

Region NER County Manitowoc Report Date 8/31/1974 Classification LAL
 Water Body: Leampton's Lake Tributary
 Discharger: Whitelaw WWTP

If stream is classified as Limited Forage Fish (LFF) or Limited Aquatic Life (LAL), check any of the following Use Attainability Analysis factors that are identified in the classification report:

- Naturally occurring pollutant concentrations prevent the attainment of use
- Natural, ephemeral, intermittent or low flow conditions or water levels prevent the attainment of the use, unless these conditions may be compensated for by the discharge of sufficient volume of effluent discharges without violating State water conservation requirements to enable uses to be met
- Human caused conditions or sources of pollution prevent the attainment of the use and cannot be remedied or would cause more environmental damage to correct than to leave in place
- Dams, diversions or other types of hydrologic modifications preclude the attainment of the use, and it is not feasible to restore the water body to its original condition or operate such modification in a way that would result in the attainment of the use
- Physical conditions related to the natural features of the water body, such as the lack of a proper substrate, cover, flow, depth, pools, riffles, and the like, unrelated to water quality, preclude attainment of aquatic life protection uses HABITAT
- Controls more stringent than those required by sections 301(b) and 306 of the Act would result in substantial and widespread economic and social impact

Supporting Evidence in the report (include comments on how complete/thorough data is)

- ¹⁰⁰ Biological Data (fish/invert) fish, macro
- ¹⁰⁰ Chemical Data (temp, D.O., etc.)
- ¹⁰⁰ Physical Data (flow, depth, etc.)
- ¹⁰⁰ Habitat Description
- ¹⁰⁰ Site Description/Map
- ¹⁰⁰ Other: photos

Historical Reports in file:

8/31/74 - Bob Lucas/Dennis Weisenschel
12/19/2000 - Charmaine Kobaldek

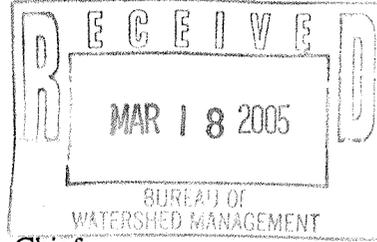
Additional Comments/How to improve report:

- doesn't clearly identify factors for LAL class'n.
- WQ limiting factor - WQ probs caused by adjacent wetland - uncontrollable (P4/5)
- ag/stormwater runoff - controllable, WWTP effluent quality - controllable factor
- habitat limiting factor

existing use = LFF
 pot use = LFF

To: Laura Bub - WT-2

CORRESPONDENCE/MEMORANDUM



FILE REF: 3200

DATE: December 26, 2000

TO: Bob Masnado - WT/2
Water Quality Standards & Policy Section Chief

FROM: Ron Fassbender - Sturgeon Bay
Lakeshore Basin Team Leader *Ron Fassbender*

SUBJECT: Stream Classification for an Unnamed Tributary to Hempton Lake

This memo is to formally request revisions to Chapter NR 104, Wisconsin Administrative Code, relative to the classification of the tributary to Hempton Lake, to which the Village of Whitelaw Wastewater Treatment Facility discharges. Specifically, it is requested that the current Limited Aquatic Life designated use be changed to Limited Forage Fish community use.

A memo from Charmaine Robaidek, dated December 19, 2000, describes a study undertaken to determine the appropriate stream classification. That memo was sent to Greg Searle of your section, among others. The report concludes that "The potential biological use and recommended stream classification of the unnamed tributary to Hempton Lake for the Village of Whitelaw WWTF Outfall 001 and 002 to Hempton Lake is Limited Forage Fish community." Recognizing the current effort to update Chapter NR 104, this change should be included in the Phase 2 revisions, because it necessitates more stringent effluent limitations for the Whitelaw WWTF. That Village has submitted a Facilities Plan for WWTF, proposing a WWTF capable of meeting the more stringent limitations, though a permit to require compliance with those limitations will not be issued until code revisions are effective.

If you have any questions, please contact Charmaine Robaidek or Jeff Haack.

