



WATER-RIGHT DOCKET

Mount Rushmore National Memorial

Docket No: 3

WELL AT EAST BOUNDARY ADJACENT TO HIGHWAY

Preliminary Docket Information

00-00-0000: water right record; moru w080206bf03

WATER RIGHT RECORD

Park: MORU

Docket Number:
Federal #3

IDENTIFICATION NO: MORU W 0 8 0 2 0 6 B F 0 3

DITCH/WATER SYSTEM: East boundary adjacent to highway

SOURCE OF SUPPLY: Well #1

LOCATION: NE $\frac{1}{4}$ SW $\frac{1}{4}$ Sec. 8, T2S, R6E, BHM

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.

Supporting Hydro Data

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 52.5 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)
Storage Area	200	Flowing	30.15	1.74
<u>East ^{Boundary} Entrance Area</u>	500	7.40	125.20	0.38

Lat.: 43-52-30N
Long.: 103-25-45

File
U.S. DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WATER RESOURCES DIVISION

1st Boundary Well
Pennington Co., S. Dak.
1 mi W Keystone
Test Well No 1

Analyses by Geological Survey, United States Department of the Interior
9-268 q (parts per million)

Sample number.....	Q-4300					
Date of collection	9-19-67					
Silica (SiO ₂)	20					
Iron (Fe)	4.1					
Manganese (Mn)	.27					
Calcium (Ca)	38					
Magnesium (Mg)	14					
Sodium (Na)	12					
Potassium (K)	5.5					
Bicarbonate (HCO ₃)	179					
Carbonate (CO ₃)	0					
Sulfate (SO ₄)	23					
Chloride (Cl)	5.3					
Fluoride (F)	.6					
Nitrate (NO ₃)	.1					
Boron (B)	.04					
Sodium-adsorption ratio (SAR)....	.4					
Dissolved solids						
Calculated	--					
Residue on evaporation at 180°C .	210					
Hardness as CaCO ₃	152					
Noncarbonate hardness as CaCO ₃ ..	5					
Alkalinity as CaCO ₃	147					
Specific conductance (micromhos at 25°C)	336					
pH	7.6					
Color	1					

Source: Drilled; Owner: Nat. Park Service, Mt. Rushmore; Date drilled; 9-67; Depth: 50
WBF: Schist, Metamorphic rocks, undiff.; Prod. inter. from 370-500'; Water level 7.40'
1sd; Sampled after pumping 1 hr.; Yield: 52 g.m. pump meas.; FOC: End of pipe; Appear.
Clear; Use: Public supply; Coll. by: D. G. Adolphson; T(°F): 49

