

Region SCR County Jefferson Report Date 10/1993 Classification LAL
 Water Body: Rock River, Trib to
 Discharger: Ixonia WWT

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 ^(in place)
- 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 ^{cultural alterations}
- 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 ^{channelization}
- 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
- 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 ^{habitat}

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

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

Historical Reports in file:

- 10/1993 - Richard Dreher / mark Seising
- 12/1989 - Dave Marshall
- 9/28/76 - Tom Bainbridge

Additional Comments/How to improve report:

- lack of flow is biggest limiting factor for trib. is ~~lack of flow~~
 - are other factors - in place pollutants, cultural alterations, etc. non-controllable?
 - what about flow that is added by discharge?
 - 93 report states that shocking revealed a very limited Forage Fishery --
 so why is the rec. class'n LAL and not LFF?
 C:\Data\WBUD\UAA resources\Site UAA checklst.doc
 Revised 10/24/2003
 - check in W/ region on class'n.

Ixonia Tributary to the Rock River Tributary
and the Rock River Trib. to the Rock River

Triennial Standards Review

October 1993

Richard Dreher / Mark Sesing

Southern District

Bureau of Water Resource Management
Wisconsin Department of Natural Resources

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INTRODUCTION

After an on-site evaluation and review of information relating to stream habitat, water quality, and biology, it is recommended that the Ixonia Tributary remain classified Limited Aquatic Life, LAL(f), while the Rock River Tributary be upgraded to a Limited Forage Fish Community, LFF(e). Low natural stream flow, in-place pollutants, and irretrievable cultural alterations suggest that no classification upgrade is in order for the Ixonia Tributary. The Rock River Tributary, although degraded and lacking good cover, is capable of supporting a Limited Forage Fish Community.

GENERAL DESCRIPTION, HABITAT, AND STREAM BIOLOGY

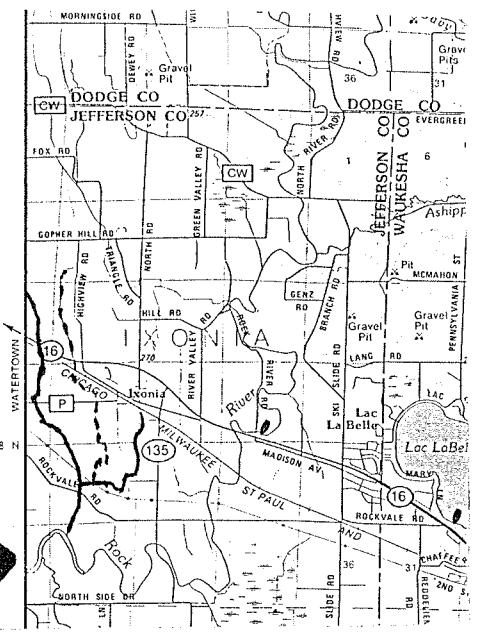
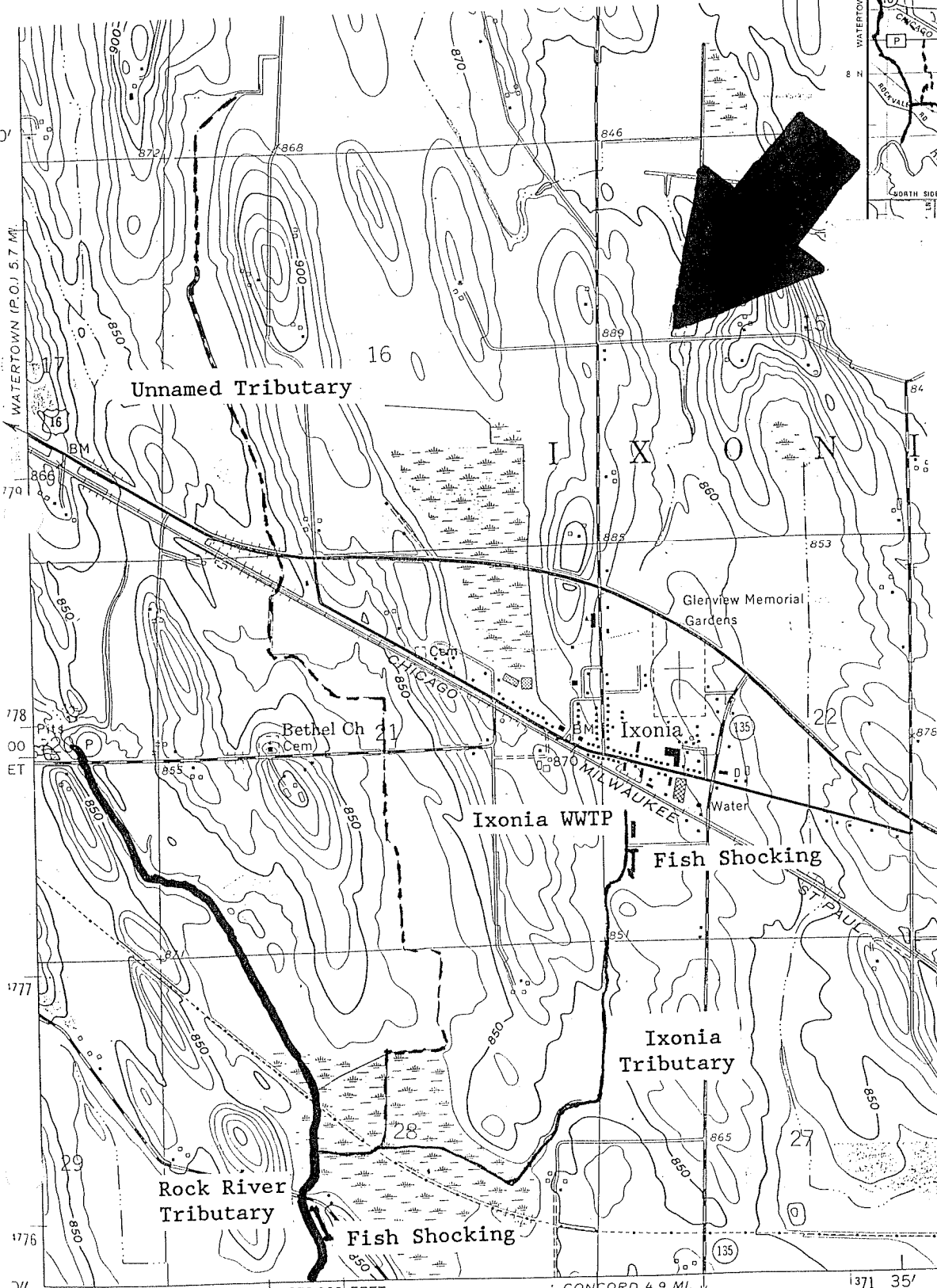
-- Ixonia Tributary from WWTP to the Rock River Tributary

The small intermittent tributary which flows past Ixonia's Wastewater Treatment Plant originates north of the plant in the town of Ixonia, flows south to join with another small tributary, and enters the Rock River Tributary near Rockvale Road (see map).

