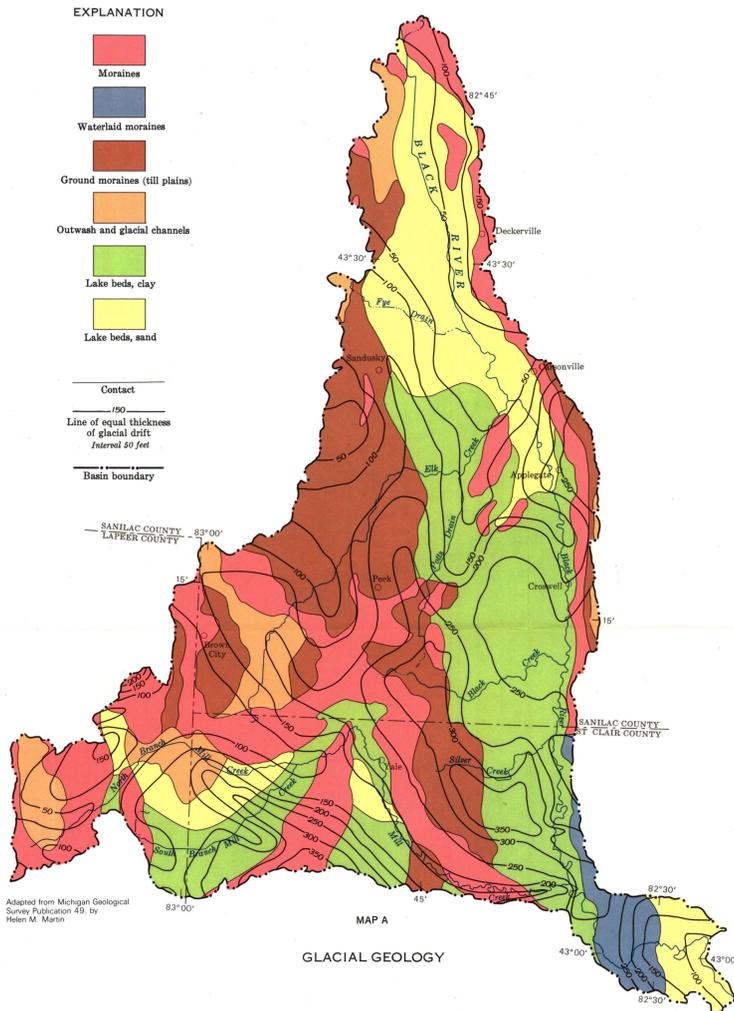
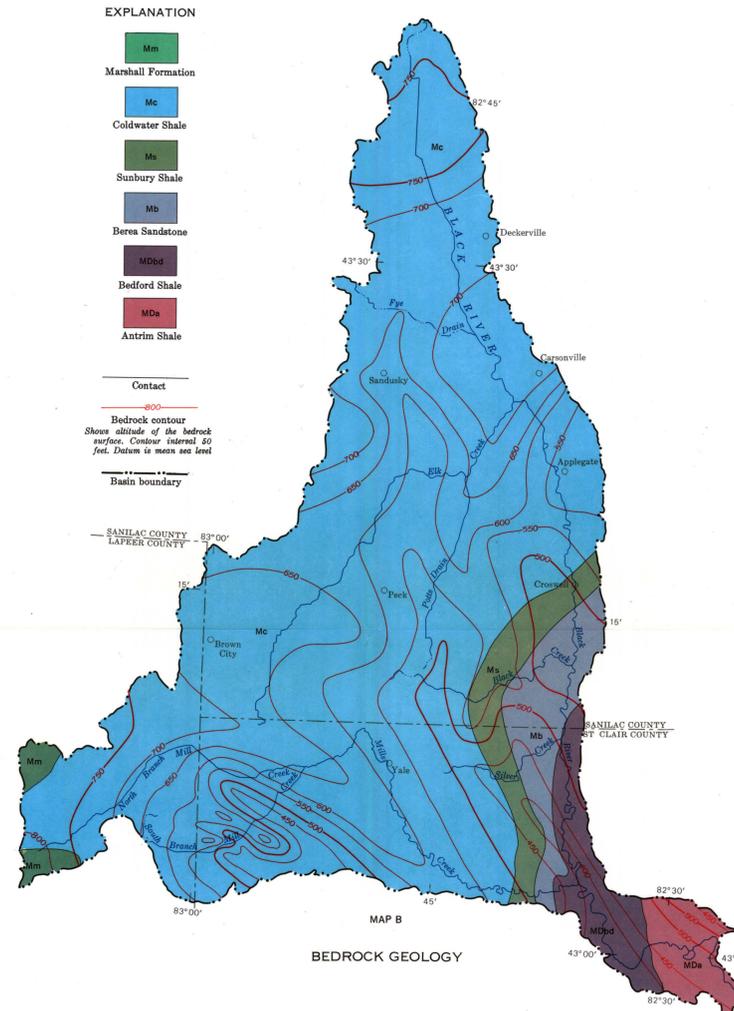


