

DATE: November 18, 2002

TO: Laura Bub, WT/2

FROM: Pamela Stubbe, Superior

SUBJECT: Pikes Bay S. D. - Surface Water Classification & Designated Use Review

The Pikes Bay S. D., formerly Pureair, wastewater treatment facility in Bayfield County includes a two-cell aerated pond with cells operated in series (Figure 1). The effluent is treated with ultraviolet disinfection from 1 May through 15 October each year. The disinfection season is extended beyond the end of September because of the longer fall recreation season in the area. The treatment system serves a marina complex with condominiums, a restaurant, and a boat maintenance garage.

The treated effluent is discharged from an underground pipe that is covered with large stones (Figure 2) to a natural ravine drainageway, which is usually dry except during runoff or discharge events, that feeds Lake Superior. The drainage ravine is approximately 100m long and descends approximately 10 m from the discharge outlet southward to its end where it drops about 3m to the beach. Water from the ravine travels a short distance across a private beach and into the lake (Figures 3 and 4). The steep slope of the ravine in addition to other physical barriers such as trees, large rocks, and leaf material within it and the characteristic low- to no-flow limit potential fish and aquatic macroinvertebrate habitat (Figures 5-7).

On 29 October 2002 Water Resources Management Specialist Bill Jaeger, Wastewater Engineer Chuck Olson, and I evaluated the site. Flow was negligible in the ravine. We found a few sparse, low-quality macroinvertebrates, including snails and midge larvae, in areas where water had pooled. The steep slope/drop to Lake Superior and the small amount of flow/water negated fish sampling.

#### RECOMMENDATION

The original recommendation (12/21/76 L. G. Hansen memorandum) that the natural ravine drainageway, which receives treated wastewater from the Pikes Bay S. D. facility, be classified as a "diffused surface water" (NR 104.02(1)(b)) and be placed in the "marginal surface water/limited aquatic life/very tolerant aquatic life" (NR 104.02(3)(b)) is appropriate. The reasons for this recommendation are as follows:

- 1. Physical conditions related to the natural features of the water body, such as the lack of proper substrate, cover, flow, depth, pools, riffles, and the like, unrelated to water quality, preclude attainment of a Diverse Fish and Aquatic Life community.*
- 2. Natural, ephemeral, intermittent, or low flow conditions or water levels prevent the attainment of a Diverse Fish and Aquatic Life community.*

