Rec'd 4-11-03
Phase 2

CORRESPONDENCE/MEMORANDUM — State of Wisconsin

DATE: December 18, 2002

TO: Pat Oldenburg – Eau Claire
Paul Laliberte – Eau Claire
Tom Jerow – Wisconsin Rapids
Eric Donaldson - Wausau

FROM: Mark Hazuga - Wausau

SUBJECT: Stream Classification for Edgar WWTP

The Village of Edgar treatment facility consists of primary clarification, followed by secondary treatment with six rotating biological contactors and two final clarifiers. The discharge is to Scotch Creek just downstream of the CTH H bridge crossing in Edgar.

Scotch Creek is an 18 mile warm water stream and is a tributary of the Big Rib River. The stream is identified as a perennial stream for most of its length based on USGS 7.5 minute QUAD maps. According to the 1997 Lower Big Rib River Priority Watershed Plan, 65% of the land use within the Scotch Creek Watershed is in agriculture.

According to the May 2001 effluent limits document, the stream has a 7Q10 of 0.06 cfs near the discharge and a 7Q10 of 0.41 cfs after the confluence with Soda Creek. The current classification of Scotch Creek listed in NR 104 is Limited Forage Fish (LFF) from the CTH H crossing to the confluence with Soda Creek. The stream receives the default classification of Full Fish and Aquatic Life (FFAL) from the confluence with Soda Creek downstream to the confluence with the Big Rib River (Figure 1).

Fishery surveys were completed during the summer of 1998 at three sites on Scotch Creek during follow-up appraisal activities in the Big Rib River Watershed. Surveys were completed following guidelines developed by Lyons for assessing the biotic integrity of warm water streams in Wisconsin. These guidelines are the basis now used for conducting stream classifications and baseline monitoring activities.

Scotch Creek 1998 Survey Results

Fishery surveys were completed at three sites on Scotch Creek. Station one was surveyed on July 1, 1998 at the CTH S bridge crossing. Electro-fishing was completed in an upstream direction beginning 245 meters downstream of the bridge. The station ended 35 meters below the CTH S bridge pool. Fish survey results found a total of 350 individuals represented by 21 species. The percent of fish tolerant to low dissolved oxygen levels was 27%. Two walleye and one smallmouth bass were captured during the survey (Appendix 1). Streamflow on the survey date was 11.99 cfs.

Scotch Creek was surveyed on July 1, 1998 upstream of Thomas Hill Road (Station Two). Fish survey results found a total of 452 individuals represented by 14 species. The percent of fish tolerant to low dissolved oxygen levels was 24%. Redside Dace, a special concern species, was also collected during the survey (Appendix 2). Streamflow on the survey date was 4.63 cfs.

Scotch Creek was surveyed on June 29, 1998 upstream of Elderberry Road (Station Three). Fish survey results found a total of 424 individuals represented by 14 species. The percent of fish tolerant to low dissolved oxygen levels was 11%. Redside Dace, a special concern species, was also collected during the survey (Appendix 3).

Historical Fishery Data

Historical fishery data was obtained from Fish Management files in Wausau. Two fish surveys were completed on Scotch Creek on July 28, 1972 to determine the number of fish species present after a deleterious discharge in May, 1972 by Mid-Whey Powder (Appendix 4). Site one was surveyed downstream the Thomas Hill road crossing. Fishery survey results found a total of 1599 individuals represented by 12 species. The percent of fish tolerant to low dissolved oxygen levels was 22%.

Site two was surveyed downstream the Cardinal Lane road crossing. Fishery survey results found a total of 1447 individuals represented by 13 species. The percent of fish tolerant to low dissolved oxygen levels was 4%. Two northern pike were also captured during the survey. The higher numbers of individuals collected in 1972 compared to 1998 surveys is likely a result of longer stations surveyed in 1972.

A memo to file from Al Hauber in August 1975 describes a fish kill that occurred in a stagnant pool, approximately 100 yards upstream from the Edgar WWTP (Appendix 5). The kill appeared to be a result of oxygen depletion related to respiration of dense algae growth in the pool. Approximately 15 northern pike, 12 white suckers and an unknown number of bullheads and minnows were known to have died.

