

Date 12/13/2001

Facility Name TOWN OF BRISTOL

Receiving Water BRISTOL CREEK

Evaluated by LAUREN, WILLIAM

This stream classification is not included in the revised code because (select one):

☐ The discharger is no longer at this location.

☐ A new classification has resulted in a full fish and aquatic life designation.
New survey date _____ Please provide copy of new classification report.

☒ This receiving water should be added to the database and to the code. Specify information, as it should be included in code.

DELETE FROM NR 104 RE-CLASSIFIED AS WASTE

☐ Other (please explain)

CORRESPONDENCE/MEMORANDUM

State of Wisconsin
Department of Natural Resources

DATE: January 26, 1998

FILE REF: 3200

TO: Joe Ball WT/2
Greg Pilarski SER/Annex

FROM: Will Wawrzyn SER *WW*

SUBJECT: Stream Classification for Bristol Creek, Des Plaines River Watershed

Attached for your information and files is a copy of the Stream Classification report for Bristol Creek. The report recommends that **Bristol Creek be classified as a Warm Water Sport Fish Community**. If you have any questions, please call me at (414) 263-8699.

attachment

cc: Diane Figiel WT/2
Sharon Gayan SER

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WATER QUALITY STANDARDS REVIEW
AND STREAM CLASSIFICATION FOR
UNNAMED TRIBUTARY TO THE DES PLAINES RIVER
(BRISTOL CREEK) FOX RIVER BASIN
KENOSHA COUNTY, WISCONSIN
DECEMBER, 1997

by Will Wawrzyn, Southeast District

INTRODUCTION

A Stream Classification survey was completed for an unnamed tributary of the Des Plaines River (hereafter referred to as Bristol Creek) in Kenosha County.

BACKGROUND

Bristol Creek is located in the Des Plaines River Watershed - Fox River Basin in southeastern Kenosha County. The stream is formed by diffuse runoff, groundwater and wastewater discharges in T1N, R21E, S.8, NE, SW and T1N, R21E, S.5, SW, SE. From its sources it flows in an easterly direction for approximately 1.3 miles before its confluence with the Des Plaines River in T1N, R21E, S.9 NW, NE. It is a first order stream, has an average gradient of 30 ft/mi, and drains approximately 1.5 mi². Based on watershed soil conditions, a significant portion of the watershed was probably wetlands prior to settlement (USDA, 1970). Channelization of Bristol Creek and its tributaries and installation of other drainage practices (e.g. subsurface tiles) has transformed many of these wetlands to the dominant agricultural land uses present in the watershed today.

The Town of Bristol U.D. #1 POTW (STORET # 303020; WPDES # WI-0022021-5) discharges to the southern-most of the two headwater tributaries of Bristol Creek and approximately 0.8 miles upstream of the Des Plaines River. The Town of Bristol U.D. #1 POTW is an activated sludge plant consisting of headworks, grit removal, comminution, two equalization tanks, and aeration tank, two final clarifiers, effluent reaeration and two aerated sludge holding tanks. As of 1995, the facility had a year-2005 design flow of 0.48 mgd. The facility reported a 1993 and 1994 average flow of 0.52 mgd and 0.44 mgd, respectively (WDNR, 1995). There is no published $Q_{7,2}$ or $Q_{7,10}$ discharge information for Bristol Creek. However, the $Q_{7,2}$ and $Q_{7,10}$ discharge are probably < 0.10 ft³/sec upstream of the wastewater discharge. The reported $Q_{7,2}$ and $Q_{7,10}$ for the Des Plaines River 1200 ft. upstream of its confluence with Bristol Creek is 0.16 ft³/sec and < 0.1 ft³/sec, respectively (Hollstrom, 1992).

Bristol Creek was previously classified as a **Limited Aquatic Life Stream** (WDNR, 1976; WDNR, 1997a). These streams are considered capable of supporting only very tolerant macroinvertebrates or no aquatic life (Ball, 1982). The 1976 stream classification was completed prior to the development and use of the Wisconsin Stream Classification Guidelines (Ball, 1982). A Recreational Use Classification and Disinfection Determination was completed for Bristol Creek and the Town of Bristol U.D. #1 POTW in 1988 (Wakeman, 1988). Disinfection of the Town of Bristol U.D. #1 POTW effluent was not considered necessary because

it was felt that the stream was not capable of supporting full body contact types of recreational uses (Appendix 1).

Previous qualitative field observations suggest the presence of sport and forage fish in Bristol Creek and that existing physical habitat is capable of supporting a viable fish population. Field observations from a 1973 Low Flow Study (VDNR, 1973) note the presence of "bluegills, minnows, suckers" in Bristol Creek approximately 55 feet downstream of the former tile outfall at CTH D. Similarly, a 1978 variance study for Bristol Creek also noted "minnows observed at head of outfall" and "bullheads, minnows observed" at points 0.05 miles and 0.12 miles downstream of the former tile outfall at CTH D. Observations were also made regarding some of the physical habitat attributes of Bristol Creek. Although the stream was previously channelized, in-stream conditions indicate habitat suitable for a viable fish community. According to these historical field observations, Bristol Creek is dominated by run and riffles with lesser numbers of pools. Substrate is variable, ranging from clay hardpan, silt, sand and small gravel material. Stream widths ranged from 5 ft. to 8 ft. and water depths were reported to be in the range of 0.2 ft. to 2.7 ft. The stream is well shaded ranging from 50% to 100%. *These observations suggest that the previous Limited Aquatic Life classification for Bristol Creek may not be appropriate (VDNR, 1997b).*

METHODS

The stream classification for Bristol Creek is based on guidelines developed by Ball (1982). A fish community and habitat survey was completed on July 24, 1997. The fish community and habitat was surveyed along a 310 ft. reach of Bristol Creek (site # 1). The lower limits of this sample site began approximately 800 ft. upstream of the Bristol Creek - Des Plaines River confluence and immediately upstream of the Bristol Creek tributary from the north (see attached map).

A second fish sample site (site #2) was located immediately downstream of CTH D or approximately midway between the POTW discharge and the Des Plaines River. The sample length for site #2 was 45 ft. (This later sample was obtained for the benefit of a Town of Bristol wastewater/public works employee who observed Department staff conducting the survey.)

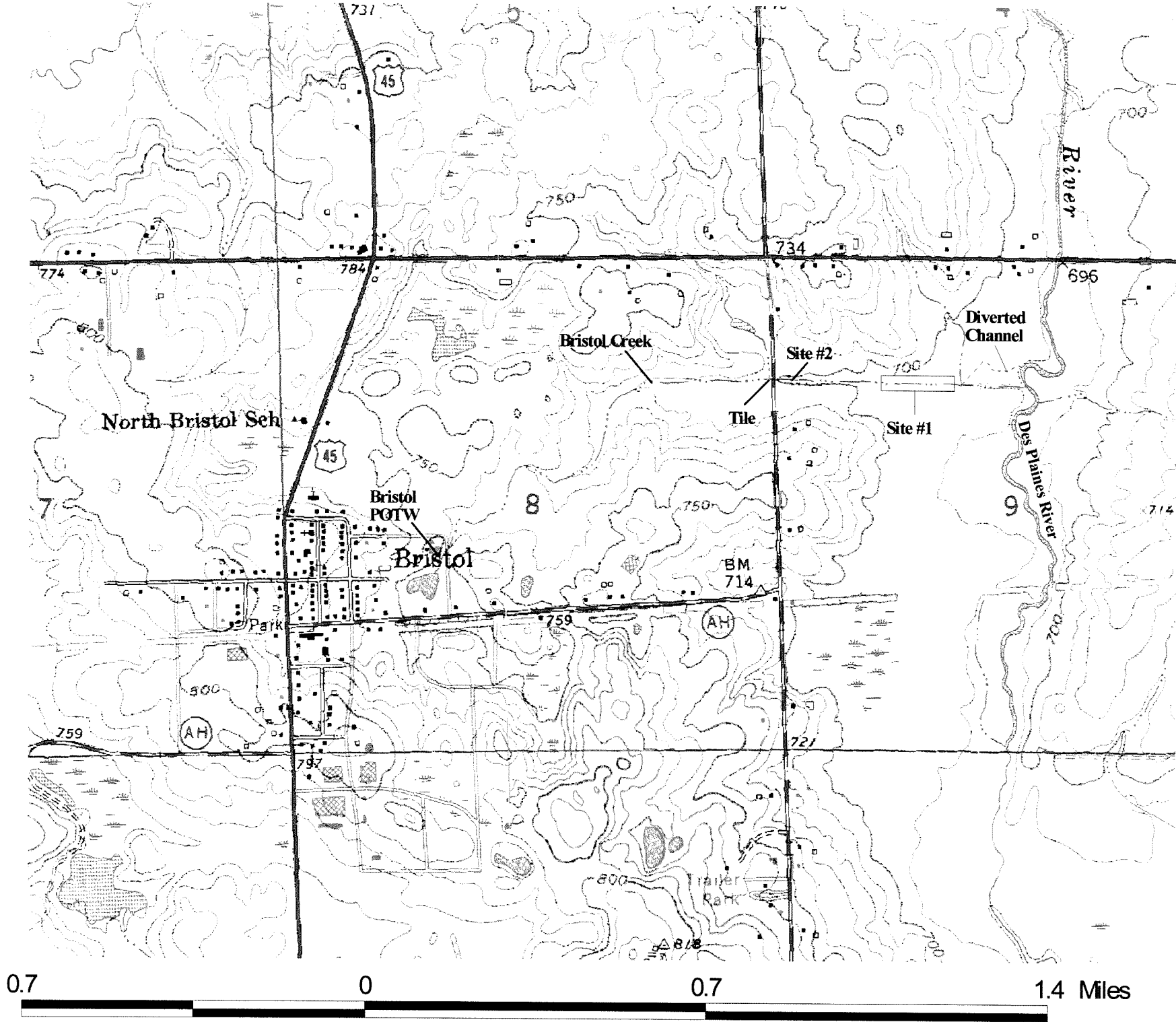
Fish community samples were obtained using a DC back pack shocker operating at 4.5 amps and 100 volts. Fish habitat attributes was evaluated according to methods modified from Simonson et al. (1994). Typical stream reach types and characteristics were photographed.

