

SANITARY SEWER SERVICE AREA FOR THE VILLAGE OF BIG BEND AND ENVIRONS

WAUKESHA COUNTY WISCONSIN

**SOUTHEASTERN WISCONSIN
REGIONAL PLANNING COMMISSION**

KENOSHA COUNTY

Anita M. Faraone
Adelene Greene,
Secretary
Robert W. Pitts

RACINE COUNTY

Susan S. Greenfield
Mary A. Kacmarcik
Michael J. Miklasevich

MILWAUKEE COUNTY

Brian Dranzik
William R. Drew,
Treasurer
John F. Weishan, Jr.

WALWORTH COUNTY

Richard A. Hansen,
Vice-Chairman
Gregory L. Holden
Nancy Russell

OZAUKEE COUNTY

Thomas H. Buestrin
William E. Johnson
Gus W. Wirth, Jr.

WASHINGTON COUNTY

John M. Jung
Daniel S. Schmidt
David L. Stroik,
Chairman

WAUKESHA COUNTY

James T. Dwyer
Anselmo Villarreal
Paul G. Vrakas

**SOUTHEASTERN WISCONSIN REGIONAL
PLANNING COMMISSION STAFF**

Kenneth R. Yunker, PE Executive Director
Stephen P. Adams Public Involvement and Outreach Manager
Nancy M. Anderson, AICP Chief Community Assistance Planner
Michael G. Hahn, PE, PH Chief Environmental Engineer
Christopher T. Hiebert, PE Chief Transportation Engineer
Elizabeth A. Larsen Business Manager
John G. McDougall Geographic Information Systems Manager
John R. Meland Chief Economic Development Planner
Dr. Donald M. Reed Chief Biologist
Donald P. Simon, RLS Chief Planning Illustrator
William J. Stauber Chief Land Use Planner

SOUTHEASTERN WISCONSIN REGIONAL PLANNING COMMISSION

W239 N1812 ROCKWOOD DRIVE • PO BOX 1607 • WAUKESHA, WI 53187-1607 •

TELEPHONE (262) 547-6721
FAX (262) 547-1103

Serving the Counties of:

KENOSHA
MILWAUKEE
OZAUKEE
RACINE
WALWORTH
WASHINGTON
WAUKESHA



SUBJECT: Certification of Amendment to the Adopted Regional Water Quality Management Plan (Big Bend Sanitary Sewer Service Area)

TO: The Legislative Bodies of Concerned Local Units of Government within the Southeastern Wisconsin Region, namely: the County of Waukesha, the Village of Big Bend, and the Town of Vernon.

This is to certify that at the meeting of the Southeastern Wisconsin Regional Planning Commission, held at the Waukesha County Communications Center, Waukesha, Wisconsin, on the 10th day of March 2010, the Commission did by vote of all Commissioners present, being 10 ayes and 1 nay, and by appropriate Resolution, a copy of which is made a part hereof and incorporated by reference to the same force and effect as if it had been specifically set forth herein in detail, adopt an amendment to the regional water quality management plan, which plan was originally adopted by the Commission on the 12th day of July 1979, as part of the master plan for the physical development of the Region. Said amendment to the regional water quality management plan pertains to the Big Bend sanitary sewer service area and consists of the documents attached hereto and made a part hereof. Such action taken by the Commission is recorded on, and is a part of, said plan, and the plan as amended is hereby transmitted to the constituent local units of government for consideration, adoption, and implementation.

IN TESTIMONY WHEREOF, I have hereunto set my hand and seal and cause the Seal of the Southeastern Wisconsin Regional Planning Commission to be hereto affixed. Dated at the City of Pewaukee, Wisconsin, this 11th day of March 2010.

David L. Stroik, Chairman
Southeastern Wisconsin
Regional Planning Commission

ATTEST:

Kenneth R. Yunker, Deputy Secretary

(This page intentionally left blank)

RESOLUTION NO. 2010-05

RESOLUTION OF THE SOUTHEASTERN WISCONSIN REGIONAL PLANNING COMMISSION AMENDING THE ADOPTED REGIONAL WATER QUALITY MANAGEMENT PLAN, THAT PLAN BEING A PART OF THE MASTER PLAN FOR THE PHYSICAL DEVELOPMENT OF THE REGION CONSISTING OF THE COUNTIES OF KENOSHA, MILWAUKEE, OZAUKEE, RACINE, WALWORTH, WASHINGTON, AND WAUKESHA IN THE STATE OF WISCONSIN (BIG BEND SANITARY SEWER SERVICE AREA)

WHEREAS, pursuant to Section 66.0309(10) of the *Wisconsin Statutes*, the Southeastern Wisconsin Regional Planning Commission, at a meeting held on the 12th day of July 1979, duly adopted a regional water quality management plan as documented in the three-volume SEWRPC Planning Report No. 30, *A Regional Water Quality Management Plan for Southeastern Wisconsin: 2000*; and

WHEREAS, by letter dated October 6, 2008, the Village of Big Bend requested that the Commission prepare an amendment to the regional water quality management plan that would establish a Big Bend sanitary sewer service area and designate the Village as the management agency that would operate a new wastewater treatment plant which would serve that area; and

WHEREAS, the Commission, working with the Village of Big Bend and other concerned units and agencies of government, has completed a sewer service area plan for the Village of Big Bend and environs, such plan being set forth in SEWRPC Community Assistance Planning Report No. 308, *Sanitary Sewer Service Area for the Village of Big Bend and Environs, Waukesha County, Wisconsin*; and

WHEREAS, the aforementioned community assistance planning report recommends a sewerage system including a new wastewater treatment plant discharging to the Fox River as the most cost-effective means for providing sanitary sewer service to the Village of Big Bend and environs; designates the Village of Big Bend as the management agency that would operate such a new wastewater treatment plant; and identifies a planned sanitary sewer service area for the Village of Big Bend and environs; and

WHEREAS, the aforementioned community assistance planning report addresses the pertinent comments included in the record of a public hearing on the proposed sewer service area plan sponsored by the Village of Big Bend and the Regional Planning Commission on November 4, 2009; and

WHEREAS, Section 66.0309(9) of the *Wisconsin Statutes* authorizes and empowers the Regional Planning Commission, as the work of making the whole master plan progresses, to amend, extend, or add to the master plan or carry any part or subject thereof into greater detail;

NOW, THEREFORE, BE IT HEREBY RESOLVED:

FIRST: That the regional water quality management plan for the Southeastern Wisconsin Region, being a part of the master plan for the physical development of the Region and comprised of SEWRPC Planning Report No. 30, Volumes One, Two, and Three, which was adopted by the Commission as a part of the master plan on the 12th day of July 1979, be and the same hereby is amended to include the sewer service area plan for the Village of Big Bend as documented in SEWRPC Community Assistance Planning Report No. 308, *Sanitary Sewer Service Area for the Village of Big Bend and Environs, Waukesha County, Wisconsin*.

SECOND: That the Executive Director is authorized to submit findings to the Wisconsin Department of Natural Resources and the Wisconsin Department of Commerce that public and private sanitary sewer extensions necessary to serve existing and anticipated development on the lands concerned are in conformance with, and would serve to implement, the adopted regional water quality management plan as herein amended.

RESOLUTION NO. 2010-05

THIRD: That a true, correct, and exact copy of this resolution, together with the aforementioned SEWRPC Community Assistance Planning Report No. 308, shall be forthwith distributed to each of the local legislative bodies of the local governmental units within the Region entitled thereto and to such other bodies, agencies, or individuals as the law may require or as the Commission, its Executive Committee, or its Executive Director, at their discretion, shall determine and direct.

The foregoing resolution, upon motion duly made and seconded, was regularly adopted at the meeting of the Southeastern Wisconsin Regional Planning Commission held on the 10th day of March 2010, the vote being: Ayes 10; Nays 1.



David L. Stroik, Chairman

ATTEST:



Kenneth R. Yunker, Deputy Secretary

COMMUNITY ASSISTANCE PLANNING REPORT No. 308

**SANITARY SEWER SERVICE
AREA FOR THE VILLAGE
OF BIG BEND AND ENVIRONS
WAUKESHA COUNTY, WISCONSIN**

Prepared by the

Southeastern Wisconsin Regional Planning Commission
W239 N1812 Rockwood Drive
P.O. Box 1607
Waukesha, WI 53187-1607
www.sewrpc.org

March 2010

\$10.00

(This page intentionally left blank)

TABLE OF CONTENTS

	Page		Page
Chapter I—INTRODUCTION	1	Alternative No. 3: Pump to	
Introduction	1	the City of Waukesha	14
Wastewater Treatment in the Big Bend Area	3	Evaluation Factors	19
Purpose of This Report	3	Cost Summary and Conclusion	19
		Environmental Impacts	23
Chapter II—PROPOSED SANITARY		WDNR Nonproliferation Policy	24
SEWER SERVICE AREA	5	Sewage Pumping Considerations	24
Introduction	5	Wastewater Treatment	
Proposed Big Bend		Plant Isolation Distance	24
Sanitary Sewer Service Area	5	Fiscal Considerations	24
Population Within the Proposed		Conclusion	25
Sewer Service Area	7		
Environmentally Significant Lands Within		Chapter IV—SUMMARY OF PUBLIC	
the Proposed Sewer Service Area	7	HEARING AND CONCLUDING	
Restrictions on Sewer Development in		RECOMMENDATIONS	27
Environmentally Significant Areas	8	Results of Public Hearing	27
Timing Considerations for the		Comments Voiced at the Hearing	27
Provision of Sewer Service Within		Written Comments	28
the Proposed Sewer Service Area	8	Written Comments from	
Chapter III—SEWERAGE		Waukesha County	28
FACILITIES	11	Written Comments from	
Introduction	11	the City of Muskego	28
Basic Assumptions and Procedures	12	Written Comments from the Western	
Population and Land Use	12	Racine County Sewerage District	28
Wastewater Flows	12	Written Comments from	
Method of Economic		the Village of Mukwonago	28
Analysis and Cost Data	12	Written Comments from	
Alternative Plans for Provision of		Private Interests	28
Sanitary Sewer and Wastewater Treatment		Response to Public Comments	29
Service To the Proposed Sewer Service		Response to Comment 1	29
Area for the Village of Big Bend	13	Response to Comment 2	29
Introduction	13	Response to Comment 3	30
Alternative No. 1: New Extended		Response to Comment 4	30
Aeration Activated Sludge		Response to Comment 5 and 12	30
Wastewater Treatment Plant	13	Response to Comment 6 and 8	31
Alternative No. 2: New Aerated		Response to Comment 7	31
Lagoon Wastewater Treatment		Response to Comment 9	31
Plant With Land Application	14	Response to Comment 10	32

	Page		Page
Response to Comment 11	32	Comment from SEWRPC Planning	
Response to Comment 14	33	and Research Committee	33
Response to Comment 15	33	Concluding Recommendations	34
Response to Comment 16	33	Village Adoption of the Plan	34

LIST OF APPENDICES

Appendix		Page
A	Maps of Environmentally Significant Lands and Planned Sanitary Sewer Service Area for the Village of Big Bend and Environs	37
B	Summary of Procedures Used in the Identification of Environmental Corridors and Isolated Natural Resource Areas.....	47
C	20-Year Cost-Effectiveness Analysis	49
D	Public Hearing Record	55

LIST OF TABLES

Table		Page
Chapter III		
1	Economic Analysis of Estimated Costs of Alternative No. 1—New Extended Aeration Activated Sludge Wastewater Treatment Plant (WWTP) to Serve the Village of Big Bend	16
2	Economic Analysis of Estimated Costs of Alternative No. 2—Aeration Lagoon Wastewater Treatment Plant (WWTP) With Land Application to Serve the Village of Big Bend	18
3	Economic Analysis of Estimated Costs of Alternative No. 3—Pump to the City of Waukesha.....	21
4	Comparison of Alternative Plan Costs	22

LIST OF MAPS

Map		Page
Chapter I		
1	Recommended Sanitary Sewer Service Areas in the Region: December 2009.....	2
Chapter II		
2	Village of Big Bend and Environs Planned Sanitary Sewer Service Area.....	6

Map		Page
3	Anticipated Changes in the Environmentally Significant Lands in Village of Big Bend and Environs Study Area.....	9

Chapter III

4	Alternative No. 1—New Extended Aeration Activated Sludge Wastewater Treatment Plant.....	15
5	Alternative No. 2—Aeration Lagoon Wastewater Treatment Plant With Land Application.....	17
6	Alternative No. 3—Pump to the City of Waukesha	20

(This page intentionally left blank)

Chapter I

INTRODUCTION

BACKGROUND

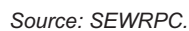
On July 12, 1979, the Southeastern Wisconsin Regional Planning Commission adopted a regional water quality management plan for Southeastern Wisconsin. The plan is aimed at achieving clean and wholesome surface waters within the seven-county Region, surface waters that are “fishable and swimmable.”¹ The plan has five basic elements: 1) a land use element, consisting of recommendations for the location of new urban development in the Region and for the preservation of primary environmental corridors and prime agricultural lands; 2) a point source pollution abatement element; 3) a nonpoint source pollution abatement element; 4) a sludge management element, consisting of recommendations for the handling and disposal of sludges from sewage treatment facilities; and 5) recommendations for the establishment of continuing water quality monitoring efforts in the Region.

The point source pollution abatement element of the regional water quality management plan includes recommendations concerning the location and extent of sanitary sewer service areas; the location, type, and capacity of, and the level of treatment to be provided at, sewage treatment facilities; the location and configuration of intercommunity trunk sewers; and the abatement of pollution from sewer system overflows and from industrial wastewater discharges. As part of the point source pollution abatement element, the initially adopted regional water quality management plan delineated a generalized sanitary sewer service area for each sanitary sewerage system in the Region. Nearly all of the initially adopted, generalized sewer service areas have now been refined and detailed through local sewer service area planning studies in order to reflect local as well as regional planning objectives. In each case, the refined sewer service area has been adopted as part of the areawide water quality management plan. The currently adopted sanitary sewer service areas in the Region are shown on Map 1.

In Southeastern Wisconsin, local sewer service area plans are prepared through a cooperative planning process involving the local unit of government responsible for operation of the sewage treatment facility, the Regional Planning Commission as the designated areawide water quality management planning agency, and the Wisconsin Department of Natural Resources, pursuant to the provisions of Chapter NR 121 of the *Wisconsin Administrative Code*. Following initial adoption, sanitary sewer service area plans may be amended in response to changing conditions and needs, subject to Chapter NR 121.

¹The adopted areawide water quality management plan is documented in SEWRPC Planning Report No. 30, A Regional Water Quality Management Plan for Southeastern Wisconsin: 2000, dated 1978-1979, as amended.

RECOMMENDED SANITARY SEWER SERVICE AREAS IN THE REGION: DECEMBER 2009



Sanitary sewer service area plans have a direct bearing on where sanitary sewers may be provided. Under State administrative rules, sanitary sewers may be extended only to lands located within a planned sewer service area adopted as part of an areawide water quality management plan. The inclusion of land in a sanitary sewer service area enables, but does not mandate, the provision of sewer service. Sanitary sewer service area plans also identify environmentally significant lands to which the extension of sewer service is prohibited or otherwise restricted.

Section NR 110.08(4) and Section Comm 82.20(4) of the *Wisconsin Administrative Code* require that the Wisconsin Department of Natural Resources, with respect to public sanitary sewers, and the Wisconsin Department of Commerce, with respect to private sanitary sewers, make a finding that all proposed sanitary sewer extensions are in conformance with adopted areawide water quality management plans, including the sanitary sewer service areas identified in such plans. In carrying out their responsibilities in this respect, these Departments require that the Southeastern Wisconsin Regional Planning Commission, as the designated areawide water quality management planning agency for Southeastern Wisconsin, review and comment on each proposed sewer extension as to its relationship to the approved plan and sewer service areas.

WASTEWATER TREATMENT IN THE BIG BEND AREA

Historically, urban development in the Village of Big Bend has relied upon private onsite wastewater treatment systems. The areawide water quality management plan adopted by the Regional Planning Commission in 1979 recommended that urban development in the Big Bend area not be included in a planned sanitary sewer service area since information available at that time did not indicate a need for the provision of centralized public sanitary sewer service to this area. Thus, the regional water quality management plan recommended that sewage disposal in the Big Bend area continue to be provided through onsite sewage disposal systems, coupled with a suitable program for monitoring and maintaining the systems. However, that plan also recommended that detailed local studies be carried out for urban enclaves, such as Big Bend, which have concentrations of onsite sewage disposal systems, recognizing that such studies may result in recommendations for additional public centralized sanitary sewer service areas in the Region.

In 2003, the Village of Big Bend retained an engineering consultant to prepare a feasibility study which examined alternatives for providing public centralized sanitary sewer and water supply service to existing and anticipated commercial development in the vicinity of the IH 43/STH 164 interchange.² Subsequently, the Village of Big Bend retained another engineering consultant to evaluate alternatives for providing centralized sanitary sewer service to the entire Village and, potentially, certain adjacent areas of the Town of Vernon.³ The resulting wastewater facilities plan recommended the construction of a new wastewater treatment plant that would discharge to the Fox River and the phased construction of a wastewater collection and conveyance system tributary to that plant.

PURPOSE OF THIS REPORT

As an outgrowth of the aforementioned facility planning, by letter dated October 6, 2008, the Village of Big Bend requested that the Regional Planning Commission prepare an amendment to the regional water quality management plan that would establish a Big Bend sewer service area and designate the Village as the management agency that would operate a new wastewater treatment plant. This community assistance planning report was prepared by the Regional Planning Commission in response to that request. The balance of this report is organized as follows:

- Chapter II sets forth a proposed sanitary sewer service area for Big Bend, identifying the area within which sanitary sewer service may be provided. Environmentally significant lands within the proposed

²*Documented in Feasibility Study for Water and Sewerage Service for the Properties at the Intersection of Interstate 43 and State Highway 164, Big Bend, Wisconsin, dated April 2003.*

³*Documented in Village of Big Bend Wastewater Facilities Plan, dated January 2007, as modified in addendums dated October 2007 and August 2008.*

sewer service area are identified, along with an explanation of policies that prohibit or otherwise restrict the extension of sewers within such areas.

- Chapter III presents and evaluates alternative systems for wastewater conveyance and treatment for the Big Bend area and identifies a recommended system. It draws upon the cost-effectiveness analyses developed under the wastewater facilities plan prepared for the Village in 2007-2008.
- Chapter IV summarizes the results of a public hearing on the proposed Big Bend sewer service area and sewerage system and presents the Regional Planning Commission and Village response to issues raised at the hearing. The chapter also sets forth final recommendation for a sewer service area and sewerage system for the Big Bend area, taking into account the results of the public hearing.

Chapter II

PROPOSED SANITARY SEWER SERVICE AREA

INTRODUCTION

As indicated in Chapter I, under State administrative rules, sanitary sewers may be extended only to lands located within a planned sewer service area adopted as part of an areawide water quality management plan.¹ The inclusion of land within a planned sanitary sewer service area enables the provision of sanitary sewer service; it does not mandate the provision of sewer service. There are certain restrictions on the provision of sanitary sewer service within environmentally significant areas identified as part of sanitary sewer service area plans, as described later in this chapter.

As also previously noted, in Southeastern Wisconsin, sewer service area plans are prepared through a cooperative planning process involving the local unit of government responsible for operation of the sewage treatment facility, the Regional Planning Commission as the designated areawide water quality management planning agency, and the Wisconsin Department of Natural Resources, pursuant to the provisions of Chapter NR 121 of the *Wisconsin Administrative Code*. Following initial adoption, sanitary sewer service area plans may be amended in response to changing conditions and needs, subject to Chapter NR 121.