Prepared by: Jeffrey J. Haack, Water Resources Engineer

Noted:

Charlie Verhoven Date: 01/02/01
Charlie Verhoven - Green Bay - NER Water Leader

- cc: → Charmaine Robaidek - Green Bay
- Jeff Haack - Green Bay
- Charlie Verhoven (Attn.: Linda Vogen) - Green Bay
- Greg Searle - WT/2

CORRESPONDENCE/MEMORANDUM

DATE: December 19, 2000 FILE REF: [Click [here](#) and type file ref.]

TO: Jeff Haack – NER Effluent Limits Calculator / Water Resources Engineer – NER HQ
Ron Fassbender – Lakeshore Basin Water Team Leader - Sturgeon Bay
Jim Cahow – Lakeshore Basin Water Resources Management Specialist – Sturgeon Bay
Linda Vogen – NER Watershed Expert – NER HQ
Greg Searle – Environmental Toxicologist – WT/2

FROM: Charmaine Robaidek – Water Resources Management Specialist – Green Bay

SUBJECT: Stream Classification for an Unnamed Tributary to Hempton Lake

Stream Classification for an Unnamed Tributary to Hempton Lake, Manitowoc CountyIntroduction

The Village of Whitelaw wastewater treatment facility (WWTF) discharges, via outfalls 001 and 002, to an unnamed tributary (SW¼ of the NE¼ of Section 3, T19N R22E) to Hempton Lake, which in turn discharges to the Branch River (Watershed Code MA 03) in Manitowoc County. The Village is proposing treatment facility modifications that will include a slight increase in the discharge flow rate. This unnamed tributary is currently classified in Wis. Adm. Code, Chapter NR 104, as Limited Aquatic Life waters.

The purpose of this study was to determine the appropriate stream classification for the unnamed tributary to Hempton Lake in order to specify correct effluent limitations for an upgraded wastewater treatment facility. The determination was made following Guidelines for Designating Fish and Aquatic Life Uses for Wisconsin Streams, WDNR Draft 01/00. This report summarizes physical, chemical, and biological data collected July-October 2000 from the unnamed tributary and recommends the appropriate Fish and Aquatic Life Use Classification for the unnamed tributary.

Methods

A preliminary field assessment was conducted on July 17, 2000, by Tim Rasman and Jeff Haack, which concluded that a formal stream classification survey was needed (Haack, 2000). Further field assessments and observations were conducted on the unnamed tributary to Hempton Lake in September, and October 2000. Field assessments and observations conducted in September and October 2000 were conducted in the following manner:

Fish community Assessment: Fish surveys were conducted using a backpack shocker, with assistance from Fisheries Management staff from the Mishicot DNR field station. The percent of tolerant individuals, % tolerant species, and warmwater Index of Biotic Integrity (IBI) ratings were calculated.

Macroinvertebrate Community Assessment: Macroinvertebrates were collected according to Guidelines for Collecting Macroinvertebrate Samples from Wadable Steams, WDNR 7/2000. Hilsenhoff Biotic Index (HBI) ratings and tolerance value percentages were reported.

Habitat Assessment: Instantaneous stream flows were measured with a Marsh-McBirney, Inc. Flowmate 2000 flow meter. Average stream widths were the mean of at least 6 randomly spaced measurements of width throughout each fish community assessment station. Mean depths were the mean of approximately equally spaced depth measurements taken at each stream width transect. Substrate characteristics were observed and recorded during fish and macroinvertebrate community assessments. A habitat assessment following *Guidelines for Evaluating Fish Habitat in Wisconsin Streams* (Simonson, Lyons and Kanehl) was not conducted.

Water Quality Assessment: Instantaneous dissolved oxygen, temperature, and pH measurements were recorded during fish and macroinvertebrate community assessments. Field dissolved oxygen (DO) and temperature was measured with a YSI 55 hand held DO meter. An Orion model 250A hand-held pH meter was used to measure field pH.

Four sites on the unnamed tributary were assessed on September 19 and October 19, 2000 (Figure 1). Fish community assessments were conducted at station 1 (Braun site), station 2 (Village Park site) and station 4 (upstream from outfall 001). Macroinvertebrate assessments were conducted at station 1 and station 3.