The treatment plant discharges continuously from its recirculating sand filtering process. The million dollar plant has a unique design which is very uncommon in the midwest. Wastewater enters the plant and is pumped into two large septic tanks where solids settle. The overflow from the tanks is then filtered through six different cells which consist of 4 feet of sand, over 2 feet of pea gravel, over 2 more feet of coarse gravel (photo 1). It then reaches an impenetrable layer which prevents the water from percolating into the soil. Here the option exists to either discharge the water or recirculate it back through the sand. The water is usually discharged immediately. The plant has worked very well since its installation with very few problems.

The width of the stream averages less than 1.0 meters with depths typically less than 0.3 m (App. 2). Channelization is severe along most of the tributary's route limiting available aquatic life habitat.

Riparian cover in the area is mainly agricultural along the first stretch which then gradually turns into a wetland area. The wetland is dominated by wetland grasses and cattails with quite a few willows providing some overhead canopy.



18°37'30" 368

2 370 000 FEET

CONCORD 4.9 MI.
SULLIVAN 9.5 MI.

371 35'

Instream vegetation is lacking within the tributary. Instream cover is about 10%, mostly coming from fallen trees, roots, and brush (photo 2). No large boulders are present instream to provide cover with most of the substrate consisting of fine inorganic silt causing embeddedness close to 100%. A few sand and gravel sections exist causing a slight riffled area and providing some habitat.

There exists a good potential for both siltation and non-point pollution problems. Row cropping throughout approximately the first half of the tributary undoubtedly contributes significant amounts of nutrients. The ditched section of the tributary has steep stream banks which are not well stabilized by healthy well-rooted vegetation. Burdocks are the dominate plant along the banks with other types of brushy plants which thrive in disturbed areas. This leaves many "raw" areas where erosion is significant.

The biggest limiting factor for the tributary is the lack of flow. During dry summers, flow decreases greatly with the only flow originating from the wastewater discharge.

Backpack electroshocking on October 18, 1993, revealed a very limited forage fish community (App. 1). The only species found were mudminnows and sticklebacks which are very tolerant of adverse conditions.

GENERAL DESCRIPTION, HABITAT, AND STREAM BIOLOGY

-- Rock River Tributary

The Ixonia Tributary converges with another small unnamed tributary and then enters the Rock River Tributary in a wetland area just north of Rockvale Road (see map). The Rock River Tributary is a continuous low-gradient stream which flows approximately half a mile before entering the Rock River.

The Rock River Tributary is much wider than the Ixonia Tributary with average widths close to ten feet and some sections up to fifteen feet wide. Depths range from six inches to five feet, with most of the tributary averaging over three feet (App. 2).

One of the stream's biggest limiting factors is lack of instream cover. Aquatic vegetation is sparse throughout its entire length, with logs, boulders, and other aquatic cover limited (photo 3).

Some overhead canopy from willows and other wetland-type vegetation is present, and there are also some stretches with good overhead bank cover.

The riparian area is almost entirely wetlands. Wetland grasses, cattails, and other wetland species dominate the shoreline area throughout the entire stream's course.

Erosion and non-point pollution sources are not severe within the Rock River Tributary itself, but the tributary is affected by the erosion and nutrient influxes from the other two streams which enter it. As mentioned earlier, erosion and non-point sources are significant in the Ixonia Tributary.

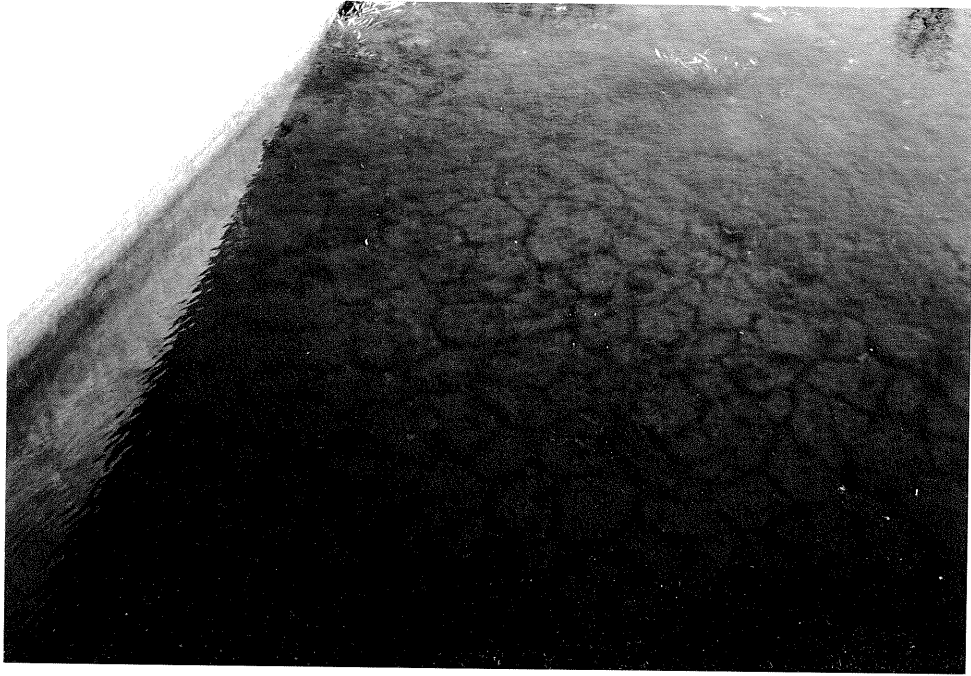
The lower bank channel capacity is not sufficient to handle peak flows. At the time of this evaluation, water levels were low, yet were barely contained. Frequent flooding into the wetland area surrounding the stream is common.

The substrate in the tributary consists of fine organic and inorganic silt. Sediment depths average over six inches with depths up to a foot not uncommon. This high degree of siltation has most likely smothered any type of aquatic vegetation within the stream. There were no riffled sections, as there was no firm substrate. Deep pools (over 5 feet) were also not apparent.

Backpack electroshocking in a fifty foot section above Rockvale Road revealed a very limited forage fish community (App. 1). Mudminnows and sticklebacks were the only species found indicating poor water quality. Both these species are very tolerant of adverse conditions. Although stream habitat would not be conducive to supporting less tolerable or a sport fish community, tolerable species such as mudminnows do not have high habitat requirements. Both depth and water quality conditions are capable of supporting these species.

After reviewing all the available information regarding the biology, habitat, and water quality of the Ixonia Tributary and the Rock River Tributary, it is recommended that the Ixonia Tributary remain classified Limited Aquatic Life, LAL(f). The Rock River Tributary should be upgraded to a Limited Forage Fish Community, LFF(e).

2



3



Photo 1 - The unique design at Ixonia's WWTP uses a recirculating sand filtering process. This is one of six different cells.