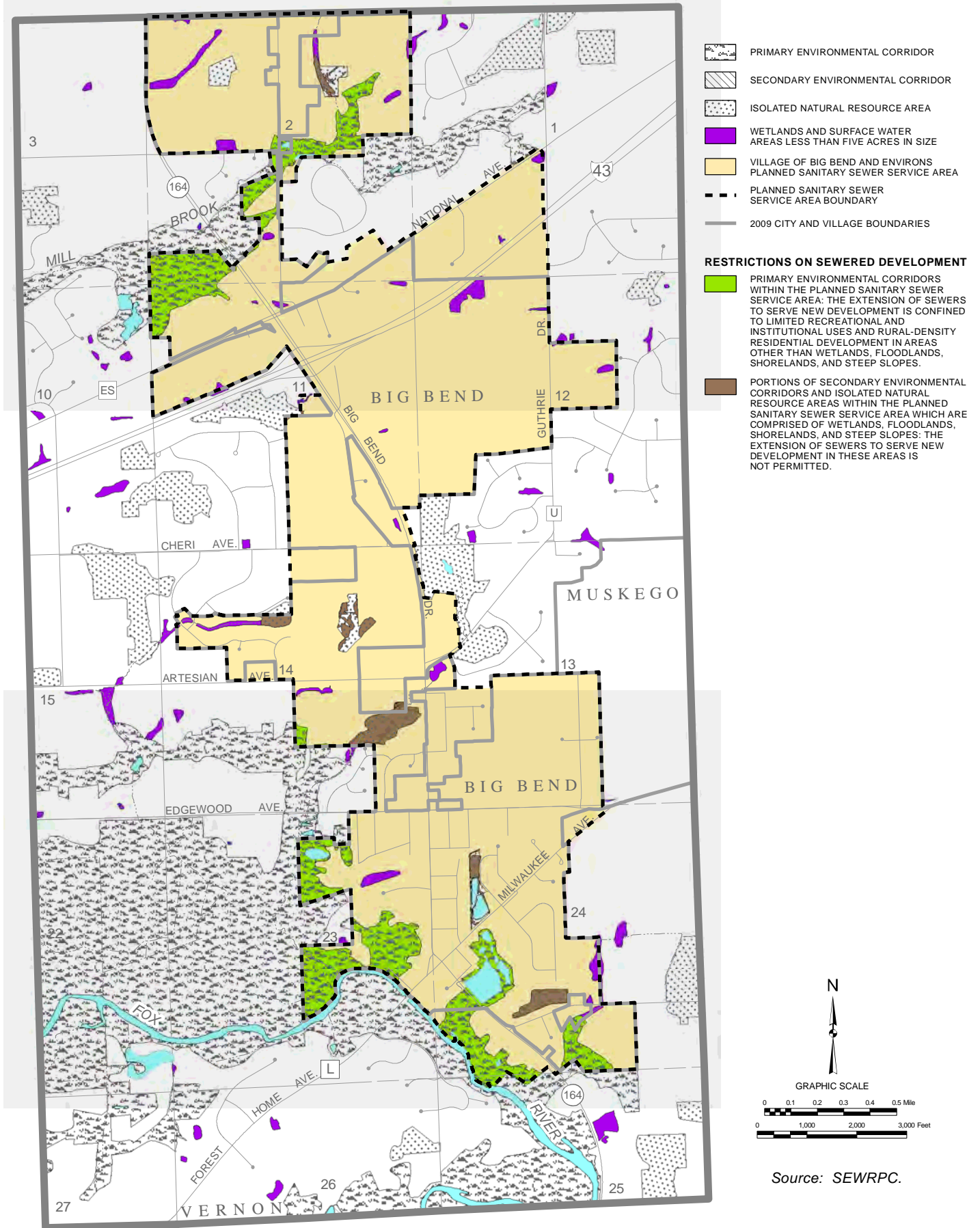
PROPOSED BIG BEND SANITARY SEWER SERVICE AREA

A proposed sanitary sewer service area for the Village of Big Bend and environs is shown on Map 2. This represents a refinement of a generalized sewer service area assumed for purposes of the wastewater facilities plan prepared for the Village in 2007-2008. The outer boundary of the proposed sanitary sewer service area shown on Map 2 was identified by Village officials in consultation with the Regional Planning Commission staff, based upon consideration of a number of factors including: the pattern of existing urban and rural development; planned future land use as indicated in the comprehensive plans for the Village of Big Bend, the Town of Vernon, and Waukesha County; the year 2035 regional land use plan; and road rights-of-way and real property boundaries.

¹*Section NR 110.08(4) and Section Comm 82.20(4) of the Wisconsin Administrative Code require that the Wisconsin Department of Natural Resources, with respect to public sanitary sewers, and the Wisconsin Department of Commerce, with respect to private sanitary sewers, make a finding that all proposed sanitary sewer extensions are in conformance with adopted areawide water quality management plans, including the sanitary sewer service areas identified in such plans. In carrying out their responsibilities in this respect, these Departments require that the Southeastern Wisconsin Regional Planning Commission, as the designated areawide water quality management planning agency for Southeastern Wisconsin, review and comment on each proposed sewer extension as to its relationship to the approved plan and sewer service areas.*

Map 2

VILLAGE OF BIG BEND AND ENVIRONS PLANNED SANITARY SEWER SERVICE AREA



The proposed sewer service area shown on Map 2 encompasses about 2,370 acres (about 3.7 square miles). It includes the entire area of the Village of Big Bend as well as certain adjacent portions of the Town of Vernon that are for the most part developed and that could likely be readily served by the proposed Big Bend sewerage system. Of the total proposed sewer service area, 1,952 acres, or 82 percent, are located in the Village of Big Bend; 418 acres, or 18 percent, are located in the Town.

Most of the southerly portion of the proposed sewer service area—the area south of Artesian Avenue—is currently developed for residential, commercial, industrial, or institutional uses or is platted for, or otherwise firmly committed to, such uses. North of Artesian Avenue, the proposed sewer service area includes scattered enclaves of residential and commercial development, along with undeveloped tracts of land designated under the Village comprehensive plan for future urban development. Future development there would consist of commercial and industrial development, primarily in the vicinity of the IH 43/STH 164 interchange, along with some low density residential development. It is estimated that there were about 639 housing units in the proposed sewer service area in 2008, including about 497 housing units in the Village of Big Bend and about 142 housing units in the Town of Vernon.

Population Within the Proposed Sewer Service Area

If the entire proposed sanitary sewer service area were fully developed in accordance with the Village comprehensive plan, the total population of the sewer service area would approximate 2,970 persons. Some existing residences within the proposed sewer service area may continue to rely upon onsite disposal systems for the foreseeable future. Conceivably, it may be a number of years before the entire population of the proposed sewer service area is actually served by sanitary sewers.

The Village wastewater facilities plan prepared in 2007-2008 was based upon the assumption of a sewered population of 2,660 persons by 2030, which is consistent with the regional land use plan intermediate-growth population projection for the facilities study planning area. Given the possibility that not all of the “buildout” population of 2,970 persons will be served by sewer by 2030, it may be concluded that the proposed sewer service area is consistent with the population assumptions of the facilities plan and the regional plan.

Environmentally Significant Lands Within the Proposed Sewer Serviced Area

The proposed sewer service area plan map (Map 2) also identifies environmentally significant lands within and in the vicinity of the proposed sewer service area. These include areas identified as primary and secondary environmental corridors and isolated natural resource areas. Also shown on Map 2 are small wetlands, less than five acres in size, located outside the environmental corridors and isolated natural resource areas. More detailed mapping of the proposed sewer service area and the environmentally significant lands within is presented in Appendix A of this report.

The environmental corridors and isolated natural resource areas were delineated by the Regional Planning Commission as part of its continuing regional planning program. They encompass concentrations of wetlands, woodlands, wildlife habitat, surface water, and other natural resource and resource-related features. Primary environmental corridors are the largest of these, by definition being at least 400 acres in area, two miles in length, and 200 feet in width. Secondary environmental corridors are by definition at least 100 acres in area and one mile in length. Isolated natural resource areas are by definition at least five acres in area and 200 feet in width. The methodology used in the identification of these areas is explained in Appendix B of this report.

The proposed sanitary sewer service area encompasses 201 acres of primary environmental corridors (9 percent of the sewer service area) and 53 acres of isolated natural resource areas (2 percent of the sewer service area). There are no secondary environmental corridors within the proposed sewer service area.² The proposed sewer service

²The only secondary environmental corridor lands shown on Map 2 is a two-acre area located outside the proposed sewer service area, in the northeast quarter of U.S. Public Land Survey Section 26, Township 5 North, Range 19 East.

area also encompasses a total of 33 acres of wetlands which are less than five acres in size and located outside the environmental corridors and isolated natural resource areas.

Included in the environmental corridors and isolated natural resource areas shown on Map 2 are certain small floodland areas which do not currently have the resource features to be classified as environmental corridors or isolated natural resource areas, but which may be expected to eventually revert to more natural conditions and become part of the system of environmental corridors and isolated natural resource areas. These areas, which are identified as dark blue on Map 3, encompass a total of 11 acres.

Finally, Map 3 also identifies undeveloped 100-year floodlands located outside the proposed sewer service area that would be considered as potential additions to the adjacent environmental corridors or isolated natural resource areas should the sewer service area be expanded in the future. These floodlands are identified as dark yellow on Map 3.

Restrictions on Sewered Development in Environmentally Significant Areas

The regional land use and water quality management plans recommend the preservation of primary environmental corridors in essentially natural, open use and recommend that County and local units of government consider protecting and preserving secondary environmental corridors and isolated natural resource areas. Consistent with regional plans, policies adhered to by the Wisconsin Department of Natural Resources and Department of Commerce in their regulation of sanitary sewerage systems prohibit or otherwise limit the extension of sanitary sewers to serve development in such areas. The following restrictions apply:

1. The extension of sanitary sewers to serve new development in primary environmental corridors is confined to limited recreational and institutional uses and rural-density residential development (maximum of one dwelling unit per five acres) in areas other than wetlands, floodlands, shorelands, and steep slopes. Primary environmental corridors within the proposed Big Bend sewer service area are shown with a green background color on Map 2.³
2. The extension of sanitary sewers to serve development in portions of secondary environmental corridors and isolated natural resource areas comprised of wetlands, floodlands, shorelands, or steep slopes is not permitted. The portions of isolated natural resource areas comprised of wetlands, floodlands, shorelands, or steep slopes within the proposed sewer service areas are identified with a brown background color on Map 2.

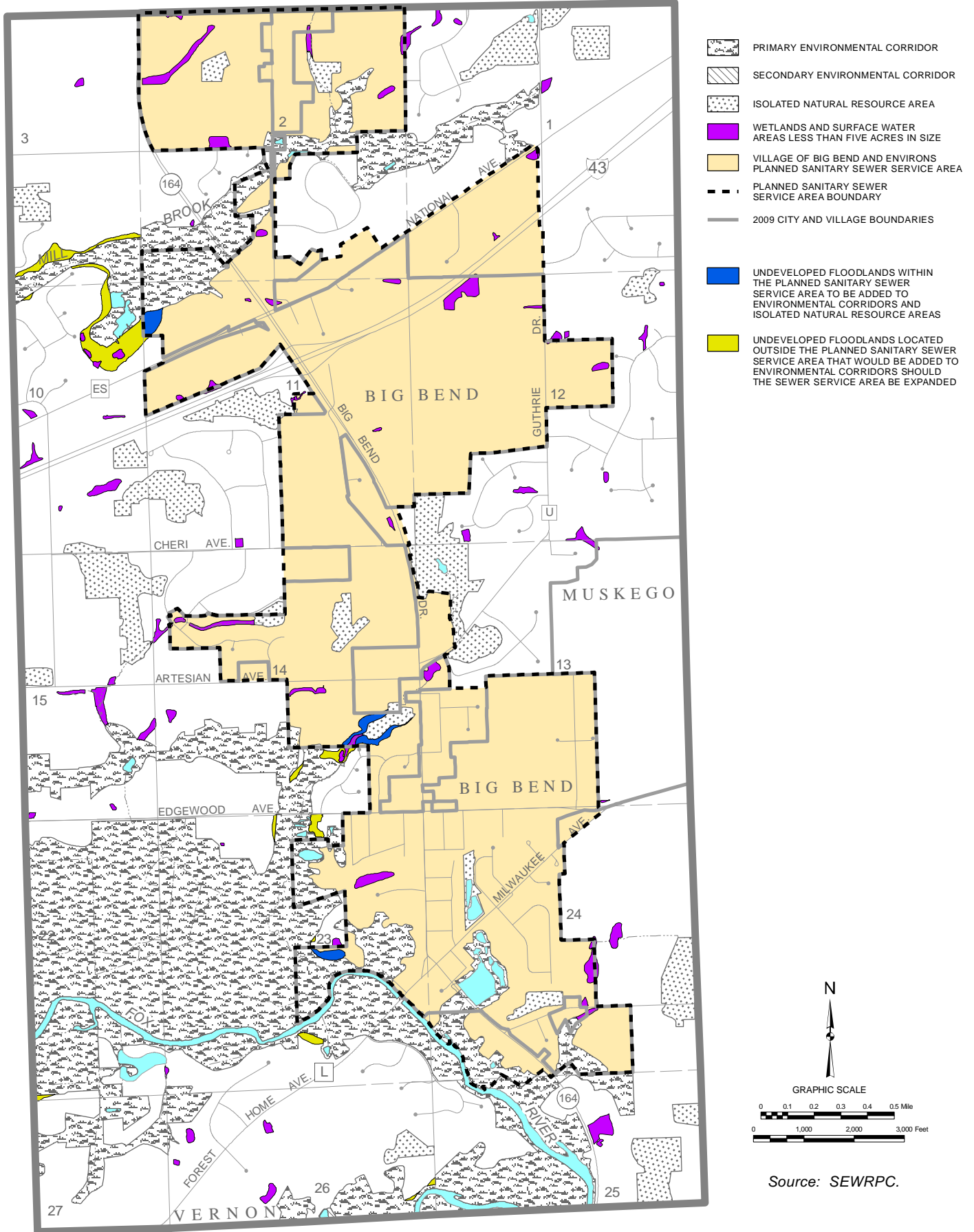
It should be recognized that the mapping of environmentally significant areas as presented in this report is a representation of conditions based upon the most recent available natural resource base information. It is expected that in many cases, as specific development proposals arise, a field survey will be necessary to more precisely identify the boundaries of environmental corridors and isolated natural resource areas in the vicinity of the proposed development.

Timing Considerations for the Provision of Sewer Service Within the Proposed Sewer Service Area

The Village envisions a phased approach to providing sewer service. The Village envisions that the sanitary sewerage system would be constructed incrementally, beginning with the construction of a sewer main along

³Consistent with the year 2035 regional land use plan, in lieu of recreational or rural density residential development, up to 10 percent of the upland corridor area in a parcel may be disturbed in order to accommodate urban residential, commercial, or other urban development under the following conditions: 1) the area to be disturbed is compact rather than scattered in nature; 2) the disturbance area is located on the edge of a corridor or on marginal resources within a corridor; 3) the development does not threaten the integrity of the remaining corridor; 4) the development does not result in significant adverse water quality impacts; and 5) development of the remaining corridor lands is prohibited by conservation easement or deed restriction. Each such proposal must be reviewed on a case-by-case basis.

**ANTICIPATED CHANGES IN THE ENVIRONMENTALLY
SIGNIFICANT LANDS IN VILLAGE OF BIG BEND AND ENVIRONS STUDY AREA**



STH 164. It anticipates that existing and planned commercial areas in the vicinity of the IH 43/STH 164 interchange, the Big Bend industrial Park, and the existing businesses along STH 164 would be among the first areas in the Village to be served by sanitary sewers.

There is no fixed schedule as to when the remainder of the Village would be connected to the sewerage system. The Village anticipates that sanitary sewer service would be extended to existing residences gradually, on an as-needed basis. The actual timing for extending sewer service to a neighborhood would depend upon how well existing onsite disposal systems are working, facility construction costs, local preferences, and other factors. It may be many years before some areas are connected to the sewerage system. As already noted, the inclusion of property in the proposed sewer service area allows for—but does not require—the provision of sanitary sewer service.

Chapter III

SEWERAGE FACILITIES

INTRODUCTION

On January 19, 2007, the Village of Big Bend submitted a document prepared by Applied Technologies, Inc. and titled *Village of Big Bend Wastewater Facilities Plan*, January 2007, to the Wisconsin Department of Natural Resources (WDNR) and SEWRPC. That plan set forth an evaluation of alternatives for providing a sanitary sewerage and wastewater treatment system for the Village, which is currently served by individual, private onsite waste treatment systems or holding tanks. Comments on the plan from the SEWRPC staff were provided to the Village and Applied Technologies in a February 8, 2007, letter. Comments were provided by the WDNR staff in a December 11, 2007, letter. The SEWRPC staff met with Village officials and staff, Applied Technologies and WDNR staff on May 31, 2007, to discuss and review issues related to the WDNR and SEWRPC reviews of the January 2007 facilities plan report. An October 11, 2007, letter from Applied Technologies to WDNR provided additional information and analyses to address WDNR and SEWRPC comments. SEWRPC staff comments on the October 2007 letter were provided in a November 26, 2007, letter to the Village and Applied Technologies. An August 29, 2008 letter from Applied Technologies to the SEWRPC staff responded to the November 2007 SEWRPC comments. A September 16, 2008, letter from WDNR to Jamie Sonenberg, the Village President, indicated that WDNR's questions on the facilities plan had been adequately addressed. A September 22, 2008 SEWRPC letter to the Village and Applied Technologies stated that the remaining SEWRPC comments had been addressed by Applied Technologies' August 2008 letter, and that the SEWRPC staff concurred with the conclusions of the facilities plan regarding the most cost-effective alternative to serve the Village.

The original January 2007 facilities plan, as modified by the information set forth in the October 2007 and August 2008 letters from the Village and Applied Technologies sets forth recommendations relative to providing for the sewage treatment needs of the Village through the year 2030. Taken as a whole, those documents conclude that construction of a new wastewater treatment plant in the Village of Big Bend is the most cost-effective alternative for providing sanitary sewer service and wastewater treatment to the Village. The August 29, 2008, Village/Applied Technologies letter also demonstrated through a fiscal analysis that the total costs to the Village ratepayers are expected to be considerably less under the selected alternative than under the other alternatives evaluated (construction of a land application treatment plant or connection to the City of Waukesha sewerage system and wastewater treatment plant).

As noted in Chapter I of this report, the regional water quality management plan does not currently include provisions for a public sanitary sewer service area for the Village of Big Bend and environs. Thus, this

amendment to the regional plan provides the framework for the WDNR, SEWRPC, and the Village of Big Bend to work cooperatively to establish a Big Bend sewer service area and to designate the Village as the management agency that would operate a new wastewater treatment plant. The cost-effectiveness analyses developed for the subject facilities plan, as subsequently modified in response to agency comments and as refined by the SEWRPC staff, is set forth in this chapter. Those analyses are performed consistent with procedures set forth in the regional water quality management plan and Chapter NR 121, “Areawide Water Quality Management Plans,” of the *Wisconsin Administrative Code*. Final approval by WDNR of the facilities plan for the Village is dependent on completion and approval of this amendment to the regional water quality management plan.

BASIC ASSUMPTIONS AND PROCEDURES

Population and Land Use

The cost-effectiveness analysis was prepared for the study area shown on Map 2. Population and land use assumptions are consistent with the Village land use plan and the Waukesha County comprehensive development plan.

The analysis utilizes information provided by the Village and Applied Technologies in the January 2007 facilities plan report, as amended by the subsequent October 2007 and August 2008 letter reports responding to WDNR and SEWRPC comments. The SEWRPC staff refined those analyses to reflect the population and land use characteristics of the proposed sewer service area, which was developed cooperatively by the Village and the SEWRPC staff to reflect Village development objectives, and which differs somewhat relative to the planning area used for the facilities plan. As indicated in Chapter II of this report, The facilities plan was developed based on a year 2030 population served of 2,660, while a population of 2,970 persons would be anticipated under buildout of the proposed sewer service area set forth in this report.

Wastewater Flows

The SEWRPC staff revised the average annual and peak hourly wastewater flows which were determined to be 0.366 million gallons per day (mgd) and 1.28 mgd, respectively, under the facilities plan to reflect the increased population anticipated under buildout conditions within the proposed sewer service area. The unit flow of 100 gallons per capita per day applied in the facilities plan was also used for the revised analysis along with a revised commercial and industrial average annual flow estimate of 97,000 gallons per day.¹ It was determined that the average annual flow would increase from 0.366 mgd under the facilities plan to 0.394 mgd under buildout conditions within the proposed sewer service area, and that the peak hourly flow would increase from 1.28 mgd to 1.38 mgd.²

Method of Economic Analysis and Cost Data

In the preparation of the adopted regional water quality management plan, the Commission used—and the WDNR and the U.S. Environmental Protection Agency approved—a method of economic analysis that involved a determination of the present worth and equivalent annual costs for each alternative considered using a 50-year economic analysis period and an interest rate of 6 percent. Since the analysis presented here is intended to provide the basis for amending the regional water quality management plan, the economic analysis method used should be the same as that used in preparing the original plan. For comparison purposes, the cost analysis was also done

¹*After issuing the facilities plan, Applied Technologies refined the estimate of the annual average wastewater flow from existing and proposed commercial and industrial development in the proposed sewer service area to be 97,000 gallons per day (gpd), which is consistent with the facilities plan estimate of 100,000 gpd.*

²*Consistent with the facilities plan, the peak hourly flow was estimated by applying a peaking factor of 3.5 to the average annual flow.*

using a 20-year economic analysis period and an interest rate of 6 percent, in a manner similar to that used to meet current facility planning requirements. The 20-year, 6 percent cost-effectiveness analyses data are presented in Appendix C.³

For this sewer service area plan, the cost estimates were refined to reflect the modest increases in estimated wastewater flow noted above.

In general, the cost estimates for sewerage system components to serve the proposed sewer service area were developed under the January 2007 Village facilities plan, as modified in addendums dated October 2007 and August 2008. Those cost estimates were reviewed by the SEWRPC staff and accepted in September 2008.

ALTERNATIVE PLANS FOR PROVISION OF SANITARY SEWER AND WASTEWATER TREATMENT SERVICE TO THE PROPOSED SEWER SERVICE AREA FOR THE VILLAGE OF BIG BEND

Introduction

Three alternatives for providing sanitary sewerage and wastewater treatment for the Village of Big Bend were developed under the Village facilities plan, as modified in addendums. Because, as described previously in this chapter, the boundaries of the proposed sewer service area are somewhat different from the planning area considered under the facilities plan, the SEWRPC staff made a detailed evaluation of the number of households and population that would be anticipated within the proposed sewer service area under buildout land use conditions. As noted previously, application of the buildout population number for the proposed area results in an increase in the average annual flow from 0.366 mgd under the facilities plan to 0.394 mgd under buildout conditions, and an increase in the peak hourly flow from 1.28 mgd to 1.38 mgd.

Preliminary cost calculations indicated that small incremental costs would be associated with staging construction of the wastewater treatment plant facilities to accommodate 0.366 mgd for the 20-year facilities planning period and then expanding to a capacity of 0.394 mgd. Thus, the cost-effectiveness analysis set forth in this report is based on construction of a 0.394 mgd plant and on conveyance and pumping facilities designed for a peak hourly flow rate of 1.38 mgd.

