirements. Bidder shall state the least number of calendar days in which shipment will be made after receipt of formal purchase order <u>30</u> Bidder shall furnish descriptive literature illustrating pump offered. Duplicate of Fairbanks Morse Pump Furnished on Other Well except for Motor Size.				\$1,450.00

NAME OF BIDDER OR CONTRACTOR
Ed. B. Mooney, Inc.

In reply refer to:
D5039

Hot Springs National Park, Arkansas

March 30, 1955

Air-Mail

Memorandum

To: Regional Director, Region Three
From: Superintendent, Hot Springs
Subject: New Cold Water Well, Hot Springs

Mr. Canfield's memorandum of March 18, 84219, suggesting that this park authorize the contractor to furnish the pump in accordance with the terms of his bid, was received on March 21.

We have now reached the 200-ft. level in the drilled well and estimate that we have penetrated 18 feet through the Big Fort Chert, which is water bearing, and had started in the Wumble Shale. It is our judgement that no further accumulation of water will be found in this formation. The temperature of the water in the well registers 68°F. but we have not been able to determine just what the flow of the well will be, until the pump is installed and tested. It has been estimated anywhere from 150 g.p.m. to between 200 and 300 g.p.m. and with the further estimate that the well will become more efficient after we have pumped it a while and also should the dry period of the past several years be improved.

This bore is being cased with 8" pipe which has been slotted below the 40-ft. level. These slots are $\frac{1}{2}$ " x 4" spaced around the casing in such manner as to not weaken the element.

We are still in the dark until it is determined as to just what amount of water the well will yield. It will be remembered that testing this well was Item Three in the proposal and bid received from the Estate of Ed B. Mooney - \$2,000.00 with the understanding that the test pump would become the property of the Government in place. There is attached specifications of the Fairbanks Morse Company.

We are now proceeding to issue work order to Ed B. Mooney Estate for inclusion of Item Three. After the well has been tested we will, of course, have data on which to write any future specifications.

Obligations to date are as follows:

200-ft. drilled well 8"	@ \$4.50 per foot	\$900.
200-ft. casing 8"	@ \$3.50 per foot	700

Job Order slotting 160 feet casing	\$ 40
200-ft. 4" pipe stock @ \$1.00 per foot	200
500-ft. 4" pipe stock from well to reservoir @ \$1.00 per foot	500
Miscellaneous force account	\$50
Electric connections, floats, switches, fuses	<u>\$200</u>
1 - Pump and testing	250
1 - Starter	2,000
	100
	<u>\$ 4,690</u>

The casing is now being installed and the pump will be available within the next, at which time we will know definitely what amount of available water we have.

It is our estimate that if the flow of the well will be a constant 200 g.p.m. plus, at 68°F., we would have sufficient water to operate. However, the maximum 300 g.p.m. would be what we are after. If the test shows below 200 g.p.m. then it would be our recommendation that another duplicate well be driven at least 200 feet from the vicinity of the first well and the two should produce a total of 300 g.p.m. plus.

As will be seen by the estimate of obligations above we would have sufficient funds from the original allotment to drive and case the well, but not sufficient balance to provide for the second pump. An additional allotment of \$2,000.00 would then provide us here with two pumps and over 300 g.p.m. of cold water at 68°F. Also, provide for any necessary travel expense.

We will keep you informed as to our progress on this project with a view of obtaining advice as to how to further proceed. When the pump and motor have been installed and the well tested, you will be further advised.

D. S. Libbey
Superintendent

Attachment
In duplicate

GCB:DSL:ah

[illegible]

Maps and Miscellaneous Information

Number of Documents in Docket	14		
Documents Dated from	1/15/1927	to	10/30/1986
Docket Compiled:	4/12/2011		