A section of Francis Creek in the NE¼ of the SW¼ of Section 15, T.20N, R.23E, Manitowoc County was selected as a possible reference site (Figure 2).

Results

Station 1 (Braun site)

Temperature measured on September 19 and October 19, 2000 was 16.3°C and 13.6°C respectively. Dissolved oxygen on September 19 and October 19, 2000 was 3.7 mg/l and 7.2 mg/l respectively. On October 19, 2000, pH was 7.3. Discharge on September 19 was .007 m³/sec (0.26cfs).

Average width and depth of this site was 2.5 m and 12.0 cm respectively. Substrate was approximately 95% silt/muck and <5% gravel and cobble/rubble. Algae covered 33 % of the stream bottom. The depth of soft sediment was great making walking in the stream difficult to impossible in places. The gravel and sand was located in the vicinity of a road culvert. Overhanging grass was abundant. This section flows through a wooded wetland and was channelized.

The fish survey yielded 35 individuals (35 fish/150 meters) representing three species; however, many fish were potentially missed due to the obstruction caused by abundant overhanging grass and difficult wading conditions. The central mudminnow was the most abundant species followed by fathead minnow and brook stickleback. All three of these species tolerate low dissolved oxygen, poor habitat, and low flow (*Guidelines for Designating Fish and Aquatic Life Uses for Wisconsin Streams, WDNR Draft 01/00*). Therefore 100% of the species and 100% of the individuals were tolerant. The IBI rating was Very Poor.

Macroinvertebrate results yielded fifteen distinct taxa. Six orders and ten families were identified with Oligochaeta (two families) being most dominant followed by Isopoda (one family) and Hirudinea (one family). The HBI of 7.94 indicates very significant organic pollution. 100% of the individuals identified had HBI tolerance values of 8 or less and 0% of individuals had tolerance values of 5 or less.

Station 2 (Village Park Site)

Temperature measured on July 17 and September 19, 2000 was 23.5°C and 17.0°C respectively. Dissolved oxygen on July 17 and September 19, 2000 was 2.9 mg/l and 1.8mg/l respectively. On July 17 and September 19, 2000, pH was 7.5. Conductivity on July 17 was 1482 µS/cm. Discharge on September 19 was 0.004 m³/sec (0.14cfs).

Average width and depth of this site was 1.3 m and 10.4 cm respectively. Substrate was approximately 60% silt/muck, 30% detritus and other debris (clay pigeons from shooting range at park), 5% each of gravel and cobble/rubble. This site was mostly shaded with an overhead tree/shrub canopy. This section has also been straightened and dredged.

The fish survey in this section yielded 154 individuals (132 individuals/150 m) representing four species. Fathead minnow (66) was most abundant followed by central mudminnow (61), brook stickleback (26), and green sunfish (1). All four of these species tolerate low dissolved oxygen, poor habitat, and low flow)(*Guidelines for designating fish and aquatic life uses for Wisconsin Streams, WDNR Draft 01/00*). Therefore 100% of the species and 100% of the individuals were tolerant. The IBI rating was Poor.

Macroinvertebrates were not collected in this section because a riffle was not present. Temperature and dissolved oxygen of one of several seeps in this section was 14.7°C and 2.23 mg/l respectively. *Wolffia* sp. and *Lemna* sp. were found in this section. Wood frogs and green frogs were also found.

Station 3 (Macroinvertebrate Site #2)

Temperature, dissolved oxygen, and pH on October 19, 2000 was 19.4°C, 4.7mg/l and 7.3 su respectively. Macroinvertebrates were collected from a small riffle area with substrate dominated by silt/muck (35%), cobble rubble (20%), sand (20%), and gravel (15%). Stream width was 1.5 m and average depth was 0.15 m. Extensive ditching has occurred at this site also.

