9-200
(Jan. 1927)

P480

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WATER RESOURCES BRANCH

RECORD OF WELL

see P266

Carmel 15' quad
15Y-3.6S-6.9E

Locate well on plat of section.

1. Location: State New York County Putnam
Nearest P. O. ________ Direction from P. O. ________
Distance from P. O. ____ miles; ____ ¼ sec. ____, T. ____, R. ____
If in city, give street and number Town of Patterson
formerly Herald Tribune Fresh Air Fund

2. Owner: George Shawe Address Towners, N.Y.
Driller: P. F. Beal & Sons Address Brewster, N.Y.

3. Situation: Is well on upland, in valley, or on hillside? Ballard on rig hillside

4. Elevation of top of well: 550 ? (clino) ft. above (Above or below) the level of sea (Sea, depot, lake, or stream)

5. Type of well: drill (Dug, driven, bored, or drilled); kind of drilling rig used core drill (Solid tool, jetting, rotary, etc.)

6. Depth of well: 299 ft.; year in which well was finished ~~1943~~ 1946
Does well enter rock? ____; if so, at what depth? ____ ft.; kind of rock ________

7. Diameter: At top 6" inches; at bottom 6" inches.

8. Principal water bed: ________ (Gravel, sand, clay, or rock. If rock, state kind)
Depth to principal water bed ____ ft.; thickness of bed ____ ft.
If other water supplies were found, give depth to each ________

9. Casings: Kind steel; size 6"; length 20'8" ft.; between depths of 0 and 20'8" ft.
Kind ________; size ____; length ____ ft.; between depths of ____ and ____ ft.
Kind ________; size ____; length ____ ft.; between depths of ____ and ____ ft.
Packers (if any): Depth at which packers were used none; kind —
Screen or Strainer: Was well finished with screen? no; kind of screen —;
length of screen — ft.; diameter — inches; size of openings —

10. Head: Does well at present overflow without pumping? No; did it overflow when new? No;
if flowing, give pressure ____ lb. per sq. inch; or height water will rise in a pipe ____ ft. above surface;
original pressure or head ________; if not flowing, give water level in well 1½ – Beal ft. below surface.

11. Pump: Is the well pumped? No; kind of pump not used ~~[illegible]~~;
size or capacity of pump ________; kind of power —

12. Yield: Natural flow at present (if any) ____ gallons per minute; original flow — gallons per minute;
well has been pumped at 1½ gallons per minute continuously for bailer test hours;
quantity of water ordinarily obtained from well ________ gallons per day.

13. Use: For what purpose is the water used? not used. abandoned

14. Quality of the water: had odor when examined (Hard or soft, fresh or salty, etc.); is there an analysis? no

15. Cost of well, not including pump: ________ Temperature of water ____ °F.

Name of person filling blank G. Grossman from Beal's records & Mr. Shawe

Date 5-24-50 Address US Geol. Survey in Albany

On the back of this sheet give the record of the beds through which the well passes and any other facts not given above.

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The principal advantage of this site is operating convenience and relatively low cost of laying the pipe line, since rock excavation will be minimu. I am reluctant about drilling there because even though a fault or stress fracture exists, it can be missed too readily. In fact a well only 50' off the line of fracture might be as dry as the last one. Moreover, the indicated yield, if successful, is from 5 gpm to possibly 10 gpm and drilling to a maximum depth of 325' may be needed to get this amount. It is possible in this case that the yield may be improved by shooting the well a few feet below the principal fracture encountered.

Conclusions

Assuming the camp will need a minimum of 6500 gals, daily during the summer, pumping at least 5 gpm with practically no letup will be required. This provides no excess to fill the swimming pool which must depend upon the spring now supplying it. Therefore it appears logical that a minimum well yield of 10 gpm is essential. This means pumping about 11 hours daily except when necessary to clean and refill the pool. It is more desirable to have at least 25 gpm because a deep well turbine pump with lower maintenance cost can be used.

The site in the northeast valley flat should develop enough capacity for a turbine pump and although the pipe line will be excessively long it can be trenched without much rock excavation.

The "railroad" site indicates a probable yield of 10 gpm by drilling about 200' and possibly a higher yield with some chance of getting 25 gpm and using a turbine instead of a plunger type pump. However the pipe line trenching will probably mean rock excavation most of the way.

The "tennis" court" site involves risk of a dry well, also indicates deeper drilling than the others, possibly to 325' maximum of 5 gpm and there are slight possibilities of getting as much as 10 gpm. The pipe line will cost much less than that of the other wells and may justify gambling the cost of drilling to save considerable pipe line expense.

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see P266

the property where converging rock walls bring the railroads together. The gorge proper appears to follow fault structure rather than limestone.

The extreme northeastern corner of the property adjacent to the N.Y.Cen. R.R. is the best available site for developing a well capable of yielding upward of 30 GPM. In this area glacial sediments fill the buried rock through the valley and sand and gravel members of the valley fill are evidently saturated with groundwater. Excessive accumulation of this underground storage runs off through Muddy Brook. The Ice Pond is simply a depression in the swampy flat that is spring fed. A well in this corner of the property may develop 30 GPM above the rock alone by setting screen in sand or gravel and developing the formations around the screen. The yield can be increased by drilling open hole into the rock. Probably sufficient rock fissures will be encountered down to 150' to supply ample water for all purposes. However, if deeper drilling shall be indicated, this should not go below a total depth of 300'.

