

DATE: February 4, 2003

FILE REF: WIBC 15900

TO: 43rd Street Ditch (WIBC 15900) File

FROM: Will Wawrzyn SER

SUBJECT: Addendum to the Stream Classification and Stream Appraisal Report for the 43rd Street Ditch, Kinnickinnic River Watershed, Milwaukee River Basin, Milwaukee County

Purpose

The purpose of this memorandum is to re-evaluate the previously assigned Stream Classification recommendations for the 43rd Street Ditch¹.

Location of Waterbodies

The 43rd Street Ditch (WIBC 15900) is a 5800 foot long tributary to the Kinnickinnic River (WIBC 15100), Kinnickinnic River Watershed, Milwaukee River Basin in Milwaukee County. The 43rd Street Ditch discharges to the Kinnickinnic River in the SW1/4 of the NW1/4, Section 12, T6N, R21E² and its headwaters are located in the NW1/4 of the SE1/4, Section 2 T6N, R21E³. Most of the watersheds original land use consisted of wetlands, all of which have been drained and filled for urban land uses.

Discussion

Habitat in the 43rd Street Ditch is extremely limited by extensive hydrological modifications to its channel and supporting wetlands. The headwaters and lower reaches of the 43rd Street Ditch have been enclosed in storm sewer conduits, and only about 1200 feet flow through an earthen open-ditch before entering the enclosed storm sewer. Habitat in the open earthen channel is poor. Substrate is dominated by scoured clay and man-made debris, lack of habitat diversity, and shallow water depths. Banks are scoured and cover is generally lacking. Water and sediment quality is degraded by high-density urban runoff with connected imperviousness exceeding 50%. The scoured bank material includes what appears to be slag. The approximately 4600 feet of enclosed stream reaches are buried under active and abandoned industrial land use, a state four-lane highway, and railroad yard.

The 43rd Street Ditch was previously classified as a *Limited Aquatic Life Community*. This biological use recognizes that the hydrological modifications and attendant impacts to the stream are culturally and technically irreversible. Day lighting the channel would require abandoning and relocating existing industrial and transportation land uses with limited return in resource biological and recreational values. Urban non-point sources of pollution would continue to be limiting in the near and long-term.

The Milwaukee Metropolitan Sewerage District (MMSD) is the agency charged with flood management throughout Milwaukee County. Since the mid-1960's the MMSD and local communities routinely practiced channelization, concrete lining and enclosure as the means for managing storm water and flood flows. More recently, it has been the MMSD's new found policy to consider removal of these structures

¹ 43rd Street Ditch. 1993. Revision to the 43rd Street Ditch Waterbody Classification, Wisconsin Department of Natural Resources, Southeast District.

² Reference United States Geological Survey 7.5 minute Greendale Quadrangle photo revised 1971 & 1976

³ Reference United States Geological Survey 7.5 minute Milwaukee Quadrangle photo revised 1971

whenever the concrete structures deteriorate to the point of needing major repairs or where removal can have a mitigating effect on flooding and habitat. Recent projects have been completed by the MMSD that involved the removal of over 4-miles of concrete invert lining in Lincoln Creek and lesser amounts to the bed and banks of the Menomonee River. While the MMSD has successfully mitigated the impacts of past hydrological modifications in other streams and watersheds, those efforts were made within the confines of adequate right-of-way and did not require relocating existing developments and large infrastructure. Where adequate right-of-way was available, the enhancements to the effected streams biological and recreational resource values were positive and measurable.

Conclusions and Recommendations

Since completion of the 1993 Stream Classification Report for the 43rd Street Ditch, in-stream and watershed conditions have not changed dramatically to the extent that they would necessitate revising the current biological use classification. Despite changes in local flood management policy and recent completion of flood management projects in other watersheds contained in the Milwaukee River Basin, there are no plans to day light or remove the concrete invert along the 43rd St. Ditch. Unlike some area streams where channel concrete liners and enclosures have been removed and other habitat enhancements were incorporated, the opportunities for similar hydrological restoration efforts for the 43rd St. Ditch appear unlikely due to right-of-way and existing infrastructure constraints.

Therefore, it is recommended that 43rd Street Ditch stream classification remain a **Limited Aquatic Life Community**.

ROW Detailed Information

Click [here](#) for Metadata regarding this page.

WBIC: 15200

Waterbody Name: 43RD STREET DITCH

Local Name:

Waterbody Type: River/Stream

Basin: Milwaukee River

County: Milwaukee

Location Data at Mouth

| TOWN | RANGE | SEC | Q SEC | QQ SEC | QQQ SEC | QQQQ SEC |
|------|-------|-----|-------|--------|---------|----------|
| 06 | 21E | 12 | SE | SE | | |

Size For Total Waterbody

| STREAM LENGTH MILES | LAKE ACRES | SHORELINE LENGTH mi |
|---------------------|------------|---------------------|
| 4.1 | 0 | 0 |

Other Data

| 1st Dwnstrm WBIC | 1st Dwnstrm Name | USGS Hydro Code | Landlocked | Status |
|------------------|------------------|-----------------|------------|--------|
| | | 4040003 | | Exist |

County info comes from County Surface Water Publications. The following is county characteristic data, it applies to the county segment of the waterbody.

County: Milwaukee

Location at County Border

| TOWN | RANGE | RANGE DIR | SEC | Q SEC | QQ SEC |
|------|-------|-----------|-----|-------|--------|
| 06 | 21 | E | 12 | SE | SE |

Size of Waterbody for County Segment

| MAX DEPTH FT | % BELOW 20 FT | % ABOVE 3 FT | SHORELINE LENGTH mi |
|--------------|---------------|--------------|---------------------|
| 1 | 0 | 99 | 8.2 |

County Segment Characteristic Data

| WATERSHED AREA mi2 | OUTLET FLOW cfs | PUBLIC FRONTAGE mi | DRAINAGE AREA mi2 | ADJOINING WETLANDS acres | % GRAV EL | % ROC K | % MUC K | % SAN D | % DRAINAGE WILD |
|--------------------|-----------------|--------------------|-------------------|--------------------------|-----------|---------|---------|---------|-----------------|
| 10 | 100 | 0 | 4 | 0 | 40 | 10 | 40 | 10 | 0 |

Date 12/13/2001

Facility Name MAYNARD STEEL

Receiving Water KINNICKINNIC RIVER, MILWAUKEE CO,
(WIBC = 15100)

Evaluated by WARREN, WILLIAM 1994

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. LAL

REVISE
"UPSTREAM OF 6TH ST IN THE NWSE T6N R22E
S.8 TO ITS HEADWATERS"

Other (please explain)

CORRESPONDENCE/MEMORANDUM

Date: February 28, 1994

File Ref: 3200

To: Joe Ball WR/2

From: Will Wawrzyn WR/SEH

Subject: Water Resource Management Appraisals and Standards Reviews for the Kinnickinnic River Watershed

Attached please find copies of water resource Appraisals and Standards Review for the Kinnickinnic River Watershed. Stream classifications were originally developed for these waterbodies in 1984 as part of the bound report titled Kinnickinnic River Watershed - Volume 3 Potential Stream Uses. These stream classification were prepared as part of the Milwaukee River Basin - MMSD Service Area Standards Reviews. A bound folder of these reports is available in both the SED and central office library. Please append the original bound documents with these latest versions.

Only one stream classification has been revised since 1993 as a result of portions of the concrete invert being removed from the Wilson Park Creek channel. Changes are as follows:

1984, Kinnickinnic River Watershed - Volume 3 Potential Stream Uses
Wilson Park Creek
Marginal Use Class E per NR 102 and NR 104

1993, Appraisal and Standards Review
Wilson Park Creek

1. All concrete lined and enclosed channel reaches shall be classified as Limited Aquatic Life
2. All earthen channel reaches located upstream and downstream of the I-94 overpass shall be classified as a Limited Forage Fish Community per NR 102 and NR 104.

I have not included any additional references (maps, photos or text) for the reports. References attached to the 1984 document have not changed.

Please call me if you feel additional information is needed or revisions are necessary.

c: Sharon Gayan WR/SEH
Pat Trochell WR/2
Kent Taylor WR/2

**South 43rd Street Ditch Stream Classification
Kinnickinnic River Watershed
from Richard Randall, 1984
Water Resource Management
Southeast District
Revised February, 1993**

Introduction

The South 43rd Street Ditch is a small tributary of the Kinnickinnic River with a drainage area of 1.7 sq. miles. The stream originates from a storm sewer outfall in Sec. 2, T6N, R21E in the city of West Milwaukee and flows for 1.1 miles. The stream drains major industrial and high density residential areas. A majority of the watershed is located upstream of the open stream channel and is drained by an extensive storm sewer system with eight known outfalls. Eleven industries discharge cooling and treated process waste water to the South 43rd St. Ditch directly or via storm sewers and there are seven sanitary sewer flow relief devices and one sanitary sewer by-pass.

Habitat Evaluation

The entire stream is channelized and a 0.3 mile section above the confluence with the Kinnickinnic River has been enclosed. Immediately upstream of the confluence there is a drop structure. Above this point the stream substrates are natural. No attempt has been made to identify additional channel modifications since 1984.

No Q7,10 data is available for the South 43rd St. Ditch, however flow is continuous throughout the year due to industrial discharges. From the storm sewer outfall downstream to the concrete channel the average width of the stream is 4-8 feet and the average depth is 0.2-0.6 feet, with greater depths in a few isolated pools. The substrates are primarily gravel, sand, and silt, however there are areas of deposition with appear to be foundry sand and slag. The stream channel is also cluttered with debris from the adjacent industries yards. Stream bank erosion and scouring of the bottom sediments is significant during storm events. The vegetation is scarce along the lower banks with the upper banks being dominated by shrubs and trees.

Habitat in the stream is rated poor using the Stream System Habitat Rating form due to channel modifications, inadequate depths, bank erosion, scour, and urban nonpoint sources.

Biological

A benthic macroinvertebrate sample was collected in May of 1984 in a riffle area at Electric Avenue. This sample results are reflective of the water quality impacts including urban nonpoint sources, industrial effluent and sanitary sewer discharges, and a

history of petroleum-like spills. The sample consisted entirely of *Oligocheata* spp. indicating very poor water quality.

No fish data are available for the South 43rd St. Ditch, however a majority of the stream habitat is unsuitable for fish and upstream movement of fish from the Kinnickinnic River is limited by the drop structure and enclosures. During several visits to the stream no fish and only a few turtles were observed.

Water Quality

Chemical data on the S 43rd St. Ditch is limited to one base flow sample collected October 22, 1975 above the confluence with the Kinnickinnic River as part of the Milwaukee County Rivers Basin Report. The sample met state water quality standards and recommended EPA criteria for all analyzed parameters. A sediment sample collected February 10, 1976 as part of the study was heavily polluted by lead, zinc and also contained PCB's.

Although most effluent are primarily non-contact cooling water, discharges of oil and grease are routinely observed from a few storm sewer outfalls. Prior to enclosure, reports of oily spills were frequent. Oily discharges observed in the Kinnickinnic River have been traced to the 43rd St. outlet. Industrial landfills consisting of foundry sands, slag balls, and scrap metal may be a contributor to groundwater and surface water pollution.

Aesthetic and Recreational Use

The stream does not contribute aesthetically to the highly developed watershed and is considered to be little more than an open sewer due to the number of industrial, sanitary and storm sewer discharges, and debris.

The recreational use potential of the South 43rd St. Ditch is limited by its small size, low-flow, poor water quality, and severe channel modifications. Although the South 43rd St. Ditch is not expected to support any recreational use activities in its present condition, it is recommended that its recreational use classification be partial body contact, primarily to support and protect for viable recreational uses for other waterbodies located downstream.

Conclusions and Recommendations

Habitat in the South 43rd St. Ditch is limited by concrete channels, bank erosion, deposition, and scouring of the channel. Urban nonpoint sources, spills, sanitary sewer overflows, and potential industrial discharges limit the biological community which consists of very tolerant Oligochaeta spp. A few isolated areas provide some habitat, however major channel modifications severely limit the overall stream potential. Elimination of sanitary sewer relief devices and by-passes, abatement of nonpoint sources of pollution, spills and illegal discharges will improve water quality in the Kinnickinnic River and estuary.

The South 43rd St. Ditch does not have the potential to support fish populations due to the extent of the concrete channel and lack of habitat in the remaining areas. It is recommended that the stream be classified as **Limited Aquatic Life** per NR 102 and NR 104. These streams are capable of supporting very limited and very tolerant community of macroinvertebrates and an occasional very tolerant fish.

References

Ball, Joseph. 1982. Stream Classification Guidelines for Wisconsin. WDNR Technical Bulletin. Madison, Wisconsin.

Hilsenhoff, William, A. 1982. Using a Biotic Index to Evaluate Water Quality in Streams. WDNR Technical Bulletin No. 132. Madison, Wisconsin.

SEWRPC. 1978. A Comprehensive Plan for the Kinnickinnic River Watershed. Planning Report No. 32.

WDNR. 1977. Milwaukee County Rivers Basin Report. Water Resource Management, Southeast District.

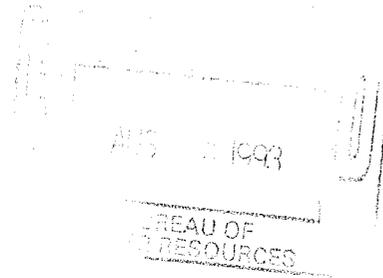
CORRESPONDENCE/MEMORANDUM

Date: July 30, 1993

File Ref: 3200

To: Joe Ball WR/2

From: Will Wawrzyn WR/SEH



Subject: Water Resource Management Appraisals and Standards Reviews for the Kinnickinnic River Watershed

Attached please find copies of water resource Appraisals and Standards Review for the Kinnickinnic River Watershed. Stream classifications were originally developed for these waterbodies in 1984 as part of the bound report titled Kinnickinnic River Watershed - Volume 3 Potential Stream Uses. These stream classification were prepared as part of the Milwaukee River Basin - MMSD Service Area Standards Reviews. A bound folder of these reports is available in both the SED and central office library. Please append the original bound documents with these latest versions.

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1984, Kinnickinnic River Watershed - Volume 3 Potential Stream Uses
Wilson Park Creek
Marginal Use Class E per NR 102 and NR 104

1993, Appraisal and Standards Review
Wilson Park Creek

1. All concrete lined and enclosed channel reaches shall be classified as Limited Aquatic Life
2. All earthen channel reaches located upstream and downstream of the I-94 overpass shall be classified as a Limited Forage Fish Community per NR 102 and NR 104.

I have not included any additional references (maps, photos or text) for the reports. References attached to the 1984 document have not changed.

Please call me if you feel additional information is needed or revisions are necessary.

c: Sharon Gayan WR/SEH
Pat Trochell WR/2
Kent Taylor WR/2

South 43rd Street Ditch

Stream Classification: Limited Aquatic Life

Limiting Factors: Water quality
 Loss of habitat
 Contaminated sediment (metals)
 Aesthetics and recreational use
 Limited fish, aquatic life and wildlife communities

Sources: Urban nonpoint sources of pollution
 Channelization and enclosure
 Sanitary sewer overflows
 Chronic spills

Holmes Avenue Creek

Stream Classification: Limited Aquatic Life

Limiting Factors: Water quality
 Loss of habitat
 Aesthetics and recreational use
 Limited fish, aquatic life and wildlife communities

Sources: Urban nonpoint sources of pollution
 Channelization and enclosure
 Sanitary sewer overflows
 Chronic spills

Lyons Park Creek

Stream Classification: Limited Aquatic Life

Limiting Factors: Water quality and quantity
 Loss of habitat
 Aesthetics and recreational use
 Limited fish, aquatic life and wildlife communities

Sources: Urban nonpoint sources of pollution
 Channelization and enclosure
 Sanitary sewer overflows
 Chronic spills

Wilson Park Creek

Stream Classification: Limited Aquatic Life (all concrete lined and enclosed reaches)
Limited Forage Fish Community (earthen channel reaches
upstream and downstream of I-94 overpass and upstream of airport)

Limiting Factors: Water quality and quantity
Loss of habitat
Contaminated sediment (metals and PCBs)
Aesthetics and recreational use
Limited fish, aquatic life and wildlife communities

Sources: Urban nonpoint sources of pollution
Channelization and enclosure
Sanitary sewer overflows
Chronic spills

Cherokee Creek

Stream Classification: Limited Aquatic Life

Limiting Factors: Water quality and quantity
Loss of habitat
Aesthetics and recreational use
Limited fish, aquatic life and wildlife communities

Sources: Urban nonpoint sources of pollution
Channelization and enclosure

Kinnickinnic River and Estuary

Stream Classification: Limited Aquatic Life (upstream of 6th St.)
Warm Water Sport Fish Community (downstream of 6th St. to
confluence with the Milwaukee River)

Limiting Factors: Water quality and quantity
Loss of habitat
Contaminated sediment
Fish Consumption advisory
Aesthetics and recreational use
Limited fish, aquatic life and wildlife communities

Sources: Urban nonpoint sources of pollution
Channelization and enclosure
Sanitary sewer overflows
Combined sewer overflows
Chronic spills

Villa Mann Creek

Stream Classification: Limited Aquatic Life

Limiting Factors: Water quality and quantity
 Loss of habitat
 Aesthetics and recreational use
 Limited fish, aquatic life and wildlife communities

Sources: Urban nonpoint sources of pollution
 Channelization and enclosure

While the biological use and recreational use is very limited for these waterbodies, consideration must be given to protecting and enhancing these uses in downstream reaches of the watershed and basin, specifically the Milwaukee Harbor Estuary and Lake Michigan. As such, the development of future water resource management objectives need to consider those already adopted or proposed for the Estuary and Lake Michigan.

Kinnickinnic River Standards Review
Kinnickinnic River Watershed
from Richard Randall, 1984
Water Resource Management
Southeast District
Revised February, 1993

Introduction

The Kinnickinnic River drains 24.8 square miles and is a major tributary of the Milwaukee Inner Harbor Estuary (Figure). The river originates from a storm sewer outfall at 60th St. in Sec. 11, T6N, R21E and flows 8.0 miles before discharging to the Milwaukee River 0.3 miles above Lake Michigan. The lower 2.5 miles of the Kinnickinnic River lying below Chase St. form part of the estuary. The river drains predominantly high density residential, commercial and industrial areas, and to a lesser extent county parks. Tributaries of the Kinnickinnic River include Lyons Park Creek, the South 43rd St. Ditch, and Wilson Park Creek.

Approximately 18 percent of the watershed is included in the combined sewer overflow area with 23 CSO outfalls located primarily downstream of 13th St. and the estuary area (Figure). There are an additional 29 known sanitary flow relief devices in the watershed. A total of 47 known industries discharge primarily non-contact cooling water to the stream directly or via tributaries and storm sewers (Table 1). The entire watershed is drained by an extensive storm sewer system with 92 outfalls.

