

upgrade delete  
pH I.

Region SCK County Sauk Date 8/1990 Classification LFF

Water Body: Narrows Creek Jrib

Discharger: Sauk Co Health Care Center

If classified as Limited Forage Fish (LFF) or Limited Aquatic Life (LAL), check any of the following Use Attainability Analysis factors that apply:

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

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 included**

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

**Comments:**

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104 change

NARROWS CREEK TRIBUTARY  
AT LOGANVILLE, SAUK COUNTY

TRIENNIAL STANDARDS REVIEW  
SAUK COUNTY HEALTH CARE CENTER WWTP

AUGUST, 1990  
ROGER SCHLESSER, SOUTHERN DISTRICT

BUREAU OF WATER RESOURCES MANAGEMENT  
WISCONSIN DEPARTMENT OF NATURAL RESOURCES

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## SUMMARY

The tributary to Narrows Creek below the Sauk County Health Care Center WWTP was originally classified as a limited forage fish community (E), due to low natural stream flow and lack of habitat. This section extends from the WWTP downstream to the juncture with Narrows Creek. From this point extending downstream, and for the remainder of Narrows Creek, the classification is a warm water sport fish community (C). This review indicates that the classification of the tributary to Narrows Creek should be changed to a warm water forage fish community (D). When the stream was originally classified, this classification category was not in place.

## INTRODUCTION

This paper presents the results of an evaluation of the stream classification for the tributary to Narrows Creek, which is the receiving water for the Sauk County Health Care Center WWTP. The evaluation was conducted as part of the Triennial Standards Review. The sites being reviewed are listed in NR 104.05 (Appendix V). These sites received a variance due to one or more of the following criteria:

- (a) The presence of inplace pollutants,
- (b) Low natural stream flow,
- (c) Natural background conditions, and
- (d) Irretrievable cultural alterations.

## GENERAL DESCRIPTION

The tributary to Narrows Creek is a spring and seepage fed stream which originates north of Loganville. A large dam is located in its headwaters on the main stem along with several small ponds on feeder streams. Some agricultural land is located in the headwaters but much of the tributary's bank area is partially wooded with good grass cover. Even in the vicinity of the lagoons the stream bank is well protected with good overhanging cover which provides additional habitat.

The reach included in this evaluation is a one mile stretch which extends from STH. "23" downstream to the juncture with Narrows Creek. Much of the tributary is well protected except for the area adjacent to CTH. "CH" which at times has been heavily pastured.

Stream flows were taken by USGS at CTH. "CH". This crossing is located downstream of the lagoons. The USGS computed  $Q_{72}$  is 0.74 cfs and the  $Q_{710}$  is 0.58 cfs. Flow remains relatively stable, probably due to the dams located in the headwaters.

Table 1 contains the actual stream flows in the Narrows Creek tributary taken from the publication "Low-Flow Characteristics of Wisconsin Streams at Sewage Treatment Plants".

Table 1: Low-Flow Characteristics, Narrows Creek Tributary

<u>Drainage Area</u> <u>(mi<sup>2</sup>)</u>	<u>Date</u>	<u>Discharge</u> <u>(ft<sup>3</sup>/s)</u>
4.57	June 13, 1973	2.19
	July 24, 1973	1.54
	Oct. 25, 1973	1.72
	June 21, 1976	0.89
	Aug. 10, 1976	1.21

#### STREAM HABITAT

Flows are probably one of the major factors limiting a sport fishery here. The stream in the vicinity of the lagoons is well protected with little bank erosion. Some nice pools are also present in this area. Overhanging vegetation provides additional habitat along with keeping water temperatures down. The substrate in the vicinity of the outfall is one of sand and gravel-rubble. With the heavy pasturing in the lower reaches along with a low gradient much of that area has been silted in. A "stream system habitat rating form" is contained in Appendix I.

#### WATER QUALITY AND BIOLOGY

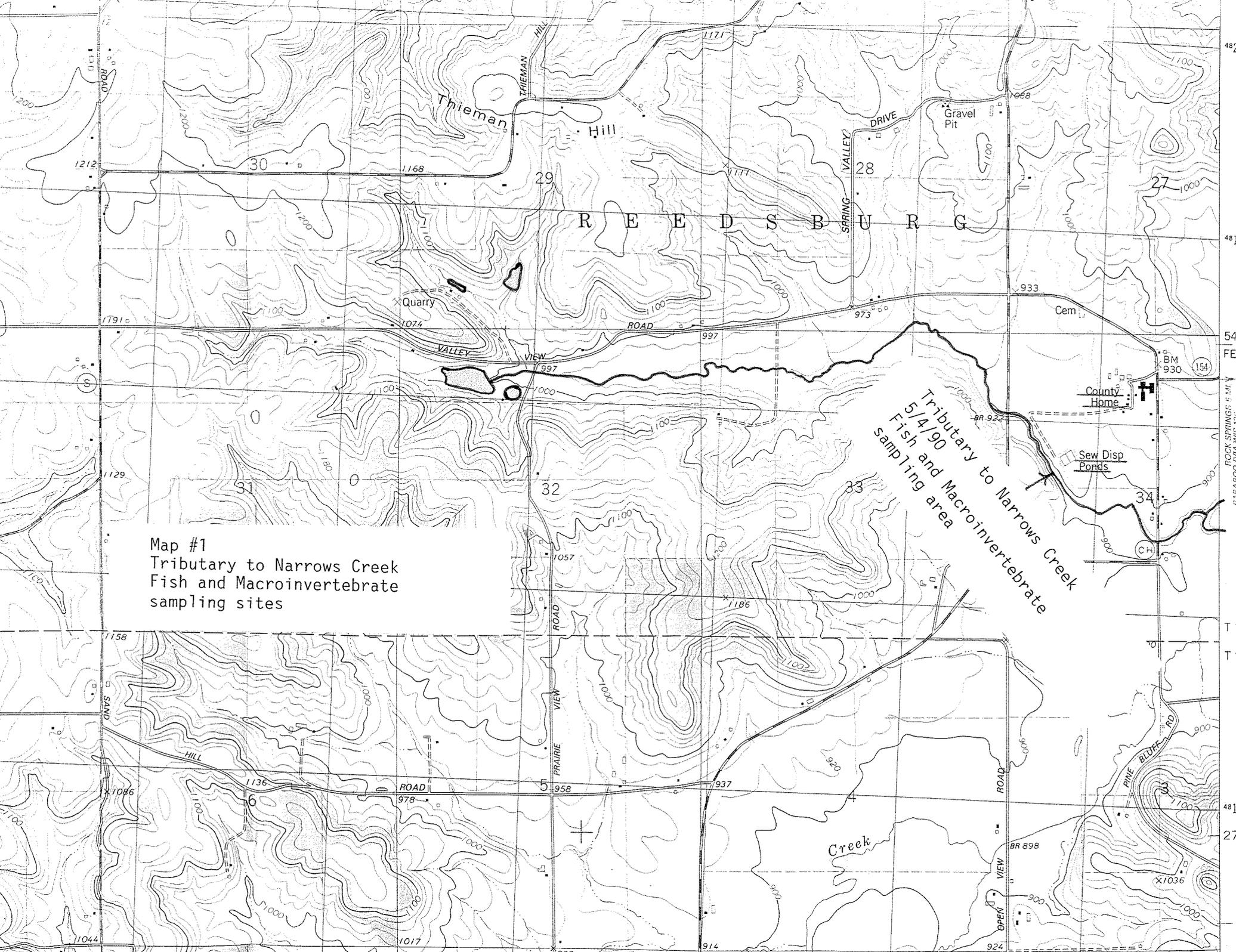
When the stream was surveyed it was very clear and looked to have good water quality.