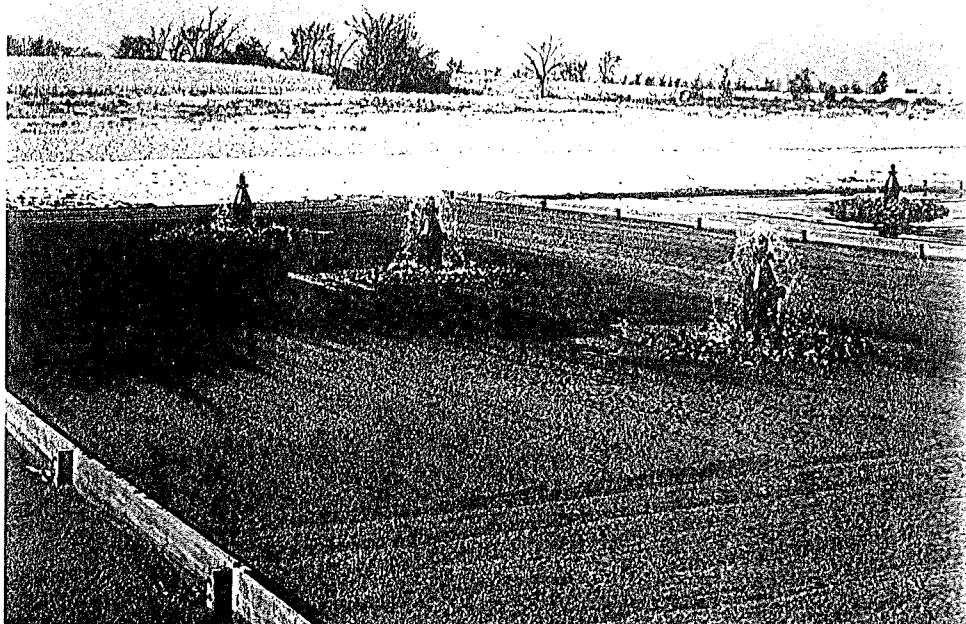


Photo 2 - The Ixonia Trib. is characterized by shallow depths and lack of instream vegetation. Logs and brush provide some good forage fish habitat.

Photo 3 - The Rock River Trib. has very limited instream cover. No aquatic vegetation is present and the substrate consists of thick muck.



FISH ELECTROSHOCKING
IXONIA / ROCK RIVER TRIBUTARIES
October 18, 1993 / Richard Dreher

Species	Ixonia	Rock River
mudminnow	27	19
brook stickleback	34	16

* Electroshocking was conducted in a 100 foot section in the Ixonia Tributary and a 50 foot section of the Rock River Trib.

Stream IXONIA TRIB Reach Location FROM WWTP TO ROCK RIVER Reach Score/Rating 217 POOR
 County JEFFERSON Date 10/18/93 Evaluator DREHER Classification LAL

Rating Item	Category			
	Excellent	Good	Fair	Poor
Watershed Erosion	No evidence of significant erosion. Stable forest or grass land. Little potential for future erosion. 8	Some erosion evident. No significant "raw" areas. Good land mgmt. practices in area. Low potential for significant erosion. 10	Moderate erosion evident. Erosion from heavy storm events obvious. Some "raw" areas. Potential for significant erosion. 14 (12)	Heavy erosion evident. Probable erosion from any run off. 16
Watershed Nonpoint Source	No evidence of significant source. Little potential for future problem. 8	Some potential sources (roads, urban area, farm fields). 10	Moderate sources (small wetlands, tile fields, urban area, intense agriculture). 14	Obvious sources (major wetland drainage, high use urban or industrial area, feed lots, impoundment). 16
Bank Erosion, Failure	No evidence of significant erosion or bank failure. Little potential for future problem. 4	Infrequent, small areas, mostly healed over. Some potential in extreme floods. 8	Moderate frequency and size. Some "raw" spots. Erosion potential during high flow. 16 (12)	Many eroded areas. "Raw" areas frequent along straight sections and bends. 20
Bank Vegetative Protection	90% plant density. Diverse trees, shrubs, grass. Plants healthy with apparently good root system. 6	70-90% density. Fewer plant species. A few barren or thin areas. Vegetation appears generally healthy. 9	50-70% density. Dominated by grass, sparse trees and shrubs. Plant types and conditions suggest poorer soil binding. 15 (12)	<50% density. Many raw areas. Thin grass, few if any trees and shrubs. 18
Lower Bank Channel Capacity	Ample for present peak flow plus some increase. Peak flow contained. W/D ratio <7. 8	Adequate. Overbank flows rare. W/D ratio 8-15. 10	Barely contains present peaks. Occasional overbank flow. W/D ratio 15-25. 14	Inadequate, overbank flow common. W/D ratio >25. 16
Lower Bank Deposition	Little or no enlargement of channel or point bars. 6	Some new increase in bar formation, mostly from coarse gravel. 9	Moderate deposition of new gravel and coarse sand on old and some new bars. 15 (16)	Heavy deposits of fine material, increased bar development. 18
Bottom Scouring and Deposition	Less than 5% of the bottom affected by scouring and deposition. 4	5-30% affected. Scour at constrictions and where grades steepen. Some deposition in pools. 8	30-50% affected. Deposits and scour at obstructions, constrictions and bends. Some filling of pools. 16	More than 50% of the bottom changing nearly year long. Pools almost absent due to deposition. 20
Bottom Substrate/ Available Cover	Greater than 50% rubble, gravel or other stable habitat. 2	30-50% rubble, gravel or other stable habitat. Adequate habitat. 7	10-30% rubble, gravel or other stable habitat. Habitat availability less than desirable. 17	Less than 10% rubble gravel or other stable habitat. Lack of habitat is obvious. 22 (20)
Avg. Depth Riffles and Runs	Cold >1'	0 6" to 1'	6 3" to 6"	18 <3"
	Warm >1.5'	0 10" to 1.5'	6 6" to 10"	18 <6"
Avg. Depth of Pools	Cold >4'	0 3' to 4'	6 2' to 3'	18 <2'
	Warm >5'	0 4' to 5'	6 3' to 4'	18 <3'
Flow, at Rep. Low Flow	Cold >2 cfs	0 1-2 cfs	6 .5-1 cfs	18 <.5 cfs
	Warm >5 cfs	0 2-5 cfs	6 1-2 cfs	18 <1 cfs
Pool/Riffle, Run/Bend Ratio (distance between riffles ÷ stream width)	5-7. Variety of habitat. Deep riffles and pools. 4	7-15. Adequate depth in pools and riffles. Bends provide habitat. 8	15-25. Occasional riffle or bend. Bottom contours provide some habitat. 16	>25. Essentially a straight stream. Generally all flat water or shallow riffle. Poor habitat. 20 (19)
Aesthetics	Wilderness characteristics, outstanding natural beauty. Usually wooded or un-pastured corridor. 8	High natural beauty. Trees, historic site. Some development may be visible. 10	Common setting, not offensive. Developed but uncluttered area. 14	Stream does not enhance aesthetics. Condition of stream is offensive. 16