Macroinvertebrate results yielded 17 distinct taxa. Eight orders and 11 families were identified with Oligochaeta (three families) being most dominant followed by Diptera (two families) and Hydroida (one family). The HBI of 9.30 indicates severe organic pollution. 98.4% of the individuals identified had HBI tolerance values of 8 or less and 1.69% of individuals had tolerance values of 5 or less. (The two Odonata and one Coleoptera family found at this site occur in semi-lotic and lentic habitats).

Immediately Below Outfall 001

Very deep, soft, bottom sediment prevented collection of fish and macroinvertebrates from outfall 001 downstream to Station 3. Channel depth, width, and overhanging grass in this section provided habitat that most likely would have held fish.

Station 4 (Upstream from Outfall 001)

Temperature measured on July 17 and September 19, 2000 was 21.5°C and 16.1°C respectively. Dissolved oxygen on July 17 and September 19, 2000 was 4.2 mg/l and 1.9 mg/l respectively. On July 17 and September 19, 2000, pH was 7.6. Conductivity on July 17 was 1050 µS/cm. Stream flow on September 19 was 0.0 m³/sec. There was no flow coming through the culvert upstream from outfall 001; therefore, the water in this section between the culvert upstream from outfall 001 and outfall 001 was backed up in the stream and essentially is from outfall 001.

The estimated average stream width was approximately 0.6 m, and maximum depth was approximately 2 feet. This reach has also been altered by ditching.

The fish survey in this section yielded four individuals (60 individuals/150 m) representing three species. The central mudminnow was the most abundant species followed by brook stickleback (1) and green sunfish (1). All three of these species tolerate low dissolved oxygen, poor habitat, and low flow (*Guidelines for Designating Fish and Aquatic Life Uses for Wisconsin Streams, WDNR Draft 01/00*). Therefore 100% of the species and 100% of the individuals identified were tolerant. The IBI rating was Poor.

Macroinvertebrates were not collected from this site.

Francis Creek (Reference Site)

On September 19, 2000, the fish community in a 61 m segment of Francis Creek was surveyed. Mean stream width was 1.86m, average depth was 10.83 cm, and the flow was 0.02 m³/sec (0.73 cfs). Temperature was 16.1°C, dissolved oxygen was 8.3 mg/l, and pH was 7.9.

Eighty-seven individuals (204 individuals/150 meters) representing nine species were identified. The most abundant species was the central mudminnow (25) followed by creek chub (20) and johnny darter (16). 22.2% of the species and 31% of the individuals identified were tolerant (*Guidelines for Designating Fish and Aquatic Life Uses for Wisconsin Streams, WDNR Draft 01/00*). The dominant substrate was cobble/rubble and gravel. The IBI rating was Good.

Discussion

The unnamed tributary to Hempton Lake flows approximately 1.5 miles from outfall 001 of the Village of Whitelaw WWTF to where it discharges to Hempton Lake. Most of the flow in the stream originates from the WWTF. Upstream from outfall 001, the stream receives storm-water from the Village of Whitelaw and flow is probably present in the spring and after rain events. There was no flow upstream from outfall 001 during this assessment.

The unnamed tributary receives WWTF discharge from two outfalls. Outfall 001 is located approximately 1.5 miles above Hempton Lake and outfall 002 is located approximately 1.25 miles above Hempton Lake (Figure 1).

The stream gradient from outfall 001 to Hempton Lake is 3.9m/km (26.7 feet/mile). Water temperature measured on July 17, 2000 ranged from 18.2°C to 23.3°C between outfalls 001 and 002. Temperature in the short tributary receiving discharge from outfall 002 only was 24.6°C. Water temperature was 23.5°C downstream from the confluence of outfall 001 and the tributary at outfall 002,

Dissolved oxygen concentration on July 17, 2000 was lower in the tributary receiving discharge from outfall 002 (3.1 mg/l and 2.1mg) than above its confluence with outfall 001 (between 5.3 and 2.5mg/l) or below its confluence with outfall 001 2.9 mg/l.

