

Reviewed by LBWB

Date 3/2004

Region SKR County Grant

Report Date 2/1989

Classification LAL

Water Body: Sinnippee Cr.

Discharger: Kieler WWTP

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

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

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

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

Historical Reports in file:

- 2/1989 - Roger Schlessler
- 12/30/80 - Roger Schlessler
- 7/13/77 - Tom Bambridge

Additional Comments/How to improve report:

- is low stream flow still a limiting factor?
- check in w/region.

SINNIPEE CREEK

AT KIELER

TRIENNIAL STANDARDS REVIEW

KIELER WWTP

FEBRUARY, 1989

ROGER SCHLESSER, SOUTHERN DISTRICT

BUREAU OF WATER RESOURCES MANAGEMENT

WISCONSIN DEPARTMENT OF NATURAL RESOURCES

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SUMMARY

Sinnipee Creek's classification was reviewed in 1980. From the outfall to the major springhead the classification remained as marginal surface waters (E) due to low natural stream flow. At that time the section of stream between the springhead and Bluff Road was upgraded to full fish and aquatic life (B). This review indicates that the existing classification is correct and should remain the same.

INTRODUCTION

This paper presents the results of an evaluation of the stream classification for Sinnipee Creek which is the receiving stream for the Kieler Municipal 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 in-place pollutants
- (b) Low natural stream flow
- (c) Natural background conditions, and
- (d) Irretrievable cultural alterations

GENERAL DESCRIPTION

Sinnipee Creek is a high gradient, spring-fed stream beginning 3/4's of a mile northwest of Kieler and flowing southwest to enter the Mississippi River five

miles above the Wisconsin-Illinois border. The headwater springs are located on the Martin Kieler farm: NW 1/4, Ne 1/4, Sec. 4, T1N, R2W. These springs provide a good quantity of high quality groundwater to the stream. The WWTP outfall is located in a dry run of Sinnipee Creek approximately a 1/2 mile above the springhead.

The reach included in this evaluation is a 2.7 mile stretch which extends from the outfall downstream to Bluff Road. Land use in the stream corridor is generally pasture with most of it at least partially wooded. Upland areas are in row crops or alfalfa. Runoff to the stream would come from cropland and also several barnyards located in the watershed.

The stream in the vicinity of the wastewater treatment plant can best be described as a dry run. The Q_{710} at the outfall would be 0.0 cfs. The USGS established a flow monitoring station 0.75 miles below the major springhead. The Q_{710} at this site is 0.15 cfs.

Table 1 contains the actual flows at the site taken from the publication "Low-Flow Characteristics of Wisconsin Streams at Sewage Treatment Plants and Industrial Plants".

Table 1: Low-Flow Characteristics, Sinnipee Creek

<u>Drainage Area</u> <u>(mi²)</u>	<u>Date</u>	<u>Discharge</u> <u>(ft³/s)</u>
1.42	October 16, 1975	0.68
	October 27, 1976	0.31
	June 21, 1977	0.28

STREAM HABITAT

The marginal section of Sinnipee Creek is best characterized as a heavily wooded dry run. There is a steep gradient from the outfall to the valley floor where the major springs are located. The springhead area is somewhat lacking in habitat but a better pool-riffle ratio develops as you move downstream. Substrate varies from sand-bedrock in the headwaters to rubble-gravel-boulder farther downstream. Additional springs and small tributaries provide high quality groundwater to the stream along its entire length. Bank vegetation varies from stretch to stretch but is much better now than what it was in 1980.

The stream corridor is not as heavily pastured as it once was, which has resulted in less sedimentation to the stream. At times much of Sinnipee Creek is totally covered with watercress.

