



WATER-RIGHT DOCKET

Great Smoky Mountains National Park

Docket No: 9

SPRING & WELL CATALOOCHEE RESIDENTIAL AREA

Preliminary Docket Information

00-00-0000: intro: see grsm docket 1 for map and preliminary map of water sources

SEE GREAT SMOKY MOUNTAIN DOCKET NO. 1 FOR MAP
AND PRELIMINARY MAP SHOWING LOCATIONS OF
WATER SOURCES WITHIN THE PARK.

WATER RIGHTS DOCKET

Cataloochee Maintenance Area

Great Smoky Mountains National Park

NAME OF SYSTEM: Cataloochee Maintenance Area, Quarters #3LOCATION: Park Route 14, about
2-3/4 miles from
North Carolina 284LOCATION: STATE: North Carolina COUNTY: HaywoodA. Source of SupplyLocation - Reference to Permanent LandmarkCoordinates

1. A small spring

Located 1,350 feet west of Residence #3
and 50 feet north of Route #14.Lat. N 35°27'44.5"
Long. W 83°05'53"

This is a gravity flow system. The spring in which the intake is located is enclosed by a 2' x 2' concrete box. The storage reservoir consists of a 500 gallon aluminum tank located 21 feet downhill from the spring connected by a 2" cast iron supply main. Elevation of the tank is about 2,720 feet, while the elevation in the use area is about 2,665 feet. There is no water treatment.

B. Consumption:

This system is not metered; estimated consumption is 109,000 gallons per year.

This system serves a single family residence.

C. Distribution Mains and Laterals:SizeTypeLength

2"

Galvanized Iron

1,386 Lineal Feet

D. Problem:

The small spring supply is subject to low flow and contamination during dry periods of the year.

E. Additional Information:

A 6-inch test well was drilled in this vicinity to a depth of 186 feet. The well was cased and cemented to a depth of 16 feet. Pump test run on the well indicates a possible sustained yield of 25 gallons per minute. Additional information on the quality and chemical analysis of the water from this well can be obtained from the geologist's report accompanying this docket. Ultimately, this deep well should be developed as the area water supply.

(Cataloochee Maintenance Area - Addendum No. 1)

WATER SUPPLY
Cataloochee Campground

The well site is located about 100 feet west of Rough Fork road, 0.8 mile southwest of Palmer Chapel, and about 2.9 miles southwest of the Cataloochee Ranger Station. The altitude of the site is approximately 2,820 feet (from topographic map).

Drilling of an 8-inch test well began on June 23, 1967. A hydrogeologic log of the well drilled in the Roaring Fork Sandstone follows:

- 0-15 ft., Soil cover and alluvium ranging from pebbles to boulders. Yield estimated at 3 gpm.
- 15-20 ft., Highly weathered, soft, fine-grained bedrock. Slight increase in yield.
- 20-27 ft., Bedrock is weathered phyllite. Yield increased to about 5 gpm. (The well was cased to 27 feet, sealing off all encountered water-bearing zones.)
- 27-35 ft., Slightly weathered fine-grained phyllite. No water encountered.
- 35-40 ft., Fine-grained phyllite containing some iron sulfide. Yield is about 5 gpm.
- 40-50 ft., Alternating layers of phyllite and mica-quartz schist containing some chloritic mica. No change in yield.
- 50-70 ft., Predominately mica-quartz schist. The yield increased to about 15 gpm after penetrating a fracture zone at 52 feet, and 20 gpm was measured after drilling to a depth of 60 feet.
- 70-72 ft., Chloritic mica-quartz schist having a high percentage of iron sulfide. Water was green and had H₂S odor. Yield increased to about 30 gpm.
- 72-80 ft., Gray phyllite interbedded with schist. Iron sulfide decreased to only a trace at 80 feet. Yield measured 36 gpm, and water is clear.
- 80-110 ft., Mica-quartz schist, and a trace of chloritic mica and iron sulfide. No change in yield.

110-150 ft., Mica-quartz schist containing scattered flakes of chloritic mica and a trace of iron sulfide. No change in yield.

150-165 ft., Same type rock with a pronounced increase in iron sulfide and chlorite. Yield measured 36 gpm; drilling terminated at 165 feet.

The water from the zone at 70-72 feet produced the familiar "rotten-egg" smell of hydrogen sulfide and much green chloritic mica. There was no significant increase in yield from 70 to 165 feet.

On June 28, 1967, a submersible test pump was installed at a depth of 126 feet. The static water level was 9.1 feet. The pump was operated at maximum discharge (100 gpm) for 5 minutes, then the discharge was reduced to 30-35 gpm (see fig. 1). After four hours the discharge was increased to 100 gpm for 15 minutes, then reduced to 30-35 gpm. During the last 3½ hours of the test, the water level remained relatively steady at about 69 feet with a discharge of 35 gpm. The specific capacity of the well is about 0.9 gpm per foot of drawdown at 35 gpm after 8 hours of pumping.

A chemical analysis of a water sample taken at the end of the pumping test is shown in table 1. The water is of good quality except for a slightly low pH value and the presence of hydrogen sulfide. Chemical treatment and/or aeration would probably correct these conditions. An alternative to treatment of the water would be the back-filling of the well with concrete to a depth of about 65 feet. This would seal the zones that yield the hydrogen-sulfide, and the well yield would be reduced to about 20 gpm. However, it is possible that the well would continue to yield water with hydrogen sulfide even if the lower part were sealed.

