



WATER-RIGHT DOCKET

Mount Rushmore National Memorial

Docket No: 5

RUSHMORE SPRING/STORAGE AREA WELL.

Preliminary Docket Information

00-00-0000: water right record; identification no. moru w100206af03

WATER RIGHT RECORD

Park: MORU

Docket Number:

Federal # ~~8~~ 5

IDENTIFICATION NO: MORU W 1 0 0 2 0 6 A F 0 3

DITCH/WATER SYSTEM: Rushmore Spring Area adjacent to service road

SOURCE OF SUPPLY: Well #2

LOCATION: SE~~1~~ SW~~1~~ Sec. ~~10~~ T2S, R6E, BHM

7

WATER RIGHT:

Appropriator: United States of America, National Park Service

Application/Permit Number:

Certificate Record Number:

Date of Priority:

Quantity of Water:

Purpose:

Irrigated Land Description:

SUMMARY OF STATUS: Well was drilled from July 17, 1967 to October 6, 1967.

The Rushmore Spring Area well is in continuous use for the entire park. The east boundary well is cased with a pump. It is periodically pumped once a month, has a high mineral content.

Aquifer Tests

Two aquifer tests, or controlled pumping tests, were made on the wells drilled in 1967 in the Mount Rushmore National Memorial. Because the aquifers do not meet the criteria for computation by the formula, the hydraulic characteristics of the aquifers could not be determined. However, a general performance rate of the wells, specific capacities, and the drawdown and recovery of the water in the wells at various times during pumping were determined.

During the period August 15-18, an aquifer test (see figure 6) was made of the well in the storage area. The well was pumped at a rate of 62.5 gpm for 72 hours. The water level was drawn down 30.15 feet during the test and recovered to the original static level in 72 hours after the pump was stopped. The well flows at an average rate of 10 gpm and has 1.5 psi (pounds per square inch) shut in pressure at land surface.

The second test (see figure 7) was made on September 18-22 on the well drilled in the East ^{Boundary Area} Entrance Area, which was pumped at an average rate of 46 gpm for 72 hours. The water level in the well was drawn down 125.20 feet during this period. After the pump was stopped the water level rose rapidly for 24 hours, but the rate of recovery gradually decreased so that after 72 hours the water level was still 4.5 feet below the original static level and 1.60 feet below after 172 hours. The slow rate of rise probably indicates that the aquifer has a relatively low transmissibility. The following tabulation lists drawdown and specific capacities:

Well Name	Well Depth (ft)	Depth to Water (ft)	Total Drawdown (ft)	Specific Capacities (gpm/ft)
<u>Storage Area</u>	200	Flowing	30.15	1.74
^{Boundary} East Entrance Area	500	7.40	125.20	0.38

No 2

DRAWDOWN OF MOUNT RUSHMORE NATIONAL MEMORIAL TEST WELL DRILLED IN STORAGE AREA
BELOW SPRINGS.Well pumped at rate of 52.53 gpm for 72 hrs. From August 15 to 18, 1967.
Depth 200 ft, diameter 6 inches.

TIME	WATER LEVEL	MINUTES OF PUMPING
Aug. 15		
0908	-----	0
0915	19.66	7
0920	20.60	12
0930	21.16	22
0940	21.45	32
0950	21.64	42
1000	21.77	52
1015	21.90	67
1030	22.04	82
1045	22.12	97
1100	22.24	112
1115	22.33	127
1130	22.41	142
1200	22.56	172
1230	22.70	202
1300	22.80	232
1400	23.03	292
1500	23.22	352
1600	23.41	412
1700	23.56	472
1820	23.81	552
1900	23.93	592
2000	24.08	652
2100		712
2200	24.50	772
2300	24.40	832
2400	24.60	892
Aug. 16		
0100	24.80	952
0200	24.90	1012
0300	25.00	1072
0400	25.10	1132
0500	25.25	1192

