



WATER-RIGHT DOCKET

Great Smoky Mountains National Park

Docket No: 30

ASHLEY BRANCH. TREMONT RANGER STATION

Preliminary Docket Information

00-00-0000: water right/source docket information

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

WATER RIGHTS DOCKET
Tremont Ranger Station
Great Smoky Mountains National Park

Supporting Hydro Data

22.

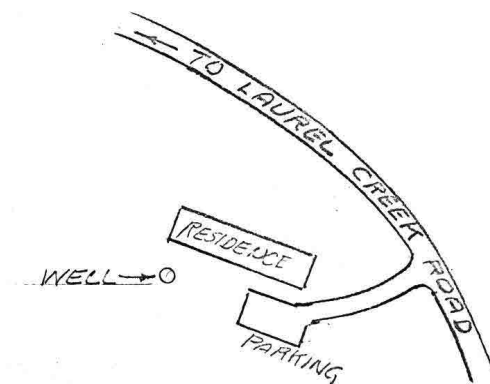
TREMONT RANGER STATION

Situation: This area is located near the Townsend Wye on the entrance to Tremont Job Corps Conservation Center. There is a single residence at the area which is occupied by a sub-district ranger. The present spring supply that serves this residence is marginal during dry spells.

Proposed: Drill a deep well system having a capacity of 10 g.p.m.

Progress to Date: Project included in contract awarded for drilling test wells in Tennessee. Work in progress.

(09/23/67)



TREMONT
RANGER STATION

Preliminary Report, Test Well at Tremont Ranger Station,
Great Smoky Mountains National Park

The Tremont Ranger Station is located on the Tremont road, 0.5 mile south of its intersection with the Cades Cove road, and about 200 ft from the left bank of Middle Prong Little River, at an altitude of about 1200 ft (see figure 1).

Water supply has been obtained from a small stream west of the residence, which in dry periods is reported to yield marginal quantities.

A ground-water supply of at least 10 gpm (gallons per minute) was desired to replace the existing source.

Geology

The Tremont area is located in a small outcrop area of the Cades Sandstone of the Ocoee Series, lying between the Greenbrier and Sinks faults and surrounded by the Metcalf Phyllite. Dip is generally to the southeast.

As shown in the columnar section, figure 2, most of the rock penetrated by the well consists of sandstone and siltstone.

Drilling

A test well was drilled at the residence on September 29, 1967, by Caldwell Well Drilling Company of Hot Springs, N. C., using an air rotary rig. Standard black 6 1/4-inch casing was set to a depth of 19 ft and the well was completed at a depth of 130 ft. Water was obtained from small weathered openings along fractures at depths of 57-59, 80, 85, and 125 ft. A columnar section of the well is shown in figure 2. The rig was blowing 10 gpm at completion.

Pumping

A pump test was run on the Tremont well on October 17, 1967, using a gasoline-powered generator to operate a 3/4 hp pump set at a depth of 107 ft. Static water level was 11.9 ft below the measuring point, which was 2.0 ft above land surface. As shown in figure 3, discharge began at 10 gpm and after 3 hrs 20 mins the pumping water level was stable at a depth of 52 ft. After 5 hrs at 10 gpm, discharge was raised to 12 gpm. The water level declined rapidly and after 1 hr 10 mins, the pump was shut off for about 10 mins to allow the water level to recover to about 52 ft, when pumping at 10 gpm was resumed. Pumping continued for another 1 hr 40 mins, when the pump was stopped; recovery was rapid to a depth of 20 ft.

The well yields water of good chemical quality, and has a dissolved solids content of 83 mg/l. A copy of results of analysis of a sample taken 4 hrs after pumping began is attached.

