(P2)

Reviewed by L. Bulb Date 10/2003

Region SER **County** Walworth **Report Date** 9/2000 **Classification** CWF/AC

Water Body: Little Turtle Creek

Discharger: Shann POTW

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) good - 2000 report

_____ Chemical Data (temp, D.O., etc.)

✓ok Physical Data (flow, depth, etc.) - ok - 2000 report (minimal)

✓ Habitat Description - 2000 report

✓ Site Description/Map Site description - 1975 report includes maps

_____ Other:

Historical Reports in file:

9/2000 - W. Wawrzyn

?1970? - unk.

Additional Comments/How to improve report:

- 2000 report is good, and information is appropriate for the recommended CWSF classification (P2)
- 1970? report gives no support for the LAL classin.

Date SEPT. 2000

Facility Name SHARON POTW, WALWORTH CO.

Receiving Water LITTLE TURTLE CREEK (WIBC = 7917 00)

Evaluated by CHMIELEWSKI, WILLIAM

phase 2

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 9/2000 Please provide copy of new classification report.
Rpt attached

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

___ Other (please explain)

WATER QUALITY STANDARDS REVIEW AND STREAM CLASSIFICATION FOR LITTLE TURTLE CREEK, LOWER ROCK RIVER BASIN WALWORTH and ROCK COUNTIES, WISCONSIN (September, 2000)

by Will Wawrzyn, Southeast District

INTRODUCTION

The Lower Rock River Water Quality Management Plan included a recommendation to conduct a Water Quality Standards Review and Stream Classification for Little Turtle Creek located in Walworth and Rock Counties, Wisconsin (WDNR, 1991). This recommendation was proposed, in part, because of contradictory stream classifications contained in the current version of NR 104 and historical file reports. These historical stream classifications were assigned prior to the development of standardized guidelines and detailed biological surveys (Ball, 1984). Following this recommendation, a Water Quality Standards Review and Stream Classification survey and report was completed for Little Turtle Creek.

BACKGROUND

Little Turtle Creek (WIBC 791700) is located in the Lower Rock River Basin, Turtle Creek Watershed (WR01-012) in southwestern Walworth County and southeastern Rock County. Little Turtle Creek drains approximately 58 mi^2 and originates in the Village of Sharon as treated wastewater discharge and diffuse agricultural and urban runoff in T01N, R15E, S.32, SW of SE. It flows west and eventually northwest for approximately 16 miles before its confluence with Turtle Creek at the Turtle Creek Wildlife Area.

Little Turtle Creek is a low to moderate gradient stream with an average gradient of 8.25 ft/mi. It is an ungaged stream and has a reported $Q_{7,2}$ and $Q_{7,10}$ discharge of <0.01 ft^3/s upstream of the Village of Sharon POTW discharge (T1N, R14E, S. 18, SW of SW) (Hollstrom, 1992). Major tributaries to Little Turtle Creek include Ladd Creek with a drainage area of 17 mi^2 (WIBC 992400) and Darien Creek with a drainage area of 18mi^2 (WIBC 791800).

Agriculture is the dominant land use in the watershed. Prior to settlement and drainage improvements, much of these lands were wetlands especially along the streams corridor and valley bottom. Houghton-Palms is the primary soil association along the lower half of the watershed. These soils are characterized as being very poorly drained organic soils in depressions; narrow streams bottoms lands, and nearly level wetlands. These characteristics have encouraged stream channelization and tiling to improve agricultural land drainage. The upper-half of the watershed is dominated by the Flagg-Pecatonica soil association. These soils are characterized as being well drained soils that have a subsoil of silty clay loam, formed in a thick layer of loess and the underlying sandy loam to loam glacial till on uplands. Erosion is a hazard to croplands and water quality because runoff accumulates as channelized flow on the long slopes (USDA, 1971). As of 1985, there were approximately 22 acres of wetlands, primarily as wet meadow, adjoining the stream.

The Village of Sharon Wastewater Treatment Facility (WWTF) (WPDES # WI-0022608) operates an activated sludge facility with an average design flow of 0.257 mgd, BOD and suspended solids load of 360

lbs/d and 420 lbs/d, respectively. Additional permitted discharges are located in the Village of Sharon. They include the Sharon Foundry, Inc. which has permits to discharge non-contact cooling water, a petroleum recovery system and a storm water industrial Tier 1 permit (WPDES WI-0044938, WI-0046531 and WI-S067849).