Low dissolved oxygen concentrations, high conductivity, and macroinvertebrate communities associated with poor to very poor water quality indicate that water quality is a factor limiting the tributary from

meeting the Full Fish and Aquatic Life (FFAL) use designation. The influences of adjacent wetlands on water quality are uncontrollable. Runoff from agricultural fields, pastures, and urban storm-water are controllable factors affecting the water quality of this tributary. However, because the WWTF effluent contributes greatly to the base flow of the stream, the water quality is in large part determined by the quality of effluent. Therefore, the WWTF effluent is a controllable factor that is limiting the ability of the tributary to attain a FFAL community.

The existing fish community at the three sites surveyed was composed of species tolerant of low dissolved oxygen, poor habitat and low flows. Therefore, habitat is also a factor limiting the tributary from supporting a FFAL community.

Most of the tributary has been straightened and deepened from outfall 001 to at least 150 meters downstream from Hempton Lake Road. Fine sediment (silt and muck) that was very deep through sections dominated the substrate through this segment. Flow was low (<0.5cfs). Average depths through this section were shallow (11.97 cm at Station 1, 10.4 cm at Station 2, and very shallow from Station 2 to Station 3. The stream was generally flat. These habitat features are uncontrollable and are limiting the ability of the tributary to attain a FFAL community.

Note: The existing biological use of Francis Creek is FFAL, non-game fish community. These streams were similar to the unnamed tributary to Hempton Lake in temperature, width, depth and watershed use; however, their substrate was dominated by cobble/gravel (as opposed to deep soft sediments), and they were not highly modified, as was the unnamed tributary to Hempton Lake. Therefore, I did not feel Francis Creek was an appropriate reference stream in this case.

Conclusions and Recommendations

The existing biological use of the unnamed tributary to Hempton Lake from the Village of Whitelaw WWTF Outfall 001 and 002 to Hempton Lake is Limited Forage Fish community. The potential biological use and recommended stream classification of the unnamed tributary to Hempton Lake from the Village of Whitelaw WWTF Outfall 001 and 002 to Hempton Lake is Limited Forage Fish community. Hempton Lake is classified as Full Fish and Aquatic Life. I recommend revisions to Chapter NR 104, Wisc. Adm. Code, to reflect this stream classification.

Respectfully submitted by: Charmaine Robaidek - date: 12-19-00
Charmaine Robaidek, Water Resources Management Specialist

Attachments:

1. Figure 1, Unnamed Tributary to Hempton Lake Site Map (all)
2. Figure 2, Francis Creek Site Map (all)
3. PowerPoint Photos of September 19th Fish Survey Work. (all)
4. Data Summary Tables for Monitoring Conducted on the Unnamed Tributary to Hempton Lake (fish, water quality, habitat characteristics, HBI data). (Robaidek, Cahow + Fassbender)
5. Haack, Jeff. July 24, 2000. Village of Whitelaw Preliminary Field Assessment Memo

(Vogen, Cahow & Fassbender, Robaidek)

Station 1 (Brawn Station): 150m downstream from Hempton Lake Road.

Station 2 (Village Park Station): Approx. 50m downstream from confluence of trib from OFL002.

Station 3 (Macroinvertebrate Site) Just downstream from first culvert below OF1001

Station 4: Directly upstream from OFL001
Figure 7.

