

CORRESPONDENCE/MEMORANDUM

STATE OF WISCONSIN

MAR 12 1982

Date: March 5, 1982 File Ref: 3200

To: Central Office - Madison

From: Frank J. Koshere 

Subject: Surface Water Classification of Receiving Water at Stokely-VanCamp, Frederic, Polk County

A surface water classification investigation of the receiving water for the Stokely-VanCamp cannery in Frederic has been conducted by the NWD. Field observations were made by aerial observation on September 14, and on-site on September 22, 1981.

Description

The seasonally operated vegetable cannery is located on the northwest side of the Village of Frederic. Some of the existing buildings date back at least to 1938. The history of the canning operation is not known. Process wastewater is comprised of vegetable wash water and can cooling water. Large solids are screened out of the discharge. The screening effluent is then discharged to the south basin of a small landlocked lake approximately 10-15 acres in size. The south basin exhibits some wetland characteristics with the presence of a mobile floating bog. There are no streams into or out of the wetland/lake system. The term wetland is used in a descriptive sense and not as defined in NR 104.

The attached sketch shows the physical relationship of the two basins during the field investigation. A copy of a 1965 air photo shows the hydrologic system under apparently lower water levels and a 1958 photo shows it under conditions similar to the date of survey. The south basin was on the date of the investigation, separated by floating bog into three distinct open water areas arbitrarily referenced as the upper pond, the receiving pond and the beaver pond. The lake is adjacent to and "below" the beaver pond. The beaver pond, so named because of an active beaver lodge, is partially separated from the main lake by what appears to be an old roadbed now grown over and built up into a dam by beaver activity. During the survey the beaver dam held an approximate head of one foot of water in the south basin. A slight overflow was occurring into the lake during the field investigation. Much higher flows were evidenced by a large overflow channel on the dam with a thick blanket of duckweed left by recent receding water. High water marks in the beaver pond also indicated frequent occurrence of higher levels.

Wastewater is discharged into the receiving (middle) pond and can flow both directions, into the upper pond (away from the lake) and into the

beaver pond. Since there is no outlet stream, the hydraulic loading from the cannery apparently has a large influence on water levels. From the evidence present at the time of the field investigation, it appears that during periods of cannery discharge, the water levels will rise in the south basin ponds and will flow into the lake. After the discharge has been discontinued, surface water levels will probably recede and stabilize at prevailing groundwater levels. The size, depth, and shape of the three open water areas of the south lake are variable due to changes in hydraulic loading and the floating bog vegetation separating the ponds. Except for purposes of description, the ponds should be considered as one body of water. Water depths were measured as 2.0 m in the receiving pond, 2.2 m in the beaver pond and 2.8 m in the main lake. Maximum depths are unknown. No depth measurement was made on the upper pond.

The cannery had ended its summer production the week previous to the field study and was discharging a reduced flow of wash water. Thus, our field observations were made when surface water levels were receding. It is unknown to what extent the lake level is influenced by the discharge.

Where the cannery wash water enters the receiving pond it has created a shallow, putrescent, organic delta of beans and vine parts. Water quality in all of the ponds was extremely poor. Dissolved oxygen was virtually nonexistent and the pH of both the pond water and influent was low. Nutrient levels were very high in the ponds, but no algal growth was observed. Toxic conditions may have been present due to low pH or chlorinated discharges. An extreme algal bloom was present in the main lake. Duck weed was abundant in the beaver pond and on the main lake. A summary of water quality sample results is attached. ~~low pH~~

Fish life is present in the lake system. A school of minnows was observed stranded by the receding water in a pool on the dump access roadbed on the west shore of the upper pond. High water levels apparently flood the access road.

The land area just west of the south lake has previously been used as a village dump, thus, various debris such as tires, bottles and boards are present in and around the water area.

Discussion

After a review of air photos dating back to 1938, Steve Fix of the wetlands mapping unit believes the area to have been a wetland-like area prior to 1938. It is the NWD's opinion that the south basin lake is a natural surface water feature and should not be identified as a wastewater treatment system in a WPDES permit. Instead it is the receiving water for the present minimally treated (screened) discharge from the cannery.