The Kinnickinnic River is currently classified non-continuous, urban above 5th St. and continuous full fish and aquatic life downstream of 5th St. There is a variance for dissolved oxygen of 2 mg/l and for fecal coliform of 1000 per 100 ml as a monthly geometric mean or 2000 per 100 ml in more than 10 percent of the monthly samples.

Habitat Evaluation

Sections of the Kinnickinnic River have been extensively modified to reduce flooding in the watershed. The natural stream channel has been replaced by a concrete channel and sidewall in a 3.5 mile section from 400 ft below 6th St. upstream to the confluence with the South 43rd St. Ditch. There is a 650 ft underground conduit adjacent to Jackson Park and several drop structures in the concrete channel.

The low flow Q7,10 for the Kinnickinnic River in the concrete channel at both 7th and 27th St. is 3.8 cfs. A significant amount of base is from the South 43rd St. Ditch and Wilson Park Creek due to effluent discharges and interception of groundwater via storm sewers. The estimate does not represent the true base flow. The mean discharge in river above the estuary is

approximately 25 cfs and the maximum recorded discharge was over 4,400 cfs prior to USGS water year 1983.

Average width of the stream in the concrete channel varies from 3 to 15 ft depending on the slope and shape of the channel. The average depth also varies from 0.1 to 0.5 ft. Depths are usually adequate enough for fish to move through the channel, however the stream can freeze-up in winter. The drop structures in the channel also prohibit fish from migrating upstream. There are no pools in the concrete channel and the available habitat is severely limited due to the lack of all forms of cover. Growth of filamentous algae in the channel provide some habitat, however this is usually temporary due to scouring of the channel during storm events.

The Stream System Habitat Rating Form is not applicable for concrete channels, however the available habitat can only be rated as very poor. The concrete section can support temporary populations of very tolerant macroinvertebrates but probably only an occasional fish because of the high velocities and lack of cover.

The remaining 1.7 miles of stream above the confluence with the South 43rd St. Ditch and the concrete section are contained in an earthen channel. The stream in this area conveys primarily storm water and at times may cease to flow or freeze-up in winter. The average width varies from 2 to 8 ft and the average depth varies from 0.1 to 1.0 ft. There are a few pool areas, and there is usually only a diffuse flow in the riffles between pools. The pools are located primarily below storm sewer outfalls and deadfalls where the channel has been scoured. Bottom substrates are primarily gravel, sand, and silt with areas of significant deposition. Bank erosion is very severe in this section. Most of the banks are eroded more than 4 ft above the bottom channel and many of the storm sewers have been eroded back more than 10 ft. Vegetation is scarce along the lower bank. Upper banks are dominated by shrubs and trees.

Habitat in this section is rated poor using the Stream System Habitat Rating Form due to inadequate depths, bank erosion, scour, deposition, and urban runoff. The available habitat can support tolerant macroinvertebrates. A viable fish community is generally lacking due to deficient habitat. A six foot drop structure between the concrete channel and this natural section prohibits any fish from moving upstream even during high flow periods.

Where the concrete channel ends below 6th St., the stream flows for about 0.3 miles before entering the estuary near Chase St. Water depth and quality and quantity of cover between the free-flowing stream and the estuary is dependent on the backwater effect of Lake Michigan. Immediately below the concrete channel the average stream width increases to 40 ft and the depths increase from 0.3 ft to about 5 ft near Chase St. Substrates are

primarily gravel and sand with an increase of silt deposition near Chase St. The dominate bank cover is shrubs and trees. In-stream cover is provided by woody and man-made debris. Bank erosion is common because of the high velocities and frequent over bank flows.

Habitat in this transition zone is rated good using the Stream System Habitat Rating Form. The habitat is limited by scouring during events and is capable of supporting a more balanced population of fish and aquatic life including most species indigenous to the estuary.

The lower 2.5 miles of the Kinnickinnic River form part of the estuary. The estuary has unique characteristics including multi-dimensional flows, stage fluctuations, and thermal stratification due to it's depth and hydraulic connection with Lake Michigan. In 1907 a flushing tunnel was constructed on the Kinnickinnic River at Chase St. which diverts water from the outer harbor to flush pollutants from the estuary and increase dissolved oxygen levels. The pump is rated at 410 cfs and is currently operated by the Milwaukee Metropolitan Sewerage District (MMSD) on a flexible schedule.

The width of the stream in the upper estuary increases from about 100 ft at the flushing tunnel, to about 200 ft above the inner harbor. The inner harbor area is about 650 ft wide and extends for about one mile including the area known as the Kinnickinnic Turning Basin. The average depths increase from 5 ft at Chase St. to about 15 ft below Becher St. From approximately Kinnickinnic Ave. downstream including the inner harbor, the depths are maintained at about 25 ft for navigation. The bottom sediments in the estuary are dominated by thick deposits of silt. From Chase St. downstream to Becher St. trees and shrubs dominate along the banks, and erosion is minimal. Downstream of Becher St. the natural banks have been replaced by steel retaining walls for docking commercial ships and smaller recreational crafts.

The Stream System Habitat Rating Form is not applicable for the estuary area because the habitat characteristics are similar to a lake. Currently the quality and texture of bottom substrates within the estuary area can only support very tolerant invertebrates and are unsuitable for the natural reproduction of most fish species. However, the estuary area does support a diverse fishery including cold water species because of the increased depths and the hydraulic connection with Lake Michigan. Although the upstream channel modifications have eliminated most spawning areas of certain species the transition area between the estuary and concrete channel does provide some spawning habitat.

Biological

Benthic macroinvertebrate information for the Kinnickinnic River is limited to the areas immediately downstream and upstream of

the concrete channel. The most recent samples were collected at four sites during June of 1992. Sites were located at 43rd St., 52nd St. and Kinnickinnic R. Parkway and Forest Home Ave. The community was dominated by oligochaeta and Chironomidae and a small population including, Physca sp., Hirudinea, Odonata and Simuliidae. All samples results were indicative of degraded environmental quality.

Benthic macroinvertebrate samples collected in May of 1984 in a riffle area above 43rd St. The most abundant arthropod collected for calculating the Hilsenhoff Biotic Index was Cricotopus spp. resulting in a HBI value of 3.76 indicating poor water quality. The sample was low in diversity and dominated by very tolerant organisms including oligochaeta. These results are similar to a sample collected in 1975 at the same location which also was dominated by oligochaeta. These later benthic samples also indicated very degraded environmental quality.

Benthic samples were collected from a riffle area downstream of the concrete channel near 6th St. in November 1977 and October 1978. Both samples were low in diversity and dominated by very tolerant oligochaeta. HBI values calculated for these two samples indicated poor water quality.

Urban runoff, low flow, hydraulic scour, spills, degraded cover, combined sewer overflows and less frequent sanitary sewer overflows are all likely contributors to the degraded invertebrate community.

Although no qualitative or quantitative biological data are available for sections of the concrete channel, very tolerant chironomidae have been observed in the filamentous algae growths along the banks. These populations are insignificant and only temporary due to the scouring of the channel. No recent benthic data is available for the lower Kinnickinnic River estuary. Oligochaeta were the dominant organism observed in sediment samples, however no qualitative or quantitative studies were conducted. The organic fine textured sediments found throughout the estuary are enriched with heavy metals, PCBs and PAHs will support only very tolerant organisms.

Fishery

A comprehensive fishery survey in the estuary was conducted by fish management from March 28, to October 4, 1983. Twenty-three species of fish were caught during the survey with the most abundant being white suckers, followed by black bullheads, rainbow trout, and carp (Table 2). Fourteen of the species collected are classified as sport fish including 5 species of cold water sport fish. Five northern pike were caught on March 29, 1984 including a ripe spawning female. This indicates that northern may be attempting to utilize the lower river and estuary for spawning purposes. A young-of-the-year yellow perch was caught in fall at the same time small perch were found in the

Menomonee River. This suggest that juvenile perch may be utilizing the estuary area.

With the exception of spring and fall trout and salmon runs, there was little movement of fish between the rivers and harbor based on fin clipping studies.

No fish data are available for the concrete sections of the Kinnickinnic River. During the only survey conducted above the concrete channel no fish were caught or observed indicating very degraded environmental quality.

Water Quality

A primary monitoring station upstream of the estuary at 7th St. provides 9 years of ambient water quality. State water quality standards and recommended EPA criteria for dissolved oxygen, nutrients, solids, and heavy metals are routinely met during base flow conditions. Only fecal coliform bacteria routinely exceeded the state standard. Samples from this station are collected randomly. Most sample periods occurred during base flow and do not reflect the full impact of urban runoff, sanitary sewer overflows, or toxic spills.

Similar results were observed in samples collected during low flow conditions for the 1975-1977 Milwaukee County Rivers Basin Report. During wet weather flows, however, nutrients, fecal coliform, and heavy metals were observed to be an order of magnitude greater than base flow conditions.

Numerous studies documenting water quality in the Kinnickinnic River estuary have been conducted and are summarized in the Milwaukee Harbor Estuary. The Milwaukee Metropolitan Sewerage District maintains an extensive surface water quality monitoring program along the upper river and estuary. These data were not analyzed for this report.

As recent as 1981 PCB's were being discharged into the Kinnickinnic River from two industries. A sample of "non-contact" cooling water discharged from Badger Die Casting contained 110 ppb PCB and a sample from the Construction Division of Rexnord contained 1.0 ppb. Currently a majority of the discharges in the watershed are non-contact cooling water.

Bottom sediments in the Kinnickinnic River estuary are heavily polluted with metals, PCB's, PAHs, and oil and grease based on limited 1980 sediment results. PCBs were 4.6 and 5.7 mg/kg near Chase St. and Baran Park, respectively. The highest concentrations of pollutants occur in the inner harbor turning basin where a core sample from 1980 contained 73 mg/kg PCB. The results of an extensive organic pollutant (PAHs, PCBs inc. congeners, and pesticides) sediment study for the entire Milwaukee River Estuary was completed by the Milwaukee

Metropolitan Sewerage district and Dr. Eric Christensen of UW-Milwaukee and are not summarized for this report.

A single sample collected at 43rd St. in 1993 contained 33 mg/kg of total PAH and PCB concentration of 0.05 mg/kg as Aroclor 1254. PAHs exceeded Sediment Quality Objects for nine of the potential carcinogenic PAHs. These results are consistent with sediment PAH concentrations in other streams drained by urban land uses.

All fish tissue samples collected in 1983 from the Kinnickinnic River estuary exceeded the FDA PCB tolerance of 2 ppm. Mean concentrations ranged from 6.2 ppm for bluegills to 22 ppm for carp. Dieldrin, DDT, toxaphene, and mercury have also been detected in fish tissue. More recent fish tissue data is available but has not been summarized in time for this report.

Aesthetics and Recreational Uses

Extensive channel modifications and adjacent industrial and commercial areas detract from the aesthetic and recreational value of the Kinnickinnic River. Where the natural stream channel has been replaced by concrete the stream's aesthetic value has been virtually eliminated. A majority of the land along the stream is county owned which makes the entire stream accessible to children who occasionally use the stream for wading. Slippery silt, algae and especially wet concrete along channelized reaches make for dangerous conditions.

Above the concrete channel to its origin, the stream flows through a county park and wooded area. Severe bank erosion and washed out storm sewers limit the aesthetics in this area. This area is an environmental corridor and can be utilized as a wildlife and nature area. Storm water management and bank stabilization would enhance the area and protect downstream water quality.

The greatest recreational use potential occurs in the Kinnickinnic River estuary. The upper estuary below the concrete channel is currently being utilized by fishermen during the spring and fall trout and salmon runs. The lower estuary is used as a marina and boating area. Floating debris, septic odors, oil and grease, and industrial yards detract from the aesthetic value of this area.

Conclusions and Recommendations

The entire Kinnickinnic River upstream of the estuary has been extensively modified for the purposes of flood control. Habitat in a 3.5 mile section of stream has virtually been eliminated by the conversion of the natural channel to concrete. Above the concrete section the stream remains unchannelized, however the available habitat is limited by insufficient flow and severe bank erosion. Both these sections can support only the most tolerant

macroinvertebrates and only an occasional tolerant forage fish. Only the area downstream of the concrete channel and estuary provide habitat suitable for supporting a diverse fishery. Presently 23 species of fish utilize the lower river of which 14 are classified as sport fish including 5 cold water sport fish. The benthic macroinvertebrate community indicates very poor environmental quality and is dominated by very tolerant oligochaeta. Urban runoff, hydraulic scour, sanitary sewer overflows, CSO's, and spills all contribute to degraded water quality and the bottom sediments. Sediments are contaminated by PAHs, PCBs and metals. The concrete channel and adjacent land uses detract from the aesthetic value of the stream and recreational uses are impaired by unsanitary conditions and PCB contaminated fish.

The lower Kinnickinnic River supports cold and warm water sport fish and should remain classified as **Warm Water Sport Fish Community** per NR 102 from it's confluence with the Milwaukee River upstream to the start of the concrete channel below 6th St. Although the lower river supports salmonids, the habitat is unsuitable for the natural reproduction of these species and a cold water sport fish classification is not justified. The variance for dissolved oxygen and fecal coliform bacteria should be removed from NR 104.

From the start of the concrete channel to the origin of the Kinnickinnic River the available habitat is not capable of supporting most fish species. It is recommended that this reach be classified as **Limited Aquatic Life** per NR 102 and NR 104 capable of supporting a limited and very tolerant macroinvertebrate community and an occasional fish.

References

- Ball, Joseph. 1982. Stream Classification Guidelines for Wisconsin. WDNR Technical Bulletin. Madison, Wisconsin.
- Hilsenhoff, William. 1982. Using a Biotic Index to Evaluate Water Quality in Streams. WDNR Technical Bulletin No. 132
- Holey, Mark, E. 1984. Milwaukee Harbor Estuary Fish Survey and Toxic Substances Evaluation 1983. WDNR File Report, Southeast District.
- SEWRPC. 1978. A Comprehensive Plan for the Kinnickinnic River Watershed. Planning Report No. 32.
- SEWRPC. 1981. Study Design for the Milwaukee Harbor Estuary Comprehensive Water Resources Planning Program.
- WDNR. 1977. Milwaukee Counties Rivers Basin Report, Southeast District.

Table 1

WPDES Permitted Industrial Discharges in the
Kinnickinnic River Watershed

| | |
|----------------------------------|----------------------------|
| Ampco Pittsburgh Corp | Milw. Malleable Associated |
| Spring Atlantic Richfield Co | Milwaukee Spring Co |
| Barnes Grey Iron Work | Milwaukee Solvay Coke Co |
| Avis Rent A Car | Minerals Reclamation Corp |
| Barclay Foundry | Murphy Diesel Co |
| Briggs Stratton Corp | Pelton Casteel Inc |
| Briggs Stratton Foundry | Perfex Group |
| Caterpillar Tractor Corp | Pressed Steel Tank Co |
| De Paul Rehabilitation Hospital | Rexnord Inc |
| Froedtert Malt Corp | Rexworks Inc |
| General Electric Hotpoint | Scrub A Dub Car Wash |
| General Electric Medical-Systems | Southeastern Wisc Products |
| George J Meyer Manufacturing | Suburban Car Wash |
| Grebes Bakeries | St. Lukes Hospital |
| Heil Co | Teledyne Wisconsin Motors |
| Howmet Turbine Co | The Oil Gear Co |
| Industrial Cylinders Co | Thrifty Rent A Car |
| Kurth Malting Corp | Union Oil |
| Ladish Co | Union Oil Car Wash |
| Litton Industrial Products | Unit Drop Forge |
| Marc's Big Boy | UW Great Lakes Facility |
| Maynard Electric Steel | Wehr Steel Co |
| Gen. Mitchell Field | Wisconsin Gas Co |
| Willows Car Wash | |

Table 2

Total Fish Catch
 March 28, 1983 through October 4, 1983

| Species | Number | Classification |
|-----------------|--------|----------------|
| White Sucker | 225 | T |
| Black Bullhead | 82 | S |
| Rainbow Trout | 78 | S |
| Carp | 70 | VT |
| Alewife | 19 | - |
| Coho Salmon | 10 | S |
| Bluegill | 9 | S |
| Northern Pike | 8 | S |
| Black Crappie | 7 | S |
| Pumpkinseed | 5 | S |
| Golden Shiner | 5 | T |
| Green Sunfish | 3 | S |
| Goldfish | 3 | S |
| Brook Trout | 2 | S |
| Brown Trout | 2 | S |
| Chinook Salmon | 2 | S |
| Gizzard Shad | 2 | - |
| Common Shiner | 2 | T |
| Spottail Shiner | 2 | I |
| Yellow Perch | 1 | S |
| Largemouth Bass | 1 | S |
| Rock Bass | 1 | S |
| Goldfish x Carp | 1 | VT |
| Coho Salmon | 10 | S |

CORRESPONDENCE/MEMORANDUM

Date: July 30, 1993

File Ref: 3200

To: Joe Ball WR/2

From: Will Wawrzyn WR/SEH



Subject: Water Resource Management Appraisals and Standards Reviews for the Kinnickinnic River Watershed

Attached please find copies of water resource Appraisals and Standards Review for the Kinnickinnic River Watershed. Stream classifications were originally developed for these waterbodies in 1984 as part of the bound report titled Kinnickinnic River Watershed - Volume 3 Potential Stream Uses. These stream classification were prepared as part of the Milwaukee River Basin - MMSD Service Area Standards Reviews. A bound folder of these reports is available in both the SED and central office library. Please append the original bound documents with these latest versions.

Only one stream classification has been revised since 1993⁸⁴ as a result of portions of the concrete invert being removed from the Wilson Park Creek channel. Changes are as follows:

1984, Kinnickinnic River Watershed - Volume 3 Potential Stream Uses
Wilson Park Creek
Marginal Use Class E per NR 102 and NR 104

1993, Appraisal and Standards Review
Wilson Park Creek

1. All concrete lined and enclosed channel reaches shall be classified as Limited Aquatic Life
2. All earthen channel reaches located upstream and downstream of the I-94 overpass shall be classified as a Limited Forage Fish Community per NR 102 and NR 104.

I have not included any additional references (maps, photos or text) for the reports. References attached to the 1984 document have not changed.