PREVIOUS STREAM CLASSIFICATIONS

The Little Turtle Creek stream classification in NR 104 and file reports contains contradictory listings and stream classifications. According to the current NR 104.06 (Register, August, 1997, No. 500), Little Turtle Creek from its origin to Turtle Creek is classified as an intermediate aquatic life stream. The NR 104 reference lists Little Turtle River (Creek) as being classified as a non-continuous, limited aquatic life stream from the Village of Sharon WWTF to the Walworth - Rock County line. An undated file report, but assumed to be from the mid-1970's, recommends that "the reach of Little Turtle Creek from above the treatment plant (Village of Sharon) to the confluence with Ladd Creek shall be classified as a non-continuous agricultural stream." "The reach of stream below the confluence with Ladd Creek to the confluence with Turtle Creek shall be classified as a continuous, intermediate aquatic life stream" (WDNR, undated) (Appendix 1). This classification was completed prior to the development and use of the Wisconsin Stream Classification Guidelines (Ball, 1984).

A Recreational Use Classification and Disinfection Determination was completed in 1993 (Galarneau, 1993). Wastewater effluent disinfection for the Village of Sharon POTW effluent was recommended on a seasonal basis from May 1 through September 30 (Appendix 1).

SAMPLE BACKGROUND AND METHODS

The stream classification proposed for Little Turtle Creek is based on guidelines developed by Ball (1984). Generally, these procedures include the collection of fish and habitat information. Instantaneous flow, conventional water quality parameter analysis and photograph documentation may also be obtained.

Since 1928, 13 qualitative fish distribution samples were collected from Little Turtle Creek at 10 different sites using a minnow seine, pulsed back pack or non-pulsed towed electrofishing unit (Fago, 1982). A summary of fish community sample site locations, dates and other points of reference are provided in Table 1.

Table 1

Fish Community Sample Location and Reference Points	Stream Mile	Collection Date
Turtle Creek confluence with Little Turtle Creek	0.0	None
Little Turtle Cr. confluence with Darien Cr.	0.6	None
Little Turtle Creek at CTH X	2.6	08/28/1928 and 07/23/1968
Little Turtle Creek at North Rd.	3.3	05/19/1975 and 10/11/1994 (2)
Little Turtle Creek below Lake Shore Dr.	6.4	07/25/1968
Little Turtle Creek above Lake Shore Dr.	6.6	08/04/1978
Little Turtle Creek at CTH J north crossing	7.3	08/04/1978
Little Turtle Creek at CTH J south crossing	9.7	05/19/1975
Little Turtle Creek downstream of Rock/Walworth Co. Line	14.1	05/19/1975
Little Turtle Creek 700m upstream of Rock/Walworth Co. line	14.3	05/19/1975
Little Turtle Creek adjacent to CTH W Walworth Co.	14.5	05/03/1996
Little Turtle Creek between private road and Salt Rd.	14.7	03/29/1999

Habitat

Habitat quality was assessed along three reaches of Little Turtle Creek in 1992. All three reaches were located in the upper-most reaches of the watershed between stream mile 14.3 and 14.7. Reach 1 was located immediately downstream of the Village of Sharon WWTF and Salt Box Rd., Reach 2 was located between Salt Box Rd. and the Walworth-Rock County line and Reach 3 was located 1000 ft. upstream of the CTH W bridge in Rock County.

Substrate is dominated by fine textured particles as sand and silt. When coarser substrate is encountered it is generally embedded by excess amounts of fines (>50%). The upper reaches of Little Turtle Creek are dominated by shallow riffles and runs and pools are generally absent. This characteristic is likely the result of past channelization practices. Absent more recent channelization along the middle and lower reaches, riffles and runs are still dominant but pool and point bars features are returning absent any new channelization. Massive stream bank failure was not observed but scour and some deposition is evident along the lower bank. Cover and adequate water depth is generally absent for large bodied game and forage fish species but is adequate for small bodied pan fish and forage fish species in the form of woody debris and overhanging vegetation. Over all physical habitat was rated "poor" along headwater reach #1 and "fair" along reaches #2 and #3 (Appendix 2).