Continued

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TIME	WATER LEVEL	MINUTES OF PUMPING
Aug. 16 (continued)		
0600	25.35	1252
0700	25.45	1312
0800	25.53	1372
0900	25.70	1432
1000	25.78	1492
1100	25.33	1552
1200	25.59	1612
1300	26.07	1672
1400	26.16	1732
1500	26.25	1792
1600	26.35	1852
1700	26.43	1912
1800	26.63	2032
2200	26.90	2212
2300	27.05	2272
2400	27.17	2332
Aug. 17		
0100	27.27	2392
0200	27.36	2452
0300	27.46	2512
0400	27.56	2572
0500	27.63	2632
0600	27.77	2692
0700	27.87	2752
0800	27.95	2812
0900	28.06	2872
1000	28.15	2932
1100	28.25	2992
1200	28.35	3052
1300	28.41	3112
1400	28.49	3172
1500	28.56	3232
1600	28.64	3292
1700	28.71	3352
1800	28.79	3412
1900	28.88	3472
2000	28.99	3532
2100	29.07	3592
2200	29.18	3652
2300	29.28	3712
2400	29.39	3772

Continued

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<u>TIME</u>	<u>WATER LEVEL</u>	<u>MINUTES OF PUMPING</u>
Aug. 18		
0100	29.49	3892
0200	29.57	3892
0300	29.62	3952
0400	29.72	4012
0500	29.80	4072
0600	29.90	4132
0700	30.04	4192
0800	30.07	4252
0900	30.15	4312

TEST WELL NUMBER 2

Mount Rushmore test well Storage Area. Drilled July 1967 by Ham Bros. Constr.

0 - 5 Granite wash, consisting of white feldspar, quartz and mica
 -10 Sand, and gray mica schist
 -15 Schist, mica, finely drilled up
 -30 Schist, same
 -35 Schist, apparently a weathered zone
 -50 Schist
 -55 Schist, fresher than above
 -65 Schist, more weathered
 -70 Schist, fresher
 -80 Schist, same, plus some granite; may be caved from top
 -85 Schist
 -95 Schist, fresh
 -100 Schist, weathered streak
 -105 Schist, fresh
 -110 Schist, weathered
 -115 Schist, fresh
 -120 Schist, and some granite, may be cavings
 -125 Schist, and some caved granite
 -130 Schist, very fine grained
 -140 Schist, some weathered
 -155 Schist, fresh
 -165 Schist, weathered
 -170 Schist, and granite
 -175 Schist
 -185 Schist, slightly weathered
 -190 Granite, fresh, consisting of white feldspar, quartz & mica
 -195 Granite, very fine grained, apparently very hard, as stained
 by bit fragments
 -200 Granite

Ham Bros. Constr.
Warren Ham

U.S. GEOLOGICAL SURVEY
WATER RESOURCES DIVISION

Test well No. 2
Pennington Co., S. Dak.
1 mi. W. Mayatona
T2S R6E Sec. 7 NE

Analyses by Geological Survey, United States Department of the Interior
(parts per million)

Sample number.....	Q-4031				
Date of collection.....	7-17-67				
Silica (SiO ₂).....	27				
Iron (Fe).....	.08				
Manganese (Mn).....	.00				
Calcium (Ca).....	11				
Magnesium (Mg).....	2.2				
Sodium (Na).....	10				
Potassium (K).....	2.3				
Bicarbonate (HCO ₃).....	49				
Carbonate (CO ₃).....	0				
Sulfate (SO ₄).....	7				
Chloride (Cl).....	2.3				
Fluoride (F).....	.1				
Nitrate (NO ₃).....	5.3				
Boron (B).....	.02				
Sodium-adsorption ratio (SAR).....	.7				
Dissolved solids					
Calculated.....	92				
Residue on evaporation at 180°C.....	97				
Hardness as CaCO ₃	36				
Noncarbonate hardness as CaCO ₃	0				
Alkalinity as CaCO ₃	40				
Specific conductance (micromhos at 25°C).....	117				
pH.....	6.8				
Color.....	2				

Lat.: 43-53-00N; Long.: 103-26-50; T(°F): 54; Source: Flowing; Owner: Nat'l Park Servi
Ht. Rushmore, Nat'l Memorial; Date drilled: 7-67; Depth: 200'; WAF: Schist; Prod.
inter. from 50-185'; Water level +41.58' abv. lsd; Sampled after pumping 2 hrs.;
Yield: 10 g.m. flow meas.; POC: end of pipe; Apper.: Clear; Use: Public supply;
Coll. by: D. C. Adolphson.

