Morgantown, W. Va.

Memorandum on the Availability of Ground Water At the Flemington High School, W. Va.

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West Virginia Geological and Economic Survey

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At the request of the Superintendent of Schools of Taylor County, a brief investigation of the availability of ground water has been made in the vicinity of the Flemington High School, W. Va. Approximately a day and a half was devoted to the collection of data on March 29 and 30, 1949, and the following brief memorandum was written subsequently.

Location and Geologic Situation

The village of Flemington, with a population of about 1,000, is near the southwestern corner of Taylor County, W. Va. The village site covers an area of about 1 square mile along both sides of the valley of Simpson Creek in the southern part of the Fairmont quadrangle. The high school is on the northern side of the valley, near the western edge of the village. It is approximately at longitude 80°08' W. and at latitude 39°16' N., on a topographic nose immediately northwest of the junction of Berry Run with Simpson Creek.

The village is on the axis of a gentle northeastward-trending syncline which crosses the westward-trending valley at an angle of about 45°. Along this synclinal axis the rocks lie nearly flat, but to the northwest and southeast they rise at a rate of about 75 to 100 feet per mile.

The area is underlain by rocks of Pennsylvanian age. The hills are capped by the lower part of the Monongahela formation, its basal member, the Pittsburgh coal, being present about 200 feet above the floor of the valley. The valley and the lower slopes of the hills are underlain immediately by the Conemaugh formation, which is about 600 feet thick in the area. Below the Conemaugh is the Allegheny formation, 200 or 300 feet thick; and beneath this is the Pottsville formation, probably about 300 feet thick. These latter two formations are not exposed in the immediate area.

The Conemaugh formation, immediately beneath the school, is composed predominantly of shale and interbedded sandstones, the shale being somewhat more abundant than the sandstone. Also present are very thin limestone and coal beds. The underlying Allegheny formation is similar in character, although containing better-developed coal beds. The Pottsville formation, beneath the Allegheny, is composed of sandstone with lesser amounts of interbedded shale and possibly contains one or more thin coal beds.

Hydrology

Flemington does not have a public water-supply system, and as a consequence there is a fairly large number of privately owned wells in the area. Most of these wells are reported to be shallow, and most of them furnish household supplies. There are six industrial wells at a pumping station owned by the Baltimore and Ohio Railroad Co. These wells, on the south side of the railroad in the eastern part of Flemington,

are used for supplying water to locomotives at times when sufficient surface water is unavailable. They range from about 110 to 125 feet in depth, and one is reported to have been plugged back from a depth of about 400 feet. An abandoned test well at this pumping station is reported to have been drilled to a depth of about 550 feet, and to have encountered salt water at a depth of about 500 feet. The semipublic supply well at the high school, used to supply drinking water at the school, is 155 feet deep.

The chief bedrock aquifers that are yielding water in the area appear to be the Connellsville sandstone member and I. C. White's Grafton sandstone member of the Conemaugh formation. The Morgantown sandstone member of this formation may be yielding some water in the area. The Connellsville member is exposed in the lower slopes of the valley, and it is probably the aquifer for many of the relatively shallow hillside wells. Judging from reports, none of these wells has a total capacity of more than a fraction of a gallon per minute. A small spring that issues from the Connellsville at the Flemington High School supplies the water used for showers and sewage disposal at the school. This spring was flowing about 2.5 gallons per minute in March, 1949, but the flow is reported to decline to a much smaller rate in the autumn. The Grafton sandstone member is present at a depth of about 90 to 125 feet beneath the bottom of the valley of Simpson Creek. This sandstone is the chief aquifer for the wells at the Baltimore and Ohio pumping station, and for a well belonging to a Mr. Byron Ross in Berry Run, a short distance north

of Simpson Creek. It is probably the chief aquifer for the well at the high school. Still another well, located on the hillside south of the creek and belonging to the Reppert Coal Co., probably obtains some water from this sandstone. The Morgantown sandstone member is present about 25 to 50 feet below the valley floor. This sandstone may yield some water to certain wells in the area.

None of the reported yields of wells in the area are high. Apparently none of the wells in the Connellsville sandstone member are capable of furnishing more than a fraction of a gallon per minute. The wells in the Grafton sandstone member appear to have a wide range in capacity. For example, the six wells at the Baltimore and Ohio pumping station are said to have yields of at least 5 gallons per minute, and the Byron Ross well is said to be capable of yielding at least 2 or 3 gallons per minute. The well at the high school, however, was reported by the driller to be capable of yielding only 20 gallons per hour, and the Reppert Coal Co. well, referred to above, is reported to be very weak. The latter two wells are located on the hillsides; the former are in the valley. This suggests that the valley may be along a zone of fracturing, or possibly the wells in the valley penetrate open fractures, because there the sandstone would be under a lesser load of overlying rocks then would be the case beneath the hillsides.

The possibility that the Grafton sandstone member may contain relatively open fractures along Simpson Creek (or along Berry Run) is not sufficiently strong to indicate definitely that a new well or wells in the valley would yield enough water for the High School. However, in order to obtain a supplemental supply of a few gallons per minute, it might be worthwhile to test this sandstone by means of another well, or perhaps two wells. Another alternative would be to test with one well both the Grafton sandstone member and the Buffalo-Mahoning unit at the base of the Conemaugh formation. The top of the latter unit, which is predominantly sandstone, is about 450 feet below the top of the Conemaugh formation (or below the base of the Pittsubrgh coal). It extends about to the base of the Conemaugh. In case this alternative should be followed, the well should be stopped at the first water found in the unit. Additional drilling might encounter iron sulfate water from thin coal beds that may be present. In any case, if water from the Buffalo-Mahoning unit is to be utilized, such a well should be bottomed above the Upper Freeport coal, which is present immediately below the Conemaugh formation.

In case neither of the above-suggested wells found sufficient water, it might be necessary to test the Pottsville formation. The top of this formation is 800 or 900 feet below the base of the Pittsburgh coal in this area. No data are available as to the quality of the water that may be present in the Pottsville in the Flemington area, but in such a well it probably would be necessary to run casing through the Allegheny formation, in order to case off water of poor quality from that formation.