Please call me if you feel additional information is needed or revisions are necessary.

c: Sharon Gayan WR/SEH
Pat Trochell WR/2
Kent Taylor WR/2

✓ **South 43rd Street Ditch**

Stream Classification: Limited Aquatic Life

Limiting Factors: Water quality
 Loss of habitat
 Contaminated sediment (metals)
 Aesthetics and recreational use
 Limited fish, aquatic life and wildlife communities

Sources: Urban nonpoint sources of pollution
 Channelization and enclosure
 Sanitary sewer overflows
 Chronic spills

✓ **Holmes Avenue Creek**

Stream Classification: Limited Aquatic Life

Limiting Factors: Water quality
 Loss of habitat
 Aesthetics and recreational use
 Limited fish, aquatic life and wildlife communities

Sources: Urban nonpoint sources of pollution
 Channelization and enclosure
 Sanitary sewer overflows
 Chronic spills

✓ **Lyons Park Creek**

Stream Classification: Limited Aquatic Life

Limiting Factors: Water quality and quantity
 Loss of habitat
 Aesthetics and recreational use
 Limited fish, aquatic life and wildlife communities

Sources: Urban nonpoint sources of pollution
 Channelization and enclosure
 Sanitary sewer overflows
 Chronic spills

accept area

Wilson Park Creek

Stream Classification: Limited Aquatic Life (all concrete lined and enclosed reaches)
Limited Forage Fish Community (earthen channel reaches upstream and downstream of I-94 overpass and upstream of airport)

Limiting Factors: Water quality and quantity
Loss of habitat
Contaminated sediment (metals and PCBs)
Aesthetics and recreational use
Limited fish, aquatic life and wildlife communities

Sources: Urban nonpoint sources of pollution
Channelization and enclosure
Sanitary sewer overflows
Chronic spills

north of airport

Cherokee Creek

Stream Classification: Limited Aquatic Life

Limiting Factors: Water quality and quantity
Loss of habitat
Aesthetics and recreational use
Limited fish, aquatic life and wildlife communities

Sources: Urban nonpoint sources of pollution
Channelization and enclosure

Kinnickinnic River and Estuary

Stream Classification: Limited Aquatic Life (upstream of 6th St.)
Warm Water Sport Fish Community (downstream of 6th St. to confluence with the Milwaukee River)

100' south of M.R.

Limiting Factors: Water quality and quantity
Loss of habitat
Contaminated sediment
Fish Consumption advisory
Aesthetics and recreational use
Limited fish, aquatic life and wildlife communities

Sources: Urban nonpoint sources of pollution
Channelization and enclosure
Sanitary sewer overflows
Combined sewer overflows
Chronic spills

Villa Mann Creek

Stream Classification: Limited Aquatic Life

Limiting Factors: Water quality and quantity
 Loss of habitat
 Aesthetics and recreational use
 Limited fish, aquatic life and wildlife communities

Sources: Urban nonpoint sources of pollution
 Channelization and enclosure

While the biological use and recreational use is very limited for these waterbodies, consideration must be given to protecting and enhancing these uses in downstream reaches of the watershed and basin, specifically the Milwaukee Harbor Estuary and Lake Michigan. As such, the development of future water resource management objectives need to consider those already adopted or proposed for the Estuary and Lake Michigan.

R. Johnson

Kinnickinnic River, Milwaukee County
Milwaukee River Drainage Basin

The Kinnickinnic River provides drainage for 26 square miles of east central Milwaukee County. The main stem originates in an urbanized area and flows intermittently approximately three miles through an altered channel before entering a concrete culvert at 43rd Street. The stream then flows four miles through an urbanized and industrialized area to a point downstream of 5th Street where the river has been dredged to allow navigation. The dredged channel runs 1.5 miles through an industrialized area to the Milwaukee Harbor.

The 43rd Street ditch is a tributary which drains a heavily industrialized area. The Wilson Park Tributary drains an urbanized area and general Mitchel Field, and enters the main stem near 30th Street. Both tributaries have been channelized and lined with concrete.

The majority of land adjacent to the main stem and tributaries is publicly owned. The river is subjected to rapid rises and falls in stage during rain events and snow melts. The majority of the flow upstream of 5th Street is contributed by waste water dischargers in dry weather.

The Kinnickinnic River downstream of 5th Street is an estuary of Lake Michigan. During periods of low flow, this section of the river is subject to stagnation and dissolved oxygen depletion. To alleviate this condition, a pumping station has been built near Chase Avenue, to flush the lower channel with water from Lake Michigan. Mixing with water in the harbor occurs to some extent as a result of lake seiches.

The fishery is limited to fall runs of salmonoids from Lake Michigan. The stream did not support a "balanced benthic macroinvertebrate community. A benthic macroinvertebrate sampling survey conducted in October, 1975 found sparse populations, indicating toxic materials had recently passed the following sites:

Main stem downstream of 6th Street
Main stem at 43rd Street
Wilson Park Tributary at Morgan Avenue

The substrate at all sites supported dense growths of filamentous algae.

Recommendations

The Kinnickinnic River upstream of 5th Street shall be classified as a noncontinuous urban stream. Downstream of 5th Street shall be classified as continuous fish and aquatic life.

7/11/00

Kinnickinnic River Reclassification
November 1984 by Richard Randall

Introduction

The Kinnickinnic River drains 24.8 square miles and is a major tributary of the Milwaukee Inner Harbor Estuary (Figure 1). The river originates from a storm sewer outfall at 60th St. in Sec. 11, T6N, R21E and flows 8.0 miles before discharging to the Milwaukee River 0.3 miles above Lake Michigan. The lower 2.5 miles of the Kinnickinnic River lying below Chase St. forms part of the estuary. The river drains predominately high density residential and industrial areas, and to a lesser extent commercial areas and county parks. Tributaries of the Kinnickinnic River include Lyons Park Creek, the South 43rd St. Ditch, and Wilson Park Creek.

About 18 percent of the watershed is included in the combined sewer overflow area with 23 CSO outfalls located primarily in the estuary. There are an additional 29 known sanitary flow relief devices in the watershed. A total of 47 known industries discharge primarily non-contact cooling water to the stream directly or via tributaries and storm sewers (Table 1). The entire watershed is drained by an extensive storm sewer system with approximately 92 outfalls.

The Kinnickinnic River is currently classified non-continuous, urban above 5th St. and continuous full fish and aquatic life downstream of 5th St. There is a variance for dissolved oxygen of 2 mg/l and for fecal coliform of 1000 per 100ml as a monthly geometric mean or 2000 per 100ml in more than 10 percent of the monthly samples.

Habitat Evaluation

Sections of the Kinnickinnic River have been extensively modified to reduce flooding in the watershed. The natural stream channel has been replaced by a concrete channel and sidewall in a 3.5 mile section from 400 ft below 6th St. upstream to the confluence with the South 43rd St. Ditch. There is a 650 ft underground conduit adjacent to Jackson Park and several drop structures in the concrete channel.

The low-flow Q7,10 for the Kinnickinnic River in the concrete channel at both 7th and 27th St. is 3.8 cfs. A majority of the flow is from the South 43rd St. Ditch and Wilson Park Creek due to effluent discharges and the estimate does not represent the true baseflow. The mean discharge in river above the estuary is 25 cfs and the maximum recorded discharge was over 4,400 cfs.

Average width of the stream in the concrete channel varies from 3 to 15 ft depending on the slope and shape of the channel. The average depth also varies from 0.1 to 0.5 ft. Depths are usually inadequate for fish to move through the channel and the stream can freeze-up in winter. Drop structures prohibit fish from migrating upstream during low flows. There are no pools in the channel and the available habitat is severely limited due to the lack of cover. Growths of filamentous algae in the channel provide some habitat, however this is usually temporary due to scouring of the channel during runoff events.

The Stream System Habitat Rating Form is not applicable for concrete channels, however the available habitat can only be rated very poor. The concrete section can support temporary populations of very tolerant macroinvertebrates but probably only an occasional fish because of the high velocities and lack of cover.

The remaining 1.7 miles of stream above the confluence with the South 43rd St. Ditch and the concrete section are unchannelized. The stream in this area conveys primarily storm water and at times may cease to flow or freeze-up in winter. The average width varies from 2 to 8 ft and the average depth varies from 0.1 to 1.0 ft depending on flow. There are a few pool areas, however there is usually only a diffuse flow in the riffles between pools. The pools are located primarily below storm sewer outfalls where the channel has been scoured. Bottom substrates are primarily gravel, sand, and silt with areas of significant deposition. Bank erosion is very severe in this section during storm events. Most of the banks are eroded more than 4 ft above the bottom channel and many of the storm sewers have been eroded back more than 10 ft. Vegetation is scarce along the lower channel and the upper banks are dominated by shrubs and trees.

Habitat in this section is rated poor using the Stream System Habitat Rating Form due to inadequate depths, bank erosion, scour, deposition, and urban runoff. The available habitat can support tolerant macroinvertebrates but probably no fish due to the insufficient depths and flow. A 6 ft. drop structure between the concrete channel and this natural section prohibits any fish from moving upstream even during high flow.

Where the concrete channel ends below 6th St., the stream flows for about 0.3 miles before entering the estuary near Chase St. The transition between a flowing stream and the estuary is dependant on the backwater effect of Lake Michigan. Immediately below the concrete channel the average stream width increases to 40 ft and the depths increase from 0.3 ft to about 5 ft near Chase St. Substrates are primarily gravel and sand with an increase of silt deposition near Case St. The dominate bank cover is shrubs and trees, however bank erosion is common because of the high velocities and over bank flows.

Habitat in this transition zone is rated good using the Stream

System Habitat Rating Form. The habitat is only limited by scouring during events and is capable of supporting a balanced population of fish and aquatic life

The lower 2.5 miles of the Kinnickinnic River forms part of the estuary. The estuary has unique characteristics including reverse flows, stage fluctuations, thermal stratification and currents due to the hydraulic connection with Lake Michigan. In 1907 a flushing tunnel was constructed on the Kinnickinnic River at Chase St. which diverts water from the outer harbor to flush pollutants from the estuary. The pumping mechanism is rated at 410 cfs and is currently operated by the Milwaukee Metropolitan Sewerage District (MMSD) on a flexible schedule.

The width of the stream in the upper estuary increases from about 100 ft at the flushing tunnel, to about 200 ft above the inner harbor. The inner harbor area is about 650 wide and extends for about one mile including the area known as the Kinnickinnic Turing Basin. The average depths increase from 5 ft at Chase St. to about 15 ft below Becher St. From approximately Kinnickinnic Ave. downstream including the inner harbor, the depths are maintained at about 25 ft for navigation. The bottom sediments in the estuary are dominated by thick deposits of muck over sand and clay. From Chase St. downstream to Becher St. trees and shrubs dominate along the banks, and erosion is minimal. Downstream of Becher St. the natural banks have been replaced by steel retaining walls for docking commercial ships and smaller recreational crafts.

The Stream System Habitat Rating Form is not applicable for the estuary area because the habitat characteristics are similar to a lake. Currently the bottom substrates within the estuary area can only support very tolerant invertebrates and are unsuitable for the natural reproduction of most fish species. However, the estuary area can support a diverse fishery including cold water species because of the increased depths and the hydraulic connection with Lake Michigan. Although the upstream channel modifications have eliminated most spawning areas of certain species the transition area between the estuary and concrete channel does provide some spawning habitat.

Biological

Benthic macroinvertebrate information for the Kinnickinnic River is limited to the areas immediately downstream and upstream of the concrete channel. The most recent sample was collected May 1, 1984 in a riffle area above 43rd St. The most abundant arthropod collected for calculating the Hilsenhoff Biotic Index was *Cricotopus* spp. resulting in a HBI value of 3.76 indicating poor water quality. The sample was low in diversity and dominated by very tolerant organisms including oligochaeta which are not included in the HBI. These results are similar to a sample

collected in 1975 at the same location which also was dominated by oligochaeta. The benthic community indicates that urban runoff, low flow, and possible sanitary bypasses are limiting water quality in this section.

Benthic samples were collected from a riffle area downstream of the concrete channel near 6th St. in November 1977 and October 1978. Both samples were low in diversity and dominated by oligochaeta. HBI values calculated for these two samples indicated poor water quality. The domination of very tolerant organisms indicates that urban runoff, sanitary bypasses, CSO's, industrial effluents, and toxic spills are affecting water quality and the bottom sediments.

Although no qualitative or quantitative biological data are available for sections of the concrete channel, very tolerant chironomidae have been observed in the filamentous algae growths along the banks. These population are insignificant and only temporary due to the scouring of the channel.

No recent benthic data is available for the the lower Kinnickinnic River estuary. Oligochaeta were the dominate organism observed in sediment samples, however no qualitative or quantitative studies were conducted. The soft mucky sediments found through out the estuary, inplace pollutants, and anaerobic conditions will support only very tolerant organisms.

A compherensive fishery survey in the estuary upstream to the concrete channel was conducted by fish management from March 28 to October 4, 1983. Twenty-three species of fish were caught during the survey with the most abundant being white suckers, followed by black bullheads, rainbow trout, and carp. (Table 2) Fourteen of the species collected are classified as sport fish including 5 species of cold water sport fish. Five northern pike were caught on March 29 including a ripe female. This indicates that northern may be utilizing the lower river for spawning. A young-of-the-year yellow perch was caught in fall at the same time small perch were found in the Menomonee River. This suggest that small perch are utilizing the estuary area duing the fall. With the exception of spring and fall trout and salmon runs, there was little movement of fish between the rivers and harbor based on fin clipping studies and toxic fish tissue data.

No fish data are available for the concrete sections of the Kinnickinnic River. During the only survey conducted above the concrete channel no fish were caught or observed. The only tributary to the Kinnickinnic River capable of supporting fish is Wilson Park Creek.

Water Quality

A primary monitoring station upstream of the estuary at 7th St.

provides 9 years of ambient water quality. State water quality standards and recommended EPA criteria for dissolved oxygen, nutrients, solids, and heavy metals are routinely met. Only fecal coliform bacteria routinely exceeded the state standard indicating some type of sanitary bypass. Samples from this station are collected primarily during baseflow and do not reflect the the full impact of urban runoff, sanitary bypasses, or toxic spills.

Similar results were observed in samples collected during low flow conditions for the 1975-1977 Milwaukee County Rivers Basin Report. During wet weather flows however, nutrients, fecal coliform, and heavy metals routinely exceeded recommended criteria. The greatest source of toxic metal concentrations to the lower river were found to occur during wet weather flows.

Numerous studies documenting water quality in the Kinnickinnic River estuary have been conducted and are summarized in the Milwaukee Harbor Estuary study design. Based on the available information, established standards and criterias for dissolved oxygen, nutrients, and metals appear to be met during dry weather flows, however the fecal coliform standard is routinely violated. The number of dissolved oxygen violation are misleading because the stream has a varience of 2 mg/l and not 5 mg/l which is recommended for fish and aquatic life. The operation of the flushing tunnel was also used to maintain standards.

The greatest impact on water quality and the bottom sediments in the estuary occurs during wet weather flows. Standards and criterias for nutrients, metals, and fecal coliform are routinely violated. Significant amounts of oxygen demanding materials, nutrients, and fecal coliform are discharged from 23 CSO outfalls of which 19 discharge directly to the estuary. The scouring action of the bottom sediments and the CSO discharges account for the majority of the dissolved oxygen impact in the estuary.

As recent as 1981 PCB's were being discharged into the Kinnickinnic River from two industries. A sample of "non-contact" cooling water discharged from Badger Die Casting contained 110 ppb PCB and a sample from the Construction Division of Rexnord contained 1.0 ppb. The Badger Die Cast discharge value is high and may represent a significant impact on the Kinnickinnic River. Both discharges were apparently due to equipement failure and the discharges are assumed to be discontinued. Currently a majority of the discharges in the watershed are non-contact cooling water however, cases like this indicate that toxic spills, illegal discharges, and human errors may always occur in the watershed.

Bottom sediments in the Kinnickinnic River estuary are heavily polluted with metals, PCB's, and oil and grease. The highest concentrations of pollutants occur in the inner harbor turning basin where a single core sample from 1980 contained 73 mg/kg PCB's. PCB concentrations above the inner harbor appear to be

decreasing due to the scouring of the channel and downward migration into the sediments. Sediment grab samples collected in 1982 upstream to the concrete channel contained levels below 4 mg/kg.

All fish tissue samples collected in 1983 from the Kinnickinnic River exceeded the FDA PCB tolerance of 2 ppm. Mean concentrations ranged from 6.2 ppm for blue gills to 22 ppm for carp. Although PCB levels remain high there does appear to be a downward trend in recent years. However, in addition to the PCB contamination dielrin, DDT, toxaphene, and mercury have been detected in fish.

The Milwaukee Harbor Estuary study which is currently being conducted by the MMSD, SEWRPC, USGS, and the WDNR will provide additional water quality data. This information will be used for the preparation of a comprehensive water resource management plan for the estuary.

Aesthetics and Recreational Uses

Extensive channel modifications and adjacent industrial and commercial areas detract from the aesthetic and recreational value of the Kinnickinnic River. Where the natural stream channel has been replaced by concrete the stream's aesthetic value has been virtually eliminated. A majority of the land along the stream is county owned which makes the entire stream accessible to children who use the stream for wading. For this reason the potentially harmful effects of sanitary bypasses, CSO's, and toxic discharges must be eliminated.

Above the concrete channel to its origin, the stream flows through a county park and wooded area and does not appear to be utilized because of the intermittent flow. Severe bank erosion and washed out storm sewers limit the aesthetics in this area. This area is an environmental corridor and can be utilized as a wildlife and nature area. Storm water management and bank stabilization would enhance the area and protect downstream water quality.

The greatest recreational use potential occurs in the Kinnickinnic River estuary. The upper estuary below the concrete channel is currently being utilized by fishermen during the spring and fall trout and salmon runs. The lower estuary is used as a marina and boating area. Floating debris, septic odors, oil and grease, and industrial yards detract from the aesthetic value of this area. The removal of in-place pollutants and the elimination of toxic discharges is necessary to reduce the health risks associated with fish consumption. Elimination of CSO's, sanitary bypasses, industrial discharges and storm water management will improve water quality and nuisance conditions. The establishment of parks, recreational areas, and maintaining clean industrial yards will improve the

asethetics of the area.

Conclusions and Recommendations

The entire Kinnickinnic River upstream of the estuary has been extensively modified for the purposes of flood control. Habitat in a 3.5 mile section of stream has virtually been eliminated by the conversion of the natural channel to concrete. Above the concrete section the stream remains unchannelized, however the available habitat is limited by insufficient flow and severe bank erosion. Both these sections can support very tolerant macroinvertebrates but probably only an occasional fish. Only the area downstream of the concrete channel and estuary provide habitat suitable for supporting a diverse fishery. Presently 23 species of fish utilize the lower river of which 14 are classified as sport fish including 5 cold water sport fish. The benthic macroinvertebrate community indicates very poor water quality and is dominated by very tolerant oligochaeta. Currently urban runoff, sanitary bypasses, CSO's, industrial discharges, and spills limit water quality and the bottom sediments. Violations of state standards for fecal coliform and dissolved oxygen are common and the sediments are heavily polluted with metals and PCB's. The concrete channel and adjacent land uses detract from the asethetic value of the stream and recreational uses are imparied by unsanitary conditions and PCB contaminated fish.

To protect and maintain a diverse fishery and recreational uses in the lower Kinnickinnic River, water quality must improve. Elimination of sanitary bypasses, CSO's, toxic discharges and storm water management will improve water quality and the impacts on aquatic life. The dissolved oxygen variance of 2 mg/l should be rased to 5mg/l since the lower river is inhabited by cold and warm water fish, and maybe utilized as a spawning area for warm water fish. The fecal coliform variance should be lowered to reduce the associated health risks of full body contact. Because fish continue to be contaminated with PCB's the removal of the bottom sediments should also be considered.

