Municipal Water Supplies of Illinois*

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AN ABSTRACT

The Municipal water supplies of Illinois are obtained from three sources. The northern part of the State obtains its water from deep, bed rock wells, the central part from shallow wells into the glacial drift, while the southern part obtains its supply from surface waters. There are many exceptions in each part of the State.

Northern Illinois. This area extends from the Wisconsin boundary south to an irregular line drawn from Streator east to the Indiana boundary and southwest to where the Des Moines River joins the Mississippi River at Keokuk, Iowa.

Most of the cities in this area obtain water from deep wells drilled into the Ordovician or Cambrian formations. The water obtained is relatively low in mineral content and is almost always cool and pure. Most of the wells are less than 2,000 feet deep.

The biggest problem in this area is lack of volume. If the wells are pumped rapidly the volume of water produced decreases in proportion. As a result many of the larger cities in this area, as for instance, the cities along Lake Michigan, Rock Island and Moline, have had to resort to treated surface water for their municipal supplies. Rockford with a population of 86,000 is the largest city using deep well water. It obtains its supply from wells drilled to a maximum depth of 1,600 feet.

Scattered throughout this region are shallow wells drilled into the glacial drift. These wells serve the smaller cities with water that frequently has a mineral content higher than that of the deep wells. For example the deep wells of Rockford produce water with a mineral content of 323 parts per million while in Poplar Grove nearby the water produced from drift wells has 402 parts per million. Another example is Freeport with water from deep wells having 449 parts per million while Pearl City nearby uses drift water with 538 parts per million.

In some cases the drift wells produce water with less mineral content than the deep wells. This becomes increasingly common the further south in Illinois one goes. For example the drift wells of LaSalle produce water with 550 parts per million, while at Peru, next door, the deep wells produce water with 878 parts per million.

Central Illinois. This area extends southward from the Streator boundary on the north to a line extending roughly east and west through northern Calhoun County, Pana, and Effingham.

Most of the cities in this area obtain water from glacial drift. This drift is an excellent reservoir since it is deep and porous. The wells produce water quite similar in total mineral content to that of many of the northern Illinois drift wells. Drift wells here do not produce sufficient water for the larger cities, so water supply from this source is confined to smaller towns. There are several outstanding exceptions. For instance Peoria uses water from drift wells. These wells are located near the Illinois River. Indirectly some water may come from this source. Champaign-Urbana also uses water from drift wells. In the case of Peoria much of the water used in manufacturing is obtained from the Illinois River. Champaign and Urbana are not manufacturing cities, so do not use large volumes of water. Large cities in this area that are required to use surface water

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because of insufficient drift water are Bloomington, Quincy, Springfield, Decatur, and Danville.

Even though the drift wells produce water that is low in mineral content, most of the surface water supplies contain even a smaller amount. For example, the water from the drift wells of Normal has a mineral content of 460 parts per million, while the surface water used by Bloomington has a mineral content at 261 parts per million. Another example of this same situation is at Mattoon. Here the mineral content of the water from drift wells is 500 parts per million, while that in Charleston's surface water supply is 281 parts per million.

There are a few deep wells in this middle area but frequently the water produced has a high mineral content. Minonk's deep well produces water containing 2,210 parts per million. Toluca's deep well produces water with a mineral content of 2,006 parts per million.

South Illinois. This area extends southward from the northern Calhoun County, Pana, and Effingham boundary of the Central area, to the southern part of the state. Most of the cities in this area obtain their water supply from surface sources. It is impossible for them to obtain enough water from the drift since in this section the drift is usually thin with very little pore space. For this reason it makes a very poor reservoir for large quantities of water.

The cost of drilling deep wells, and of pumping them after drilling, is prohibitive since in some places the wells would have to be as much as 5,000 feet deep. Water produced from these wells would be highly charged with minerals, and hence, without treatment would be unfit for human use. This then leaves but one satisfactory source of water and that is from the surface of the land. Usually the streams are dammed and a reserve of water obtained in this manner. Since the soil is compact there is little loss of reservoir water excepting by evaporation.

Surface supplies here have the same advantages and disadvantages as are found at other places in Illinois. The advantage is that the water is low in mineral content. At Centralia the surface supply has 178 parts per million and at Carbondale 163 parts per million. The disadvantage is that all surface water must be purified.

Summary

Because of definite physical conditions it is advantageous for northern Illinois to use deep wells, central Illinois to use drift wells, and southern Illinois to use surface water. These regions, in every case, however, have cities using other sources of water.

In the last ten years there has been a tendency for the three regions to develop surface water supplies. This tendency will probably continue as the demand for water in Illinois increases.