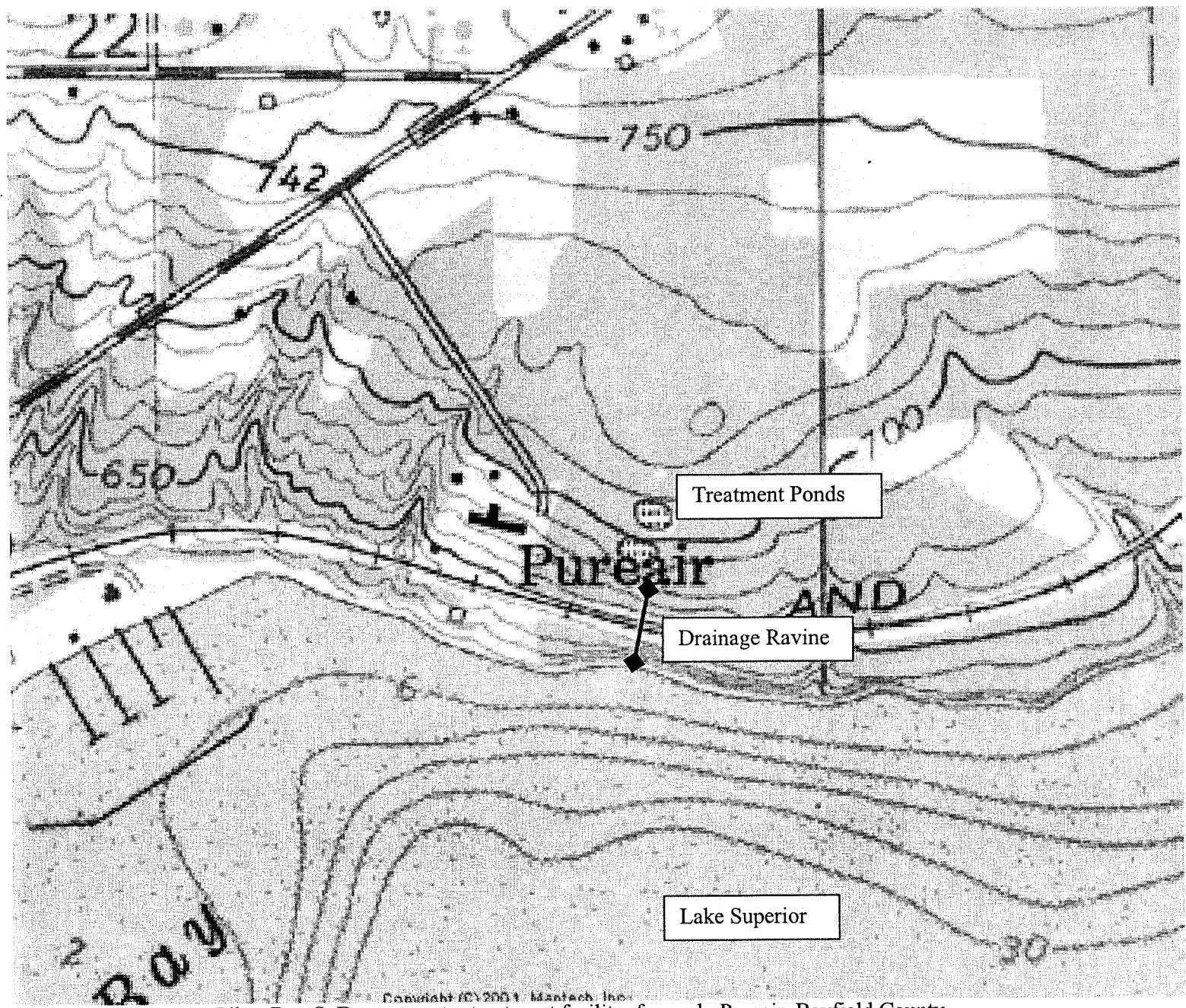


Figure 1. Pikes Bay S. D. wastewater treatment facility, formerly Pureair, Bayfield County.



Figure 2. Pikes Bay S. D. effluent discharge pipe, which is covered with large stones.



Figure 3. Path of ravine drainage water across private beach and into Lake Superior.



Figure 4. View of drainage ravine from the beach.



Figure 5. Facing Lake Superior with drainage ravine on the left. Note steep drop to the beach.



Figure 6. Drainage ravine.