The alternative plans were developed to identify only those sewerage system components that are essential to providing service to the proposed area. It was assumed that the collection sewer system tributary to the facilities plan system components would be essentially the same for each alternative considered.

Alternative No. 1: New Extended Aeration Activated Sludge Wastewater Treatment Plant

This alternative calls for the following components (see Map 4):

1. An approximately 4,100-foot-long, eight-inch diameter gravity sewer flowing south from the point of collection, followed by an approximately 5,000-foot-long, 10-inch diameter gravity sewer discharging to a pump station.
2. A pump station with a peak capacity of 1.38 mgd, discharging to a 10-inch diameter force main running to a new wastewater treatment plant.
3. A 0.394 mgd average annual flow extended aeration activated sludge wastewater treatment plant, discharging to the Fox River through a gravity outfall.

³The facilities plan used a 20-year analysis period and interest rate of 4.875 percent, consistent with WDNR planning requirements.

The SEWRPC staff reviewed the adequacy of the gravity sewer, pump station, and wastewater treatment plant capacities in light of the increase in wastewater flows relative to those estimated under the facilities plan (as described previously). It was found that the eight- and 10-inch gravity sewers called for under the facilities plan would be adequate to convey the additional flow, and that the pump station and wastewater treatment plant capacities would have to be increased to accommodate the increased flows. Thus, the estimated gravity sewer costs are unchanged from those in the facilities plan, the pump station capital cost was increased by 2.5 percent, based on cost relationships applied in the Village facilities plan, and the treatment plant cost was increased by about 2.2 percent, based on regional cost curves developed by SEWRPC.

As shown in Table 1, the total capital cost of Alternative No. 1 is estimated to be \$5,993,500. Operation and maintenance costs would approximate \$260,000 annually. The present worth cost to serve the Village under this alternative would be about \$10,923,500.

Alternative Plan No. 2: New Aerated Lagoon Wastewater Treatment Plant With Land Application

This alternative calls for the following components (see Map 5):

1. An approximately 4,100-foot-long, eight-inch diameter gravity sewer flowing south from the point of collection, followed by an approximately 5,000-foot-long, 10-inch diameter gravity sewer discharging to a pump station.
2. A pump station with a peak capacity of 1.38 mgd, discharging to a 10-inch diameter force main running to a new wastewater treatment plant.
3. A 0.394 mgd average annual flow aerated lagoon wastewater treatment plant with land application of effluent.

The gravity sewer and pump station capacities are the same as under Alternative No. 1. The SEWRPC staff reviewed the adequacy of the gravity sewer, pump station, and wastewater treatment plant capacities in light of the increase in wastewater flows relative to those estimated under the facilities plan and increased the pump station capital cost by 2.5 percent, and increased the treatment plant capital cost was by about 2.6 percent.

As shown in Table 2, the total capital cost of Alternative No. 2 is estimated to be \$9,089,500. Operation and maintenance costs would approximate \$174,000 annually. The present worth cost to serve the Village under this alternative would be about \$12,557,500.

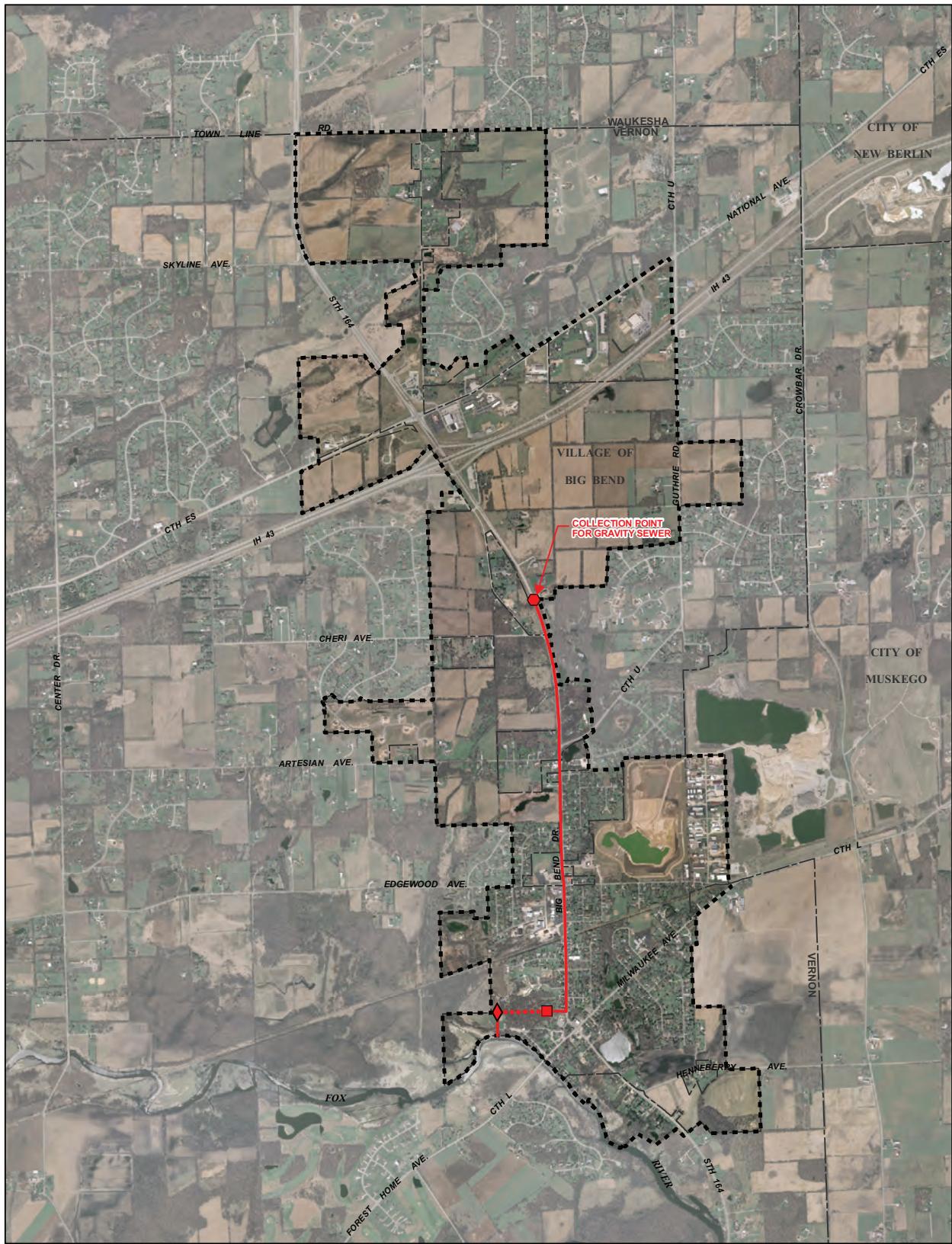
Alternative Plan No. 3: Pump to the City of Waukesha

This alternative calls for the following components (see Map 6):

1. A 10-inch diameter gravity sewer from CTH U to Pump Station No. 2.
2. Pump Station No. 2 with a peak capacity of 0.51 mgd, discharging to an eight-inch diameter force main that connects to Pump Station No. 1.
3. Pump Station No. 1 designed with a peak capacity of 1.38 mgd, discharging to a 10-inch diameter force main that connects to an existing gravity sewer in the City of Waukesha sewerage system at West Avenue.

The City of Waukesha wastewater treatment plant has a design capacity of 14.5 mgd, and it is currently operating at an average rate of about 10 mgd, which has remained generally stable for the past 15 years. Thus, the Waukesha plant has adequate capacity to accommodate the additional wastewater flow of 0.394 mgd from the Village of Big Bend.

ALTERNATIVE 1 - NEW EXTENDED AERATION ACTIVATED SLUDGE WASTEWATER TREATMENT PLANT



DATE OF PHOTOGRAPHY: APRIL 2007

- PROPOSED PLANNED SANITARY SEWER SERVICE AREA BOUNDARY
- PROPOSED GRAVITY SEWER
- PROPOSED FORCE MAIN
- PROPOSED PUMP STATION
- ◆ PROPOSED PUBLIC WASTEWATER TREATMENT PLANT
- CITY, VILLAGE, AND TOWN BOUNDARIES

Source: Applied Technologies and SEWRPC.

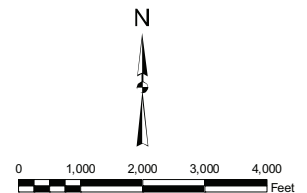


Table 1

**ECONOMIC ANALYSIS OF ESTIMATED COSTS OF ALTERNATIVE NO. 1—NEW EXTENDED AERATION
ACTIVATED SLUDGE WASTEWATER TREATMENT PLANT (WWTP) TO SERVE THE VILLAGE OF BIG BEND**

Alternative Plan Component ^a	Initial Capital Cost	Service Life (years)	Future Cost at 10 Years	Future Cost at 20 Years	Future Cost at 30 Years	Future Cost at 40 Years	Salvage Value at 50 Years	Annual Operation and Maintenance Cost	Total Present Worth Cost ^b
0.394 mgd WWTP									
Structures and Yard Piping	\$1,484,000	40	--	--	--	\$1,484,000	\$1,113,000	--	--
Equipment, Site Work, Electrical	940,000	20	--	\$ 940,000	--	940,000	470,000	--	--
Instrumentation and Control	289,000	10	\$289,000	289,000	\$289,000	289,000	--	--	--
8-Inch Gravity Sewer Flowing South from Point of Collection	329,000	50	--	--	--	--	--	--	--
10-Inch Gravity Sewer from End of 8-Inch Sewer to Pump Station	620,000 ^c	50	--	--	--	--	--	--	--
1.38 mgd Pump Station									
Structure	300,000	40	--	--	--	300,000	225,000	--	--
Equipment	110,000	20	--	110,000	--	110,000	55,000	--	--
10-Inch Force Main to WWTP	86,000 ^c	50	--	--	--	--	--	--	--
Gravity Sewer Discharge to Fox River	76,500	50	--	--	--	--	--	--	--
Construction Cost Subtotal	\$4,234,500	--	--	--	--	--	--	--	--
Construction Cost Contingencies at 20 Percent	\$ 847,000	--	--	--	--	--	--	--	--
Construction Cost Total	\$5,081,500	--	--	--	--	--	--	--	--
Land Acquisition	\$ 150,000	--	--	--	--	--	--	--	--
Engineering, Legal, and Administration at 15 Percent	\$ 762,000	--	--	--	--	--	--	--	--
Total Capital Cost	\$5,993,500	--	\$289,000	\$1,339,000	\$289,000	\$3,123,000	\$1,863,000	\$ 260,000	--
Present Worth	\$5,993,500	--	\$161,000	\$ 418,000	\$ 50,000	\$ 304,000	\$ 101,000 ^d	\$4,098,000	\$10,923,500

NOTE: For future replacement costs or salvage values, double dashes indicate no cost is applicable. Annual operation and maintenance and present worth costs are not itemized, as indicated by double dashes.

^aSee Map 4.

^bBased upon a 50-year analysis period and a 6 percent interest rate.

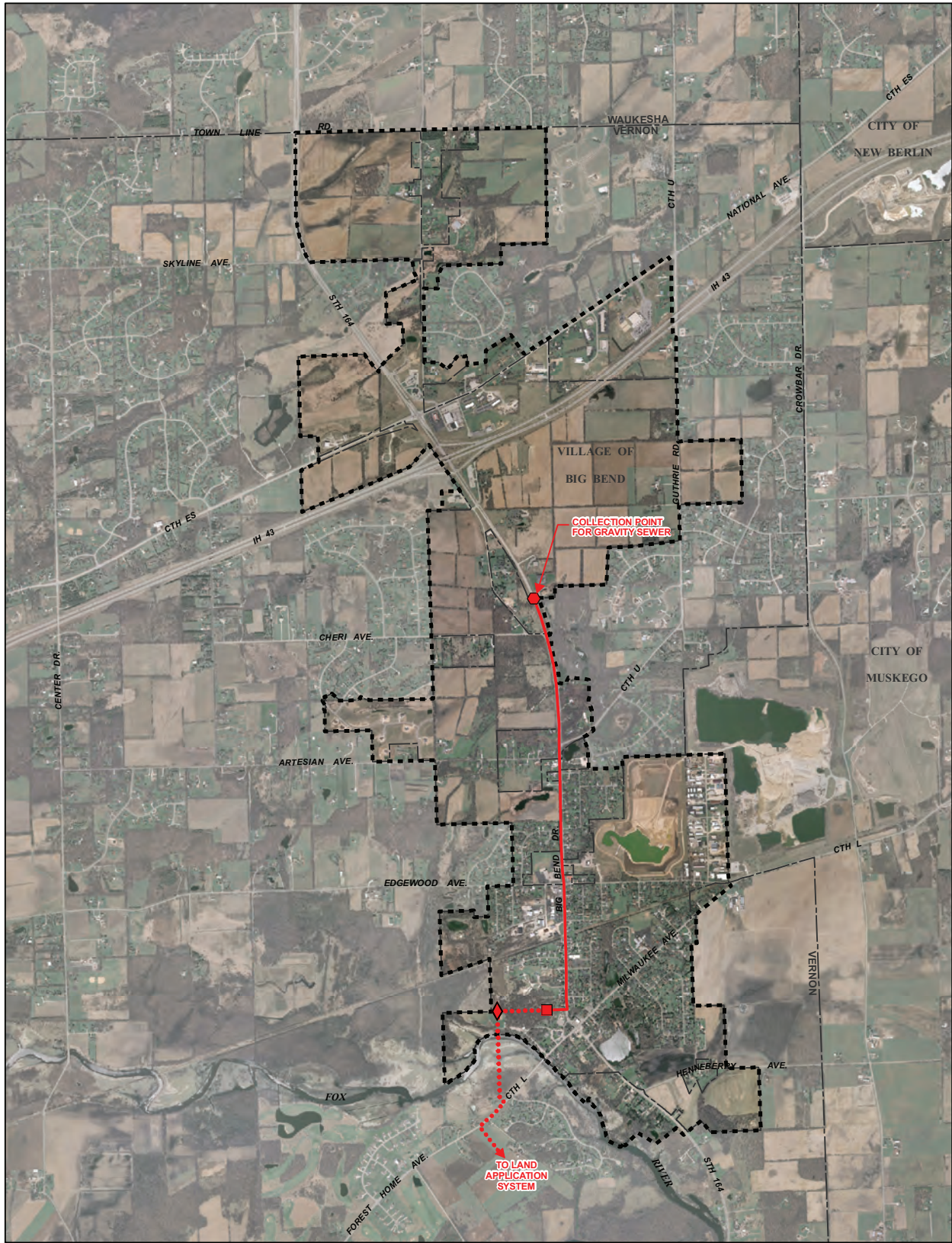
^cRevised from Facilities Plan and Addendums to reflect refined component length.

^dSubtracted in calculating total present worth.

Source: Applied Technologies, Inc. and SEWRPC.

Map 5

ALTERNATIVE 2 - NEW AERATED LAGOON WASTEWATER TREATMENT PLANT WITH LAND APPLICATION



DATE OF PHOTOGRAPHY: APRIL 2007

- PROPOSED PLANNED SANITARY SEWER SERVICE AREA BOUNDARY
- PROPOSED GRAVITY SEWER
- PROPOSED FORCE MAIN
- PROPOSED PUMP STATION
- ◆ PROPOSED PUBLIC WASTEWATER TREATMENT PLANT
- CITY, VILLAGE, AND TOWN BOUNDARIES

Source: Applied Technologies and SEWRPC.

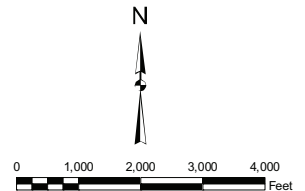


Table 2

**ECONOMIC ANALYSIS OF ESTIMATED COSTS OF ALTERNATIVE NO. 2—AERATED LAGOON
WASTEWATER TREATMENT PLANT (WWTP) WITH LAND APPLICATION TO SERVE THE VILLAGE OF BIG BEND**

Alternative Plan Component ^a	Initial Capital Cost	Service Life (years)	Future Cost at 10 Years	Future Cost at 20 Years	Future Cost at 30 Years	Future Cost at 40 Years	Salvage Value at 50 Years	Annual Operation and Maintenance Cost	Total Present Worth Cost ^b
0.394 mgd WWTP									
Structures and Yard Piping	\$1,387,700	40	--	--	--	\$1,387,700	\$1,040,775	--	--
Equipment, Site Work, Electrical	702,300	20	--	\$ 702,300	--	702,300	351,150	--	--
Instrumentation and Control	280,000	10	\$280,000	280,000	\$280,000	280,000	--	--	--
8-Inch Gravity Sewer Flowing South from Point of Collection	329,000	50	--	--	--	--	--	--	--
10-Inch Gravity Sewer from End of 8-Inch Sewer to Pump Station	620,000 ^c	50	--	--	--	--	--	--	--
1.38 mgd Pump Station									
Structure	300,000	40	--	--	--	300,000	225,000	--	--
Equipment	110,000	20	--	110,000	--	110,000	55,000	--	--
10-Inch Force Main to WWTP	86,000 ^c	50	--	--	--	--	--	--	--
Force Main to Irrigation System	187,500	50	--	--	--	--	--	--	--
Irrigation System	120,000	50	--	--	--	--	--	--	--
Construction Cost Subtotal	\$4,122,500	--	--	--	--	--	--	--	--
Construction Cost Contingencies at 20 Percent	\$ 825,000	--	--	--	--	--	--	--	--
Construction Cost Total	\$4,947,500	--	--	--	--	--	--	--	--
Land Acquisition	\$3,400,000	--	--	--	--	--	--	--	--
Engineering, Legal, and Administration at 15 Percent	\$ 742,000	--	--	--	--	--	--	--	--
Total Capital Cost	\$9,089,500	--	\$280,000	\$1,092,300	\$280,000	\$2,780,000	\$1,671,925	\$ 174,000	--
Present Worth	\$9,089,500	--	\$156,000	\$ 341,000	\$ 49,000	\$ 270,000	\$ 91,000 ^d	\$2,743,000	\$12,557,500

NOTE: For future replacement costs or salvage values, double dashes indicate no cost is applicable. Annual operation and maintenance and present worth costs are not itemized, as indicated by double dashes.

^aSee Map 5.

^cRevised from Facilities Plan and Addendums to reflect refined component length.

^bBased upon a 50-year analysis period and a 6 percent interest rate.

^dSubtracted in calculating total present worth.

Source: Applied Technologies, Inc. and SEWRPC.

The SEWRPC staff reviewed the adequacy of the capacities of Pump Station No. 1 and of the 10-inch diameter force main discharging from Pump Station No. 1 in light of the increase in wastewater flows relative to those estimated under the facilities plan. It was found that the force main called for under the facilities plan would be adequate to convey the additional flow, and that the pump station capacity would have to be increased to accommodate the increased flows. Thus, the estimated force main costs are unchanged from those in the facilities plan, but the pump station capital cost was increased by 4.2 percent.⁴ The wastewater flows to the gravity sewer discharging to Pump Station No. 2, Pump Station No. 2, and the force main from Pump Station No. 2 to Pump Station No. 1 would not be affected by the population increase anticipated under the proposed sewer service area relative to the facilities plan planning area; thus, no adjustments to the costs of those components were necessary.

As shown in Table 3, the total capital cost of Alternative No. 3 is estimated to be \$7,377,000. Operation and maintenance costs would approximate \$277,000 annually. The present worth cost to serve the Village under this alternative would be about \$11,868,000.

EVALUATION FACTORS

Cost Summary and Conclusion

As noted above, the cost analyses set forth in Tables 1 through 3 were based on a 6 percent interest rate and a 50-year analysis period. Analyses using a 6 percent interest rate and a 20-year analysis period are included in Appendix C. In comparing the cost of the alternatives, guidelines applied by the Commission indicate that, if two compared alternatives are found to be within 10 percent of one another in present worth cost, then those alternatives were considered to be equally cost-effective.⁵ If two alternatives are found to be equally cost-effective, and assuming that there are no significant differences in environmental impact, then other factors, e.g. fiscal impact analyses and implementation considerations, may be taken into account in the selection of a final plan.