Recommended Stream Classification

Currently, Scotch Creek is classified as a Limited Forage Fishery (Tolerant Aquatic Life) in NR 104 from the CTH H bridge Crossing (T28N R5E Sec 7 SW SW) downstream to the confluence with Soda Creek (T28N R5E Sec 10 NE NW). According to the 1976 stream classification report, Scotch Creek should be classified as Fish and Aquatic Life from the confluence with Soda Creek downstream to the mouth. Scotch Creek upstream of CTH H is not listed in NR 104 and therefore receives the default classification of Full Fish and Aquatic Life (Diverse Aquatic Life).

Based on surveys completed in 1998, the current Limited Forage Fish classification of Scotch Creek should be removed from NR 104 allowing the default classification of Fish and Aquatic Life (Diverse Fish and Aquatic Life) to become effective (Figure 2). The three fishery surveys

completed in 1998 indicate that Scotch Creek supports a diverse forage fishery with a few game fish found in the lower reaches. Surveys completed at Thomas Hill Road (~ 0.8 miles below outfall) and CTH S (~ 4.2 miles below outfall) were completed in the upper and lower reaches of the current Limited Forage Fish classification, respectively. The fish community within this reach contained several species and the percent low dissolved oxygen tolerant fish was below 26%. Redside Dace found during the survey at Thomas Hill Road are a special concern species, which also warrants the FFAL classification. The survey completed at Elderberry Road was located ~ 3.3 miles upstream from the outfall. The fish community in this reach contained several species and the percent low dissolved oxygen tolerant fish was 11%. Redside Dace were also collected during the survey. This data suggests the FAL classification should extend upstream to Elderberry Road.

Historical data in Fish Management files also supports the FAL classification based on the new draft guidance. The 1972 surveys completed downstream of Edgar found a diverse forage fish community with a few northern pike. The percent of fish tolerant to low dissolved oxygen levels was less than 22% at both sites. The fish kill investigation in 1975 found 15 dead northern pike 100 yards upstream Edgar WWTP. The presence of northern pike indicates some gamefish will occupy the stream (at least certain times of a year) in this reach if water quality conditions are appropriate.

The Limited Forage Fish classification of Scotch Creek from CTH H (T28N R5E Sec 7 SW SW) to the confluence with Soda Creek (T28N R5E Sec 10 NE NW) should be removed from NR 104 allowing the default classification of Full Fish and Aquatic Life (Diverse Fish and Aquatic Life) to become effective. The data collected indicates this is the appropriate classification from the mouth upstream 11 miles to the Elderberry Road crossing. The reach above Elderberry Road receives the default classification, however additional surveys would need to be completed to determine if this classification is appropriate.

Appendix 1. Scotch Creek Fish Survey Results at CTH S

(REV. 7/15/2002)

Sample Date	07/01/1998
SITE	Scotch Creek 245 meters downstream CTH S
PERSONNEL	Hazuga, Kampa

MATRIX	VALUE	SCORE
total # of fish	350	n/a
total # of native spp.	21	10
total # of darter spp.	3	5
total # of sucker spp.	1	0
total # of sunfish spp. < 8km from lake	0	0
total # of sunfish spp. >8km from lake	2	7
total # of intolerant spp.	3	5
total # of tolerant fish	193	0
total # of omnivores	39	10
total # of insectivores	237	10
total # of top carnivores	3	0
total # of simple lithophils	144	5
	subtotal	52
Correction Factors		52
total # of DELT fish	0	52
Total after correction factors =		52
IBI SCORE =		**52**

Equipment Type =	Stream shocker
Stream width (m) =	6
Ln stream width (m) =	1.79
Distance shocked (m)=	210
Is your sample site greater than 8 km from a lake?	y

% of tolerant spp.	55
% of omnivorous spp.	11
% of insevtivores	68
% of carnivores	1
% of simple lithophilous	41
Correction Factors	
# of nontolerant fish per 300m	224
% DELT	0