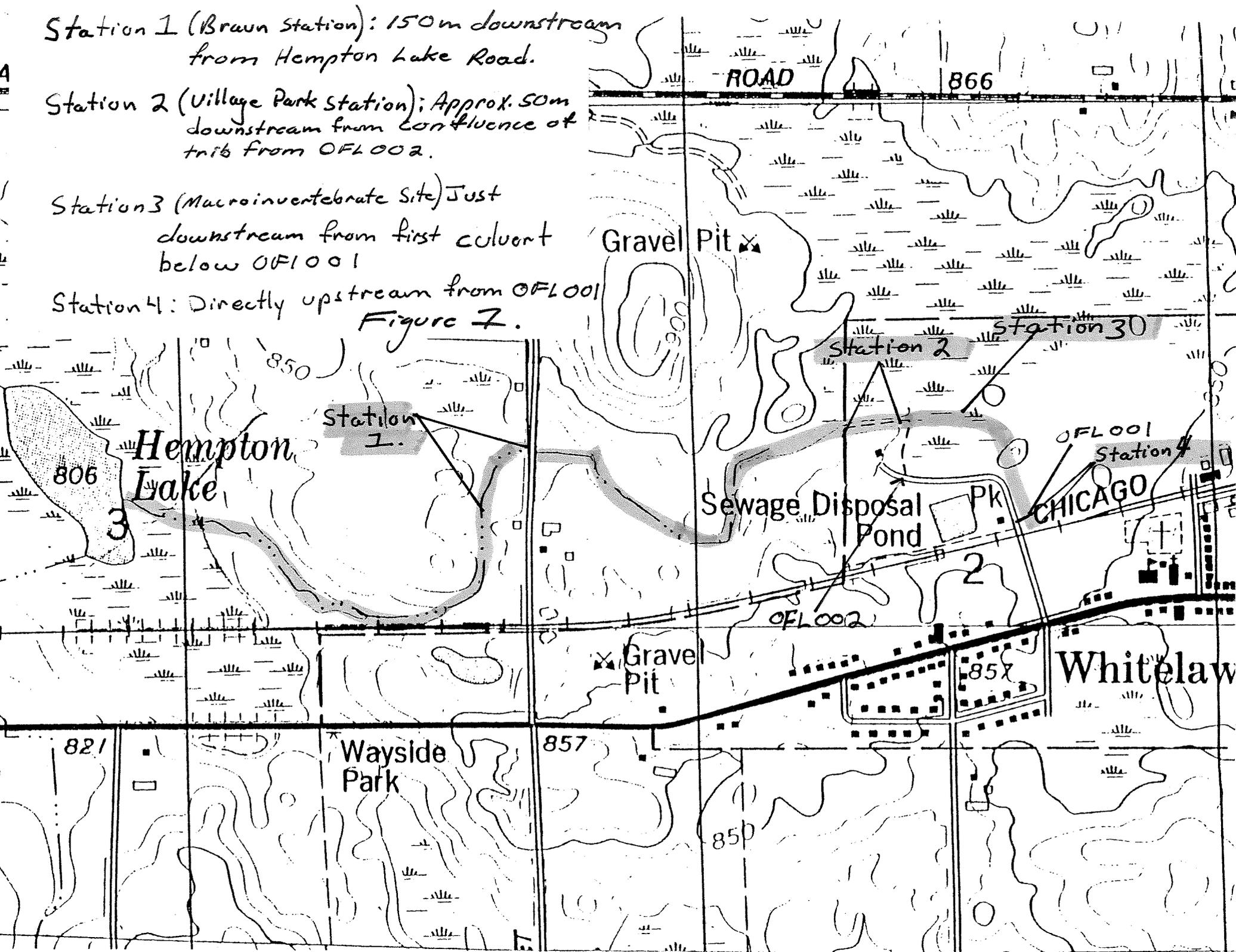




Figure 2. Francis Creek Reference Site.

Whitelaw WWTF Stream Classification

September 19, 2000



This photo was taken from the culvert crossing the field road on the Gordon Braun property, the downstream end of the first stream segment evaluated (Station 1). Charmaine Robaidek is seen measuring the Dissolved Oxygen in the stream.

This photo was taken from upstream of the culvert mentioned in the previous caption, facing downstream (Station 1). Steve Surendonk is attempting to use the backpack shocker from the stream bed, but sinking in the soft sediments.



This photo was taken at approximately the mid-point of the stream segment on the Gordon Braun property, facing upstream (Station 1). In the foreground Sue Kersten and Charmaine Robaidek are measuring the stream cross-section, and in the background is the rest of the Fisheries crew shocking the stream.

This photo was taken after completing the shocking of the stream segment on the Gordon Braun property (Station 1), in the SE 1/4 of the NE 1/4 of Section 3, T 19 N, R 22 E, showing the fish collected from shocking.

