



WATER-RIGHT DOCKET

Great Smoky Mountains National Park

Docket No: 26

SPRING. OLD OCANALUFTEE RESIDENCE (RAVENSFORD)

Preliminary Docket Information

00-00-0000: explanation/summary for docket 26

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

WATER RIGHTS DOCKET
Old Oconaluftee Residence Area
Great Smoky Mountains National Park

Administrative Agreements

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)

ALSO 1967 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.

W. M. McMaster
Hydrologist

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



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 analysis 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 low-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.

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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, RODE (2), w/c of inc.



UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

Great Smoky Mountains National Park
Gatlinburg, Tennessee 37738

August 23, 1965

Y REFER TO:
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EAST 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 Au.	

X *Land & Water*
Point

Memorandum

To: Regional Director, Southeast Region
From: Superintendent, Great Smoky Mountains *lost file*
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

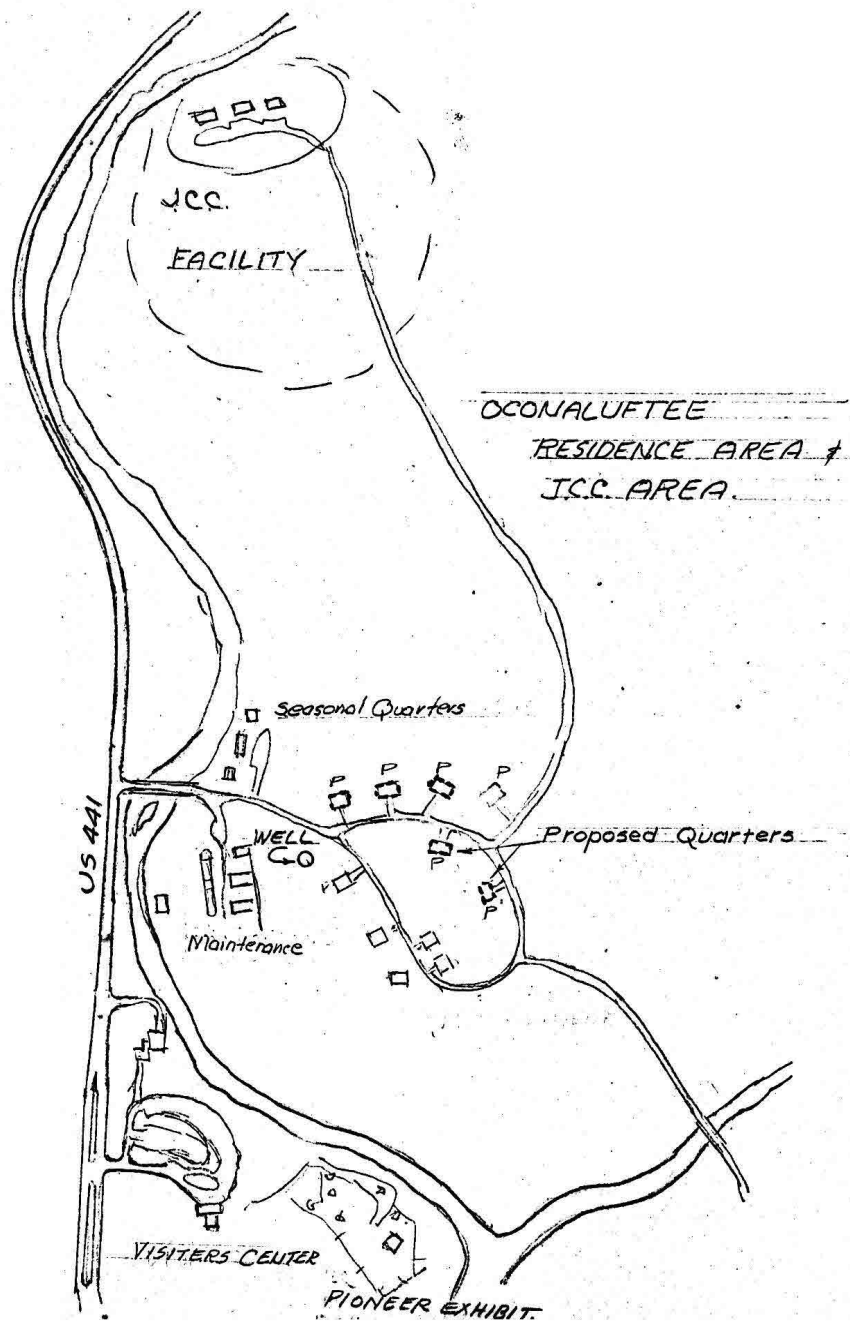
25. MAIN OCONALUFTEE RESIDENTIAL AREA

Situation: At the present time, the Park Service receives free water from the Indian Service in exchange for our permission to operate an intake on Mingus Creek within the Smokies. Over the years, consumption by the Park Service has increased to the point where the Indian Service now voices concern that too great a demand is being placed on their available supply. By agreement, a 50,000 gallons per day demand was set as an arbitrary limit. With a new 200-man Job Corps Conservation Center established in the area and a new visitor center proposed, it is likely that in the next few years this limit will be reached.