A short distance above and below the outfall (75 yds. total) was surveyed with a backpack fish shocker (Map #1). Since the lagoons are operated as a fill and draw, no discharge was occurring on the day of the survey. The survey was conducted in May 1990 (Table II). Eleven species of fish were present and most were in good numbers. They ranged from intolerant to very tolerant. Due to the overhanging vegetation and other cover present a good population of forage fish were present in the stream. Species ranged from darters and dace to fatheads, creek chubs, white suckers, and green sunfish.

A macroinvertebrate sample was also taken on May 4, 1990 approximately 60' upstream of the outfall (Table III). According to the HBI data the site was considered to have "very good water quality" with a value of 4.22. The site had a good diversity of macroinvertebrates and was dominated by Gammarus pseudolimnaeus (25%), Ceratopsyche slossonae (28%), Optioservus sp. (10%), Diamesa sp. (10%), and Optioservus fastiditus (7%). The combination of the fishery and the macroinvertebrates revealed that the tributary has a pretty diverse aquatic community.

#### WWTP

Appendix II contains the DMR monthly averages for BOD and TSS from January 1989 to December 1989. This data would indicate that the facility has been bumping up against their TSS permit limit of 60 mg/l.



Map #1  
Tributary to Narrows Creek  
Fish and Macroinvertebrate  
sampling sites

Tributary to Narrows Creek  
5/4/90  
Fish and Macroinvertebrate  
sampling area

Thieman Hill

R E E D S B U R G

County Home

Sew Disp Ponds

Creek

PINE BLUFF RD

THIEMAN HILL

VALLEY DRIVE

VALLEY VIEW ROAD

PRAIRIE VIEW ROAD

ROAD

OPEN VIEW

Gravel Pit

Quarry

Cem

BM 930

154

ROCK SPRINGS 6 MI

## CLASSIFICATION

Based on this review of available physical and biological data the limited forage fish community (E) section of the tributary to Narrows Creek should be upgraded to a warm water forage fish community (D). The macroinvertebrate survey revealed a good diversity of arthropods and very good water quality. The fish survey resulted in finding eleven species, some in good numbers along with several intolerant species. Improvements in water quality will continue the improvement in the macroinvertebrate and fish community. Due to stream flow and habitat limitations it is not expected that this section of the tributary would support a good solid warm water sport fishery. But it is felt that a good forage fish population can be maintained.

Narrows Creek below the juncture should remain classified as a warm water sport fish community (C).

TABLE: II List of fish for sampling site: Upstream and Downstream of WWTP Outfall (75 yds. total)

DATE: 5/04/90 TwN 12N Rng 4E Sec 34 1/4 1/4 SW NW STREAM: Tributary of Narrows Creek

Station mileage: 0.75 County: 57

SOURCE OF DATA: WRM GEAR: 3 EFFORT: 015

CODE	COMMON NAME	FAMILY	GENUS/SPECIES	# FISH	TOLERANCE LEVEL
K01	CENTRAL MUDMINNOW	UMBRIDAE	Umbra limi	8	Very Tolerant
M14	BRASSY MINNOW	CYPRINIDAE	Hybognathus hankinsoni	11	
M28	COMMON SHINER	CYPRINIDAE	Notropis cornutus	18	Tolerant
M43	SOUTHERN REDBELLY DACE	CYPRINIDAE	Phoxinus erythrogaster	6	Intolerant
M46	FATHEAD MINNOW	CYPRINIDAE	Pimephales promelas	1	Very Tolerant
M50	CREEK CHUB	CYPRINIDAE	Semotilus atromaculatus	99	Tolerant
N09	WHITE SUCKER	CATOSTOMIDAE	Catostomus commersoni	12	Tolerant
U01	BROOK STICKLEBACK	GASTEROSTEIDAE	Culaea inconstans	25	Tolerant
W05	GREEN SUNFISH	CENTRARCHIDAE	Lepomis cyanellus	28	Sport Fish
X10	FANTAIL DARTER	PERCIDAE	Etheostoma flabellare	6	Intolerant
X12	JOHNNY DARTER	PERCIDAE	Etheostoma nigrum	23	Tolerant

HBI \_ 4.220 Rep1 \_ 0.000 Rep2 \_ 0.000 Rep3 \_  
 Sample ID # \_ 900504-57-01 Waterbody Name \_ TRIBUTARY TO NARROWS CREEK  
 Water Temp (Celsius) \_ Dissolved Oxygen (mg/l) \_  
 Sample Location: SW NW S34 T12N R 4E Master Waterbody # \_  
 Project Name \_ TRIENNIAL STANDARDS Storet Station # \_  
 Ave. Stream Width (Ft.) at Site \_ 4.0 Ave. Stream Depth (Ft.) at Site \_ 0.2  
 Collector \_ SCHLESSER, R. Field # 01 Rep 1  
 Measured Velocity (fps) \_  
 Est. Velocity (fps) \_  
 Sorter \_ McMULLIN, R. Moderate (0.5-1.5)  
 Est % of sample sorted \_ 14  
 Taxonomist \_ DIMICK, J. Sampled Habitat  
 Location Description \_ 60' UPSTREAM OF LAGOON OUTFALL \_ 1. Riffle

Est. Time Spent Sampling (Min.) \_ 2\_

Sampling Device \_ 1. D Frame

Substrate at Site Location (%)

0.0 Bedrock	55.0 Rubble	5.0 Sand	0.0 Clay	0.0 Muck
0.0 Boulders	35.0 Gravel	5.0 Silt	0.0 Detritus	0.0 Debris/Veg

Substrate Sampled (%) (Same as above Yes)

0.0 Bedrock	0.0 Rubble	0.0 Sand	0.0 Clay	0.0 Muck
0.0 Boulders	0.0 Gravel	0.0 Silt	0.0 Detritus	0.0 Debris/Veg

Aquatic Vegetation 0 % of Total Stream Channel at Sampling Site  
 Observed Instream Water Quality Indicators (Perceived WQ \_ Good \_\_\_ )

	Not Present	Insig- nificant	Sig- nificant	Comments
Turbidity	1			
Chlorine or Toxic Scour	1			
Macrophytes	1			
Filamentous Algae	1			
Planktonic Algae	1			
Slimes	1			
Iron Bacteria	1			

Factors Which May Be Affecting Habitat Quality

Sludge Deposits	1
Silt and Sediment	2
Channel Ditching	
Down/Up Stream Impoundment	1
Low Flows	2
Wetlands	2