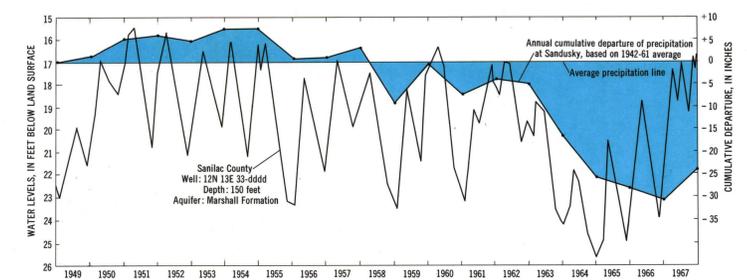
GEOLOGY AND GROUND WATER



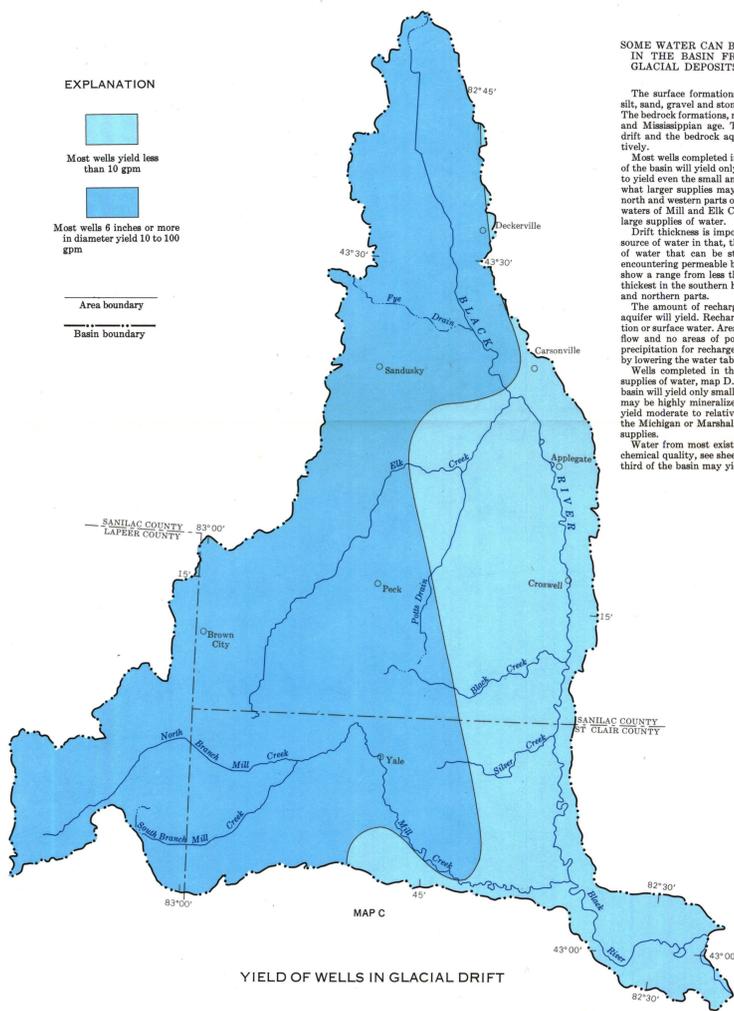
MAP A
GLACIAL GEOLOGY



MAP B
BEDROCK GEOLOGY



WATER LEVELS IN A BEDROCK AQUIFER AT ELMER, 5 MILES EAST OF SANDUSKY, FLUCTUATE ABOUT 6 FEET ANNUALLY AND FOR THE PERIOD OF RECORD HAVE A RANGE IN STAGE OF ABOUT 10 FEET



MAP C
YIELD OF WELLS IN GLACIAL DRIFT

SOME WATER CAN BE OBTAINED ALMOST ANYWHERE IN THE BASIN FROM WELLS COMPLETED IN THE GLACIAL DEPOSITS OR IN BEDROCK

The surface formations, map A, consist of unconsolidated clay, silt, sand, gravel and stones deposited by glacial ice and meltwaters. The bedrock formations, map B, are shale and sandstone of Devonian and Mississippian age. The potential yield of wells in the glacial drift and the bedrock aquifers is shown in maps C and D, respectively.