Column Totals: _____ 10 _____ 96 _____ 111

Column Scores E _____ +G _____ +F _____ +P _____ = 217 = Score

<70 = Excellent, 71-129 = Good, 130-200 = Fair, >200 = Poor

EXONIA 1010 AL MW 11/10/15		PICE FC12	
Stream Reach Type			
Stream Reach Length	100'		
Stream Reach Depth (ft.)	1'		
z present	1/2'		
z max. present	2'		
z low flow			
Stream Reach Width (ft.)			
x present	3'		
x high flow	5'		
x low flow	0		
Substrate Size (Min. 10%)			
Detritus (P/Present)			
Clay			
Silt	80		
Sand	10		
Gravel .25"-3.0"	10		
Rubble 3.01"-12.0"			
Boulder >12.01"			
Bedrock			
Velocity x present (m e)	2 / fps		
Vel. max. present			
Gradient	low		
Bottom Deposition (Min. 10%)			
% area bottom covered	90%		
x depth sediment	2"		
max. depth sediment	6"		
deposition type			
Material Comp. (Min. 10%)			
detritus			
silt	80		
sand	10		
gravel	10		
Overhead Bank Cover			
x bank width *0', <.25', <.5' etc.			
% of reach (10% Min.)			
x depth below bank *			
x bank + veg. width *			
% of reach (10% Min.)			
x depth below bank+veg.*			
Instream Cover Rating			
↑ Cover Material (Min. 10%)	10		
=np rock/bould. (P/Present) np	15		
=ff log/tree/roots	50		
=gf debris (other)			
=fg instream veg.			
=gg bank+veg. (terrestrial)	40		
depth/channel morph.			
Shading (0,25,50,75,100)	25		
Aquatic Veg. (Min.10%) macro	0		
% coverage meso	0		
Floodplain Vegetation Type			
Uprule Loosestrife			
Lower Bank Height			
Bank Stability % >90 >70 >50 <50	>70		
Channel Bank Deposition			
Channelization	75%		
Comments			

Stream Rock Riv Reach Location AT ROCKVALE Rd Reach Score/Rating 202 Poor
 County JEFFERSON Date 10/18/93 Evaluator DREHER Classification LFF

Rating Item	Category			
	Excellent	Good	Fair	Poor
Watershed Erosion	No evidence of significant erosion. Stable forest or grass land. Little potential for future erosion. 8	Some erosion evident. No significant "raw" areas. Good land mgmt. practices in area. Low potential for significant erosion. 10	Moderate erosion evident. Erosion from heavy storm events obvious. Some "raw" areas. Potential for significant erosion. 14	Heavy erosion evident. Probable erosion from any run off. 16
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Bank Vegetative Protection	90% plant density. Diverse trees, shrubs, grass. Plants healthy with apparently good root system. 6	70-90% density. Fewer plant species. A few barren or thin areas. Vegetation appears generally healthy. 9	50-70% density. Dominated by grass, sparse trees and shrubs. Plant types and conditions suggest poorer soil binding. 15	<50% density. Many raw areas. Thin grass, few if any trees and shrubs. 18
Lower Bank Channel Capacity	Ample for present peak flow plus some increase. Peak flow contained. W/D ratio <7. 8	Adequate. Overbank flows rare. W/D ratio 8-15. 10	Barely contains present peaks. Occasional overbank flow. W/D ratio 15-25. 14	Inadequate, overbank flow common. W/D ratio >25. 15
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Bottom Scouring and Position	Less than 5% of the bottom affected by scouring and deposition. 4	5-30% affected. Scour at constrictions and where grades steepen. Some deposition in pools. 8	30-50% affected. Deposits and scour at obstructions, constrictions and bends. Some filling of pools. 16	More than 50% of the bottom changing nearly year long. Pools almost absent due to deposition. 20
Bottom Substrate/ Available Cover	Greater than 50% rubble, gravel or other stable habitat. 2	30-50% rubble, gravel or other stable habitat. Adequate habitat. 7	10-30% rubble, gravel or other stable habitat. Habitat availability less than desirable. 17	Less than 10% rubble gravel or other stable habitat. Lack of habitat is obvious. 22
Avg. Depth Riffles and Runs	Cold >1' 0 Warm >1.5' 0	6" to 1' 6 10" to 1.5' 6	3" to 6" 18 6" to 10" 18	<3" 24 <6" 24
Avg. Depth of Pools	Cold >4' 0 Warm >5' 0	3' to 4' 6 4' to 5' 6	2' to 3' 18 3' to 4' 18	<2' 24 <3' 24
Flow, at Rep. Low Flow	Cold >2 cfs 0 Warm >5 cfs 0	1-2 cfs 6 2-5 cfs 6	.5-1 cfs 18 1-2 cfs 18	<.5 cfs 24 <1 cfs 24
Pool/Riffle, Run/Bend Ratio (distance between riffles ÷ stream width)	5-7. Variety of habitat. Deep riffles and pools. 4	7-15. Adequate depth in pools and riffles. Bends provide habitat. 8	15-25. Occasional riffle or bend. Bottom contours provide some habitat. 16	>25. Essentially a straight stream. Generally all flat water or shallow riffle. Poor habitat. 20
Aesthetics	Wilderness characteristics, outstanding natural beauty. Usually wooded or unpastured corridor. 8	High natural beauty. Trees, historic site. Some development may be visible. 10	Common setting, not offensive. Developed but uncluttered area. 14	Stream does not enhance aesthetics. Condition of stream is offensive. 16

Column Totals: _____ 26 _____ 88 _____ 88

Column Scores E _____ +G _____ +F _____ +P _____ = 202 = Score

0 = Excellent, 71-129 = Good, 130-200 = Fair, >200 = Poor

TRIENNIAL STANDARDS REVIEW OF AN
UNNAMED IXONIA DRAINAGE DITCH
JEFFERSON COUNTY
UPPER ROCK DRAINAGE BASIN

WISCONSIN DEPARTMENT OF NATURAL RESOURCES
DECEMBER, 1989

Prepared by David Marshall

The Ixonia municipal wastewater treatment plant discharges to a noncontinuous drainage ditch originating in Section 22, T8N, R16E. Downstream of the wastewater treatment facility, surrounding land use is agricultural. The stream is affected by a combination of pasture, croplands, and barnyard runoff. Except during periods of runoff, flow in the ditch is sustained almost entirely by the treatment plant. Historically, the channel became braided and undefined in a small wetland near the Rock River. More recently, a channel has been dredged through the wetland defining a stream course to the confluence with the Rock River.

In November, 1988, fish shocking and macroinvertebrate sampling were performed to characterize the stream use potential. No fish were found in the stream but hibernating Leopard frogs were abundant. Stream flow was not discernable during the survey. The substrate was compacted and honeycombed indicating prior low flow and desiccation. The macroinvertebrate community was dominated by chironomids and the Hilsenhoff Biotic Index (HBI) indicated "fair" water quality (HBI = 5.93). The recent HBI value indicated substantially improved water quality compared to an earlier study. In 1980, representative macroinvertebrate collections had HBI values of 8.84, 9.44 and 9.35 reflecting "very poor" water quality conditions.