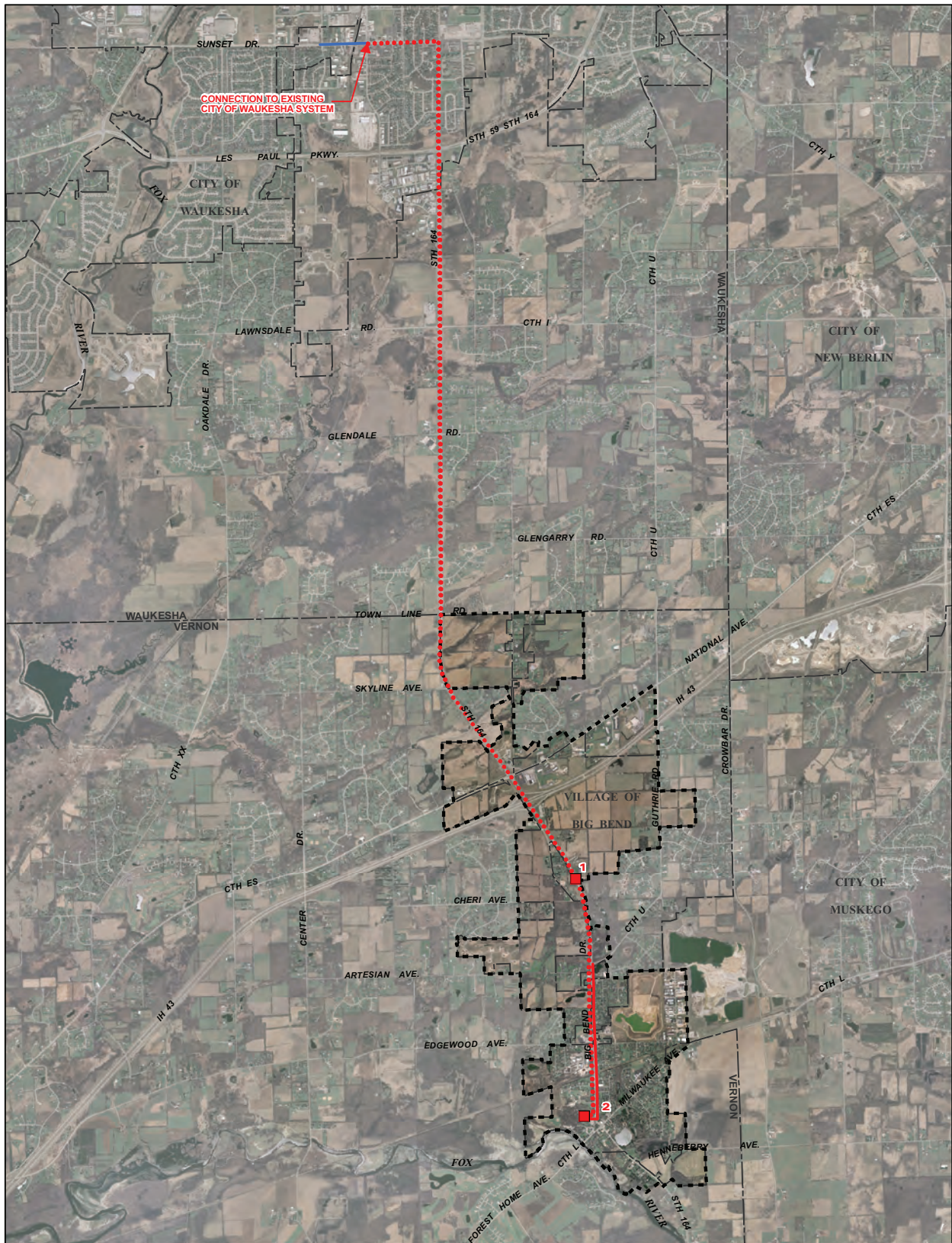
Review of the information set forth in Table 4 for a 50-year analysis period indicates that the estimated present worth cost of Alternative No. 2 – Aerated Lagoon Wastewater Treatment Plant with Land Application is 15 percent greater than the present worth cost of Alternative No. 1 – New Extended Aeration Activated Sludge Wastewater Treatment Plant, and that the present worth cost of Alternative No. 3 – Pump to the City of Waukesha is 9 percent greater than the present worth cost of Alternative No. 1. Table 4 also indicates that for a 20-year analysis period, the present worth cost of Alternative No. 2 is 12 percent greater than the cost of Alternative No. 1, and the present worth cost of Alternative No. 3 is 11 percent greater than the cost of Alternative No. 1. Thus, the present worth cost of Alternative No. 2 is more than 10 percent greater than the corresponding cost of Alternative No. 1 for either a 50- or 20-year analysis period. The present worth cost of Alternative No. 3 is within 10 percent of the cost of Alternative No. 1 for a 50-year analysis period, but more than 10 percent greater for a 20-year analysis period.

On the basis of the foregoing, applying the cost equivalence criterion described previously, Alternative No. 1 would be considered the lowest cost alternative relative to the others for all conditions except for a 50-year period, for which it could be considered equivalent in cost to Alternative No. 3. However, according to the facilities plan

⁴While the pump station called for under this alternative has the same capacity as the pump station in both Alternatives No. 1 and 2, the facilities plan calls for an odor control feed station under Alternative No. 3, increasing the station cost.

⁵The 10 percent guideline is founded in good engineering practice and is generally accepted as the degree of precision with which the costs entailed can be estimated. The use of this 10 percent guideline has been endorsed by the technical advisory committees that have assisted the Commission over the years in the economic evaluation of alternative public works projects.

ALTERNATIVE 3 - PUMP TO THE CITY OF WAUKESHA



DATE OF PHOTOGRAPHY: APRIL 2007

- PROPOSED PLANNED SANITARY SEWER SERVICE AREA BOUNDARY
- PROPOSED GRAVITY SEWER
- PROPOSED FORCE MAIN
- ² PROPOSED PUMP STATION AND DESIGNATION
- EXISTING GRAVITY SEWER
- CITY, VILLAGE, AND TOWN BOUNDARIES

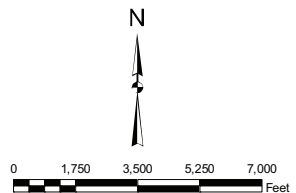


Table 3

ECONOMIC ANALYSIS OF ESTIMATED COSTS OF ALTERNATIVE NO. 3—PUMP TO THE CITY OF WAUKESHA

Alternative Plan Component ^a	Initial Capital Cost	Service Life (years)	Future Cost at 10 Years	Future Cost at 20 Years	Future Cost at 30 Years	Future Cost at 40 Years	Salvage Value at 50 Years	Annual Operation and Maintenance Cost	Total Present Worth Cost ^b
10-Inch Gravity Sewer from CTH U to Pump Station No. 2	\$ 641,000	50	--	--	--	--	--	--	--
0.51 mgd Pump Station No. 2 Structure	300,000	40	--	--	--	\$300,000	\$225,000	--	--
Equipment	100,000	20	--	\$100,000	--	100,000	50,000	--	--
8-Inch Force Main from Pump Station No. 2 to Pump Station No. 1	743,000	50	--	--	--	--	--	--	--
1.38 mgd Pump Station No. 1 and Odor Control Feed Station Structure	370,000	40	--	--	--	370,000	277,500	--	--
Equipment	130,000	20	--	130,000	--	130,000	65,000	--	--
10-Inch Force Main to STH 59/164	2,100,000	50	--	--	--	--	--	--	--
Force Main Crossings of IH 43 and STH 59/164	300,000	50	--	--	--	--	--	--	--
10-Inch Force Main from STH 59/164 to West Avenue	627,000	50	--	--	--	--	--	--	--
Force Main Crossing of Sunset Drive	35,000	50	--	--	--	--	--	--	--
Construction Cost Subtotal	\$5,346,000	--	--	--	--	--	--	--	--
Construction Cost Contingencies at 20 Percent	\$1,069,000	--	--	--	--	--	--	--	--
Construction Cost Total	\$6,415,000	--	--	--	--	--	--	--	--
Engineering, Legal, and Administration at 15 Percent	\$ 962,000	--	--	--	--	--	--	--	--
Total Capital Cost	\$7,377,000	--	--	\$230,000	--	\$900,000	\$617,000	\$ 277,000	--
Present Worth	\$7,377,000	--	--	\$ 72,000	--	\$ 87,000	\$ 34,000 ^c	\$4,366,000	\$11,868,000

NOTE: For future replacement costs or salvage values, double dashes indicate no cost is applicable. Annual operation and maintenance and present worth costs are not itemized, as indicated by double dashes.

^aSee Map 6.

^bBased upon a 50-year analysis period and a 6 percent interest rate.

^cSubtracted in calculating total present worth.

Source: Applied Technologies, Inc. and SEWRPC.

Table 4

COMPARISON OF ALTERNATIVE PLAN COSTS

Alternative Plan	Total Capital Cost	Annual Operation and Maintenance Cost	Present Worth Cost 50-Year Analysis Period and 6 Percent Interest	Present Worth Cost 20-Year Analysis Period and 6 Percent Interest	50-Year Present Worth Cost Ratios		20-Year Present Worth Cost Ratios	
					Alternative No. 2 to Alternative No. 1	Alternative No. 3 to Alternative No. 1	Alternative No. 2 to Alternative No. 1	Alternative No. 3 to Alternative No. 1
No. 1—New Extended Aeration Activated Sludge WWTP	\$5,993,500	\$260,000	\$10,923,500	\$8,650,500				
					1.15		1.12	
No. 2—New Aerated Lagoon WWTP with Land Application	9,089,500	174,000	12,557,500	9,676,500				
						1.09		1.11
No. 3—Pump to the City of Waukesha	7,377,000	277,000	11,868,000	9,618,000				

Source: SEWRPC.

and discussions between the SEWRPC staff and Village officials, it is intended to phase implementation of the wastewater treatment plant to initially accommodate the commercial area in the vicinity of STH 164 and IH 43, the Big Bend Industrial Park, and existing businesses along STH 164, and to expand the plant in the future to reach the anticipated buildout capacity at an undetermined future date. The economic analyses presented in the facilities plan and associated addendums did not determine present worth costs assuming phased construction of wastewater treatment plant facilities under Alternative Nos. 1 and 2. Such phasing is not as significant of a consideration under Alternative No. 3. Phased construction of a new wastewater treatment plant under either Alternative Nos. 1 or 2 would reduce their present worth costs relative to those set forth in Tables 1, 2, C-1, and C-2. Such phasing would not be expected to significantly affect the relative cost relationship between Alternative Nos. 1 and 2, with Alternative No. 1 remaining more cost-effective than Alternative No. 2, but phasing would increase the difference in present worth cost and the cost ratio between Alternative No. 3 and either Alternative No. 1 or Alternative No. 2. Thus, given that the 20-year analysis period cost difference between Alternative No. 3 and Alternative No. 1 is greater than 10 percent as set forth in Table 4 and would remain greater than 10 percent with phased implementation of the wastewater treatment plant, and that the 50-year analysis cost difference between Alternative No. 3 and Alternative No. 1 is just below 10 percent as set forth in Table 4 and could exceed 10 percent with phased implementation, it is concluded that Alternative No. 1 is the most cost-effective alternative.

On that basis, in the absence of any significant factors that would override the cost difference, the option of serving the proposed Village of Big Bend sewer service area with a new extended aeration activated sludge wastewater treatment plant would be recommended. In order to evaluate whether there are any overriding factors that could change this conclusion, several additional factors were considered as described in the following subsections.

Environmental Impacts

The long-term environmental impacts of the alternatives being considered are generally considered to be similar. In all cases, the urban development patterns considered are the same between alternatives and do not envision permanent encroachment into environmentally sensitive areas. Construction of a relatively short force main to the wastewater treatment plant under either Alternative No. 1 or No. 2 would require temporary disturbance of lands lying along the Fox River that are designated as primary environmental corridor. In addition, construction of the wastewater treatment plant discharge pipes called for under Alternative Nos. 1 and 2 would also temporarily disturb primary environmental corridor lands, with the Alternative No. 2 pipe potentially causing greater disturbance since it would cross under the Fox River. The force main called for under Alternative No. 3 could be constructed within highway and street rights-of-way and would not be expected to disturb corridors or wetlands.

Thus, under Alternative Nos. 1 and/or 2 there would be some short-term construction impacts on the corridor lands and the stream system. It is assumed that with proper construction techniques these impacts could be minimized and would be short-term in nature.

The preliminary location of the new wastewater treatment plant under Alternative No. 1 is in land currently designated as local parkland. Thus, under Alternative No. 1, there would be a loss of about eight acres of parkland.

As documented in the 2007 Village facilities plan, in 2006 the WDNR established effluent limits for the alternative of providing publicly owned treatment works, as called for under Alternative No. 1.⁶ Limits were established for biochemical oxygen demand, total suspended solids, dissolved oxygen, pH, ammonia nitrogen,

⁶*Alternative No. 2 includes a land application system, so the treatment plant would not discharge directly to the Fox River.*

total phosphorus, pathogens, and total residual chlorine according to the requirements Chapter NR 207, “Water Quality Antidegradation,” of the *Wisconsin Administrative Code*, and those limits are designed to not result in a significant lowering of water quality in the receiving water.

The effluent limits developed by WDNR were based on an average annual wastewater flow of 0.317 mgd. The facilities plan increased the design flow to 0.366 mgd and the analysis for this sewer service area plan once again increased the flow to 0.394 mgd. The increased flow would have to be addressed in establishing revised effluent limits prior to design of the treatment plant.

WDNR Nonproliferation Policy

Amending the regional water quality management plan to provide for the construction of a new wastewater treatment plant to serve the Village of Big Bend may be considered to conflict with the wastewater treatment plant nonproliferation policy adopted by the WDNR. Particularly as it applies in metropolitan areas, such as Southeastern Wisconsin, that policy operates to favor fewer and larger treatment plants.

Sewage Pumping Considerations

Under Alternative No. 3, sewage being conveyed to the City of Waukesha system would be pumped at two locations. Under Alternative Nos. 1 and 2, sewage being conveyed to a proposed new wastewater treatment plant in the Village of Big Bend would only be pumped at one location. In general, gravity flow is preferred to the pumping of sewage, due to energy consumption and maintenance considerations. Should fuel prices and labor costs escalate in the future, the cost of the alternative requiring the most pumping would be affected negatively.

Wastewater Treatment Plant Isolation Distance

A new wastewater treatment plant for the Village, as proposed under Alternative Nos. 1 and 2, would currently meet the 500-foot isolation distance from commercial establishments and residential buildings as required under Section NR 110.15(3)(d)1 of the *Wisconsin Administrative Code* under existing conditions, but development in the vicinity of a new plant may have to be restricted in the future to maintain the permissible distance.

Fiscal Considerations

The August 2008 addendum to the 2007 facilities plan, as prepared by Applied Technologies, included a fiscal analysis of the three alternative plans. That analysis was performed to reflect additional costs to the Village that would not appropriately be considered as part of a cost-effectiveness analysis prepared to determine total resources costs according to the requirements of Chapter NR 110, “Sewerage Systems,” of the *Wisconsin Administrative Code*. The fiscal analysis was performed for a 20-year period, using an interest rate of 4.875 percent. With respect to Alternative Nos. 1 and 2, both of which call for new wastewater treatment facilities in the Village, the present worth costs are the same as those for the cost-effectiveness analysis, \$8,710,000 and \$9,429,000, respectively.⁷ For Alternative No. 3, however, the capital cost was increased by the estimated \$1,649,000 Waukesha wastewater treatment plant connection fee and the annual operation and maintenance costs were revised to include an estimated \$550,000 in annual sewer user charges to the residents of the Village.

⁷Those present worth costs differ somewhat from the 20-year analysis period costs set forth in Appendix C of this report because the analysis presented herein uses an interest rate of 6 percent, consistent with the regional water quality management plan, and because the costs for the analysis presented herein were revised slightly from those developed under the Village facilities plan to account for somewhat larger wastewater flows based on the expansion of the proposed sewer service area to reflect Village development objectives identified subsequent to the preparation of the facilities plan. Because the fiscal analysis identifies potential large cost differences between Alternative No. 3 and either Alternative Nos. 1 or 3, it is considered unnecessary to change the analysis set forth in the 2008 Addendum to reflect the relatively small cost adjustments ultimately incorporated in this sewer service area plan.

Including those cost adjustments, the fiscal analysis in the August 2008 Addendum sets forth an Alternative No. 3 present worth cost of \$16,105,000. That cost is 85 percent and 71 percent greater than the present worth costs of Alternative Nos. 1 and 2, respectively. This analysis indicates that the user charges to the customers served in the planned sewer service area would be greater under Alternative No. 3 than under Alternative Nos. 1 and 2.

CONCLUSION

The analyses set forth in this chapter demonstrate that the proposed sewer service area for the Village of Big Bend would be served most cost-effectively through construction by the Village of a new extended aeration activated sludge wastewater treatment plant. In addition, the following fiscal and nonmonetary considerations favor that alternative:

- The fiscal analysis indicates that the total cost to Village residents would be considerably lower if Alternative No. 1 were implemented, rather than Alternative No. 3.
- Under Alternative No. 1, only one pump station would be required, while two stations would be required for service by the City of Waukesha system.

The nonmonetary considerations in favor of Alternative No. 3 include:

- Implementation of Alternative No. 1 would be consistent with the WDNR nonproliferation policy.
- Unlike implementation of Alternative Nos. 1 or 2, implementation of Alternative No. 3 would generally avoid temporary disturbance of lands lying along the Fox River that are designated as primary environmental corridor.
- Under Alternative No. 3, there would be no loss of parkland as would be expected under Alternative No. 1.

Based upon the foregoing, it is concluded the nonmonetary considerations that favor Alternative No. 3 are not sufficiently significant to override the finding that Alternative No. 1 is the most cost-effective. Thus, it is recommended that the proposed sewer service area be served by a new extended aeration activated sludge wastewater treatment plant.

(This page intentionally left blank)

Chapter IV

SUMMARY OF PUBLIC HEARING AND CONCLUDING RECOMMENDATIONS

A public hearing jointly sponsored by the Village of Big Bend and the Regional Planning Commission was held on November 4, 2009, at the Big Bend/Vernon Fire Station No. 3 for the purpose of receiving public comment on, and reaction to, the proposed sewer service area and sewerage system for the Big Bend area, as set forth in Chapters II and III. The record of the hearing was left open for written comments through November 23, 2009. This chapter summarizes the public comments received and responds to the concerns raised with respect to the proposed sewer service area and sewerage system. This chapter also includes final recommendations regarding a sewer service area and sewerage system for the Big Bend area, taking into account the results of the public hearing.

RESULTS OF PUBLIC HEARING

The minutes to the public hearing and all related written comments are set forth in Appendix D of this report. A summary of the public comments is presented below.

Comments Voiced at the Hearing

Public comments voiced at the hearing centered on the following issues and concerns:

1. Should the cost-effectiveness analysis take into account potential service to properties in the Town of Waukesha under the alternative of pumping to the Waukesha system?
2. How would a new treatment plant discharging to the Fox River impact groundwater levels?
3. How much existing Village park land would be impacted by a new sewage treatment plant?
4. How would the proposed plan impact taxes and costs of local services? In this regard, some expressed general concerns about higher taxes; concerns about costs to existing residents if and when their property is connected to the system; concerns that the potential interchange development—which would be relied upon to fund the STH 164 sewer main and treatment plant—may not materialize; concerns that additional urban development which sewers would accommodate may lead to higher public service costs.

Some individuals expressed support for a sewerage system and Village efforts to promote economic development.

Written Comments

Written Comments from Waukesha County

Written comments from the Waukesha County Department of Parks and Land Use include the following suggestions:

5. Consider an alternative involving the connection of the Big Bend area to the sewerage system operated by the Western Racine County Sewerage District.
6. Consider as additions to the sewer service area lands in the Town of Vernon located in the west half of Sections 12 and 13 and in the south half of Section 2.
7. Revise the text of the report to indicate that the Waukesha County comprehensive plan and Town of Vernon comprehensive plan were considered in the process of delineating the proposed sewer service area.
8. Include text in the report regarding the possibility of additional areas, whether annexed by the Village or remaining in the Town, which could potentially be served with sewer at some time in the future.
9. Consider whether the inclusion of northeastern portions of Section 2 in the proposed sewer service area conflicts with the recommendations of the Waukesha County comprehensive plan for that area.

Written Comments from the City of Muskego

Written comments from the Mayor of the City of Muskego included the following suggestions:

10. Consider an alternative of connecting the Big Bend area to the City of Muskego sewerage system tributary to the Milwaukee Metropolitan Sewerage District.
11. Consider the possibility of providing for sewer service in westerly portions of the City of Muskego via a connection to a new Big Bend wastewater treatment plant if, in fact, a Big Bend treatment plant is recommended.

Written Comments from the Western Racine County Sewerage District

12. Written comments from the Secretary of the Western Racine Sewerage District indicate that the District is not opposed to connecting the Big Bend area to its sewerage system. The District noted, however, that any such connection from Big Bend would have to be at a point south of CTH D in the Rochester area, about 11 miles south of the proposed Big Bend sewer service area.

Written Comments from the Village of Mukwonago

13. Written comments from the President of the Village of Mukwonago indicate that the Village agrees with findings of preliminary draft; does not object to the proposed plan; and seeks to enter into discussions with the Village of Big Bend and Town of Vernon on long-term sewer service area planning.

Written Comments from Private Interests

Private individuals submitted written comments with the following suggestions:

14. Consider providing sewer service only to the IH 43/STH 164 interchange area, via a connection to the Waukesha sewerage system.
15. Consider removing a single-family house and lot—located at S83 W22770 Martin Street in the Town of Vernon—from the proposed sewer service area (submitted by owners of that property).
16. Consider the impacts of a new sewage treatment plant discharging to the Fox River on water levels downstream.

In addition, written comments from one individual expressed strong support for the provision of utility service to the IH 43/ STH 164 interchange area.

RESPONSE TO PUBLIC COMMENTS

This section sets forth the Regional Planning Commission and Village of Big Bend responses to both the verbal comments made at the public hearing and the written comments received before and after the hearing, as enumerated in the preceding section of this chapter. These responses were finalized following a February 3, 2010, intergovernmental meeting—attended by representatives of the Village of Big Bend, the Towns of Vernon and Waukesha, Waukesha County, and SEWRPC—at which the various issues and concerns were discussed further.¹ In some cases, related comments are grouped and addressed with a single response.

Response to Comment 1

Those areas of the Town of Waukesha that are within the adopted sewer service area for the City of Waukesha and environs, and that are located generally south of the City between the City and the Village of Big Bend, were included in the City's sewer service area as a precaution in the event that future problems developed with private onsite wastewater treatment systems. It is unlikely that most of those areas of the Town would be served by the City sewerage system in the foreseeable future.

