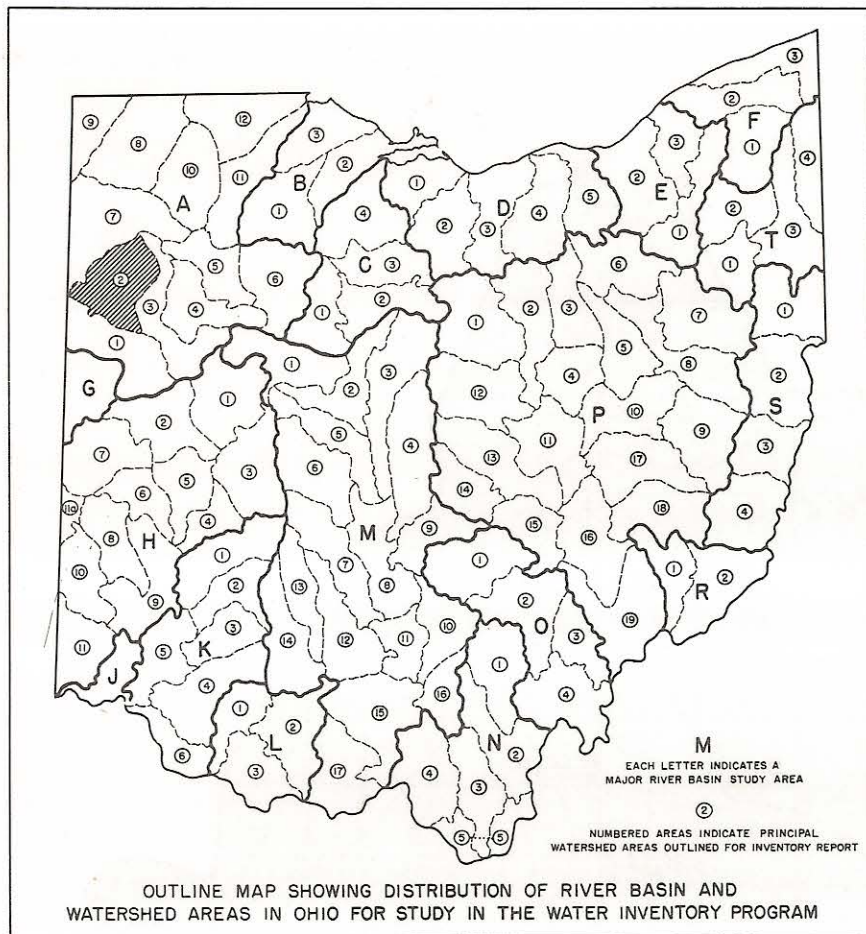


OHIO WATER PLAN INVENTORY
1959

LITTLE AUGLAIZE RIVER BASIN

UNDERGROUND WATER RESOURCES

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from data compiled by Lawrence R. Brunstetter.



The amount of water available to wells depends upon the types of geologic formations present in the area. Underground water is contained in the small open spaces that are present in the rocks. The number, kind and size of these openings in a formation determine its water-bearing characteristics. Therefore, wide variations in underground-water conditions are found as the geology differs from place to place.

FILE INDEX
A-2

GENERALIZED STRATIGRAPHIC SEQUENCE OF THE
ROCKS IN THE LITTLE AUGLAIZE BASIN

System or Series	Group or Formation	Character of Material	Water-bearing Characteristics
Quaternary	Recent	Clay, silt and alluvium deposited on flood plains of the major streams.	Generally a poor source of water due to fineness of the material.
	Pleistocene	Sands and gravels interbedded with less permeable glacial material.	Quantity of ground water available depends upon the extent of sand and gravel and source of recharge.
		Till, a heterogeneous mixture of clay, sand and gravel with a pre-dominance of clay.	Generally not a source of ground water, although in places gravel lenses within the till will yield small domestic supplies.
Silurian	Bass Islands	Brown to gray, massive to thin-bedded dolomites.	Dependable source of water over large areas.
	Niagara	Brown to blue-gray dolomites. Shaley in lower portion.	Dependable water source. May contain sulfur in varying amounts.
	Clinton	Undifferentiated.	Water-bearing properties not considered.
	Medina		
Ordovician	Richmond		

The geologic formations of the Little Auglaize basin may be divided into two major groups: (1) unconsolidated glacial deposits consisting of clay, sand and gravel, and (2) limestone and dolomite bedrock formations.