Biotic Integrity Rating **GOOD**

Notes

# of fish	Fish species
84	Central Mudminnow
67	Common Shiner
66	Creek Chub
38	White Sucker
29	Hornyhead Chub
23	Rosyface Shiner
12	Johnny Darter
10	Blackside Darter
3	Brook Stickleback
2	Black Bullhead
2	Blacknose Dace
2	Green Sunfish
2	Northern Redbelly Dace
2	Sand Shiner
2	Walleye
1	Central Stoneroller
1	Fathead Minnow
1	Longnose Dace
1	Pumpkinseed
1	Rainbow Darter
1	Smallmouth Bass

1 200

Stream Class Guidance (6/2002) Tolerance Summary Data		
Total # of game-fish species with more than 2 individuals per 100m.	0	
Total # of DO tolerant fish	92	
Total # of DO tolerant fish per 100 meter stream length	44	
% fish belonging to spp. that are tolerant to low DO	27	%
Total # of fish tolerant to disturbed habitat	106	
Total # of fish tolerant to disturbed habitat per 100m. stream length	50	
% of fish species that are tolerant to disturbed habitats	31	%
% of DO fish AND tolerant to disturbed habitat fish spp.	58	%
Total # of DO tolerant species =	5	
Total # of Disturbed habitat species =	3	
Total # of fish species collected =	21	
Total # of fish collected =	350	
Steam length shocked (m) =	210	

Appendix 2. Scotch Creek Fish Survey Results at Thomas Hill Road

(REV. 7/15/2002)

Sample Date	07/01/1998
SITE	Scotch Creek `180 meters upstream Thomas Hill Road
PERSONNEL	Hazuga, Kampa

MATRIX	VALUE	SCORE
total # of fish	452	n/a
total # of native spp.	14	5
total # of darter spp.	1	0
total # of sucker spp.	1	0
total # of sunfish spp. < 8km from lake	0	0
total # of sunfish spp. >8km from lake	1	2
total # of intolerant spp.	1	0
total # of tolerant fish	180	5
total # of omnivores	57	10
total # of insectivores	344	10
total # of top carnivores	0	0
total # of simple lithophils	213	5
	subtotal	37
Correction Factors		37
total # of DELT fish	0	37
Total after correction factors =		37

IBI SCORE = **37**

Equipment Type =	Stream shocker
Stream width (m) =	5
Ln stream width (m) =	1.61
Distance shocked (m)=	180
Is your sample site greater than 8 km from a lake?	y

% of tolerant spp.	40
% of omnivorous spp.	13
% of insevtivores	76
% of carnivores	0
% of simple lithophilous	47
Correction Factors	
# of nontolerant fish per 300m	453
% DELT	0

Biotic Integrity Rating **FAIR**

Notes

# of fish	Fish species
185	**Common Shiner**
74	**Central Mudminnow**
52	**Bigmouth Shiner**
45	**Creek Chub**
20	**Fathead Minnow**
19	**White Sucker**
18	**Bluntnose Minnow**
10	**Brook Stickleback**
9	**Johnny Darter**
9	**Redside Dace**
4	**Green Sunfish**
3	**Brassy Minnow**
3	**Northern Redbelly Dace**
1	**Sand Shiner**

1 200

Stream Class Guidance (6/2002) Tolerance Summary Data		
Total # of game-fish species with more than 2 individuals per 100m.	0	
Total # of DO tolerant fish	108	
Total # of DO tolerant fish per 100 meter stream length	60	
% fish belonging to spp. that are tolerant to low DO	24	%
Total # of fish tolerant to disturbed habitat	82	
Total # of fish tolerant to disturbed habitat per 100m. stream length	46	
% of fish species that are tolerant to disturbed habitats	18	%
% of DO fish AND tolerant to disturbed habitat fish spp.	42	%
Total # of DO tolerant species =	4	
Total # of Disturbed habitat species =	3	
Total # of fish species collected =	14	
Total # of fish collected =	452	
Steam length shocked (m) =	180	

Appendix 3. Scotch Creek Fish Survey Results at Elderberry Road

(REV. 7/15/2002)

Sample Date	06/29/1998
SITE	Scotch Creek upstream Elderberry Road
PERSONNEL	Hazuga, Kampa

