



WATER-RIGHT DOCKET

Cumberland Gap National Historical Park

Docket No: 7

SUGAR RUN.

Supporting Hydro Data

08-03-1967: well drillers log; august 03, 1967

STATE OF TENNESSEE
Dept. of Conservation - Well Drillers Log

Log No. 453
Owner of well Art Suggs
Address: street 1000 city Madison phone 248-2817
Date well was completed August 3, 1967
License No. 988 Driller in charge of rig Art Suggs
County in which well is located Bell
Location: Name of road Sugar Run and approximately 3 miles
N, NE, E (SE), S, SW, W, NW (circle one) of Madison nearest town, school, store, etc.)

Mail To Tennessee Division of Water Resources
331-C Cordell Hull Bldg. Nashville phone 741-2572

Do not write in this space

Log of Well

Total Depth: 453 feet
to the water-bearing zones: (1) _____ feet
(2) _____ feet
(3) _____ feet

Yield of water-bearing zones: (1) 3 gpm 51 feet
(2) 10 gpm 90 feet
(3) _____ gpm _____ feet

Water level 4 feet below land surface.
Quality of water (sulfur, iron, oil, etc.) _____

Diameter of well: 8 inches from 0 feet to 21 feet
8 inches from 21 feet to 453 feet
_____ inches from _____ feet to _____ feet

Cased to 21 feet with 8 7/8 inch Steel casing
(type)

Perforated casing from _____ feet to _____ feet

Screen diameter _____ inches, set from _____ feet to _____ feet

Type Screen _____ Slot size _____

Gravel pack from _____ feet to _____ feet

Purpose of well: Domestic, Industrial, municipal, etc.

Remarks _____

Description of rock: Use field terms such as color of rock and type of rock material. Do not describe by geologic name.

Water information	Overburden above bedrock	From	To
		-Feet-	-Feet-
	dirt	0	10
	Equal	10	30
	Coal seam	30	35
	sandstone	35	110
	Coal seam	110	110
	Sand	110	120
	Coal plate	120	125
	Sand	125	130
	plate	130	165
	Coal seam & plate	165	210
	Sand	210	220
	Slate	220	240
	Sand	240	280
	Blue plate	280	300
	Gray Sand	300	330
	plate	330	340
	Water	340	400
	Coal	400	410
	crystalline	410	450
	plate	450	453



UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
Water Resources Division

JAN 31 1968

file
Moore
USGS

522 W. Jefferson St., Rm. 310
Louisville, Kentucky 40202
January 29, 1968

Chief, Office of Land and Water Rights
Washington Planning and Service Center
National Park Service
1370 North Lynn Street
Arlington, Virginia 22209

Attention: Mr. Gary Moore

Dear Sir:

Replying to your telephone request of January 26, 1968, we are enclosing herewith the measurements of water level made during the recovery period following the pumping tests at the Hensley Flats and Sugar Run test wells, Cumberland Gap National Historical Park. We are also enclosing an additional copy of the summary of the measurements taken during the pumping test. The latter are not all the measurements taken, of course, but are the pertinent measurements.

After your telephone call, Bob Cushman contacted Woodie Mull relative to the possibility of encountering more water by deeper drilling at the existing wells. We wish to amend our statements with regard to the Hensley Flats well. Because the static water level in this well stands 240 feet below land surface, because the first water encountered was at about 300 feet, and because the rock was dry at depth, we feel that it may not be economically feasible to drill this well deeper. The chances of encountering additional water would not justify the cost and it would be best to drill a second well if additional water is needed. At Sugar Run, however, we still feel that additional water could be obtained by deeper drilling.

Sincerely yours,

F. F. Schrader
F. F. Schrader
District Chief

Enclosures

cc: D.S. Mull, Lexington, Ky., WRD

PROGRESS ON DRILLING OF TEST WELL AT
SUGAR RUN, CUMBERLAND GAP NATIONAL HISTORICAL PARK

Test well (8-inch diameter) located about 100 feet south of Kentucky Highway 988 and about 300 feet west of Sugar Run Creek.