No. 2

RECOVERY OF MOUNT RUSHMORE NATIONAL MEMORIAL TEST WELL DRILLED IN STORAGE AREA
BELOW SPRINGS.Well pumped at rate of 52.53 gpm for 72 hrs. From August 15 to 18, 1967.
Depth 200 ft, diameter 6 inches.

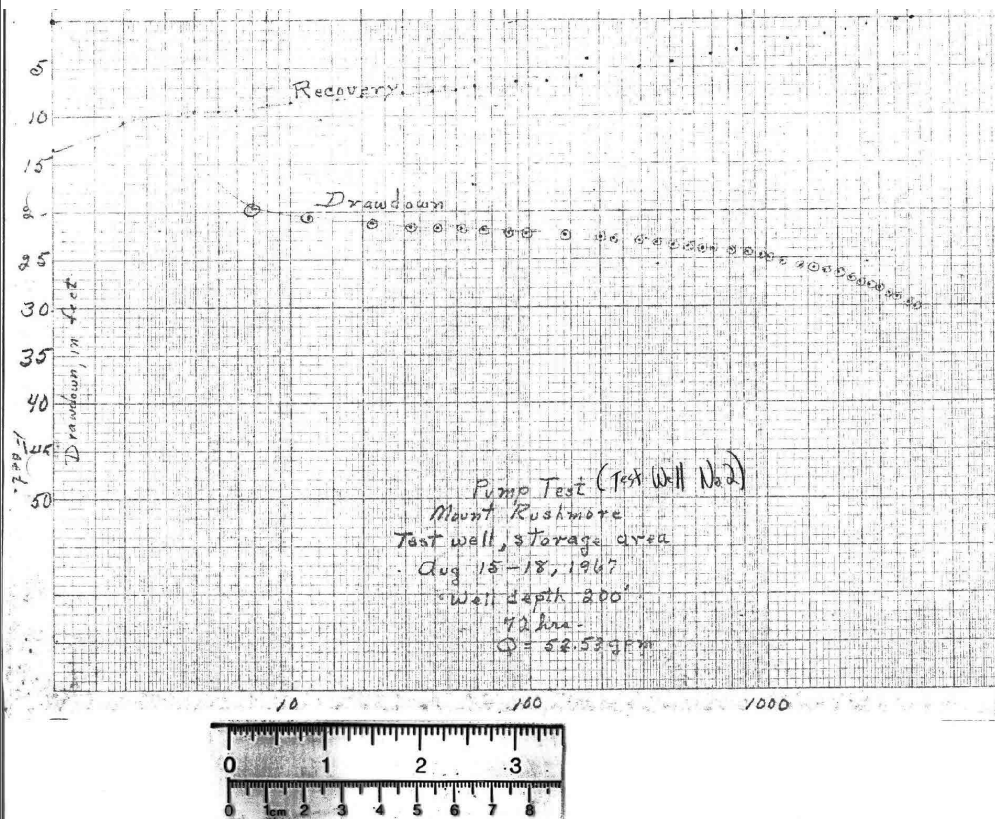
Recovery data for August 18-21, 1967.

