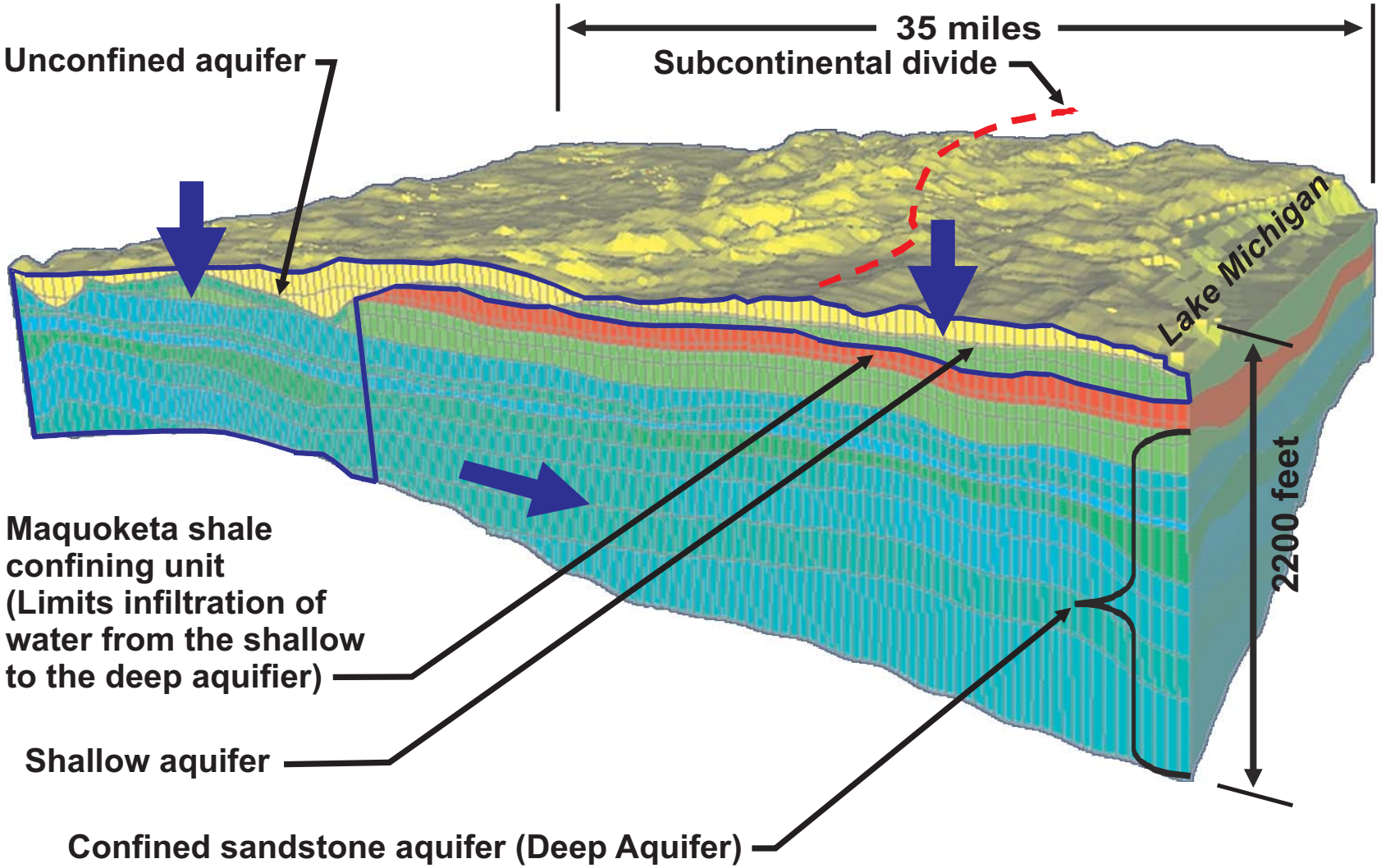
Background

General Hydrogeology of Southeast Wisconsin



Private residential wells are generally in the shallow aquifer and 100 to 300 feet deep. Most municipal wells are 200 to 800 feet deep with some up to 2,200 feet deep, and are in both the shallow and deep aquifer.