Because the three ponds of the south basin area and the main lake are integral parts of the whole surface water feature, they should be grouped into the hydrological classification of a lake as defined in NR 104. Thus the discharge has essentially been to a lake.

The general water quality standards enumerated in NR 102.02(1) are not presently being met in the south basin portion of the lake.

A non-wastewater impacted lake similar to this one would support a marginal fishery dependant on the frequency of natural winterkill, primarily a habitat related problem. However, this system's natural capacity for fish and aquatic life has been drastically and probably permanently diminished by the past discharges and adjacent landfill. It is doubtful that year-round dissolved oxygen levels sufficient to support an abundance and diversity of fish would be attainable in this water even without a future discharge.

Because of natural seasonal limitations during winter and the seasonal operation of the cannery during summer, a discharge into the hydrologic system should be required to maintain water quality similar to naturally expected water quality from a comparable ecosystem during the open water (ice-free) season. However due to essentially irretrievable cultural impacts, lower water quality can be anticipated.

It is therefore recommended that a variance from fish and aquatic life standards (NR 104.02(2)(a)) be permitted because of the presence of in-place pollutants, natural background conditions, and irretrievable cultural alterations (NR 104.01(a)(c)(d)).

Although not directly applicable because of the lake hydrologic classification, the surface water criteria of the intermediate aquatic life variance category (NR 104.02(3)(a)) appear to be reasonable if applied to the open water season. Maintenance of a reasonable dissolved oxygen level is a primary concern. Because of the lake discharge, consideration should also be made to phosphorus limitations depending on the expected fate of the already high concentrations present. Chlorine residuals and pH levels should also be established to prevent toxic conditions to any forage fish present and potential plant communities.

It was not possible to apply the new stream classification guidelines in much detail to this classification. However, the recommended intermediate aquatic life variance category does agree with the proposed use class description "D-capable of supporting tolerant or very tolerant forage or rough fish, or tolerant macroinvertebrates" of the 1981 stream classification guidelines.

Personnel involved in the field investigation and classification include the entire District Water Quality Management Unit. Consultation was also made with the area Fish Manager, the area Wastewater Engineer, and the Wetlands Mapping Unit in central office.