DRILLERS LOG OF EAST BOUNDARY WELL

TEST WELL NUMBER 1

1967

July 28,	0-10	Overburden
	10-30	Blue gray schist, clay, soft
	30-35	Schist, quartz, little harder
	35-40	Quartz, schist, fairly soft
	40-45	Quartz, mica, a little schist, looks like pegmatite dike
July 29	45-50	Mica, Quartz, some schist
	50-55	Mica, quartz, some schist, real soft
	55-60	Mica, quartz, some clay schist
	60-65	Soft schist, quartz, mica, getting less mica and quartz, soft, some or
	65-70	Schist, quartz, mica, some harder caving
July 31	70-75	Quartz, some mica hard
Aug 2	75-80	Quartz and 1st 12" mica
	80-85	Quartz, little schist and mica; first 2 1/2 ft very hard, last little soft
Aug 3	85-90	Layers of quartz and mica, mostly mica
	90-95	Quartz and mica
	95-100	Mostly mica
Aug 4	100-105	Mostly mica
	105-110	Mica, looks like some schist and possible fractures
	110-115	Schist and mica. Looks like some fractures
	115-120	Schist and mica
Aug 5	120-125	Schist and mica
	125-130	Gray Black schist quite hard
	130-135	Greenish black schist
Aug 10	135-140	Black schist - quite a lot of color
	140-145	Black schist - quite hard
	145-150	Black gray schist quite hard
	150-155	Black schist looks like some quartz
Aug 11	155-160	Gray-black schist
	160-165	Gray black schist some oxidation
	165-170	Schist to 168; 168-170 pegmatite, light colored mostly mica and spar
	170-175	Light colored pegmatite
Aug 19	175-180	Light colored pegmatite
	180-185	Light colored pegmatite, looks like mostly quartz and mica
	185-190	Light colored pegmatite, looks like mostly quartz and mica
	190-195	Light colored pegmatite
	195-200	Light colored pegmatite
Aug 22	200-205	Same, some change in last feet, looks like it might be schist
	205-210	Almost a redish schist and mica, real fine, not too hard
	210-215	Soft schist, some mica back in, started at 21 1/4 to pegmatite
	215-220	Light pegmatite
Aug 23	220-225	Light pegmatite
	225-230	Pegmatite to 228 changed to schist
	230-235	Gray black schist, quite soft
Aug 24	235-240	Schist to 237, back to pegmatite
Aug 25	240-245	Pegmatite to 243 back to schist
	245-250	A dark mica, schist hard
Aug 26	250-255	Dark mica, schist hard
	255-260	Mica, schist, quite hard
	260-265	Mica, schist, quite hard
Aug 27	265-270	Mica, schist to 269 then it looks like a little white clay and quartz
Aug 28	270-275	Gray schist, garnets, medium hard
	275-280	Gray schist, garnets, medium hard
	280-285	Gray schist, garnets, medium hard
	285-290	Gray to black fine grained schist
Aug 29	290-295	Gray black schist, medium hard
	295-300	Gray black schist, medium hard
	300-305	Gray black schist, medium hard
	305-310	Gray black schist, medium hard

Page two

1967

	310-315	Gray black schist, medium hard
Aug 30	315-320	Gray black schist, garnets, medium hard
	320-325	Gray black schist, garnets, medium hard
	325-330	Gray schist, less garnets, real hard at 324 feet
Aug 31	330-335	Gray schist, quite a lot of white, real hard
	335-340	Gray schist, not quite as hard
	340-345	Gray schist and garnets, medium hard
	345-350	Gray schist and garnets, medium hard
	350-355	Gray schist and garnets, medium hard
	355-360	Gray schist and garnets, medium hard
Sept 1	360-365	Gray schist and garnets, medium hard
	365-370	Gray schist and garnets, medium hard
	370-375	Schist, quartz, appears fractured from oxidation present
	375-380	Same to 379 then whitish rock
Sept 2	380-385	Light gray schist, medium hard
	385-390	Light gray schist, medium hard, some oxidation
	390-395	Light gray schist, medium hard, some oxidation
	395-400	Gray schist
Sept 5	400-405	Light gray schist, fair soft, maybe some white feldspar
Sept 6	405-410	Gray schist, light colored; oxidation indicates fracture
	410-415	Mostly fine grained gray schist, appears to be some fracturing
	415-420	Mixed coarse and fine schist, some white; fractures
	420-425	Mixed coarse and fine schist, some white; fractures
	425-430	Schist, some white and possible fractures
	430-435	Schist, some white and possible fractures
Sept 7	435-440	Schist, medium hard, light colored with white and brown-possible
	440-445	Schist, fine grained medium hard; gray with white and brown
	445-450	Schist, fine grained medium hard; gray with white and brown
	450-455	Schist, fine grained medium hard; gray with white and brown
	455-460	Mostly fine grained schist
Sept 8	460-465	Hard fine grained gray schist
	465-470	Hard fine grained gray schist
	470-475	Hard schist, gray, started getting a little coarse, showed little
	475-480	Hard schist, gray, fine with garnets
Sept 9	480-485	Schist, fairly fine, hard, some white, lots of garnets, possible
	485-490	Schist, fine, gray, garnets, medium hard
	490-495	Schist, fine, gray, garnets, medium hard
	495-500	Schist, fine, gray, garnets, medium hard

Harmon B. Coates
Warren

Sample description, lower test well at Mt. Rushmore, Aug-Sept. 1967.