In addition, construction of a sanitary sewer force main along the STH 164 corridor with possible connections to lands within the Town of Waukesha would open up the possibility of higher-density urban development along that corridor, which would be inconsistent with the adopted regional land use plan. The possible provision of future sanitary sewers to serve areas of the Town of Waukesha if onsite system problems developed might be accomplished incrementally without a major sewer along that corridor; thus, such service would not create the same pressure for higher density development.

If the cost of serving the southern areas of the Town that are within the adopted sewer service area for the City and environs were to be included in the cost-effectiveness analysis, it also would have to be considered under the other two alternatives analyzed since it would be inconsistent for the cost-effectiveness to have one alternative addressing the provision of sewer service to certain areas of the Town of Waukesha while the other alternatives did not address service to the Town. If service to the Town were included under each of the three alternatives, two of which call for wastewater treatment with new facilities owned and operated by the Village, the only way that a conclusion different from that of the existing cost-effectiveness analysis would be reached would be because of the cost of adding service to the Town. Thus, 1) given the likelihood that most of the southern areas of the Town between the City and the Village would not require service within the 20-year facilities planning time frame, 2) given the possibility that serving the Town with a sewer along STH 164 could create pressure for development that is inconsistent with the regional land use plan, and 3) considering that it would not be appropriate for service of that area to be the deciding factor in establishing the future sewerage system for the Village of Big Bend, it is concluded that service to the Town of Waukesha should not be included in the cost-effectiveness analysis.

Response to Comment 2

The results of the groundwater modeling conducted under the ongoing planning effort documented in the preliminary draft of SEWRPC Planning Report No. 52, *A Regional Water Supply Plan for the Southeastern Wisconsin*, in preparation, provide information that can be used to estimate the effects of replacing existing private onsite treatment systems with a new wastewater treatment plant serving Big Bend. While a scenario under which the Village would switch from private onsite wastewater treatment systems (POWTS) to a centralized system while maintaining individual, private wells was not specifically modeled for the regional water supply, alternative plans were developed under which the Village would switch from POWTS to centralized wastewater

¹While not present at the meeting, the City Engineer for the City of Muskego informed the Commission staff that the written comments submitted into the hearing record by the City have been appropriately addressed in this section.

treatment and also eventually abandon individual wells, replacing them with a municipal water supply utilizing high capacity wells developed in the shallow aquifer. The maximum, localized drawdown under that scenario would be between 40 and 50 feet below the existing groundwater level in the shallow aquifer. It is likely that the drawdown from the continuation of the Village residents obtaining their water supply from scattered individual wells would be considerably less than 40 to 50 feet; however, it is possible that some of the shallowest individual wells might have to be deepened following complete abandonment of the POWTS serving existing development. As an alternative, the preliminary recommendation of the regional water supply plan calls for the Village to establish a municipal water utility at such time in the future that there is a demonstrated need for such a utility. If it were necessary to deepen a significant number of private wells in the future, that could potentially constitute such a demonstrated need.

An important consideration regarding the effects of the Village switching from POWTS to a centralized wastewater treatment system would be improvements in groundwater quality resulting from the elimination of POWTS on small lots that may not be providing adequate treatment, or that may fail.

On balance, given the nature of the alternatives for providing an adequate water supply and the potential groundwater quality benefits of abandoning existing POWTS, the possible drawdown of the shallow aquifer would not be considered significant enough to change the conclusion of the cost-effectiveness analysis described in this report.

Response to Comment 3

A preliminary concept site plan included in the Village facilities plan indicates that the proposed wastewater treatment plant would be located on what is now a softball diamond in the Village park located north of the Fox River and west of STH 164. It is estimated that sewage treatment facilities would require 2-3 acres of land. It should be noted that Waukesha County owns the parcels just north of the Village park. Village officials have indicated that they have had preliminary discussions with Waukesha County staff regarding a possible exchange or other transfer of lands in this vicinity that might be beneficial to the Village and County, potentially providing an alternative site for Village recreational facilities in the area.

Response to Comment 4

Some of the comments at the public hearing centered on concerns regarding the impacts of the proposed plan on taxes and the cost of local services, and concerns as to what would happen if the potential interchange development—which would be relied upon to finance the STH 164 sewer main and treatment plant—may not materialize. While these are certainly valid concerns, they are essentially local issues which pertain not only to wastewater treatment but to overall community goals and objectives and which should be carefully considered by the Village before taking steps to implement a sewerage system.

Response to Comments 5 and 12

The wastewater treatment plant for the Western Racine County Sewerage District (WRCSD) is located in the Village of Rochester near the intersection of STH 36 and N. River Road. A November 20, 2009 letter from the WRCSD commenting on the possible connection of the Village of Big Bend to the WRCSD sewerage system indicates that such a connection would require construction of a force main from the Village to the WRCSD existing 36-inch diameter gravity interceptor at a location south of CTH D. The WRCSD letter notes that any connection north of CTH D would require 1) replacement of WRCSD interceptor sewers which do not have adequate capacity to convey the additional flow from the Village of Big Bend, 2) replacement of the major WRCSD lift station, and 3) possible replacement of all, or portions, of the collection systems of municipal customers of the WRCSD.

Over 11 miles of force main would be required to connect Big Bend with the WRCSD sewerage system. That force main and associated pumping facilities would have the same capacity as the force main called for under Alternative Plan No. 3: Pump to the City of Waukesha as described in the cost-effectiveness analysis, but the force main would be more than twice as long as the force main to the City of Waukesha. Thus, the cost of connection to the WRCSD system would be expected to be far in excess of that for Alternative No. 3, and the alternative of connection to the WRCSD system was eliminated based on cost-effectiveness considerations.

Response to Comment 6 and 8

In its written comments, the Waukesha County Department of Parks and Land Use staff suggested that consideration be given to the inclusion of certain additional Town of Vernon lands in the planned sewer service area—including certain developed lands in the west halves of Sections 12 and 13 and in the south half of Section 2 which are adjacent to, and partially surrounded by, the proposed sewer service area. The County staff expressed concerns about high water table conditions and associated impacts on existing onsite wastewater disposal systems, noting that there are some mound systems in these areas. In subsequent comments at the intergovernmental meeting on February 3, 2010, the County staff urged the Town and Village to consider the possibility of shared sewer service where appropriate and to be open to the possibility of other cooperative service sharing that may be beneficial to both.

Following initial adoption, the Big Bend sanitary sewer service area may be revised in the years ahead in response to changing needs, in accordance with the provisions of Chapter NR 121 of the *Wisconsin Administrative Code*. There is a process, coordinated by the Regional Planning Commission and subject to approval by the Wisconsin Department of Natural Resources, through which sewer service areas may be amended. Future amendments could involve the addition of developed areas of the Town of Vernon, such as residential subdivisions that may experience problems with onsite wastewater treatment systems, or undeveloped lands in the Town, and may include the addition of lands which may be annexed to the Village.

The proposed sewer service area as presented on Map 2 in Chapter II, includes the entirety of the Village of Big Bend and certain lands in the Town of Vernon that are for the most part developed and that could likely be readily served by the proposed Big Bend sewerage system. No additional areas are recommended to be added to the planned sewer service area as presented on Map 2 at this time. As a practical matter, this will maintain the buildout population of the sewer service area at a level consistent with previous facility planning. Moreover, this will provide flexibility for the future addition of other areas to the service area, as the need for sewer service becomes more apparent.

Response to Comment 7

The Town of Vernon and Waukesha County comprehensive plans were considered in identifying the boundaries of the proposed sewer service area as presented in Chapter II. The text of Chapter II will be revised to note this in the final report.

Response to Comment 9

In its comments, the Waukesha County Department of Parks and Land Use staff indicated that the inclusion of the northeast portions of Section 2 deviates from the Waukesha County comprehensive plan, noting that the County plan recommends no more than rural-density residential development (at least five acres per dwelling) in that area. In subsequent discussions with the Regional Planning Commission staff, the County staff indicated that the County comprehensive plan discourages the extension of sanitary sewers to rural density residential development, including rural residential development that utilizes cluster designs. The County staff indicated that this policy is related to the goal of increasing housing affordability in sewered areas. While recognizing that land use planning within the Village limits is the responsibility of the Village (this area having been annexed to the Village in 2009), the County would urge the Village to consider a higher density for this area if it is to be included in the planned sewer service area.

The adopted Village comprehensive plan designates the developable land in the northeast quarter of Section 2 as Low Density Residential, which has a recommended density of 3-5 acres per dwelling under the Village plan. Village officials have indicated that, if provided with sanitary sewer service, this area would be proposed to be developed at an overall density of up to one dwelling per acre, with conservation subdivision designs (clustering of smaller lots surrounded by open space, consistent with the overall proposed density) being recommended. The Village will consider revising its comprehensive plan to accommodate this higher density in a future amendment to its comprehensive plan.

Response to Comment 10

In its written comments, the City of Muskego suggested that consideration be given to the possibility of connecting Big Bend to the MMSD sewerage system through the City of Muskego. Such a connection would involve the diversion of shallow aquifer groundwater from the Fox River watershed in the Mississippi River Basin to the Great Lakes Basin. Chapter NR 142, “Wisconsin Water Management and Conservation,” of the *Wisconsin Administrative Code* requires that an entity making a withdrawal of more than 100,000 but less than 5 million gallons per day from waters of the State, which include groundwater, pay a \$35.00 annual fee. Chapter NR 142 does not define inter-basin diversion or consumptive use of 2 million gpd or less as a water loss requiring formal approval from the Wisconsin Department of Natural Resources. Thus, the proposed average annual wastewater flow from the Village of Big Bend and environs, which is estimated to be 0.394 million gallons per day, would be subject to the annual fee, but would not be considered a water loss under Chapter NR 142. Also, the Great Lakes-St. Lawrence River Basin Water Resources Compact does not address the diversion of groundwater into the Great Lakes-St. Lawrence River Basin.

Although there are no legal impediments to such an inter-basin diversion of groundwater, there are MMSD policies that relate to extension of the MMSD sewer service area to areas that are both outside of its planning area and outside of the Great Lakes Basin. A January 25, 2010 resolution adopted by the MMSD Commission revised the sewer service area to include the New Berlin West High School campus and connecting road right-of-way to address “existing extreme hardship to the school campus.” The school campus and connecting right-of-way, which are both located in the Fox River watershed in the Mississippi River Basin, were included in the MMSD planning area under the MMSD 2020 facilities plan, but adjacent lands in the Fox River watershed are not in the planning area. The January 2010 MMSD resolution also states that the Milwaukee Metropolitan Sewerage District “Commission does not intend to extend its sewer service area in the future to those areas adjacent to either the sanitary sewer approved by this resolution or to the school campus.” Thus, the resolution provides a policy statement regarding extension of the MMSD sewer service area to areas that are both outside of its planning area and outside of the Great Lakes Basin. That policy statement can be viewed as a reaffirmation of an MMSD Commission policy that was also exercised in both 1987 and 1989 when the MMSD Commission rejected the Bark Lake Sanitary District’s request for a sewer connection. The Bark Lake Sanitary District is located in the Bark River watershed, which is in the Mississippi River Basin and is outside of the MMSD planning area.

Finally, inter-basin diversions of groundwater could reduce baseflows to streams, rivers, lakes, and wetlands that are hydrologically connected to the aquifer from which the groundwater is diverted.

Thus, based on MMSD policy and general considerations related to the environmental impacts of inter-basin groundwater diversions, connection of a future sewerage system for the Village of Big Bend and environs to the MMSD sewerage system is not considered to be a viable option, and will not be investigated further.

Response to Comment 11

In its written comments, the City of Muskego also suggested that, if a new wastewater treatment facility for Big Bend is determined to be the best alternative, consideration should be given to extending the associated sewer service area to portions of the City of Muskego west of the ultimate Muskego-MMSD service area. The lands in question are located along the westerly border of the City.

The Cities of Franklin and Muskego have submitted a January 11, 2010 request that the Milwaukee Metropolitan Sewerage District Commission adopt Addendum 2 to the MMSD 2020 facilities plan regarding the Franklin/Muskego Metropolitan Interceptor Sewer project. The proposed interceptor project would ultimately serve all of the City of Muskego within the MMSD planning area, the southwest portion of the City of Franklin, and a small portion of the extreme southwestern part of the City of New Berlin.

The City of Muskego comprehensive plan projects relatively modest growth in residential development—roughly 70 dwelling units per year—in the City over the long term. While a detailed analysis has not been undertaken, a review of the City land use plan map included in the comprehensive plan suggests that there is ample land within the ultimate Muskego-MMSD service area to accommodate the projected residential growth for the City.

Development of the areas west of the Muskego-MMSD ultimate area does not appear likely within the 20-year planning horizon of the Big Bend facilities plan. Thus, it is concluded that the proposed sewer service area for the Village of Big Bend should not be expanded to include the far western portions of the City of Muskego at this time.

Response to Comment 14

The cost-effectiveness analysis documents that construction of a sewerage system and a new wastewater treatment plant owned and operated by the Village of Big Bend is the most cost-effective of the three alternatives considered under the Village facilities plan, including connection to the City of Waukesha system. It is likely that the relative cost-effectiveness of the three alternatives would be the same if service were only to be provided to the IH 43/STH 164 interchange area. Also, over the long-term, the provision of service only to the interchange area would be inconsistent with the Village objectives for future development and for serving existing development, including properties with poorly functioning onsite systems.

Response to Comment 15

Village officials recommend against removing the property located at S83 W22770 Martin Street, in the Town of Vernon—a single-family homesite—from the proposed sewer service area. The Village position considers that inclusion in the sewer service area enables, but does not mandate, the extension of sanitary sewers; that the Village would not force sewer service on, or annexation of, lands in the Town; and that the exclusion of the parcel in question in this case would create an irregular sewer service area boundary in that vicinity. Consistent with the Village position on this matter, it is recommended that the property in question be retained in the proposed sewer service area.

Response to Comment 16

The average annual flow from the proposed wastewater treatment plant to the Fox River would be 0.394 million gallons per day (mgd), or 0.6 cubic feet per second (cfs). The peak hourly flow from the proposed plant to the Fox River would be 1.38 mgd, or 2.1 cfs. The closest U.S. Geological Survey streamflow recording gauge on the Fox River, which is located at the City of Waukesha, has a drainage area of 126 square miles. The Fox River drainage area at the Village of Big Bend is 322 square miles, which is about 2.6 times the drainage area at Waukesha. There is no Fox River streamflow gauge at Big Bend, so the recorded flows at Waukesha were used to characterize the relative magnitude of the additional flow to the River from the proposed Big Bend treatment plant. The actual flows in the River at Big Bend from sources other than the proposed Big Bend treatment plant would be considerably greater than those at Waukesha, thus, the magnitude of the additional flow from Big Bend is overstated when compared to flows at Waukesha. Also, a portion of the flow from the existing onsite wastewater treatment systems in the Village reaches the Fox River as groundwater base flow. The average annual flow from the proposed wastewater treatment plant would include a flow component equal to the current contribution to baseflow from the existing onsite systems. That factor also contributes to overstatement of the relative effects of a future Big Bend treatment plant discharge on an average annual basis.

The average annual flow from the proposed wastewater treatment plant would only be from 0.3 to 1.9 percent of the largest and smallest average annual flows recorded at Waukesha during the 45-year period of record from 1964 through 2008, respectively. The peak hourly flow from the proposed plant would only be from 1.0 to 6.6 percent of the largest and smallest average annual flows recorded at Waukesha during the period of record, respectively. The peak hourly flow from the proposed plant would also be less than 1 percent of the maximum daily mean flow for the period of record of the gauge. Because of the differences in drainage area between Waukesha and Big Bend, it is likely that the actual relative percentage increases could be about half those based on comparison to flows at Waukesha. Thus, it is concluded that the relative magnitude of the flow increase in the Fox River due to discharge from the proposed Big Bend wastewater treatment plant would be insignificant.

Comment from SEWRPC Planning and Research Committee

The draft sewer service area plan and cost-effectiveness analysis were reviewed by the SEWRPC Planning and Research Committee at the November 2009 meeting. A member of the Committee asked that further consideration be given to Alternative Plan No. 2-New Aerated Lagoon Wastewater Treatment Plant with Land

Application. These comments related to the possibility that implementation of Alternative No. 2 would have less significant effects on groundwater levels than the recommended Alternative No. 1. As noted previously, if the Village switched from private onsite wastewater treatment systems to a centralized system, there could be a lowering of groundwater levels. The degree of lowering would be expected to be similar under each of the three alternatives considered. Under the land application alternative, there would be very little treated effluent discharged to groundwater. The large majority of the effluent applied for agricultural irrigation would be lost to the groundwater through evapotranspiration from the crops. Also, given the proximity of the land application sites to the Fox River, a part of the remaining small fraction of the irrigation water would reach the River as subsurface interflow and base flow, leaving little to recharge the groundwater.

CONCLUDING RECOMMENDATIONS

In accordance with the foregoing, no changes to the proposed sanitary sewer service area and sewerage system for the Village of Big Bend and environs as presented in Chapters II and III of this report are found to be warranted. Accordingly, it is recommended that the regional water quality plan for Southeastern Wisconsin be amended as follows:

1. Add to the plan a sewer service area for the Village of Big Bend and environs as presented on Map 2 in Chapter II of this report.
2. Add to the plan a sewerage system for the Village of Big Bend and environs as described in Alternative No. 1 in Chapter III of this report, including a new extended aeration activated sludge wastewater treatment plant discharging to the Fox River.
3. Identify the Village of Big Bend as the designated management agency for the proposed sewerage system.

VILLAGE ADOPTION OF THE PLAN

The Big Bend Village Board adopted the sewer service area plan as documented in this report on March 4, 2010.

APPENDICES

(This page intentionally left blank)

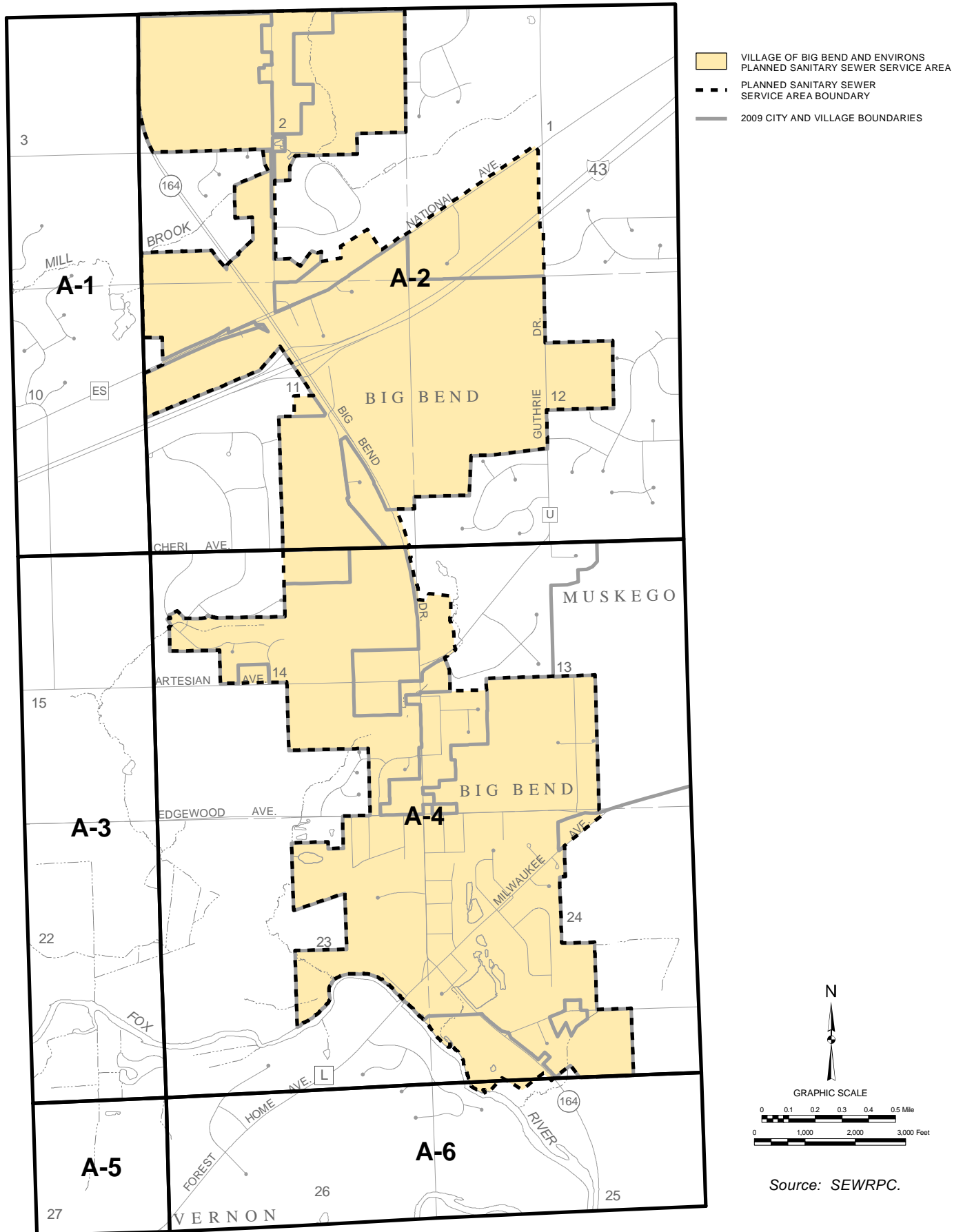
Appendix A

**MAPS OF ENVIRONMENTALLY SIGNIFICANT
LANDS AND PLANNED SANITARY SEWER
SERVICE AREA FOR THE VILLAGE OF
BIG BEND AND ENVIRONS**

(This page intentionally left blank)