MATRIX	VALUE	SCORE
total # of fish	424	n/a
total # of native spp.	14	5
total # of darter spp.	3	5
total # of sucker spp.	1	0
total # of sunfish spp. < 8km from lake	0	0
total # of sunfish spp. >8km from lake	0	0
total # of intolerant spp.	2	5
total # of tolerant fish	315	0
total # of omnivores	64	10
total # of insectivores	113	0
total # of top carnivores	0	0
total # of simple lithophils	203	5
	subtotal	30
Correction Factors		30
total # of DELT fish	0	30
Total after correction factors =		30
IBI SCORE =		**30**

Equipment Type =	Back Pack
Stream width (m) =	3.4
Ln stream width (m) =	1.22
Distance shocked (m)=	119
Is your sample site greater than 8 km from a lake?	y

% of tolerant spp.	74
% of omnivorous spp.	15
% of insevtivores	27
% of carnivores	0
% of simple lithophilous	48
Correction Factors	
# of nontolerant fish per 300m	275
% DELT	0

Biotic Integrity Rating **FAIR**

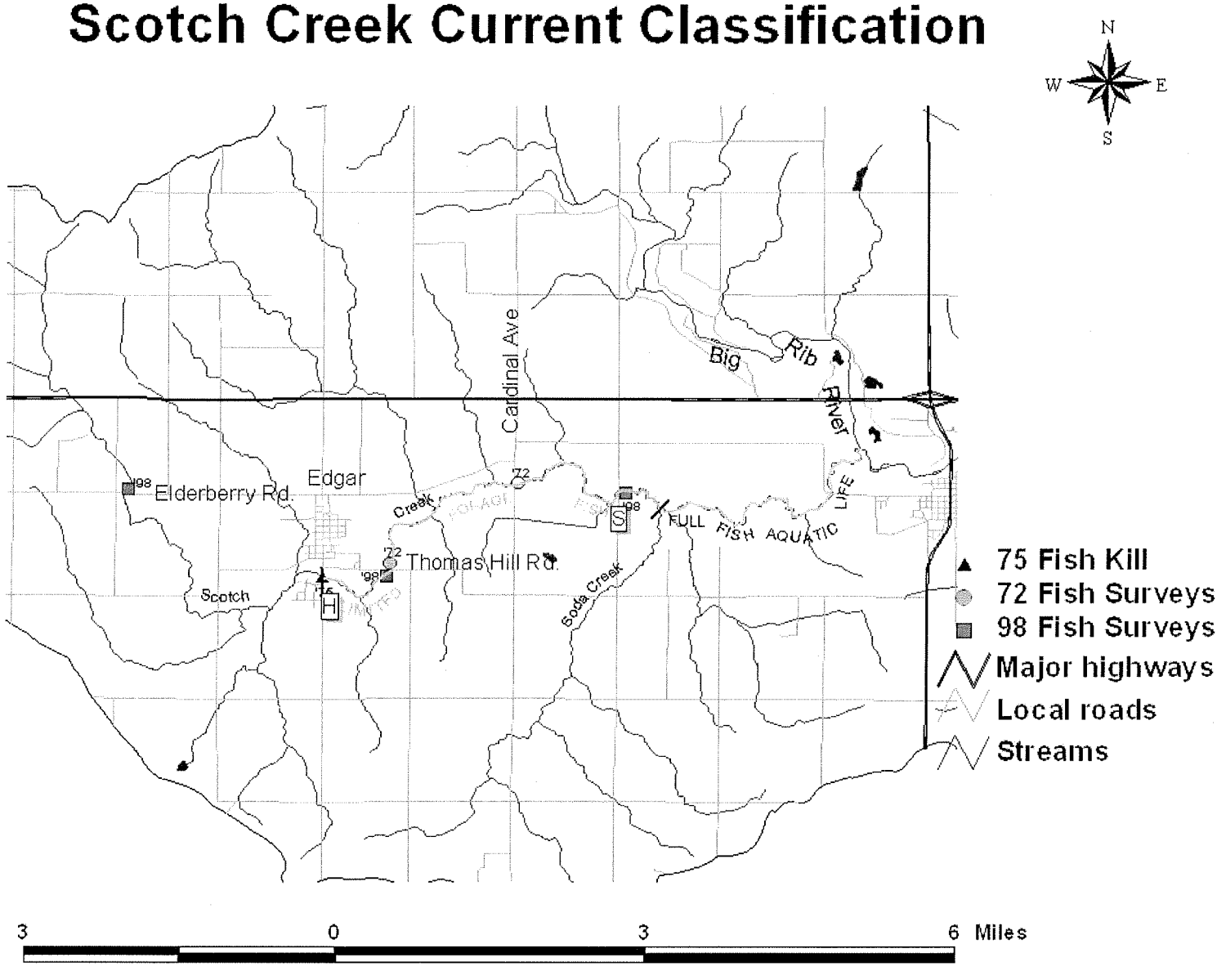
Notes

# of fish	Fish species
149	**Blacknose Dace**
97	**Creek Chub**
45	**Fantail Darter**
31	**Fathead Minnow**
28	**White Sucker**
24	**Johnny Darter**
14	**Redside Dace**
12	**Brook Stickleback**
11	**Common Shiner**
5	**Bluntnose Minnow**
5	**Central Mudminnow**
1	**Banded Darter**
1	**Northern Redbelly Dace**
1	**Pearl Dace**