Proposed: Investigate area for a well site that would produce 50 g.p.m.

Progress to Date: This project was programmed for 1969 F.Y. but now advanced to 1968 F.Y. as per Acting Superintendent Davis' memorandum dated February 3, 1967, based on potential restrictions by Cherokee Office of B.I.A. on total daily capacity.

(09/28/67)



Area 4. Old Oconaluftee Residence Area

Illustration

Page

Figure 4.1. Location of wells at Old Oconaluftee residence area.... 36

(Old Oconaluftee Residence Area - Addendum No. 1)

Old Oconaluftee Residence Area

As a part of the cooperative program between the U. S. National Park Service and the U. S. Geological Survey, two proposed well sites were selected in June 1968 near the Old Oconaluftee residence area in Swain County, N. C.

The Old Oconaluftee residence area includes two houses occupied by personnel of the National Park Service. The source of the existing water supply is a small spring in the area, which is inadequate for their needs. The National Park Service estimated that 15 gpm are required to meet these needs.

In an effort to obtain additional water for the residence area, one well was drilled at each site in June 1968 (fig. 4.1). Both sites are near two residences about 2,000 feet east of the Main Oconaluftee residence area, and between Big Cove Road and the Blue Ridge Parkway. Site number 1 is about 100 feet south of the southernmost residence and site number 2 is about 250 feet south of the northernmost residence.

The residences are situated on a hillside at an altitude of about 2070 feet above mean sea level, and overlooking the flood plain of the Raven Fork of the Oconaluftee River.

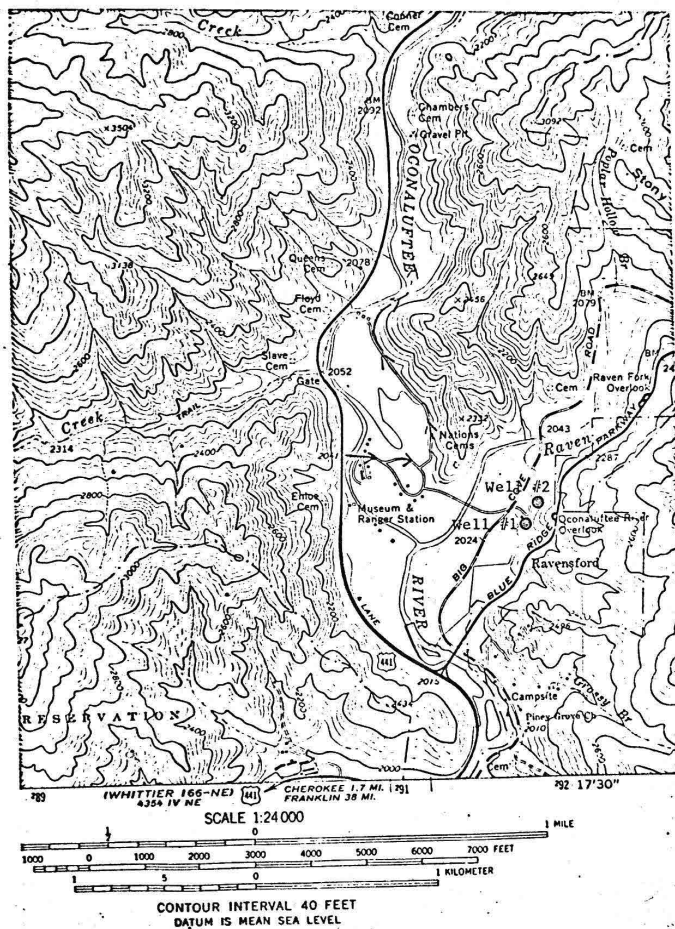
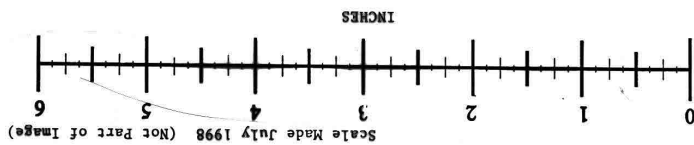