Test Well No. 1

- 0- 20 no samples
- 25 schist, mica, fine grained, weathered
- 35 no sample
- 40 schist as above, and some coarse quartz, mica, feldspar. Driller logged granite pegmatite at 35 feet.
- 45 probably white granite; much schist cavings
- 50 granite, white; trace of caved schist
- 55 granite, or quartz-mica dike. Sample appears very low in feldspar
- 60 granite, consisting of white feldspar, muscovite, quartz, and much pyrite.
- 65 schist and granite. Probably a schist horse or stringer within the granite
- 70 granite, plus about half schist as above
- 75 granite, white
- 80 muscovite mica with a trace of quartz. Probably a mass of "bull-mica"
- 85 granite, fine-grained, white
- 90 "bull mica" zone, consisting of fine to coarse mica and quartz.
- 105 granite, fine grained mica, feldspar and quartz. Driller logged change @ 104
- 110 white pegmatite, consisting of mica and quartz with a trace of feldspar
- 115 pegmatite, same, plus some weathered, pyritic schist
- 120 schist, less weathered
- 125 schist, mica, pyritic; some caved pegmatite
- 135 mica schist, same. Most of Fe-stain is from bit chips.
- 160 mica schist, fresh and unstained, pyritic
- 165 mica schist, very pyritic, some oxidized.
- 170 schist as above, and new white granite. Driller logged change at 168 feet.
- 175 granite, somewhat coarser
- 185 granite, white, somewhat bit stained.
- 190 granite, same, but probably weathered or altered
- 195 granite, weathered to fresh
- 205 granite, same, and some red contact zone rock.
- 210 biotite-garnet-tourmaline schist
- 215 schist, as above, with some granite as below
- 220 granite, white but slightly weathered.
- 230 granite, slightly stained; some border zone rock
- 235 biotite-garnet schist
- 245 granite, white. Driller logged change back to schist at 234 feet.
- 265 biotite-garnet schist
- 270 schist with biotite and muscovite
- 275 contact zone, with garnet schist and fine grained granite
- 280 mixture, as above
- 285 biotite schist
- 290 biotite-garnet schist
- 295 schist and border zone pegmatite
- 300 muscovite-tourmaline schist
- 315 muscovite-biotite-garnet schist

(Over)

JOHN PAUL GRIES
CONSULTING GEOLOGIST

- 320 garnet schist
- 325 biotite-garnet schist
- 330 schist, same, slightly stained by bit chips
- 345 biotite schist, slightly bit stained
- 350 biotite garnet schist
- 360 muscovite-biotite schist
- 370 schist, same, bit stained
- 375 tourmaline-biotite-muscovite-garnet schist, weathered in addition to bit stain. Driller logged weathered and oxidized zone 370-75
- 380 same, and into fine grained granite
- 385 granite, white, fine to coarse grained
- 390 granite, same, and some very garnetiferous schist
- 400 border zone between chilled granite and schist

Comments: I'd look for water at and above 35 feet, around 168, 243, between 370-375, and around 380-400.

The contact zones seem to have suffered some alteration as reflected in the oxidation of pyrite to give iron staining. The oxidation is particularly notable at 170-175.

In summary, the zones which look as though they might yield water are likely to produce a high-iron, acid water.

Continued

TIME	WATER LEVEL	MINUTES OF RECOVERY
Sept. 23		
0100	25.57	960
0400	22.69	1140
0700	19.97	1320
1000	17.58	1500
1300	15.25	1680
1515	13.74	1815
1800	12.19	1980
2100	10.85	2160
2400	9.78	2340
0300	8.90	2520
0600	8.15	2700
0900	7.47	2880
1200	6.96	3060
1400	6.66	3180
1730	6.16	3390
2145	5.71	3645
Sept. 24		
0100	5.36	3840
0630	4.79	4170
0930	4.53	4350
1145	4.37	4565
1400	4.26	4700
1800	3.90	4940
Sept. 26		
0710	3.44	5650
1500	3.04	6120
Sept. 29		
1200	1.60	10050

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RECOVERY OF MOUNT RUSHMORE NATIONAL MEMORIAL TEST WELL DRILLED IN EAST BOUNDARY AREA

Well pumped at rate of 46 gpm for 72 hrs. From September 18 to 22, 1967.