Unfortunately, this site is so remote from the principal camp buildings that a lesser water yield would be acceptable to avoid laying such a long pipe line. There are only two other sites on the property where the typography indicates subterranean fissuring. The better of these two sites lies in the gorge along the N.Y.Cen. right-of-way, down the steep hillside below the main buildings. I designated this to Mr. Stuart as the "Railroad" site. It is opposite the point where a side valley enters the gorge from the east, at ground elevation appreciimately 460'. There does not appear to be very thick rock cover at this point, possibly not over 15' of it. Were it possible to locate the well in the center of the gouge between the two railroad tracks, I believe the yield of the well would be considerably greater. However, there are sufficient indications of rock fracture at this point to justify drilling and fissures, or rock fracture, may be encountered anywhere down to 300' with water level rising fairly close to El. 440'. There may be sufficient fissuring to yield 10 gpm or more within 200' of the surface.

The third site is directly north of the tennis courts, which I designated to Mr. Stuart as the "Tennis Court" site. This site depends entirely upon the possible existence of cross-country faulting projecting northeastward from the Tilly Foster Mine. The principal fault which developed the mineralization of the mine was described extensively by Dr. Newberry of Columbia, and others, during a law suit against the City of New York many years ago. The line of faulting has a NE.-S.W. strike, dipping about 60 degrees toward the east. If projected it would pass under the valley between Dykeman and your camp, possibly the gorge may be erosion of this faulted structure.

As previously noted minor faults may result from stresses caused by earth adjustments paralleling the main faults. There is some indication of such adjustment under the small swale noted by Mr. Stuart below the face of the sheer rock bluffs to the northwest of the tennis courts. The depression is slight, but the face of the bluff pitches close enough to 60 degrees to indicate it resulted from deep stress fracture. Should this be true, a well drilled to intercept this fracture would get water. Cores from the dry well show no evidence of fracturing, not even thin streaks of limestone. There are no precise surface indications of faulting anywhere between the railroad and the western property boundary. Therefore, it is impossible to salect a well site north of the tennis courts except on a guess.

J. Homer Sandford
500 Fifth Ave.
New York 18, N.Y.

Copy

To: Frederick H. Lewis, Manager
The Herald Tribune Fresh Air Fund
230 West 41st St.
New York 18, N.Y.

Following is my report covering underground water conditions affecting the possibilities of developing a well water supply for Camp Warren in Putnam County, New York.

The area investigated lies easterly of Ice Pond Road, with the right-of-way of the N. Y. Central R.R. forming its eastern boundary. the Topography pitches rather steeply from the road toward the bottom of the valley through which the railroad runs, the higher areas of the camp being from 130' to 140' above the valley flat. The relief arises from the erosion-resisting character of the Fordham gneiss, which constitutes the underlying bedrock. Overlaying the rock is a mantle of poorly classified Glacial sediments, which vary in thickness from less than a foot to a possible maximum of 20 feet, except in the extreme north-eastern part of the property. The glacial mantle is highly permeable and wherever it exceeds 10' thickness will absorb and store ground water above the rock. This is the source of water in the farmhouse well and spring that supplies the swimming pool.

The wide-spread glacial mantling of bedrock throughout that general region is the principal source of feeding rainfall into rock fissures and crevices. Of itself, the Fordham gneiss has physical characteristics that makes it a very poor water bearer. However, it is one of the oldest rocks on earth as measured by geologic history. In the southeastern New York Counties it has undergone several confolutions during countless ages of erosion. This has developed band-like distributions of limestone or dolomite through the gneiss, accompanied by faulting due to stresses set up by earth adjustment. Wherever a major fault exists, minor faults may parallel it for distances ranging up to several miles. Moreover, shearing effects resulting from fault adjustment may cause cross fractures and myraad small cracks adjacent to the lines of faulting. These fissures afford openings into which water may pefcolate and travel considerable distances from the areas of inflow. They may also afford rather capacious under ground storage to maintain well pumpage. In addition to cross country faulting of the gneiss well water may sometimes be developed along contacts between it and limestone belts, because fracturing may exist along these contacts.

Limestone belts may be found to underlie the longer valleys, particularly those running in a southerly direction. This is due to glacial scarification of the surface when the great ice sheet moved down from the north. Advancing tongues of the Ice Front gouged more deeply into the softer limestone than into the hard gneiss, and the deep troughs of such valleys are usually filled with unconsolidated glacial sediments, forming a characteristic flat valley floor bordered by steep sided hills on either side. A typical example of such typography extends northward from the camp property toward Towners. The valley flat is drained by northward flowing Muddy Brook with Ice Pond surrounded by swamp land near the south end. This valley heads into the narrow gorge along

the

LOG OF WELL

KIND OF ROCK OR OTHER MATERIAL (Give color and tell whether hard or soft)	DEPTH, IN FEET From—	DEPTH, IN FEET To—	THICKNESS, IN FEET	REMARKS (Especially information as to water found)

a dug well is now used for water.
Is 12' deep with 4½-5' water level
Ran dry from mid-November to Jan. 1st 1949.
a pool on property is fed by a spring.
Water was then obtained from neighbor Weishopf.

a detailed hydrologic study was made of the area.
See attached sheet.