Figure 4.1—Location of wells at Old Oconaluftee residence area.



The residence area is underlain by a basement complex composed chiefly of gneiss, schist, and granitic rocks of early Precambrian age. The Greenbrier fault, a low angle thrust, is a short distance east of the area and may account for the nature of sediments penetrated by the two test wells (see logs below). The two wells penetrated greater thicknesses of unconsolidated fine sediment than are usually found in the mountainous areas. It may be breccia associated with erosion along the fault plane, or the material may have been deposited by an ancestral stream. Whatever the origin, the sediments are relatively impervious to the movement of appreciable amounts of ground water.

A test well was drilled to a depth of 120 feet at the first site on July 18-21, 1968. A log of the well follows:

<u>Depth</u>	<u>Description</u>
0 - 15 feet	Soil and silty clay.
15 - 24	Sandy clay, caves badly.
24 - 45	Clay.
45 - 50	Sand, yield about 5 gpm.
50 - 60	Sandstone.
60 - 120	Alternating clay and sandstone.

Because of the low yield, this well was filled and abandoned.

At the second site, a well was drilled to a depth of 100 feet on June 21, 1968. A log of the well follows:

<u>Depth</u>	<u>Description</u>
0 - 10 feet	Sand.
10 - 100	Sandy clay and clay.

Because of the low yield, this well was also filled and abandoned.

NAME OF SYSTEM: Old Oconaluftee Residence Area (Ravensford)LOCATION: On Oconaluftee Access
Road, 3/4 mile from
U.S. 441LOCATION: STATE: North Carolina COUNTY: SwainA. Source of SupplyLocation - Reference to Permanent LandmarkCoordinates

1. Spring fed stream

On east side of Blue Ridge Parkway about
500 feet south of Oconaluftee River Overlook,
3/4 mile from U.S. 441.Lat. N $35^{\circ}30'40.5''$
Long. W $83^{\circ}17'32''$

This gravity flow system has a "U" type headwall that contains a spring and a small stream. The intake structure is covered with a heavy screen. A 2" iron pipe carries water from the spring house to a 500 gallon steel tank reservoir 45 feet downstream. 280 feet of $1\frac{1}{2}$ " plastic pipe is used through the embankment of the Blue Ridge Parkway crossing. The available quantity of water from the spring is estimated at 5 gallons per minute.

B. Consumption:

This system is not metered. The estimated quantity used is 237,000 gallons per year.

C. Distribution Mains and Laterals:

<u>Size</u>	<u>Type</u>	<u>Length</u>
2"	Galvanized Iron	45 Lineal Feet
$1\frac{1}{2}$ "	Galvanized Iron	35 Lineal Feet
$1\frac{1}{2}$ "	Plastic	280 Lineal Feet
$1\frac{1}{4}$ "	Galvanized Iron	1,019 Lineal Feet
1"	Galvanized Iron	<u>363 Lineal Feet</u>
TOTAL		1,742 Lineal Feet

D. Problems:

The present water system for these two residences is a spring fed stream with a minimum storage and subject to contamination during dry seasons of the year.