Instantaneous measurements of dissolved oxygen (mg/l), water temperature (C°), dissolved oxygen as percent saturation (%), conductivity (umohs/cm), pH (su) and total dissolved solids (mg/l) were made using a calibrated Hydrolab Surveyor II. Instantaneous discharge was obtained using a Marsh-McBirney model 201 electromagnetic flow meter following the velocity-cross section area method.

RESULTS

Water Quality

Instantaneous physical and chemical water quality data, and discharge results are presented in Appendix 2. Instantaneous water temperatures, pH and dissolved oxygen temperatures are generally satisfactory



to support fish and aquatic life. Conductivity values are significantly elevated over ambient or reference sites in the watershed and are indicative of agricultural and concentrated wastewater discharges. Impacts associated with the wastewater discharge was not evaluated.

Bristol Creek discharge increased from 0.59 ft³/sec upstream of the "tile" and CTH D culvert to 0.81 ft³/sec upstream of its confluence with the Des Plaines River. The increased discharge of 0.22 ft³/sec (or approximately 7×10^{-5} ft³/sec/feet of stream) between the two sites is, in part, a result of observed tiled groundwater discharges.

Habitat

Bristol Creek habitat quality was rated "fair" to "poor" (Table 2). Habitat quality was evaluated along 310 ft. of the total 6,800 ft. (4%) of Bristol Creek. Habitat in this reach was somewhat typical of channelized streams. Generally absent are well defined meanders and bends. The stream is dominated by run and riffle features. Pools, when present, are formed as a result of debris dams or the damming effect of riffles. Water depth at low or base flow conditions and in-stream cover is suitable for maintenance of small-bodied fish species. Average depth in riffles is 0.3 ft.; runs at 1.0 ft; and pools at 1.2 ft. Maximum depth in pools and runs are 2.5 ft and 1.5 ft., respectively. Cover is provided by overhanging vegetation, woody debris and emergent vegetation. Stream bank stability is variable, ranging from 100% stable to 0% (Appendix 2 and 3).

Approximately 800 ft. of the former channelized lower reach of Bristol Creek has been diverted to form a meandering stream and wet meadow before discharging to the Des Plaines River. It appears that sedimentation of the former channel is at least partially responsible for diverting stream flow northeast to form a new channel and wet meadow complex (Appendix 3). This area provides important new habitat for fish, aquatic life and wildlife resident to Bristol Creek and the Des Plaines River. This area was previously managed in agricultural use.

Factors and sources responsible for limiting existing biological uses and habitat quality include stream channelization, modification or draining of wetlands, agricultural sources of nonpoint source pollution including upland erosion and runoff. All of these factors and sources which currently limit habitat quality are controllable or partially controllable. Installation of agricultural land use best management practices, and other stream and riparian management practices would enhance Bristol Creek habitat quality.

Fish Community

Although just a first order stream, Bristol Creek supports a low to moderately diverse and abundant warm water sport and forage fish community. Eight fish species were collected at the two fish community sample sites (Appendix 2). Bluegill, green sunfish, pumpkinseed and black bullhead are resident sport fish species. Bluegill and green sunfish are the dominant fish species and they are present as young-of-the-year and older year classes indicating that natural reproduction is occurring. Creek chub, common white sucker, central mudminnow, brook stickleback and fathead minnow are also present. These later forage fish species are considered tolerant to very tolerant of degraded habitat. No state Endangered, Threatened or Special Concern status fish species were collected.

Recreational Use

Existing or potential water based recreational uses for Bristol Creek include wading, sport fishing, bait fish collection, and others. No public lands or access are known to exist along the stream or its tributaries. Full body contact forms of recreation, such as swimming, are not likely to occur on a frequent basis due to shallow water depths and limited public access.

SUMMARY AND RECOMMENDATIONS

In 1976, Bristol Creek was classified as a Limited Aquatic Life Community stream. These streams are capable of supporting very tolerant macroinvertebrates or no aquatic life. The 1976 stream classification for Bristol Creek was completed prior to the development and use of the Wisconsin Stream Classification Guidelines, or without consideration of previous qualitative field observations suggesting the presence of sport and forage fish populations or habitat capable of supporting a viable population of fish and other aquatic life.

A formal stream classification survey following current Wisconsin Stream Classification Guidelines was completed for Bristol Creek in July 1997. Survey results indicate that Bristol Creek currently supports a low to moderately diverse and abundant warm water sport and forage fish community. Eight fish species were collected and included forage and sport fish species. Bluegill, green sunfish, pumpkinseed and black bullhead are resident sport fish species. Bluegill and green sunfish are the dominant fish species in Bristol Creek and both are present as young-of-the-year and older classes indicating that natural reproduction is occurring. Resident forage fish include creek chub, common white sucker, central mudminnow, brook stickleback and fathead minnow. These forage fish species are considered to be tolerant to very tolerant of degraded habitat. No state Endangered, Threatened or Special Concern status fish species were collected.

Bristol Creek habitat quality is rated "fair" to "poor". Water depth at low or base flow conditions and in-stream cover is suitable for maintenance of small-bodied fish species. The fish community assessment supports this conclusion.

Approximately 800 ft. of the former channelized lower reach of Bristol Creek has been partially diverted outside the existing channelized section of stream to form a meandering stream and wet meadow before discharging to the Des Plaines River. This area provides important habitat for fish, aquatic life and wildlife resident to Bristol Creek and the Des Plaines River.

While POTW effluent may dominate stream flow under low flow conditions, in-stream flow measurements indicate additional groundwater flow occurs between the POTW discharge and the lower reaches of Bristol Creek.

Based on existing biological and in-stream habitat conditions, Bristol Creek shall be classified as a **Warm Water Sport Fish Community**.