Appendix A

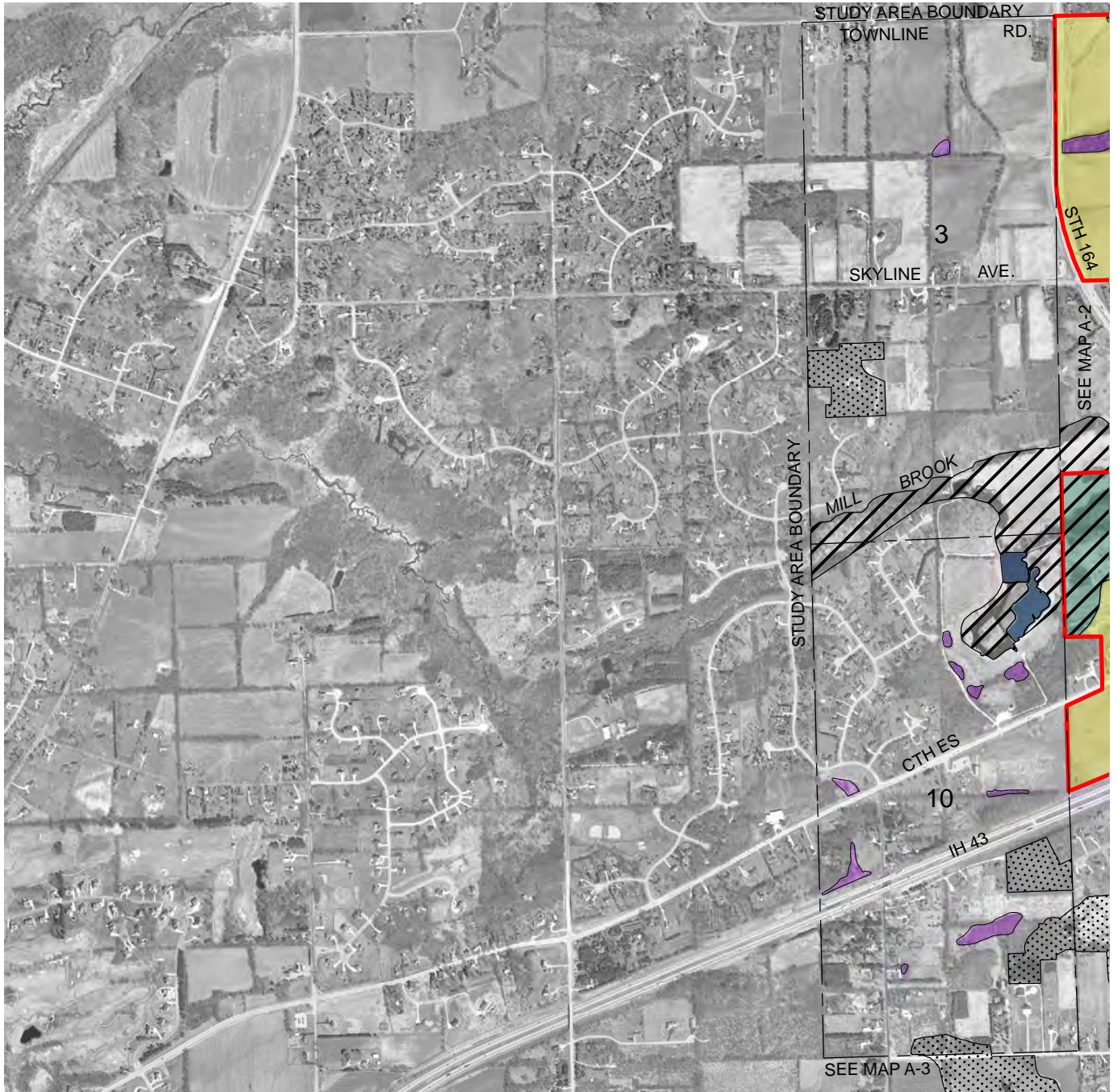
INDEX OF MAPS IN APPENDIX A









Map A-1

**ENVIRONMENTALLY SIGNIFICANT LANDS AND PLANNED SANITARY
SEWER SERVICE AREA FOR VILLAGE OF BIG BEND AND ENVIRONS**

**East Half of U.S. Public Land Survey Sections 3 and 10
Township 5 North, Range 19 East**





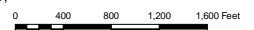
Photography Date: April 2005

-  PRIMARY ENVIRONMENTAL CORRIDOR
-  SECONDARY ENVIRONMENTAL CORRIDOR
-  ISOLATED NATURAL RESOURCE AREA
-  WETLANDS AND SURFACE WATER AREAS LESS THAN FIVE ACRES IN SIZE
-  SURFACE WATER WITHIN ENVIRONMENTAL CORRIDORS AND ISOLATED NATURAL RESOURCE AREAS
-  GROSS SANITARY SEWER SERVICE AREA BOUNDARY

-  PLANNED SANITARY SEWER SERVICE AREA

RESTRICTIONS ON SEWERED DEVELOPMENT

-  PRIMARY ENVIRONMENTAL CORRIDORS WITHIN THE PLANNED SANITARY SEWER SERVICE AREA: THE EXTENSION OF SEWERS TO SERVE NEW DEVELOPMENT IS CONFINED TO LIMITED RECREATIONAL AND INSTITUTIONAL USES AND RURAL-DENSITY RESIDENTIAL DEVELOPMENT IN AREAS OTHER THAN WETLANDS, FLOODLANDS, SHORELANDS, AND STEEP SLOPES.
-  PORTIONS OF SECONDARY ENVIRONMENTAL CORRIDORS AND ISOLATED NATURAL RESOURCE AREAS WITHIN THE PLANNED SANITARY SEWER SERVICE AREA WHICH ARE COMPRISED OF WETLANDS, FLOODLANDS, SHORELANDS, AND STEEP SLOPES: THE EXTENSION OF SEWERS TO SERVE NEW DEVELOPMENT IN THESE AREAS IS NOT PERMITTED.

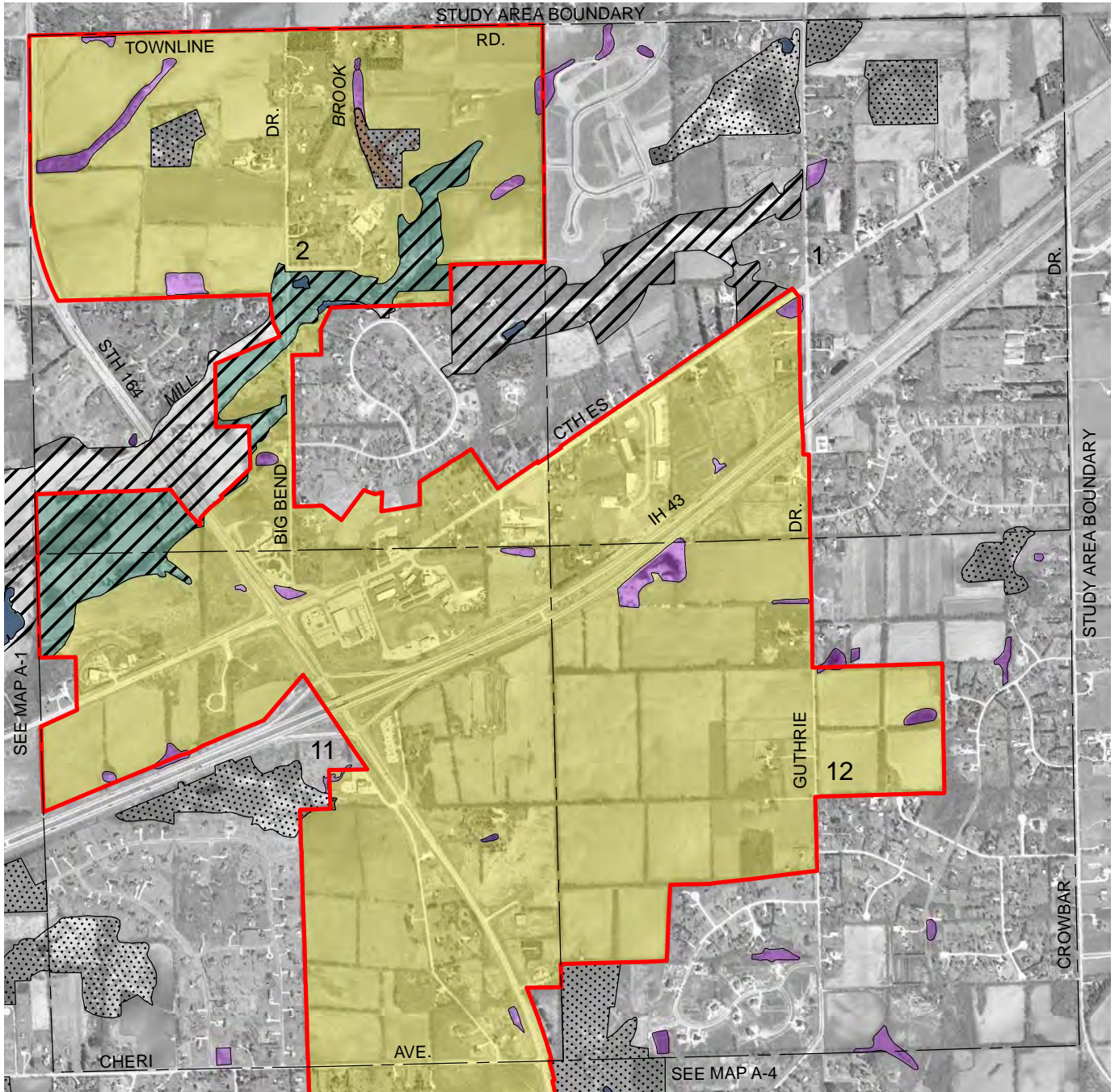


Source: SEWRPC.







Map A-2

ENVIRONMENTALLY SIGNIFICANT LANDS AND PLANNED SANITARY SEWER SERVICE AREA FOR VILLAGE OF BIG BEND AND ENVIRONS

**U.S. Public Land Survey Sections 1, 2, 11, and 12
Township 5 North, Range 19 East**





Photography Date: April 2005

-  PRIMARY ENVIRONMENTAL CORRIDOR
-  SECONDARY ENVIRONMENTAL CORRIDOR
-  ISOLATED NATURAL RESOURCE AREA
-  WETLANDS AND SURFACE WATER AREAS LESS THAN FIVE ACRES IN SIZE
-  SURFACE WATER WITHIN ENVIRONMENTAL CORRIDORS AND ISOLATED NATURAL RESOURCE AREAS
-  GROSS SANITARY SEWER SERVICE AREA BOUNDARY

-  PLANNED SANITARY SEWER SERVICE AREA

RESTRICTIONS ON SEWERED DEVELOPMENT

-  PRIMARY ENVIRONMENTAL CORRIDORS WITHIN THE PLANNED SANITARY SEWER SERVICE AREA: THE EXTENSION OF SEWERS TO SERVE NEW DEVELOPMENT IS CONFINED TO LIMITED RECREATIONAL AND INSTITUTIONAL USES AND RURAL-DENSITY RESIDENTIAL DEVELOPMENT IN AREAS OTHER THAN WETLANDS, FLOODLANDS, SHORELANDS, AND STEEP SLOPES.
-  PORTIONS OF SECONDARY ENVIRONMENTAL CORRIDORS AND ISOLATED NATURAL RESOURCE AREAS WITHIN THE PLANNED SANITARY SEWER SERVICE AREA WHICH ARE COMPRISED OF WETLANDS, FLOODLANDS, SHORELANDS, AND STEEP SLOPES: THE EXTENSION OF SEWERS TO SERVE NEW DEVELOPMENT IN THESE AREAS IS NOT PERMITTED.



0 400 800 1,200 1,600 Feet

Source: SEWRPC.

Map A-3

ENVIRONMENTALLY SIGNIFICANT LANDS AND PLANNED SANITARY SEWER SERVICE AREA FOR VILLAGE OF BIG BEND AND ENVIRONS

East Half of U.S. Public Land Survey Sections 15 and 22
Township 5 North, Range 19 East



Photography Date: April 2005

PRIMARY ENVIRONMENTAL CORRIDOR

SECONDARY ENVIRONMENTAL CORRIDOR

ISOLATED NATURAL RESOURCE AREA

WETLANDS AND SURFACE WATER AREAS LESS THAN FIVE ACRES IN SIZE

SURFACE WATER WITHIN ENVIRONMENTAL CORRIDORS AND ISOLATED NATURAL RESOURCE AREAS

GROSS SANITARY SEWER SERVICE AREA BOUNDARY

PLANNED SANITARY SEWER SERVICE AREA

RESTRICTIONS ON SEWERED DEVELOPMENT

PRIMARY ENVIRONMENTAL CORRIDORS WITHIN THE PLANNED SANITARY SEWER SERVICE AREA: THE EXTENSION OF SEWERS TO SERVE NEW DEVELOPMENT IS CONFINED TO LIMITED RECREATIONAL AND INSTITUTIONAL USES AND RURAL-DENSITY RESIDENTIAL DEVELOPMENT IN AREAS OTHER THAN WETLANDS, FLOODLANDS, SHORELANDS, AND STEEP SLOPES.

PORTIONS OF SECONDARY ENVIRONMENTAL CORRIDORS AND ISOLATED NATURAL RESOURCE AREAS WITHIN THE PLANNED SANITARY SEWER SERVICE AREA WHICH ARE COMPRISED OF WETLANDS, FLOODLANDS, SHORELANDS, AND STEEP SLOPES: THE EXTENSION OF SEWERS TO SERVE NEW DEVELOPMENT IN THESE AREAS IS NOT PERMITTED.



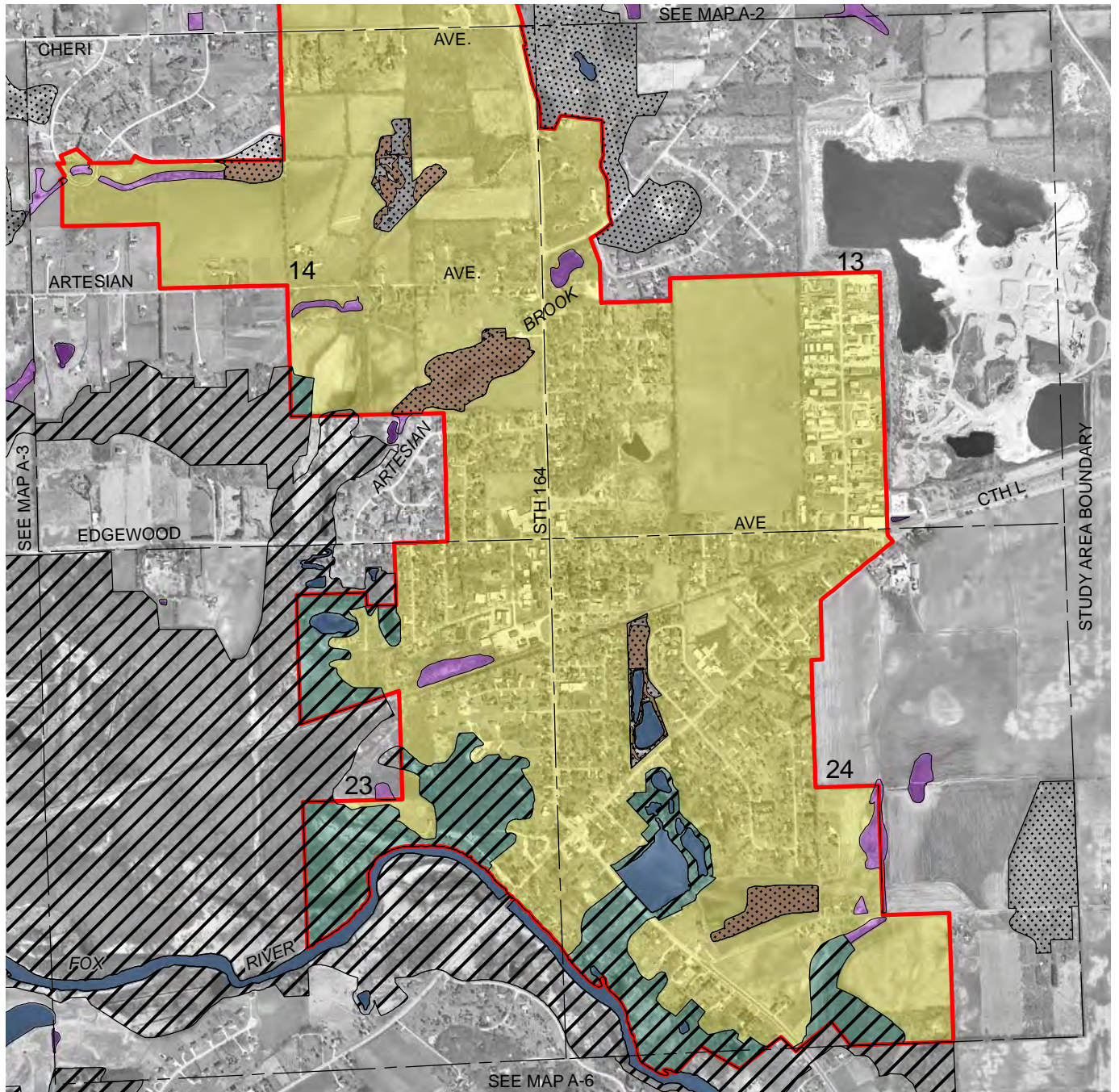
0 400 800 1,200 1,600 Feet

Source: SEWRPC.

Map A-4

ENVIRONMENTALLY SIGNIFICANT LANDS AND PLANNED SANITARY SEWER SERVICE AREA FOR VILLAGE OF BIG BEND AND ENVIRONS

**U.S. Public Land Survey Sections 13, 14, 23, and 24
Township 5 North, Range 19 East**



Photography Date: April 2005

PRIMARY ENVIRONMENTAL CORRIDOR

SECONDARY ENVIRONMENTAL CORRIDOR

ISOLATED NATURAL RESOURCE AREA

WETLANDS AND SURFACE WATER AREAS LESS THAN FIVE ACRES IN SIZE

SURFACE WATER WITHIN ENVIRONMENTAL CORRIDORS AND ISOLATED NATURAL RESOURCE AREAS

GROSS SANITARY SEWER SERVICE AREA BOUNDARY

PLANNED SANITARY SEWER SERVICE AREA

RESTRICTIONS ON SEWERED DEVELOPMENT

PRIMARY ENVIRONMENTAL CORRIDORS WITHIN THE PLANNED SANITARY SEWER SERVICE AREA: THE EXTENSION OF SEWERS TO SERVE NEW DEVELOPMENT IS CONFINED TO LIMITED RECREATIONAL AND INSTITUTIONAL USES AND RURAL-DENSITY RESIDENTIAL DEVELOPMENT IN AREAS OTHER THAN WETLANDS, FLOODLANDS, SHORELANDS, AND STEEP SLOPES.

PORTIONS OF SECONDARY ENVIRONMENTAL CORRIDORS AND ISOLATED NATURAL RESOURCE AREAS WITHIN THE PLANNED SANITARY SEWER SERVICE AREA WHICH ARE COMPRISED OF WETLANDS, FLOODLANDS, SHORELANDS, AND STEEP SLOPES: THE EXTENSION OF SEWERS TO SERVE NEW DEVELOPMENT IN THESE AREAS IS NOT PERMITTED.



0 400 800 1,200 1,600 Feet

Source: SEWRPC.







Map A-5

ENVIRONMENTALLY SIGNIFICANT LANDS AND PLANNED SANITARY SEWER SERVICE AREA FOR VILLAGE OF BIG BEND AND ENVIRONS

Northeast One-Quarter of U.S. Public Land Survey Section 27
Township 5 North, Range 19 East





Photography Date: April 2005

-  PRIMARY ENVIRONMENTAL CORRIDOR
-  SECONDARY ENVIRONMENTAL CORRIDOR
-  ISOLATED NATURAL RESOURCE AREA
-  WETLANDS AND SURFACE WATER AREAS LESS THAN FIVE ACRES IN SIZE
-  SURFACE WATER WITHIN ENVIRONMENTAL CORRIDORS AND ISOLATED NATURAL RESOURCE AREAS
-  GROSS SANITARY SEWER SERVICE AREA BOUNDARY

-  PLANNED SANITARY SEWER SERVICE AREA

RESTRICTIONS ON SEWERED DEVELOPMENT

-  PRIMARY ENVIRONMENTAL CORRIDORS WITHIN THE PLANNED SANITARY SEWER SERVICE AREA: THE EXTENSION OF SEWERS TO SERVE NEW DEVELOPMENT IS CONFINED TO LIMITED RECREATIONAL AND INSTITUTIONAL USES AND RURAL-DENSITY RESIDENTIAL DEVELOPMENT IN AREAS OTHER THAN WETLANDS, FLOODLANDS, SHORELANDS, AND STEEP SLOPES.
-  PORTIONS OF SECONDARY ENVIRONMENTAL CORRIDORS AND ISOLATED NATURAL RESOURCE AREAS WITHIN THE PLANNED SANITARY SEWER SERVICE AREA WHICH ARE COMPRISED OF WETLANDS, FLOODLANDS, SHORELANDS, AND STEEP SLOPES: THE EXTENSION OF SEWERS TO SERVE NEW DEVELOPMENT IN THESE AREAS IS NOT PERMITTED.