Pollutant Sources

Livestock Pasturing	3	
Barnyard Runoff	3	
Cropland Runoff	3	
Tile Drains	3	
Septic Systems	2	MAY BE SOME IN THE WATERSHED
Stream Bank Erosion	2	
Urban Runoff	1	
Construction Runoff	1	
Point Source (Specify Type)	1	
Other (Specify)		

***	TAXA	***	TAXONOMIC	TOL	ORGANISM	ORGANISM			
		SPECIES	KEY	VAL	ID	COUNT	REP1	REP2	REP3
			USED						
E	EMEROPTERA								
	BAETIDAE								
	BAETIS	**POOR SPECIMEN**	*1		02010115	1	0	0	0
	TRICHOPTERA								
	HYDROPSYCHIDAE								
	CHEUMATOPSYCHE		*1	5.00	04040100	10	0	0	0
	HYDROPSYCHE	**POOR SPECIMEN**	*1		04040219	1	0	0	0
	CERATOPSYCHE	SLOSSONAE	*2	4.00	04040706	48	0	0	0
		**POOR SPECIMEN**	*1		04040713	1	0	0	0
	LIMNEPHILIDAE								
	NEOPHYLAX		*1	3.00	04080900	5	0	0	0
	COLEOPTERA								
	ELMIDAE								
	OPTIOSERVUS		*1	4.00	07020500	18	0	0	0
		FASTIDITUS	*3	4.00	07020501	13	0	0	0
	STENELMIS	CRENATA	*4	5.00	07020601	1	0	0	0
	DIPTERA								
	CHIRONOMIDAE								
	CHAETOCLADIUS	SP.A	*4	5.00	08050503	1	0	0	0
	DIAMESA		*1	5.00	08051700	18	0	0	0
	MICROTENDIPES		*1	6.00	08053500	1	0	0	0
	ORTHOCLADIUS	SP.D	*4	5.00	08054004	1	0	0	0
	POLYPEDILUM	NR.CONVICTUM	*4	5.00	08055001	9	0	0	0
	AMPHIPODA								
	GAMMARIDAE								
	GAMMARUS	PSEUDOLIMNAEUS	*5	4.00	09010201	43	0	0	0
	OLIGOCHAETA								
	NAIDIDAE		*6		16020000	1	0	0	0
	HAFLOTAXOIDA		*7		16060000	1	0	0	0

\*\*\* TOTALS: \*\*\* 173

0  
0

\*\*\* BIOTIC INDEX: \*\*\* 4.220

#### Taxonomic Key Code References

- \*1 Hilsenhoff 1981
- \*2 Hilsenhoff 1981,86
- \*3 Hilsenhoff 1981,82
- \*4 Hilsenhoff 1981,85
- \*5 Holsinger 1972
- \*6 Klemm 1985
- \*7 Pennak 1978



Tributary to Narrows Creek

Downstream of STH. "23".



Tributary to Narrows Creek

Downstream of STH. "23".



Tributary to Narrows Creek

Upstream of outfall, Fish and Macroinvertebrate sampling area.

Sauk Co. Health Care Center  
WWTP lagoon, final cell.



Sauk Co. Health Care Center  
WWTP lagoon, final cell.



Sauk Co. Health Care Center  
WWTP, outfall structure.





Sauk Co. Health Care Center  
WWTP, outfall to stream.



Tributary to Narrows Creek

Juncture of outfall and  
stream.



Tributary to Narrows Creek

Juncture of outfall and  
stream, fish sampling area.

Tributary to Narrows Creek

Upstream of CTH. "CH"



Tributary to Narrows Creek

Upstream of CTH. "CH"



Tributary to Narrows Creek

Downstream of CTH. "CH".



APPENDIX I

Tributary to

Stream Narrows Cr. Reach Location Downstream of STH "23" Reach Score/Rating 144/Fair

County Sauk Date 5/4/90 Evaluator Roger Schlessler Classification WWFF (D)

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	
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. 16	Moderate frequency and size. Some "raw" spots. Erosion potential during high flow. 16	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	<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	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	
Avg. Depth Riffles and Runs	Cold >1'	0 6" to 1'	6 3" to 6"	18 <3"	24
	Warm >1.5'	0 10" to 1.5'	6 6" to 10"	18 <6"	24
Avg. Depth of Pools	Cold >4'	0 3' to 4'	6 2' to 3'	18 <2'	24
	Warm >5'	0 4' to 5'	6 3' to 4'	18 <3'	24
Flow, at Rep. Low Flow	Cold >2 cfs	0 1-2 cfs	6 .5-1 cfs	18 <.5 cfs	24
	Warm >5 cfs	0 2-5 cfs	6 1-2 cfs	18 <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. 10	>25. Essentially a straight stream. Generally all flat water or shallow riffle. Poor habitat. 20	
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:	<u>6</u>	<u>60</u>	<u>78</u>	<u>0</u>	