REFERENCES

- Ball, Joseph. 1982. Stream Classification Guidelines for Wisconsin. Technical Bulletin. Wisconsin Department of Natural Resources, Madison, Wisconsin.
- Fago, Donald. 1984. Distribution and Relative Abundance of Fishes in Wisconsin. Volume IV. Root, Milwaukee, Des Plaines and Fox River Basins. Technical Bulletin No 147. Department of Natural Resources, Madison, Wisconsin.
- Hollstrom, Barry, K. 1992. Low-Flow Characteristics of Wisconsin Streams at Sewerage Treatment Plants and Industrial Plants. U.S. Geological Survey, Madison, Wisconsin.
- Simonson, Timothy; John Lyons and Paul Kanehl. 1994. Guidelines for evaluating Fish Habitat in Wisconsin Streams. United States Department of Agriculture, North Central Forest Experiment Station. General Technical Report NC-164.
- United States Department of Agriculture. 1970. Soil Survey. Kenosha County, Wisconsin.
- Wakeman, Robert. 1988. Effluent Limits for the Town of Bristol U.D. #1 POTW Discharge to Bristol Creek. Bristol Creek file memo, Water Resource Management, Southeast District.
- Wisconsin Department of Natural Resources. 1973. Low Flow Survey for the Town of Bristol STP and an Unnamed Tributary of the Des Plaines River. Bristol Creek file memo, Water Resource Management, Southeast District.
- Wisconsin Department of Natural Resources. 1976. Stream Classification for Bristol Creek and the Des Plaines River. Bristol Creek file memo, Water Resource Management, Southeast District.
- Wisconsin Department of Natural Resources. 1978. Variance Survey for Bristol Creek. Bristol Creek file memo, Water Resource Management, Southeast District.
- Wisconsin Department of Natural Resources. 1995. Facility Information Form for the Town of Bristol U.D. #1 Wastewater Treatment Plant. Bristol Creek file memo, Water Resource Management, Southeast District.
- Wisconsin Department of Natural Resources. 1997a. Chapter NR 104 Uses and Designated Standards. Register. August, 1997, No. 500.
- Wisconsin Department of Natural Resources. 1997b. Stream Classification for Bristol Creek. Bristol Creek file memo July 21, 1997, Water Resource Management, Southeast District.

cc: Municipal Wastewater file for Town of Bristol U.D. #1 /SER
Watershed Management file for Bristol Creek /SER
Joe Ball WT/2
Greg Pilarski /SER

attachments

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Appendix 1

Previous Stream Classification and Disinfection Determinations for Bristol Creek

CORRESPONDENCE/MEMORANDUM

State of Wisconsin
Department of Natural Resources

DATE: July 21, 1997

FILE REF: 3200

TO: Judy Gottlieb SER

FROM: Will Wawrzyn SER

SUBJECT: Stream Classification for the Bristol WWTP - Kenosha County

Background

At the request of Diane Figiel please find attached the stream classification for the Bristol WWTP in Kenosha County. Two receiving waters are potentially effected by the discharge. They include an unnamed tributary of the Des Plaines River (hereafter referred to as the Bristol Tributary) and the Des Plaines River. Based on the 1976 stream classification report, the Des Plaines River was classified as a continuous fish and aquatic life stream, and the Bristol Tributary was classified as a non-continuous agricultural ditch (WDNR, 1976).

The Bristol WWTP discharges to the Bristol Tributary approximately 0.5 miles upstream of the confluence with the Des Plaines River. Given the short distance between the discharge point and the Des Plaines River, and limited assimilative capacity of the Bristol Tributary, water resource staff previously recommended that appropriate effluent limits be assigned which are protective of the highest use receiving water which might be effected by the discharge. The highest use receiving water potentially impacted by the discharge is the Des Plaines River.

Des Plaines River Stream Classification

The 1976 continuous fish and aquatic life stream for the Des Plaines River is synonymous with the current Warm Water Sport Fish Community classification. Although the original 1976 stream classification for the Des Plaines River pre-dated the formal Stream Classification Guidelines for Wisconsin (1982), a review of the historical and current fish community data base for the Des Plaines River support my conclusion that the Des Plaines River shall remain classified as a Warm Water Sport Fish Community.

Bristol Tributary Stream Classification

The 1976 non-continuous agricultural ditch classification for the Bristol Tributary is synonymous with the current Limited Aquatic Life classification. The Limited Aquatic Life classification is appropriate if the stream has a severely limited capacity and naturally poor water quality or habitat. Streams classified as Limited Aquatic Life are generally capable of supporting a community of aquatic life considered very tolerant of naturally degraded environmental quality, and few if any fish.

Unlike the Des Plaines River, no historical or current biological data base exists by which to formally classify the Bristol Tributary according to the formal Stream Classification Guidelines for Wisconsin (1982). However, previous qualitative field observations suggest the presence of sport and forage fish in the Bristol Tributary, and that existing physical habitat is capable of supporting a viable fish population. *These observations suggest that the Limited Aquatic Life classification for the Bristol*

Tributary may not be appropriate.

Field observations from a 1973 Low Flow Study (WDNR, 1973) note the presence of "bluegills, minnows, suckers" in Bristol Creek approximately 55 feet downstream of the tile outfall. Similarly, a 1978 variance study for the Bristol Creek (Bristol Tributary) also noted "minnows observed at head of outfall" and "bullheads, minnows observed" at points 0.05 miles and 0.12 miles downstream of the outfall. Observations were also made regarding some of the physical habitat attributes of Bristol Tributary. Although the stream was previously channelized, in-stream conditions indicate habitat suitable for a viable fish community. According to field observations, Bristol Tributary is dominated by run and riffles with lesser numbers of pools. Substrate is variable, ranging from clay hardpan, silt, sand and small gravel material. Stream widths ranged from 5 ft. to 8 ft. and water depths were reported to be in the range of 0.2 ft. to 2.7 ft. The stream is well shaded ranging from 50% to 100%.

Recommendations

The Des Plaines River shall remain classified as a Warm Water Sport Fish Community. Appropriate effluent limits should be developed which are protective of this fish and aquatic life use classification.

The Bristol Tributary was previously classified as a Marginal Aquatic Life Community. Historical observations suggest that this classification may not be appropriate.

I would like to schedule a formal stream classification survey for this stream. Please advise me as to the extent that the Bristol Tributary stream classification may impact the Bristol WWTP effluent limits so that we may prioritize our other field activities.

attachments

Stream Classification, 1976

Fish Distribution Data Base for Des Plaines River Watershed

Low Flow Survey, 1973

Variance Survey for Bristol Creek, 1978

cc: Diane Figiel WT/2

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CORRESPONDENCE/MEMORANDUM

STATE OF WISCONSIN

Date: February 4, 1988

File Ref: 3200

To: Tom Bennwitz - WR/2

From: Bob Wakeman - SED

Subject: Disinfection Determination for Town of Bristol

It is my recommendation that this discharger not be required to disinfect.

The proposed discharge is to an unnamed intermittent tributary to the Des Plaines River in T1N R22E Sec.19 NWSE. The proposed discharge is approximately 0.8 miles upstream of the confluence with the Des Plaines River.

Based on the USGS quad and aerial photograph of this area, the adjacent land downstream of the discharge and confluence with the Des Plaines River is predominately wetlands. The closest upstream access to the Des Plaines is approximately 2.2 miles at Hwy C which is located adjacent to Pleasant Prairie. The closest downstream access to the Des Plaines is located 2.5 miles at Hwy ML. The closest downstream municipality is Russell Illinois, which is 3.9 miles downstream of the proposed discharge.

Based upon the adjacent land type, limited accessibility to the Des Plaines River and the proximity to any residential areas, I feel that the potential for a significant human health risk due to a non-disinfected discharge from the proposed waste water treatment plant is very low. Therefore, disinfection is not recommended.

Since the nature of the waste is not exactly known, I am uncertain if the proposed discharge would pose a health risk to wildlife (ie. waterfowl). If the waste water contains any poultry waste, an assessment of the risk to waterfowl should be conducted prior to a final determination.

sjh

104.00

BRISTOL CREEK AT BRISTOL

NE $\frac{1}{4}$, SW $\frac{1}{4}$ SEC. 8, T. 1N., R. 21E

VARIANCE SURVEY

The Bristol Waste Water Treatment Plant (W.W.T.P.) is located in the town of Bristol on 81st Street and 195th Avenue in Kenosha County.

The contact stabilization treatment facility incorporates comminutors bar screens, mix aeration, settling basins, reaeration chambers, aerobic sludge digestion and chlorination as a final disinfectant before discharge.

The Bristol W.W.T.P. has an average hydraulic design capacity of .21 million gallons per day (MGD) and a peak capacity of .40 MGD. During 1977 the average annual and maximum monthly hydraulic loadings to the treatment plant were .107 MGD and .156 MGD respectively, indicating the treatment plant's adequacy in handling the sewer service area.

Effluent from the Bristol W.W.T.P. is discharged to an underground agricultural drain tile, which flows approximately 0.75 miles before entering Bristol Creek at County Highway D. Bristol Creek tributary flows 0.5 miles through primarily agricultural land usage before confluence with the Des Plaines River. The Des Plaines River is classified according to the Natural Resources Administrative Code NR 104, as continuous fish and aquatic life. The Bristol Creek tributary receives the majority of its flow from the waste water treatment plant.

A variance survey was conducted on August 8, 1978, on a section of Bristol Creek, extending .5 miles from County Highway D to the confluence with the Des Plaines River. Weather conditions at the time of the survey were clear with sunny skies, with air temperatures ranging in the eighties.