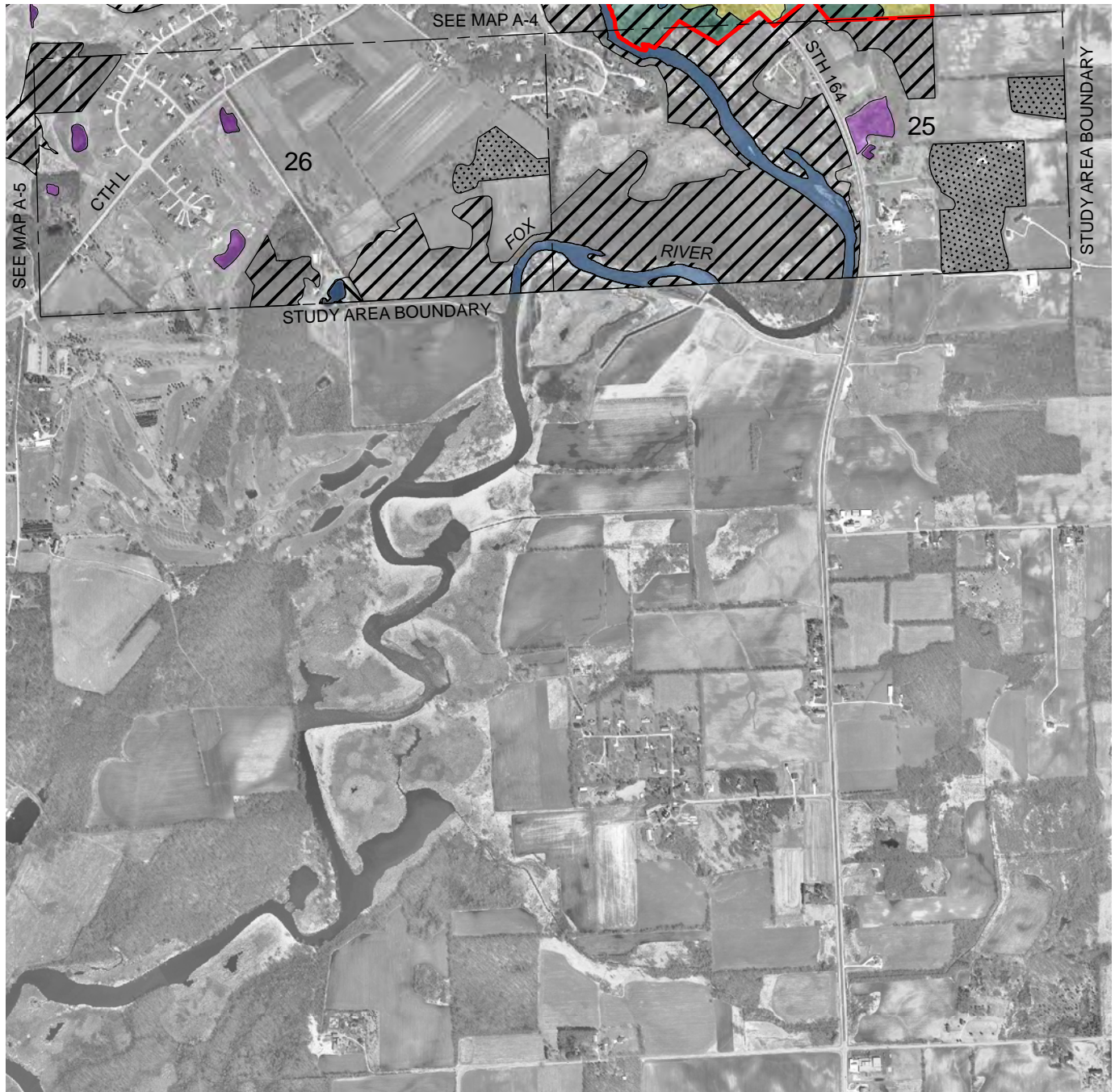
0 400 800 1,200 1,600 Feet

Source: SEWRPC.

Map A-6

**ENVIRONMENTALLY SIGNIFICANT LANDS AND PLANNED SANITARY
SEWER SERVICE AREA FOR VILLAGE OF BIG BEND AND ENVIRONS**

**North Half of U.S. Public Land Survey Sections 25 and 26
Township 5 North, Range 19 East**



Photography Date: April 2005

PRIMARY ENVIRONMENTAL CORRIDOR

SECONDARY ENVIRONMENTAL CORRIDOR

ISOLATED NATURAL RESOURCE AREA

WETLANDS AND SURFACE WATER
AREAS LESS THAN FIVE ACRES IN SIZE

SURFACE WATER WITHIN ENVIRONMENTAL CORRIDORS
AND ISOLATED NATURAL RESOURCE AREAS

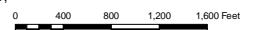
GROSS SANITARY SEWER SERVICE AREA BOUNDARY

PLANNED SANITARY SEWER SERVICE AREA

RESTRICTIONS ON SEWERED DEVELOPMENT

PRIMARY ENVIRONMENTAL CORRIDORS WITHIN THE PLANNED SANITARY
SEWER SERVICE AREA: THE EXTENSION OF SEWERS TO SERVE NEW
DEVELOPMENT IS CONFINED TO LIMITED RECREATIONAL AND INSTITUTIONAL
USES AND RURAL-DENSITY RESIDENTIAL DEVELOPMENT IN AREAS OTHER
THAN WETLANDS, FLOODLANDS, SHORELANDS, AND STEEP SLOPES.

PORTIONS OF SECONDARY ENVIRONMENTAL CORRIDORS AND ISOLATED
NATURAL RESOURCE AREAS WITHIN THE PLANNED SANITARY SEWER SERVICE
AREA WHICH ARE COMPRISED OF WETLANDS, FLOODLANDS, SHORELANDS,
AND STEEP SLOPES: THE EXTENSION OF SEWERS TO SERVE NEW
DEVELOPMENT IN THESE AREAS IS NOT PERMITTED.



Source: SEWRPC.

(This page intentionally left blank)

Appendix B

SUMMARY OF PROCEDURES USED IN THE IDENTIFICATION OF ENVIRONMENTAL CORRIDORS AND ISOLATED NATURAL RESOURCE AREAS

One of the most important tasks completed by the Commission under the regional planning program for Southeastern Wisconsin is delineation of environmental corridors. Environmental corridors are linear areas in the landscape containing concentrations of natural resource and resource-related amenities. These corridors generally lie along the major stream valleys, around major lakes, and in the Kettle Moraine area of southeastern Wisconsin. Almost all the remaining high-value wetlands, woodlands, wildlife habitat areas, major bodies of surface water, and delineated floodlands and shorelands are contained within these corridors. In addition, significant groundwater recharge and discharge areas, many of the most important recreational and scenic areas, and the best remaining potential park sites are located within the environmental corridors. Such corridors are, in effect, a composite of the most important individual elements of the natural resource base in southeastern Wisconsin, and have immeasurable environmental, ecological, and recreational value.

The process of delineating environmental corridors began with the mapping of individual natural resource and resource-related elements on aerial photographs at a scale of one inch equals 400 feet. The various natural resource and resource-related elements were assigned a numeric rating intended to reflect the value of their natural characteristics. The types of natural resource and resource-related features that were mapped and the point values assigned are indicated in Table B-1.

Areas having a total point value of 10 or more based upon this mapping were identified as having “significant” natural resource value. These areas were, in turn, classified as primary environmental corridors, secondary environmental corridors, or isolated natural resource areas based upon the following criteria:

- Primary environmental corridors encompass at least 400 acres and have a minimum length of at least two miles and a minimum width of at least 200 feet.
- Secondary environmental corridors encompass at least 100 acres and have a minimum length of at least one mile.
- Isolated natural resource areas encompass at least five acres and have a minimum width of at least 200 feet.

Table B-1

**VALUES ASSIGNED TO NATURAL RESOURCE BASE AND RESOURCE BASE-RELATED ELEMENTS IN
THE PROCESS OF DELINEATING ENVIRONMENTAL CORRIDORS AND ISOLATED NATURAL RESOURCE AREAS**

Natural Resource Base Element	Point Value	Natural Resource Base Related Element	Point Value
Lake		Existing Park or Open Space Site	
Major (50 acres or more).....	20	Rural Open Space Site.....	5
Minor (5-49 acres).....	20	Other Park and Open Space Site.....	2
Rivers or Streams (perennial).....	10	Potential Park Site	
Shoreland		High-Value.....	3
Lake or Perennial River or Stream.....	10	Medium-Value.....	2
Intermittent Stream.....	5	Low-Value.....	1
Floodland (100-year recurrence interval).....	3	Historic Site	
Wetland.....	10	Structure.....	1
Woodland.....	10	Other Cultural.....	1
Wildlife Habitat		Archaeological.....	2
Class I.....	10	Scenic Viewpoint.....	5
Class II.....	7	Natural Area	
Class III.....	5	State Scientific Area.....	15
Steep Slope		Statewide or Greater Significance.....	15
20 Percent or More.....	7	County or Regional Significance.....	10
12-19 Percent.....	5	Local Significance.....	5
Prairie.....	10		

Source: SEWRPC.

The resulting delineations are held out as subject to field verification where appropriate. The Commission staff is frequently called upon by county and local units of government to verify and stake in the field the boundaries of these environmentally significant lands.

Additional documentation regarding the environmental corridor delineation process is presented in an article titled "Refining the Delineation of Environmental Corridors in Southeastern Wisconsin" published in SEWRPC *Technical Record*, Volume Four, Number Two, dated 1981, which may be viewed on the Regional Planning Commission website.

Appendix C

20-YEAR COST-EFFECTIVENESS ANALYSES

(This page intentionally left blank)

Table C-1

**ECONOMIC ANALYSIS OF ESTIMATED COSTS OF ALTERNATIVE NO. 1—NEW EXTENDED AERATION
ACTIVATED SLUDGE WASTEWATER TREATMENT PLANT (WWTP) TO SERVE THE VILLAGE OF BIG BEND**

Alternative Plan Component ^a	Initial Capital Cost	Service Life (years)	Future Cost at 10 Years	Salvage Value at 20 Years	Annual Operation and Maintenance Cost	Total Present Worth Cost ^b
0.394 mgd WWTP						
Structures and Yard Piping	\$1,484,000	40	--	\$ 742,000	--	--
Equipment, Site Work, Electrical	940,000	20	--	--	--	--
Instrumentation and Control	289,000	10	\$289,000	--	--	--
8-Inch Gravity Sewer Flowing South from Point of Collection	329,000	50	--	197,400	--	--
10-Inch Gravity Sewer from End of 8-Inch Sewer to Pump Station	620,000 ^c	50	--	372,000	--	--
1.38 mgd Pump Station						
Structure	300,000	40	--	150,000	--	--
Equipment	110,000	20	--	--	--	--
10-Inch Force Main to WWTP	86,000 ^c	50	--	51,600	--	--
Gravity Sewer Discharge to Fox River	76,500	50	--	45,900	--	--
Construction Cost Subtotal	\$4,234,500	--	--	--	--	--
Construction Cost Contingencies at 20 Percent	\$ 847,000	--	--	--	--	--
Construction Cost Total	\$5,081,500	--	--	--	--	--
Land Acquisition	\$ 150,000	--	--	--	--	--
Engineering, Legal, and Administration at 15 Percent	\$ 762,000	--	--	--	--	--
Total Capital Cost	\$5,993,500	--	\$289,000	\$1,558,900	\$ 260,000	--
Present Worth	\$5,993,500	--	\$161,000	\$ 486,000 ^d	\$2,982,000	\$8,650,500

NOTE: For future replacement costs or salvage values, double dashes indicate no cost is applicable. Annual operation and maintenance and present worth costs are not itemized, as indicated by double dashes.

^aSee Map 4.

^bBased upon a 20-year analysis period and a 6 percent interest rate.

^cRevised from Facilities Plan and Addendums to reflect refined component length.

^dSubtracted in calculating total present worth.

Source: Applied Technologies, Inc. and SEWRPC.

Table C-2

**ECONOMIC ANALYSIS OF ESTIMATED COSTS OF ALTERNATIVE NO. 2—AERATED LAGOON
WASTEWATER TREATMENT PLANT (WWTP) WITH LAND APPLICATION TO SERVE THE VILLAGE OF BIG BEND**

Alternative Plan Component ^a	Initial Capital Cost	Service Life (years)	Future Cost at 10 Years	Salvage Value at 20 Years	Annual Operation and Maintenance Cost	Total Present Worth Cost ^b
0.394 mgd WWTP						
Structures and Yard Piping	\$1,387,700	40	--	\$663,850	--	--
Equipment, Site Work, Electrical	702,300	20	--	--	--	--
Instrumentation and Control	280,000	10	\$280,000	--	--	--
8-Inch Gravity Sewer Flowing South from Point of Collection	329,000	50	--	197,400	--	--
10-Inch Gravity Sewer from End of 8-Inch Sewer to Pump Station	620,000 ^c	50	--	372,000	--	--
1.38 mgd Pump Station						
Structure	300,000	40	--	150,000	--	--
Equipment	110,000	20	--	--	--	--
10-Inch Force Main to WWTP	86,000 ^c	50	--	51,600	--	--
Force Main to Irrigation System	187,500	50	--	112,500	--	--
Irrigation System	120,000	50	--	72,000	--	--
Construction Cost Subtotal	\$4,122,500	--	--	--	--	--
Construction Cost Contingencies at 20 Percent	\$ 825,000	--	--	--	--	--
Construction Cost Total	\$4,947,500	--	--	--	--	--
Land Acquisition	\$3,400,000	--	--	\$3,400,000	--	--
Engineering, Legal, and Administration at 15 Percent	\$ 742,000	--	--	--	--	--
Total Capital Cost	\$9,089,500	--	\$280,000	\$5,019,350	\$ 174,000	--
Present Worth	\$9,089,500	--	\$156,000	\$1,565,000 ^d	\$1,996,000	\$9,676,500

NOTE: For future replacement costs or salvage values, double dashes indicate no cost is applicable. Annual operation and maintenance and present worth costs are not itemized, as indicated by double dashes.

^aSee Map 5.

^bBased upon a 20-year analysis period and a 6 percent interest rate.

^cRevised from Facilities Plan and Addendums to reflect refined component length.

^dSubtracted in calculating total present worth.

Source: Applied Technologies, Inc. and SEWRPC.

Table C-3

ECONOMIC ANALYSIS OF ESTIMATED COSTS OF ALTERNATIVE NO. 3—PUMP TO THE CITY OF WAUKESHA

Alternative Plan Component ^a	Initial Capital Cost	Service Life (years)	Future Cost at 10 Years	Salvage Value at 20 Years	Annual Operation and Maintenance Cost	Total Present Worth Cost ^b
10-Inch Gravity Sewer from CTH U to Pump Station No. 2	\$ 641,000	50	--	\$ 384,600	--	--
0.51 mgd Pump Station No. 2						
Structure.....	300,000	40	--	150,000	--	--
Equipment	100,000	20	--	--	--	--
8-Inch Force Main from Pump Station No. 2 to Pump Station No. 1.....	743,000	50	--	445,800	--	--
1.38 mgd Pump Station No. 1 and Odor Control Feed Station						
Structure.....	370,000	40	--	185,000	--	--
Equipment	130,000	20	--	--	--	--
10-Inch Force Main to STH 59/164.....	2,100,000	50	--	1,260,000	--	--
Force Main Crossings of IH 43 and STH 59/164	300,000	50	--	180,000	--	--
10-Inch Force Main from STH 59/164 to West Avenue	627,000	50	--	376,200	--	--
Force Main Crossing of Sunset Drive.....	35,000	50	--	21,000	--	--
Construction Cost Subtotal	\$5,346,000	--	--	--	--	--
Construction Cost Contingencies at 20 Percent	\$1,069,000	--	--	--	--	--
Construction Cost Total	\$6,415,000	--	--	--	--	--
Engineering, Legal, and Administration at 15 Percent	\$ 962,000	--	--	--	--	--
Total Capital Cost	\$7,377,000	--	--	\$3,002,600	\$ 277,000	--
Present Worth	\$7,377,000	--	--	\$ 936,000 ^c	\$3,177,000	\$9,618,000

NOTE: For future replacement costs or salvage values, double dashes indicate no cost is applicable. Annual operation and maintenance and present worth costs are not itemized, as indicated by double dashes.

^aSee Map 6.

^bBased upon a 20-year analysis period and a 6 percent interest rate.

^cSubtracted in calculating total present worth.

Source: Applied Technologies, Inc. and SEWRPC.

(This page intentionally left blank)

Appendix D

PUBLIC HEARING RECORD

(This page intentionally left blank)

MINUTES FROM THE PUBLIC HEARING
REGARDING THE
VILLAGE OF BIG BEND'S
SEWER SERVICE AREA

Wednesday, November 4, 2009

President Soneberg called the Hearing to order at 6:35 pm. The meeting was held at the Big Bend-Vernon Fire Station #3, located at W233 S7475 Woodland Lane.

The meeting was conducted by Bill Stauber and Mike Hahn from SEWRPC, as well as the Village Engineer, Jim Smith. All the Village Trustees as well as most of the Plan Commission members were in attendance. Also in attendance were residents and business owners from the Village, Town of Vernon and Town of Waukesha.

After Engineer Smith introduced Mr. Stauber and Mr. Hahn, he gave a brief history of the project. The first feasibility study for the project was conducted in 2001. The Waste Water Facilities Plan was prepared in 2005. In 2007 the DNR and SEWRPC concurred with the Plan. In 2009, the Sanitary Sewer Service Area Plan was prepared by SEWRPC. Three alternatives were provided and SEWRPC determined that the 1st option, the gravity flow to our own plant, was the most cost effective plan. The next steps will be for the DNR to approve the plan, design the facility, and find funding for the TID district. This should be done in 2010. Construction can start in 2011, with operation at the end of 2011 or beginning of 2012.

Engineer Smith went on to explain that this project will be done in phases. In the first phase, no residents will be forced to hook up. If any residents want to, they can. The first phase is for the proposed businesses in the interchange area of I-43 and Hwy 164. The flow is predicted to be 100,000 gallons a day with a capital cost for the project to be between 5 & 6 million dollars.

The implementation of the project will be paid by the developers in the TID district. In a TID, there is no impact on the residents tax bill. The users of the TID pay all the costs.

At this point, Mr. Stauber took over the meeting and went through the map of the purposed service area. The area is the entire Village of Big Bend with a small amount of residences in the Town of Vernon. The total area in the plan is 3.7 miles. Three miles are in the Village and .7 miles is in the Town of Vernon. It could affect about 500 homes in the Village and 140 in the Town. He identified the outer areas that may be serviced at some time in the future, as well as the wet lands.

Mr. Hahn then spoke to the group about the cost effectiveness and how SEWRPC had made it decision on which alternative to choose. He said that we don't need to build the

plant to full capacity right away. We can add more capacity later. Also with a gravity feed system it eliminated the need for a lot of pump stations. We would only need one station.

Question and Answers;

- Wendy Tipton of the Town of Vernon.
She wanted to know if she was in the service area and if she was going to have to hook up. **President Soneberg said that she was not in the area and even if she was she would have to annex into the Village before she would be able to hook up.**
- Len Creston of the Town of Vernon.
He wanted to know the difference between a Planned Sanitary Service Area and a Sewer District and would the hook up strictly be for Village residents. **Yes, he would have to be in the Village before hooking up.**
- Judy Dorava, W228 S8730 Cherry St, Big Bend.
How big will the plant be? **Engineer Smith said that it would be couple of acres.** What is the cost of the plant? **One to 1 ½ million dollars.** Will there be an odor? **No, the discharge into the river will be cleaner water then what is in there now.** When you put water into the river will there be any solids? **No.** Where do the solids go? **The solids are recycled into fertilizer for farm fields.** Will this be done in the plant? **Yes.**
- Jim Hammes, Town of Waukesha.
Why would we take into consideration going from Townline Rd to Sunset? It should be part of the overall analysis to let people along Hwy 164 hook up. He thinks that these factors should be touched upon. **Engineer Smith said that it would be twice as costly to run a pipe from the Interchange area to Sunset.** Did we consider extending a force main along Hwy 164 corridor? Don't we think we should look at those considerations since no one in the Village is being required to hook up? Doesn't the present regulation require residence to hook up after one year? **President Soneberg said not unless a resident asks to.**
- Mark Strelow, S88 W22530 Willow Ct, Big Bend.
If eventually the residents need to hook up, what will be the cost? **Engineer Smith and Mr. Hahn said that it would depend on how far the house is from the lateral.** He thinks that the first option is the best.

President Soneberg said that we are looking to sewer down Hwy L at this time. The goal is to get the businesses at the interchange area. We are not going to force the residents to hook up.