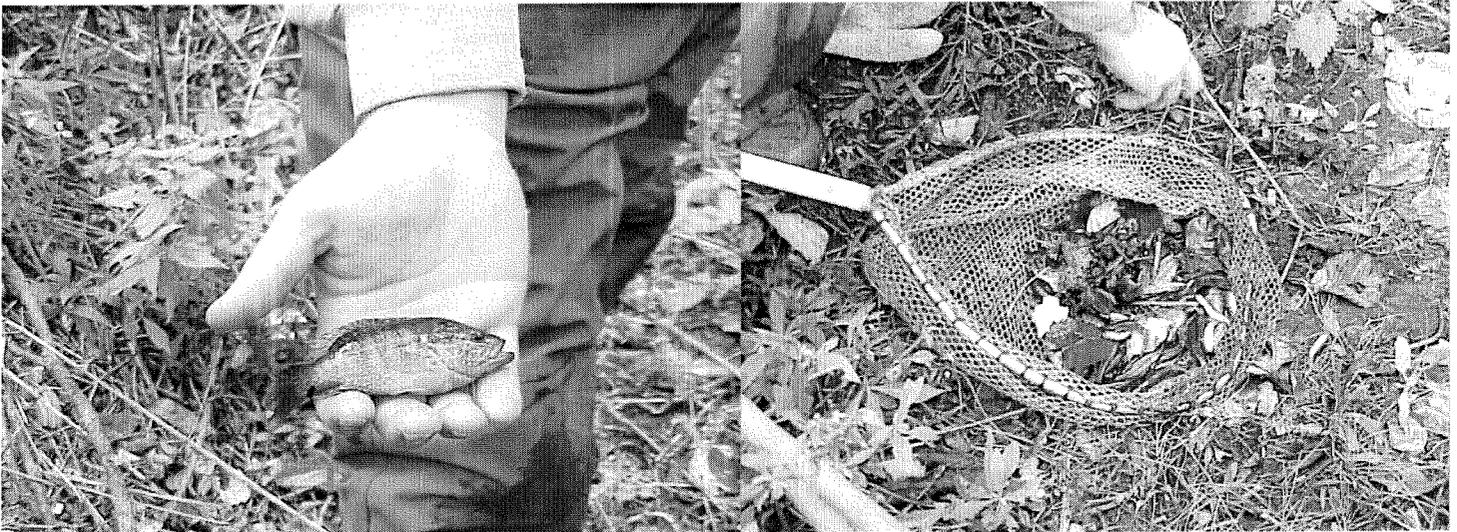
Whitelaw WWTF Stream Classification

September 19, 2000



This photo was taken from about the midpoint of the stream segment adjacent to the Village park (Station 2), downstream from the confluence of the two tributaries, facing upstream. Charmaine Robaidek is measuring the Dissolved Oxygen in the stream.

This photo was taken near the same location as the previous photo (Station 2), in the stream segment adjacent to the Village park. At this segment Troy Vannieuwenhoven is operating the backpack shocker.



In this photo Steve Hogler is showing the Green Sunfish, that was shocked in this stream segment (Station 2).

And this photo shows all of the fish shocked in the stream segment adjacent to the Village park (Station 2), in the SE 1/4 of the NW 1/4 of Section 2, T 19 N, R 22 E.

Whitelaw WWTF Stream Classification

September 19, 2000



This is the only photo taken at the stream segment upstream of Outfall 001(Station 4), in the SW 1/4 of the NE 1/4 of Section 2, T 19 N, R 22 E. The photo was taken facing upstream from roughly parallel to the outfall, so that outfall would be near the lower right-hand corner. Steve Hogler is operating the backpack shocker at this segment, while the rest of the crew looks on.



This photo was taken at the “reference stream” site of Francis Creek, on the James Tuma property, in the Ne 1/4 of the SW 1/4 of Section 15, T 20 N, R 23 E, facing downstream. Here Sue Kersten is operating the backpack shocker.

And one final photo from the “reference stream” again facing downstream, showing Sue Kersten transferring some fish to Troy Vannieuwenhoven.

All photos were taken by Jeff Haack, using a SONY.MVC-FD91 digital camera.