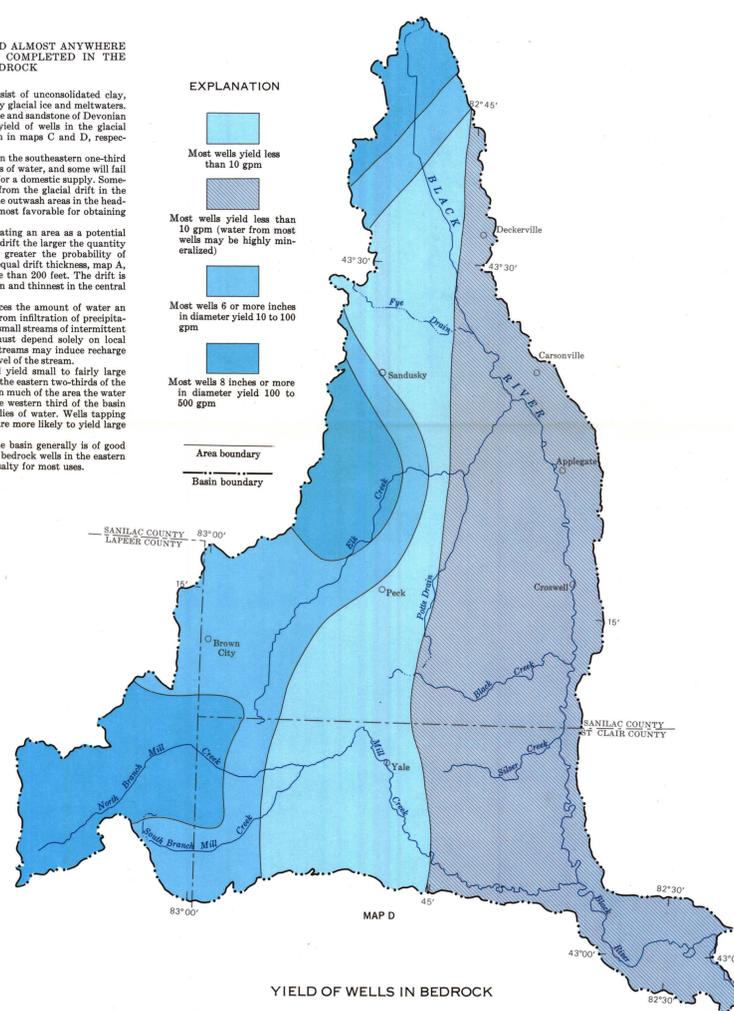
Most wells completed in glacial drift in the southeastern one-third of the basin will yield only small supplies of water, and some will fail to yield even the small amount needed for a domestic supply. Some-what larger supplies may be obtained from the glacial drift in the north and western parts of the basin. The outwash areas in the headwaters of Mill and Elk Creeks are the most favorable for obtaining large supplies of water.

Drift thickness is important in evaluating an area as a potential source of water in that, the thicker the drift the larger the quantity of water that can be stored and the greater the probability of encountering permeable beds. Lines of equal drift thickness, map A, show a range from less than 50 to more than 200 feet. The drift is thickest in the southern half of the basin and thinnest in the central and northern parts.