Considering the above mentioned conditions and the needed quantity of water, it is apparent that another well should be drilled, at a new site, to replace or supplement the well described in this report.

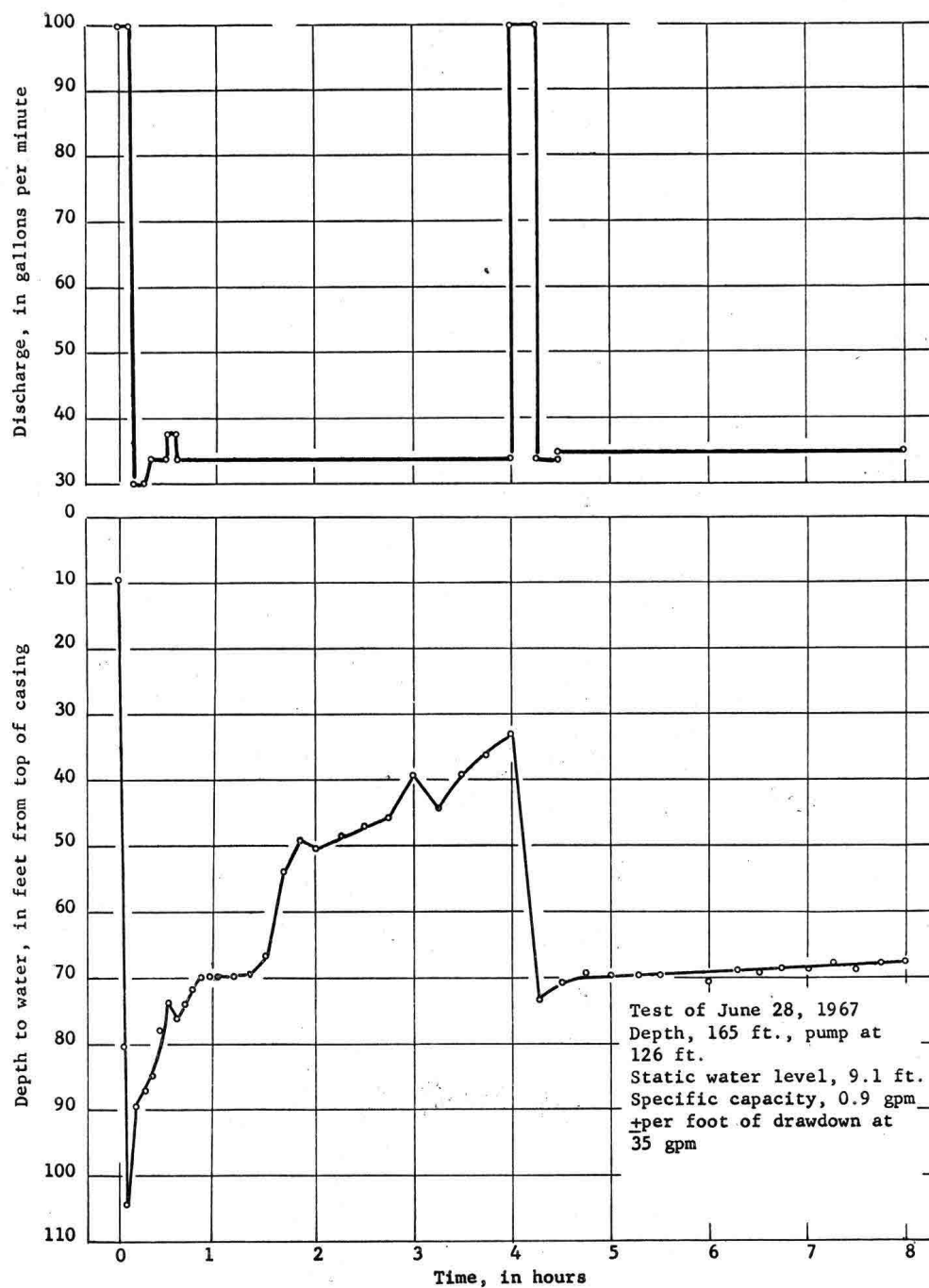


Figure 1. Discharge and depth to water in well at Cataloochee Campground.

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WATER RESOURCES DIVISION
WATER ANALYSIS