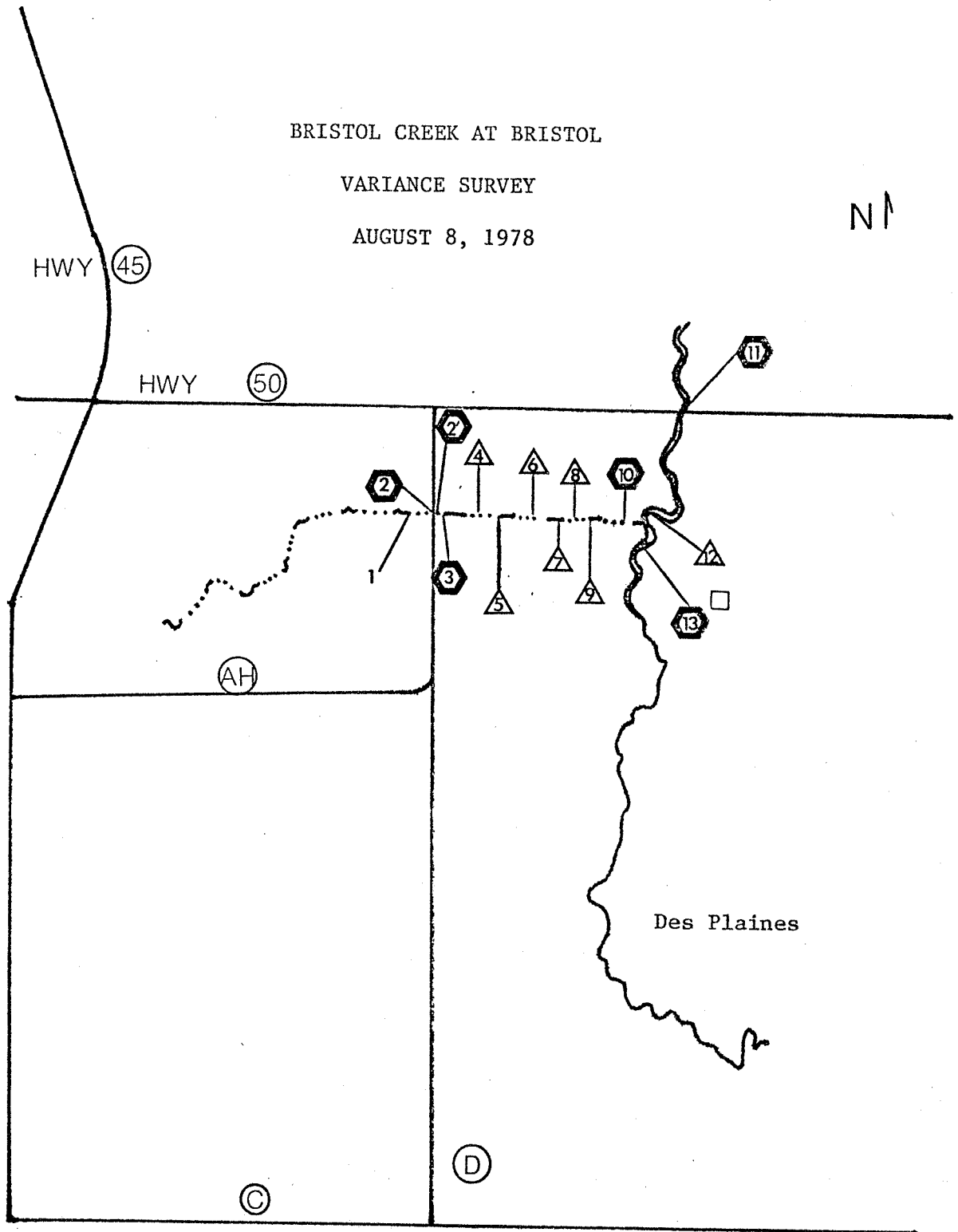
Bristol Creek tributary upstream of the W.W.T.P. outfall pipe at site 1D, had no flow. The stream bed was practically dry. Flow from the discharge pipes (site 2) was averaged to be 0.45 cubic feet per second (CFS). A small drainage ditch, approximately 1.4 feet wide and .13 feet deep, enters the Bristol Creek tributary several feet downstream of the discharge pipe from the north. Discharge from this source was estimated to be 0.063 cfs, (site 2). The maximum depths for the section surveyed ranged from 2.7 feet to 0.3 feet with widths ranging from 8.5 feet to 5 feet.

BRISTOL CREEK AT BRISTOL

VARIANCE SURVEY

AUGUST 8, 1978

N ↑



Flow Gauging and Chemical Monitoring Site



Dissolved Oxygen Site



Time of Travel site

AUGUST 8, 1978
STREAM OBSERVATIONS

Station No.	Miles From WWTP	Physical Description and Percent Cloud Cover	Substrate Type	Land Usage	Ecology
1	.05	Bristol Creek Upstream from Outfall No Flow	70% Mud 30% Gravel	Agricultural Cond. Usage Right (Rt.) & Left Sides of Creek	Stream Bed practically Dry. Algae Mats upon Mud
2	Outfall Pipe at CTH D 0.0	Run	50% Gravel 50% Sand	Pastureland Rt. Side Grassland Lt. Side	Minnows observed at Head of Outfall Pipe
3	.05	Run - Riffle 0% Overcast 100% Shaded	50% Gravel 50% Sand	Pastureland Rt. Side Grassland Lt. Side of Creek	Bullheads Observed
4	.12	Run - Width ~ 8 ft. Max. Depth ~ 2 - 5 ft. .05% Overcast 100% Shaded	30% Clay 50% Pea Gravel 20% Muck	Pastureland Rt. Side Grassland Lt. Side of Creek	<u>Potamogeton</u> filiforms scarce. Bullheads observed
5	.20	Run - Riffle - width 6 Ft. Max. Depth - .5 Ft. 95% Shaded 0% Overcast	30% Clay 30% Gravel 20% Rubble 20% Sand	Agricultural Land Use Rt. & Lt. Sides of Creek. Hay, Corn, Beans	Macrophytes absent Nettle along Banks Mosquitos heavy
6	.25	Pool Area - Width 8 Ft. Shallow Riffles between Pool 50% Shaded 0% Overcast	80% Clay 20% Gravel	Agricultural Land use Hay, Beans, Corn, both Banks	Macrophytes absent Nettles Mosquitos heavy
7	.30	Run - Riffle Some Pools 30% Shaded 0% Overcast	40% Gravel 20% Rubble 30% Clay 10% Sand	Agriculture Land Usage both Sides of Creek Willows along Banks	Banks eroding Nettles Mosquitos