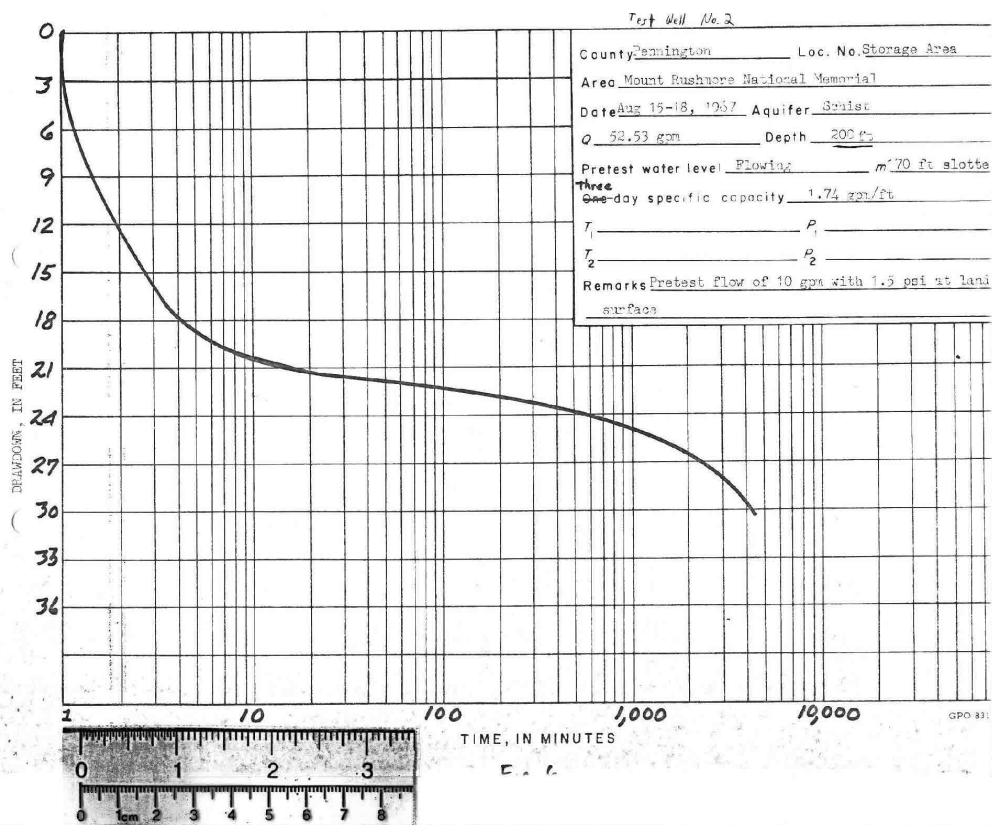
TIME	WATER LEVEL	MINUTES OF RECOVERY
Aug. 18		
0900	38.15	0
0911	19.07	1
0912	10.63	2
0913		3
0914	9.49	4
0915	9.23	5
0916	9.04	6
0918	8.75	8
0920	8.54	10
0922	8.40	12
0926	8.14	16
0930	7.96	20
0935	7.77	25
0940	7.63	30
0950	7.33	40
1000	7.13	50
1010	6.96	60
1025	6.73	75
1040	6.55	90
1055	6.37	105
1110	6.22	120
1200	5.78	170
1230	5.55	200
1300	5.34	230
1400	4.98	290
1500	4.63	350
1600	4.35	410
1700	4.07	470
1900	3.67	590
2200	3.12	770
Aug. 19		
0600	2.05	1260
0900	1.85	1440
1200	1.64	1620
1500	1.40	1800
1800	1.20	1980
2100	1.06	2160

Continued

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<u>TIME</u>	<u>WATER LEVEL</u>	<u>MINUTES OF RECOVERY</u>
Aug. 20		
0630	.62	2730
0900	.56	2880
2030	.20	3600
Aug. 21		
0715	Flowing	4215





Other Supporting Information

L54
LW3SC - MOBU
(WR Docket #3)

25 FEB 1969

CHAVEZ
WITUCKI
GRAY
RITCHEY

Memorandum

To: Chief, Division of Land and Water Rights, WASO
Attention: Chief, Branch of Water Resources

From: Chief, Office of Land and Water Rights, SSC

Subject: Temporary Water Right Docket #3, Mount Rushmore

Enclosed is a copy of a completion report for two test wells located in the East Boundary area and the Rushmore Spring area of Mount Rushmore National Memorial. Our office has established a temporary Water Right Docket (No. 3) for these test wells. As we receive and assemble further information and documentation concerning these wells, we shall advise your office accordingly.

(Sgd) [Signature]

Enclosures

cc:
Regional Director, Midwest
Supt., Mount Rushmore

DCHAVEZ/mdr/2/25/69
GSWITUCKI

(*) & Docket No. 5
A. Houtzager, 4-18-76

Form 10-174
(June 1962)UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

FACE SHEET FOR COMPLETION REPORT

Work Order No.
SSC-WR-67-BFund Symbol
14X1035

Park Mount Rushmore National Memorial	Region Midwest	Year Programmed 1967 F. Y.
Location in Park Test Well No. 1: Located in NE $\frac{1}{4}$ SW $\frac{1}{4}$, Sec. 8 East Boundary	State(s) South Dakota	PCP No.
Test Well No. 2: Located in SE $\frac{1}{4}$ SW $\frac{1}{4}$, Sec. 10 Rushmore Spring Area	County or Counties Pennington	Master Plan No.
Both in T2S; R6E; B.H.M.		Master Plan Corrected By
☒ Contract and/or ☐ Day Labor		As Built Drawings By
Work Order Title Drilling of Test Wells		Date Started June 17, 1967
		Date Completed October 6, 1967