To: Central Office - Madison, March 5, 1982

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Recommendation

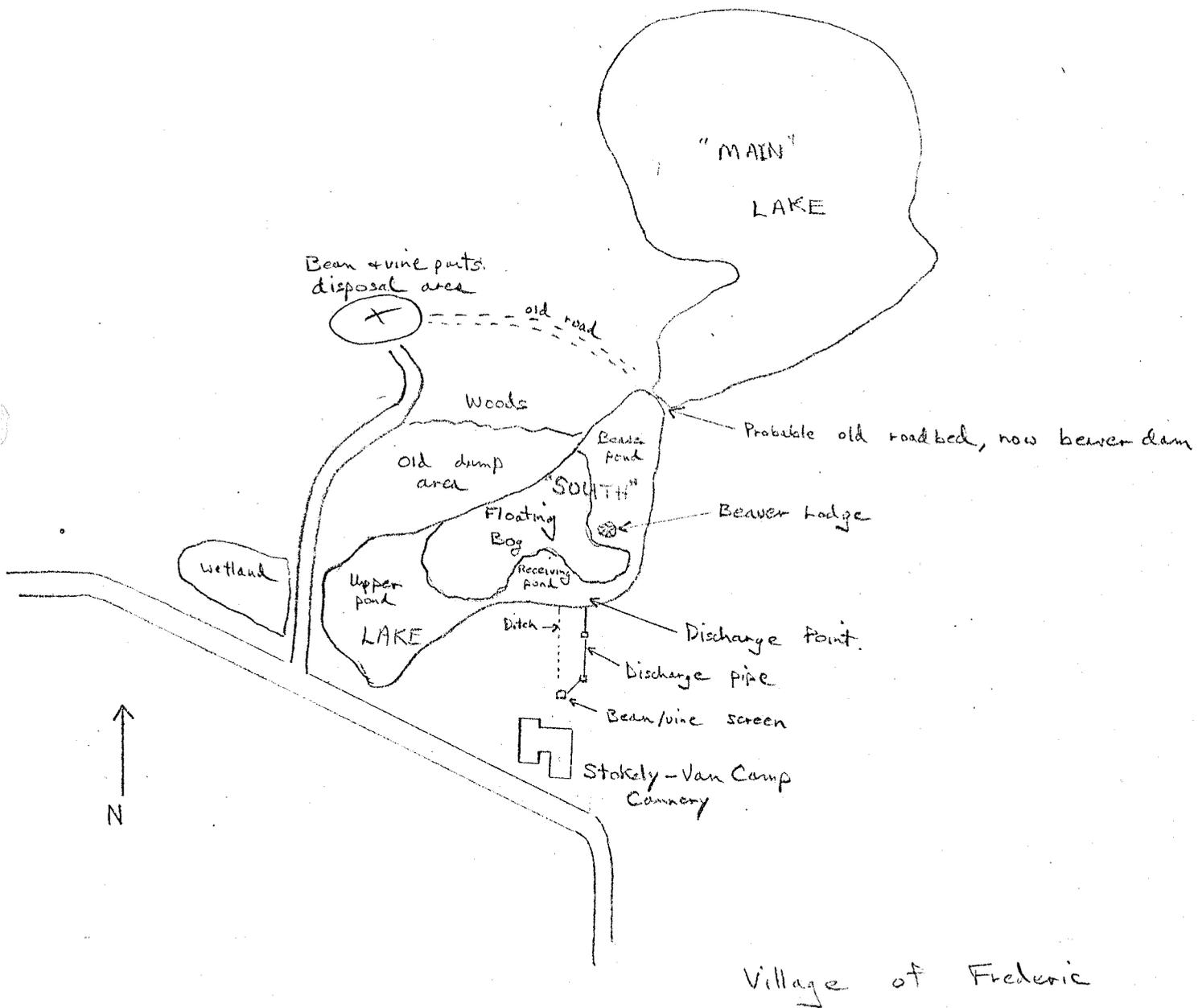
The NWD recommends the surface water described as a small lake consisting of a main lake and smaller south basin with some wetland characteristics located at T37N, R17W, NW^{1/4}, Section 28, Polk County, shall be placed in the hydrologic classification of a lake (NR104.02(2)) and shall be given a variance from fish and aquatic life standards (NR 102.02(3)(a)), and instead meet criteria similar to the intermediate aquatic life variance category (NR 104.02(3)(a)), to apply only during the open water (ice-free) season. The need for phosphorus limits and control of potential chlorine toxicity should also be considered.