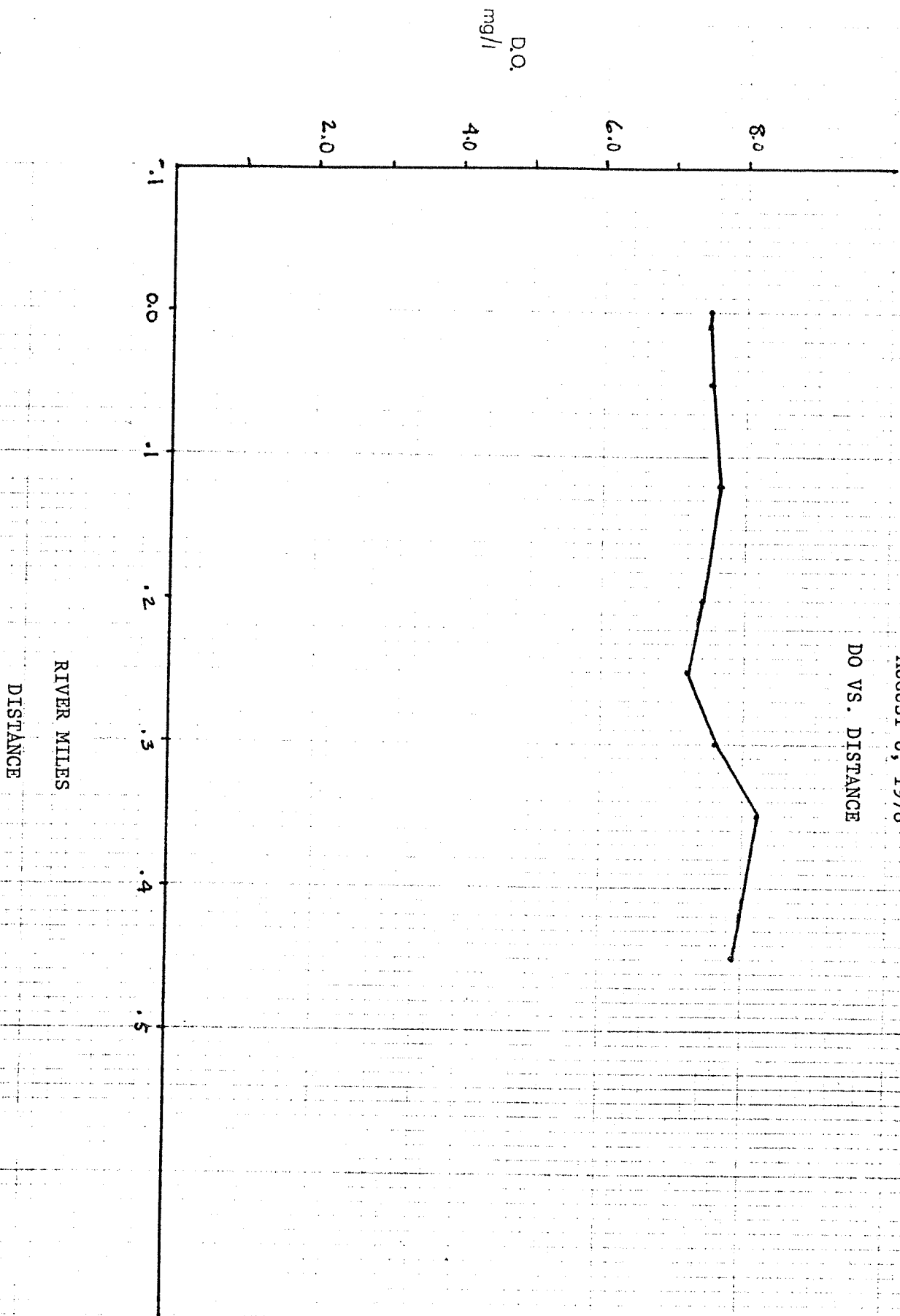
August 10, 1978
STREAM OBSERVATIONS

Station No.	Miles From WWTP	Physical Description and Percent Cloud Cover	Substrate Type	Land Usage	Ecology
8	.35	Run - Width ~ 6 Ft. 0% Overcast 50% Shaded	70% Gravel 30% Clay & Silt	Willows Along Banks Agricultural Land Use	<u>Sagittaria</u> Sp. Scarce
9	.40	Run - Width ~ 6.0 Ft. 50% Shaded 0% Overcast	60% Gravel 20% Rubble 20% Silt	Agricultural Land Useage Bottomland	Macrophytes Absent. Water Clear
10	.48	Run - Riffle Area - 1 Ft Width - 5 Ft. 0% Shaded 0% Cloud Cover	85% Small Gravel & Sand 15% Clay	Agriculture Rt & Lt Sides of Creek	No Aquatic Vegetation Observed. Water Clear
11	At Hwy 50	Run - Width 34 Ft. 0% Shaded 0% Cloud Cover	Muck & Mud Substrate (100%)	Rt & Lt Bank Heavy Growth of Tall Grasses Agricultural Land Use	Water Very Turbid.

BRISTOL CREEK AT BRISTOL
VARIANCE SURVEY

AUGUST 8, 1978

DO VS. DISTANCE



Station No.	Distance Downstream From WWTP	Time	Temp. °C	D.O. mg/l	Percent Oxygen Saturation	pH (S.U.)	Nitrogen						
							Tot. Org. N		NH ₃		NO ₂ -NO ₃		mg/l
							mg/l	lbs./day	mg/l	lbs./day	mg/l	lbs./day	
1	-0.05												
2	At CTH D 0.0	10:15	19.0	7.5	83	7.4	.7	1.69	.20	.48	6.6	16.0	1.48
2'	0.01	10:40	19.0	7.5	83	7.7	.8	.272	.05	.017	7.6	2.58	.06
3	0.05	10:30	19.0	7.5	83								
4	.12	10:35	19.0	7.6	85								
5	.20	10:55	19.0	7.4	84								
6	.25	11:20	19.5	7.2	81								
7	.30	11:45	20.5	7.6	87								
8	.35	11:50	20.5	8.2	94								
9	.40	12:20	20.5	8.1	93								
10	.48	12:30	22.5	7.9	94		1.5	4.28	.07	.19	6.2	17.71	1.39
11	At Hwy. 50	11:40	21.0	6.0	70	7.9	1.5	145.3	.09	8.71	1.81	175.3	.21

[illegible]

*All sample times taken with time of travel of dye

STATION # NO.	MILES FROM WWTP	Physical Description Percent Cloud COVER	SUBSTRATE TYPE	LAND USAGE	Ecology
1	.05	BRISTOL CREEK . . . up stream FROM OUTFALL NO FLOW	70% MUD 30% GRAVEL	Agricultural land Usage: Right (RT) & Left (LT) SILWOT CREEK	STREAM BED Practically dry Algae Mats upon MUD
2	OUTFALL PIPE AT CWN D 0.0	RUN	50% Gravel AND 50% SAND	Pasture land, RT side Grass land, LT, side	Minnows observed at head of OUTFALL PIPE
3	.05	RUN - Riffle 0% OVERCAST 100% SHADED	50% GRAVEL 50% SAND	PASTURE LAND RT SIDE GRASSLAND LT. SIDE OF CREEK	BULLHEAD; MINNOWS OBSERVED
4	.12	RUN - WIDTH ~ 3 ft MAX. DEPTH ~ .2 - .5 ft .05% OVERCAST 100% SHADED	30% Clay 50% PER GRAVEL 20% MUCK	PASTURE LAND RT SIDE GRASSLAND LT SIDE OF CREEK	Potamogeton filiformes Scarce Bullhead, Minnows OBSERVED
5	.20	RUN - Riffle - WIDTH - 6 ft MAX. DEPTH - .5 ft 95% SHADED 0% OVERCAST	30% Clay 30% GRAVEL 20% rubble 20% sand	AGRICULTURAL LAND USE RT + LT SIDES OF CREEK HAY, CORN, BEANS	Macrophytes ABSENT NETLES ALONG BANKS HEAVY MOSQUITOS
6	.25	POOL AREA - WIDTH 8 ft SHALLOW Riffles Between Pool 50% SHADED 0% OVERCAST	80% Clay 20% GRAVEL	Agricultural LAND USE HAY, BEAN, CORN BOTH BANKS	Macrophytes abundant Netles Mosquitoes
7	.30	RUN - Riffle Some Pools 30% SHADED 0% OVERCAST	40% Gravel 20% Rubble 30% Clay 10% sand	AGRICULTURAL LAND USE BOTH SIDES OF CREEK WILLOWS ALONG BANKS	Banks eroding Netles Mosquitoes
8	.35	RUN - WIDTH 6.0 ft 0% OVERCAST 50% SHADED	70% Gravel 30% Clay + silt	WILLOWS ALONG BANKS AGRICULTURAL LAND USE	Sagittaria sp. scarce
9	.40	RUN - WIDTH 16.0 ft 50% SHADED 0% OVERCAST	60% gravel 20% Rubble 20% silt	AGRICULTURAL LAND USE BOTTOM LAND	Macrophytes ABSENT Water clear
10	.48	RUN - Riffle AREA - WIDTH - 5 ft 0% SHADED 0% Cloud COVER	85% small gravel and sand 15% Clay	AGRICULTURE RT + LT SIDES OF CREEK	No Aquatic vegetation OBSERVED WATER clear
11	AT HW 50	RUN - WIDTH 34 ft. 0% SHADED	Muck & Mud Substrate (100%)	RT + LT BANK HEAVY Growth OF TALL GRASSES	Water VERY TURBID

[illegible]