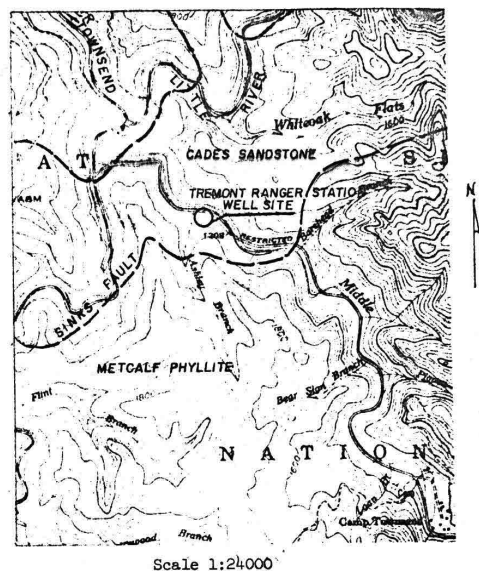
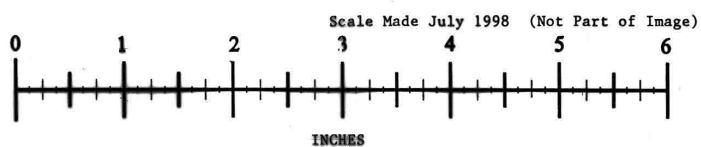