TIME	WATER LEVEL	MINUTES OF RECOVERY
Sept. 22		
0900	125.20	0
0901	112.15	1
0902	110.15	2
0903	108.90	3
0904	108.05	4
0905	107.30	5
0906	106.65	6
0907	106.00	7
0908	105.44	8
0909	105.00	9
0910	104.24	10
0912	103.43	12
0914	102.56	14
0916	101.33	16
0918	100.54	18
0920	99.54	20
0925	97.02	25
0930	94.86	30
0945	89.04	45
0955	86.21	55
1005	83.42	65
1020	79.50	80
1040	74.89	100
1100	70.43	120
1130	63.99	150
1200	59.99	180
1230	55.99	210
1300	52.94	240
1400	48.23	300
1500	44.31	360
1600	40.84	420
1700	37.86	480
1900	33.58	600
2100	30.34	720
2300	27.73	840

Continued

TIME	WATER LEVEL	MINUTES OF PUMPING
0530	76.48	1230
0630	78.90	1290
0730	80.88	1350
0930	85.07	1470
1130	89.96	1590
1330	94.40	1710
1530	98.30	1830
1730	101.50	1950
1945	106.20	2085
2130	106.30	2190
2230	107.30	2250
Sept. 21		
0230	110.60	2490
0530	112.90	2670
0730	113.10	2790
0930	114.20	2910
1140	116.60	3040
1330	117.50	3150
1530	118.60	3270
1730	119.10	3390
1930	120.10	3510
2345	122.10	3765
Sept. 22		
0145	122.90	3885
0445	123.90	4065
0745	124.92	4245
0845	125.20	4305
0900	125.20	4320

No. 1

DRAWDOWN OF MOUNT RUSHMORE NATIONAL MEMORIAL TEST WELL DRILLED IN EAST BOUNDARY AREA

Well pumped at rate of 46 gpm for 72 hrs. From September 19 to 22, 1967.
Depth 500 ft, diameter 6 inches.

TIME	WATER LEVEL	PUMPING MINUTES OF PUMPING
Sept. 19		
0900	7.40	0
0901	9.44	1
0904	13.64	4
0906	14.53	6
0908	15.37	8
0910	16.10	10
0912	16.78	12
0915	17.66	15
0920	19.96	20
0925	20.10	25
0930	21.10	30
0940	22.81	40
0950	24.24	50
1000	25.50	60
1020	27.62	80
1040	29.26	100
1100	30.86	120
1130	32.74	150
1200	34.40	180
1245	41.64	225
1330	44.50	270
1430	47.50	330
1530	49.88	390
1630	51.91	450
1730	53.72	510
1830	55.06	570
1935	56.51	630
2030	57.85	690
2130	59.20	750
2230	60.86	810
2330	62.29	870
Sept. 20		
0030	64.10	930
0130	65.97	990
0230	67.86	1050
0330	70.16	1110
0430	72.89	1170