WATER QUALITY, BIOLOGY

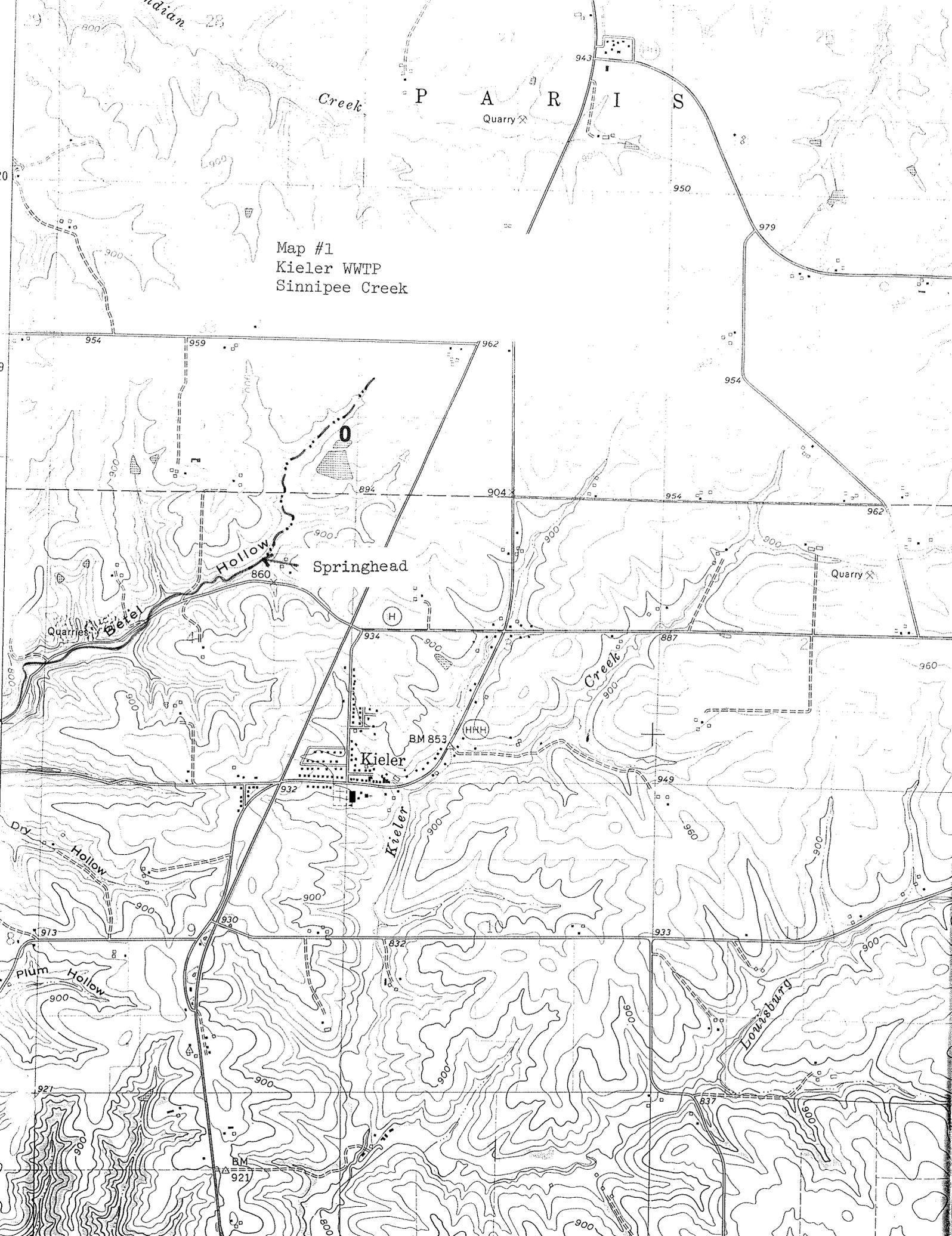
The water quality and biology of the dry run is solely dependent on the discharge from the WWTP. It has a very steep gradient and in the absence of the effluent would only contain water during times of surface runoff.

Sinnipee Creek was surveyed with a backpack shocker upstream of Bluff Road on November 3, 1988 (Map #1). A good diversity of forage fish were present along with a couple of species of sport fish (Table II). The most notable species

found at the site were the largemouth bass, pumpkinseed, grass pickerel, and bullhead. Due to the fact that Sinnipee Creek flows into the Mississippi River there is probably a good migration of fish in and out of the stream depending on flow and time of the year.