Although the upper river does not support fish, water quality should be maintained to protection recreational uses and to reduce the impacts on aquatic life in the lower river. Therefore, the elimination of sanitary and toxic discharges, and storm water management will be necessary throughout the watershed.

The lower Kinnickinnic River supports cold and warm sport fish and should remain classified full fish and aquatic life or use Class B, warm water sport fish, from the confluence with the Milwaukee River upstream to the start of the concrete channel below 6th St. Although the lower river supports salmonids, the habitat is unsuitable for the natural reproduction of these species and a cold water sport fish classification is non

justified.

From the start of the concrete channel to the origin of the Kinnickinnic River the available habitat is not capable of supporting most fish species and it is recommended this section be classified marginal or use Class E, which are stream capable of only supporting very tolerant macroinvertebrates and an occasional fish.

References

Ball, Joseph, 1982. Stream Classification Guidelines For Wisconsin
WDNR Technical Bulletin

Hilsenhoff, William L., 1982. Using a Biotic Index to Evaluate Water Quality in Streams. WDNR Technical Bulletin No. 132

Holey, Mark E., 1984. Milwaukee Harbor Estuary Fish Survey and Toxic Substances Evaluation 1983. WDNR Report

SEWRPC 1978. A Comprehensive Plan for the Kinnickinnic River Watershed. Planning Report No. 32

SEWRPC 1981. Study Design for the Milwaukee Harbor Estuary Comprehensive Water Resources Planning Program.

WDNR 1977. Milwaukee Counties Rivers Basin Report.

Table 1

WPDES Permitted Industrial Discharges
Kinnickinnic River Watershed.

Ampco Pittsburgh Corp
Associated Spring Barnes
Atlantic Richfield Co
Avis Rent A Car
Barclay Foundry
Briggs & Stratton Corp
Briggs & Stratton Foundry
Caterpillar Tractor Corp
De Paul Rehabilitation Hospital
Froedtert Malt Corp
General Electric Hotpoint
General Electric Medical-Systems
George J Meyer Manufacturing
Grebes Bakeries
Heil Co
Howmet Turbine Co
Industrial Cylinders Co
Kurth Malting Corp
Ladish Co
Litton Industrial Products
Marc's Big Boy
Maynard Electric Steel
Wehr Steel Co
Willows Car Wash

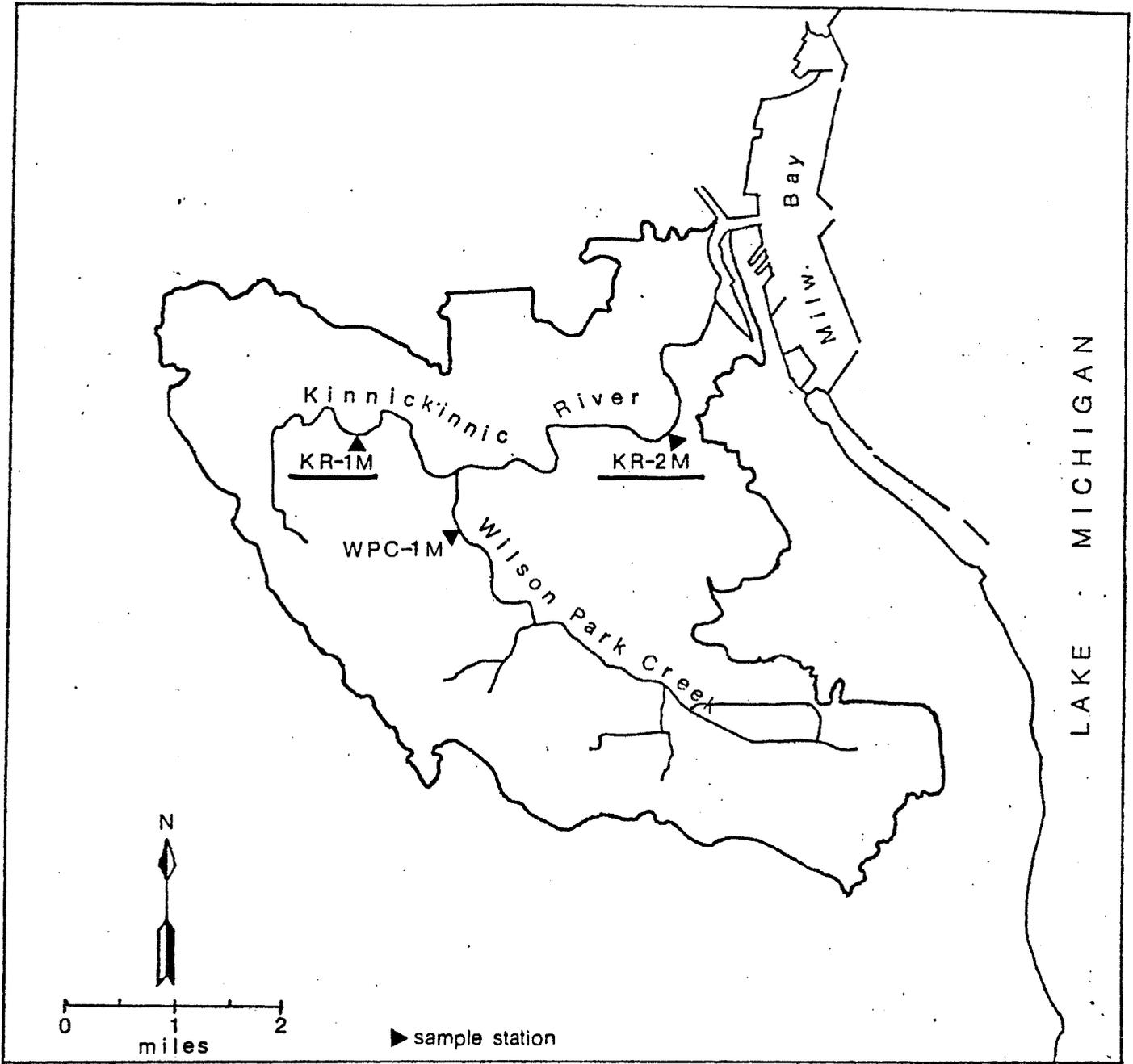
Milwaukee Malleable &
Grey Iron Work
Milwaukee Solvay Coke Co
Milwaukee Spring Co
Minerals Reclamation Corp
Murphy Diesel Co
Pelton Casteel Inc
Perfex Group
Pressed Steel Tank Co
Rexnord Inc
Rexworks Inc
Scrub A Dub Car Wash
Southeastern Wisc Products
Suburban Car Wash
St. Lukes Hospital
Teledyne Wisconsin Motors
The Oil Gear Co
Thrifty Rent A Car
Union Oil Mitchell Field
Union Oil Car Wash
Unit Drop Forge
UW Great Lakes Facility
Wisconsin Gas Co

Table 2

Total Fish Catch March 28 - October 4, 1983

| Species | Number | Classification |
|-----------------|--------|----------------|
| White Sucker | 225 | T |
| Black Bullhead | 82 | S |
| Rainbow Trout | 78 | S |
| Carp | 70 | VT |
| Alewife | 19 | - |
| Coho Salmon | 10 | S |
| Bluegill | 9 | S |
| Northern Pike | 8 | S |
| Black Crappie | 7 | S |
| Pumpkinseed | 5 | S |
| Golden Shiner | 5 | T |
| Green Sunfish | 3 | S |
| Goldfish | 3 | S |
| Brook Trout | 2 | S |
| Brown Trout | 2 | S |
| Chinook Salmon | 2 | S |
| Gizzard Shad | 2 | - |
| Common Shiner | 2 | T |
| Spottail Shiner | 2 | I |
| Yellow Perch | 1 | S |
| Largemouth Bass | 1 | S |
| Rock Bass | 1 | S |
| Goldfish x Carp | 1 | VT |

Fig. 2.3 - Location of macroinvertebrate sample stations in the Kinnickinnic River Basin



1975

Benmos

Fig. 2.1_b - Location of biological sample stations in the Kinnickinnic River Basin

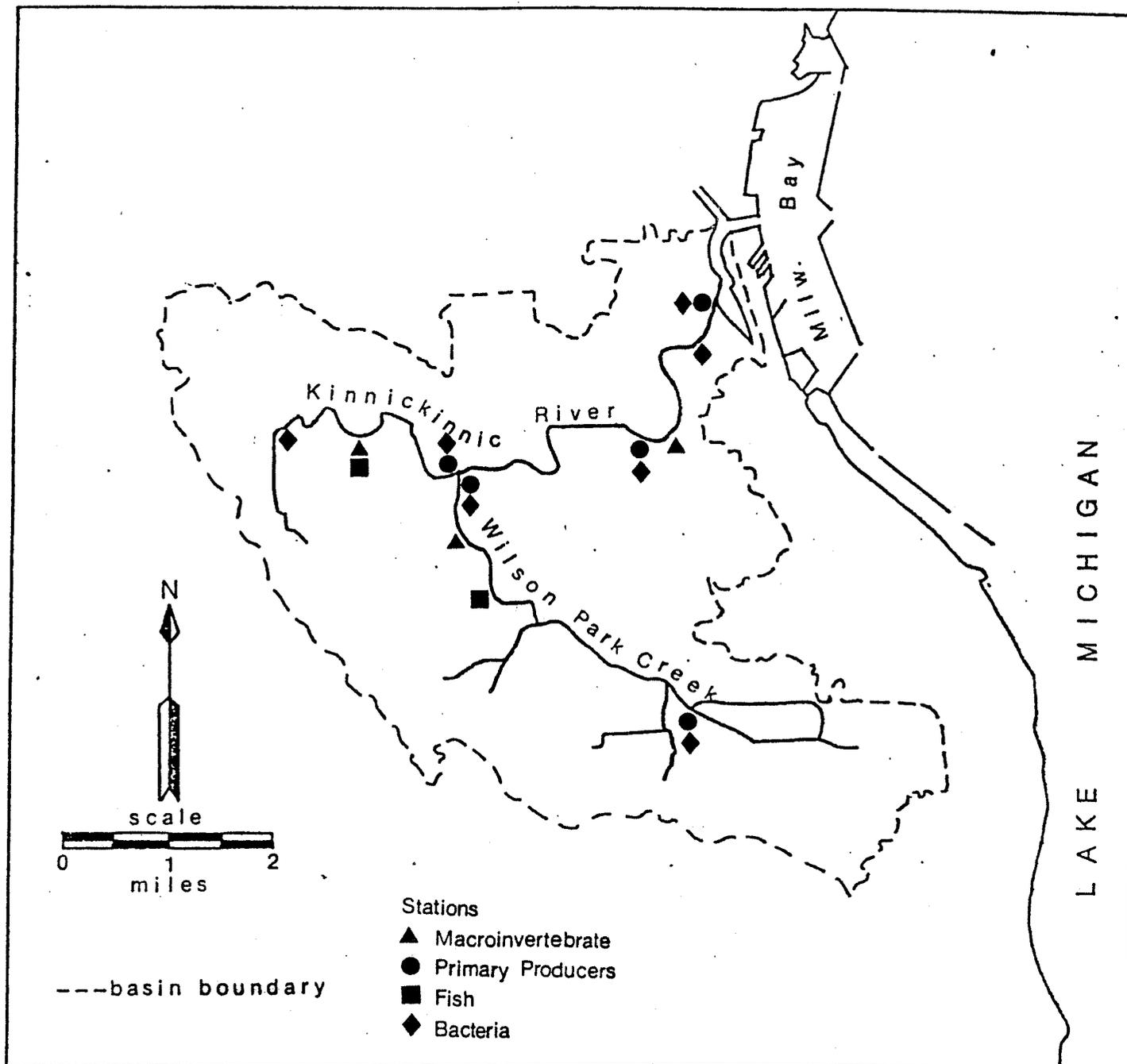


Table 2.2 - Station descriptions for macroinvertebrate sample stations
in the Kinnickinnic River Basin

| <u>Station</u> | <u>Stream Miles</u> | <u>Station Location</u> | <u>Collection Date</u> | <u>Current</u> | <u>Substrate</u> | <u>Comments</u> |
|---------------------------|---------------------|--|------------------------|----------------|--------------------------------|---|
| <u>Kinnickinnic River</u> | | | | | | |
| <u>KR-1M</u> | 6.68 | 300 yards upstream of South 43rd Street | October 28, 1975 | Riffle | 0.1 rock, 0.6 gravel, 0.3 sand | Leaves abundant on substrate. |
| <u>KR-2M</u> | 2.55 | South 4th Street | October 27, 1975 | Riffle | 0.8 rock, 0.1 gravel, 0.1 sand | Salmon swimming upstream. Rocks covered with green slime and tar-like material. |
| <u>Hilson Park Creek</u> | | | | | | |
| <u>WPC-1M</u> | 0.64 | 100 yards downstream of Morgan Avenue bridge | October 28, 1975 | Riffle | 0.6 rock, 0.3 gravel, 0.1 sand | Abundant filamentous algae on rock substrates. Substrate oil laden. Oil on water surface. |

APPENDIX 2.2

Macroinvertebrate Taxa (Mean No./Sq. Ft.) Collected in the Kinnickinnic River Basin
and Their Corresponding Tolerance Classifications

| | Tolerancy ¹ | Biotic Index | KR-1M | | | KR-2M | | | WPC-1M | | |
|----------------------|------------------------|--------------|-------|------|--------------------|-------|------|-------|--------|------|-------|
| | | | X | SD | Qual. ² | X | SD | Qual. | X | SD | Qual. |
| <i>Baetis</i> | I | 3 | - | - | R, P | - | - | R | - | - | |
| <i>Enallagma</i> | I | 4 | - | - | | | | V | | | P, V |
| Empididae | T | * | 0.4 | 1.3 | | - | - | | - | - | |
| <i>Palpomyia</i> | T | 3 | 0.4 | 1.3 | | - | - | | - | - | |
| <i>Simulium</i> | V | 4 | - | - | | 1.6 | 3.9 | | 1.6 | 3.4 | |
| <i>Chironomus</i> | V | 5 | 0.4 | 1.3 | | - | - | | 5.1 | 16.2 | |
| <i>Conchapelopia</i> | T | 4 | 12.9 | 11.1 | R, P | 0.4 | 1.3 | | 16.2 | 18.4 | |
| <i>Cricotopus</i> | T | 4 | 52.0 | 50.0 | | 17.0 | 22.1 | | 74.0 | 63.4 | |
| <i>Dicrotendipes</i> | T | 3 | - | - | | 0.8 | 2.5 | | - | - | |
| <i>Polypedilum</i> | T | 3 | - | - | | 0.8 | 2.5 | | - | - | |
| <i>Zavreliomyia</i> | T | 4 | - | - | | - | - | | 1.1 | 3.5 | |
| <i>Haliphus</i> | I | * | - | - | V | - | - | | - | - | |
| <i>Peltodytes</i> | I | * | - | - | | - | - | V | - | - | |
| <i>Belostoma</i> | V | * | - | - | | - | - | | - | - | V |
| <i>Ranatra</i> | * | * | - | - | | - | - | | - | - | V |

| | Tolerancy ¹ | Biotic Index | KR-1M | | | KR-2M | | | WPC-1M | | |
|--------------------|------------------------|--------------|-----------|------|--------------------|-----------|------|------------|-----------|-------|-------|
| | | | \bar{X} | SD | Qual. ² | \bar{X} | SD | Qual. | \bar{X} | SD | Qual. |
| <i>Sigara</i> | * | * | - | - | P | - | - | V | - | - | |
| <i>Hyallela</i> | T | 4 | 2.8 | 6.0 | P | 0.4 | 1.3 | | - | - | |
| Hirudinea | * | * | - | - | | 4.0 | 6.2 | R, P V | - | - | |
| Planariidae | T | * | - | - | | 0.4 | 1.3 | | 0.8 | 2.5 | |
| <i>Asellus</i> | V | 5 | - | - | V | - | - | | - | - | |
| <i>Crangonyx</i> | T | 4 | 35.2 | 51.2 | R, V | - | - | | - | - | |
| <i>Ferrisia</i> | V | * | - | - | | - | - | | 4.8 | 10.8 | |
| <i>Physa</i> | V | * | 2.0 | 2.8 | R, V | 45.6 | 52.0 | R, P, V | - | - | V |
| <i>Sphaerium</i> | T | * | - | - | | - | - | | 3.2 | 6.7 | |
| <i>Aulodrilus</i> | V | * | 41.4 | 44.6 | V | - | - | | 7.7 | 24.3 | |
| <i>Ilyodrilus</i> | V | * | - | - | | 8.4 | 13.0 | | 23.5 | 27.7 | |
| <i>Limnodrilus</i> | V | * | 62.8 | 65.9 | R | 40.6 | 47.5 | P | 68.9 | 36.0 | R |
| <i>Nais</i> | V | * | 6.7 | 14.3 | | 45.7 | 20.1 | | 202.0 | 169.0 | |
| <i>Pelosclex</i> | V | * | - | - | | - | - | | - | - | R |
| <i>Pristina</i> | V | * | 24.1 | 36.4 | | - | - | | 16.6 | 29.1 | |
| <i>Tubifex</i> | V | * | 10.6 | 24.0 | | 10.4 | 12.7 | | - | - | P |

| | <u>Tolerancy</u> ¹ | <u>Biotic Index</u> | <u>KR-1M</u> | | | <u>KR-2M</u> | | | <u>WPC-1M</u> | | |
|-------------------------|-------------------------------|---------------------|--------------|-----------|---------------------------|--------------|-----------|--------------|---------------|-----------|--------------|
| | | | <u>X̄</u> | <u>SD</u> | <u>Qual.</u> ² | <u>X̄</u> | <u>SD</u> | <u>Qual.</u> | <u>X̄</u> | <u>SD</u> | <u>Qual.</u> |
| Oligochaeta w/chaetae | V | 8 | 67.1 | 64.4 | R | 21.9 | 14.4 | | 79.0 | 50.9 | |
| Oligochaeta w/o chaetae | V | * | 166.2 | 132.4 | R | 38.3 | 33.6 | P | 540.9 | 363.0 | P |

¹Intolerant (I); Tolerant (T); Very Tolerant (V); Unclassified (*)

²Qualitative sample areas - Riffle (R); Pool (P); Submerged Vegetation (V); Backwater (B)
Mean (X̄); Standard Deviation (SD)