Bristol, Kenosha County
Des Plaines River Drainage Basin

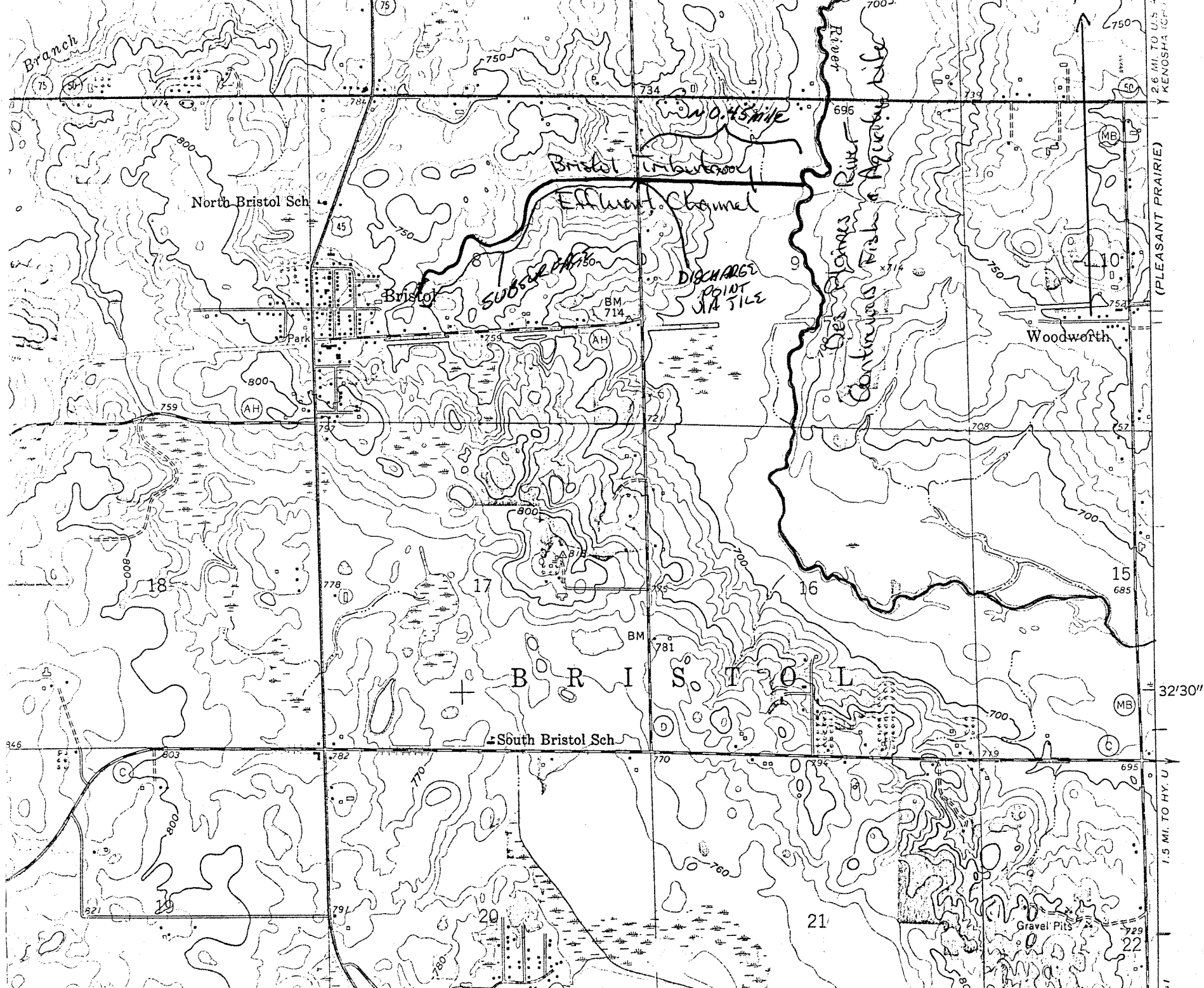
The effluent from the Bristol Wastewater Treatment Plant (Section 8, T1N, R21E) discharges to Bristol Tributary, an intermittent tributary of the Des Plaines River draining .35 square miles. The land use in the drainage area is primarily agricultural.

The effluent is discharged to an underground agricultural drain tile which flows approximately 0.75 mile before entering the Bristol Tributary. The tributary flows 0.5 mile over a rock substrate to the Des Plaines River.

During dry weather, the majority of the flow is from the treatment plant.

Recommendations

The section of underground tile shall be classified as an effluent channel. Bristol Tributary shall be classified as a non-continuous agricultural ditch. The Des Plaines River shall be classified as a continuous fish and aquatic life stream.



Appendix 2

Water Quality, Fish and Habitat Survey Results

Location: Bristol Cr. 800 ft. upstream of confluence w/ Des Plaines R.
Date: 7/24/97 Time: 11:45 Discharge: 0.81 ft³/sec (0.52 mgd)

Location: Bristol Cr. 15 ft. upstream of CTH D culvert and "tile"
Date: 7/24/97 Time: 12:50 Discharge: 0.59 ft³/sec (0.39 mgd)
Comments: Warm and humid. Overcast 80° F. No recent precipitation
Dissolved O₂: 7.90 mg/l Temperature: 19.6° C Dissolved O₂ sat.: 81% pH: 7.75 su
Conductivity: 2075 umhos/cm Total dissolved solids: 1330 mg/l

Location: Tile discharge approx. 10 ft. upstream of CTH D culvert along south bank
Date: 7/24/97 Time: 12:55 Comments: Warm and humid. Overcast 80° F
Dissolved O₂: 8.21 mg/l Temperature: 16.3° C Dissolved O₂ sat.: 85% pH: 8.21 su
Conductivity: 1116 umhos/cm Total dissolved solids: 714 mg/l

Fish Distribution Summary for Bristol Creek - Kenosha County, Des Plaines River Watershed, Fox River Basin					

Creek, Howard County, 2001 James River Watershed, Fox River Basin							
River Mile		0.15	0.45				
Location TRS1/41/4		1,21,9,NE,NW	1,21,9,NW,NW				
Sample Date		7/24/97	7/24/97				
Sample Length (ft)		310	45				
Mean Width (ft)		6.7	10				
Common Name	Classification *	Number	Number				
Creek chub	Tolerant	15	21				
White sucker	Tolerant	9	11				
Central mudminnow	Very Tolerant	2					
Brook stickleback	Very Tolerant	1	10				
Fathead minnow	Very Tolerant		15				
Green sunfish	Sport	67	27				
Black bullhead	Sport	4	1				
Pumpkinseed	Sport		1				
Bluegill	Sport	39	24				
No. of native taxa		7	8				
Total		137	110				
* Classification based on Ball (1982)							

Habitat Summary for Bristol Creek, July 24, 1997

Reach Number	Reach Type	Reach Length (ft)	Reach Width (ft)	Reach Area (ft2)	Left Bank Water Depth (ft)	Center Water Depth (ft)	Right Bank Water Depth (ft)	Average Water Depth (ft)	Maximum Water Depth (ft)	Embedded-ness (%)	Maximum Depth of Fines (ft)	Substrate Gravel (%)	Substrate Sand (%)	Substrate Silt (%)
1	Pool	60	10	600	1.3	1.6	1.7	1.5	2.2	100	1.5	0	50	25
2	Run/Pool	70	6	420	1	0.8	0.8	0.9	2.5	100	1	0	50	25
3	Run	60	6	360	0.5	1	0.7	0.7	1.5	100	0.5	0	5	20
4	Run	65	5	325	0.3	0.5	0.3	0.4	1	100	0.3	0	10	40
5	Riffle	20	7	140	0.3	0.4	0.6	0.4	0.4	100	1	0	50	30
6	Run	35	6	210	0.9	0.9	0.6	0.8	1	75	0.5	25	50	0
7	Riffle	30	3	90	0.2	0.3	0.5	0.3	0.5	50	0.1	50	40	0
8	Run	100	9	900	1.3	1.3	0.9	1.2	1.5	100	0.5	0	30	60
Average			6.50		0.73	0.85	0.76	0.78	1.33	90.63	0.68	9.38	35.63	25.00
Maximum			10		1.3	1.6	1.7	1.5	2.5	100	1.5	50	50	60
Minimum			3		0.2	0.3	0.3	0.3	0.4	50	0.1	0	5	0

Reach	Reach	Substrate	Substrate	Algae	Macrophyte	Shading	Cover	Cover	Cover	Left Bank	Left Bank	Right Bank	Right Bank	
Number	Type	Clay	Detritus	(%)	(%)	(%)	Overhang-	Woody	Emergent	Erosion	Erosion	Erosion	Erosion	
		(%)	(%)				ing	Debris	Vegetation	(ft)	(%)	(ft)	(%)	
							Vegetation							
							(%)	(%)	(%)					
1	Pool	25	P	0	0	75	0	5	0	1	50	1	50	
2	Run/Pool	25	P	0	0	50	30	0	0	0	0	0	0	
3	Run	75	0	0	0	50	30	0	20	0	0	0	0	
4	Run	50	0	0	0	50	5	0	0	2	100	1.5	75	
5	Riffle	20	0	0	0	90	0	0	0	3	100	2	75	
6	Run	25	P	0	0	100	0	5	0	1.5	90	1	100	
7	Riffle	10	0	0	0	100	0	5	0	1	75	0	0	
8	Run	10	0	0	0	75	0	10	0	1	50	0.5	50	
Average		30.00	0.00	0.00	0.00	73.75	8.13	3.13	2.50	1.19	58.13	0.75	43.75	
Maximum		75	0	0	0	100	30	10	20	3	100	2	100	
Minimum		10	0	0	0	50	0	0	0	0	0	0	0	