DESCRIPTION OF FIXED ASSETS
(For completion by employee in charge of project)TOTAL COSTS
(For completion by FFO)

230 Water Systems, additions to present water system

Test Well No. 1 located East Boundary adjacent to highway. Cost \$13,908.00

Test Well No. 2 located Rushmore Spring Area adjacent to service road. Cost \$6,929.00

Total Cost \$20,837.00

Contract No. 14-10-7-973-80
Hamm Brothers Construction Co.
Keystone Route, Box 685
Rapid City, South Dakota

No Day Labor Used

TOTAL \$

DISTRIBUTION		THE FIXED ASSET DESCRIBED ABOVE HAS BEEN COMPLETED IN ACCORDANCE WITH APPROVED DRAWINGS, SPECIFICATIONS, AND AUTHORIZED CHANGES		
No.	To	Submitted By:	Title:	Date:
1	WASO	<i>Wallace B. Elms</i>	Chief Park Ranger	11-27-68
1	SSC	<i>Wallace O. McCaw</i>	Superintendent	11-27-68
1	MW Reg.			
1	MWRO-FFO			
1	MORU			
		COSTS VERIFIED	Title:	Date:
		BY		

11360

Form 10-174A
(June 1962)UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICEWork Order Number
SSC-WR-67-B

COMPOSITION OF COST FOR COMPLETION REPORT

Fund Symbol
14X1035

Park

Mount Rushmore National Memorial

Region

Midwest

Year Programmed
1967 F.Y.

Location in Park

Test Well No. 1: Located in NE¹/₄SW¹/₄; Sec.8 - Test Well No. 2: SE¹/₄SW¹/₄; Sec. 10; T2S; R6E; BH.M.

Work Order Title

Drilling of Test Wells

COMPOSITION OF COST

COSTS CHARGED TO FUNDS ALLOTTED TO FIELD FINANCE OFFICE

(1) Personal Services.....	\$	
(2) Travel.....		
(3) Contract Work.....	20,837.00	
(4) Supplies and Materials.....		
(5) Other Direct Expenses.....		
(6) Operation of Equipment.....		
(7) Depreciation of Equipment.....		
(8) Purchase of Construction Equipment.....		
(9) Purchase of Other Accountable Equipment.....		
(10) Other Costs:		
(11) TOTAL COST CHARGED TO FFO FUNDS	xxxxxxxxxx	\$
OTHER COSTS:		
(12) PS&S, AP, and/or Facilitating Services @ _____ %.....	\$	
(13) Inventory and Other Non-Fund Costs		
(14) GROSS WORK ORDER COSTS	xxxxxxxxxx	\$
LESS:		
(15) Residual Value of Construction Equipment on Line 8	\$	
(16) Other Credits		
(17) NET COST OF FIXED ASSETS	xxxxxxxxxx	\$

Identify other costs and other credits by line item entry, on an attached schedule, or explain in narrative.



IN REPLY REFER TO:

105
2
UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

Mount Rushmore National Memorial
Keystone, South Dakota 57751

October 12, 1967

G-54 LWSSC

Memorandum

To: Chief, Office of Land & Water Rights,
San Francisco Service Center

From: Superintendent, Mount Rushmore

Subject: Completion of Test Drilling - Contract No. 14-10-7-973-80

This is submitted in reply to Mr. Field's memorandum of August 17, 1967. We have inspected well locations #1 and #2 and find that both areas are in an acceptable condition.

Enclosed are necessary copies of "Unit Price Contract" for final payment on Contract No. 14-10-7-973-80, in the amount of \$14,251.70. Also enclosed are the original and four executed copies of "Release of Claims".

The items that exceed the contract quantities were approved by phone before authorization was given to the contractor to proceed. These are : Item No. 3 represents an increase of 100 ft.; Item No. 6 represents an increase of 195 ft.; and Item No. 8 represents an increase of 32 hrs.