Column Scores E 6 +G 60 +F 78 +P 0 = 144 = Score

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

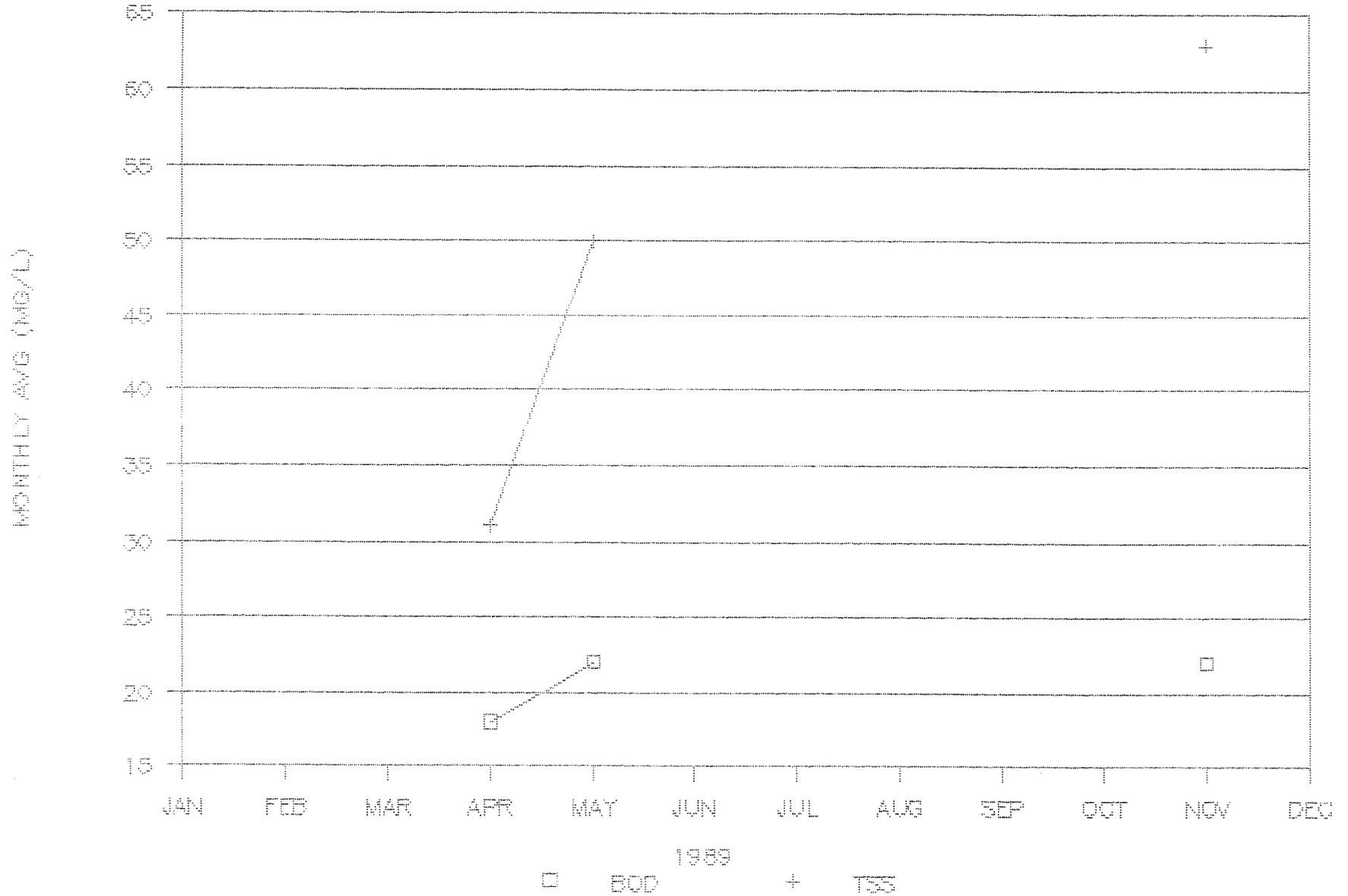
APPENDIX II

SAUK COUNTY HEALTH CARE CENTER  
FILL AND DRAW EFFLUENT QUALITY 1989

	FLOW (MGD)	BOD (MG/L)	TSS (MG/L)
JAN	NA	NA	NA
FEB	NA	NA	NA
MAR	NA	NA	NA
APR	0.1520	18	31
MAY	0.2215	22	50
JUN	NA	NA	NA
JUL	NA	NA	NA
AUG	NA	NA	NA
SEP	NA	NA	NA
OCT	NA	NA	NA
NOV	0.1595	22	63
DEC	NA	NA	NA

# SAUK COUNTY HEALTH CARE CENTER

## FILL & DRAW EFFLUENT QUALITY



APPENDIX III

Sauk County Health Care Center  
Sauk County

October 20, 1976  
Narrows Creek Tributary

Sauk County Health Care Center discharges into Narrows Creek Tributary. It has a gravel rubble-bottom in its headwaters but is heavily silted in its lower reaches because of erosion. It is a spring and seepage fed stream which has a limited fishery due to low flow. It enters Narrows Creek northeast of Loganville.

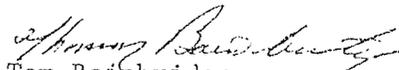
Recommendations

From the Sauk County Health Care Center discharge downstream to the juncture with Narrows Creek the classification should be noncontinuous surface waters not supporting a balanced aquatic community. From this point and for the remainder of Narrows Creek the classification should be continuous fish and aquatic life.

The above recommendations represent a concurrence of opinion of the stream classification team who are as follows:

George Osipoff, District Engineer  
Gene Van Dyck, Area Fish Manager  
Tom Bainbridge, District Biologist  
Roger Schlessler, Natural Resources Technician

Respectfully submitted,

  
Tom Bainbridge  
Stream Classification Coordinator

TB:cb

APPENDIX IV

B. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

During the period beginning on the effective date of this permit and lasting until June 30, 1992, the permittee is authorized to discharge from outfall serial number 001.

Samples taken in compliance with the monitoring requirements specified below shall be taken at the discharge from the holding pond.

There shall be no discharge of visible or floating solids in other than trace amounts.

During any 30 consecutive days, the average effluent concentrations of BOD<sub>5</sub> and of total suspended solids shall not exceed 15% of the average influent concentrations, respectively.

EFFLUENT PARAMETERS	EFFLUENT LIMITATIONS					MONITORING REQUIREMENTS	
	Quantity—kg/day(lbs/day)		Other Limitations (Specify Units)			Sample Frequency	Sample Type
	Average	Maximum	Minimum	Average	Maximum		
FLOW	—	—	—	—	0.250 MGD	Daily	Total Daily
BOD <sub>5</sub> (Monthly)	28.6(63.0) <sup>1</sup>	—	—	30 mg/l	—	3x Weekly <sup>2</sup>	Grab
BOD <sub>5</sub> (Weekly)	42.8(94.6) <sup>1</sup>	—	—	45 mg/l	—	3x Weekly <sup>2</sup>	Grab
SUSPENDED SOLIDS (Monthly)	55.2(126) <sup>1</sup>	—	—	60 mg/l	—	3x Weekly <sup>2</sup>	Grab
SUSPENDED SOLIDS (Weekly)	55.2(126) <sup>1</sup>	—	—	60 mg/l	—	3x Weekly <sup>2</sup>	Grab
pH (Daily)	—	—	6.0 s.u.	—	9.0 s.u.	Daily <sup>2</sup>	Grab
DISSOLVED OXYGEN (Daily)	—	—	4.0 mg/l	—	—	3x Weekly <sup>2</sup>	Grab

1. Based on a discharge rate of 0.250 over a 30-day period.
2. The permittee shall notify the Department District Office at least 7 days prior to an anticipated discharge. The pond contents shall be sampled prior to any discharge to assure that adequate stabilization has taken place. Monitoring frequency shall be 3x weekly during discharge, grab sample type. For a discharge of less than one week duration, 3 samples shall be taken, grab sample type.

APPENDIX V

Chapter NR 104

INTRASTATE WATERS — USES AND  
DESIGNATED STANDARDS

NR 104.01	General (p. 33)	NR 104.07	Variances and additions applicable in the Lake Michigan district (p. 44)
NR 104.02	Surface water classifications and effluent limitations (p. 34)	NR 104.08	Variances and additions applicable in the north central district (p. 48)
NR 104.03	Classification of surface waters and antidegradation (p. 37)	NR 104.09	Variances and additions applicable in the west central district (p. 49)
NR 104.04	Provision for changes (p. 38)	NR 104.10	Variances and additions applicable in the northwest district (p. 52)
NR 104.05	Variances and additions applicable in the southern district (p. 38)		
NR 104.06	Variances and additions applicable in the southeast district (p. 41)		

Note: Chapter NR 104 as it existed on September 30, 1976 was repealed and a new chapter NR 104 was created effective October 1, 1976.