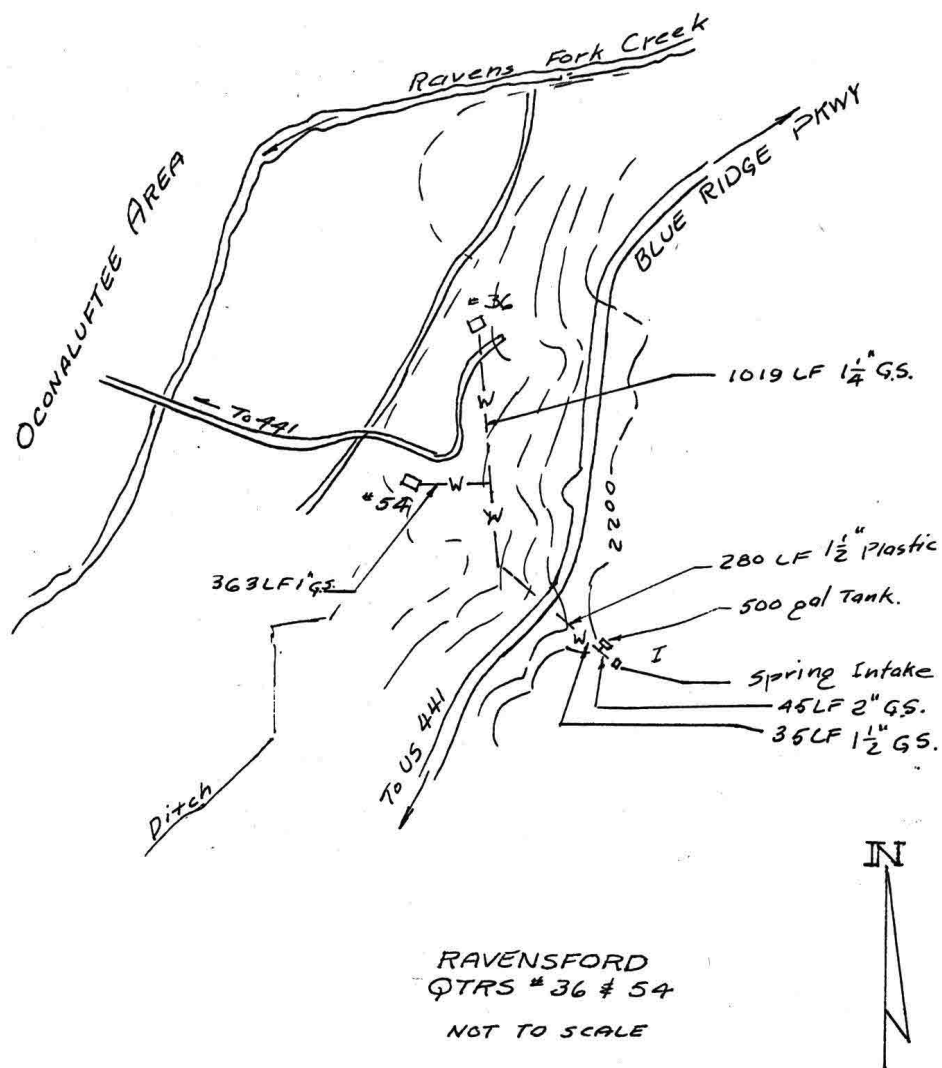
E. Additional Information:

In this area two test holes were drilled under the 1968 F.Y. water resources program. Neither of these two holes yielded any appreciable amounts of water. The two holes were filled and abandoned. However, the revised Master Plan for the area now suggests the razing of the two park residences served by this system; and thus it appears that existing system will suffice until the residences can be removed.

(Old Oconaluftee Residence Area - Addendum No. 1)



A 500 GALLON STEEL TANK RESERVOIR FOR RESIDENCE AT OLD OCONALUFTEE AREA
THE CONCRETE BLOCK HOUSE IN UPPER PART OF PHOTO IS
AN ATTEMPT AT A SAND FILTER FOR THE SYSTEM.



Docket Information

Number of Documents in Docket 21

Documents Dated from 9/14/1965 to 9/28/1967

Docket Compiled: 3/30/2011