FJK:mj

cc: Chuck Olson - Cumberland

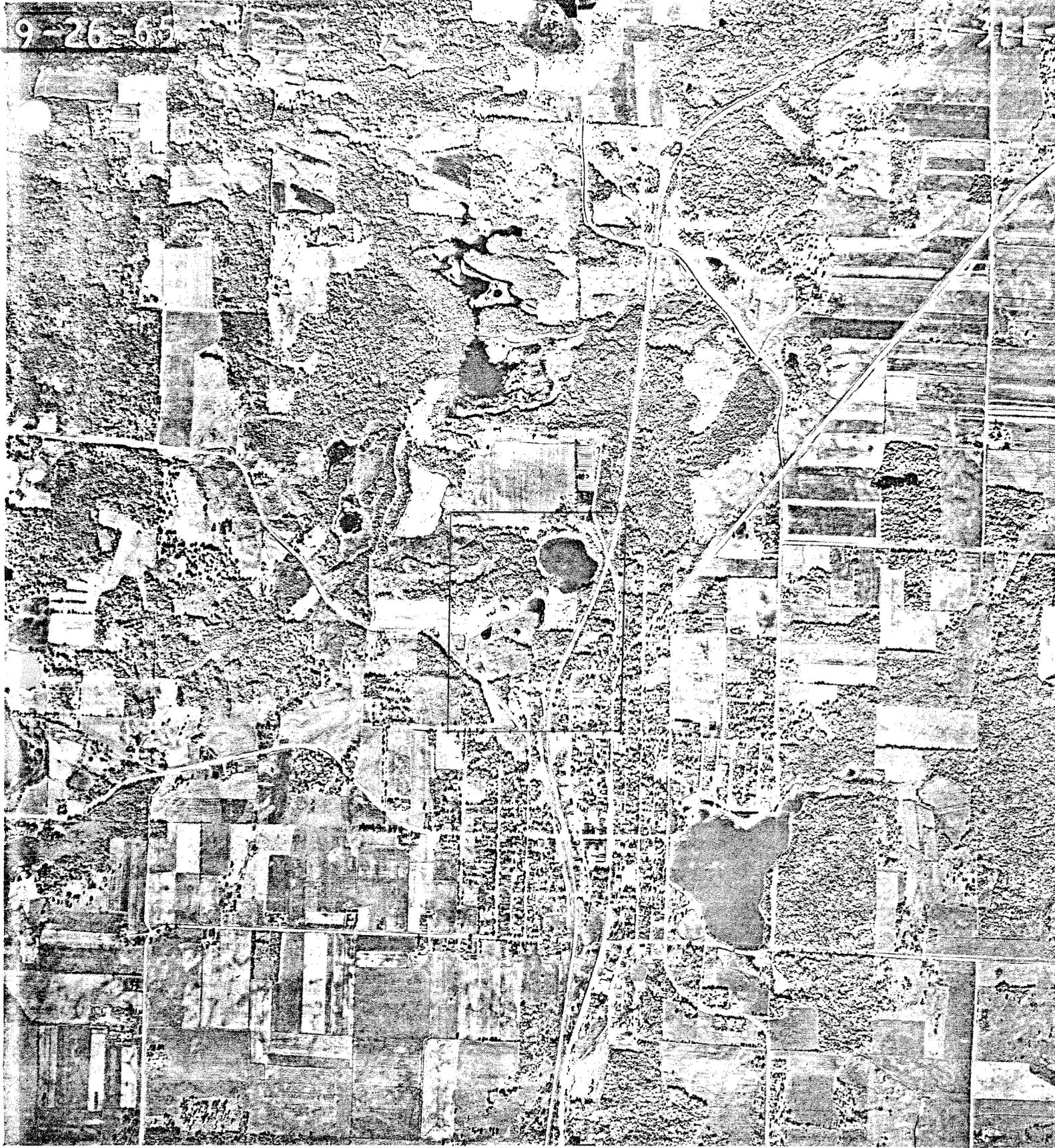
SUMMARY OF WATER QUALITY SAMPLES
 STOKELY-VANCAMP, FREDERIC, WISCONSIN
 September 22, 1981

Location	D.O.	Temp.	Field		Tot. Solids	Tot. Phos.	(mg/l)			
			lab pH	BOD ₅			Diss. Phos.	Kjel N	NO ₂ + NO ₃ -N	NH ₃ N
1. Stokely Discharge at Large Screen	9.6	14.0	<u>2.2</u> 2.8	≈ 10	10	300.	--	0.8	1.0	0.1
2. South Branch of Discharge	9.7	15.0	<u>8.8</u> 9.8	≈ 4	4	1.14	0.96	0.2	1.2	< 0.1
3. Discharge to Receiving Pond	9.4	14.8	<u>2.2</u> 3.0	--	45	310	--	1.6	1.0	0.1
4. Receiving Pond	0.1	16.1	5.6	≈ 39.0	18	5.1	3.9	5.5	< 0.02	2.8
5. North Shore of Upper Pond	0.2	17.2	6.4	26	38	4.4	3.4	3.4	< 0.02	0.29
6. Beaver Pond Below Receiving Pond	0.1	17.0	5.9	≈ 41	58	4.6	3.1	5.5	< 0.02	0.40
7. Upper End of Lake Below Beaver Pond	13.9	16.2	7.8	6.1	18	2.3	1.87	2.4	< 0.02	< 0.02
8. Middle of Lake	14.1	16.1	7.6	9.2	24	2.4	1.88	2.6	< 0.02	0.02