Likely factors and sources responsible for limiting habitat quality include historical stream channelization, modification or draining of wetlands, and agricultural sources of nonpoint source pollution including upland erosion and runoff. Approximately 9 miles (or 43%) of the upper-half of Little Turtle Creek has been channelized to accommodate agricultural drainage. Major negative impacts associated with stream channelization include reduction in stream length, development of monotonous run-like habitat in lieu of diverse pool-riffle-run complexes, encouragement of sedimentation through increased rates of channel scour and bank erosion, removes fish and aquatic life cover, and increases water temperatures in the summer and cooler water temperatures in the winter (Brooker, 1985; Brookes, 1987; Brookes, 1988; Brookes, 1989; Brooker, 1991).

All of these factors and sources, which 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 or restore Little Turtle Creek habitat quality.

Fish Community

Little Turtle Creek also supports a very diverse and abundant warm water forage fish community and lesser number of game fish and pan fish species. Forty fish species have been collected at 10 sites since 1928. All of the historical sample sites are located upstream of the confluence with Darien Creek and 3 sites are located between the Village of Sharon WWTF and the Walworth-Rock County line. All but two species, the central mudminnow and largescale stoneroller, have been collected since 1968 and likely still exist in the watershed. Forage fish include species intolerant to very tolerant of degraded habitat. The slender madtom (State Endangered status) and ozark minnow (State Threatened status) are present. Game and pan fish species include smallmouth bass, bluegill, pumpkinseed, green sunfish, and rock bass. A summary of historical and recent fishery assessment results is presented in Table 2.

Recreational Use

Potential or existing recreational uses for Little Turtle Creek and its corridor include wading, fishing, hunting, trapping, hiking, bait fish collection, aesthetics, nature study, and others. 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

The Lower Rock River Water Quality Management Plan included a recommendation to conduct a Water Quality Standards Review and Stream Classification for Little Turtle Creek located in Walworth and Rock Counties, Wisconsin. This recommendation was proposed, in part, because of contradictory stream classifications contained in the current version of NR 104 and historical file reports. These historical stream classifications were assigned prior to the development of standardized guidelines and detailed biological surveys.

Habitat assessments were completed along three reaches of Little Turtle Creek and were concentrated along the upper 0.5 miles of the stream. Fish and aquatic life habitat was rated "poor" in the upper most reach and "fair" along the lower two surveyed reaches. Overall, physical habitat conditions are adequate to support a diverse warm water forage and sport fish community. Factors which limit Little Turtle Creek habitat quality include stream channel and wetland modifications, erosion and runoff from agricultural lands, and livestock pasturing. All of these factors are controllable or partially controllable, and as such, habitat quality could be significantly improved with installation of agricultural land use best management practices and other stream and riparian management practices.

Little Turtle Creek supports a very diverse and abundant warm water forage fish community and lesser numbers of warm water game fish and pan fish species. Forty fish species have been collected at 10 sites since 1928. The slender madtom (State Endangered status) and ozark minnow (State Threatened status) are present. Game and pan fish species include smallmouth bass, bluegill, pumpkinseed, green sunfish, and rock bass.

RECOMMENDATIONS

1. Little Turtle Creek supports a diverse community of fish including warm water game fish, pan fish and forage fish species. State listed Endangered and Threatened fish species are present. Physical habitat is suitable for sustaining these species. Based on existing biological uses and physical habitat conditions, Little Turtle Creek shall be re-classified as a **Warm Water Sport Fish Community.**

2. Significant improvements to all of the streams biological and recreational uses could be attained. The following land and stream management practices could be implemented to enhance or restore aquatic life and wildlife communities, water quality, and recreational use opportunities:

    a. Prevent future modifications to the stream channel, stream corridor and wetlands throughout the watershed.

b. Restore former wetlands whenever feasible, especially along the stream corridor, headwater ditched reaches, and tributaries.

c. Protect and restore riparian habitats, which provide important fish, and wildlife habitats. The width of the buffer should be adequate to protect water quality and enhance fish, aquatic life and wildlife populations.

d. Restore riparian habitat and control bank erosion and scour by isolating livestock from stream banks and stream channel.

e. Encourage installation of soil erosion control practices on lands, especially those that exhibit channelized flow to Little Turtle Creek and its tributaries.

f. Develop and implement a comprehensive watershed management plan, which will protect and enhance endangered, threatened, and special concern status biota.

REFERENCES

Ball, Joseph. 1982. Stream Classification Guidelines for Wisconsin.
Technical Bulletin. Wisconsin Department of Natural Resources, Madison, Wisconsin.

