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GEOLOGICAL SURVEY

Salinity of ground water at sampling wells located in southeastern Nassau County Long Island, New York

by

Norbert J. Luszynski

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SALINITY OF GROUND WATER AT SAMPLING WELLS LOCATED IN SOUTHEASTERN NASSAU COUNTY, LONG ISLAND, NEW YORK

In 1939, a special program for the systematic collection of chloride data in southeastern Nassau County was inaugurated in which three agencies participated. The Nassau County Department of Public Works constructed the sampling wells, the Ground Water Branch of the U. S. Geological Survey began to collect at periodic intervals water samples which were analyzed at the Mount Prospect Laboratory of the New York City Department of Water Supply, Gas and Electricity. The Nassau County Department of Public Works and the U. S. Geological Survey have continued financial cooperation for the maintenance of this program up to the present time.

The observation wells are located in southeastern Nassau County from Freeport to Massepequa at various distances south of Sunrise Highway which also parallels all the City of New York surface and ground water developments in the County. Groups of two to three wells had been driven at each site to the several water-bearing sands and gravels which are separated by more or less local lenses of clay. Salinities collected at these so-called "outpost" wells would then provide adequate warning of any approaching intrusion of salt water much before any contamination of water pumped for public-water supply and other uses could take place.

The New York City Department of Water Supply, Gas and Electricity operates its Long Island surface and ground water plants on an intermittent basis usually during periods of deficient precipitation when the storage in the Upstate reservoirs is being depleted at a fairly rapid rate because of reduced inflow of surface water. Between 1939 and 1948 the maximum pumpage from Long Island averaged 74 million gallons a day in 1942; at this time 60 million gallons a day

were taken from Nassau County, 31 million gallons a day from ground-water sources and 29 million gallons a day from surface-water reservoirs and ponds. The minimum pumped during this period was in 1943 when only 19 million gallons a day were withdrawn from the Long Island sources; of this amount 18 million gallons a day was from surface and ground-water plants in Nassau County. In 1947, of the 44 million gallons a day pumped from Long Island for New York City, 35 million gallons a day were taken from Nassau County (24 million gallons a day from ground-water and 11 million gallons a day from surface-water sources).

Some of the data collected since the chloride program was started have been listed in the attached table. These include the chlorides of (1) the first samples taken at each well, (2) those taken on December 15 and 16, 1947 after nearly five months of continuous pumping by the City of New York, and (3) those obtained on Nov. 2, 1949 four months after the City of New York began emergency withdrawals of large quantities of surface and ground-water from Nassau and Queens Counties which averaged 89 million gallons a day in October 1949.

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Well Number	Location	Depth of well (in feet)	Chloride content (parts per million)		
			Date as listed	Dec. 15, 16 1947	Nov. 2 1949
N 1265	Freeport	14	5.0 (1939)	4.5	8.0
N 1266	"	17	3.0 "	3.5	8.0
N 1269	Merrick	14	10 (1939)	12	14
N 1270	"	34	3.0 "	12	12
N 1271	"	14	4.0 "	6.5	12
N 1272	"	25	3.0 "	9.5	12
N 1273	Wantagh	13	23 "	16	14
N 1274	"	40	5.0 (1942)	4.0	8.0
N 1275	"	13	6.0 (1939)	11	12
N 1276 *	"	35	1450 "	730	710
N 1277	"	87	6.0 (1942)	6.0	8.0
N 1278	Massapequa	14	10 (1939)	10	14
N 1279	"	45	11 "	6.0	8.0
N 1280	"	29	10 (1940)	9.0	12
N 1281	"	46	5.0 (1939)	8.0	10
N 1282 *	Wantagh	20	6750 "	6300	7500
N 1283 *	"	38	6500 "	6200	7500
N 1284	"	64	7.0 (1942)	7.0	12
N 1285	"	18	24 (1939)	8.0	20
N 1286	"	39	5.0 "	9.0	—
N 1287	"	64	5.0 (1942)	6.0	—
N 1288	"	19	13 (1939)	19	—
N 1289	"	29	6.0 "	9.0	8.0
N 1290	"	63	6.0 (1942)	8.5	9.0

* Chloride high since start of record.