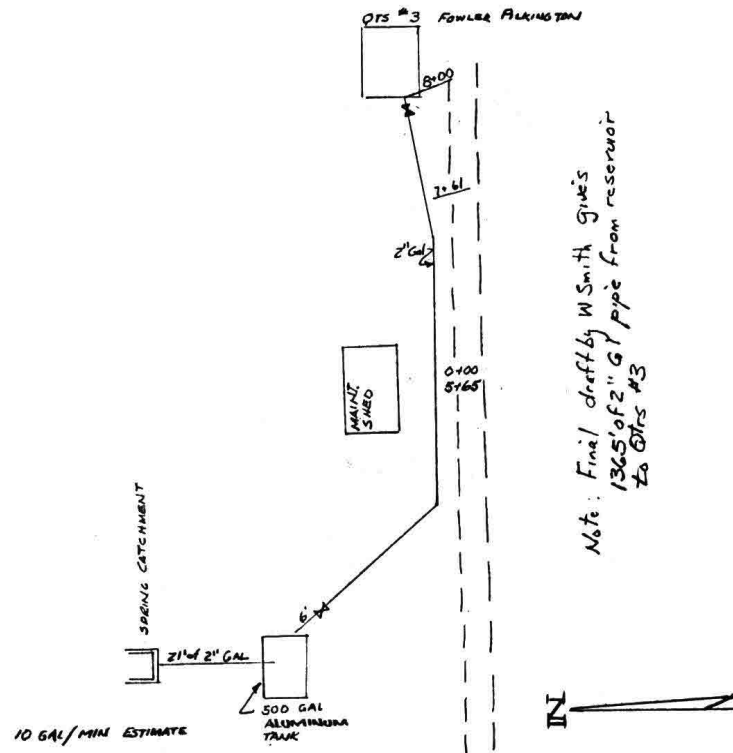
W.R. Lab. No. NC 48653

Location <u>Haywood County - Great Smoky Mountains National Park</u>			
Source <u>Cataloochee Campground. Drilled well, 165', 8" diameter. Cased to:</u>			
<u>27 ft. Collected at pump after 8 hrs. of pumping.</u>			
Date of collection <u>6-28-67</u>			
Gage height(ft.) _____ Discharge(sec.ft.) _____ Temp.(°F) _____			
(Parts per million)			
Silica (SiO ₂).....	13	Carbonate (CO ₃).....	0
Aluminum (Al).....	.1	Bicarbonate (HCO ₃).....	26
Iron (Fe).....	.16	Sulfate (SO ₄).....	1.6
Manganese (Mn).....	.02	Chloride (Cl).....	6.5
Calcium (Ca).....	4.6	Fluoride (F).....	.6
Magnesium (Mg).....	.3	Nitrate (NO ₃).....	.1
Sodium (Na).....	7.9	Phosphate (PO ₄).....	.00
Potassium (K).....	1.0	.....	
Lithium (Li).....		.....	
(Parts per million)			
Dissolved solids:			
Sum.....	49	ABS.....	
Residue upon evapo- ration @ 180°C.....		Color.....	2
Hardness as CaCO ₃	14	.....	
Noncarbonate.....	0	.....	
pH.....	6.1	Specific conductance (micromhos at 25°C).....	65

Table 1. Chemical quality of water from the Cataloochee Campground well.

Unpublished records subject to revision

CATALOOCHEE
10/27/60
SHULTZ - SMITH



1

Other Supporting Information

Cataloochee Maintenance Area

As a part of the cooperative program between the U. S. National Park Service and the U. S. Geological Survey, a well site was selected in October 1968 near the Cataloochee Maintenance Area in Haywood County, N. C.

The Maintenance Area includes one residence and a maintenance building. The National Park Service plans to enlarge the maintenance facilities as the campground and picnic areas are expanded, and it estimates that a minimum of 10 gpm are required to meet the future needs.

In order to obtain a supply of water for the maintenance area, a well was drilled in November 1968 (fig. 4.1) at the site No. 1 as described in our letter of October 17, 1968. The site is about 750 feet northeast of the maintenance building on Park Route 14, about 2.75 miles from North Carolina Highway No. 284, and at the edge of the alluvial plain of Cataloochee Creek.

The Maintenance Area is at the foot of the hill on the northwest side of the flood plain of Cataloochee Creek. The altitude of the alluvial plain here is about 2,670 feet above mean sea level.

(Cataloochee Maintenance Area - Addendum No. 1)

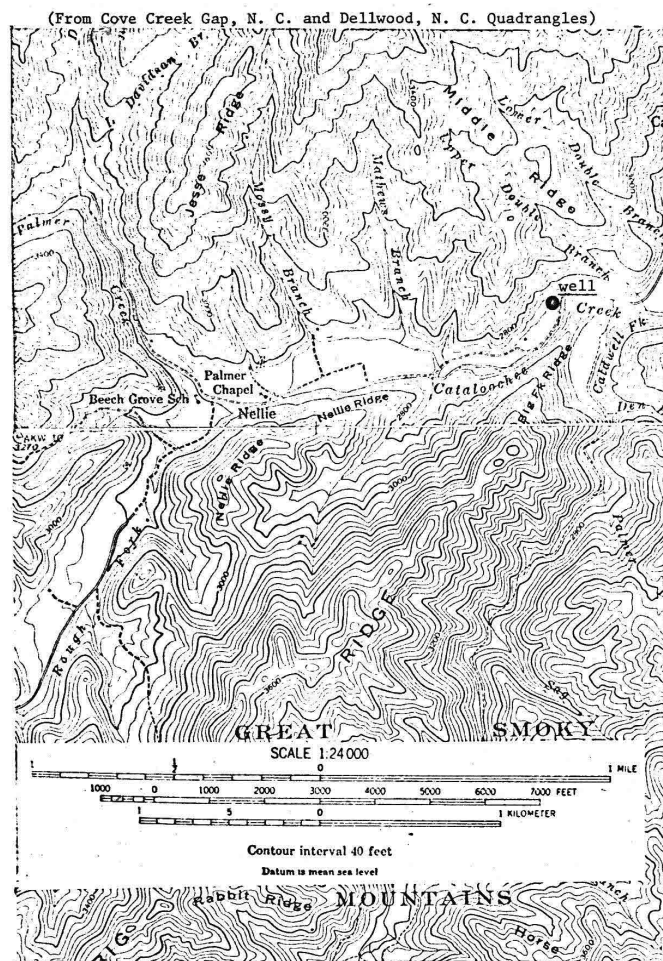
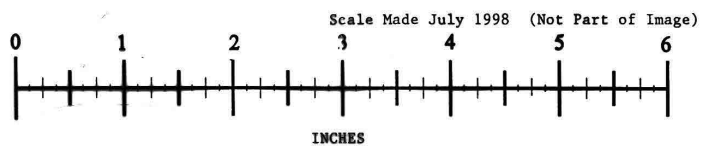


Figure 4.1.—Location of well at Cataloochee Maintenance Area.