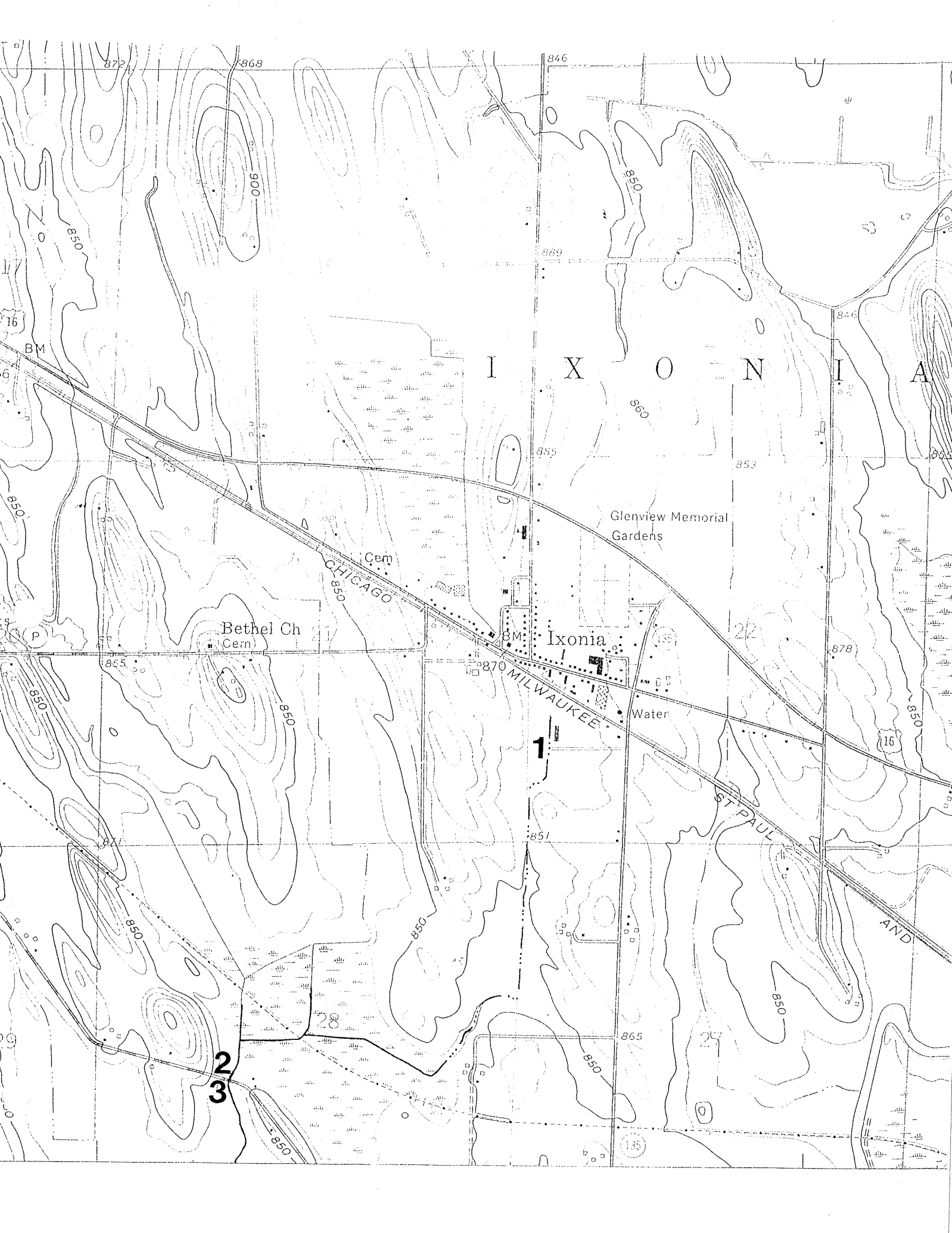
The improved HBI value in 1988 indicated improved wastewater treatment at the Ixonia plant. During October, 1980, average BOD₅ concentrations were 39 mg/l. Recent BOD₅ levels average less than 20 mg/l and frequently below 5 mg/l.

Based on the unnatural stream conditions, low flow, and land use impacts, the marginal stream classification (MARG-E) accurately characterizes the limited use potential of the unnamed Ixonia drainage ditch.

\8912\WR1Ixonia.dm

1





872

868

846

900

850

16

BM

I X O N I A

889

860

853

Glenview Memorial Gardens

Cern
CHICAGO

Bethel Ch
Cern

BM

Ixonia

22

878

Water

MILWAUKEE

870

16

855

850

851

ST PAUL

AND

877

850

850

865

850

32

28

850

850

29

135

Stream Ixonía Reach Location Entire Reach Score/Rating 240 Poor
 County Jefferson Date 11-88 Evaluator Marshall Classification MARG-E

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Flow, at Rep. Low Flow	Cold >2 cfs 0 Warm >5 cfs 0	1-2 cfs 6 2-5 cfs 6	.5-1 cfs 18 1-2 cfs 18	<.5 cfs 24 <1 cfs 24
Pool/Riffle, Run/Bend Ratio (distance between riffles ÷ stream width)	5-7. Variety of habitat. Deep riffles and pools. 4	7-15. Adequate depth in pools and riffles. Bends provide habitat. 8	15-25. Occasional riffle or bend. Bottom contours provide some habitat. 16	>25. Essentially a straight stream. Generally all flat water or shallow riffle. Poor habitat. (19) 20
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Column Totals: _____

Column Scores E _____ +G _____ +F _____ +P _____ = 240 = Score

<70 = Excellent, 71-129 = Good, 130-200 = Fair, >200 = Poor

IXONIA SANITARY DISTRICT

Tributary and Rock River Tributary

The tributaries are characterized as having a very low gradient, a substrate consisting of silt and muck and a limited benthic community. Much of the stream's course has been altered by ditching and straightening.

The tributary which the treatment plant discharges to has been encroached upon by cattails and marsh grasses. A biological sample taken below the treatment plant on 1/15/74 showed the stream's biota consisting of only a few tolerant species. On 2/14/79 the tributary upstream of the treatment plant was completely filled with snow, flow was minimal and a biological sample resulted in no macroinvertebrates being found.

The Rock River tributary was also surveyed on 2/14/79. Approximately .6 of a mile above the Rock River, the stream was completely snow and ice covered. Two to two and a half feet of ice covered the stream and the water quality was very poor. There seemed to be little flow, the water was blackish in color, anaerobic conditions were present and a very strong hydrogen sulfide smell was evident. Under these conditions it is nearly impossible to have much of any biological community present.

The existing classification should remain unchanged.

IXONIA SANITARY DISTRICT #1

Jefferson County

September 28, 1976

Ixonia Tributary

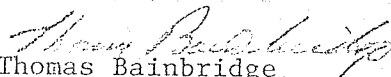
The Ixonia Tributary is an intermittent stream, which in its upper reaches has been severely ditched. It flows through a large marsh, picks up another tributary and enters the Rock River tributary. The Rock River tributary enters the Rock River approximately 3/4 of a mile below this juncture.

Recommendations

From the Ixonia Sanitary District outfall downstream to the juncture with the Rock River tributary, the classification should be noncontinuous marginal surface waters. From this point to the confluence with the Rock River, the classification should be continuous marginal surface waters.

The above recommendations represent a concurrence of opinion of the stream classification team who are as follows: Roy Lembcke, District Engineer; Jim Congdon, Area Fish Manager; Tom Bainbridge, Stream Classification Coordinator; Roger Schlessler, Natural Resources Technician.