(Time shown in Eastern Daylight. Depths in feet;
colors refer to wet samples.)

Wednesday, July 19, 1967

Driller moved rig onto site and drilled 19 feet.

- * 0 - 10 Soil and weathered sandstone, light-reddish-brown.
- * 10 - 20 Sandstone, light-gray, fine-grained.

Thursday, July 20, 1967

No drilling, driller seeking new bit.

Friday, July 21, 1967

8:00 a.m. - Austin P. Whittaker, driller, arrived, installed new bit, began reaming hole.

10:00 a.m. - Reaming completed, 19 feet of 8-inch casing set, drilling begun.

- 20 - 30 Sandstone, light-gray, medium- to fine-grained, scattered dark-gray material.
- 30 - 40 Sandstone, light-gray, medium- to coarse-grained, abundant carbonaceous laminae, micaceous.
- 40 - 45 Sandstone - Same as 30-40.
- 45 - 50 Sandstone, medium- gray, medium-grained, carbonaceous laminae common.
- 50 - 60 Sandstone, dark-gray, fine- to medium-grained; micaceous on bedding surfaces, black laminae common.
- 60 - 70 Sandstone - Same as 50-60.

* (Samples collected by driller.)

- 70 - 75 Sandstone - Same as 60-70.
- 75 - 78 Sandstone, light-brownish-gray, fine-grained.
- 78 - 80 Sandstone, medium-gray, fine- to medium-grained.
- 80 - 90 Sandstone, light-gray, thick-bedded, very little carbonaceous material.
- 90 - 100 Sandstone, light-gray, few carbonaceous laminae in lower part.
- 100 - 105 Sandstone, very light-gray, fine- to medium-grained.
- 105 - 120 Shale, dark-gray.
- 120 - 130 Sandstone, dark-gray, thin, platy-bedded, micaceous on bedding surfaces.
- 130 - 140 Sandstone, dark-gray, thin-bedded.
- 140 - 148 Sandstone, dark-gray, thin shale partings.
- 148 - 155 Sandstone, medium-gray, shale partings less common.
- 155 - 160 Sandstone, dark-gray, platy-bedding, thin laminae, siltstone in lower 2 feet.
- 160 - 170 Sandstone, dark-gray, fine- to medium-grained, hard drilling.
- 170 - 180 Siltstone, dark-gray.
- 180 - 190 Sandstone, gray, fine- to medium-grained, few siltstone partings, drills hard.
- 190 - 205 Sandstone, light-gray, few thin beds of dark-gray shale in lower 2 feet.
- At 205 Coal, thin, 3-4 inches.
- 205 - 217 Sandstone, light-gray, fine-grained, very hard drilling.
- 217 - 220 Siltstone, dark-gray, stringers of sandstone, dark-gray, fine-grained.

220 - 222 Siltstone and shale, dark-gray.

222 - 230 Shale, dark-gray, soft, plant fossils.

6:40 p.m. - Drilling ceased, driller returned to Tazewell,
Tennessee. Water heard running into hole.

Thursday, July 27, 1967

Drilling resumed. Remainder of samples collected by driller,
samples described by D. S. Mull.

230 - 240 Siltstone, dark-gray.

240 - 250 Siltstone, dark-gray.

250 - 260 Sandstone, light-gray, fine- to medium-grained
shale laminae.

260 - 270 Sandstone, light-gray, very fine- to fine-grained.

270 - 280 Sandstone, light-gray, fine- to medium-grained,
micaceous.

280 - 290 Sandstone, very light-gray, fine- to medium-
grained, micaceous.

290 - 300 Siltstone, dark-gray, micaceous on bedding
surfaces.

300 - 310 Sandstone, medium-light-gray, fine-grained,
grains of carbonaceous or other black material
common, micaceous.