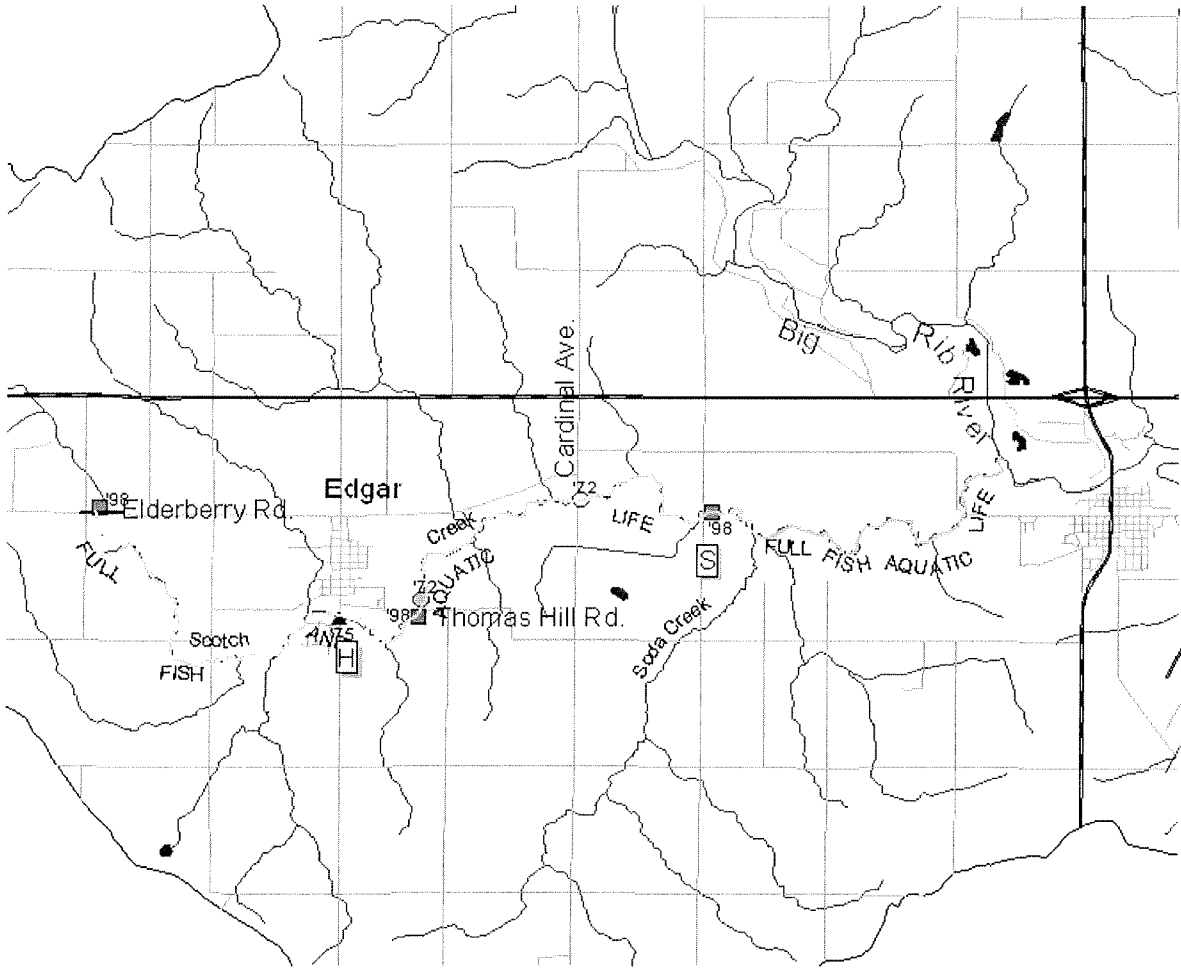
1 200

Stream Class Guidance (6/2002) Tolerance Summary Data		
Total # of game-fish species with more than 2 individuals per 100m.	0	
Total # of DO tolerant fish	48	
Total # of DO tolerant fish per 100 meter stream length	40	
% fish belonging to spp. that are tolerant to low DO	11	%
Total # of fish tolerant to disturbed habitat	279	
Total # of fish tolerant to disturbed habitat per 100m. stream length	234	
% of fish species that are tolerant to disturbed habitats	66	%
% of DO fish AND tolerant to disturbed habitat fish spp.	77	%
Total # of DO tolerant species =	3	
Total # of Disturbed habitat species =	4	
Total # of fish species collected =	14	
Total # of fish collected =	424	
Steam length shocked (m) =	119	

Scotch Creek Current Classification



Scotch Creek Proposed Classification



N
W E
S

▲ 75 Fish Kill
● 72 Fish Surveys
■ 98 Fish Surveys
Major highways
Local roads
Streams

3 0 3 6 Miles

Edgar, Marathon County

Wastewater Receiving Stream Classification

The Edgar sewage treatment plant discharges to Scotch Creek, which has a seven-day Q_{10} of 0.01 cfs. On September 8, 1976, no flow was found above the treatment plant. At the sewage treatment plant, the stream widens and the velocity becomes very slow. Ponding occurs several hundred feet above the outfall and extends about 100 feet below. Conditions are similar to the effluent being discharged to a pond with the stream as an outlet. The water in the pond area is stagnant and circulation is very slow in this reach. About 100 feet below the outfall, the stream narrows, the velocity increases and it exhibits characteristics of a normal flowing stream. The banks are well defined with the stream flowing through semi-wooded land to marshy, lowland areas, some used as pastures. Up to the first town road bridge, ponding occurs infrequently. Below the town road bridge, the stream bank is less well defined, and there are more extensive marshy areas with ponding. About four miles below Edgar, Soda Creek joins Scotch Creek. At this point, Scotch Creek has continuous flow and is a high quality stream because of its larger size and fewer agricultural effects. Scotch Creek is strongly affected by agricultural diffuse source pollutants. It is nutrient rich and, therefore, has dense aquatic plant growth, causing wide diurnal dissolved oxygen fluctuation in the summer.

Fish shocking surveys have recently been conducted at the first and second town roads below the discharge and several minnow species, bullhead and northern pike were found. Small fish kills have been noted in the ponded area at the Edgar sewage treatment outfall.

Recommendations: Scotch Creek should be classified "noncontinuous not supporting a balanced aquatic community" from CTH "H" to the junction with Soda Creek. Thereafter, it should be "continuous fish and aquatic life". It is also recommended that the discharge point be moved downstream of the ponded area and into the flowing portion of the stream.