NR 104.01 General. (1) "It is . . . the goal of the state of Wisconsin that, wherever attainable, an interim goal of water quality which provides for the protection and propagation of fish, shellfish and wildlife and provides for recreation in and on the water be achieved by 1983. . ." s. 147.01(1)(b), Stats. The long-range goal of Wisconsin water quality standards is, therefore, to permit the use of water resources for all lawful purposes. Surface waters which because of natural conditions are not conducive to the establishment and support of the complete heirarchy of aquatic organisms shall not be degraded below present levels, but shall be upgraded as necessary to support assigned uses. Most surface waters within the state of Wisconsin already meet or exceed the goals specified above. However, certain waters of the state may not meet these goals for the following reasons:

- (a) The presence of inplace pollutants,
- (b) Low natural streamflow,
- (c) Natural background conditions, and
- (d) Irretrievable cultural alterations.

(1m) Where it is determined that one or more of these factors may interfere with the attainment of the statutory objectives, a variance from the criteria necessary to achieve those objectives is provided.

(2) Surface waters within the boundaries of the state shall meet the standards for fish and aquatic life and recreational use with the variances and additions listed below in ss. NR 104.05 to 104.10. A system is provided within which small streams and other surface waters which cannot support high quality uses are granted a variance from the high quality criteria.

(3) Effluent limitations specified in this chapter shall be achieved by industrial, private and municipal dischargers by July 1, 1983 unless an earlier date is otherwise provided in a permit issued under s. 147.02, Stats. Municipal dischargers eligible for state or federal grant-in-aid

shall achieve the specified effluent limitations upon completion of construction or modification of facilities approved by the department of natural resources subsequent to adoption of this chapter unless otherwise provided in a permit issued under s. 147.02, Stats.

History: Cr. Register, September, 1976, No. 249, eff. 10-1-76; am. (1), Register, December, 1977, No. 264, eff. 1-1-78.

NR 104.02 Surface water classifications and effluent limitations. (1) HYDROLOGIC CLASSIFICATION. "Surface waters" as defined in s. NR 102.01(7), may be classified according to their hydraulic or hydrologic characteristics. For purposes of this chapter, surface waters will be classified by the department into one of the following categories:

(a) *Lakes or flowages*. This classification includes bodies of water whose current is more or less stagnant or which lacks a unidirectional current.

(b) *Diffused surface waters*. This classification includes any water from rains, intermittent springs or melting snow which flows on the land surface, through ravines, etc., which are usually dry except in times of runoff. This category does not include waters at the land surface in the vicinity of agricultural or wastewater irrigation disposal systems.

(c) *Wellands*. This classification includes areas where water is at, near, or above the land surface long enough to be capable of supporting aquatic or hydrophytic vegetation and which have soils indicative of wet conditions.

(d) *Wastewater effluent channels*. This classification includes discharge conveyances constructed primarily for the purpose of transporting wastes from a facility to a point of discharge. Drainage ditches (including those established under ch. 88, Stats.) constructed primarily for the purposes of relieving excess waters on agricultural lands shall not be construed as effluent channels. Modifications made to natural watercourses receiving wastewater effluents for the purpose of increasing or enhancing the natural flow characteristics of the stream shall not be classified as effluent channels.

(e) *Noncontinuous streams*. This classification includes watercourses which have a defined stream channel, but have a natural 7-day  $Q_{\cong}$  flow of less than 0.1 cfs and do not exhibit characteristics of being perpetually wet without wastewater discharges.

(f) *Continuous streams*. This classification includes watercourses which have a natural 7-day  $Q_{\cong}$  flow of greater than 0.1 cfs or which exhibit characteristics of a perpetually wet environment, are generally capable of supporting a diverse aquatic biota and flow in a defined stream channel.

Note: The application of this classification system is not dependent on the the navigability properties of the watercourse, but is dependent upon the quantity-quality relationships of the surface water.

(2) WATER QUALITY CLASSIFICATION. (a) Whenever the goals as specified in s. 147.01(1)(b), Stats., cannot be attained because of conditions enumerated in s. NR 104.01(1), a variance may provided. Variances from a specific water quality criteria may be given in s. NR 104.05 et. seq. or a variance under one of the categories provided in this chapter may be specified.

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(b) Practices attributable to municipal, industrial, commercial, domestic, agricultural, land development, or other activities shall be controlled so that waters regardless of their hydrologic and water quality classifications meet the general aesthetic and acute toxicity conditions in s. NR 102.02(1).

(3) VARIANCE CATEGORIES. (a) Surface waters not supporting a balanced aquatic community (intermediate aquatic life):

1. Applicability. This category of variance may be applied to either the continuous or noncontinuous stream hydrologic classification.

2. Surface water criteria. The following water quality criteria shall be met in all surface waters included in this variance category:

a. Dissolved oxygen shall not be less than 3 mg/l.

b. Ammonia nitrogen (as N) at all points in the receiving water shall not be greater than 3 mg/l during warm temperature conditions nor greater than 6 mg/l during cold temperatures to minimize the zone of toxicity and to reduce dissolved oxygen depletion caused by oxidation of the ammonia.

c. The pH shall be within the range of 6.0 to 9.0.

d. Other substances may not exceed concentrations determined in accordance with s. NR 102.02(1).

3. Effluent criteria. a. The effluent limitations determined necessary to meet the surface water criteria listed above are enumerated in table 1.

Parameter	Monthly Average (mg/l)	Daily Maximum (mg/ l)	Weekly Average (mg/l)	Other (mg/l)
BOD <sub>5</sub>	15	30	-	-
Total Suspended Solids	20	30	-	-
NH <sub>3</sub> -N (May-October)	-	-	3	-
NH <sub>3</sub> -N (November-April)	-	-	6	-
Dissolved Oxygen	-	-	-	4 (minimum)

b. Unless otherwise specified in table 1 above, effluent limitations for sewage treatment works shall be as adopted in ch. NR 210.

c. In addition to the effluent limitations enumerated in table 1 above, effluent limitations for these and any other substance necessary to protect assigned uses shall be met.

(b) Marginal surface waters: 1. Applicability. This variance category may be applied to the continuous or noncontinuous stream hydrologic classification, except that it shall be applied to all surface waters classified as effluent channel, wetland or diffuse surface water.

2. Surface water criteria. The following surface water quality criteria shall be met in all surface waters included in this variance category:

a. Dissolved oxygen shall not be less than 1 mg/l.

b. The pH shall be within the range of 6.0 to 9.0.

c. Other substances may not exceed concentrations determined in accordance with s. NR 102.02(1).

3. Effluent criteria. a. The effluent limitations determined necessary to meet the surface water criteria listed above are enumerated in table 2.

Parameter	Monthly Average (mg/	Weekly Average (mg/	Other (mg/l)
	1)	1)	
BOD <sub>5</sub>	20	30	-
Total Suspended Solids	20	30	-
Dissolved Oxygen	-	-	4 (minimum)

b. Unless otherwise specified in table 2 above, effluent limitations for sewage treatment works shall be as adopted in ch. NR 210.

c. In addition to the effluent limitations enumerated in table 2 above, effluent limitations for these and any other substance necessary to protect assigned uses shall be met.