RECOVERY OF MOUNT RUSHMO NATIONAL MEMORIAL TEST WELL DRAINED IN EAST BOUNDARY AREA

Well pumped at 45.9 gpm for 24 hours. September 12 to September 13, 1967

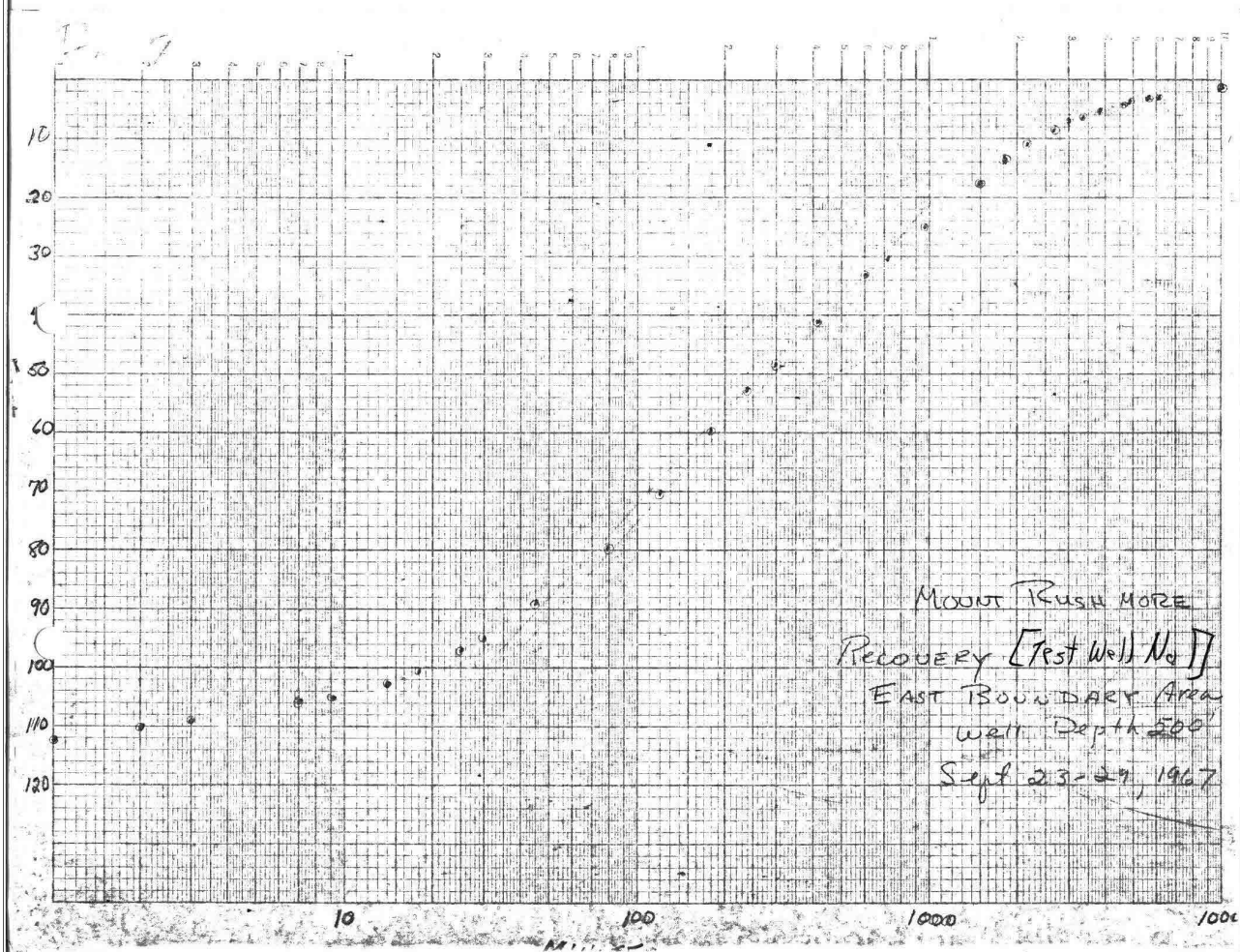
<u>TIME</u>	<u>WATER LEVEL</u>	<u>MINUTES OF RECOVERY</u>
Sept. 12		
1300	54.95	0
1301	46.25	1
1302	44.82	2
1303	44.15	3
1304	43.60	4
1305	43.18	5
1306	42.83	6
1307	42.49	7
1308	42.21	8
1309	41.92	9
1310	41.63	10
1315	40.47	15
1320	39.50	20
1325	38.56	25
1330	37.81	30
1340	36.48	40
1350	35.35	50
1400	34.36	60
1410	33.44	70
1425	32.27	85
1450	30.98	110
1520	28.94	140
1550	27.74	170
1620	26.63	200
1650	25.55	230
1720	24.75	260
1800	23.73	300
1900	22.30	360
2000	21.38	420
2100	20.58	480
2200	19.63	540
2300	18.19	600
Sept 13		
0100	15.86	720
0300	14.39	840
0600	13.22	1020
0700	12.96	1080
0800	12.76	1140
0900	12.55	1200
1000	11.69	1260
1100	12.24	1320
1200	12.08	1380
1300	11.92	1440
1400	11.70	1500