The Cataloochee Creek valley is cut by several large faults, and the age and type of rock changes within relatively short distances. The alluvium at the Maintenance Area is underlain by the Longarm Quartzite of the Snowbird Group of the Ocoee Series. The Longarm Quartzite consists mainly of light-colored medium- to coarse-grained feldspathic quartzite and arkose. In the upper part the quartzite is interbedded with sandstone (King and others, 1968, p. 4). Fractures commonly provide the avenues through which ground water moves. The fractures in the Cataloochee Creek area occur more abundantly at greater depth than at most places in the Great Smoky Mountains.

A six-inch well was drilled, using an air-percussion type of rotary drill, to a depth of 186 feet on November 13 and 15-18, 1968.

A log of the well follows:

<u>Depth</u>	<u>Description</u>
0 - 10 feet	Alluvium.
10 - 19	Sandstone. Set casing at 16 feet.
19 - 20	Fine sugary sand.
20 - 42	Sandstone alternating with thin layers of sand.
42 - 45	Soft, unconsolidated sand. Yield 3 gpm, water has red-muddy appearance.
45 - 50	Schist and sandstone.
50 - 60	Soft sandstone.
60 - 80	Hard feldspathic sandstone.
80 - 90	Sandstone.
90 - 100	Quartz and chert.
100 - 116	Hard sandstone. Yield 5 gpm.
116 - 120	Hard, dark gray colored sandstone.
120 - 125	Gray-green phyllite.
125 - 130	Soft schist. Yield 10 gpm.
130 - 160	Hard, dark-sandstone. Yield 13 gpm.
160 - 175	Gray-green phyllite. Yield 15 gpm.
175 - 180	Sandstone with several fractures. Yield 20-25 gpm.
180 - 186	Sandstone.

Prior to the test, on December 12, 1968, the static water level was 3.7 feet below land surface. A three-horsepower submersible test pump was installed in the well at a depth of 150 feet. On December 12 the well was pumped at several different rates ranging from 15 gpm to 28 gpm. Figure 4.2 is a graph showing the drawdown in the well related to time of pumping.

In the first three steps the well was pumped at 15 gpm for 1 hour, 25 gpm for 2-1/4 hours, and 28 gpm for 3-1/2 hours. In each step the increase in pumping rate was accompanied by a rapid decline of the water level followed by a much slower decline. The water level declined below the bottom of the casing in the first step. In the second step, the decline of the water level halted momentarily at about 43 feet which is about the level of a three-foot bed of sandstone. In step three the decline was halted twice. These and other irregular fluctuations of the water level may have been caused by unintentional and unobserved changes in the pumping rate. After the test it was found that worn packing in the gate valve on the discharge pipe had caused the difficulty in maintaining uniform pumping rates.