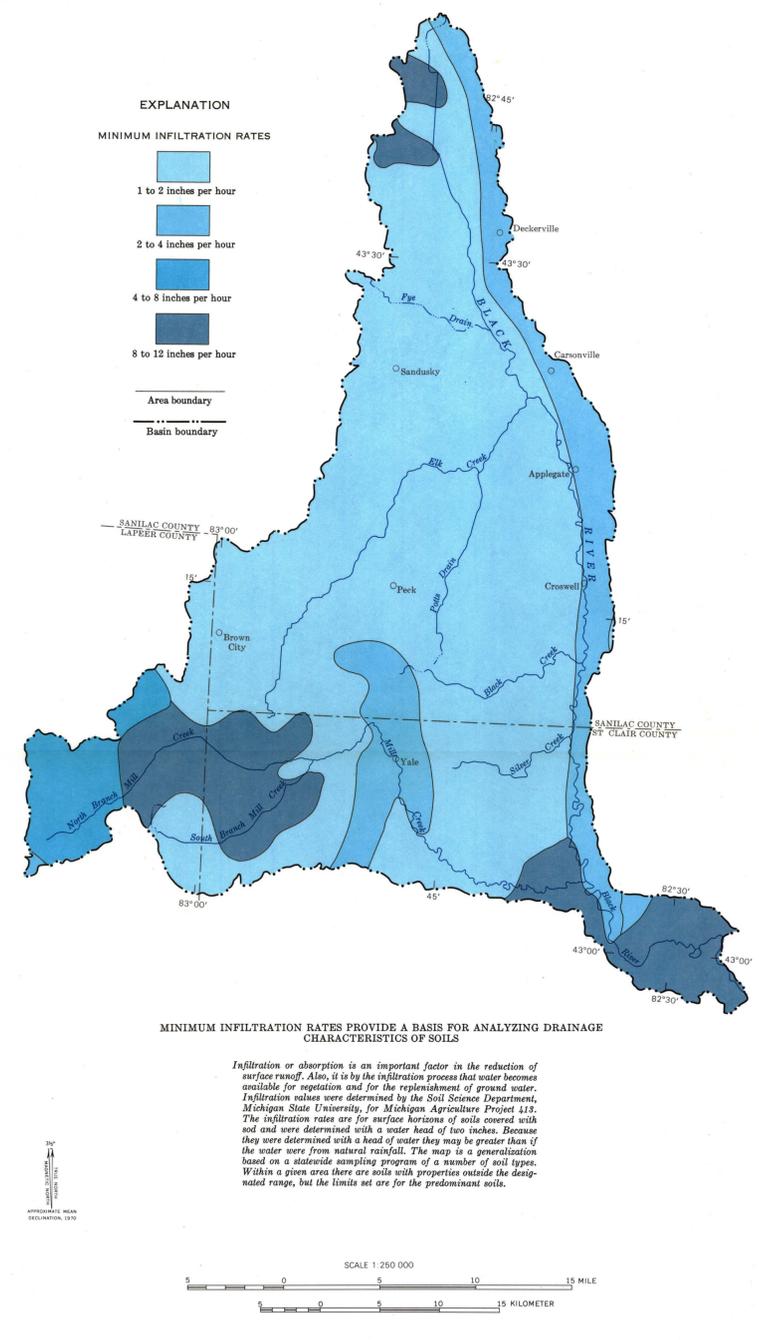
The amount of recharge also influences the amount of water an aquifer will yield. Recharge is derived from infiltration of precipitation or surface water. Areas which have small streams of intermittent flow and no areas of ponded water must depend solely on local precipitation for recharge. Wells near streams may induce recharge by lowering the water table below the level of the stream.

Wells completed in the bedrock will yield small to fairly large supplies of water, map D. Most wells in the eastern two-thirds of the basin will yield only small supplies and in much of the area the water may be highly mineralized. Wells in the western third of the basin yield moderate to relatively large supplies of water. Wells tapping the Michigan or Marshall Formations are more likely to yield large supplies.

Water from most existing wells in the basin generally is of good chemical quality, see sheet 2. However, bedrock wells in the eastern third of the basin may yield water too salty for most uses.



MAP D
YIELD OF WELLS IN BEDROCK



MINIMUM INFILTRATION RATES PROVIDE A BASIS FOR ANALYZING DRAINAGE CHARACTERISTICS OF SOILS

Infiltration or absorption is an important factor in the reduction of surface runoff. Also, it is by the infiltration process that water becomes available for vegetation and for the replenishment of ground water. Infiltration values were determined by the Soil Science Department, Michigan State University, for Michigan Agriculture Project 418. The infiltration rates are for surface horizons of soils covered with sod and were determined with a water head of two inches. Because they were determined with a head of water they may be greater than if the water were from natural rainfall. The map is a generalization based on a statewide sampling program of a number of soil types. Within a given area there are soils with properties outside the designated range, but the limits set are for the predominant soils.

WATER RESOURCES OF THE BLACK RIVER BASIN, SOUTHEASTERN MICHIGAN

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1970