Reach	Reach	Riparian	Riparian	Riparian	Riparian
Number	Type	Land Use	Land Use	Buffer	Buffer
		Cropland	Meadow	Width	Width
		(%)	(%)	Left	Right
				(ft)	(ft)
1	Pool	0	100	30	30
2	Run/Pool	0	100	30	25
3	Run	0	100	30	30
4	Run	0	100	30	30
5	Riffle	0	100	30	25
6	Run	50	50	30	25
7	Riffle	50	50	30	25
8	Run	100	0	15	15
Average		25.00	75.00	28.13	25.63
Maximum		100	100	30	30
Minimum		0	0	15	15

STREAM AND SITE SAMPLE BACKGROUND FORM (Rev. 10/96)

PERSONNEL: W. WAWRZYN T. AARTICA
S. GALARRAU

DATE: 07/24/97

STREAM LOCATION

STREAM NAME: UNNAMED TRIB. TO DES PLAINES R. (BRISTOL CR.) WBIC: NA
 LOCATION: T 1 N R 21 E SEC: 9 1/16: NW 1/4: NE STREAM ORDER: 1
 (at confluence with next downstream waterbody)

MAJOR BASIN CODE*: 2 MINOR BASIN CODE*: 210 WATERSHED CODE*: 020 - FX01
 (Fago code) (Fago code) (Standard code)

SAMPLE SITE LOCATION

LOCATION DESCRIPTION: 800 FT UPSTREAM OF CONFL. W/ DES PLAINES R.
(BEGINNING AT NORTH CHANNEL DIVERSION THROUGH WET MEADOWS)
 LOCATION: T 1 N R 21 E SEC: 9 1/16: NE 1/4: NW STREAM ORDER: 1
 (at sample site)

AT: _____° _____' _____" N LONG: _____° _____' _____" W

COUNTY CODE*: 30 SAMPLE NO: 1 OF 1

SAMPLE SITE WATER QUALITY and GENERAL INFORMATION

SAMPLE TIME: 11 : 45 DISCHARGE: 0.81 cfs GAGE HEIGHT (ft): NA

GAGE LOCATION: NA

METEOROLOGICAL CONDITIONS: WARM ~ 80°F 50% OVERCAST

TEMP. (C): _____ DISS. O2 (mg/l): _____ DISS. O2 (% sat.): _____ TURB. (ntu): _____ pH (su): _____

COND. (umhos/cm): _____ TDS (mg/l): _____ OTHER: _____

PERENNIAL or INTERMITTENT FLOW: PERENNIAL W/O
 (as depicted on USGS 7.5" map, or otherwise based on other references or observations)

CHANNEL MORPHOLOGY: Natural Old Channelization Recent Channelization
 (> 5-years) (≤ 5-years)

PHOTOGRAPHS & COMMENTS

PHOTO / FRAME / DESCRIPTION: A1 - LOOKING DOWNSTREAM OF FISH SURVEY REACH #1 AND BELOW DIVERSION
A2 - LOOKING NE AND DOWNSTREAM INTO DIVERTED WET MEADOW A3 - LOOKING WEST AND UPSTREAM IN
FISH SURVEY REACH #1 TYPICAL RUN OH+SB VEG COVER A4 - TYPICAL POOL MAX D = 1.7'
A5 - LOOKING WEST AND UPSTREAM RUN/POOL DENSE VEG. W/ WOODEN SNAG MAX D = 1.0' A6 - LOOKING
WEST AND UPSTREAM TYPICAL RIFPLE POOLLY SURFED GRAVEL + SAND FINE = 50% POINT BAR RT CHANNEL
W/ 1% SHADY FORE/GRASS (1.1) TREE, SHRUB A7 - WEST AND UPSTREAM NARROW RUN - RECENT FINE
DEPOSITION ALONG BEND A8 - LOOKING EAST AND DOWNSTREAM OF CTH D CULVERT SCOUR POOL
 COMMENTS: 45' FIRST SAMPLE SITE #2

Common Name	Species Code	Number	Taxa	Tol Val	Feed Gr	Spawn	DELT
CREEK CHUB		(15)					1
COMMON WHITE SUCKER		(9)					
BIG BULL		(39)					
GREEN SUNFISH		(67)					
CENTRAL MUDMINNOW		(2)					
BLACK BULLHEAD		(4)					

(Rev. 10/96)

Stream Bristol Reach Location 900' upstream of confluence w/ Platte P. Reach Score/Rating 200
 nty Kenosha Date 7/24/97 Evaluator W. Waurzyn Classification WWFF
BASED 100% on Fish Community

Rating Item	Category			
	Excellent	Good	Fair	Poor
Watershed Erosion <u>14</u>	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 <u>14</u>	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 <u>12</u> <u>x 0.75 = 1.2</u> <u>MX 2</u> <u>MIN 0</u>	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	Many eroded areas. "Raw" areas frequent along straight sections and bends. 20
Bank Vegetative Protection <u>(44-58%)</u>	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 <u>6.5</u> <u>6.5/12</u>	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 <u>5</u>	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 <u>16</u>	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 <u>22</u>	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 <u>8</u>	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 <u>4</u>	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 <u>0.57</u>	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) <u>35/6.5 = 5.4</u>	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 <u>4</u>	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:

 Column Scores E _____ +G _____ +F _____ +P _____ = 200 = Score

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

STREAM AND SITE SAMPLE BACKGROUND FORM (Rev. 10/96)

PERSONNEL: W. WAURZYK S. GALARNEAU
T. ADRIEN

DATE: 07/24/97

STREAM LOCATION

STREAM NAME: UNNAMED TRIB. TO DES PLAINES R. (BRISTOL CR.) WBIC: NA

LOCATION: T 1 N R 21 E SEC: 9 1/16: NW 1/4: NE STREAM ORDER: 1
(at confluence with next downstream waterbody)

MAJOR BASIN CODE*: 2 MINOR BASIN CODE*: 210 WATERSHED CODE*: 020 - Fxd1
(Fago code) (Fago code) (Standard code)

SAMPLE SITE LOCATION

LOCATION DESCRIPTION: STARTING 45' DNSTREAM OF CTH D TO CULVERT AT CTH

LOCATION: T 1 N R 21 E SEC: 9 1/16: NW 1/4: NW STREAM ORDER: 1
(at sample site)

AT: 42° 33' 52" N LONG: 88° 01' 50" W

COUNTY CODE*: 30 SAMPLE NO: 10K1

SAMPLE SITE WATER QUALITY and GENERAL INFORMATION

SAMPLE TIME: 12 : 50 DISCHARGE: 0.59 cfs GAGE HEIGHT (ft): N/A

GAGE LOCATION: N/A

METEOROLOGICAL CONDITIONS: WARM ~80F AND 50% OVERCAST

TEMP. (C): 19.6 DISS. O2 (mg/l): 7.39 DISS. O2 (% sat.): 81 TURB. (htu): — pH (su): 7.75

COND. (umhos/cm): 2075 TDS (mg/l): 1130 OTHER: N/A

PERENNIAL or INTERMITTENT FLOW: —

(as depicted on USGS 7.5" map, or otherwise based on other references or observations)

CHANNEL MORPHOLOGY: Natural

Old Channelization
(> 5-years)

Recent Channelization
(≤ 5-years)

PHOTOGRAPHS & COMMENTS

ROLL / FRAME / DESCRIPTION: —

COMMENTS: TILE AT SW CORNER OF CTH D

TEMP 16.28 °C

DO 8.21 mg/l

D-AT 85 %

COND 7.55 umhos/cm

TDS 1116 mg/l

TDS 714 mg/l

See reverse side for basin and watershed codes; and land use types

FISH ASSEMBLAGE SAMPLE FORM (Rev. 10/96)

WATER MILEAGE CODING (Fago): _____

STATION MILEAGE (Fago): _____

START TIME: 12 : 50 SAMPLE END TIME: 13 : 10 TOTAL SAMPLE TIME: 0 : 20

LENGTH OF REACH SAMPLED (ft): _____

MEAN CHANNEL WIDTH (ft): 10 n=10 10 _____

REACH: Back Pack OPERATING VOLTS: 100 and AMPS: 4.5

DISTANCE FROM NEAREST LAKE >10 ac. (km): —

DISTANCE FROM NEAREST STREAM W/ MEAN Q > 1500 cfs (km): —

MACROINVERTEBRATES / AQUATIC VEGETATION: RUSY CANY FISH PRESENT

Common Name	Species Code	Number	Taxa	Tol Val	Feed Gr	Spawn	DELT
CREEK CHUB		(21)					1 parasite
COMMON WHITE SUCKER		(11)					
BLACK BULLHEAD		(1)					
BROOK SILVERDART							
GREEN SUNFISH		(27)					
BLUEGILL		(24)					
WATER PUPPET		(15)					
WATER PUPPET		(1)					

Appendix 3

Photograph Documentation for Bristol Creek Stream Classification Survey

Photograph 1

July 24, 1997

Bristol Creek - Looking west and downstream from the beginning of fish survey reach #1. Note absence of water. Flow diverted to northeast through alternate channel as a result of sedimentation in former channel.