Wallace O. McCaw
Wallace O. McCaw

Enclosure

In duplicate

483

RECEIVED	
San Francisco Planning and Service Center Office of Land and Water Rights NATIONAL PARK SERVICE	
OCT 17 1967	
ACT. INFO.	INITIALS DATE
CHIEF	
ASS'T. CHIEF	
STAFF ASS.	
SUPV. AP'R	
SUP. Hyd. Eng.	<i>Jms</i>
DOCKET	
FILE	

OPTIONAL FORM NO. 10
5010-104

UNITED STATES GOVERNMENT

110644 Contract
254
12524
Memorandum

TO : Bill Fields, Hydraulic Engineer

DATE: July 31, 1967

FROM : Acting Superintendent, Mount Rushmore National Memorial

SUBJECT: Test Wells 1 & 2, Mount Rushmore

Enclosed is Form 10-194, Unit Price Contract, for a partial payment on Contract No. 14-10-7-973-80, Drilling of Test Wells at Mount Rushmore.

The well at site No. 2 has been completed. The well is 200' deep and is cased with 187' of 6" casing with 135' perforated. At the present time the well has a sanitary seal and is flowing approximately 10 g.p.m. It was pumped at 37 g.p.m. for 24 hours during the development and at 75 g.p.m. for about two hours. The official pump test of this well is scheduled to begin August 15.

The well at site No. 1 was drilled to approximately 200 feet and then it began caving so badly that this site had to be abandoned. The site was moved about 30' from the original site towards the drainage. This has made it desirable to stage the casing and has been recommended by the U.S.G.S. and by the driller. The first 200' would be 8" casing at an additional cost of \$1.25 per foot or a total additional cost of \$250.00. The rest of the necessary casing would be stepped down to 6".

Wallace B. Elms
Wallace B. Elms
Acting Superintendent

Enclosure

Form 10-194
(Rev. 9/60)UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICEMount Rushmore National Memorial
(Park)

Check One:

Monthly
Estimate☒Final
Estimate☐

UNIT PRICE CONTRACT

ESTIMATE NO. 1	FOR (Period) June 17, 1967-July 27, 1967	DATE July 27, 1967
CONTRACT NO. 14-10-7-973-80	COMPLETION DATE	EXTENDED DATE
CONTRACTOR Hamm Bros. Construction		ORIGINAL CONTRACT \$21,932.00
PROJECT Drilling of Test Wells		CHANGE ORDERS* \$
LOCATION Mount Rushmore National Memorial		TOTAL CONTRACT \$21,932.00

ITEM NO.	CONTRACT QUANTITY	DESCRIPTION	QUANTITY TO DATE	UNIT PRICE	AMOUNT TO DATE
3	400	Lineal ft. of bore 8" in diameter, Hole #1	100	20.00	2,000.00
4	400	Lineal Ft. of bore 8" in diameter, Hole #2	200	20.00	4,000.00
5	600	Lineal ft. furnishing and installing 6" I.D. casing	52	3.00	156.00
6	200	Lineal ft. furnishing and installing 6" I.D. perforated casing	135	5.00	675.00
7	16	Hours Bailing test	8	12.00	96.00
8	136	Hours pumping test	-0-	-0-	-0-
9	2	Bores, plugging of abandoned exploratory bores	-0-	-0-	-0-
10	40	Hours developing well	20	12.00	240.00
11	20	Feet of reaming hole to 14" from 0' to 10' and placing concrete around casing	10	10.00	100.00
12	10	Days standby time for evaluation of well data	1	50.00	50.00

RECOMMENDED (Project Supervisor)

James W. Roberts
James W. Roberts
Acting Supervisory Hydraulic Engineer

APPROVED (Contracting Officer)

Bruce J. Miller
Bruce J. Miller, Actg Chief, LWSSC

DATE

8-7-67

SUMMARY

TOTAL TO DATE	\$ 7317.00
LESS RETAINED AMOUNT.....	731.70
NET.....	6585.30
LESS PREVIOUS PAYMENTS.....	-0-
LESS LIQUIDATED DAMAGES.....	-0-
DUE THIS ESTIMATE.....	6585.30
% COMPLETED TO DATE:	33.4

*Show Breakdown on Reverse

(See Reverse for Distribution)

MOUNT RUSHMORE NATIONAL MEMORIAL
COMPLETION REPORT NARRATIVE

Contract Number 14-10-7-973-80

Drilling of Test Wells

Test Well Number 1: Located near east boundary adjacent to Keystone road.