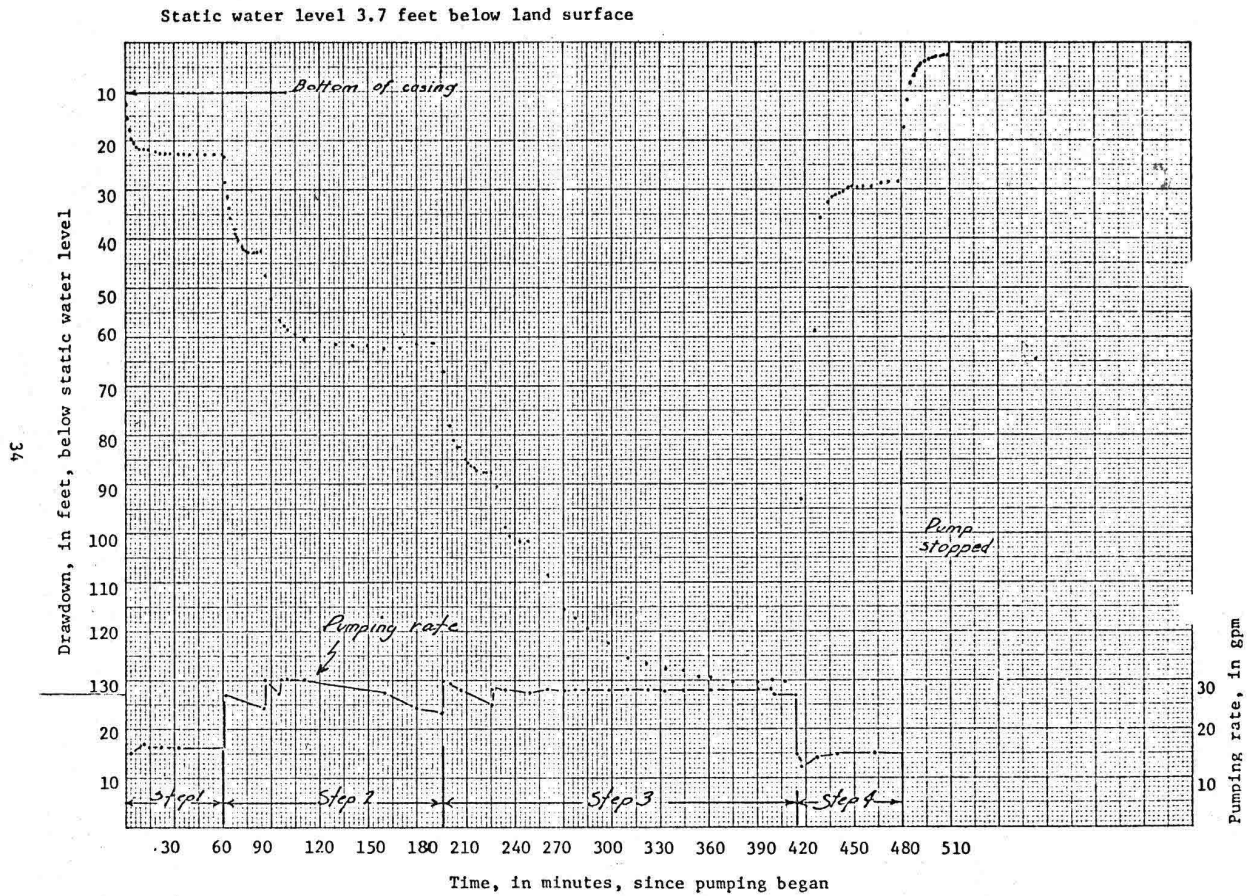


Figure 4.2.--Cataloochee Maintenance Area pumping test, December 12, 1968

During the pumping test the water had a cloudy or turbid appearance. When the pumping rate was increased at the beginning of each step, the muddy appearance was intensified. After a period of time the muddy appearance changed back to cloudy. The pumping rate was reduced to 15 gpm in step 4 in an attempt to alleviate the conditions that caused the cloudiness in the water. The cloudy appearance, however, did not disappear. After eight hours of testing, the pump was stopped and the recovery measured.

As the water was still cloudy at the end of the test, it was tested again on the following day in an effort to clear the water. On December 13, the well was pumped for seven hours, during which the pumping rate was 9 gpm in the first step and 15 gpm in the second step. In the first step the water was clear. In the second step the water became cloudy after 12 minutes of pumping. After pumping for a total of 380 minutes the water became muddy. At the end of this test, it was concluded that extensive pumping would be required to clear the water.

An alternative to extensive pumping to clear the water would be to case the well to a greater depth. While drilling the well, it was noted that fine sediment from a bed of sandstone at a depth of 45 feet imparted the same reddish appearance to the water that was observed during the pumping tests. If this stratum is the source of the material clouding and muddying the water, extending the casing to a depth of 50 feet may eliminate the cloudiness in the water. Casing off the upper 50 feet of the hole would reduce the yield of the well somewhat.

The specific capacity of the well ranged from 0.65 gpm per foot while pumping 15 gpm to 0.22 gpm per foot of drawdown while pumping 28 gpm. A comparison of the water-level trends in step 2 and in step 3 indicates that the sustained yield of the well is about 25 gpm. The well probably cannot be pumped at a greater rate for any significant period of time.

Water samples collected at the beginning and at the end of the first test, and during the second test were analyzed by the U. S. Geological Survey laboratory in Raleigh, North Carolina. The results are shown in tables 4.1, 4.2, and 4.3. The water is of excellent quality, except for the cloudy appearance.

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WATER RESOURCES DIVISION
WATER ANALYSIS

W.R. Lab. No. NC 50573

Location Cataloochee Maintenance Area, 8 miles northwest of Delwood, N. C.			
County: Haywood.			
Source Drilled well. Depth: 186 ft. Drilled: Nov. 18, 1968. Collected at discharge pipe. Owner: National Park Service, Gatlinburg, Tennessee. Use: Public supply. Water-bearing formation: Crystalline rocks. Pumping water level: 28 ft. below measuring point. Yield: 16 gpm. Appearance when collected: Cloudy. Producing intervals: 45 to 180 ft. Sampled after pumping 40 minutes.			
Date of collection December 12, 1968			
Gage height(ft.)		Discharge(sec.ft.)	
		Temp.(°C) 13	
(milligrams per liter)			
Silica (SiO ₂).....	16	Carbonate (CO ₃).....	0
Aluminum (Al).....	.6	Bicarbonate (HCO ₃).....	28
Iron (Fe).....	.78	Sulfate (SO ₄).....	11
Manganese (Mn).....	.02	Chloride (Cl).....	1.0
Calcium (Ca).....	9.0	Fluoride (F).....	.3
Magnesium (Mg).....	.6	Nitrate (NO ₃).....	.4
Sodium (Na).....	7.4	Phosphate (PO ₄).....	.12
Potassium (K).....	.6	.....	
Lithium (Li).....		.....	
(milligrams per liter)			
Dissolved solids:		ABS.....	
Sum.....	62	Color.....	15
Residue upon evapo- ration @ 180°C.....	66	.....	
Hardness as CaCO ₃	25	.....	
Noncarbonate.....	2	.....	
pH.....	7.0	Specific conductance (micromhos at 25°C).....	74

Table 4.1.--Chemical analysis of water sampled at beginning of first test.