Barclay, J.S. (1980). Impact of Stream Alterations on Riparian Communities in South Central Oklahoma. Report No. FWS/OBS-80/17, Office of Biological Services, Fish and Wildlife Service, US Department of the Interior, Washington, D.C

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United States Department of Agriculture. 1971. Soil Survey. Walworth County, Wisconsin.

Galarneau, Steve. 1993. Effluent Limits for the Village of Sharon WWTF Discharge to Little Turtle Creek. Little Turtle Creek file memo, Water Resource Management, Southeast District.

Wisconsin Conservation Department. 1961. Surface Water Resources of Walworth County, Madison, Wisconsin.

Wisconsin Department of Natural Resources. Undated. Stream Classification for Little Turtle Creek. Little Turtle Creek file memo, Water Resource Management, Southeast District.

Wisconsin Department of Natural Resources. 1997. Department of Natural Resource Administrative Code NR 104. Register August, 1997. No. 500.

Wisconsin Department of Natural Resources. 1992. Lower Rock River Basin Water Quality Management Plan. PUBL-WR-280-91-REV. Bureau of Water Resource Management, Madison, Wisconsin.

cc: Municipal Wastewater file for Village of Sharon / SER
Watershed Management file for Little Turtle Creek / SER
Greg Searle WT/2
Steve Fix Southern Region

attachments

c:\ww\wrmgmt\Lturtlecr.ww.09262000.doc

Table 2. Fish Distribution Summary for Little Turtle Creek - Walworth and Rock Counties - Lower Rock River Basin

River Mile			2.6	2.6	3.3	3.3	3.3	6.4	6.6	7.3
Location T,R,S,1/16,1/4			1,15,6,NE,NE	1,15,6,NE,NE	1,15,6,SE,NE	1,15,6,SW,NE	1,15,6,NE,NE	1,15,7,SW,NW	1,15,7,NW,SW	1,15,7,SW,SW
Sample Date			07/23/1968	08/28/1928	05/19/1975	10/11/1994	10/11/1994	07/25/1968	08/04/1978	08/04/1978
Sample Length					422 ft					
Mean Width (ft)										
Common Name	Classification*	State Status	Number **	Number **	Number **	Number **	Number **	Number **	Number **	Number **
Largescale stoneroller	Intolerant			+						
Central stoneroller	Intolerant			99			+		6	6
Stonerollers (unsp)	Intolerant		+		99			+	32	5
Horneyhead chub	Intolerant		+	21	19	+	+	+	13	19
Southern redbelly dace	Intolerant			8	13				4	4
Blacknose dace	Intolerant				10		2		7	6
Stonecat	Intolerant		+		9					
Slender madtom	**Intolerant**	**Endangered**			**2**					
Rainbow darter	Intolerant		+		14			+		
Fantail darter	Intolerant				6	+	+			
Banded darter	Intolerant		+	1	23	+	+	+		
Blackside darter	Intolerant			1		+	+			
Blackchin shiner	Intolerant									
Blacknose shiner	Intolerant					+				
Rosyface shiner	Intolerant		+	41	61	+	+	+		5
Golden redhorse	Intolerant		+		28	+	1			
Shorthead redhorse	Intolerant					+	1			
Sand shiner	Tolerant			7	40	+	+		21	5
Golden shiner	Tolerant									
Common shiner	Tolerant		+	99	99	+	+	+	99	99
Bluntnose minnow	Tolerant		+	5	56	+	+	+	38	4
Johnny darter	Tolerant					+	+	+		
Creek chub	Tolerant		+	90	9	+		+	5	
White sucker	Tolerant		+	2	61		+	+		1
Northern hogsucker	Tolerant		+	2	2			+		
Brook stickleback	Tolerant		+	15					2	
Spotfin shiner	Tolerant								2	
Bigmouth buffalo	Very Tolerant									
Quillback carpsucker	Very Tolerant				7					
Central mudminnow	Very Tolerant			2						
Common carp	Very Tolerant		+		8					
Fathead minnow	Very Tolerant									
Ozark minnow	**-**	**Threatened**		**33**	**22**	+	**40**		**12**	**15**
Bigmouth shiner	-		+		23			+	60	10
Suckermouth minnow	-		+	1	3		1		2	
Brassy minnow	-							+		
Pumpkinseed	Sport					+	1			
Bluegill	Sport		+							
Green sunfish	Sport		+		2		+		1	
Yellow bullhead	Sport					+	2			
Smallmouth bass	Sport		+	5	4	+	84	+		