Test Well Number 2: Located in the Rushmore Spring area.

Contract Awarded June 2, 1967

Contractor: Hamm Brothers Construction

Keystone Route, Box 685

Rapid City, South Dakota

Original Contract Amount \$21,932.00

The Notice to Proceed was issued June 12, 1967. Notice of Beginning Date was issued June 21, 1967 establishing June 17, 1967 as the first calendar day of the contract. The Completion Date was established as October 15, 1967.

Change Order Number 1 was issued July 27, 1967 for a change in the pump test from 0 - 20 g.p.m. to 0 - 75 g.p.m., and increased the contract amount by \$1,088.00 to a total of \$23,020.00. A later reduction in the depth of Test Well Number 2 reduced the total contract amount to \$20,837.00.

Mr. Don Adolfson, Geologist, U. S. Geological Survey supervised the drilling operations in locations recommended by Mr. John Powell, District Chief, Water Resources Division, United States Geological Survey, Huron, South Dakota.

After consultation with Mr. Powell, United States Geological Survey and Mr. Weaver, Office of Land and Water Rights, it was decided to drill Test Well Number 2, located in the Rushmore Spring area, first because of management needs and lower cost to put the well into operation.

Mr Hamm moved his cable rig and equipment into the Memorial on June 24, 1967 to a location near the present water system in the Rushmore Spring area and adjacent to the service road. (Test Well Number 2) Mr. Hamm did drilling at two different locations, each within the Memorial boundaries. A location map is attached and made a part of this report.

Test Well Number 2: located in SE $\frac{1}{4}$ SW $\frac{1}{4}$, Sec. 7; T2S R6E; B. H. M. (Rushmore Spring Area). Drilling started June 25, 1967 and was completed July 18, 1967. The well was drilled to a depth of 200 feet. A piece of 12-inch casing, 30-feet long, was installed as

a collar, and the well was cemented to 30-feet. The well was cased with 6-inch casing. Permanent casing was installed July 19, 1967; six inch plain casing to 170-feet and then perforated casing to 186 feet and open bottom to 200 feet.

Upon completion of the well drilling operation the well was developed by surging, using the bailing bucket. The bailing bucket was lowered to the bottom of the well, then repeatedly surged by quickly raising the bucket to above the water surface and dropping the bucket to the bottom of the well, the developing process was performed. The well was also pumped 37 g.p.m. for 24 hours as a part of the development process.

A submersible pump developed for six-inch casing and with a capacity of up to 100 g.p.m. was used to test the yield of the well. The well was test pumped for 72 hours during August 15 - 18, 1967 at 52.53 g.p.m.

The well was disinfected and a sanitary seal installed August 25, 1967. Driller's log, drilling and test pump data, also a discharge drawdown relationship curve are attached and made a part of this report.

Test Well No. 1: Located in NE $\frac{1}{4}$ SW $\frac{1}{4}$; Sec. 8; T2S R6E; B.H.M., approximately 50 feet from the east boundary and adjacent to the Keystone road. Drilling was started July 28, 1967 and completed September 9, 1967. The well was drilled to a depth of 500 feet. A piece of 12 inch casing, 25 feet long, was installed as a collar in the well, it was then cemented to 25 feet.

Permanent casing was installed September 14-16, 1967. The well was cased with 6-inch casing. Plain casing was installed to the 100 foot level, then plain and perforated, at staggered intervals, to 370 feet. From 370 feet to 500 feet perforated casing was installed.

Well No. 1 was developed essentially as was well No. 2. The well was then test pumped at 46 gallons per minute for 72 hours. The pump test was conducted from September 19-22, 1967.

The well was disinfected and a sanitary cap installed September 28, 1967.

Driller's log and test pump data also a discharge drawdown relationship curve are attached and made a part of this report.

The construction was completed within the contract period time, with a final inspection made on October 12, 1967. The Letter of Acceptance was prepared accepting the work as complete on October 18, 1967. A copy of the final estimate is attached listing in detail the work accepted and its cost.

Maps and Miscellaneous Information

Test wk 11 2 (of 2)





WELL SITE
TEST WELL NUMBER 2

Docket Information

Number of Documents in Docket 21

Documents Dated from 7/27/1967 to 2/25/1969

Docket Compiled: 5/27/2011