(4) OTHER CLASSIFICATIONS AND EFFLUENT CRITERIA. (a) *Surface waters significant to the environmental integrity of the state or region.* Under all hydrologic categories, the department reserves the right to require other effluent limitations, including allocation of wasteloads for organic material, toxicants and chlorine residuals if it is determined that the specified surface water is important to the overall environmental integrity of the area. In waters identified as trout streams, located in scientific areas or wild and scenic areas, providing endangered species habitat or of high recreational potential, effluent criteria will be evaluated on a case-by-case basis.

(b) *Surface waters classified for fish and aquatic life.* 1. Streams. Where flowing streams or rivers are specified to achieve fish and aquatic life criteria, wasteload allocation for organic material, toxicants and chlorine residuals shall determine effluent criteria necessary to achieve that standard.

2. Lakes and flowages. Effluent characteristics for discharges to lakes or flowages shall be based upon an evaluation of water quality necessary to protect fish and aquatic life taking into account mixing zone and nutrient removal criteria.

3. Minimum effluent criteria. If it can be reasonably demonstrated that the quality of the surface water is independent of a wastewater discharge, effluent limitations established under ss. 147.04 and 147.06, Stats., shall apply.

(c) *Wastewater treatment lagoons.* Effluents from fill-and-draw wastewater treatment lagoons or domestic waste stabilization ponds discharging to waters receiving a variance in this chapter may be permitted to vary from the limitations specified in table 1 or 2 provided the following conditions are met:

1. The discharge occurs only during the spring and fall of the year when the flow in the receiving water is normally high, and the temperature is low. The rate of discharge shall not exceed that specified in a permit under s. 147.02, Stats., or where no rate is indicated, the allowable discharge quantities shall be determined by the department based upon current evaluation of the receiving water.

2. In lieu of the previous conditions, the discharge from a fill-and-draw lagoon may occur at any time provided the rate does not exceed the assimilative capacity of the receiving water as specified in a permit under s. 147.02, Stats.

3. The dissolved oxygen in the effluent is maintained at a level greater than or equal to 4 mg/l, and the permitted rate of discharge shall be such that the dissolved oxygen and ammonia nitrogen criteria necessary to sustain fish and aquatic life are maintained in the stream during the period of discharge.

4. The effluent limitations do not exceed those established under ss. 147.04 and 147.06, Stats.

(5) CHANGES IN CLASSIFICATION. Surface waters which exhibit changing hydrologic and quality characteristics shall be classified accordingly. Effluent criteria for upstream discharges shall be based upon the most critical downstream classification and shall be specified by the department either on the basis of justified inference or by the application of a wasteload allocation analysis. Any subsequent changes in a stream's morphology or potential may necessitate the reevaluation of the classification.

History: Cr. Register, September, 1976, No. 249, eff. 10-1-76; am. Tables 1 and 2, (2), (3) (a) 2a and d, (3) (b) 2a and c, (4) (c), Register, December, 1977, No. 264, eff. 1-1-78; am. (3) (a) 2a, Register, June, 1978, No. 270, eff. 7-1-78; am. (1) (c), Register, June, 1984, No. 342, eff. 2-1-84; r. (3) (a) 2. b. to d., (b) 2. b. and c., renum. (3) (a) 2. e. to g. and (3) (b) 2. d. and e. to be (3) (a) 2. b. to d. and (3) (b) 2. b. and c. and am (3) (a) 2. g. and (3) (b) 2. c., am. (3) (a) 3. a. and (3) (b) 3. a., Register, October, 1986, No. 370, eff. 11-1-86.

NR 104.03 Classification of surface waters and antidegradation. In no case shall the effluent criteria specified herein cause degradation of surface water quality below present levels. Surface waters which, because of their hydrologic classification, are permitted to receive a new effluent of a quality specified in NR 104.02 shall not receive such effluent unless it has been affirmatively demonstrated to the department that such degradation is necessary to protect the public health or to maintain or restore the environmental integrity of a higher value resource. In no case shall a new effluent interfere with or become injurious to any assigned uses made of or presently possible in any surface water.

History: Cr. Register, September, 1976, No. 249, eff. 10-1-76; am. Register, December, 1977, No. 264, eff. 1-1-78.

NR 104.04 Provision for changes. The surface waters specified in this chapter are not intended to be an exclusive listing nor do the specified effluent criteria purport to meet the 1983 water quality goals set forth in ch. 147, Stats. Additions to or deletions from these listings may be made based upon the accumulation of information necessary to make such determination and in accordance with the requirements of ch. 227, Stats.

History: Cr. Register, September, 1976, No. 249, eff. 10-1-76.

NR 104.05 Variances and additions applicable in the southern district. Subject to the provision of NR 104.04, intrastate surface waters in the southern district counties of Columbia, Dane, Dodge, Grant, Green, Iowa, Jefferson, Lafayette, Richland, Rock and Sauk shall meet the criteria for fish and aquatic life and recreational use with exceptions and additions as follows:

Register, October, 1986, No. 370

(1) ADDITION. The public water supply standard shall be met on the Wisconsin river in section 8, township 10 north, range 7 east.

(2) VARIANCE. Surface waters in the southern district subject to a variance under NR 104.02(3) are listed in table 3.

TABLE 3  
SOUTHERN DISTRICT

Surface Water (Facility Affected)	Reach Description	Hydrologic Classification	Applicable Criteria (1)	Effluent Limitations (2) Effluent limitations to be determined
1. Goose Lake Tributary (Arlington)	Tributary upstream from Goose Lake	Noncontinuous	II	B
2. Tributary - East Branch Pecatonica River (Barneveld)	From the Barneveld STP downstream to the East Branch Pecatonica River	Noncontinuous	II	B
3. Williams Creek (Blue Mounds)	From the Blue Mounds STP downstream to the east line of Sec. 14, T6N, R5E	Noncontinuous	I	A
4. Sanders Creek (Boscobel)	From the Boscobel STP downstream to the Wisconsin River	Continuous	I	A
5. Allen Creek (Brooklyn)	Upstream from Butts Corner Road	Continuous	I	A
6. Kummel Creek (Brownsville)	From Brownsville STP downstream to CTH "HH"	Noncontinuous	I	A
7. Spring Brook and Tributary (Clinton)	Tributary from the Clinton STP to Spring Brook	Effluent ditch	II	B
8. Tributary - Dead Creek (Clyman)	Spring Brook in Clinton Township	Continuous	II	NA
9. West Branch Pecatonica River (Cobb)	Tributary from Clyman STP downstream to Dead Creek	Noncontinuous	II	B
	From the Cobb STP downstream to confluence with an unnamed tributary NE¼, NW¼, Sec. 2, T5N, R1E.	Continuous	I	A
10. Door Creek (Cottage Grove)	Door Creek upstream from STH 12 & 18	Noncontinuous	I	A
	From STH 12 & 18 downstream to Lake Kegonsa	Continuous	I	NA
11. Coon Branch (Cuba City)	Upstream from westerly tributary approximately 1 mile above STH "11"	Noncontinuous	II	B
	Downstream from above tributary to confluence with Galena River	Continuous	I	NA
12. Mud Creek and Tributary (Deerfield)	Tributary from Deerfield STP to confluence with Mud Creek	Effluent ditch	II	B
	Mud Creek from above tributary downstream to confluence with Koshkonong Creek	Continuous	I	