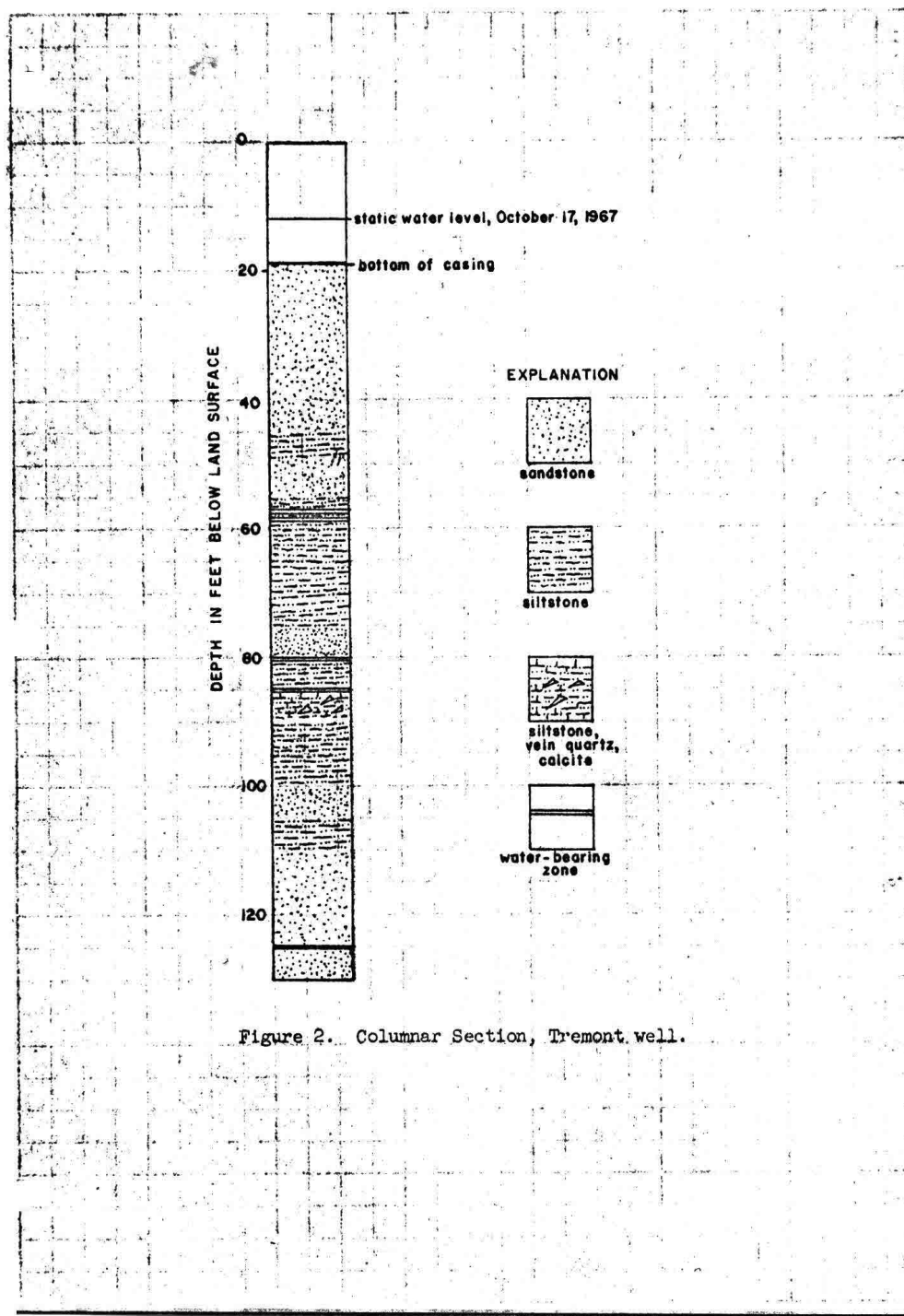
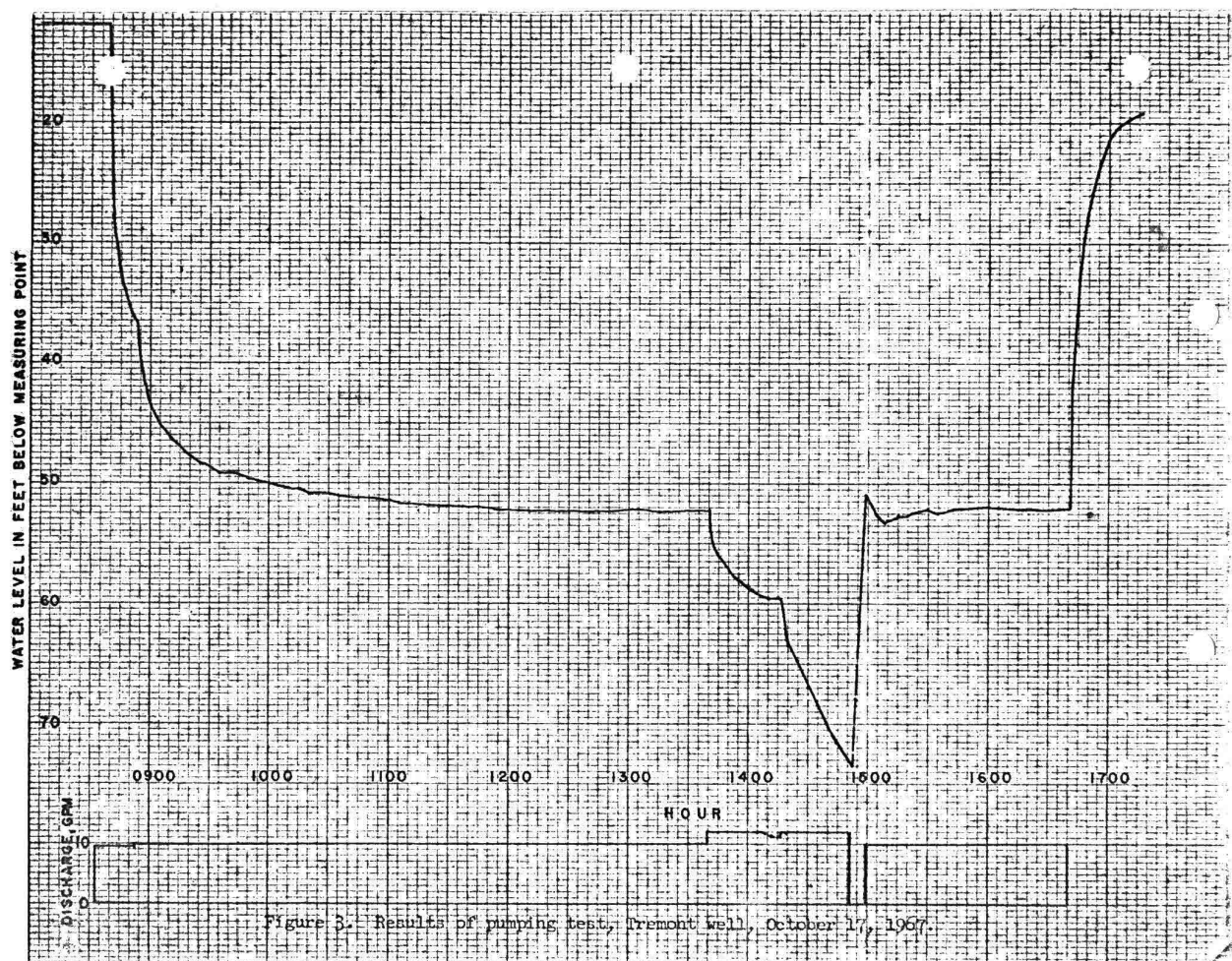