Table 2. Fish [illegible]tribution Summary for Little Turtle Creek								
River Mile			9.7	14.1	14.3	14.5	14.7	
Location T,R,S,1/16,1/4			1,14,14,SE,SE	1,14,36,NE,NE	1,15,31,NW,NW	1,15,31,NE,NW	1,15,31,SW,NE	
Sample Date			05/19/1975	05/19/1975	03/29/1999	05/03/1996	09/29/1992	
Sample Length			370 ft	317 ft	300 m	152 m	137 m	
Mean Width (ft)			12 ft	5 ft	2 m	2 m	2 m	
Common Name	Classification*	State Status	Number **	Number **	Number **	Number **	Number **	
Largescale stoneroller	Intolerant							
Central stoneroller	Intolerant		10					
Stonerollers (unsp)	Intolerant				34	6	4	
Horneyhead chub	Intolerant		94					
Southern redbelly dace	Intolerant		53	7	441	203	9	
Blacknose dace	Intolerant		1		18	6		
Stonecat	Intolerant		1					
Slender madtom	**Intolerant**	**Endangered**						
Rainbow darter	Intolerant							
Fantail darter	Intolerant							
Banded darter	Intolerant		3					
Blackside darter	Intolerant							
Blackchin shiner	Intolerant							
Blacknose shiner	Intolerant							
Rosyface shiner	Intolerant		11					
Golden redhorse	Intolerant							
Shorthead redhorse	Intolerant							
Sand shiner	Tolerant		4					
Golden shiner	Tolerant							
Common shiner	Tolerant		99	13	9			
Bluntnose minnow	Tolerant		5		30	3	9	
Johnny darter	Tolerant		11	3	95	76	49	
Creek chub	Tolerant		9	3	110	75	13	
White sucker	Tolerant		99	99	52	87	8	
Northern hogsucker	Tolerant							
Brook stickleback	Tolerant			39	50	37	31	
Spotfin shiner	Tolerant							
Bigmouth buffalo	Very Tolerant		1					
Quillback carpsucker	Very Tolerant							
Central mudminnow	Very Tolerant							
Common carp	Very Tolerant		6			1		
Fathead minnow	Very Tolerant			7	62	58	1	
Ozark minnow	**-**	**Threatened**	**99**					
Bigmouth shiner	-		5		74			
Suckermouth minnow	-							
Brassy minnow	-							
Pumpkinseed	Sport							
Bluegill	Sport							
Green sunfish	Sport		1					
Yellow bullhead	Sport							
Smallmouth bass	Sport		4					

Rock bass	Sport		+		1		+	+		
No. of native taxa	**40**		**19**	**17**	**24**	**17**	**21**	**15**	**15**	**13**
Total Catch			**n.a.**	**>432**	**>621**	**n.a.**	**n.a.**	**n.a.**	**>304**	**0.18**
* Classification based on Ball (1982)										
** "99" indicates a count of greater than or equal to 99. "+" indicates species as being present, no count specified.										

Rock bass	Sport		1					
No. of native taxa	**40**		**19**	**6**	**10**	**9**	**8**	
Total Catch			**>517**	**>171**	**975**	**552**	**124**	
* Classification based on Ball (1982)								
** "99" indicates a count of greater than or equal to 99. "+" in								

Sharon, Walworth County
Lower Rock River Drainage Basin

The effluent from the Sharon Wastewater Treatment Plant is discharged to Little Turtle Creek, which has a $_7Q_{10}$ of <0.01 cfs and a drainage area of 1.71 square miles. The stream originates just upstream of the treatment plant and flows west and then north to Turtle Creek, which is a tributary to the Lower Rock River. The stream flows in modified channel through open agricultural land, with intense farming occurring along its banks.

There are no other streams located in close proximity to Sharon.

Recommendations

The reach of Little Turtle Creek from above the treatment plant to the confluence with Ladd Creek shall be classified as a non-continuous agricultural stream. The reach of stream below the confluence with Ladd Creek to the confluence with Turtle Creek shall be classified as a continuous agricultural stream. Turtle Creek shall be classified as a continuous fish and aquatic life stream.