Photograph 2

July 24, 1997

Bristol Creek - Looking northeast and downstream through the recently diverted Bristol Creek alignment and newly created wet meadow. Des Plaines River located at distant tree line.



Photograph 3

July 24, 1997

Bristol Creek - Looking west and upstream in fish survey reach # 1. Typical run stream reach. Well shaded stream with stable stream banks vegetated by grasses. Overhanging and submerged bank vegetation provides fish and aquatic life cover.

Photograph 4
July 24, 1997

Bristol Creek - Looking west and upstream through a typical pool. Stream banks relatively stable and stream well shaded. Maximum water depth 1.7 ft. Cover provided by submerged and overhanging vegetation and submerged tree roots.



Photograph 5
July 24, 1997

Bristol Creek - Looking west and upstream. Narrow run/pool reach. Stream banks are stable and stream well shaded. In-stream cover provided by overhanging and submerged vegetation and woody snags. Maximum water depth of 1.0 ft.

R. Johnson

Bristol, Kenosha County
Des Plaines River Drainage Basin

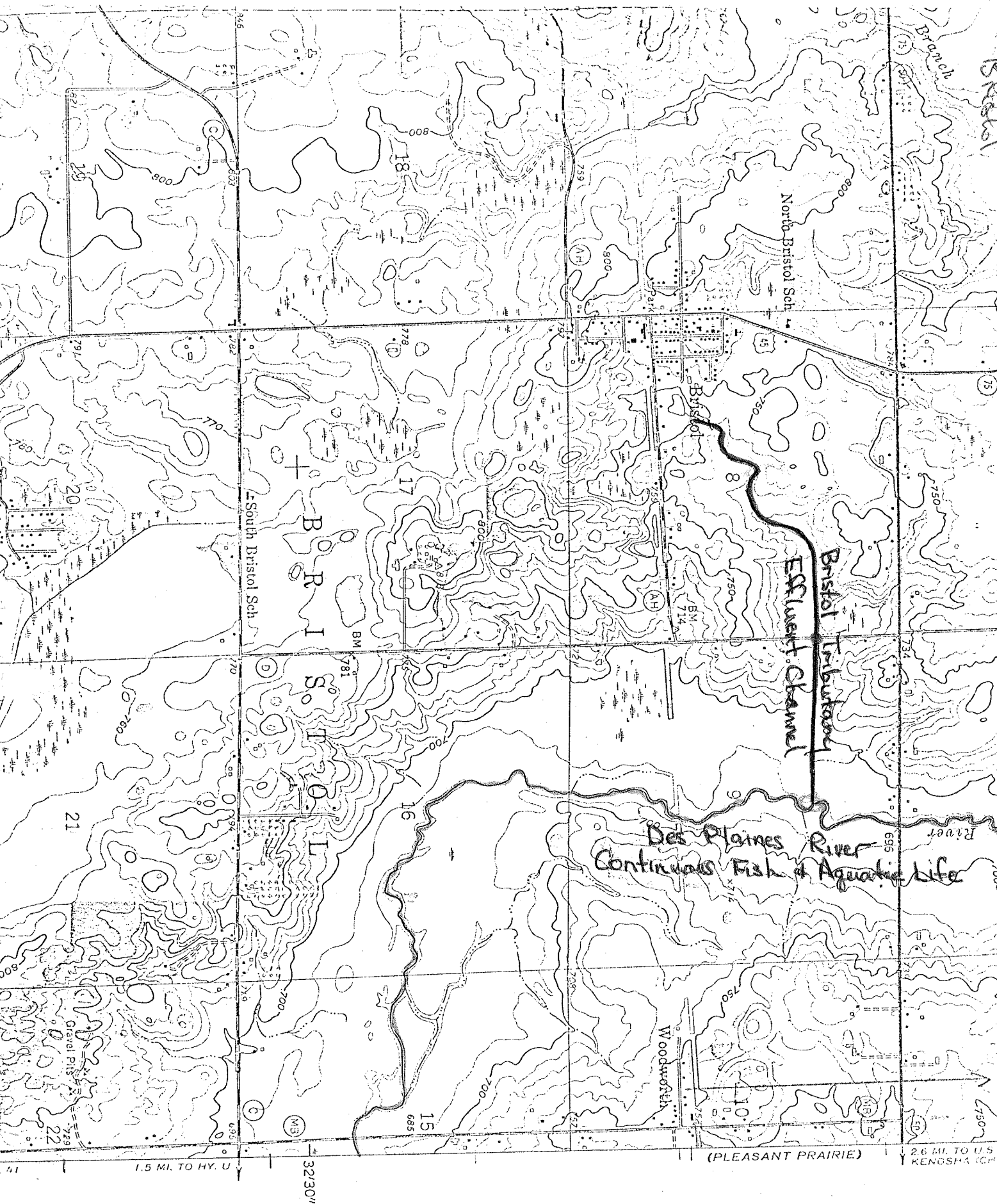
The effluent from the Bristol Wastewater Treatment Plant (Section 8, T1N, R21E) discharges to Bristol Tributary, an intermittent tributary of the Des Plaines River draining .35 square miles. The land use in the drainage area is primarily agricultural.

The effluent is discharged to an underground agricultural drain tile which flows approximately 0.75 mile before entering the Bristol Tributary. The tributary flows 0.5 mile over a rock substrate to the Des Plaines River.

During dry weather, the majority of the flow is from the treatment plant.

Recommendations

The section of underground tile shall be classified as an effluent channel. Bristol Tributary shall be classified as a non-continuous agricultural ditch. The Des Plaines River shall be classified as a continuous fish and aquatic life stream. — 100



R. Johnson

Paddock Lake, Kenosha County
Des Plaines River Basin

The effluent from the Paddock Lake wastewater treatment plant discharges to a tributary of Brighton Creek, which is a tributary to the Des Plaines River.

The effluent discharges to a small wetland in Section 2, Salem Township. A small stream originates at the wetland and flows less than a mile before entering a marsh bordering Brighton Creek. The land surrounding the stream is used primarily as cropland. During periods of dry weather, there is no flow in the stream.

Brighton Creek originates in the Bong Recreation Area (Section 15, T2N, R20E) and flows through agricultural land to the Salem Branch of the Des Plaines River. Most of the wetlands along the stream have been drained. An electrofishing survey conducted by Department of Natural Resources personnel in October, 1975, near Highway "K", collected the following fish: carp and pirate perch. The stream in this area is approximately three feet deep and 20 feet wide with no perceptible flow. The substrate is predominantly muck and detritus.

The stream has little recreational potential.

Recommendations

The wetland adjacent to the treatment plant shall be classified as a wetland. The stream shall be classified as a non-continuous agricultural stream. The marsh shall be classified as a wetland. Brighton Creek shall be classified as a continuous fish and aquatic life stream.

Drop Delete

R. J. L. 1000

Bristol, Kenosha County
Des Plaines River Drainage Basin

The effluent from the Bristol Wastewater Treatment Plant (Section 8, T1N, R21E) discharges to Bristol Tributary, an intermittent tributary of the Des Plaines River draining .35 square miles. The land use in the drainage area is primarily agricultural.

The effluent is discharged to an underground agricultural drain tile which flows approximately 0.75 mile before entering the Bristol Tributary. The tributary flows 0.5 mile over a rock substrate to the Des Plaines River.

During dry weather, the majority of the flow is from the treatment plant.

Recommendations

The section of underground tile shall be classified as an effluent channel. Bristol Tributary shall be classified as a non-continuous agricultural ditch. The Des Plaines River shall be classified as a continuous fish and aquatic life stream. DC