310 - 320 Sandstone, medium-gray, fine- to medium-grained,
micaceous, carbonaceous, laminae common.

320 - 330 Sandstone, same as 310-320 except carbonaceous
laminae less common.

330 - 340 Siltstone, dark-gray, slightly micaceous.

340 - 350 Sandstone, light-gray, fine- to medium-grained,
micaceous.

350 - 360 Shale, medium-dark-gray.

- 360 - 370 - Shale, medium-dark-gray.
- 370 - 380 - Shale, medium-dark-gray, slightly silty.
- 380 - 390 - Shale, medium-dark-gray.
- 390 - 400 - Shale, medium-dark-gray, silty.
- 400 - 410 - Sandstone, medium-light-gray, very fine-
to fine-grained, micaceous, thin coal
partings.
- 410 - 420 - Sandstone, light-gray, very fine-grained,
micaceous, abundant black material
probably carbonaceous.
- 420 - 430 - Sandstone, light-gray, very fine- to fine-
grained, micaceous, abundant grains of
carbonaceous material.
- 430 - 440 - Sandstone, same as 420-430.
- 440 - 450 - Sandstone, light-gray, fine-grained, shale
and siltstone, laminae common.
- 450 - 452 - Siltstone, medium-dark-gray, slightly
micaceous.

6:00 pm. - Drilling stopped.

PUMPING TEST MADE ON TEST WELL
AT SUGAR RUN

Thursday, August 3, 1967

- 10:30 a.m. - Driller arrived and began setting air-jet and discharge pipe. Well was to be pumped with compressed air because electrical power not available at well site. Driller installed jet device which is 3.2 feet in length. Bottom of jet was set 444.2 feet below top of casing which is 0.5 feet above land surface. The bottom of the jet was 8.3 feet above the bottom of the well.
- 4:45 p.m. - Installation of discharge pipe completed.
- 4:55 p.m. - First attempts to pump well unsuccessful because driller's compressor too small.
- 6:15 p.m. - Driller obtained larger compressor capable of 200 psi.

Friday, August 4, 1967

- 9:00 a.m. - Driller arrived, test began.

DISCHARGE PIPE - One and 1/4 inch galvanized pipe discharging through a gate valve thence into 55-gallon barrel. Overflow from barrel collected behind dam and measured with bucket as water flowed from impoundment through 4-inch pipe. This procedure necessary because high air pressure made conventional discharge measurements impossible.

AIRLINE - Total length of 1/4-inch galvanized pipe 441 feet.

DURATION OF TEST - Friday, August 4, 1967. Pumped for 6 hours and 50 minutes.

PUMPING RATE - Stabilized at 12 gallons per minute.

STATIC WATER LEVEL AT START OF TEST - 7.1 feet below top of casing.

PUMPING LEVEL AT END OF PUMPING - 210 feet below top of casing.

SPECIFIC CAPACITY OF WELL - About 0.06 gallons per minute per foot of drawdown.

CHEMICAL QUALITY OF WATER - August 4, 1967, 10:30 a.m., Temperature, 57°F; pH, 7.0; hardness, 6 grains per gallon(102 ppm); chloride, 5 ppm; iron, 1.0 ppm. Sample for complete chemical analysis collected. Results of this analysis not available at time of this writing.

Data on water levels and pumping rates during the test are summarized in the following table:

Date	Time	Depth to water ^{1/} below top casing (feet)	Yield of well-gpm
Aug. 4, 1967	0900	7.1	0
	0912	8.7	2/
	0919		
	0930		
	0933	79	45
	0933	95	30
	0935	108	30
	0945	141	25.5
	0955	160	20.0
	1005	172	16.3
	1015	181	15.0
	1045	191	14.0
	1107	196	13.0
	1131	200	13.0
	1145	201	15.0
	1200	202	13.0
	1300	207	13.0
	1330	208	13.0
	1415	209	12.0
	1445	209	12.0
	1500	209	12.0
	1530	210	12.0
	1545	210	12.0
	1550	214	12.0
	1602	Pump off.	