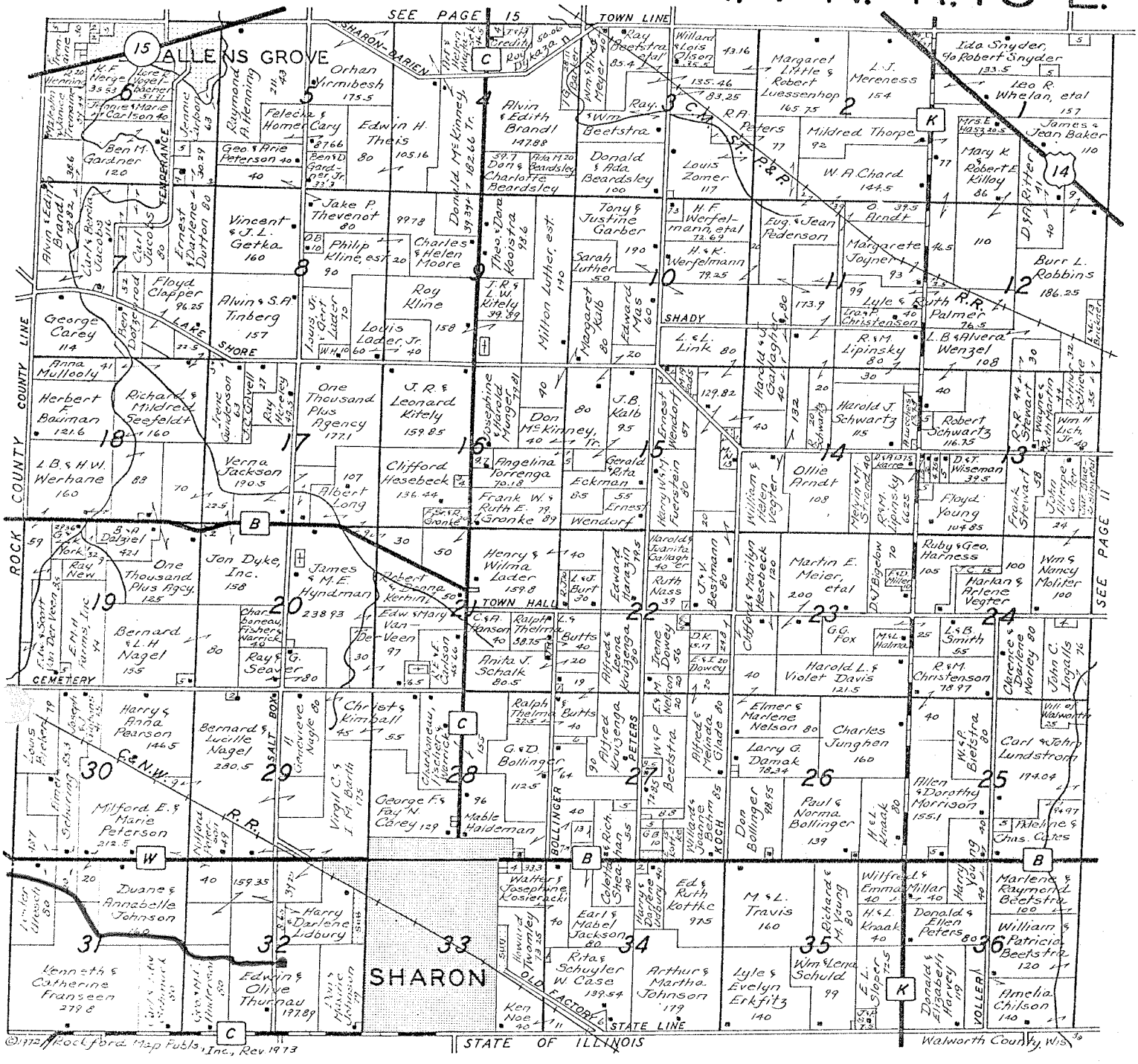
Little Turtle Cr., SHARON, WALWORTH CO.