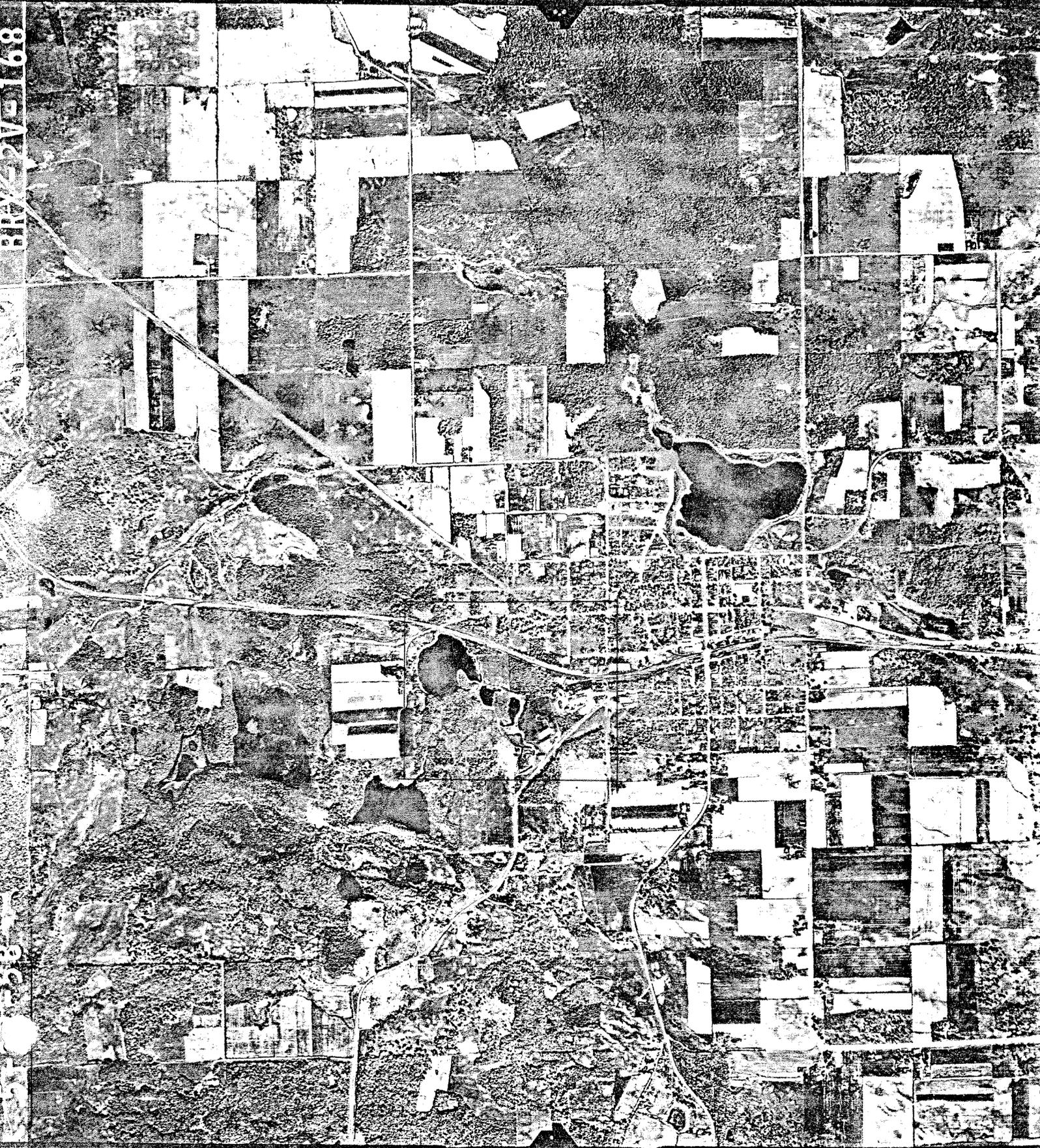
Receiving water @ Stokely-Van Camp, Frederic
 Sept 22, 1981

9-26-65



Stokely - Van Camp, Fredonia, Polk Co during lower water levels c. 1965

ORDER NO. 71309B



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