- Terri Long, S88 W22905 Park Ave, Big Bend.
In these slow economic times, she doesn't see anything happening in that area in the next 5 years. Why do we need this and at what cost and benefit to residents? **Engineer Smith said that there will be no cost to the residents. The developers in the TID will be paying the costs. President Soneberg said that the Village will get in writing commitments from the developers before starting the project.** With the TIF Law, does the Village get paid first or the State? **President Soneberg said that the Village will still get its tax money from the businesses in the TID. Any growth in the TID will go to pay off the debt.** Why do we need them now? **President Soneberg said that to move forward we need to approve the Sewer Service Area Plan.** She doesn't want to pay anymore taxes. Why do we need to put it in now? **President Soneberg said that the residents will not be paying anymore taxes, that the developers in the TID will be paying for it.**
- Jerome Washicheck, S90 W22785 Milwaukee Ave, Big Bend
How is this going to impact the face of the park? **President Soneberg said that the plant would be located north of the ball diamond.**
- Scott Hein, W232 S8775 Edgewood Ct, Big Bend.
Say you get this built and the economy crumbles, who will pay for it? **President Soneberg said that it would go back to the taxpayers in the TID area. We want to find stable businesses for the area.** What about the smell? A pump station is refilling mode smells. **Engineer Smith said that we can put in an odor control system. We have addressed that problem.**
- John Mattick, W226 S9075 Marianne Ave, Big Bend.
He feels that the greater concern is if there should be an area at all. This is a monumental issue for the Village. It could be very costly. He is not in favor of option #1. We are losing water from the aquifer by pulling it out and discharging it into the river. This will drain our wells. His biggest concern is what this do to his tax bill if the 6 million dollar infrastructures take place? What would the cost of just putting in the pipe be? In his opinion, we should not try to draw big box development. It is already over saturated.
- Howard Strickler, S82 W23480 Artesian Ave, Big Bend.
Is it fair to say that the area around the I-43 & Moreland Interchange is comparable?
- Angie VanScyoc, Town of Waukesha/Plan Commissioner
If we are looking to develop along Hwy 164, why can't we go to Waukesha and then service the Town of Waukesha along Hwy 164? Why hasn't the Town of

Waukesha been approached? Why do you want to build a plant when there is one in Waukesha? We are in between and willing to help pay the costs. **President Soneberg said that Waukesha does not want to service us past the I-43. If the rest of the Village needed to hooked up, there would be no place to hook to.**

- Francis Stadler, W232 S8745 Edgewood Ct, Big Bend.
If we have our own plant we can set our own rates. Waukesha's rate can keep going up.
- Tekla Fingland, W230 S8075 Big Bend Dr, Big Bend.
She has an environmental focus. Lot of people live here because of the open spaces. Giving services to people on top of the hill can cause problems for people at the bottom. Will the acreage taken from the park for the plant be replaced? She has a problem letting her son play in a park next to a sewer plant. Show me how taxes will go down with development. There are reasons we all enjoy living in the present environment. Think long and hard.
- Earl Joslyn, W232 S8750 Bronk Dr, Big Bend.
He does not want to pay more taxes. The water table and purity is not there anymore. He will live three blocks from the plant and doesn't want to smell it in the summer. Why don't we go to Waukesha?
- Mark Strelow, S88 W22530 Willow Ct, Big Bend.
We may have to cow down to Waukesha in the future. If the project is done right, the environmental impact should be minimal. We may be passing up an opportunity to lower taxes.

The public comments will be left open until November 23rd. Any written comments can be dropped off at the Village Hall.

- Someone from Ruckert/Mielke, representing the Village of Mukwonago said that the Town had comments but they were unable to attend. They would submit their comment in writing.
- Richard Waldherr, W231 S8580 Villa Dr, Big Bend.
There has been lots of talk regarding the environment. It doesn't seem that any disturbance would be irreversible or catastrophic. It seems like the only real disturbance would be to put the pipe from the plant to the river. Waukesha discharges directly into the river. It is encouraging to see some progress and that the Village is moving forward. It is long over due. Will there be something saying we won't have to hook up? **President Soneberg said that the Village will make that a written policy.** What is the prudent course of action?

President Soneberg said that if we don't have the businesses lined up, we won't go forward.

- Deborah Waldherr, W231 S8580 Villa Dr, Big Bend.
Waukesha will only go as far as the interchange. If we don't have an option to hook up, what would be the cost? We can't look at just today. We have to look at the long term picture.
- Len Creston of the Town of Vernon.
What is the cost of putting sewer main in per foot? Engineer Smith thought it would be about \$50 to \$80 per ft and about \$3,000 to connect to the lateral.
- John Quilla, Big Bend.
Are all the rules the same for the developers or can some get away with more? Is it standard? **Mr. Hahn said that it depends on the Community. They set the rules through their zoning.**
- Howard Strickler, S82 W23480 Artesian Ave, Big Bend.
Did SEWPRC ask for the number of systems that had failed in the Village? **Engineer Smith said that right now if a system fails they will probably have to put in a mound and in some cases the lots aren't even big enough for that.**
- John Mattick, W226 S9075 Marianne Ave, Big Bend.
The purpose of this public hearing is hear comments on the Sanitary Service Area. The public hearing was to determine the shape of the area. **Mr. Hahn said that it was irrelative to talk about pipes and plants at this hearing. Engineer Smith said that there will be more public hearings to discuss the Facilities Plan and the Sewer Service Area.** What does this approval process allow the Village to do? **Engineer Smith said that it allows the Village to move forward.**
- Dave Craig, S88 W22540 Willow Ct, Big Bend.
The Hwy 164 construction coming through the Village may impact 1 or 2 leach fields. Is the State going to pay for fixing them? **President Soneberg said that the State will pay to have those people hooked into the sewer.** There are a number of ratios to be met with this project. Do we know if all of them have been met with this district? In your experience, have you heard of some TID's failing? I am hesitant to move forward with established companies failing. I have yet to find data that community growth will cause tax relief.

- Tom Ludwick, Engineer for the Town of Vernon.
The Town of Vernon has no public comment at this time.
- Dave Craig, S88 W22540 Willow Ct, Big Bend.
The approval for this is on the Thursday Board agenda. The Village may want to wait until all public comments are in before approving this. **President Soneberg said that he will recommend that the Board table this.**

At this point, a letter from Waukesha County Park and Planning was read into the minutes. The letter is attached.

Adjournment was then called for.

--Motion made by Trustee Peterson seconded by Trustee Treichel to adjourn the public hearing for the Sewer Service Area Plan. Motion carried. Public Hearing adjourned at 8:30 pm.

Respectfully submitted:

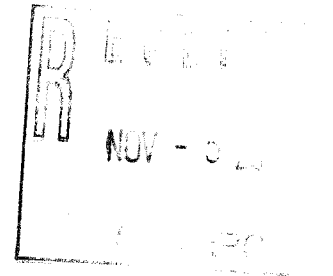
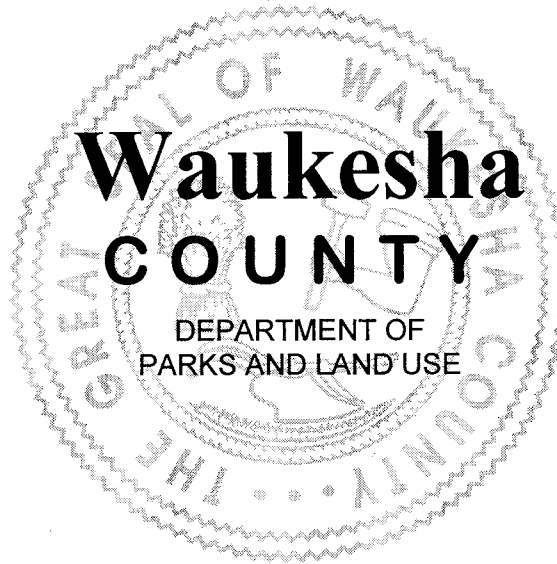
Barbara Woppert
Clerk for the Village of Big Bend

Public Hearing
Sanitary Sewer Service Area Plan
Village of Big Bend
November 4, 2009

Name	City/Village/Town
Judith DORAVN	Big Bend
JAMES HANMER	Town of Waukesha
Doug Brown	Big Bend
Richard + Deb Waldherr	Big Bend
Jim BODENDORFER	BIG BEND
Bob Tallinger	Town of Waukesha
Haen Schnaple	Big Bend
Sam & Lini Hoy	BIG BEND
Bill & Leah Dickau	Big Bend
Harold Stotler	Big Bend
Francis Stadler	Big Bend
Pat Heideman	Big Bend
Brian PATT	Vernon
Ed Bushman	Big Bend
Al E. VanSlyke	Town of Waukesha
Raymond Torgerson	Town of Waukesha
Leonard Kleson	Town of Vernon
STEVE MCKELSON	BIG BEND
TOM LUDWIG	VERNON TOWN ENG. (FOTH)

**Public Hearing
Sanitary Sewer Service Area Plan
Village of Big Bend
November 4, 2009**

Name	City/Village/Town
Earl W. Loshon	Big Bend, WI
Randy [unclear]	Big Bend Wis
[unclear]	Big Bend WI
David Craig	Big Bend
Doug Nelson	Ruekert Mielke, Inc.
CARLY & Robert Redden	
SCOTT KEN	Big Bend
JOHN MATTICK	BIG BEND
Wendy Tipton	Town Vernon
Angela	Big Bend
Tekla Finland	Big Bend.



November 3, 2009

Village Board of Big Bend
P.O. Box 130
W230 S9185 Nevins Street
Big Bend, WI 53103

Southeastern Wisconsin Regional
Planning Commission
P.O. Box 1607
Waukesha, Wisconsin 53187-1607

Dear Village Board Members and Southeastern Wisconsin Regional Planning Commission Staff:

This letter responds to the proposed SEWRPC Community Assistance Planning Report No. 308, providing sanitary sewer service area for the Village of Big Bend and its Environs, received by this office on October 29, 2009. It is requested that this letter be made a part of the proposed public hearing minutes being held on November 4, 2009, at the Big Bend/Vernon Fire Station.

At the outset, we would like to indicate that we are pleased to see that the Village and the Town, along with the assistance of the SEWRPC Staff have cooperatively planned for future sewer service for the Village and its Environs. We hope this plan can move forward in order to provide said services to the areas outlined. However, we do have a few comments that we would like to make with respect to the Planning Document as follows:

1. In Chapter 2, under "Proposed Big Bend Sanitary Sewer Service Area", Page 9, reference is made to the refinement of the sewer service area, and documents which were identified to assist in the formulation of the plan. There is mention of the planned future land use indicated by the Village of Big Bend Comprehensive Plan, the Year 2035 Regional Land Use Plan, and road rights-of-way and real property boundaries. There is no mention or reference to the Comprehensive Development Plan for Waukesha County, adopted by the County in February 2009, nor is reference made to the Town of Vernon's Development Plan. We feel those documents need to be referenced. Some have indicated that the 2035 Regional Plan is the same as the Comprehensive Development Plan for Waukesha County. However, we differ with that outlook as the Comprehensive Development Plan for Waukesha County is considered to be a refinement of the Regional Land Use Plan for 2035 and therefore, it and the Town's Plan should be included to assist in the future planning for the sewer service areas in the Village and its Environs. It is also noted in the discussion on population, on Page 18 under "Basic Assumptions and Procedures" reference is made to the Comprehensive Development Plan for Waukesha County, which supports our suggestion that the Comprehensive Development Plan for Waukesha County should be mentioned.

2. There were three (3) alternatives identified on Pages 19 through 21 for provisions for the wastewater treatment system. However, we believe a fourth alternative may be appropriate to at least consider, that being the possible connection to the Waterford sewage facility, immediately down stream from the Town of Vernon and serving the Tichigan area. Although that may not be a cost effective or technical possibility, we believe there should be at least discussion about the fact that it exists and why it can't be used as an alternative in addition to the three (3) alternatives mentioned in the plan.
3. We did not recognize any discussion about the possibility of additional areas, whether annexed by the Village or remaining in the Township, which could be potentially served with sewer at some time in the future. We feel this should be discussed and what the possibilities are of providing sewer service to those additional attached or annexed areas to the sewer service planning area.
4. We would draw your specific attention to the areas in the west half of Sections 12 and 13 and in the SE ¼ and SW ¼ of Section 2 that we are aware of that have some high ground water table conditions which presently have on site waste disposal systems with some having mound systems, indicative of high ground water conditions. Because those areas are immediately adjacent, surrounded and in close proximity to the new sewer service boundaries, those areas could be included within the sewer service district in order to afford the opportunity in the future, if it was found to be necessary, to service said areas with municipal sewers.
5. We note that the planned service area deviates somewhat from the Comprehensive Development Plan for Waukesha County with respect to the northeast portions of Section 2. The Comprehensive Development Plan for Waukesha County indicates those areas are to remain in very low densities (one dwelling unit per five acres) yet the sewer service planning area includes them for potential service in the future. We feel this conflicts with the Comprehensive Development Plan for Waukesha County and should be addressed further.

This concludes our remarks regarding the new sewer service planning area for the Village of Big Bend and its Environs and we appreciate the opportunity to be heard.

Respectfully submitted,

Richard L. Mace / RLM

Richard L. Mace
Planning and Zoning Division Manager

RLM:kab

cc: Dale Shaver, Director, Waukesha County Dept. of Parks and Land Use
Town of Vernon Clerk
Village of Big Bend Clerk
File

Bobbi Woppert

From: Brickman, Mark @ Milwaukee [Mark.Brickman@cbre.com]
Sent: Thursday, November 05, 2009 11:02 AM
To: clerk@villageofbigbend.com
Subject: FW: New sanitary sewer service for Big Bend, WI

Please pass this along to Jamie.

Thanks

From: Brickman, Mark @ Milwaukee
Sent: Thursday, November 05, 2009 10:51 AM
To: 'WSTAUBER@SEWRPC.org'
Cc: 'jjsmith@ati-ae.com'; 'jsonenberg@wi.rr.com'
Subject: New sanitary sewer service for Big Bend, WI

Good morning

I am the managing partner for two entities that own parcels of commercially zoned land in Big Bend.

One parcel, consisting of approximately 53 acres is at the SW corner of Highways 164 & ES. The other parcel consisting of approximately 8 acres is at the NW corner of 164 & ES.

It's our understanding that a public hearing was held on November 4, 2009 for the purpose of receiving public comment on the proposed sewer project. We were not notified of the hearing until today and therefore did not attend, but it's my understanding that you are welcoming written comments such as this.

We are strongly in favor of the proposed project. The area to be served has great potential for development, which has been stifled by the lack of sewer and water service. We're quite confident that having those utilities available to our properties will stimulate interest from potential users and result in significant commercial development which will add to the tax base of the Village of Big Bend and provide much needed services to the citizens of Big Bend as well as the greater trade area.

Please notify us of any future hearings or meetings on the subject that are open to the public. We will be pleased to attend.

**S83W22770 Martin Street
Town of Vernon, Wisconsin**

November 10, 2009

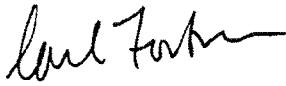
Village of Big Bend
President & Village Board
W230 S9185 Nevins St.
Big Bend, WI 53103

Re: Sanitary Sewer Service Area

To: Village of Big Bend President & Village Board

Please remove our home located at **S83W22770 Martin Street**, Town of Vernon, Wisconsin from the Sanitary Sewer Service Area.

Thank you.



Carl Fortner



Patti Fortner

Cc: Southeastern Wisconsin Regional Planning Commission

RECEIVED
R 11-11-09

11-10-09

Dear Village Board et al.

I would like you to explore the town of Waukesha's suggestion of running a sewer line from Waukesha to the 164-743 intersection.

That intersection seems to be the impetus for sewer service. It was stated sewers were not needed in the Village proper, so why do it?

Judith Blarman

Just a note...

Town of Vernon
Big Bend SSSA Amendment
Public Comment Form
November 18, 2009 Open House

The Town Board is providing you this opportunity to give feedback to the Southeastern Wisconsin Regional Planning Commission (SEWRPC) regarding the Village of Big Bend's proposed Sanitary Sewer Service Area creation as reported in SEWRPC Planning Report No. 308. The proposed SSSA includes lands currently in the Town of Vernon as depicted on the map discussed at the Vernon open house meeting. If you have concerns about your property being included in the proposed SSSA and would like to get your feedback on the written record, please fill out the form below and either submit the form at the open house or mail/deliver to the Town Clerk, so that we may transmit all the comments to the SEWRPC by the deadline of November 23, 2009.

~~~~~

Name: Jill Brandemuehl Date: 11-18-09

Mailing  
Address: W229 S. 9325 River Side DR

Please provide your feedback. Attach additional pages if necessary.

water level on River  
Reinforcing our shore lower  
Alarm on Bridge for high water level  
notifying waterford Bridge control

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

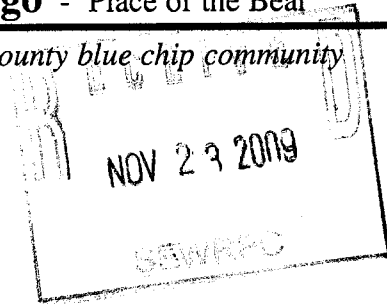
Thank you for your interest and participation!



## Mukwonago - Place of the Bear

*a Waukesha County blue chip community*

**Village of Mukwonago**



November 19, 2009

Mr. William J. Stauber  
Chief Land Use Planner  
Southeastern Wisconsin Regional Planning Commission  
P.O. Box 1607  
Waukesha, WI 53187-1607

RE: Preliminary Draft Big Bend Sanitary Sewer Service Area  
Community Report No. 308

Dear Mr. Stauber:

The Village of Mukwonago agrees with the findings of the preliminary draft of the above report, and further agrees that implementation of these findings would help obtain the goals of the Regional Water Quality Management Plan. As such, the Village of Mukwonago does not object to the proposed Big Bend Sewer Service Area and Treatment Facility.

Rather, the Village of Mukwonago seeks to enter into discussions with the Village of Big Bend and Town of Vernon to discuss long term sewer service area planning to support each community's Comprehensive Planning efforts. The goal of such discussions would be to assure that each community is cost-effectively planning for the future. We hope the Village of Big Bend and Town of Vernon will work with us to this mutually beneficial goal.

Thank you for considering the Village of Mukwonago's concerns. We look forward to working with you to shape the growth of this portion of the Southeastern Wisconsin Region.

Very truly yours,

VILLAGE OF MUKWONAGO

James Wagner, Village President

Cc: Frederic J. Michalek, Town of Vernon  
James S. Soneberg, Village of Big Bend  
Paul Moderacki, Administrator/Clerk-Treasurer  
Kurt Peot, Village Engineer, Ruekert & Mielke  
file

# **WESTERN RACINE COUNTY SEWERAGE DISTRICT**

**A METROPOLITAN SYSTEM**

P. O. BOX 177 \* Rochester , Wisconsin 53167 \* ( 262 ) 534-6237

November 20, 2009

Mr. James Soneberg  
President  
Village of Big Bend  
W230 S9185 Nevins Road  
Big Bend, WI 53103

Subject: Sanitary Sewer Service for the Village of Big Bend

Dear Mr. Soneberg:

We have been requested by Mr. James Smith of Applied Technologies to respond to comments from Waukesha County on the possibility of connecting the Village of Big Bend to the Western Racine County Sewerage District (WRCSD).

Mr. Smith has appraised the District of a number of technical, legal and financial studies that might have to be performed by WRCSD. We would need to discuss who will pay those costs.

Some of the major conflicts the District views with this issue, are:

1) the only place to connect a force main from Big Bend would be to the District's 36" gravity interceptor, which begins south of County Highway D, along County Highway J and/or the former River Road as it passes alongside Case Eagle Park - OR - at our plant entrance location at STH 36 and River Road. Any location to the north of County Highway D would result in replacement of WRCSD interceptor pipe, because of inadequate size, and replacement of our major lift station. Any other connection point could also impact our municipal customers by them having to replace part or all of their collection systems. We realize the locations mentioned would require a rather lengthy force main, the cost of which could be very prohibitive;

RECEIVED  
11-23-09

2) we should caution that a hydrogen sulfide removal system would have to be installed with this force main because of the long detention times in a force main from Big Bend. Hydrogen sulfide is a very dangerous gas that can be emitted at the discharge of long force mains, and also causes severe corrosion in downstream sewers and manholes;

3) WRCSD charges an annexation fee for properties annexed to the District, which at present is \$ 2,750 per each residential equivalent unit, or REU. We are not sure how this would impact the project. That would be a legal issue;

Western Racine County Sewerage District is not against a Big Bend connection, in fact, we welcome it. However, we feel there needs to be additional analyses and investigations made before this project moves from the planning stage, to the agreement stage and then to the construction stage

If you have any questions or would like to discuss this matter further, please contact us, at 262 534 6237.

Sincerely,

A handwritten signature in cursive script, appearing to read "Lynn Tamblyn".

Western Racine County Sewerage District  
Mr Lynn Tamblyn, Secretary



November 23, 2009

Southeastern Wisconsin Regional Planning Commission  
Attn: Kenneth R. Yunker  
P.O. Box 1607  
Waukesha, WI 53187-1607

RE: Sanitary Sewer Service Area for the Village of Big Bend and Environs  
(Community Assistance Planning Report Number 308)

Dear Mr. Yunker:

The City of Muskego has reviewed the Preliminary Draft Report titled "Sanitary Sewer Service Area for the Village of Big Bend and Environs".

In reviewing this report, it appears that certain alternatives were not explored that may in fact best serve the overall sanitary service planning area. One such alternative would be the expansion and connection of Big Bend to the Milwaukee Metropolitan Sewerage District. This would most likely be completed through connections to the City of Muskego sanitary conveyance system. This alternative would of course require the MMSD and the City of Muskego to agree and for capacity to be studied, but it seems to be a very viable alternative. It in fact appears that a gravity line to existing City of Muskego facilities could service much of the current study area.

Should this study yield that a treatment plant is in fact the best alternative, it should be considered that a portion of the City of Muskego might in fact benefit from the extension of the sanitary planning area into the City of Muskego. This could benefit future land development to the west of the current ultimate service boundary within Muskego.

I feel that these alternatives must be explored as part of this planning report in order to ensure proper planning alternatives are presented so that the best decision can be made.

Please feel free to contact should you have any questions or comments regarding this matter.

Thank you,  
City of Muskego

John R. Johnson  
Mayor

cc: Big Bend, Village President, James Soneberg, W230 S9185 Nevins St, Big Bend, WI 53103

W182 S8200 Racine Avenue • Box 749 • Muskego, Wisconsin 53150-0749 • Fax (262) 679-4106