APPENDIX 2.5Community Structure of Macroinvertebrates
in the Kinnickinnic River Basin

| | <u>KR-1M</u> | <u>KR-2M</u> | <u>WPC-1M</u> |
|--|--------------|--------------|---------------|
| Number of Individuals (\bar{X}) ¹ | 485.0 | 236.3 | 1045.4 |
| Total Taxa | 15 | 14 | 14 |
| Intolerant Number (\bar{X}) ¹ | 0.00 | 0.00 | 0.00 |
| Intolerant Taxa | 0 | 0 | 0 |
| Tolerant Number (\bar{X}) ¹ | 103.7 | 19.8 | 95.3 |
| Tolerant Taxa | 6 | 6 | 5 |
| Very Tolerant Number (\bar{X}) ¹ | 381.3 | 212.5 | 950.1 |
| Very Tolerant Taxa | 9 | 7 | 9 |
| Unclassified Number (\bar{X}) ¹ | 0.0 | 4.0 | 0.0 |
| Unclassified Taxa | 0 | 1 | 0 |
| <hr/> | | | |
| Community Diversity | 2.00 | 2.04 | 1.55 |
| Intolerant Diversity | 0.00 | 0.00 | 0.00 |
| Tolerant Diversity | 0.24 | 0.05 | 0.06 |
| Very Tolerant Diversity | 1.25 | 1.62 | 1.18 |
| Unclassified Diversity | 0.00 | 0.00 | 0.00 |
| Diversity of Tolerance Groups | 0.52 | 0.37 | 0.31 |
| Biotic Index | 4.00 | 3.92 | 4.05 |
| No. of Taxa Included in Biotic Index | 6 | 5 | 4 |

Simpson's Similarity Index

| | <u>KR-2M</u> | <u>WPC-1M</u> |
|--------------|--------------|---------------|
| <u>KR-1M</u> | 0.63 | 0.86 |
| <u>KR-2M</u> | - | 0.67 |

TABLE 3.16

SEDIMENT RESULTS (mg/kg) FOR THE KINNICKINNIC RIVER BASIN

| Sampling Site | Land Use | Date | PCB | Cd | Cr | Cu | Pb | Ni | Zn | Hg | EPA Pollutional Classification |
|---------------|-------------------------------|---------------|-----------|------------|------------|-----------|-----------|----------|-----------|------|--------------------------------------|
| WMD-1S | Industry Residential | Feb. 10, 1976 | 2.7 | 3.5 | 22 | MP 49 | HP 670 | 15 | HP 750 | 0.31 | Heavily Polluted |
| KR-1CS | Residential | May 8, 1975 | 1.1 | | | | | | | | Insufficient Data |
| WPC-2CS | Residential Transportation | Feb. 2, 1976 | 0.11 | 1.25 | 16 | MP 36 | HP 375 | 12 | HP 250 | 0.25 | Heavily Polluted |
| KR-2CS | Residential | Feb. 10, 1976 | P 11.0 | 3.5 | MP 37.5 | HP 78 | HP 650 | MP 25 | HP 825 | 0.34 | Heavily Polluted |
| KR-3S | Residential | May 8, 1975 | 3.6 | | | | | | | | Insufficient Data |
| KR-3CS | Residential Transportation | May 8, 1975 | 5.5 | | | | | | | | Insufficient Data |
| | Residential Transportation | Feb. 10, 1976 | 9.7 | HP 11.2 | HP 530 | HP 118 | MP 670 | MP 32 | HP 850 | 0.55 | Heavily Polluted |

P-Polluted

MP-Moderately polluted

HP-Heavily polluted

FIGURE 3.6
WATER QUALITY AND SEDIMENT SAMPLING STATIONS IN THE KINNICKINNIC
RIVER BASIN

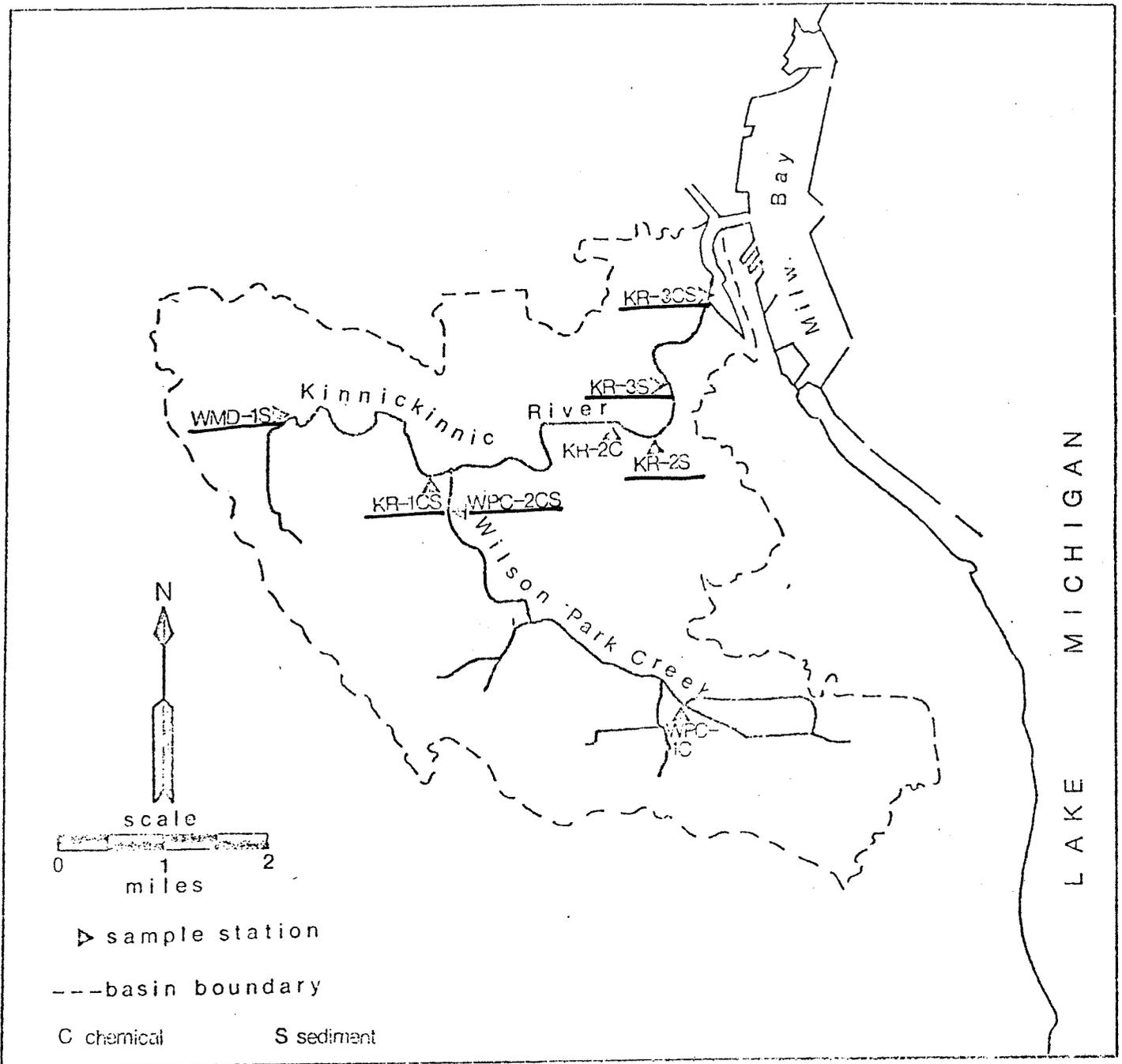


TABLE 3.16

SEDIMENT RESULTS (mg/kg) FOR THE KINNICKINNIC RIVER BASIN

| Sampling Site | Land Use | Date | PCB | Cd | Cr | Cu | Pb | Ni | Zn | Hg | EPA Pollutional Classification |
|---------------|-------------------------------|---------------|-----------|------------|------------|-----------|-----------|----------|-----------|------|--------------------------------------|
| WMD-1S | Industry Residential | Feb. 10, 1976 | 2.7 | 3.5 | 22 | MP 49 | HP 670 | 15 | HP 750 | 0.31 | Heavily Polluted |
| KR-1CS | Residential | May 8, 1975 | 1.1 | | | | | | | | Insufficient Data |
| WPC-2CS | Residential Transportation | Feb. 2, 1976 | 0.11 | 1.25 | 16 | MP 36 | HP 375 | 12 | HP 250 | 0.25 | Heavily Polluted |
| KR-2CS | Residential | Feb. 10, 1976 | P 11.0 | 3.5 | MP 37.5 | HP 78 | HP 650 | MP 25 | HP 825 | 0.34 | Heavily Polluted |
| KR-3S | Residential | May 8, 1975 | 3.6 | | | | | | | | Insufficient Data |
| KR-3CS | Residential Transportation | May 8, 1975 | 5.5 | | | | | | | | Insufficient Data |
| | Residential Transportation | Feb. 10, 1976 | 9.7 | HP 11.2 | HP 530 | HP 118 | MP 670 | MP 32 | HP 850 | 0.55 | Heavily Polluted |

P-Polluted

MP-Moderately polluted

HP-Heavily polluted

1977-82

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MICROCONTAMINANTS IN SOUTHEAST DISTRICT FISH
WISCONSIN DEPARTMENT OF NATURAL RESOURCES

GENERAL DATA:

| | | | | | | | |
|-----------------|----------|------------------|------------|------------------|------------|-------------------|--------|
| BASIN -----> | 052 | WATER BODY ----> | KINNIC R | SPECIES -----> | N REDHORSE | WEIGHT(KG) ----> | 000.40 |
| SAMPLE DATE --> | 07/02/80 | SAMPLE LOC. --> | KINNIC AVE | QUANTITY -----> | 03 | LENGTH(IN) ----> | 013.20 |
| LAB NUMBER --> | 53256 | COUNTY -----> | MILWAUKEE | SAMPLE FORM --> | WHOLE FISH | % FAT -----> | 007.70 |
| ORGANICS: | | | | | | | |
| OP-DDT -----> | <00.05 | PP-DDD -----> | 000.05 | DIELDRIN -----> | 000.04 | PCB -----> | 002.70 |
| PP-DDT -----> | <00.05 | C-CHLORDANE --> | <00.05 | ENDRIN -----> | | PENTCHLORPHNOL--> | |
| OP-DDE -----> | <00.05 | T-CHLORDANE --> | <00.05 | ALDRIN -----> | | HEXCLRBENZENE--> | |
| PP-DDE -----> | 000.12 | C-NONACHLOR --> | <00.05 | ALPHA BHC -----> | | METHOXYCHLOR --> | |
| OP-DDD -----> | <00.05 | T-NONACHLOR --> | <00.05 | GAMMA BHC -----> | | | |
| METALS: | | | | | | | |
| ARSENIC -----> | | CADMIUM -----> | | CHROMIUM -----> | | COPPER -----> | |
| LEAD -----> | | MERCURY -----> | | | | | |

GENERAL DATA:

| | | | | | | | |
|-----------------|----------|------------------|------------|------------------|------------|-------------------|--------|
| BASIN -----> | 052 | WATER BODY ----> | KINNIC R | SPECIES -----> | CARP | WEIGHT(KG) ----> | 004.07 |
| SAMPLE DATE --> | 07/02/80 | SAMPLE LOC. --> | KINNIC AVE | QUANTITY -----> | 03 | LENGTH(IN) ----> | 013.30 |
| LAB NUMBER --> | 53257 | COUNTY -----> | MILWAUKEE | SAMPLE FORM --> | WHOLE FISH | % FAT -----> | 013.10 |
| ORGANICS: | | | | | | | |
| OP-DDT -----> | <00.07 | PP-DDD -----> | 000.24 | DIELDRIN -----> | 000.04 | PCB -----> | 034.00 |
| PP-DDT -----> | <00.05 | C-CHLORDANE --> | 000.07 | ENDRIN -----> | | PENTCHLORPHNOL--> | |
| OP-DDE -----> | <00.05 | T-CHLORDANE --> | 000.05 | ALDRIN -----> | | HEXCLRBENZENE--> | |
| PP-DDE -----> | 000.38 | C-NONACHLOR --> | <00.05 | ALPHA BHC -----> | | METHOXYCHLOR --> | |
| OP-DDD -----> | 000.11 | T-NONACHLOR --> | <00.05 | GAMMA BHC -----> | | | |
| METALS: | | | | | | | |
| ARSENIC -----> | | CADMIUM -----> | | CHROMIUM -----> | | COPPER -----> | |
| LEAD -----> | | MERCURY -----> | | | | | |

PARAMETERS ABOVE FDA TOLERANCE:

PCB -----> 34.00

GENERAL DATA:

| | | | | | | | |
|-----------------|----------|------------------|-----------|------------------|-------------|-------------------|--------|
| BASIN -----> | 052 | WATER BODY ----> | KINNIC R | SPECIES -----> | RAINF TROUT | WEIGHT(KG) ----> | |
| SAMPLE DATE --> | 09/15/77 | SAMPLE LOC. --> | HXY 94 | QUANTITY -----> | 04 | LENGTH(IN) ----> | 021.70 |
| LAB NUMBER --> | 53076 | COUNTY -----> | MILWAUKEE | SAMPLE FORM --> | WHOLE FISH | % FAT -----> | 004.50 |
| ORGANICS: | | | | | | | |
| OP-DDT -----> | | PP-DDD -----> | | DIELDRIN -----> | 000.01 | PCB -----> | 005.70 |
| PP-DDT -----> | | C-CHLORDANE --> | | ENDRIN -----> | <00.01 | PENTCHLORPHNOL--> | |
| OP-DDE -----> | | T-CHLORDANE --> | | ALDRIN -----> | <00.05 | HEXCLRBENZENE--> | |
| PP-DDE -----> | 001.90 | C-NONACHLOR --> | | ALPHA BHC -----> | | METHOXYCHLOR --> | <00.50 |
| OP-DDD -----> | | T-NONACHLOR --> | | GAMMA BHC -----> | | | |
| METALS: | | | | | | | |
| ARSENIC -----> | <02.00 | CADMIUM -----> | <00.20 | CHROMIUM -----> | <00.60 | COPPER -----> | 000.40 |
| LEAD -----> | <05.00 | MERCURY -----> | 000.14 | | | | |

PARAMETERS ABOVE FDA TOLERANCE:

PCB -----> 5.70

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MICROCONTAMINANTS IN SOUTHEAST DISTRICT FISH
WISCONSIN DEPARTMENT OF NATURAL RESOURCES

GENERAL DATA:

| | | | | | | | |
|-----------------|----------|------------------|-----------|------------------|------------|-------------------|--------|
| BASIN -----> | 052 | WATER BODY ----> | KINNIC R | SPECIES -----> | CARP | WEIGHT(KG) ----> | |
| SAMPLE DATE --> | 09/15/77 | SAMPLE LOC. --> | HXY 94 | QUANTITY -----> | 03 | LENGTH(IN) ----> | 015.00 |
| LAB NUMBER --> | 53077 | COUNTY -----> | MILWAUKEE | SAMPLE FORM --> | WHOLE FISH | % FAT -----> | 003.00 |
| ORGANICS: | | | | | | | |
| OP-DDT -----> | | PP-DDD -----> | | DIELDRIN -----> | 000.01 | PCB -----> | |
| PP-DDT -----> | | C-CHLORDANE --> | | ENDRIN -----> | | PENTCHLORPHNOL--> | |
| OP-DDE -----> | | T-CHLORDANE --> | | ALDRIN -----> | | HEXCLRBENZENE--> | |
| PP-DDE -----> | | C-NONACHLOR --> | | ALPHA BHC -----> | | METHOXYCHLOR --> | |
| OP-DDD -----> | | T-NONACHLOR --> | | GAMMA BHC -----> | | | |
| METALS: | | | | | | | |
| ARSENIC -----> | | CADMIUM -----> | | CHROMIUM -----> | | COPPER -----> | |
| LEAD -----> | | MERCURY -----> | | | | | |

PARAMETERS ABOVE FDA TOLERANCE:

PCB -----> 5.70

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MICROCONTAMINANTS IN SOUTHEAST DISTRICT FISH
WISCONSIN DEPARTMENT OF NATURAL RESOURCES

GENERAL DATA:

BASIN -----> 052 WATER BODY -----> KINNIC R
SAMPLE DATE --> 09/15/77 SAMPLE LOC. --> HWY 94
LAB NUMBER --> 53077 COUNTY -----> MILWAUKEE

SPECIES ----->
QUANTITY ----->
SAMPLE FORM -->

CARD
03
WHOLE FISH

WEIGHT(KG) ---->
LENGTH(IN) ----> 005.00
% FAT -----> 003.70

ORGANICS:

OP-DDT -----> PP-DDD ----->
PP-DDT -----> C-CHLORDANE --> <00.10
OP-DDE -----> T-CHLORDANE -->
PP-DDE -----> <00.01 C-NONACHLOR -->
OP-DDD -----> T-NONACHLOR -->

DIELDRIN -----> <00.01
ENDRIN -----> <00.01
ALDRIN -----> <00.05
ALPHA BHC ----->
GAMMA BHC ----->

PCB -----> 004.20
PENTCHLORPHNOL -->
HEXCLORBENZENE -->
METHOXYCHLOR --> <00.05

METALS:

ARSENIC -----> <02.00 CADMIUM -----> <00.20
LEAD -----> <05.00 MERCURY -----> 000.02

CHROMIUM -----> <00.50

COPPER -----> 001.30

GENERAL DATA:

BASIN -----> 052 WATER BODY -----> KINNIC R
SAMPLE DATE --> 09/15/78 SAMPLE LOC. --> HWY 94
LAB NUMBER --> 34498 COUNTY -----> MILWAUKEE

SPECIES ----->
QUANTITY ----->
SAMPLE FORM -->

GOLDFISH
05
WHOLE FISH

WEIGHT(KG) ---->
LENGTH(IN) ----> 015.50
% FAT -----> 012.00

ORGANICS:

OP-DDT -----> PP-DDD -----> 000.45
PP-DDT -----> C-CHLORDANE --> 000.15
OP-DDE -----> T-CHLORDANE --> 000.04
PP-DDE -----> 000.57 C-NONACHLOR -->
OP-DDD -----> T-NONACHLOR -->

DIELDRIN -----> 000.03
ENDRIN -----> <00.02
ALDRIN -----> <00.07
ALPHA BHC ----->
GAMMA BHC -----> <00.07

PCB -----> 018.00
PENTCHLORPHNOL --> <00.05
HEXCLORBENZENE --> <00.07
METHOXYCHLOR --> <00.40

METALS:

ARSENIC -----> <02.00 CADMIUM -----> <00.20
LEAD -----> <05.00 MERCURY -----> 000.01

CHROMIUM -----> <00.50

COPPER -----> 001.30

PARAMETERS ABOVE FDA TOLERANCE:

PCB -----> 18.00

GENERAL DATA:

BASIN -----> 052 WATER BODY -----> KINNIC R
SAMPLE DATE --> 09/15/78 SAMPLE LOC. --> HWY 94
LAB NUMBER --> 34499 COUNTY -----> MILWAUKEE

SPECIES ----->
QUANTITY ----->
SAMPLE FORM -->

GOLDFISH
04
WHOLE FISH

WEIGHT(KG) ---->
LENGTH(IN) ----> 014.50
% FAT -----> 010.50

ORGANICS:

OP-DDT -----> PP-DDD -----> 000.22
PP-DDT -----> C-CHLORDANE --> 000.12
OP-DDE -----> T-CHLORDANE --> 000.06
PP-DDE -----> <00.55 C-NONACHLOR -->
OP-DDD -----> T-NONACHLOR -->