Respectfully submitted,


Thomas Bainbridge
Stream Classification Coordinator

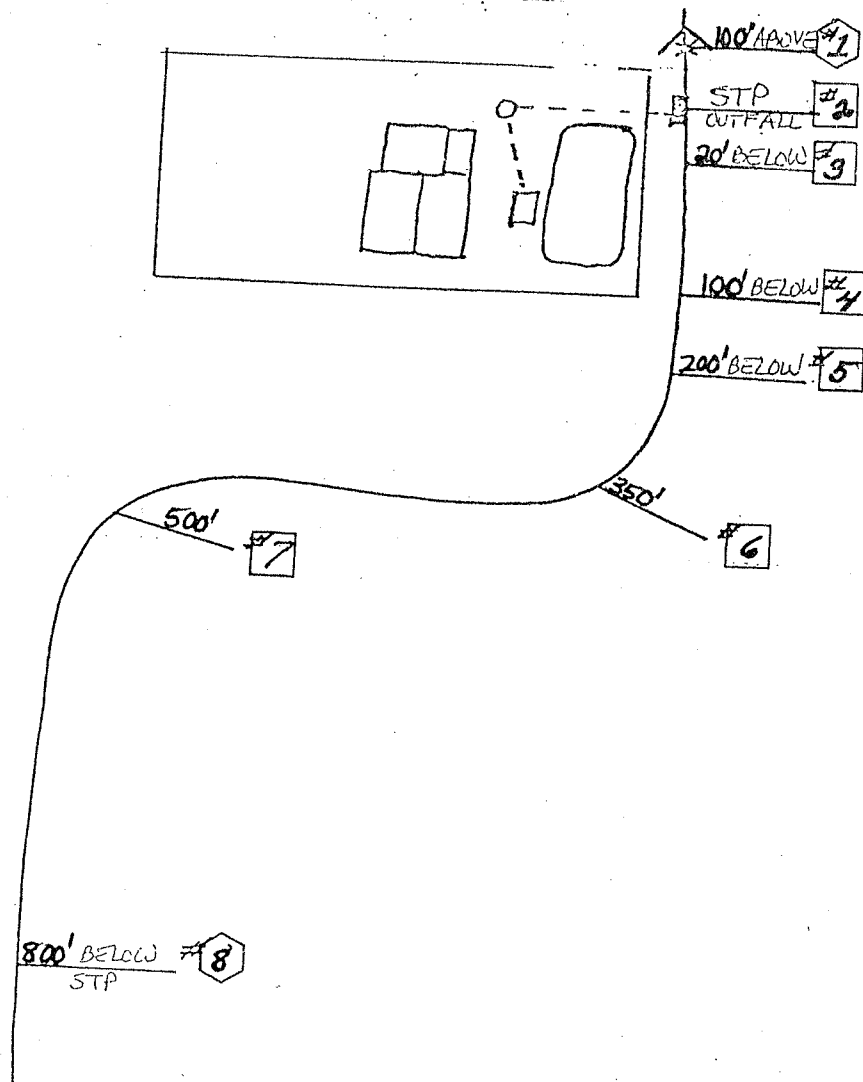
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IXONIA TRIBUTARY AT IXONIA

The Ixonia Tributary is an intermittent stream which has been severely ditched in its upper reaches. It flows through a large marsh, picks up another tributary and enters the Rock River tributary .4 miles downstream. The Rock River tributary enters the Rock River .75 miles below the above mentioned confluence. The classification of the Ixonia tributary is noncontinuous marginal; and the Rock River tributary is classified as continuous marginal.

A low flow survey was conducted below the Ixonia STP on November 8, 1973. At this time the flow from the plant was .02 cfs. The weather was clear and sunny, with no precipitation. Partly cloudy conditions were observed at 14:00. The stream bottom had accumulations of soft muck and organic matter throughout the reach; marsh grasses and cattails were also present. The water at the upstream station had an unnatural blue-green appearance.

The study was conducted by Richard Harf.

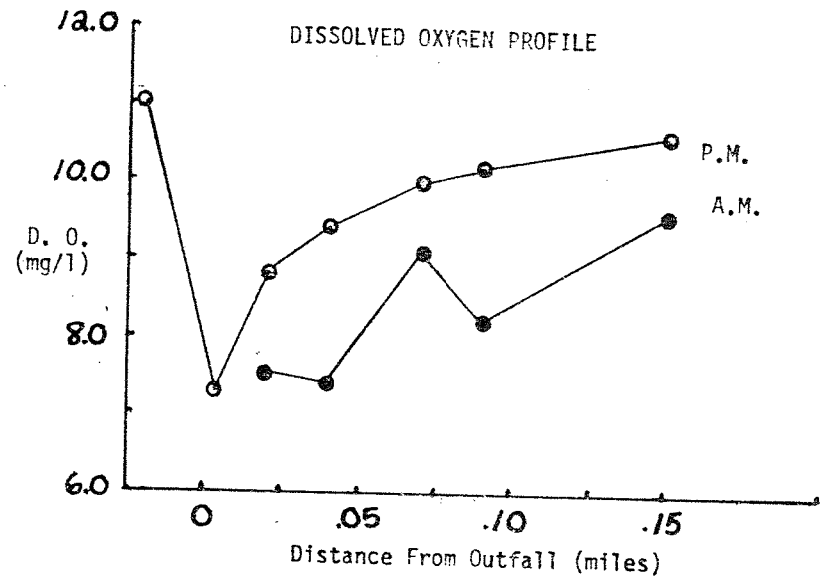


CHEMICAL AND PHYSICAL DATA

IXONIA STP

11/8/73

Station Number	Distance From Outfall (miles)	Time	Temp		D.O.		Total Organic N (mg/l)	NH ₃ -N (mg/l)	NO ₃ -N + NO ₂ -N (mg/l)		Total Phosphorus (mg/l)	Soluble Phosphorus (mg/l)	Chlorides (mg/l)	BOD 5-day (mg/l)	BOD 5-day INH (mg/l)	BOD 20-day (mg/l)	Width ft.	Max. Depth ft.	Ave. Vel. (fps)	Flow (cfs)	Dye Time To Station (hours)	
			P.M.	A.M.	P.M.	A.M.																
1	-.02	13:22	2	-	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	.00	13:32	-	-	-	-	3.4	9.2	.27	2.4	1.3	350	58	9.2	-	2	.3	.21	.02	-	-	
3	.004	13:35	10	-	7.3	-	4.1	9.0	2.2	2.6	1.5	-	<7.0	<7.0	>35	-	-	-	-	-	0.0	
4	.02	13:46	7	2	8.8	6.5	3.9	5.7	18.6	2.2	.63	-	12	7.7	-	-	-	-	-	-	.05	
5	.04	14:01	5	4	9.4	6.4	-	-	-	-	-	-	7.8	-	-	-	-	-	-	-	.23	
6	.07	14:06	5	3	10.0	9.1	-	-	-	-	-	-	8.6	-	-	-	-	-	-	-	.40	
7	.09	14:16	4	1	10.2	8.2	-	-	-	-	-	-	7.8	-	-	-	-	-	-	-	.57	
8	.15	14:39	5	.5	10.6	9.6	-	-	-	-	-	-	12	-	-	1.2	.3	.65	.04	-	.73	
																					1.12	



IXONIA SANITARY DISTRICT #1

Jefferson County

September 28, 1976

Ixonía Tributary

The Ixonía Tributary is an intermittent stream, which in its upper reaches has been severely ditched. It flows through a large marsh, picks up another tributary and enters the Rock River tributary. The Rock River tributary enters the Rock River approximately 3/4 of a mile below this juncture.