The glacial deposits cover the entire basin, ranging in thickness from 20 feet to as much as 200 feet in the deepest part of a buried valley in the southern part of the basin. This buried valley is a remnant of an old drainage system which cut valleys deep into the bedrock before the area was glaciated. Later, with the coming of the glaciers, the valleys were completely filled with drift. Where sand and gravel lenses of sufficient extent are encountered, supplies of around 20 gallons per minute may be obtained. Glacial material in the buried valley margin areas, shown on the map, ranges from 60 to 120 feet thick. Generally, less than 20 gallons per minute are obtained from sand and gravel in the margin areas. The limestone beneath these areas, however, is a good possible source of large underground-water supplies because it may contain numerous fractures capable of yielding water to wells. Cross-section AA' shows the thickness of the fill in the valley and in the adjacent area.

Although the limestone and dolomite bedrock varies from place to place in its ability to produce water, depending upon the number of fractures and solution openings it contains, it usually is a good water source. Yields of as much as 300 gallons per minute may be obtained from wells drilled to depths of around 300 feet into the bedrock. Throughout most of the basin the bedrock is covered with thin drift which is a poor underground-water source.

The following logs of two wells show the typical sequence of formations in the valley margin area and in the northern part of the basin.

Mercer County			Paulding County		
	Thickness (ft.)	Depth (ft.)		Thickness (ft.)	Depth (ft.)
Clay	30	30	Clay	28	28
Gravel & Clay	55	85	Gravel	8	36
Gravel	25	110	Clay & Boulders	6	42
			Gravel	3	45
			Clay	2	47
			Limestone	103	150

Records of approximately 500 water wells in the Little Auglaize basin are on file at the Ohio Division of Water. Locations of typical wells are indicated on the map.

QUALITY OF WATER

Underground water, obtained from both the drift and the bedrock is hard and may contain iron in varying amounts. Many of the wells drilled into the limestone and dolomite produce water that is high in hydrogen sulfide, sometimes at shallow depths. However, the probability of obtaining sulfur in objectionable amounts increases with the depth drilled.

Partial analyses of the water obtained from five wells are shown in the following table.

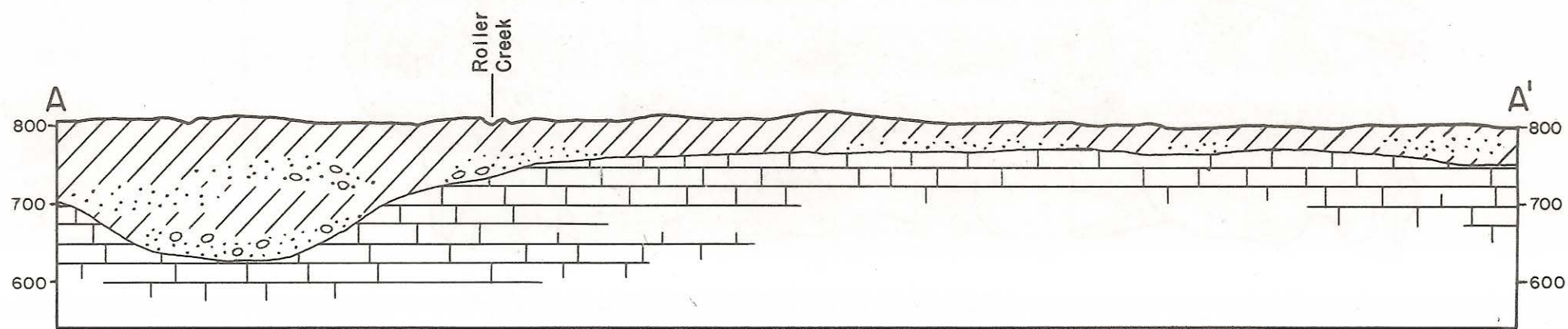
Two of the samples contain excessive iron which is likely to cause "red water." On exposure to air, iron oxide forms as a precipitate. Excessive iron will stain laundry, plumbing fixtures and other water containers.