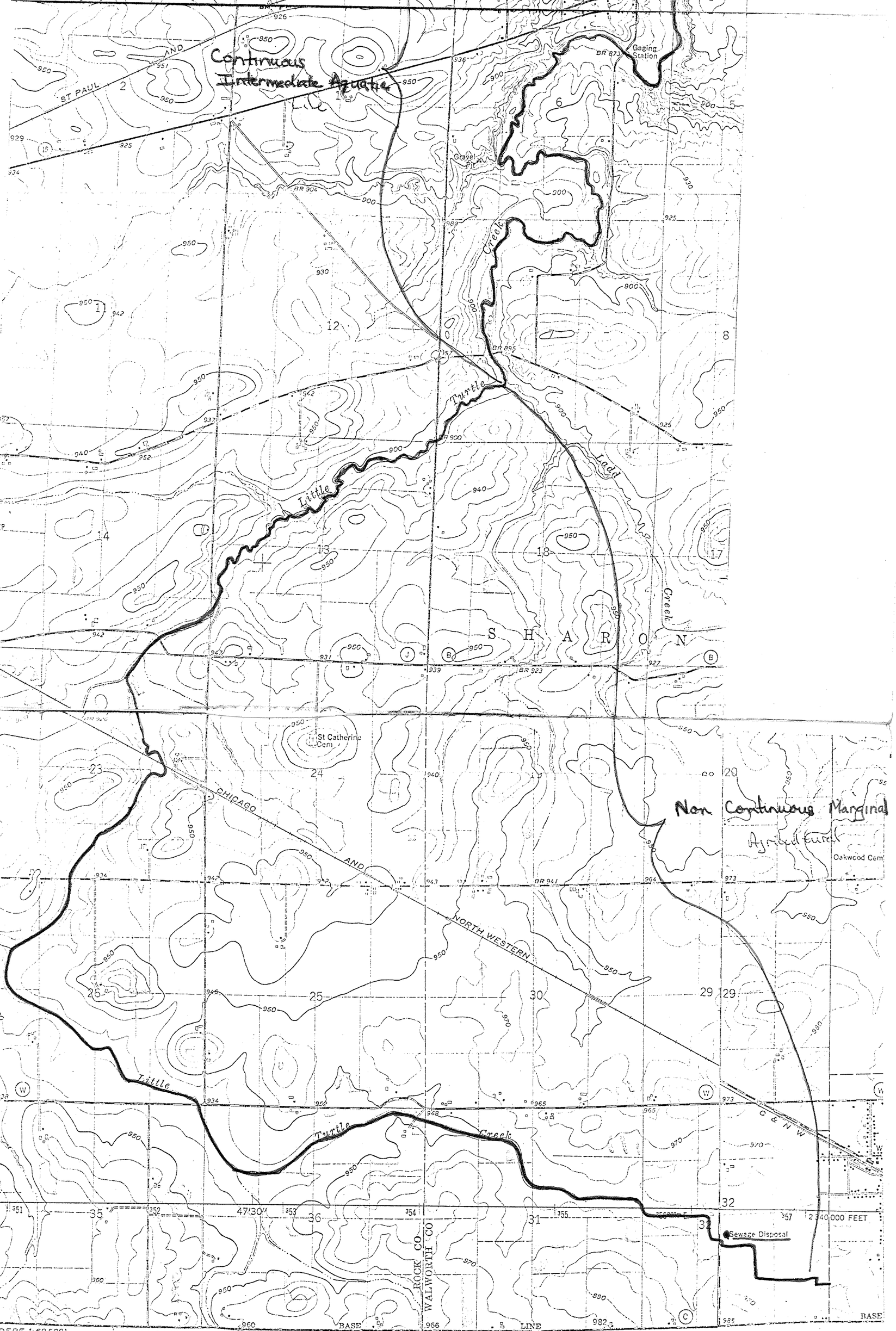
SOUTHEAST DISTRICT

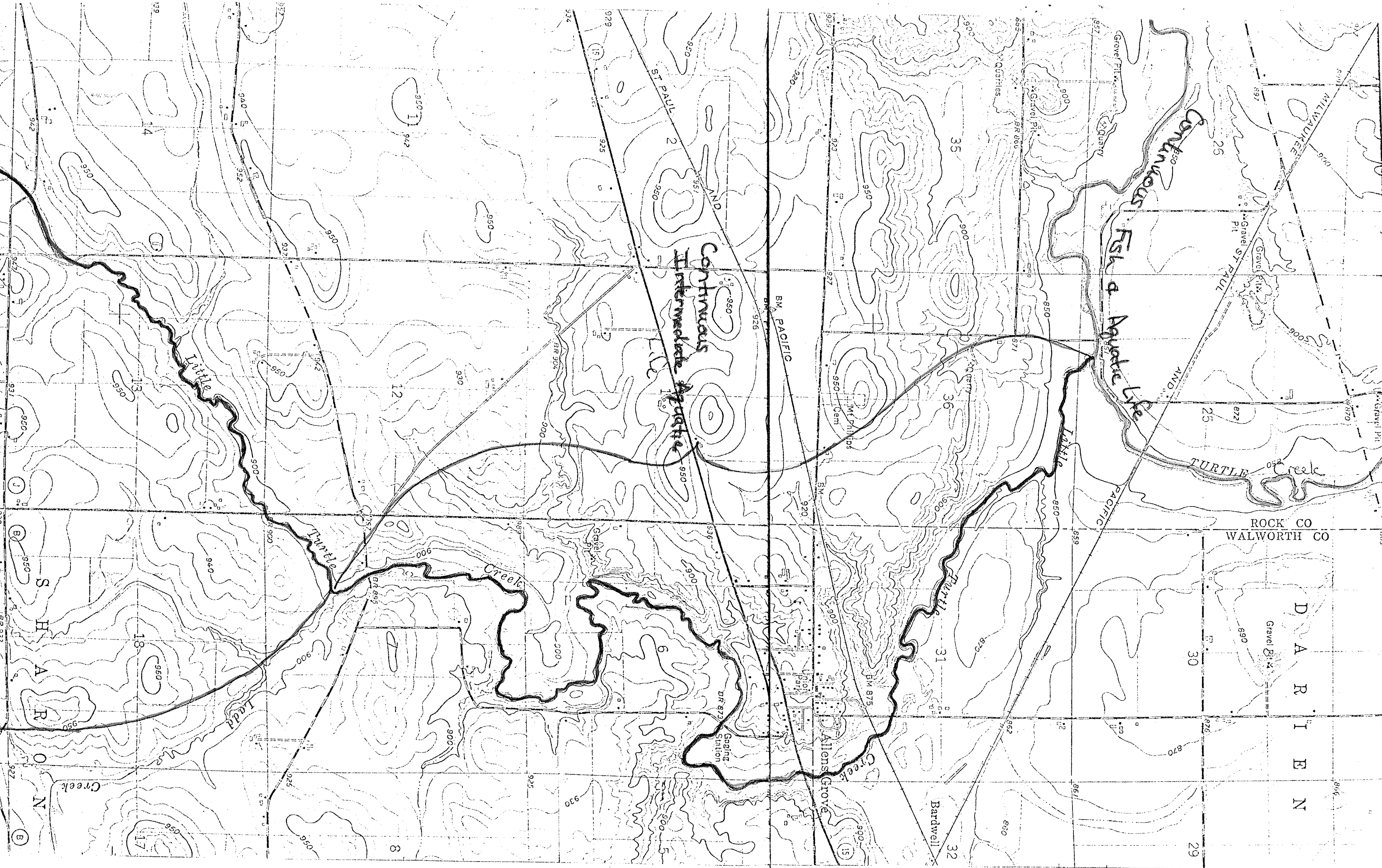
Surface Water (Facility Affected)	Reach Description	Hydrologic Classification	Applicable Criteria (1)	Effluent Limitations (2)
	LITTLE TURTLE CREEK ABOVE SHARON WWTP.	NON-CONT.	Agr.	
	L. TURTLE CREEK BELOW SHARON WWTP to WIS/ILL STATE LINE	NON-CONT to CONTINUOUS	Agr.	(B)

Turtle Creek:

SHARON T. 1 N.–R. 15 E.




Continuous Intermediate Aquatic
Non Continuous Marginal Agricultural Land
ST PAUL AND
CHICAGO AND NORTH WESTERN
Gaging Station
Gravel Pit
St Catherine Cem
Oakwood Cem
Sewage Disposal
Turtle Creek
Little Turtle Creek
Ladd Creek
S H A R O N
ROCK CO
WALWORTH CO
BASE LINE
R. 14 E. BOONE CO R. 15 E.
BLAINE 3.1 MI.
INTERIOR—GEOLOGICAL SURVEY, WASHINGTON, D. C.—1964
2 340 000 FEET
ROAD CLASSIFICATION
Heavy-duty
Light-duty
1 MILE
1 KILOMETER


Continuous Fish & Aquatic Life
Continuous Intermediate Aquatic Life
ST PAUL AND PACIFIC
MILWAUKEE
TURTLE Creek
Little Turtle Creek
Ladd Creek
ROCK CO
WALWORTH CO
SHARON
DARIEN
Allens Grove
Bardwell
Gaging Station

to Darien