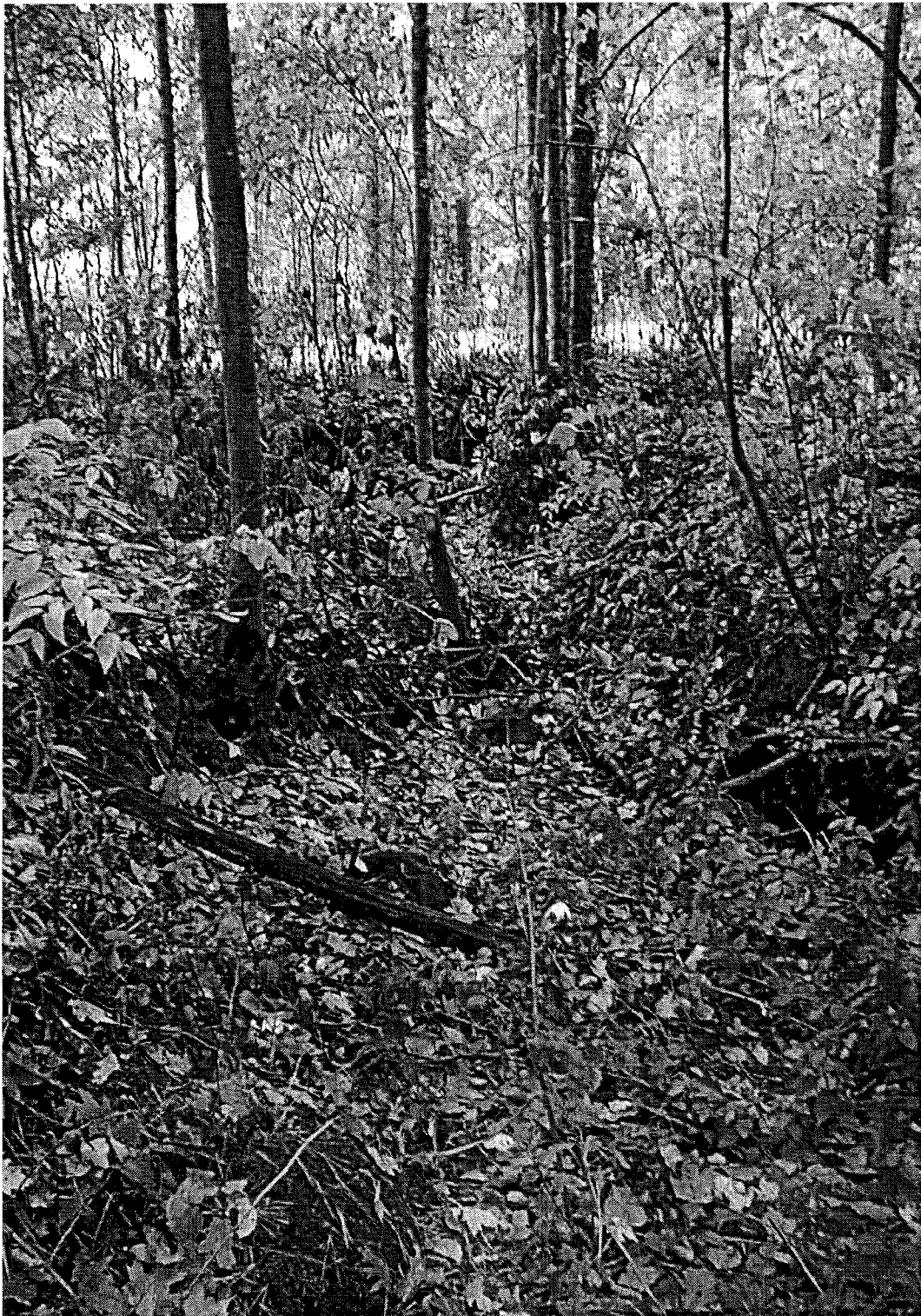


Figure 7. Drainage ravine.

INTRA-DEPARTMENT

MEMORANDUM

DEC 30 1976

Spoooner

Station

Date December 21, 1976

IN REPLY REFER TO: 3200

TO: Anthony S. Earl
FROM: L. G. Hansen
SUBJECT: Surface Water Classification (NR 104)
Pureair, Bayfield County

Pikes Bay SD

The Pureair wastewater treatment facility is included in a recently formed sanitary district and serves the Pureair Sanatorium complex, the Port Superior Marina complex, and the Port Superior housing complex. Pureair Sanatorium, owned by the counties of Ashland, Bayfield and Iron, was operated as a tuberculosis sanatorium but is currently not occupied, except by a caretaker.

The Pureair wastewater treatment facility is a two cell aerated lagoon with a chlorine contact chamber. The treated effluent is discharge to a natural drainageway which terminates in Lake Superior. The drainage-way is usually dry except in times of runoff.

A map and photographs are attached.

RECOMMENDATION

The natural drainageway, receiving treated wastewater from the Pureair treatment facility, shall be classified as "diffused surface water" (NR 104.02(1)(b)) and shall be placed in the "marginal surface water" category (NR 104.02(3)(b)).

Effluent characteristics shall be based upon an evaluation of water quality necessary to protect fish and aquatic life of Lake Superior (NR 102.02(3)), (NR 104.02(4)(b)).

Ted R. Smith

Ted R. Smith

TRS:mm

Attachments

APPROVED:

Danny J. Ryan
Danny J. Ryan

12/27/76
Date

NOTED:

Department of Natural Resources

INTRA-DEPARTMENT

MEMORANDUM

DEC 30 1976

Spooner

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*Ted R. Smith*

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TRS:mm

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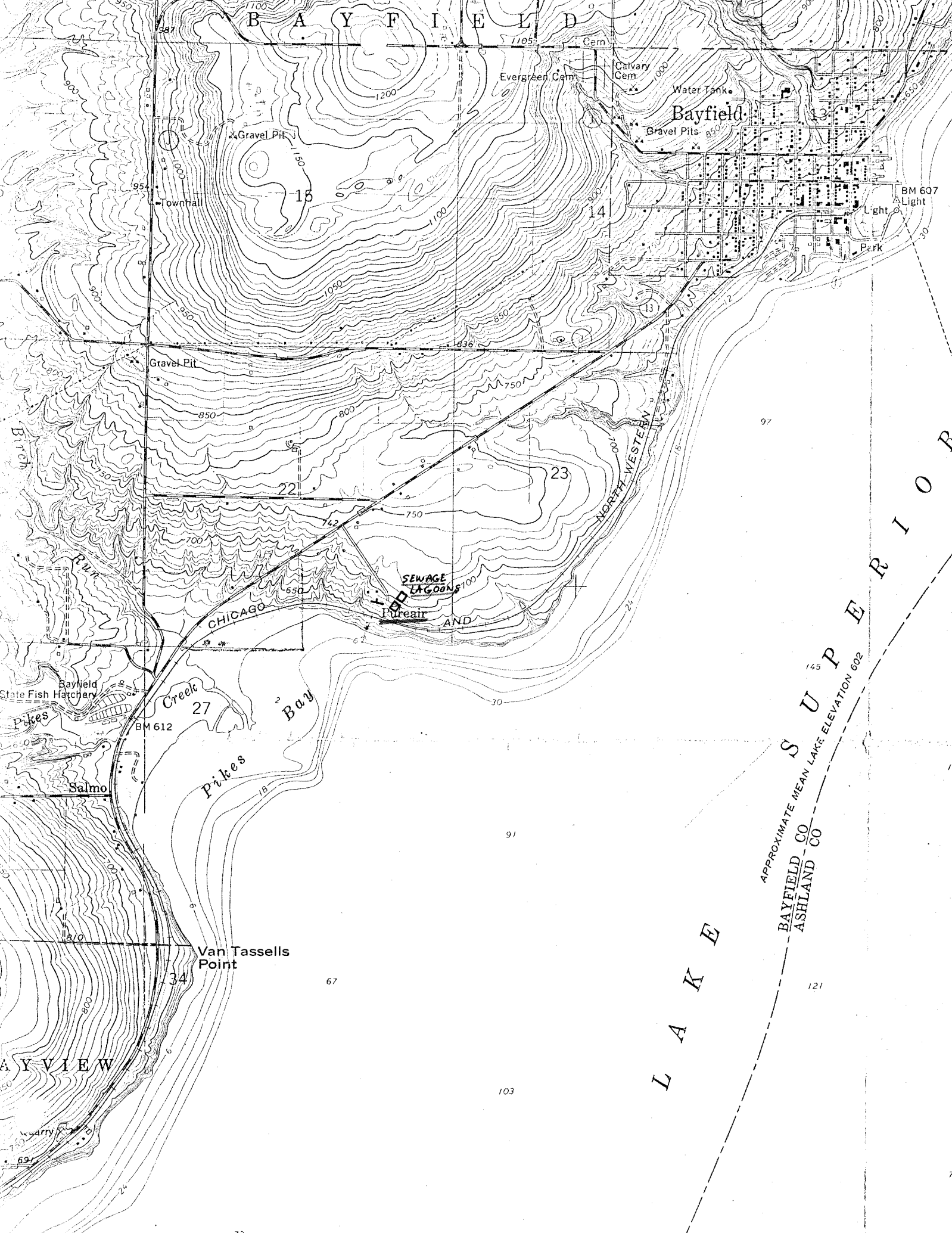
*Danny J. Ryan*  
\_\_\_\_\_  
Danny J. Ryan

*12/27/76*  
Date

NOTED:

\_\_\_\_\_  
Date





BAYFIELD

Bayfield

Townhall

Evergreen Cem.

Calvary Cem.

Water Tank

Gravel Pit

Gravel Pits

BM 607

Light

Perk

Gravel Pit

Birch

SEWAGE LAGOONS

Purair

AND

Bayfield State Fish Hatchery

Pikes

Creek

Pikes Bay

Salmo

Van Tassells Point

LAK E

APPROXIMATE MEAN LAKE ELEVATION 602

BAYFIELD CO  
ASHLAND CO

SUPERIOR

BAYVIEW

103

67

91

121

Harry



F I E L D

L A K E S U P E R I O R

W E S T I S L A N D S C H A N N E L

A P O S T L E

BAYFIELD CO  
ASHLAND CO

M A D E L I N E I S L A N D

L A P O I N T E

C H A N N E L