A macroinvertebrate sample was also taken upstream of Bluff Road on October 28, 1988 (Table III). According to the HBI the site was considered to have "fair water quality". A lower HBI was expected due to all of the high quality groundwater entering the stream. The sample contained a high percentage of Asellus intermedius (43%) and Chimarra aterrima (26%). No mayflies were present at the site which was also surprising.

The fish and macroinvertebrate data would indicate that Sinnipee Creek supports a decent fish population and macroinvertebrate community.



Map #1
Kieler WWTP
Sinnipee Creek

Creek

P A R I S

Quarry

950

979

954

962

Hollow

Springhead

Quarry

Quarries

Bebel

Kieler

BM 853

Creek

960

Dry Hollow

Kieler

950

Plum Hollow

Lonsburg

BM 921

900

TABLE: II List of fish for sampling site: Upstream Bluff Road

DATE: 11/3/88 Twn 1N, R2W, Sec. 8, 1/4 1/4 NWNW STREAM: Sinnipee Creek

Station mileage: 1.2 County: 22

SOURCE OF DATA: 05 GEAR: 3 EFFORT: 03

CODE	COMMON NAME	FAMILY	GENUS/SPECIES	# FISH	TOLERANCE LEVEL
K01	CENTRAL MUDMINNOW	UMBRIDAE	Umbra limi	1	Very Tolerant
L01	GRASS PICKEREL	ESOCIDAE	Esox americanus vermiculatus	1	Sport fish
M06	CENTRAL STONEROLLER	CYPRINIDAE	Campostoma anomalum	13	Intolerant
M19	HORNHEAD CHUB	CYPRINIDAE	Nocomis biguttatus	6	Intolerant
M43	SOUTHERN REDBELLY DACE	CYPRINIDAE	Phoxinus erythrogaster	2	Intolerant
M49	LONGNOSE DACE	CYPRINIDAE	Rhinichthys cataractae	21	Intolerant
M50	CREEK CHUB	CYPRINIDAE	Semotilus atromaculatus	7	Tolerant
O02	BULLHEAD	ICTALURIDAE	(Unsp.)	1	Sport Fish
W06	PUMPKINSEED	CENTRARCHIDAE	Lepomis gibbosus	17	Sport Fish
W12	LARGEMOUTH BASS	CENTRARCHIDAE	Micropterus salmoides	6	Sport Fish
X10	FANTAIL DARTER	PERCIDAE	Etheostoma flabellare	4	Intolerant

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Table III

HBI _ 5.977 Rep1 _ Rep2 _ Rep3 _
 Sample ID # _881028-22-06 Waterbody Name _SINNIPPEE CR.
 Water Temp (Celsius) _ Dissolved Oxygen (mg/l) _
 Sample Location: NW NW S 8 T 1N R 2W_ Master Waterbody # _
 Project Name _TRIENNIAL STANDARDS Storet Station # _
 Ave. Stream Width (Ft.) at Site _5.5 Ave. Stream Depth (Ft.) at Site _0.4
 Collector _SCHLESSER, R. Field # 06 Rep 1_
 Measured Velocity (fps) _
 Est. Velocity (fps) _
 Sorter _GEHRING, T. _Moderate (0.5-1.5)
 Est % of sample sorted _10
 Taxonomist _DIMICK, J. Sampled Habitat
 Location Description _75 FT. UPS. BLUFF ROAD _1. Riffle

Est. Time Spent Sampling (Min.) _ 3__

Sampling Device _1. D Frame

Substrate at Site Location (%)

0.0 Bedrock	25.0 Rubble	10.0 Sand	0.0 Clay	0.0 Muck
0.0 Boulders	30.0 Gravel	10.0 Silt	0.0 Detritus	25.0 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 20 % 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			3	H2O CRESS
Filamentous Algae		2		
Planktonic Algae	1			
Slimes	1			
Iron Bacteria	1			

Factors Which May Be Affecting Habitat Quality

Sludge Deposits	1		
Silt and Sediment			3
Channel Ditching	1		
Down/Up Stream Impoundment	1		
Low Flows	1		
Wetlands	1		