The chloride content of the samples is negligible.

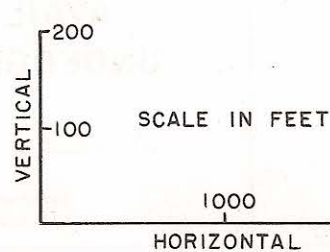
Water that has less than 50 parts per million hardness is usually rated as soft and its treatment for removal of hardness is seldom justified. Hardness between 50 and 150 parts per million does not interfere with the use of water for many purposes, but its removal by softening processes may be profitable for laundries and other industries. Water with hardness beyond 150 parts per million, such as these samples, usually requires some treatment for removal of hardness before being used.

Well number	C-1	C-2	C-3	C-4	C-5
Depth (feet)	50	290	410	144	335
Water-bearing formation	limestone	limestone	limestone	limestone	limestone
	Parts per million				
Iron	*1.8	0.5	0.3	0.6	*4.4
Chloride	5.5	20.	26.0	12.0	12.0
Dissolved solids	1678.	1364.	1560.	918.	1640.
Total hardness	*1320.	*693.	*870.	*591.	*803.
pH	6.4	7.6	7.4	7.5	7.3

*Would require treatment for most uses.







CROSS SECTION A-A', SHOWING THICKNESS OF FILL IN BURIED VALLEY.