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13. Indian Creek and Tributary (Dickeyville)	Tributary from Dickeyville STP to confluence with Indian Creek	Noncontinuous	II	NA
	Indian Creek from above tributary downstream to confluence with Platte River	Continuous	I	A
14. Dodge Branch (Dodgeville)	Upstream from a point approximately 3,500 feet downstream from STH "191"	Noncontinuous	I	A
15. Tributary - North Branch Crawfish River (Fall River)	Tributary from the Fall River STP downstream to the North Branch Crawfish River	Noncontinuous	II	Effluent limitations to be determined
16. Gregory Branch (Pennimore)	Upstream from STH "61"	Continuous	I	A
17. Tributary - Rock River (Hidden Meadows Mobile Home Park)	Tributary from the Hidden Meadows Mobile Park STP discharge downstream to the Rock River	Noncontinuous	II	B
18. Big Spring Branch (Highland)	Upstream from the North line of Sec. 19, T7N, R1E	Noncontinuous	I	A
19. Pedler Creek (Iowa Co. Nursing Home)	From the Iowa Co. Nursing Home STP downstream to the confluence with an unnamed tributary, SE $\frac{1}{4}$ , SE $\frac{1}{4}$ , Sec. 34, T6N, R2E	Noncontinuous	I	A
20. Tributary - Wildcat Creek (Iron Ridge)	From the Iron Ridge STP downstream to Wildcat Creek	Noncontinuous	II	B
21. Tributary & Rock River Tributary (Ixonian San. Dist.)	From the Ixonian San. Dist. STP downstream to the juncture with the Rock River Tributary	Noncontinuous	II	B
	Rock River Tributary from above tributary to confluence with Rock River	Continuous	II	NA
22. Tributary - Menominee River (Jamestown San. Dist. #2)	From Jamestown San. Dist. #2 STP to the Menominee River	Diffused surface water	II	B
23. Dead Creek (Juneau)	Upstream from CTH "M"	Effluent ditch	II	B
	From CHT "M" to St. Helena Rd.	Continuous	I	NA
24. Sinnipee Creek (Kieler San. Dist. #1)	From Kieler lagoon outfall to Bluff Road	Continuous	I	A
25. Rock Creek (Lake Mills)	From the Lake Mills STP downstream to CTH "V"	Noncontinuous	I	A
	From CTH "V" to Harper's Mill Pond	Continuous	I	NA
26. Tributary - Pigeon Creek (Lancaster)	Tributary from Lancaster STP downstream to south line of section 10	Continuous	II	Effluent limitations to be determined
	Tributary from above point downstream to confluence with Pigeon Creek	Continuous	I	
27. Tributary - Baker Creek (Lebanon San. Dist.)	From Lebanon STP downstream to Baker Creek	Noncontinuous	II	B
28. Little Platte River (Livingston)	From Livingston STP downstream to New California Road	Noncontinuous	I	A
29. Tributary-East Branch Rock River (Lomira)	Tributary upstream from confluence with East Branch Rock River.	Noncontinuous	I	A
30. (Madison Metro Sewerage Commission)	From the STP outfall aerator to the Oregon Branch	Effluent ditch	II	Effluent limitations to be determined

31. Brewery (Furnance) Creek (Mineral Point)	Brewery Creek upstream from confluence with Mineral Point Branch	Continuous	II	B (Note: the above limitation shall remain in effect until significant nonpoint source problems can be corrected)
32. Tributary - Blue River (Montfort)	From the Montfort STP downstream to the Blue River	Continuous	I	A
33. Little Grant River (Mount Hope)	From the Mt. Hope STP downstream to the west boundary of Sec. 10, T5N, R4W	Noncontinuous	I	A
34. West Branch Sugar River (Mt. Horeb)	From Mt. Horeb STP downstream to CTH "JG".	Continuous	I	A
35. Tributary - Austin Branch (Orchard Manor)	Drainage from Orchard Manor outfall to Austin Branch	Diffused surface waters	II	Effluent limitations to be determined
36. Oregon Branch - Badfish Creek (Oregon)	From the Oregon outfall downstream to juncture with the Madison Met effluent ditch	Noncontinuous	II	Effluent limitations to be determined
	From this point downstream to CTH "A"	Continuous	I	
37. Swan Creek and Tributary (Orfordville)	Tributary from Orfordville STP outfall to Swan Creek.	Effluent ditch	II	NA
	Swan Creek from confluence with above tributary to Dicky Road.	Noncontinuous	I	A
38. Tributary - Blake Fork (Patch Grove)	Tributary from the Patch Grove STP downstream to Blake Fork	Noncontinuous	I	A
39. Tributary - Honey Creek (Plain)	From the Plain STP downstream to Honey Creek	Continuous	I	Effluent limitations to be determined
40. Randolph Branch - Tributary	From the Randolph STP downstream to Beaver Creek Tributary	Noncontinuous	II	Effluent limitations to be determined
Beaver Creek (Randolph)	Tributary to Beaver Creek upstream from Beaver Creek	Noncontinuous	I	A
41. Tributary-Beaver Dam River (Reeseville)	Tributary from Reeseville STP to confluence with Beaver Dam River	Noncontinuous	I	A
42. Conley - Smith Creek (Ridgeway)	From the Ridgeway STP downstream to the south boundary of Sec. 14, T6N, R4E	Noncontinuous	I	Effluent limitations to be determined
43. Tributary - Rocky Run Creek (Rio)	From the Rio STP downstream to Rocky Run Creek	Noncontinuous	II	B
44. Tributary - Narrows Creek (Sauk Co. Health Care Center)	From the Sauk County Health Care Center STP downstream to Narrows Creek	Noncontinuous	I	A
45. Duck Creek and Tributary (Sullivan)	Tributary from the Sullivan STP to Duck Creek	Effluent channel	II	Effluent limitations to be determined
	Duck Creek from the effluent ditch downstream juncture with northerly drainage ditch in Sec. 5, T6N, R16E	Noncontinuous	I	
46. Koshkonong Creek (Sun Prairie)	Koshkonong Creek upstream from first bridge above Sun Prairie STP	Noncontinuous	II	Effluent limitations to be determined
	Koshkonong Creek from above location to CTH "T".	Continuous	II	
47. Badger Mill Creek (Verona)	Badger Mill Creek from road at Verona STP downstream to STH "69".	Continuous	I	A

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48. Tributary - Murphy Creek (Wisconsin Department of Health & Social Services - Oakwood State Camp) Tributary from Oakwood State Camp STP downstream to Murphy Creek Noncontinuous II B

- (1) Criteria I requires the maintenance of surface water criteria specified in NR 104.02(3)(a)2.  
Criteria II requires the maintenance of surface water criteria specified in NR 104.02(3)(b)2.  
(2) Effluent limitation A requires those limits specified in NR 104.02(3)(a)3.  
Effluent limitation B requires those limits specified in NR 104.02(3)(b)3.  
NA—Not applicable

History: Cr. Register, September, 1976, No. 249, eff. 10-1-76; am. table 3, r. (3), Register, December, 1977, No. 264, eff. 1-1-78.