Recommendations

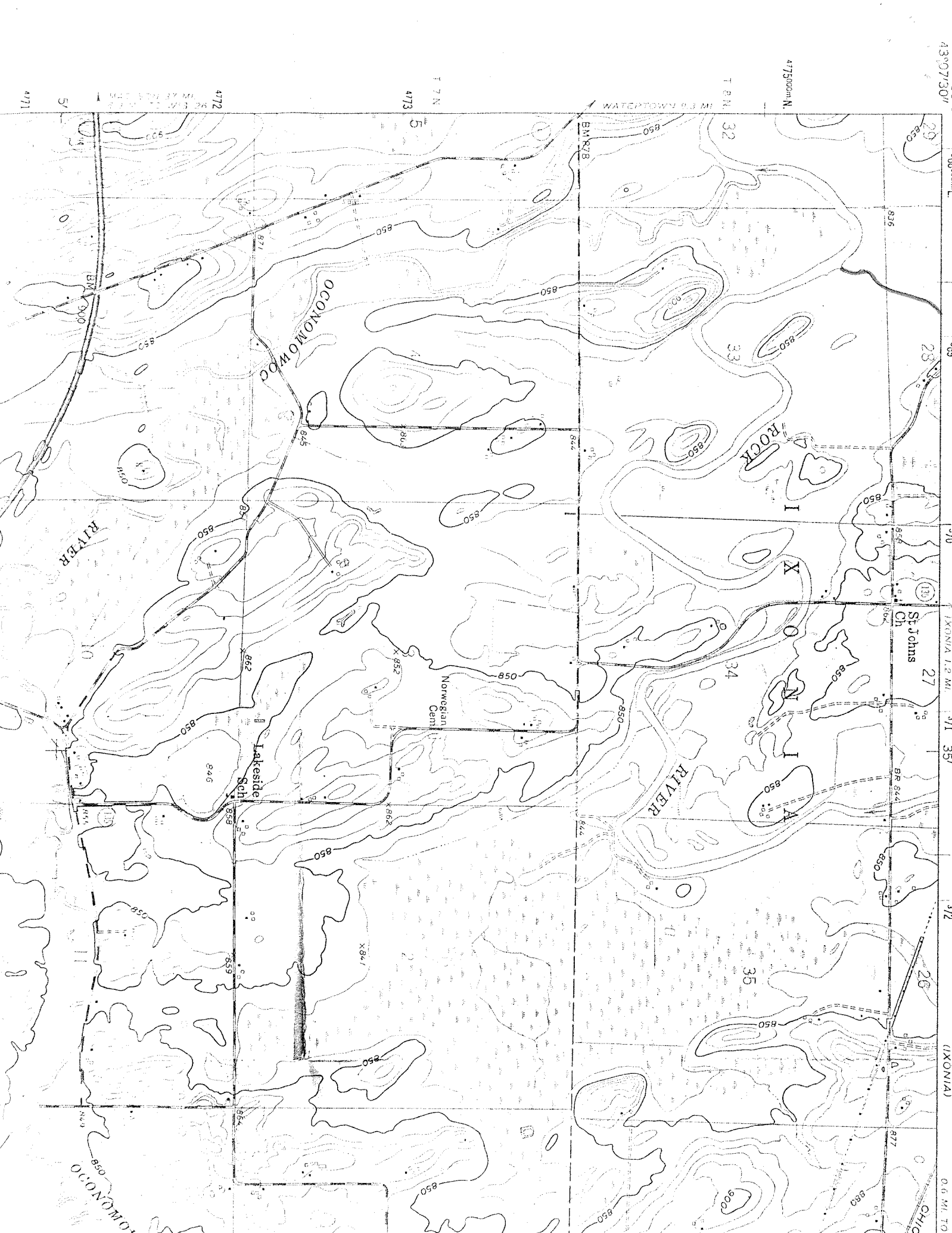
From the Ixonía Sanitary District outfall downstream to the juncture with the Rock River tributary, the classification should be noncontinuous marginal surface waters. From this point to the confluence with the Rock River, the classification should be continuous marginal surface waters.

The above recommendations represent a concurrence of opinion of the stream classification team who are as follows: Roy Lembcke, District Engineer; Jim Congdon, Area Fish Manager; Tom Bainbridge, Stream Classification Coordinator; Roger Schlessler, Natural Resources Technician.