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WATER RESOURCES DIVISION
WATER ANALYSIS

W.R. Lab. No. NC 50562

Location <u>Cataloochee Maintenance Area, 8 miles northwest of Delwood, N. C.</u>			
County: <u>Haywood.</u>			
Source <u>Drilled well. Depth: 186 ft. Drilled: Nov. 18, 1968. Collected at</u> <u>discharge pipe. Owner: National Park Service, Gatlinburg, Tennessee. Use: Public</u> <u>supply. Water-bearing formation: Crystalline rocks. Pumping water level: 135 ft.</u> <u>below measuring point. Yield: 27 gpm. Appearance when collected: Cloudy. Producing</u> <u>intervals: 45 to 180 ft. Sampled after pumping 6 hrs., 40 minutes.</u>			
Date of collection <u>December 12, 1968</u>			
Gage height(ft.) _____		Discharge(sec.ft.) _____ Temp.(°C) <u>13</u>	
(milligrams per liter)			
Silica (SiO ₂).....	17	Carbonate (CO ₃).....	0
Aluminum (Al).....	1.0	Bicarbonate (HCO ₃).....	47
Iron (Fe).....	.68	Sulfate (SO ₄).....	1.4
Manganese (Mn).....	.01	Chloride (Cl).....	1.0
Calcium (Ca).....	8.7	Fluoride (F).....	.3
Magnesium (Mg).....	.6	Nitrate (NO ₃).....	.4
Sodium (Na).....	6.8	Phosphate (PO ₄).....	.09
Potassium (K).....	.6	.....	
Lithium (Li).....		.....	
(milligrams per liter)			
Dissolved solids:		ABS.....	
Sum.....	61	Color.....	7
Residue upon evapo- ration @ 180°C.....	62	.....	
Hardness as CaCO ₃	24	.....	
Noncarbonate.....	0	.....	
pH.....	6.7	Specific conductance (micromhos at 25°C).....	73

Table 4.2.--Chemical analysis of water sampled at end of first test.

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WATER RESOURCES DIVISION
WATER ANALYSIS

W.R. Lab. No. NC 50563

Location <u>Cataloochee Maintenance Area, 8 miles northwest of Delwood, N. C.</u>			
County: <u>Haywood.</u>			
Source <u>Drilled well. Depth: 186 ft. Drilled: Nov. 18, 1968. Collected at discharge pipe. Owner: National Park Service, Gatlinburg, Tennessee. Use: Public supply. Water-bearing formation: Crystalline rocks. Pumping water level: 30 ft. below measuring point. Yield: 17 gpm. Appearance when collected: Cloudy. Producing intervals: 45 to 180 ft. Sampled after pumping 4-1/2 hours.</u>			
Date of collection <u>December 13, 1968</u>			
Gage height(ft.) _____ Discharge(sec.ft.) _____ Temp.(°C) _____			
(milligrams per liter)			
Silica (SiO ₂).....	16	Carbonate (CO ₃).....	0
Aluminum (Al).....	.2	Bicarbonate (HCO ₃).....	43
Iron (Fe).....	.10	Sulfate (SO ₄).....	2.6
Manganese (Mn).....	.01	Chloride (Cl).....	.6
Calcium (Ca).....	8.0	Fluoride (F).....	.2
Magnesium (Mg).....	.6	Nitrate (NO ₃).....	.2
Sodium (Na).....	6.2	Phosphate (PO ₄).....	.09
Potassium (K).....	.8	.....	
Lithium (Li).....		.....	
(milligrams per liter)			
Dissolved solids:		ABS.	
Sum.....	57	Color	5
Residue upon evaporation @ 180°C.....	58	.....	
Hardness as CaCO ₃	22	.....	
Noncarbonate.....	0	.....	
pH	6.6	Specific conductance (micromhos at 25°C).....	66

Table 4.3.--Chemical analysis of water sampled during second test.

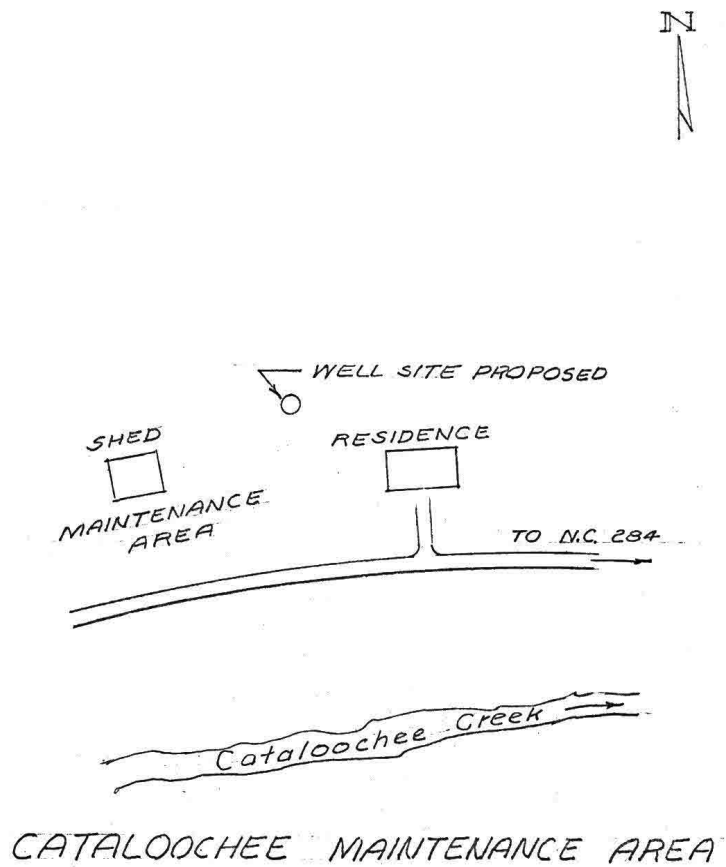
29. CATALOCHEE MAINTENANCE AREA

Situation: This area is located approximately one mile west of Residence No. 30 and is on the newly constructed Cataloochee access road. The area consists of a single residence, Building No. 3, and a small maintenance area. The existing water supply is from a small spring 1350 feet from the area and is subject to low flow and contamination during dry periods of the year.