DIELDRIN -----> 000.03
ENDRIN -----> <00.01
ALDRIN -----> <00.07
ALPHA BHC ----->
GAMMA BHC -----> <00.02

PCB -----> 017.00
PENTCHLORPHNOL --> 000.07
HEXCLORBENZENE --> <00.02
METHOXYCHLOR --> <00.40

METALS:

ARSENIC -----> CADMIUM ----->
LEAD -----> MERCURY ----->

CHROMIUM ----->

COPPER ----->

PARAMETERS ABOVE FDA TOLERANCE:

PCB -----> 17.00

MICROCONTAMINANTS IN SOUTHEAST DISTRICT FISH
WISCONSIN DEPARTMENT OF NATURAL RESOURCES

GENERAL DATA:

BASIN -----> 052 WATER BODY ----> KINNIC R
 SAMPLE DATE --> 07/09/79 SAMPLE LOC. --> HWY 94
 LAB NUMBER ----> 05996 COUNTY -----> MILWAUKEE

SPECIES ----->

GOLDFISH QUANTITY -----> 01 WEIGHT(KG) ----> 016.60
 WHOLE FISH % FAT -----> 006.70

ORGANICS:

OP-DDT -----> <00.05 PP-DDD -----> 000.68
 PP-DDT -----> <00.05 C-CHLORDANE --> 000.11
 OP-DDE -----> <00.05 T-CHLORDANE --> 000.05
 PP-DDE -----> 000.30 C-NONACHLOR --> <00.05
 OP-DDD -----> <00.05 T-NONACHLOR -->

DIELDRIN -----> <00.02 PCB -----> 012.00
 ENDRIN -----> <00.02 PENTACHLORPHNOL --> <00.05
 ALDRIN -----> <00.02 HEXACHLOROBENZENE --> <00.01
 ALPHA BHC -----> <00.02 METHOXYCHLOR --> <00.05
 GAMMA BHC -----> <00.02

METALS:

ARSENIC -----> <02.00 CADMIUM -----> <00.20
 LEAD -----> <05.00 MERCURY -----> 000.03

CHROMIUM -----> <00.50 COPPER -----> 001.50

PARAMETERS ABOVE FDA TOLERANCE:

PCB -----> 12.00

GENERAL DATA:

BASIN -----> 052 WATER BODY ----> KINNIC R
 SAMPLE DATE --> 07/09/79 SAMPLE LOC. --> HWY 94
 LAB NUMBER ----> 05997 COUNTY -----> MILWAUKEE

SPECIES ----->

CARP QUANTITY -----> 02 WEIGHT(KG) ----> 025.90
 WHOLE FISH % FAT -----> 013.00

ORGANICS:

OP-DDT -----> <00.05 PP-DDD -----> 000.20
 PP-DDT -----> <00.05 C-CHLORDANE --> 000.15
 OP-DDE -----> <00.05 T-CHLORDANE --> 000.05
 PP-DDE -----> 000.68 C-NONACHLOR --> <00.05
 OP-DDD -----> <00.05 T-NONACHLOR -->

DIELDRIN -----> 000.12 PCB -----> 017.00
 ENDRIN -----> <00.02 PENTACHLORPHNOL --> <00.05
 ALDRIN -----> <00.02 HEXACHLOROBENZENE --> <00.01
 ALPHA BHC -----> 000.03 METHOXYCHLOR --> <00.05
 GAMMA BHC -----> <00.02

METALS:

ARSENIC -----> <02.00 CADMIUM -----> <00.20
 LEAD -----> <05.00 MERCURY -----> 000.16

CHROMIUM -----> <00.50 COPPER -----> 003.70

PARAMETERS ABOVE FDA TOLERANCE:

PCB -----> 17.00

GENERAL DATA:

BASIN -----> 052 WATER BODY ----> KINNIC R
 SAMPLE DATE --> 07/09/79 SAMPLE LOC. --> HWY 94
 LAB NUMBER ----> 05998 COUNTY -----> MILWAUKEE

SPECIES ----->

CARP QUANTITY -----> 02 WEIGHT(KG) ----> 027.60
 WHOLE FISH % FAT -----> 022.00

ORGANICS:

OP-DDT -----> <00.05 PP-DDD -----> 000.51
 PP-DDT -----> <00.05 C-CHLORDANE --> 000.44
 OP-DDE -----> <00.05 T-CHLORDANE --> 000.17
 PP-DDE -----> 001.60 C-NONACHLOR --> <00.05
 OP-DDD -----> <00.05 T-NONACHLOR -->

DIELDRIN -----> 000.23 PCB -----> 013.00
 ENDRIN -----> 000.02 PENTACHLORPHNOL --> <00.05
 ALDRIN -----> <00.02 HEXACHLOROBENZENE --> 000.05
 ALPHA BHC -----> <00.02 METHOXYCHLOR --> <00.05
 GAMMA BHC -----> <00.02

METALS:

ARSENIC -----> <02.00 CADMIUM -----> <00.20
 LEAD -----> <05.00 MERCURY -----> 000.11

CHROMIUM -----> <00.50 COPPER -----> 002.40

PARAMETERS ABOVE FDA TOLERANCE:

TOT:CHLORDANE --> 061
 PCB -----> 13.00

MICROCONTAMINANTS IN SOUTHEAST DISTRICT FISH
WISCONSIN DEPARTMENT OF NATURAL RESOURCES

GENERAL DATA:

BASIN -----> 052 WATER BODY ----> KINNIC R
 SAMPLE DATE --> 07/09/81 SAMPLE LOC. --> SARAN PK
 LAB NUMBER ----> 18405 COUNTY -----> MILWAUKEE

SPECIES ----->

GOLDFISH QUANTITY -----> 02 WEIGHT(KG) ----> 001.40
 WHOLE FISH % FAT -----> 010.70

ORGANICS:

PARAMETERS ABOVE FDA TOLERANCE:
 DDT, CHLORDANE -> .61
 PCB -----> 13.00

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MICROCONTAMINANTS IN SOUTHEAST DISTRICT FISH
 WISCONSIN DEPARTMENT OF NATURAL RESOURCES

GENERAL DATA: BASIN -----> 052 WATER BODY -----> KINNIC R SPECIES -----> GOLDFISH WEIGHT(KG) -----> 001.80
 SAMPLE DATE ---> 07/08/81 SAMPLE LOC. ---> BARAN PK QUANTITY -----> 02 LENGTH(IN) -----> 316.70
 LAB NUMBER ---> 18405 COUNTY -----> MILWAUKEE SAMPLE FORM ---> WHOLE FISH % FAT -----> 014.20

ORGANICS: OP-DDT -----> <00.05 PP-DDD -----> 000.05 DIELDRIN -----> 000.03 PCB -----> 021.00
 PP-DDT -----> <00.05 C-CHLORDANE --> <00.05 ENDRIN -----> PENTCHLORPHNOL-->
 OP-DDE -----> <00.05 T-CHLORDANE --> <00.05 ALDRIN -----> HEXCLRBENZENE-->
 PP-DDE -----> 000.63 C-NONACHLOR --> <00.05 ALPHA BHC -----> METHOXYCHLOR -->
 OP-DDD -----> 000.05 T-NONACHLOR --> <00.05 GAMMA BHC ----->

METALS: ARSENIC -----> CADMIUM -----> CHROMIUM -----> COPPER ----->
 LEAD -----> MERCURY -----> 000.18

PARAMETERS ABOVE FDA TOLERANCE:

PCB -----> 21.00

GENERAL DATA: BASIN -----> 052 WATER BODY -----> KINNIC R SPECIES -----> CARP WEIGHT(KG) -----> 004.76
 SAMPLE DATE ---> 07/08/81 SAMPLE LOC. ---> BARAN PK QUANTITY -----> 03 LENGTH(IN) -----> 027.20
 LAB NUMBER ---> 18406 COUNTY -----> MILWAUKEE SAMPLE FORM ---> WHOLE FISH % FAT -----> 014.40

ORGANICS: OP-DDT -----> <00.05 PP-DDD -----> 000.28 DIELDRIN -----> 000.05 PCB -----> 019.00
 PP-DDT -----> <00.05 C-CHLORDANE --> <00.05 ENDRIN -----> PENTCHLORPHNOL-->
 OP-DDE -----> <00.05 T-CHLORDANE --> <00.05 ALDRIN -----> HEXCLRBENZENE-->
 PP-DDE -----> 001.30 C-NONACHLOR --> <00.05 ALPHA BHC -----> METHOXYCHLOR -->
 OP-DDD -----> <00.05 T-NONACHLOR --> 000.04 GAMMA BHC ----->

METALS: ARSENIC -----> CADMIUM -----> CHROMIUM -----> COPPER ----->
 LEAD -----> MERCURY ----->

PARAMETERS ABOVE FDA TOLERANCE:

PCB -----> 17.00

GENERAL DATA: BASIN -----> 052 WATER BODY -----> KINNIC R SPECIES -----> CARP WEIGHT(KG) -----> 001.49
 SAMPLE DATE ---> 09/28/82 SAMPLE LOC. ---> BARAN PK QUANTITY -----> 05 LENGTH(IN) -----> 017.02
 LAB NUMBER ---> 00824 COUNTY -----> MILWAUKEE SAMPLE FORM ---> WHOLE FISH % FAT -----> 013.00

ORGANICS: OP-DDT -----> <00.05 PP-DDD -----> 000.25 DIELDRIN -----> 000.02 PCB -----> 079.80
 PP-DDT -----> <00.05 C-CHLORDANE --> <00.05 ENDRIN -----> <00.02 PENTCHLORPHNOL-->
 OP-DDE -----> <00.05 T-CHLORDANE --> <00.05 ALDRIN -----> <00.02 HEXCLRBENZENE-->
 PP-DDE -----> 000.34 C-NONACHLOR --> <00.05 ALPHA BHC -----> <00.01 METHOXYCHLOR -->
 OP-DDD -----> <00.05 T-NONACHLOR --> 000.05 GAMMA BHC -----> <00.01

METALS: ARSENIC -----> CADMIUM -----> CHROMIUM -----> COPPER -----> 002.50
 LEAD -----> 006.00 MERCURY -----> 000.04

PARAMETERS ABOVE FDA TOLERANCE:

PCB -----> 5.80

MICROCONTAMINANTS IN SOUTHEAST DISTRICT FISH
WISCONSIN DEPARTMENT OF NATURAL RESOURCES

| | | | | | | | | | |
|---------------|----------|-------------|-----------|-------------|------------|----------------|--------|--|--|
| GENERAL DATA: | | | | | | | | | |
| BASIN | 052 | WATER BODY | KINNIC R | SPECIES | CAPP | WEIGHT(KG) | 000.50 | | |
| SAMPLE DATE | 09/28/82 | SAMPLE LOC. | BARAN PK | QUANTITY | 03 | LENGTH(IN) | 009.50 | | |
| LAB NUMBER | 00825 | COUNTY | MILWAUKEE | SAMPLE FORM | WHOLE FISH | % FAT | 006.30 | | |
| ORGANICS: | | | | | | | | | |
| OP-DDT | <00.05 | PP-DDD | 000.14 | DIELDRIN | <00.02 | PCB | 004.10 | | |
| PP-DDT | <00.05 | C-CHLORDANE | <00.05 | ENDRIN | <00.02 | PENTCHLORPHNOL | | | |
| OP-DDE | <00.05 | T-CHLORDANE | <00.05 | ALDRIN | <00.02 | HEXCLORBENZENE | 000.01 | | |
| PP-DDE | 000.08 | C-NONACHLOR | <00.05 | ALPHA BHC | <00.01 | METHOXYCHLOR | <00.05 | | |
| OP-DDD | <00.05 | T-NONACHLOR | <00.05 | GAMMA BHC | <00.01 | | | | |
| METALS: | | | | | | | | | |
| ARSENIC | | CADMIUM | <00.20 | CHROMIUM | <00.50 | COPPER | 001.60 | | |
| LEAD | <05.00 | MERCURY | <00.02 | | | | | | |

| | | | | | | | | | |
|---------------|----------|-------------|-----------|-------------|------------|----------------|--------|--|--|
| GENERAL DATA: | | | | | | | | | |
| BASIN | 052 | WATER BODY | KINNIC R | SPECIES | CAPP | WEIGHT(KG) | 001.25 | | |
| SAMPLE DATE | 09/17/80 | SAMPLE LOC. | 7TH ST | QUANTITY | 05 | LENGTH(IN) | 015.50 | | |
| LAB NUMBER | 53305 | COUNTY | MILWAUKEE | SAMPLE FORM | WHOLE FISH | % FAT | 009.40 | | |
| ORGANICS: | | | | | | | | | |
| OP-DDT | <00.05 | PP-DDD | 000.35 | DIELDRIN | <00.02 | PCB | 012.00 | | |
| PP-DDT | <00.05 | C-CHLORDANE | <00.05 | ENDRIN | <00.02 | PENTCHLORPHNOL | <00.02 | | |
| OP-DDE | <00.05 | T-CHLORDANE | <00.05 | ALDRIN | <00.02 | HEXCLORBENZENE | <00.01 | | |
| PP-DDE | 000.32 | C-NONACHLOR | <00.05 | ALPHA BHC | 000.02 | METHOXYCHLOR | <00.05 | | |
| OP-DDD | <00.05 | T-NONACHLOR | <00.05 | GAMMA BHC | <00.01 | | | | |
| METALS: | | | | | | | | | |
| ARSENIC | <00.50 | CADMIUM | <00.20 | CHROMIUM | 000.50 | COPPER | 002.90 | | |
| LEAD | <05.00 | MERCURY | 000.04 | | | | | | |

PARAMETERS ABOVE FDA TOLERANCE:

PCB -----> 12.00

| | | | | | | | | | |
|---------------|----------|-------------|-----------|-------------|------------|----------------|--------|--|--|
| GENERAL DATA: | | | | | | | | | |
| BASIN | 052 | WATER BODY | KINNIC R | SPECIES | W SUCKER | WEIGHT(KG) | 000.14 | | |
| SAMPLE DATE | 09/17/80 | SAMPLE LOC. | 7TH ST | QUANTITY | 05 | LENGTH(IN) | 009.50 | | |
| LAB NUMBER | 53305 | COUNTY | MILWAUKEE | SAMPLE FORM | WHOLE FISH | % FAT | 002.30 | | |
| ORGANICS: | | | | | | | | | |
| OP-DDT | <00.05 | PP-DDD | 000.19 | DIELDRIN | <00.02 | PCB | 020.00 | | |
| PP-DDT | <00.05 | C-CHLORDANE | <00.05 | ENDRIN | <00.02 | PENTCHLORPHNOL | <00.02 | | |
| OP-DDE | <00.05 | T-CHLORDANE | <00.05 | ALDRIN | <00.02 | HEXCLORBENZENE | <00.01 | | |
| PP-DDE | 000.88 | C-NONACHLOR | <00.05 | ALPHA BHC | <00.01 | METHOXYCHLOR | <00.05 | | |
| OP-DDD | <00.05 | T-NONACHLOR | <00.05 | GAMMA BHC | <00.01 | | | | |
| METALS: | | | | | | | | | |
| ARSENIC | <00.50 | CADMIUM | <00.20 | CHROMIUM | 000.80 | COPPER | 005.00 | | |
| LEAD | <05.00 | MERCURY | 000.03 | | | | | | |

PARAMETERS ABOVE FDA TOLERANCE:

PCB -----> 20.00

MICROCONTAMINANTS IN SOUTHEAST DISTRICT FISH
WISCONSIN DEPARTMENT OF NATURAL RESOURCES

| | | | | | | | | | |
|---------------|----------|-------------|-----------|-------------|------------|------------|--------|--|--|
| GENERAL DATA: | | | | | | | | | |
| BASIN | 052 | WATER BODY | KINNIC R | SPECIES | W PIKE | WEIGHT(KG) | 000.45 | | |
| SAMPLE DATE | 09/17/80 | SAMPLE LOC. | 7TH ST | QUANTITY | 01 | LENGTH(IN) | 021.00 | | |
| LAB NUMBER | 53307 | COUNTY | MILWAUKEE | SAMPLE FORM | WHOLE FISH | % FAT | 001.60 | | |
| ORGANICS: | | | | | | | | | |

PARAMETERS ABOVE FDA TOLERANCE:

PCB -----> 20.00

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MICROCONTAMINANTS IN SOUTHEAST DISTRICT FISH
WISCONSIN DEPARTMENT OF NATURAL RESOURCES

| | | | | | | | | | |
|---------------|--|-----------------|----------|-------------------|-----------|------------------|------------|-------------------|--------|
| GENERAL DATA: | | BASIN -----> | 052 | WATER BODY -----> | KINNIC R | SPECIES -----> | N PIKE | WEIGHT(KG) -----> | 000.45 |
| 1 | | SAMPLE DATE --> | 09/17/80 | SAMPLE LOC. --> | 7TH ST | QUANTITY -----> | 01 | LENGTH(IN) -----> | 021.00 |
| 2 | | LAB NUMBER --> | 53307 | COUNTY -----> | MILWAUKEE | SAMPLE FORM --> | WHOLE FISH | % FAT -----> | 001.60 |
| ORGANICS: | | OP-DDT -----> | <00.05 | PP-DDD -----> | 000.06 | DIELDRIN -----> | <00.02 | PCB -----> | 002.60 |
| 3 | | PP-DDT -----> | <00.05 | C-CHLORDANE --> | <00.05 | ENDRIN -----> | <00.02 | PENTCHLRPHNOL --> | <00.02 |
| 4 | | OP-ODE -----> | <00.05 | T-CHLORDANE --> | <00.05 | ALDRIN -----> | <00.02 | HEXCLRBENZENE --> | <00.01 |
| 5 | | PP-DDE -----> | 000.08 | C-NONACHLOR --> | <00.05 | ALPHA BHC -----> | <00.01 | METHOXYCHLOR --> | <00.05 |
| 6 | | OP-DDD -----> | <00.05 | T-NONACHLOR --> | <00.05 | GAMMA BHC -----> | <00.01 | | |
| METALS: | | ARSENIC -----> | <00.50 | CADMIUM -----> | <00.20 | CHROMIUM -----> | <00.50 | COPPER -----> | 002.30 |
| 7 | | LEAD -----> | <05.00 | MERCURY -----> | 000.21 | | | | |

| | | | | | | | | | |
|---------------|--|-----------------|----------|-------------------|------------|------------------|-------------|-------------------|--------|
| GENERAL DATA: | | BASIN -----> | 290 | WATER BODY -----> | LK MICH. | SPECIES -----> | RAINB TROUT | WEIGHT(KG) -----> | |
| 1 | | SAMPLE DATE --> | 04/19/79 | SAMPLE LOC. --> | GRID 1502 | QUANTITY -----> | 05 | LENGTH(IN) -----> | 024.00 |
| 2 | | LAB NUMBER --> | 05983 | COUNTY -----> | SHERBOYGAN | SAMPLE FORM --> | WHOLE FISH | % FAT -----> | 006.90 |
| ORGANICS: | | OP-DDT -----> | <00.05 | PP-DDD -----> | 000.08 | DIELDRIN -----> | 000.07 | PCB -----> | 002.60 |
| 3 | | PP-DDT -----> | 000.09 | C-CHLORDANE --> | 000.13 | ENDRIN -----> | <00.02 | PENTCHLRPHNOL --> | <00.05 |
| 4 | | OP-ODE -----> | <00.05 | T-CHLORDANE --> | <00.05 | ALDRIN -----> | <00.02 | HEXCLRBENZENE --> | <00.01 |
| 5 | | PP-DDE -----> | 000.84 | C-NONACHLOR --> | <00.05 | ALPHA BHC -----> | <00.01 | METHOXYCHLOR --> | <00.05 |
| 6 | | OP-DDD -----> | <00.05 | T-NONACHLOR --> | | GAMMA BHC -----> | <00.01 | | |
| METALS: | | ARSENIC -----> | <02.00 | CADMIUM -----> | <00.20 | CHROMIUM -----> | <00.50 | COPPER -----> | 001.90 |
| 7 | | LEAD -----> | <05.00 | MERCURY -----> | 000.07 | | | | |