Figure 1. Location of test well at Tremont Ranger Station.







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

DEC 8 Rec'd

W.R. Lab. No. NC 49430

Location <u>Near Townsend, Tenn.</u>			
Source <u>Drilled Well (Tremont Well) 130' drilled Sept 67</u>			
<u>WL 50' below LSD 10 gm pump meas</u>			
Date of collection <u>10-17-67</u>			
Gage height(ft.) _____		Discharge(sec.ft.) _____	Temp.(°F) <u>14</u>
(~~Parts per million~~) (in milligrams per liter)			
Silica (SiO ₂).....	17	Carbonate (CO ₃).....	0
Aluminum (Al).....	.1	Bicarbonate (HCO ₃).....	60
Iron (Fe).....	.00	Sulfate (SO ₄).....	10
Manganese (Mn).....	.00	Chloride (Cl).....	1.6
Calcium (Ca).....	18	Fluoride (F).....	.2
Magnesium (Mg).....	1.8	Nitrate (NO ₃).....	.1
Sodium (Na).....	3.4	Phosphate (PO ₄).....	.00
Potassium (K).....	1.0		
Lithium (Li).....			
(~~Parts per million~~) (in milligrams per liter)			
Dissolved solids:		ABS.....	
Sum.....	83	Color.....	4
Residue upon evapo- ration @ 180°C.....	77		
Hardness as CaCO ₃	* 54		
Noncarbonate.....	4		
pH.....	7.1	Specific conductance (micromhos at 25°C).....	113

* INCLUDES HARDNESS OF ALL
POLYVALENT CATIONS REPORTED.

Unpublished records subject to revision

NAME OF SYSTEM: Tremont Ranger StationLOCATION: On Route 17 about
0.7 mile from Route
3BN to Cades CoveLOCATION: STATE: Tennessee COUNTY: BlountA. Source of SupplyLocation - Reference to Permanent LandmarkCoordinates

1. Ashley Branch

700 feet upstream Ashley Branch from intersection of Ashley Branch and Middle Prong Little River. Ashley Branch is 2,400 feet upstream Middle Prong from intersection of Middle Prong and Laurel Creek west.

Lat. N 35°39'10.5"
Long. W 83°42'16.7"

This is a gravity flow system with the intake located in Ashley Branch Creek, a tributary of Middle Prong Little River. The intake structure consists of a small masonry dam which impounds about 10,000 gallons of water in a natural basin. The intake consists of a 6" diameter perforated pipe with a screen and is embedded in the pond bottom with loose gravel. The intake pipe is connected directly to a two compartment sand filter which also serves as the main storage reservoir having a capacity of about 700 gallons, connected to the single residence by a 2" main.

2. A Deep Well

Located in rear of residence about 15 feet from the southeast corner

Lat. N 35°39'15.3"
Long. W 83°42'08.3"

This test well was drilled to a depth of 130 feet. During an eight hour pumping test it showed a yield of 10 gallons per minute with a drawdown of 41 feet. Static water level 12 feet.