Proposed: Drill a deep test well in the vicinity; 10 g.p.m. capacity is desirable.

Progress to Date: This project is programmed for 1969 F.Y.

(09/28/67)



PROPOSED SITES FOR WATER RESOURCES INVESTIGATION

1. Park Headquarters
2. Green Mountain (Foothills Parkway)
3. Newfound Gap
4. Cades Cove
5. Deep Creek
6. Smokemont
7. Abrams Creek
8. Twin Creeks
9. Collins Creek
10. Metcalf Bottoms
11. Cataloochee
12. Elkmont
13. Cosby
14. Chimneys
15. Rocky Mountain (Foothills Parkway)
16. Webb Mountain (Foothills Parkway)
17. Little Greenbrier
13. Greenbrier
19. Sinks
20. Towstring
21. Indian Camp Creek
22. Tremont Ranger Station
23. Round Bottom Campground
24. Balsam Mountain Campground
25. Main Oconaluftee Residential Area
26. Old Oconaluftee Residence Area (Ravensford)
27. Big Creek Ranger Station
28. Cataloochee Ranger Station
29. Cataloochee Maintenance Area
30. Twentymile Ranger Station
31. Cherokee Orchard
32. Sugarlands

(09/28/67)

OPTIONAL FORM NO. 10
MAY 1962 EDITION
GSA FPMR (41 CFR) 101-11.6

UNITED STATES GOVERNMENT

Memorandum

TO : Gerald Rowe, Chief of Maintenance
Great Smoky Mountains National Park
Gatlinburg, Tennessee 37738

DATE: September 7, 1967

FROM : W. M. McMaster, USGS, WRD
Knoxville, Tennessee

SUBJECT: Summary of work plans for study of water resources of Great Smoky Mountains
National Park, North Carolina and Tennessee Districts

As I promised you on August 11, I am sending you our plans for the study of water resources of Great Smoky Mountains National Park that have been modified as a result of a meeting between North Carolina and Tennessee U. S. Geological Survey personnel July 6-7, 1967.

WMM

W. M. McMaster
Hydrologist

cc: Edward J. Kennedy, Chief, Tenn. District
Ralph C. Heath, Chief, N. C. District



5010-108

Buy U.S. Savings Bonds Regularly on the Payroll Savings Plan

Summary of work plans for study of water resources of Great Smoky Mountains
National Park, North Carolina and Tennessee Districts

Sept. 7, 1967

At a meeting in Knoxville during July 6-7, 1967, North Carolina and Tennessee personnel discussed modification of plans in the study of water resources of the Great Smoky Mountains National Park. Those who attended the meeting were: Ralph C. Heath, North Carolina District Chief; Edward J. Kennedy, Tennessee District Chief; D. R. Rima, Assistant District Chief for Tennessee; Nat Thomas, G. C. Goddard, and E. F. Hubbard of North Carolina; and W. M. McMaster of Tennessee.

At the meeting it was agreed that the effort in both districts should be combined under leadership of one individual; McMaster was delegated project leadership. McMaster will be responsible for ground water interpretive aspects of the study and Hubbard will be responsible for surface water interpretive aspects.

The final product will be a hydrologic atlas of the Smokies area, published by the Geological Survey, that will consist of the 1:125,000 base map upon which will be delineated ground water and surface water information. Ground water occurrence and availability will be shown as a series of patterns, each defining a range between a minimum, a maximum, and an average of expected well yields within the area covered by the pattern. These areas are expected to be established by topographic criteria, geologic location, estimated soil thickness, and background information provided by test wells drilled during the course of the study. If a test well appears capable of yielding the desired quantity of water for water supply at the drilling site, a pumping test will be run.

Surface water information will be indicated by isopleths of minimum flow in cubic feet per second per square mile at the 2-year 7-day recurrence interval, based on a series of low-flow measurements made during the course of the study, at a total of about 100 sites throughout the Park distributed so as to define variations in flow with location and altitude. It is hoped that these sites can be measured a total of 6-8 times following periods of about 7 days of no rainfall.

Ground water and surface water chemical quality will be described, based on results of analyses of water from test wells and samples collected from streams. A series of coliform analyses of stream water is planned to define possible areas of contamination.

An explanatory text and supplementary illustrations will be included. The atlas is expected to provide the NPS engineer a basis for planning future developments of any kind in the Park for which knowledge of water resources is required.

Consideration will be given to popular-type brochure for distribution to Park visitors, describing and illustrating the occurrence of water in the area and its role in shaping the mountains.

Test drilling and reporting will continue to be handled by the District in which the site is located.

Plans are to complete the text of the final report by May 1969 for transmission through final review prior to publication. However, if insufficient opportunities to collect flow measurements occurs during the remaining time through November 1968, it is hoped that supplementary funds will be available from NPS to make additional measurements during the following year.

725-9-17-65-

LS4 SER(OLW)

SEP 14 1965

Reed
ARC 9/17
WRA

Memorandum

To: Superintendent, Great Smoky Mountains
From: Acting Assistant Regional Director, Operations,
Southeast Region
Subject: Water Resources Investigations, Great Smoky Mountains
National Park

We will be glad to assist you in developing a detailed water resources study at Great Smoky Mountains National Park during the 1966 fiscal year as requested in your memorandum of August 23. The results produced from such a study should provide us with the basis for a full and most effective development of all water resources located within the Park boundaries. It is evident that new sources of water are needed to meet the demands of future and existing Park facilities.