- TILL OR CLAY
- SAND AND GRAVEL
- LIMESTONE

LEGEND

AREAS IN WHICH YIELDS OF 100, OR MORE, GALLONS PER MINUTE CAN BE DEVELOPED

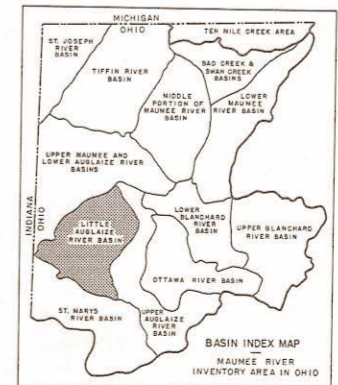
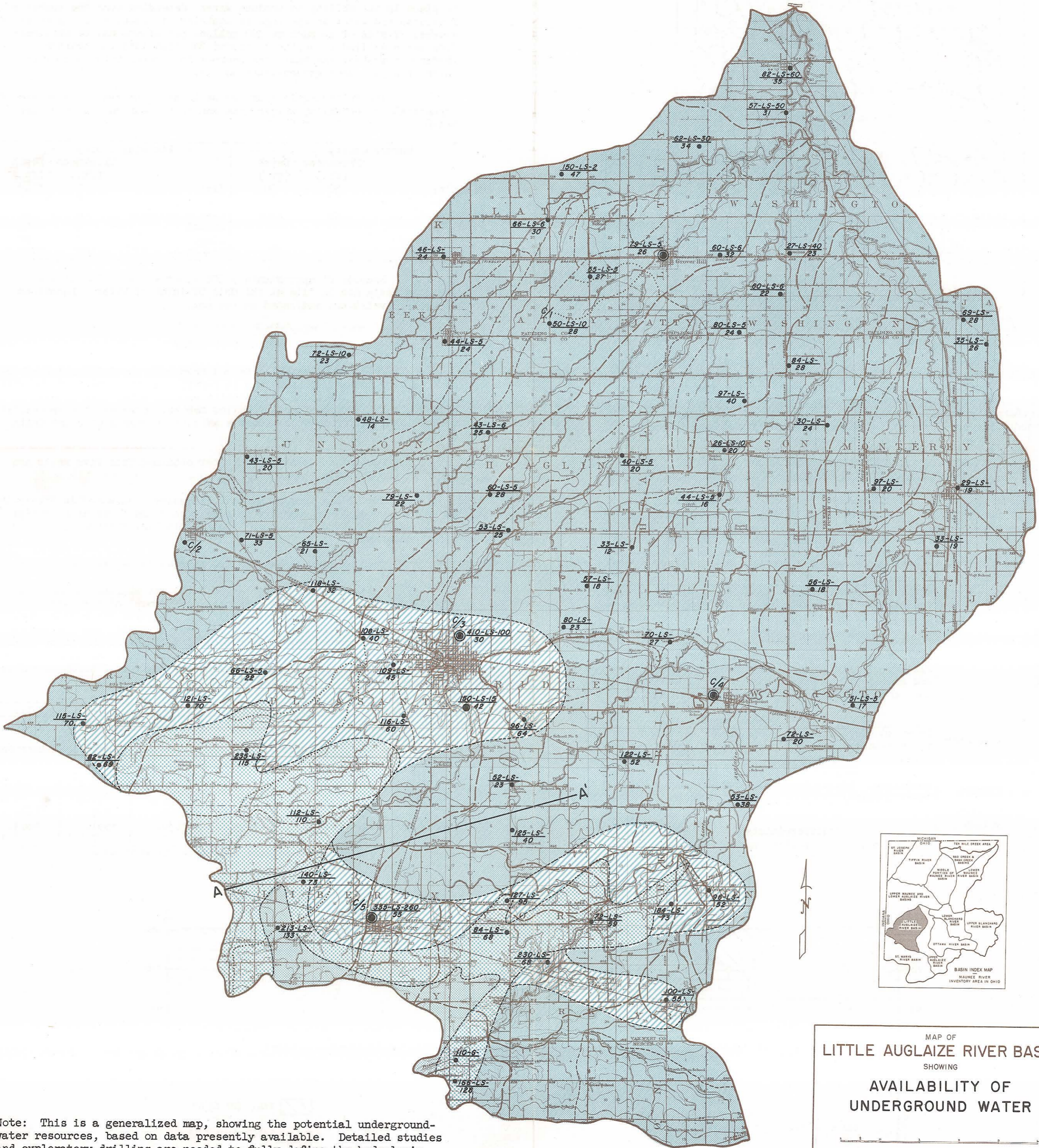
-  Limestone, covered with an average of 30 feet of drift, may supply as much as 300 gallons per minute at depths of 300, or more, feet. Little water obtained from thin drift.
-  Buried valley. Yields of 20 gallons per minute obtained from sand and gravel layers, where present in the deep fill. Larger yields available from underlying limestone.
-  Buried valley margins. Sands and gravels in the drift generally yield less than 20 gallons per minute. Good possibilities for large supplies from limestone.
-  Adequate domestic supplies from sand and gravel at depths of from 20 to 80 feet. Larger yields available from limestone bedrock.

EXPLANATION OF SYMBOLS

- Domestic well
- ⊙ Industrial well
- ⊙ Municipal well
- LS Limestone
- G Gravel

$\frac{1}{2}$ Chemical analysis in text.

$\frac{\text{Total depth (Ft.) - Water bearing formation - Yield (gpm)}}{\text{Depth to bedrock (Ft.)}}$



MAP OF
LITTLE AUGLAIZE RIVER BASIN
SHOWING
AVAILABILITY OF
UNDERGROUND WATER

Note: This is a generalized map, showing the potential underground-water resources, based on data presently available. Detailed studies and exploratory drilling are needed to fully define the hydrologic characteristics of the glacial and bedrock aquifers.