(Tremont Ranger Station - Addendum No. 1)

B. Consumption:

This system is not metered. The estimated yearly demand is 83,000 gallons.

C. Distribution Mains and Laterals:

<u>Size</u>	<u>Type</u>	<u>Length</u>
2"	Galvanized Iron	733 Lineal Feet
1"	Galvanized Iron	<u>60 Lineal Feet</u>
TOTAL		793 Lineal Feet

D. Problems:

This system presently serves a single residence occupied by a sub-district ranger.

The present supply that serves this residence is marginal during dry seasons.

E. Additional Information:

The deep well was put into production in the summer of 1969 as the primary source of supply.

The system consists of a $\frac{1}{2}$ H.P. Fairbanks-Morse, 12 Stage pump, two hydrocells,

and controls. The old system will be retained for use as fire protection only and will be isolated from the new system.

(Tremont Ranger Station - Addendum No. 1)



WATER INTAKE STRUCTURE, INCLUDING CONCRETE DAM AND SAND FILTER
SERVING TREMONT RANGER STATION

Other Supporting Information

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
18. 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.

W. M. McMaster

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.

775-9-17-65-

L54 SER(OLW)

SEP 14 1965

Read
ELC 9/17
WRR

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. Mikell

cc:

Director, w/c of inc.

Chief, EODC (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

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. (DI)	
Resource Studies Asst.	

X *Land & Water*
Main

Memorandum

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

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. | |

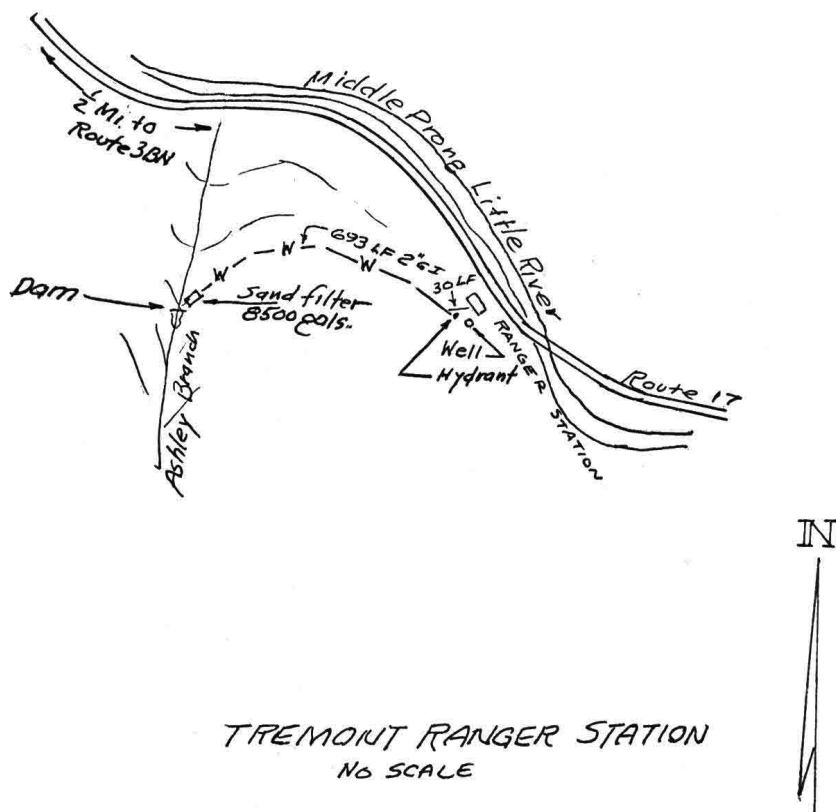
As suggested to Mr. Vick in the abovementioned telephone call, the following listing is a tentative priority list of well investigations which we would like to see programmed:

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

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



Docket Information

Number of Documents in Docket 22

Documents Dated from 8/23/1965 to 10/17/1967

Docket Compiled: 3/30/2011