^{1/} Depth to water measured with electric tape.

^{2/} Although pump in operation, no flow from discharge line.

PROVISIONAL RECORDS, SUBJECT TO REVISION

 UNITED STATES DEPARTMENT OF THE INTERIOR
 GEOLOGICAL SURVEY
 WATER ANALYSIS

2GW

Location Hensley Flats, Kentucky County Bell
 Source Drilled well Depth (ft) 450 Diam (in.)
 Cased to (ft) Date drilled July 1967 Point of coll. At well
 Owner Job Corps, Middlesboro, Kentucky
 Treatment Use Public supply
 WBF Sandstone and shale, 387-391 ft. WL 240 ft. Yield 7 GPM pump measured
 Temp (°F) 55 Appear. when coll. Slightly turbid
 Collected August 2, 1967 By D. V. Whitesides
 Remarks Samples for iron and manganese filtered clear when collected. Sampled after pumping

6 hours.	ppm	epm		ppm	epm
Silica (SiO ₂)	6.3	--	Bicarbonate (HCO ₃)	11	0.18
Aluminum (Al)			Carbonate (CO ₃)	0	.00
Iron (Fe)	.22	--			
Manganese (Mn)	.10	--	Sulfate (SO ₄)	2.0	.04
			Chloride (Cl)	.5	.01
			Fluoride (F)	.1	.01
Calcium (Ca)	1.6	0.08			
Magnesium (Mg)	.7	.06	Nitrate (NO ₃)	.1	.00
Sodium (Na)	.8	.04			
Potassium (K)	.9	.02			
Total		0.20	Total		0.24
	ppm				
			Specific conductance (micromhos at 25° C)	24	
Dissolved solids:			pH	6.1	
Calculated	18		Color		
Residue on evaporation at 180° C	27				
Hardness as CaCO ₃	7				
Noncarbonate	0				

Lab. No. Col 42776

Field No.

Project

WIS WRD GW

RELEASE OF CLAIMS

For and in consideration of the receipt of final payment in the amount of \$6,535.00 from the United States of America (hereinafter called the Government) under and pursuant to Contract No. 14-10-1-380-1, for drilling two (2) test wells at Cumberland Gap National Historical Park, one at Hensley Flat and one at Sugar Run Area, the undersigned hereby does remise, release and discharge the Government, its officers, agents, and employees of and from any and all claims and demands whatsoever under or arising from the said contract, except specified claims in stated amounts listed as below:

No Exceptions

This release has been executed this 10 day of

Austin P. Whitaker, Well Drilling Co.

By *Austin P. Whitaker*

Owner
(Title)

Copy to: WSC
WASO
SERO
WCRO
Robert Cushman, USGS
Center Director, Gap JCCC

INVOICE ~~XXXXXXXXXXXX~~ INVOICE

TAEWELL, TENN. August 10, 19 67

National Park Service - Cumberland Gap Natl. Hist. Park

P. O. Box 840, Middlesboro, Kentucky 40965

IN ACCOUNT WITH

Austin P. Whitaker

— WELL DRILLING —

• Pumps • Pipes • Supplies 37879

PHONE 626-3481

TAEWELL, TENNESSEE

- Hensley Flat -

Contract No. 14-10-1-380-1 P.O. 380-70

Item		
1	Moving drilling equipment	\$ 500.00
2	Drilling 8" hole 454 Ft. X \$5.00	2,270.00
3	21 Ft. 6" casing X \$5.00	105.00
4	Developing well 4 hrs. X \$50.	200.00
5	Resp testing 13Hrs. X \$25.	325.00
6	Standby time for crew 8 hrs. X \$15.00	120.00
7	Plugging abandoned hole	.00