BASIN: _____
 STREAM: Kinnickinnic River COUNTY Milwaukee SAMPLE NO. _____
 PRIMARY STATION NO. _____ LOCATION: SE 1/4, NE 1/4, S 11, T06N, R21E WATERSHED _____
 DATE: 05/01/84 ≈ 400 FT UPSTREAM 43RD ST BIOTIC INDEX: _____
 Chemical Sample? yes (no) IN RIFPLE AREA

13:00 TIME (24 hr) AT SAMPLE SITE: 15.0 AVG. WIDTH (ft)
 _____ DO (mg/l) _____ AVG. DEPTH (ft) POOLS TO 1.5 FT
10.0 TEMP (°C) _____ AVG. VELOCITY (measured fps)
 _____ pH (s.u.) _____ EST. VELOCITY (fps) 1. very slow (.2); 2. slow
 _____ CONDUCTIVITY (umhos) (0.2-.5); 3. moderate (.5-1.5); 4. fast (1.5)
IN RIFPLE

SAMPLED HABITAT: 1. Riffle 2. Run 3. Pool

SAMPLER: 1. D Frame Net 2. Artificial Substrate _____ 3. Other _____

SUBSTRATE AT SITE LOCATION (%):

Bedrock _____ Rubble (2 1/2 - 10" dia.) 10 Sand _____ Clay _____ Muck _____
 Boulders (10" dia.) 40 Gravel (1/10 - 2 1/2" dia.) 40 Silt _____ Detritus _____ Debris & Vegetation _____

SUBSTRATE SAMPLED (%): SAME AS ABOVE OR/

Bedrock _____ Rubble (2/12 - 10" dia.) _____ Sand _____ Clay _____ Muck _____
 Boulders (10" dia.) _____ Gravel (1/10 - 2 1/2" dia.) _____ Silt _____ Detritus _____ Debris & Vegetation _____

AQUATIC VEGETATION: _____ % of Total Stream Channel at Sample Site

OBSERVED INSTREAM CONDITIONS AT SAMPLING SITE LIMITING W.Q.

| | not present | slight | moderate | significant | Comments |
|--------------------------|--------------|---------------|------------|-------------|--|
| Sludge Deposits | <u>(n)</u> | sl | m | s | <u>IN POOLS AND RUN AREAS SCOUR FROM HEAVY RAINING PREVIOUS TWO DAYS</u> |
| Silt & Sediment Deposits | n | sl | m | <u>(s)</u> | |
| Turbidity | n | sl | <u>(m)</u> | s | |
| Chlorine or Toxic Scour | n | <u>(sl)</u> ? | m | s | |
| Macrophytes | <u>(n)</u> | sl | m | s | |
| Filamentous Algae | n | <u>(s)</u> | m | s | |
| Planktonic Algae | <u>(n)</u> | sl | m | s | |
| Slimes | <u>(n)</u> ? | sl | m | s | |
| Iron Bacteria | <u>(n)</u> | sl | m | s | |

FACTORS WHICH MAY BE AFFECTING SAMPLING SITE

| degree of influence: | General Watershed | | | At Site | Comments |
|-----------------------------------|-------------------|--------------|--------------|---------------|-------------------------------|
| | not present | possible | important | direct impact | |
| Livestock Pasturing | <u>(np)</u> | pos | imp | di | <u>STORM SEWERS SSO ?</u> |
| Barnyard Runoff | <u>(np)</u> | pos | imp | di | |
| Cropland Runoff | <u>(np)</u> | pos | imp | di | |
| Tile Drains | <u>(np)</u> | pos | imp | di | |
| Septic Systems | <u>(np)</u> | pos | imp | di | |
| Streambank Erosion | np | pos | <u>(imp)</u> | <u>(di)</u> | |
| Channel Ditching & Straightening | np | pos | <u>(imp)</u> | <u>(di)</u> | |
| Downstream Impoundment | <u>(np)</u> | pos | imp | di | |
| Upstream Impoundment | <u>(np)</u> | pos | imp | di | |
| Low Flow | np | pos | <u>(imp)</u> | <u>(di)</u> | |
| Wetlands | <u>(np)</u> | pos | imp | di | |
| Urban Runoff | np | pos | <u>(imp)</u> | <u>(di)</u> | |
| Construction Runoff | np | <u>(pos)</u> | imp | di | |
| Point Source (specify type) _____ | np | <u>(pos)</u> | <u>(imp)</u> | di ? | |
| Other (specify) _____ | np | pos | imp | di | |

PERCEIVED WATER QUALITY: 1. Excellent 2. Good 3. Fair 4. Poor 5. Very Poor

SAMPLE TRACKING INFORMATION

Time Spent Collecting Sample (minutes) 15 Replicate #'s _____
 Sampler Collector R. RANDELL Sorter R. RANDELL Identifier _____
 Date 5-1-84 Date 5-15-84 Date _____
 Dates Artificial Sampler In _____ Out _____

MACROINVERTEBRATE IDENTIFICATION

Surface Water: Kinnickinnic River Site No.: _____ Sample No.: _____

Site Location: ≈ 400' west. 43rd St. County: _____

Sample Collected By: R.R. Date: 5-1-84 Sample Type: _____

Sample Sorted By: R.R. Date: 5-15-84 Identified By: BW Date: 5-22-84

Chironomidae Mounted By: R. RANDALL Date: 6-5-84 Identified By: _____ Date: _____

Oligochaeta Mounted By: _____ Date: _____ Identified By: _____ Date: _____

Subsample _____ Mesh size _____ Chironomidae Mounted: _____

| Taxa | Stage* | Count | Total No. | Biotic Index | Taxa | Stage* | Count | Total No. | Biotic Index |
|----------------------------|--------|-------|-----------|--------------|---------------------------|--------|-------|-----------|--------------|
| Chironomidae | | 101 | | | Plecoptera | | | | |
| <i>Cricotopus</i> sp. | | | 77 | 4 | | | | | |
| <i>Natarsia</i> sp. | | | 14 | 3 | | | | | |
| <i>Thienemannimyia</i> | | | 9 | 2 | Odonata | | | | |
| <i>Cryptochironomus</i> | | | 1 | 4 | | | | | |
| | | | | | Coleoptera | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | Oligochaeta | | | | |
| Other Diptera | | | | | | | | | |
| | | | | | Isopoda | | | | |
| | | | | | | | | | |
| | | | | | Gastropoda | | | | |
| Trichoptera | | | | | | | | | |
| <i>Hydropsyche betteni</i> | | III | 3 | 3 | Amphipoda | | | | |
| | | | | | <i>Crangonyx gracilis</i> | | III | 4 | 4 |
| | | | | | | | | | |
| | | | | | Gastropoda | | | | |
| | | | | | | | | | |
| | | | | | Lepidoptera | | | | |
| Ephemeroptera | | | | | | | | | |
| | | | | | Other | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

Total No. of Organisms 108

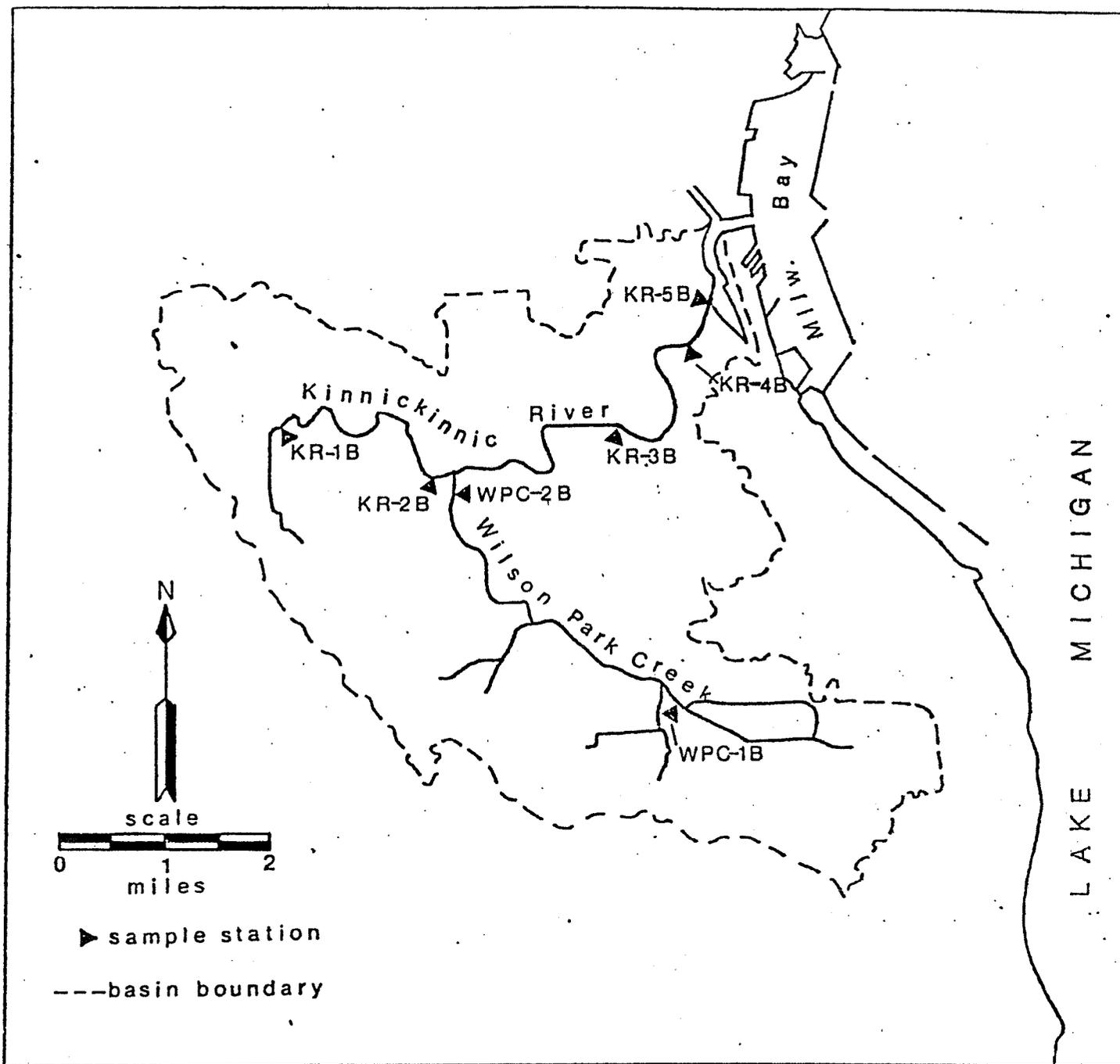
Total No. Per Sq. Ft. _____

*L - Larval; P - Pupal; A - Adult; I - Early Instar

Checked by: _____ Date: _____

Site HBI 3.76

Fig. 2.23 - Location of fecal coliform sampling stations in the Kinnickinnic River Basin



2261-4661
1974-1977
MHD
6,700 CHIN

Indian Creek

| | | | |
|-------|--------------|------|------|
| IC-1B | Bradley Road | 0.15 | WDNR |
|-------|--------------|------|------|

Kinnickinnic River

| | | | |
|-------|--|------|------|
| KR-1B | South 60th Street | 8.05 | MHD |
| KR-2B | South 35th Street | 5.45 | WDNR |
| KR-3B | South 6th Street | 2.82 | WDNR |
| KR-4B | South 1st Street | 1.43 | MHD |
| KR-5B | Chicago and Northwestern Railroad Trestle | 1.35 | WDNR |

Wilson Park Creek

| | | | |
|--------|--------------------------------|------|------|
| WPC-1B | Howell Avenue at Layton | 3.51 | WDNR |
| WPC-2B | Oklahoma Avenue at 30th Street | 0.15 | WDNR |

Oak Creek

| | | | |
|--------|---------------------|------|------|
| OC-1B | Pennsylvania Avenue | 4.9 | WDNR |
| OC-2B | Oak Creek Parkway | 0.72 | WDNR |
| nOC-1B | Marquette Avenue | 3.08 | |
| nOC-2B | Puetz Road | 0.94 | WDNR |

¹WDNR - Wisconsin Department of Natural Resources, Southeast District Office
MHD - Milwaukee Health Department

APPENDIX 2.30

Monthly Summary of Fecal Coliform Data in the Kinnickinnic River Basin (1974-1977)
Source: City of Milwaukee Health Department

| STATION | DATE | No. Obs. | Monthly Geometric Mean | | | RANGE |
|---|------------|----------|------------------------|---------|-----------|------------------|
| | | | No./100 ml | % > 400 | % > 2,000 | |
| KR-1B Mile 8.05 (South 60th Street) | STANDARD | | 1,000/100 ml | N/A | 10% | |
| | June, 1974 | 4 | 13,237 | 100 | 100 | 6,800- 27,000 |
| | July, 1974 | 7 | 77,654 | 100 | 100 | 23,000- 210,000 |
| | Aug., 1974 | 9 | 24,650 | 100 | 89 | 800- 530,000 |
| | June, 1975 | 4 | 5,286 | 100 | 75 | 550- 21,000 |
| | July, 1975 | 10 | 50,823 | 90 | 90 | 100- 980,000 |
| | Aug., 1975 | 8 | 128,334 | 100 | 100 | 5,200-1,300,000 |
| | June, 1976 | 5 | 108,642 | 100 | 100 | 44,000- 210,000 |
| | July, 1976 | 9 | 98,425 | 100 | 100 | 5,000- 590,000 |
| | Aug., 1976 | 9 | 7,580 | 89 | 78 | 340- 100,000 |
| | June, 1977 | 6 | 94,256 | 100 | 100 | 22,000-1,200,000 |
| | July, 1977 | 8 | 56,960 | 100 | 100 | 25,000- 150,000 |
| | Aug., 1977 | 8 | 13,388 | 100 | 88 | 500- 110,000 |

| STATION | DATE | No. Obs. | Monthly Geometric Mean | | | RANGE |
|---|------------|----------|------------------------|---------|-----------|-----------------|
| | | | No./100 ml | % > 400 | % > 2,000 | |
| KR-4BE Mile 1.43 (South 1st Street) | STANDARD | | 1,000/100 ml | N/A | 10% | |
| | June, 1974 | 4 | 1,426 | 100 | 25 | 820- 3,500 |
| | July, 1974 | 7 | 4,643 | 100 | 57 | 780- 110,000 |
| | Aug., 1974 | 9 | 8,776 | 100 | 89 | 1,000- 210,000 |
| | June, 1975 | 4 | 7,762 | 100 | 100 | 22,000- 47,000 |
| | July, 1975 | 7 | 2,038 | 86 | 29 | 820- 70,000 |
| | Aug., 1975 | 8 | 7,200 | 100 | 88 | 780- 96,000 |
| | June, 1976 | 5 | 427 | 40 | 0 | 240- 800 |
| | July, 1976 | 9 | 724 | 56 | 33 | 40- 22,000 |
| | Aug., 1976 | 9 | 5,161 | 100 | 67 | 660- 87,000 |
| | June, 1977 | 6 | 31,957 | 100 | 100 | 3,400-1,400,000 |
| | July, 1977 | 8 | 37,894 | 100 | 100 | 11,000- 330,000 |
| | Aug., 1977 | 8 | 55,818 | 100 | 88 | 1,500- 520,000 |

Stream Kinnickinnick River Reach Location @ CONFLUENCE W 43RD ST DISCH TO 60th ST.
 County MILWAU. Date 8-9-84 Evaluator WALKERMAN / RANDALL

Reach Score/Rating 237 / POOR
 Classification E

| Rating Item | Category | | | |
|--------------------------------|---|--|---|--|
| | Excellent | Good | Fair | Poor |
| Watershed Erosion | No evidence of significant erosion. Stable forest or grass land. Little potential for future erosion. | Some erosion evident. No significant "raw" areas. Good land mgmt practices in area. Low potential for significant erosion. | Moderate erosion evident. Erosion from heavy storm events obvious. Some "raw" areas. Potential for significant erosion. | Heavy erosion evident. Probable erosion from any runoff. |
| Watershed Nonpoint Source | No evidence of significant source. Little potential for future problem. | Some potential sources. (roads, urban area, farm fields). | Moderate sources. (Small wetlands, tile fields, urban area, intense agriculture). | Obvious sources. (Major wetland drainage, high urban or industrial area feed lots, impoundment). |
| Bank Erosion, Failure | No evidence of significant erosion or bank failure. Little potential for future problem. | Infrequent, small areas, mostly healed over. Some potential in extreme floods. | Moderate frequency and size. Some "raw" spots. Erosion potential during high flow. | Many eroded areas. "Raw" areas frequent along straight sections and bends. |
| Bank Vegetative Protection | 90% plant density. Diverse trees, shrubs, grass. Plants healthy with apparently good root systems. | 70-90% density. Fewer plant species. A few barren or thin areas. Vegetation appears generally healthy. | 50-70% density. Dominated by grass, sparse trees and shrubs. Plant types and conditions suggest poorer soil binding. | <50% density. Many bare areas. Thin grass, few if any trees and shrubs. |
| Lower Bank Channel Capacity | Ample for present peak flow plus some increase. Peak flows contained. W/D ratio <7. | Adequate. Overbank flows rare. W/D ratio 8-15. | Barely contains present peaks. Occasional overbank flow. W/D ratio 15-25. | Inadequate, overbank flow common. W/D ratio >25. |
| Lower Bank Deposition | Little or no enlargement of channel or point bars. | Some new increases in bar formation, mostly from coarse gravel. | Moderate deposition of new gravel and coarse sand on old and some new bars. | Heavy deposits of fine material, increased by development. |
| Bottom Scouring and Deposition | Less than 5% of the bottom affected by scouring and deposition. | 5-30% affected. Scour at constrictions and where grades steeper. Some deposition in pools. | 30-50% affected. Deposits and scour at obstructions, constrictions and bends. Some filling of pools. | More than 50% of the bottom changing nearly year long. Pools almost absent due to deposition. |
| Bottom Substrate | Greater than 50% rubble, gravel or other stable habitat. | 30-50% rubble, gravel or other stable habitat. Adequate habitat. | 10-30% rubble, gravel or other stable habitat. Habitat availability less than desirable. | Less than 10% rubble, gravel or other stable habitat. Lack of habitat obvious. |
| Aug. Depth Ripples and Runs | Cold > 16T | 0 6" to 16T | 6 3" to 6" | 18 Less than 3" |
| Aug. Depth of Pools | Warm > 1.56T | 0 10" to 1.56T | 6 6" to 10" | 18 Less than 6" |
| Flow, at Reg. Low Flow | Cold > 46T | 0 3' to 4' | 6 2' to 3' | 18 Less than 2' |
| Pool/Riffle, Run/Bend Ratio | Warm > 56T | 0 4' to 5' | 6 3' to 4' | 18 Less than 3' |
| Flow, at Reg. Low Flow | Warm water >5 cfs. Cold water >2 cfs. | 0 Warm water 2-5 cfs. Cold water 1-2 cfs. | 6 Warm water 0.5-2 cfs. Cold water 0.5-1 cfs. Continuous flow. | 18 Less than 0.5 cfs. Stream may cease to flow in very dry years. |
| Pool/Riffle, Run/Bend Ratio | 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. | 18 >25. Essentially a straight stream. Generally all flow water or shallow flow. Poor habitat. |
| Aesthetics | Wilderness characteristics, outstanding natural beauty. Usually wooded or unpaired 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 inhale aesthetics. Condition stream is offensive. |