We believe the investigative work should include the following:
(1) The first and most pressing problem involves the need to expand several water supply systems in order to provide more water to take care of a greater number of Park visitors and increased Park uses. This requires an evaluation of the probable capacity of the present sources of supply and the locating of possible new sources of water supply of acceptable quality for increased demands of the future and (2) The second phase of the project (extending over a period of several years) would be to conduct surface and ground water studies throughout the Park in order to obtain a general knowledge of all water resources. With such information at hand, the Park staff will be able to plan efficiently for new or expanded developments.

An over-ceiling item was included in the 1966 F.Y. Regional Water Resources Program in the amount of \$26,000 to initiate a study of domestic water supply needs and test well drilling work at the Park. Mr. E. W. Reed, Chief, Water Resources, has recently advised that at present the Washington Office reserve contains sufficient funds to finance this study.

We agree a meeting and field reconnaissance should be held at the Park between representatives of the U. S. Geological Survey, the Regional Office and the Park staff to properly formulate a logical approach to this water resources project. In early October, we will take the necessary action to firm up a satisfactory date for the meeting with all those concerned.

(SIGNED)

W. Mikkell

cc:

Director, w/c of inc.

Chief, RADC (2), w/c of inc.



UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

Great Smoky Mountains National Park
Gatlinburg, Tennessee 37738

Y REFER TO:
L54

August 23, 1965

Memorandum

To: Regional Director, Southeast Region
From: Superintendent, Great Smoky Mountains
Subject: Water Resources Investigations, Great Smoky Mountains
National Park

SOUTHEAST REGION	
AUG 26 1965	
Regional Director	
Asst. Reg. Dir. (A)	26
Asst. Reg. Dir. (CA)	
Asst. to Reg. Dir. (PA)	
Asst. to Reg. Dir. (D)	
Resource Studies Div.	

X *East Water*
Main

Over the past couple of years, continued increases in demands on the numerous surface water supplies have gradually developed into a problem that needs immediate attention. While it is recognized that in the past we have shown little or no interest in water resources investigations, it now appears that well supplies may not only be a desirability but a necessity. During periods of prolonged drouth such as we are now experiencing in the Park, the surface supplies diminish to the point of nearly drying up, and supplemental supplies of low quality water are heavily treated and pumped into the supply lines.

During USPHS Engineer Henderson's recent trip to the Park, we had occasion to closely observe several of our major supplies. For example, we found that the Ash Hopper Branch gravity supply that ordinarily supplies headquarters was providing 19 gallons per minute (actual meter readings) over a period of a week. The consumption at this time was metered at 35,000 to 37,000 gallons per day and so, needless to say, we had to pump a supplemental supply out of a branch of Fighting Creek which runs through the residential area. We actually were only able to obtain a maximum of 15 gallons per minute from this supply. Incidentally, this creek pumping station is only a couple of hundred feet from the first domestic user and less than 1,000 feet from our major development area which definitely does not allow the desired chlorine retention time for safe water treatment. Also, when you realize that our actual usage exceeded an average of 25 gallons per minute and all available water in the system amounted to 34 gallons per minute, it is easy to see there is little margin for any emergency whether it be a leak in the line, any type of fire drawdown or allowance for any consideration of lawn sprinkling. If either of these supplies decrease further, we do have several alternatives in order to retain a minimum supply on hand.

By metering, we have determined that we are wasting 13,000 gallons per day through our Visitor Center dehumidifier system. This is quite a luxury and one that needs some study as to the possibility of re-circulation of this water. If our present supply should decrease any further, we would of course have to shut down the dehumidifier system which would have rather detrimental effects on artifacts storage as well as causing the Visitor Center to be rather uncomfortable.

Further checks on other major supplies in the Park showed similar conditions but none as critical as that that exists in the Headquarters area. If at all possible, and if it can be worked into your Water Resources Investigation program as an emergency measure, we would like to suggest the programming of an exploratory well for this fall. While we have little information on the characteristics of wells in this area, Mr. Henderson felt that a well programmed for 100-foot depth with rotary drill method (possible heavy river boulder sub-surface) should provide a plentiful supply for the area. On this basis, it appears that funds in the construction amount of \$2,500 would be needed to drill, case and test the well.

In an August 19 telephone conversation between Hydraulic Engineer Vick of your office and Chief of Maintenance Rowe, Mr. Vick had mentioned that he had put an over-ceiling item in his 1966 F.Y. Water Resources budget in the amount of \$24,000 to initiate a study of Park domestic water supply needs. We support this program whole-heartedly and hope that a necessary field inspection involving personnel from the USGS, the Regional Office, and the Park can be set up for the month of November. / /

As suggested to Mr. Vick in the abovementioned telephone call, the following listing is a tentative priority list of well investigations which we would like to see programmed:

1. Headquarters -- As soon as possible.
2. Green Mountain Picnic Area, Foothills Parkway -- 1967 F.Y.
3. Cades Cove -- 1967 F.Y.
4. Cataloochee -- 1967 F.Y.
5. Rocky Mountain -- 1967 F.Y.
6. Chilhowee, Foothills Parkway -- 1968 F.Y.

7. Cades Cove -- 1968 F.Y.
8. Deep Creek -- 1968 F.Y.
9. Smokemont -- 1968 F.Y.
10. Chimneys -- 1969 F.Y.
11. Elkmont -- 1969 F.Y.
12. Cosby -- 1969 F.Y.
13. Webb Mountain, Foothills Parkway -- 1969 F.Y.


George W. Fry

Docket Information

Number of Documents in Docket 31

Documents Dated from 10/27/1960 to 9/7/1967

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