TOTAL \$ 3,520.00

\$ 3,520.00

PROVISIONAL RECORDS, SUBJECT TO REVISION

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

2GW

WATER ANALYSIS

Location Middlesboro, Kentucky - Sugar Run County Bell
Source Drilled well Depth (ft) 450 Diam (in.) _____
Cased to (ft) _____ Date drilled July 1967 Point of coll. At well
Owner Job Corps, Middlesboro, Kentucky
Treatment _____ Use Public supply
WBF Sandstone and shale WL 4 ft. below LSD Yield 12 GPM pump measured
Temp (°F) 57 Appear. when coll. Clear
Collected August 4, 1967 By D. V. Whitesides
Remarks Samples for iron and manganese filtered clear when collected. Sampled after pumping

5 hours.	ppm	epm		ppm	epm
Silica (SiO ₂)	8.0	--	Bicarbonate (HCO ₃)	128	2.10
Aluminum (Al)			Carbonate (CO ₃)	0	.00
Iron (Fe)	.13	--			
Manganese (Mn)	.21	--	Sulfate (SO ₄)	5.6	.12
			Chloride (Cl)	1.5	.04
			Fluoride (F)	.2	.01
Calcium (Ca)	33	1.65			
Magnesium (Mg)	5.1	.42	Nitrate (NO ₃)	.1	.00
Sodium (Na)	1.2	.05			
Potassium (K)	4.1	.10			
Total		2.22	Total		2.27

	ppm	Specific conductance (micromhos at 25° C)	212
Dissolved solids:		pH	7.5
Calculated	122	Color	
Residue on evaporation at 180°C	133		
Hardness as CaCO ₃	104		
Noncarbonate	0		

Lab. No.	Col	42777	Field No.	Project	WIS WRD GW
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Other Supporting Information

RELEASE OF CLAIMS

For and in consideration of the receipt of final payment in the amount of \$6,535.00 from the United States of America (hereinafter called the Government) under and pursuant to Contract No. 14-10-1-380-1, for drilling two (2) test wells at Cumberland Gap National Historical Park, one at Hensley Flat and one at Sugar Run Area, the undersigned hereby does remise, release and discharge the Government, its officers, agents, and employees of and from any and all claims and demands whatsoever under or arising from the said contract, except specified claims in stated amounts listed as below:

No Exceptions

This release has been executed this 10 day of August, 1967.

Austin P. Whitaker, Well Drilling Co.

by *Austin P. Whitaker*

Owner
(Title)

Copy to: WEC
WASO
SENO
MCRO
Robert Cushman, USGS
Center Director, Gap JCCC

~~INVOICE~~ ~~XXXXXXXXXXXX~~ INVOICE

FAZEWELL TENN. August 10, 1967

National Park Service - Cumberland Gap Natl. Hist. Park

P. O. Box 840, Middlesboro, Kentucky 40965

IN ACCOUNT WITH

Austin P. Whitaker

— WELL DRILLING —

• Pumps • Pipes • Supplies 37879

PHONE 626-3481

FAZEWELL, TENNESSEE

~~Sugar run area~~

Contract No. 14-10-1-380-1 P.O. 380-70

Item	Description	Rate	Quantity	Amount	Balance
1	Drilling 8" hole 453 Ft. X \$5.00	\$5.00	453	\$2,265.00	2,265.00
2	Casing 21 Ft. 8" X \$5.00	\$5.00	21	105.00	
3	Developing well 4 hrs. X \$50.00	\$50.00	4	200.00	
4	Pump testing 13 hrs. X \$25.	\$25.00	13	325.00	325.00
5	Standby time for crew 8 hrs. X \$15.00	\$15.00	8	120.00	120.00
6	Plugging test well hole abandoned				
TOTAL				\$3,015.00	

\$ 3,015.00
 \$ 3,015.00

Docket Information

Number of Documents in Docket 14

Documents Dated from 7/19/1967 to 1/26/1968

Docket Compiled: 2/15/2011