Pollutant Sources

Livestock Pasturing			3
Barnyard Runoff			3
Cropland Runoff			3
Tile Drains			
Septic Systems			
Stream Bank Erosion			3
Urban Runoff	1		
Construction Runoff	1		
Point Source (Specify Type)		2	KIELER WWTP
Other (Specify)			

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SAMPLE ID# 881028-22-06

***	TAXA	***	TAXONOMIC	TOL	ORGANISM	ORGANISM		
		SPECIES	KEY	VAL	ID	COUNT		
			USED			REP1	REP2	REP3
TRICHOPTERA								
HYDROPSYCHIDAE								
	CHEUMATOPSYCHE		*1	5.00	04040100	7	0	
	HYDROPSYCHE	BETTENI	*2	6.00	04040201	5	0	
	CERATOPSYCHE	MOROSA BIFIDA	*2	6.00	04040704	1	0	
PHILOPOTAMIDAE								
	CHIMARRA	ATERRIMA	*3	4.00	04110101	34	0	
COLEOPTERA								
ELMIDAE								
	OPTIOSERVUS		*1	4.00	07020500	14	0	
	STENELMIS		*1	5.00	07020600	1	0	
DIPTERA								
CHIRONOMIDAE								
	CHAETOCLADIUS	SP.A	*4	5.00	08050503	1	0	
	ORTHOCLADIUS	SP.D	*4	5.00	08054004	7	0	
SIMULIIDAE								
	SIMULIUM	VITTATUM	*5	7.00	08110217	1	0	
AMPHIPODA								
GAMMARIDAE								
	GAMMARUS	PSEUDOLIMNAEUS	*6	4.00	09010201	2	0	
ISOPODA								
ASELLIDAE								
	ASELLUS	INTERMEDIUS	*7	8.00	10010101	56	0	
OLIGOCHAETA								
			*8		16000000	2	0	

*** TOTALS: *** 131

0

*** BIOTIC INDEX: *** 5.977

Taxonomic Key Code References

*1 Hilsenhoff 1981
 *2 Hilsenhoff 1981,86
 *3 Hilsenhoff 1981,82
 *4 Hilsenhoff 1981,85
 *5 Hilsenhoff 1985
 *6 Holsinger 1972
 *7 Williams 1972
 *8 Klemm 1985

WWTP

Appendix II contains the 1988 DMR monthly averages for flow, BOD, TSS, and NH₃-N. According to this data the WWTP has been staying within their limits on a consistent basis.

During 1983-84 the Kieler lagoon system was replaced with a mechanical plant. This resulted in better treatment and much lower suspended solids levels, especially during the summer months.

CLASSIFICATION

Based on this review of available chemical, physical, and biological data, the section of Sinnipee Creek from the outfall to the major springhead is correctly classified as marginal surface waters (E). The remainder of Sinnipee Creek is classified as full fish and aquatic life (B).



Kieler WWTP

Outfall.



Kieler WWTP

Below outfall.