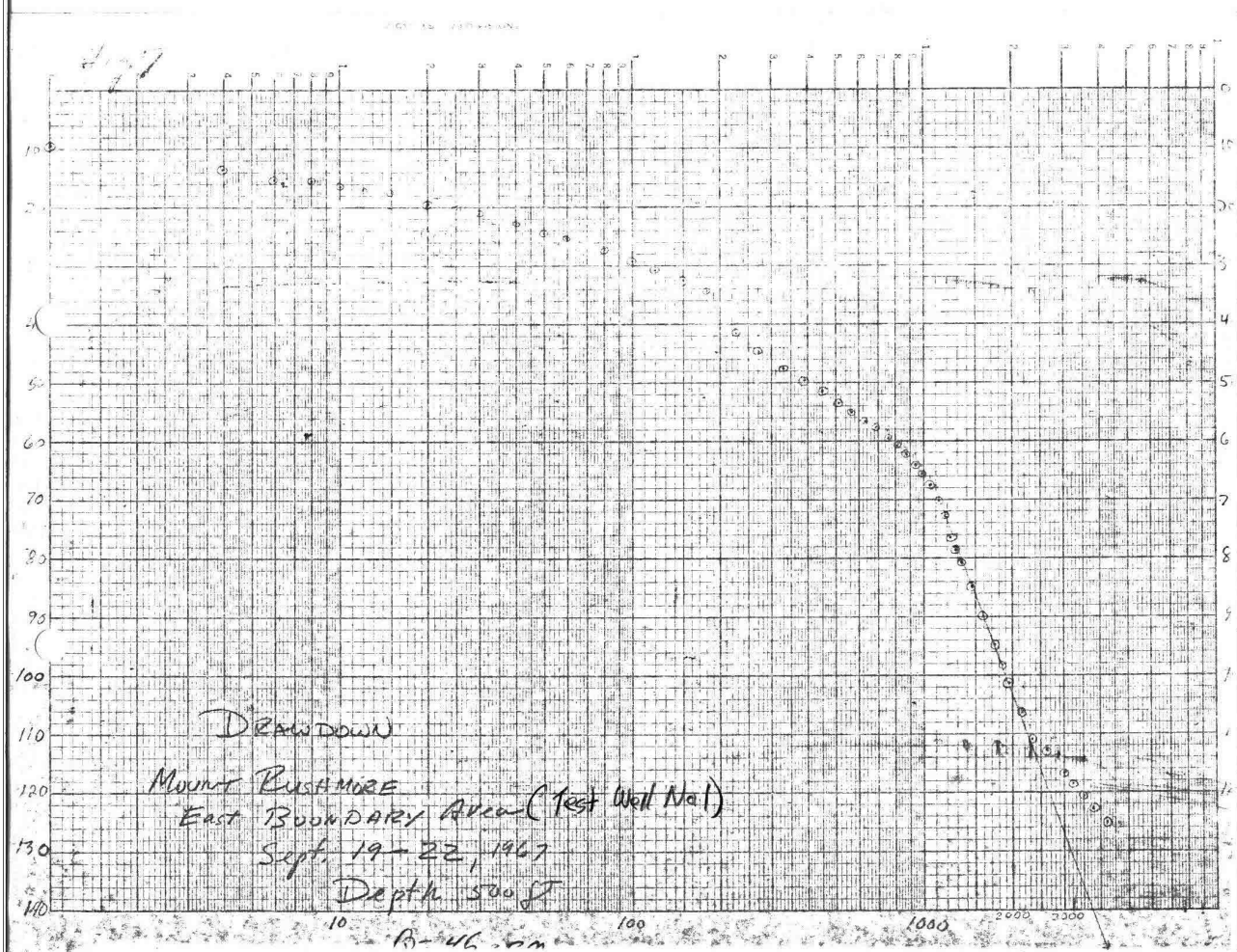
NO. 1

DRAWDOWN OF MOUNT HUSHMORE NATIONAL MEMORIAL TEST WELL DRILLED IN EAST BOUNDARY AREA

Well pumped at 459 gpm for 24 hours. From September 11 to September 12, 1967

<u>TIME</u>	<u>WATER LEVEL</u>	<u>MINUTES OF PUMPING</u>
Sept. 11		
1300	9.08	0
1301		1
1302	18.61	2
1303		3
1304		4
1305	22.16	5
1306	22.98	6
1307	23.72	7
1308	24.35	8
1309	25.02	9
1310	25.56	10
1315	29.08	15
1320	31.12	20
1325	32.90	25
1330	34.26	30
1340	36.48	40
1350	37.99	50
1400	39.08	60
1415	40.42	75
1430	41.34	90
1445	41.89	105
1500	42.20	120
1530	42.60	150
1600	42.97	180
1630	43.32	210
1700	43.58	240
1800	43.46	300
1900	43.63	360
2000	43.80	420
2100	44.31	480
2200	44.89	540
2300	45.34	600
2400	45.70	660
Sept 12		
0100	46.19	720
0200	46.73	780
0300	47.75	840
0420	48.05	900
0500	48.38	960
0600	49.01	1020
0700	49.77	1080
0800	50.46	1140
0900	51.31	1200
1000	52.00	1260
1100	52.63	1320
1200	53.19	1380
1300	54.95	1440





Other Supporting Information

LS4
LWSSC - MDRJ
(WR Docket #3)

25 FEB 1969

CHAVEZ
WITUCKI
GRAY
RITCHEE

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) JOHN E. GRAY

Enclosures

cc:
Regional Director, Midwest
Supt., Mount Rushmore

DCHAVEZ/mdr/2/25/69
GSWITUCKI

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

FACE SHEET FOR COMPLETION REPORT

Park Mount Rushmore National Memorial		Region Midwest	Work Order No. SSC-WR-67-B
Location in Park Test Well No. 1: Located in NE 1/4 SW 1/4, Sec. 8 East Boundary		State(s) South Dakota	Fund Symbol 14X1035
Test Well No. 2: Located in SE 1/4 SW 1/4, Sec. 10 Rushmore Spring Area		County or Counties Pennington	Year Programmed 1967 F. Y.
Both in T2S; R6E; B.H.M.		Master Plan No.	PCP No.
☒ Contract and/or ☐ Day Labor		Master Plan Corrected By	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: Wallace B. Elms Date: 11-27-68
1	WASO	By: <i>Wallace B. Elms</i>	Chief Park Ranger
1	SSC	Approved By: <i>Wallace O. McCaw</i>	Title: Wallace O. McCaw Date: 11-27-68
1	MW Reg.	By: <i>Wallace O. McCaw</i>	Superintendent
1	MWRO-FFO		
1	MORU		
COSTS VERIFIED		Title:	Date:
BY			

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
14X1035Park
Mount Rushmore National MemorialRegion
MidwestYear Programmed
1967 F.Y.

Location in Park

Test Well No. 1: Located in NE 1/4 SW 1/4, Sec. 8 - Test Well No. 2: SE 1/4 SW 1/4, 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:

UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

Mount Rushmore National Memorial
Keystone, South Dakota 57751

October 12, 1967

C-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

183

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>Jur</i>
DOCKET	
FILE	

OPTIONAL FORM NO. 10
5010-104

UNITED STATES GOVERNMENT

254
9/1/67
WBR
MOEY
Contract
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) <i>James W. Roberts</i> James W. Roberts Acting Supervisory Hydraulic Engineer		SUMMARY	
APPROVED (Contracting Officer) <i>Bruce J. Miller</i> Bruce J. Miller, Actg Chief, LWSSC		DATE 8-4-67	
		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 yeild 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 draw-down 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.

File

MRD

Water Resources Division
P. O. Box 1412
Huron, South Dakota
February 27, 1967

Mr. Wallace C. McGaw
Park Superintendent, National Park Service
Mt. Rushmore National Memorial
Keystone, South Dakota

Dear Mr. McGaw:

We plan to run a series of pumping tests on the east boundary well. We hope to conduct the first of these the week of March 13, 1967. We will appreciate any help you can give us in preliminary preparations and Don Adolphson of our Rapid City Office will contact you on this in the near future.

After the pumping tests, we will decide whether or not it is feasible to do some preliminary test drilling this fiscal year.

In his letter of October 31, 1966, Mr. Manuel Morris indicated that your agency would be able to issue a contract for some test drilling this fiscal year. I imagine that his office will want a sketch map showing proposed locations. By copy of this letter I am requesting information on any additional data that he will require.