NR 104.06 Variances and additions applicable in the southeast district. Subject to the provisions of NR 104.04, intrastate surface waters in the southeast district counties of Kenosha, Milwaukee, Ozaukee, Racine, Walworth, Washington and Waukesha shall meet the criteria for fish and aquatic life and recreational use with exceptions and additions as follows.

(1) VARIANCE. Surface waters in the southeast district subject to a variance under NR 104.02(3) are listed in table 4.

(2) OTHER VARIANCES. (a) The following surface waters in the southeast district shall meet the standards for fish and aquatic life except that the dissolved oxygen shall not be lowered to less than 2 mg/l at any time, nor shall the membrane filter fecal coliform count exceed 1,000 per 100 ml as a monthly geometric mean based on not less than 5 samples per month nor exceed 2,000 per 100 ml in more than 10% of all samples during any month:

1. Underwood creek in Milwaukee and Waukesha counties below Ju-neau boulevard.
2. Barnes creek in Kenosha county.
3. Pike creek, a tributary of Pike river, in Kenosha county.
4. Pike river in Racine county.
5. Indian creek in Milwaukee county.
6. Honey creek in Milwaukee county.
7. Menomonee river in Milwaukee county below the confluence with Honey creek.
8. Kinnickinnic river in Milwaukee county.
9. Lincoln creek in Milwaukee county.

(b) The following surface waters in the southeast district shall meet the standards for fish and aquatic life except that the dissolved oxygen shall not be lowered to less than 2 mg/l at any time, nor shall the membrane filter fecal coliform count exceed 1,000 per 100 ml as a monthly geometric mean based on not less than 5 samples per month nor exceed 89DF at any time at the edge of the mixing zones established by the department under s. NR 102.03 (4):

Sauk County Health Care Center  
Sauk County

October 20, 1976  
Narrows Creek Tributary

Sauk County Health Care Center discharges into Narrows Creek Tributary. It has a gravel rubble-bottom in its headwaters but is heavily silted in its lower reaches because of erosion. It is a spring and seepage fed stream which has a limited fishery due to low flow. It enters Narrows Creek northeast of Loganville.

Recommendations

From the Sauk County Health Care Center discharge downstream to the juncture with Narrows Creek the classification should be noncontinuous surface waters not supporting a balanced aquatic community. From this point and for the remainder of Narrows Creek the classification should be continuous fish and aquatic life.

The above recommendations represent a concurrence of opinion of the stream classification team who are as follows:

George Osipoff, District Engineer  
Gene Van Dyck, Area Fish Manager  
Tom Bainbridge, District Biologist  
Roger Schlessler, Natural Resources Technician

Respectfully submitted,

  
Tom Bainbridge

Stream Classification Coordinator

TB:cb

728

10'

TOWNSHIP 10 N

731

R. 1 E (REEDSBURG) REEDSBURG 6.8 MI.

735

5'

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737

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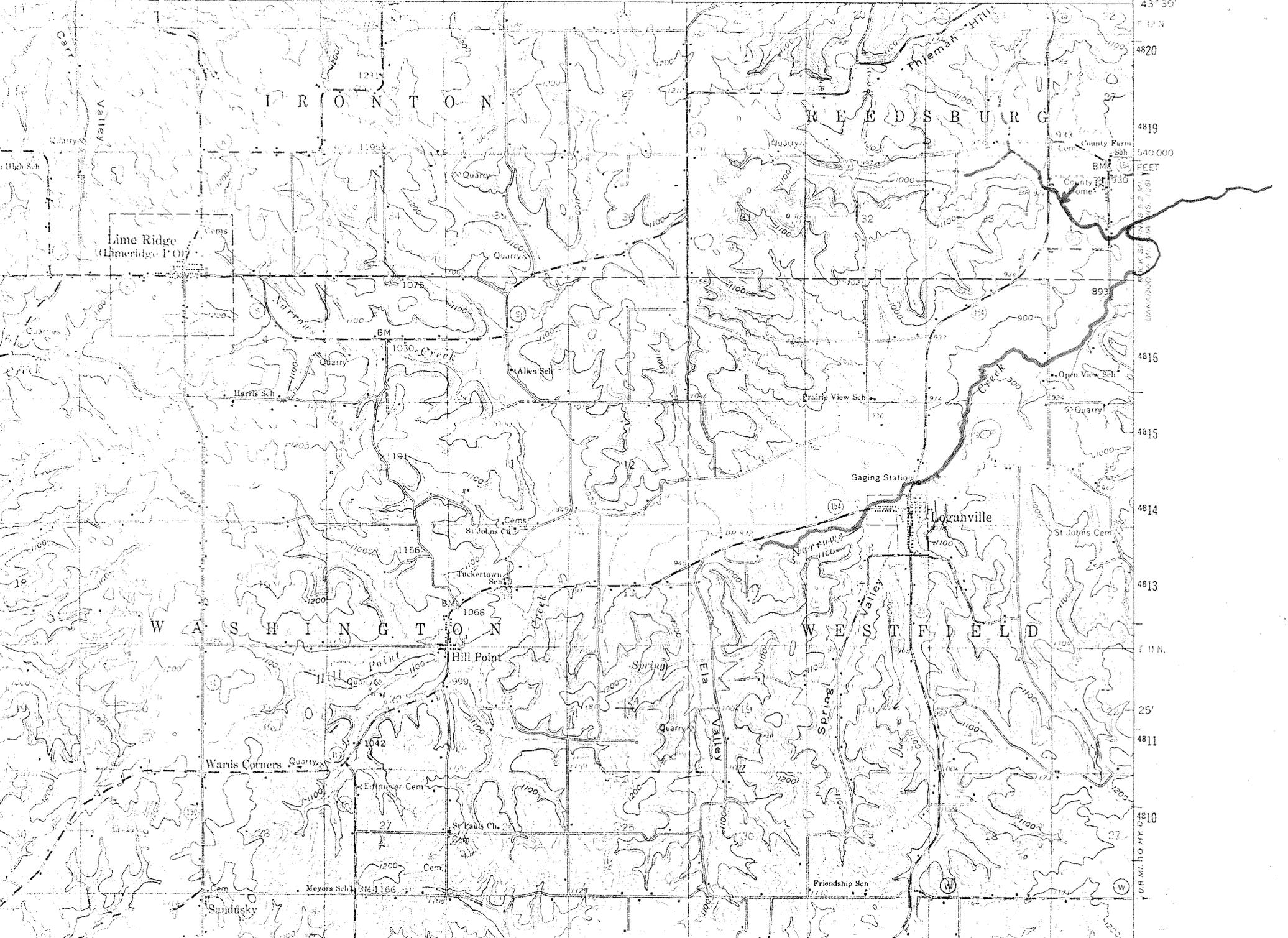
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90° 00'

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WISCONSIN

3071 III  
(REEDSBURG)

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY

STATE OF WISCONSIN