12/10/76
Bill Jaeger

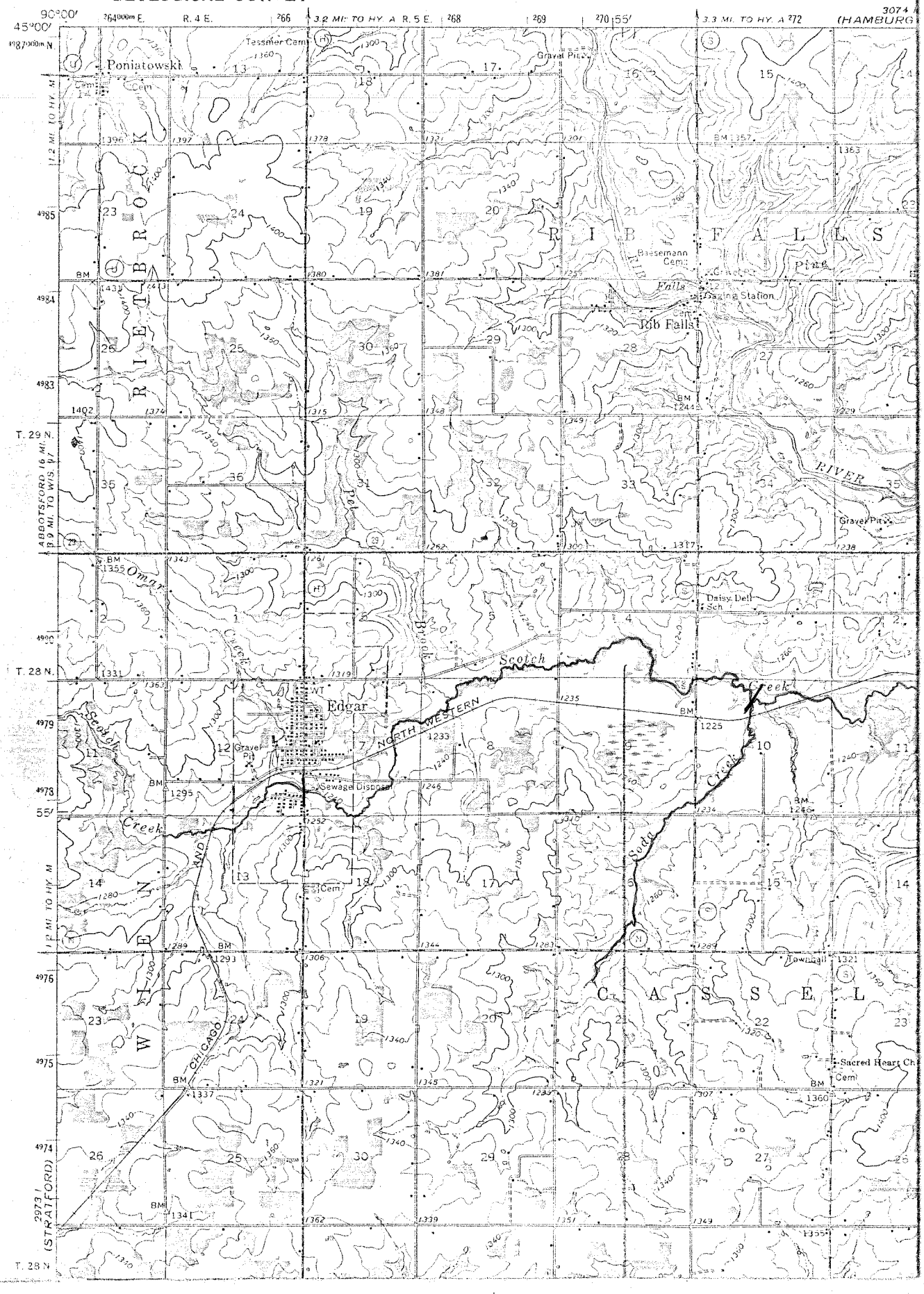
Scotch Creek at pool that receives Edgar discharge. STP is on the left.

Scotch Creek at first Town road below discharge.

Scotch Creek at CTH "S".

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

STATE OF W



Field Survey Dates: Preliminary 9/16/76
Primary 10/21/76

Survey Crew: Al Hauber, Fish Management
Bill Jaeger, E. P. Biologist