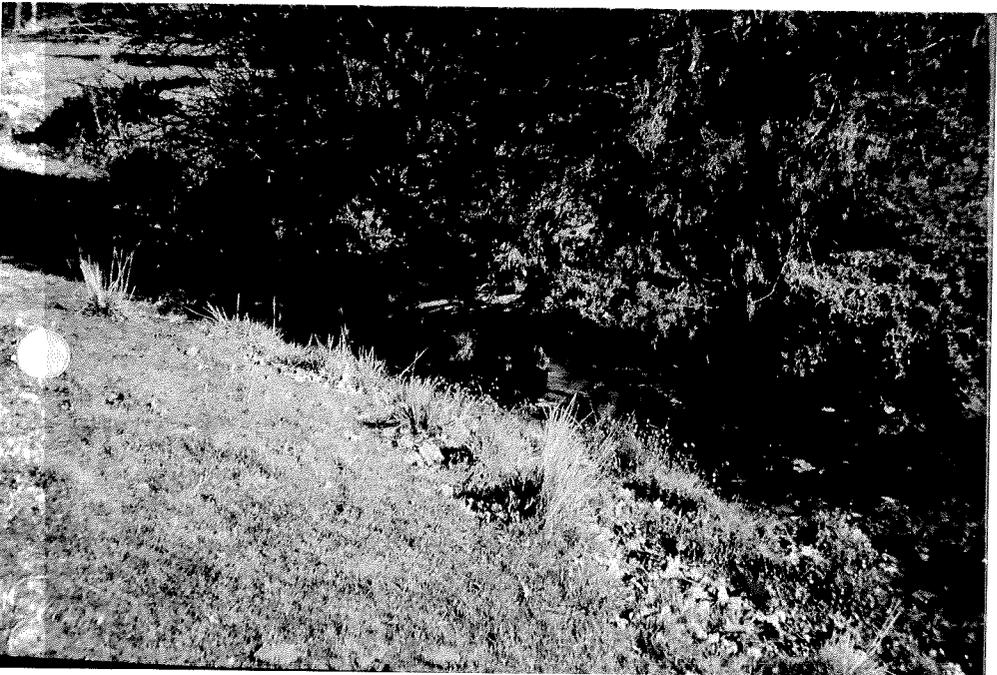
Kieler WWTP

Valley below outfall.



Sinnipee Creek

Dry run above
springhead.



Sinnipee Creek

Springhead area.



Sinnipee Creek

Below springhead.



Sinnipee Creek

Below springhead.



Sinnipee Creek

Below springhead.



Sinnipee Creek

Peddle Hollow Road, note
watercross.



Sinnipee Creek

Peddle Hollow Road.



Sinnipee Creek

Upstream of Bluff Road,
macroinvertebrate and
fish sampling site.



Sinnipee Creek

Downstream of Bluff
Road.

APPENDIX I

Stream Sinnipee Creek Reach Location Kieler Outfall to Springhead Reach Score/Rating 222/E
 County Grant Date 10/28/88 Evaluator Roger Schlessler Classification Marginal

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. 12	Heavy erosion evident. Probable erosion from any run off. 16
Watershed Nonpoint Source	No evidence of significant source. Little potential for future problem. 8	Some potential sources (roads, urban area, farm fields). 10	Moderate sources (small wetlands, tile fields, urban area, intense agriculture). 12	Obvious sources (major wetland drainage, high use urban or industrial area, feed lots, impoundment). 16
Bank Erosion, Failure	No evidence of significant erosion or bank failure. Little potential for future problem. 4	Infrequent, small areas, mostly healed over. Some potential in extreme floods. 8	Moderate frequency and size. Some "raw" spots. Erosion potential during high flow. 12	Many eroded areas. "Raw" areas frequent along straight sections and bends. 20
Bank Vegetative Protection	90% plant density. Diverse trees, shrubs, grass. Plants healthy with apparently good root system. 6	70-90% density. Fewer plant species. A few barren or thin areas. Vegetation appears generally healthy. 9	50-70% density. Dominated by grass, sparse trees and shrubs. Plant types and conditions suggest poorer soil binding. 15	< 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 Warm > 1.5' 0	6" to 1' 6 10" to 1.5' 6	3" to 6" 18 6" to 10" 18	< 3" 24 < 6" 24
Avg. Depth of Pools	Cold > 4' 0 Warm > 5' 0	3' to 4' 6 4' to 5' 6	2' to 3' 18 3' to 4' 18	< 2' 24 < 3' 24
Flow, at Rep. Low Flow	Cold > 2 cfs 0 Warm > 5 cfs 0	1-2 cfs 6 2-5 cfs 6	.5-1 cfs 18 1-2 cfs 18	< .5 cfs 24 < 1 cfs 24
Pool/Riffle, Run/Bend Ratio (distance between riffles ÷ stream width)	5-7. Variety of habitat. Deep riffles and pools. 4	7-15. Adequate depth in pools and riffles. Bends provide habitat. 8	15-25. Occasional riffle or bend. Bottom contours provide some habitat. 16	> 25. Essentially a straight stream. Generally all flat water or shallow riffle. Poor habitat. 20
Aesthetics	Wilderness characteristics, outstanding natural beauty. Usually wooded or 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: _____ 9 _____ 67 _____ 146

Column Scores - E 0 + G 9 + F 67 + P 146 = 222 = Score

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