Respectfully submitted,


Thomas Bainbridge
Stream Classification Coordinator

TB:cb



43°07'30" N
100°00'00" W
28
29
30
31
32
33
34
35
IXONIA 1.2 MI. S/E
St. Johns Ch
BR 844
CHIC
0.6 MI. T 7 N

473500m N

T 8 N

WATER TOWN 0.3 MI

BM 878

T 7 N

R 5 W

4772

WATER TOWN 0.3 MI

R 5 W

4771

OCONOMOWOC

ROCK

RIVER

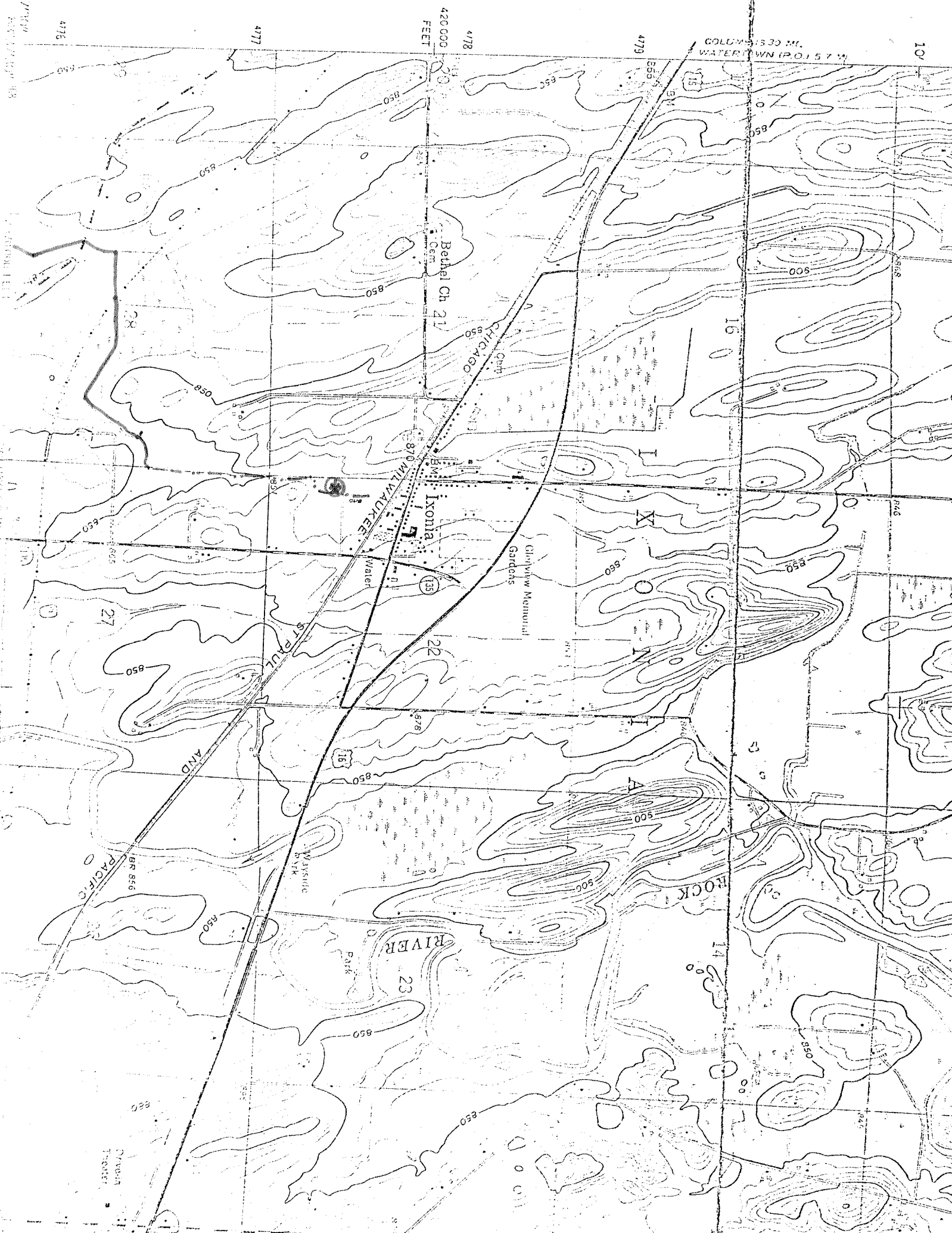
Norwegian Cemetery

Lakeside

RIVER

OCONOMOWOC

CHIC



Rejustification of the Stream Classification for the Ixonia Tributary and an Unnamed Tributary to the Rock River

The Ixonia Sanitary District discharges its effluent into the Ixonia tributary. The Ixonia tributary is a small intermittent stream which originates north of Ixonia and flows south and then west through a large marsh before it discharges into an unnamed tributary of the Rock River. (See attached map) In its upper reaches, the Ixonia tributary is severely ditched. Both the Ixonia tributary and the Rock River tributary flow through predominantly agricultural lands and have adjacent wetlands along much of their lengths. The tributaries are characterized as having very low gradients, substrates consisting of silt and muck and limited benthic communities.

The Ixonia tributary has been encroached upon by cattails and marsh grasses. Biological samples taken both above and below the treatment plant have documented only a few, tolerant species of macroinvertebrates in the streams. A survey of the Ixonia tributary was attempted in February 1979. Upstream of the treatment plant, the tributary was completely filled with snow and had a minimal flow. No macroinvertebrates could be found.

The Rock River tributary was also surveyed in February 1979. Approximately 0.6 of a miles above the confluence with the Rock River the stream was completely snow and ice covered. There appeared to be little flow in the stream and the water quality was very poor. The water was blackish in color, anaerobic conditions were present and a very strong hydrogen sulfide odor was evident.

The chemical data available for the Ixonia tributary shows that the stream cannot consistently meet the dissolved oxygen standards for a fish and aquatic life stream. In addition, high levels of BOD₅ and fecal coliform have been documented both above and below the Ixonia STP discharge. The existing water quality of both of the streams is poor

— Ixonia tributary
— Unnamed tributary to the Rock River



Stream Classification Worksheet

Receiving Watercourse: Ixonia Tributary and Rock River Tributary

District: Southern

Location: From T8N, R16E, Section 21 to T8N, R16E, Section 33

River Basin: Upper Rock River

Discharger: Ixonia Sanitary District

Classification Recommendation:

It is recommended that the Ixonia tributary and Rock River tributary be classified as follows:

1. Noncontinuous, marginal - From the Ixonia Sanitary District outfall downstream to the juncture with the Rock River tributary.
2. Continuous, marginal - From the juncture with the Rock River tributary to the confluence with the Rock River.

References Used:

1. Rock River Basin Areawide Water Quality Management Plan.
2. Surface Water Resources of Jefferson County (1968).
3. Wisconsin Small Stream Studies - The Upper Rock River Basin (1979).
4. Upper Rock River Drainage Basin Report (January 10, 1963).
5. Upper Rock River Drainage Basin Report (March 17, 1969).
6. Upper Rock River Drainage Basin Report (August 1976).

Physical Characteristics:

Land Use	Predominantly agricultural lands and adjacent wetlands along much of their lengths.
Bottom Type	Muck and organic matter line the entire stream bottom.
Stream Bank Vegetation	Marsh grasses and cattails

Hydrological
Features

Color: Blue-green
Length: Ixonia Tributary, 0.4 miles,
Rock River Tributary, 0.75 miles
Velocity: 0.21-0.65 ft/sec.
Depth: Average 0.3 ft.
Flow: .02 cfs (above STP) - .04 cfs (below STP)
Width: 1.2-2.0 ft.

Wetlands

100 acre surrounding the entire length (3.0 miles)
of the Rock River tributary.

Channel
Alterations

In its upper reaches, the Ixonia tributary is
severly ditched.

BIOLOGICAL DATA FOR THE IXONIA TRIBUTARY

<u>Date & Size Description</u>	<u>Bottom</u>	<u>Current</u>	<u>Organisms</u>		<u>/ Sq. Ft.</u>		<u>Very Tolerant</u>	
			<u>Intolerant</u> Spp. No.	<u>ToTolerant</u> Spp. No.	<u>Spp.</u>	<u>No.</u>		
Above the Ixonias STP (R.M. 2.3+) 1961	Clay	Slow	0	0	1	16	1	1792
Below the Ixonias STP (R.M. 2.3-) 1961	Clay, Sludge	Slow	0	0	3	96	1	32
1-15-74	Silt - Organic Deb.	Moderate	-	-	3*	20**	1*	192**
Dead End Rd. (R.M. 0.8) 4-10-68	Leaf Debris	Slow	-	-	2	64	2	64

* Organisms not necessarily identified to species level

** Does not represent population density

CHEMICAL DATA FOR THE IXONIA TRIBUTARY

<u>Date and Site</u> <u>Description</u>	<u>BOD5</u> (mg/l)	<u>Temp.</u> (°C)	<u>pH</u> (s.u.)	<u>D.O.</u> (mg/l)	<u>Fecal</u> <u>Coliform</u> (MFCC per 100 ml)
Above Ixonia					
STP					
(R.M. 2.3+)					
5-24-61	1.8	25	7.4	8.2	140,000
8-24-61	3.6	19	7.6	6.0	140,000
2-20-68	3.7	0	7.4	5.8	1,000
8-14-68	5.8	20	7.8	5.3	20,000
9-27-68	1.5	15	7.6	5.1	13,000
5-31-73	5.7	17	7.4	3.2	15,000
7-30-73	8.2	25	8.6	4.6	2,000
10-10-73	4.9	19	8.0	3.9	320
Below Ixonia STP					
(R.M. 2.3-)					
5-24-61	23.4	20	7.6	8.1	150,000
8-24-61	3.1	19	7.8	6.3	240,000
Dead End Road					
(R.M. 0.7)					
8-14-68	4.9	21	7.8	4.5	110,000
9-4-68	2.8	24	7.9	6.5	59,000
9-27-68	3.1	15	8.0	5.8	4,800
5-31-73	5.7	19	7.5	3.4	4,500
7-30-73	21.0	26	8.2	5.3	1,500
10-10-73	16.0	19	8.0	4.1	1,800