COLUMN TOTALS:

Column Scores: 0 + 10 + 7 + 180 = 237 = Reach Score

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

SEDIMENT

PAGE 1 SEDIMENT DATA FROM THE SOUTHEAST DISTRICT WISCONSIN DEPT OF NAT RESOURCES - PARAMETER VALUES ARE IN PPM 10/11/83

| | | | | | | | |
|----|---------------|-------------|----------------|-------------|----------|-------------|---------------------|
| 1 | GENERAL DATA: | BASIN | 051 | COUNTY | 46 | WATER BODY | CEDAR CR |
| 2 | | SAMPLE LOC. | 06 CDRBURG STP | SAMPLE DATE | 11/14/80 | LAB ID | HYG |
| 3 | | LAB NUMBER | 35806 | SAMPLE TYPE | SEDIMENT | STATION NO. | 46MISC |
| 4 | ORGANICS: | TIME | 11:00 | DEPTH | | HEPTACHLOR | |
| 5 | | PCB | 000.07 | DIELDRIN | <00.01 | PP,DDE | <00.01 |
| 6 | | MIREX | | OP,DDE | <00.01 | OP,DDT | <00.01 |
| 7 | | OP,DDD | <00.01 | PP,DDD | <00.01 | TRNCLODN | <00.01 |
| 8 | | PP,DDT | <00.01 | CISCL3DN | <00.01 | | |
| 9 | | CISNONCL | <00.01 | TRANONCL | <00.01 | | |
| 10 | | | | | | | |
| 11 | GENERAL DATA: | BASIN | 051 | COUNTY | 46 | WATER BODY | CEDAR CR |
| 12 | | SAMPLE LOC. | 03 HAMLTON DAM | SAMPLE DATE | 05/11/82 | LAB ID | HYG |
| 13 | | LAB NUMBER | 72631 | SAMPLE TYPE | SEDIMENT | STATION NO. | 46MISC |
| 14 | ORGANICS: | TIME | 13:20 | DEPTH | | HEPTACHLOR | |
| 15 | | PCB | 003.70 | DIELDRIN | 000.01 | PP,DDE | 000.18 |
| 16 | | MIREX | | OP,DDE | <00.01 | OP,DDT | <00.01 |
| 17 | | OP,DDD | 000.01 | PP,DDD | 000.11 | TRNCLODN | 000.04 |
| 18 | | PP,DDT | <00.01 | CISCL3DN | 000.02 | | |
| 19 | | CISNONCL | 000.01 | TRANONCL | <00.01 | | |
| 20 | | | | | | | |
| 21 | | | | | | | |
| 22 | GENERAL DATA: | BASIN | 052 | COUNTY | 41 | WATER BODY | KINNIC R |
| 23 | | SAMPLE LOC. | 05 KINNIC AVE | SAMPLE DATE | 11/18/80 | LAB ID | HYG |
| 24 | | LAB NUMBER | 38668 | SAMPLE TYPE | SEDIMENT | STATION NO. | 41MISC |
| 25 | ORGANICS: | TIME | 12:30 | DEPTH | | HEPTACHLOR | |
| 26 | | PCB | 005.70 | DIELDRIN | <00.01 | PP,DDE | 000.12 |
| 27 | | MIREX | | OP,DDE | <00.01 | OP,DDT | <00.01 |
| 28 | | OP,DDD | <00.01 | PP,DDD | 000.09 | TRNCLODN | <00.01 |
| 29 | | PP,DDT | 000.01 | CISCL3DN | 000.01 | | |
| 30 | | CISNONCL | <00.01 | TRANONCL | <00.01 | | |
| 31 | | | | | | | |
| 32 | | | | | | | |
| 33 | GENERAL DATA: | BASIN | 052 | COUNTY | 41 | WATER BODY | KINNIC R |
| 34 | | SAMPLE LOC. | 11 BARAN PK | SAMPLE DATE | 11/18/80 | LAB ID | HYG |
| 35 | | LAB NUMBER | 37424 | SAMPLE TYPE | SEDIMENT | STATION NO. | 41MISC |
| 36 | ORGANICS: | TIME | 12:30 | DEPTH | | HEPTACHLOR | |
| 37 | | PCB | 004.60 | DIELDRIN | <00.01 | PP,DDE | 000.06 |
| 38 | | MIREX | | OP,DDE | <00.01 | OP,DDT | <00.01 |
| 39 | | OP,DDD | <00.01 | PP,DDD | 000.10 | TRNCLODN | <00.01 |
| 40 | | PP,DDT | 000.05 | CISCL3DN | <00.01 | | |
| 41 | | CISNONCL | <00.01 | TRANONCL | <00.01 | | |
| 42 | | | | | | | |

Samples for 1980-1982 only
Root R. + Pike R samples for 1982 are missing.

SEDIMENT DATA FROM THE SOUTHEAST DISTRICT
 WISCONSIN DEPT OF NAT RESOURCES - PARAMETER VALUES ARE IN PPM

10/11/83

| | | | | | | |
|---------------|-----------------|--------------|-----------------|----------|------------------|----------|
| GENERAL DATA: | BASIN -----> | 052 | COUNTY -----> | 41 | WATER BODY ----> | KINNIC R |
| | SAMPLE LOC. --> | 12 WILSON PK | SAMPLE DATE --> | 11/14/80 | LAB ID -----> | HYG |
| | LAB NUMBER --> | 37422 | SAMPLE TYPE --> | SEDIMENT | STATION NO. --> | 41MISC |
| | TIME -----> | 15:00 | DEPTH -----> | | | |
| ORGANICS: | PCB -----> | 000.15 | DIELDRIN -----> | <00.01 | HEPTACHLOR ----> | |
| | MIREX -----> | | OP,DDE -----> | <00.01 | PP,DDE -----> | <00.01 |
| | OP,DDD -----> | <00.01 | PP,DDD -----> | 000.02 | OP,DDT -----> | <00.01 |
| | PP,DDT -----> | <00.01 | CISCLODN -----> | <00.01 | TRNCLODN -----> | <00.01 |
| | CISNONCL -----> | <00.01 | TRANONCL -----> | <00.01 | | |

| | | | | | | |
|---------------|-----------------|---------------|-----------------|----------|------------------|----------|
| GENERAL DATA: | BASIN -----> | 052 | COUNTY -----> | 41 | WATER BODY ----> | KINNIC R |
| | SAMPLE LOC. --> | 15 JACKSON PK | SAMPLE DATE --> | 11/24/90 | LAB ID -----> | HYG |
| | LAB NUMBER --> | 37423 | SAMPLE TYPE --> | SEDIMENT | STATION NO. --> | 41MISC |
| | TIME -----> | 10:00 | DEPTH -----> | | | |
| ORGANICS: | PCB -----> | 001.10 | DIELDRIN -----> | <00.01 | HEPTACHLOR ----> | |
| | MIREX -----> | | OP,DDE -----> | <00.01 | PP,DDE -----> | <00.02 |
| | OP,DDD -----> | <00.01 | PP,DDD -----> | 000.09 | OP,DDT -----> | <00.01 |
| | PP,DDT -----> | 000.04 | CISCLODN -----> | <00.01 | TRNCLODN -----> | <00.01 |
| | CISNONCL -----> | <00.01 | TRANONCL -----> | <00.01 | | |

| | | | | | | |
|---------------|-----------------|---------------|-----------------|----------|------------------|----------|
| GENERAL DATA: | BASIN -----> | 052 | COUNTY -----> | 41 | WATER BODY ----> | KINNIC R |
| | SAMPLE LOC. --> | 05 KINNIC AVE | SAMPLE DATE --> | 05/17/82 | LAB ID -----> | HYG |
| | LAB NUMBER --> | 72635 | SAMPLE TYPE --> | SEDIMENT | STATION NO. --> | 41MISC |
| | TIME -----> | 15:45 | DEPTH -----> | | | |
| ORGANICS: | PCB -----> | 003.50 | DIELDRIN -----> | <00.01 | HEPTACHLOR ----> | |
| | MIREX -----> | | OP,DDE -----> | <00.01 | PP,DDE -----> | 000.01 |
| | OP,DDD -----> | <00.01 | PP,DDD -----> | 000.09 | OP,DDT -----> | <00.01 |
| | PP,DDT -----> | <00.01 | CISCLODN -----> | <00.01 | TRNCLODN -----> | <00.01 |
| | CISNONCL -----> | <00.01 | TRANONCL -----> | <00.01 | | |

| | | | | | | |
|---------------|-----------------|--------------|-----------------|----------|------------------|----------|
| GENERAL DATA: | BASIN -----> | 052 | COUNTY -----> | 41 | WATER BODY ----> | KINNIC R |
| | SAMPLE LOC. --> | 11 CHASE AVE | SAMPLE DATE --> | 05/17/82 | LAB ID -----> | HYG |
| | LAB NUMBER --> | 72634 | SAMPLE TYPE --> | SEDIMENT | STATION NO. --> | 41MISC |
| | TIME -----> | 15:10 | DEPTH -----> | | | |
| ORGANICS: | PCB -----> | 001.10 | DIELDRIN -----> | <00.01 | HEPTACHLOR ----> | |
| | MIREX -----> | | OP,DDE -----> | <00.01 | PP,DDE -----> | 000.05 |
| | OP,DDD -----> | 000.01 | PP,DDD -----> | 000.05 | OP,DDT -----> | <00.01 |
| | PP,DDT -----> | <00.01 | CISCLODN -----> | <00.01 | TRNCLODN -----> | 000.01 |
| | CISNONCL -----> | <00.01 | TRANONCL -----> | <00.01 | | |

 SEDIMENT DATA FROM THE SOUTHEAST DISTRICT
 WISCONSIN DEPT OF NAT RESOURCES - PARAMETER VALUES ARE IN PPM

10/11/83

| | | | | | | |
|---------------|-----------------|------------|-----------------|----------|------------------|----------|
| GENERAL DATA: | BASIN -----> | 052 | COUNTY -----> | 41 | WATER BODY ----> | MONONONG |
| | SAMPLE LOC. --> | 05 27TH ST | SAMPLE DATE --> | 12/10/80 | LAB ID -----> | HYG |
| | LAB NUMBER --> | 40514 | SAMPLE TYPE --> | SEDIMENT | STATION NO. --> | 41MISC |
| | TIME -----> | 13:40 | DEPTH -----> | | | |
| ORGANICS: | PCB -----> | 000.25 | DIELDRIN -----> | <00.01 | HEPTACHLOR ----> | |
| | MIREX -----> | | OP,DDE -----> | <00.01 | PP,DDE -----> | |

OCTOBER,
1975

Kinnickinnic River, Milwaukee County
Milwaukee River Drainage Basin

The Kinnickinnic River provides drainage for 26 square miles of east central Milwaukee County. The main stem originates in an urbanized area and flows intermittently approximately three miles through an altered channel before entering a concrete cuenette at 43rd Street. The stream then flows four miles through an urbanized and industrialized area to a point downstream of 5th Street where the river has been dredged to allow navigation. The dredged channel runs 1.5 miles through an industrialized area to the Milwaukee Harbor.

The 43rd Street ditch is a tributary which drains a heavily industrialized area. The Wilson Park Tributary drains an urbanized area and general Mitchel Field, and enters the main stem near 30th Street: Both tributaries have been channelized and lined with concrete.

The majority of land adjacent to the main stem and tributaries is publicly owned. The river is subjected to rapid rises and falls in stage during rain events and snow melts. The majority of the flow upstream of 5th Street is contributed by waste water dischargers in dry weather.

The Kinnickinnic River downstream of 5th Street is an estuary of Lake Michigan. During periods of low flow, this section of the river is subject to stagnation and dissolved oxygen depletion. To alleviate this condition, a pumping station has been built near Chase Avenue, to flush the lower channel with water from Lake Michigan. Mixing with water in the harbor occurs to some extent as a result of lake seiches.

The fishery is limited to fall runs of salmonoids from Lake Michigan. The stream did not support a "balanced benthic macro-invertebrate community. A benthic macroinvertebrate sampling survey conducted in October, 1975 found sparse populations, indicating toxic materials had recently passed the following sites:

- Main stem downstream of 6th Street
- Main stem at 43rd Street
- Wilson Park Tributary at Morgan Avenue

The substrate at all sites supported dense growths of filamentous algae.

Recommendations

The Kinnickinnic River upstream of 5th Street shall be classified as a noncontinuous urban stream. Downstream of 5th Street shall be classified as continuous fish and aquatic life.

OCT 19, 1983

PCB IN SOUTHEAST DISTRICT FISH
WISCONSIN DEPARTMENT OF NATURAL RESOURCES

1972 - 1982

| WATER BODY | SAMPLE LOCATION | DATE | SPECIES | SMPL QUANT | SAMPLE FORM | LENGTH (IN.) | WEIGHT (KG.) | PCB (PPM) | PERCENT FAT | N |
|------------|-----------------|-------------|-------------|------------|-------------|--------------|--------------|------------|-------------|--------|
| KILBOURN D | RADTKE FILL | 03/11/81 | CARP | 02 | WHOLE FISH | 011.70 | 000.41 | 001.50 | 004.40 | 6 |
| | | | CREEK CHUB | 12 | WHOLE FISH | 007.70 | 000.09 | 000.98 | 003.90 | 6 |
| | | | GR SUNFISH | 07 | WHOLE FISH | 003.90 | 000.03 | 000.98 | 002.20 | 6 |
| | | 11/06/81 | BL BULLHEAD | 03 | WHOLE FISH | 006.60 | 000.10 | 001.40 | 003.70 | 6 |
| | | | W SUCKER | 03 | WHOLE FISH | 012.20 | 000.36 | 000.52 | 001.70 | 5 |
| | | | N PIKE | 02 | WHOLE FISH | 015.50 | 000.40 | 000.34 | 000.93 | 5 |
| | | | W SUCKER | 05 | WHOLE FISH | 008.85 | 000.10 | 000.30 | 002.90 | 5 |
| | | | BL BULLHEAD | 03 | WHOLE FISH | 007.00 | 000.08 | <00.20 | 001.70 | 5 |
| | | | BL BULLHEAD | 03 | WHOLE FISH | 006.90 | 000.10 | <00.20 | 001.70 | 5 |
| | | | KINNIC R | KINNIC AVE | 07/02/80 | N REDHORSE | 03 | WHOLE FISH | 013.20 | 000.40 |
| CARP | 03 | WHOLE FISH | | | 018.30 | 004.07 | 034.00 | 018.10 | 5 | |
| HWY 94 | 09/15/77 | RAINB TROUT | | 04 | WHOLE FISH | 021.90 | . | 005.70 | 004.50 | 5 |
| | CARP | 03 | | WHOLE FISH | 005.00 | . | 004.20 | 003.90 | 5 | |
| 08/15/78 | GOLDFISH | 05 | | WHOLE FISH | 015.50 | . | 018.00 | 012.00 | 5 | |
| | GOLDFISH | 04 | | WHOLE FISH | 014.50 | . | 017.00 | 010.50 | 5 | |
| 07/09/79 | GOLDFISH | 01 | | WHOLE FISH | 016.60 | . | 012.00 | 005.70 | 0 | |
| | CARP | 02 | | WHOLE FISH | 025.80 | . | 017.00 | 013.00 | 0 | |
| BARAN PK | 07/08/81 | CARP | | 02 | WHOLE FISH | 027.60 | . | 013.00 | 022.00 | 0 |
| | GOLDFISH | 02 | | WHOLE FISH | 016.70 | 001.80 | 021.00 | 014.20 | 1 | |
| 09/28/82 | CARP | 03 | | WHOLE FISH | 027.20 | 004.76 | 019.00 | 014.80 | 1 | |
| | CARP | 05 | | WHOLE FISH | 017.02 | 001.49 | 008.90 | 013.00 | 0 | |
| 7TH ST | 09/17/80 | CARP | | 03 | WHOLE FISH | 009.50 | 000.50 | 004.10 | 006.30 | 0 |
| | | CARP | | 05 | WHOLE FISH | 015.50 | 001.25 | 012.00 | 009.40 | 5 |
| | | W SUCKER | | 05 | WHOLE FISH | 009.50 | 000.14 | 020.00 | 002.30 | 5 |
| | | | N PIKE | 01 | WHOLE FISH | 021.00 | 000.85 | 002.60 | 001.60 | 5 |
| LK MICH | GRID 1502 | 05/14/75 | LAKE TROUT | 01 | FILLET | 028.70 | . | 018.20 | 021.00 | 1 |
| | | | LAKE TROUT | 01 | FILLET | 019.50 | . | 001.90 | 006.00 | 1 |
| | | | LAKE TROUT | 01 | FILLET | 020.00 | . | 000.09 | 005.30 | 1 |
| | | | BLOATER | 01 | FILLET | 010.70 | . | 000.25 | 004.50 | 1 |
| | | | LAKE TROUT | 01 | FILLET | 012.20 | . | 000.50 | 001.10 | 1 |
| | | | LAKE TROUT | 01 | FILLET | 016.70 | . | 002.40 | 004.30 | 1 |
| | | | BROWN TROUT | 01 | FILLET | 013.80 | . | 000.03 | 008.00 | 1 |
| | | | 05/15/75 | LAKE TROUT | 01 | FILLET | 021.90 | . | 004.00 | 010.00 |
| | | 05/25/75 | LAKE TROUT | 01 | FILLET | 029.50 | . | 010.60 | 019.40 | 1 |
| | | | BROWN TROUT | 01 | FILLET | 024.40 | . | 003.40 | 001.50 | 1 |
| | | | LAKE TROUT | 01 | FILLET | 020.40 | . | 009.00 | 012.10 | 1 |