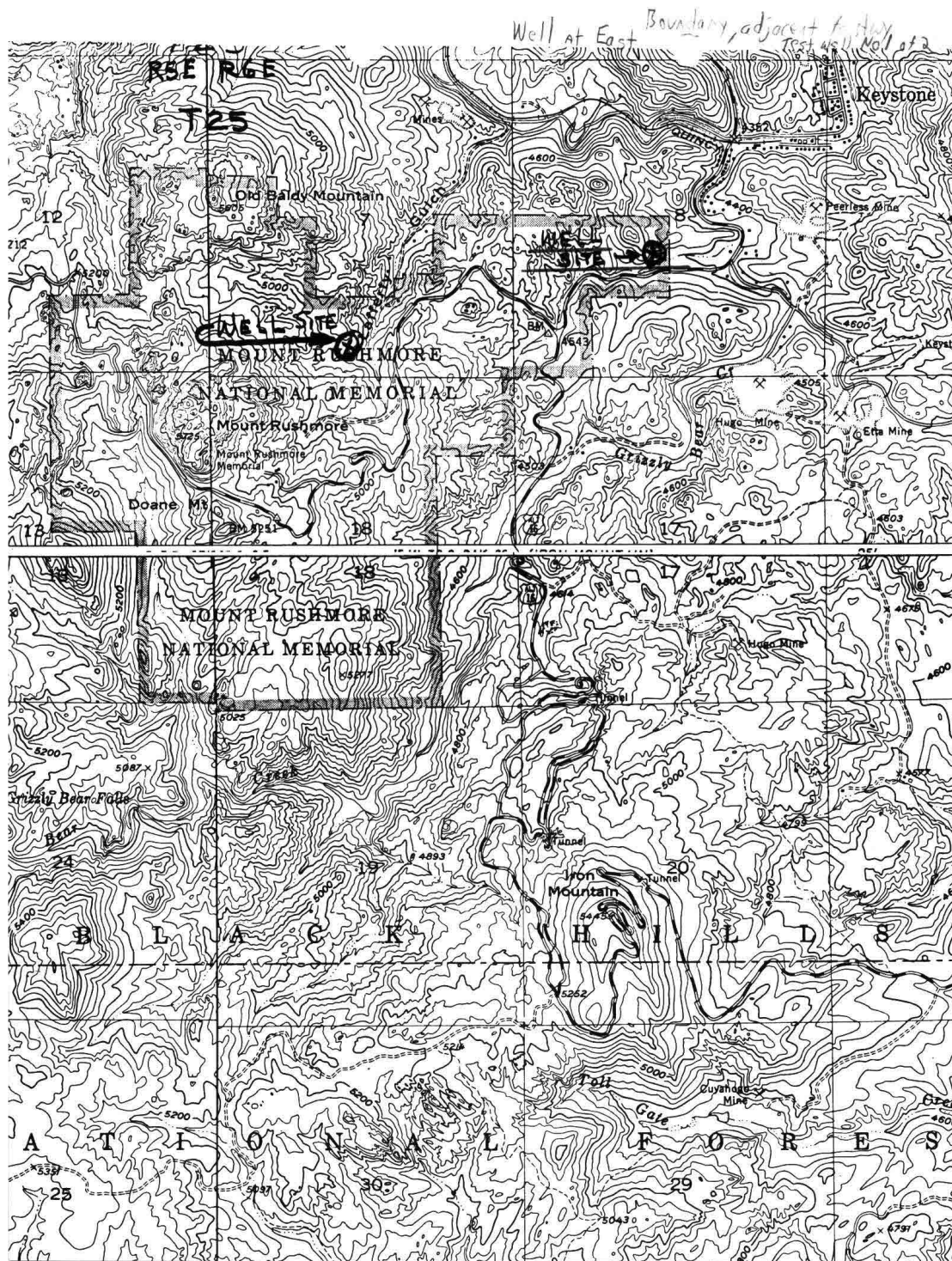
We will appreciate your assistance in this matter.

Sincerely,

J. E. Powell
District Chief (WRD)

cc:

Mr. Manuel Morris
Subdistrict Chief, Rapid City, S. Dak.





WELL SITE
TEST WELL NUMBER I

Docket Information

Number of Documents in Docket 26

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

Docket Compiled: 5/27/2011