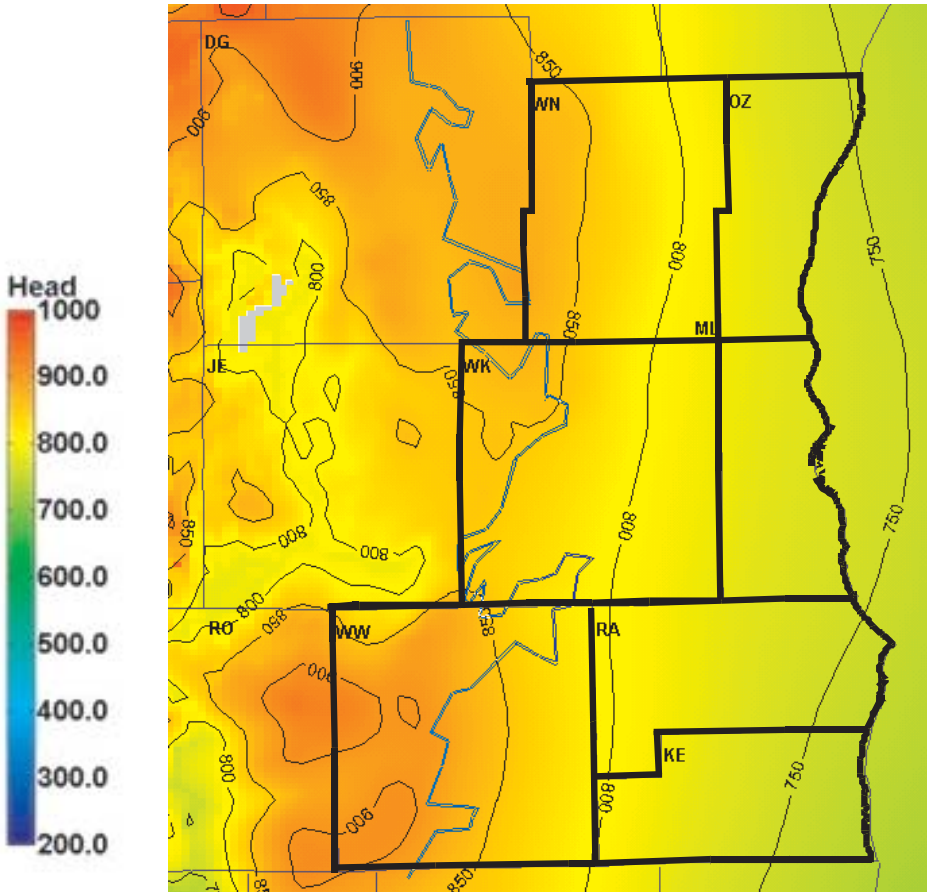
Source: USGS.

Background

State of Wisconsin 2003 Wisconsin Act 310 Groundwater Management Area (Area including and surrounding Brown and Waukesha Counties consisting of the entire City, Village, and Town where the groundwater level has been reduced by 150' or more)

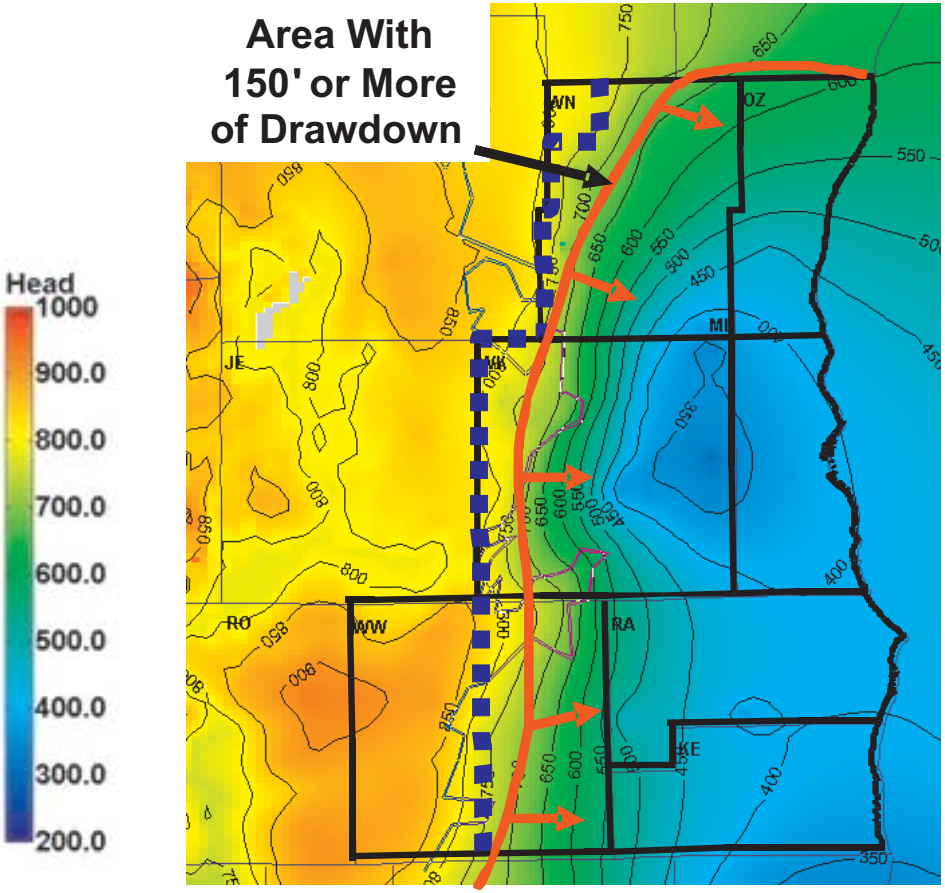
Deep Sandstone Aquifer Drawdown

Pre-1864



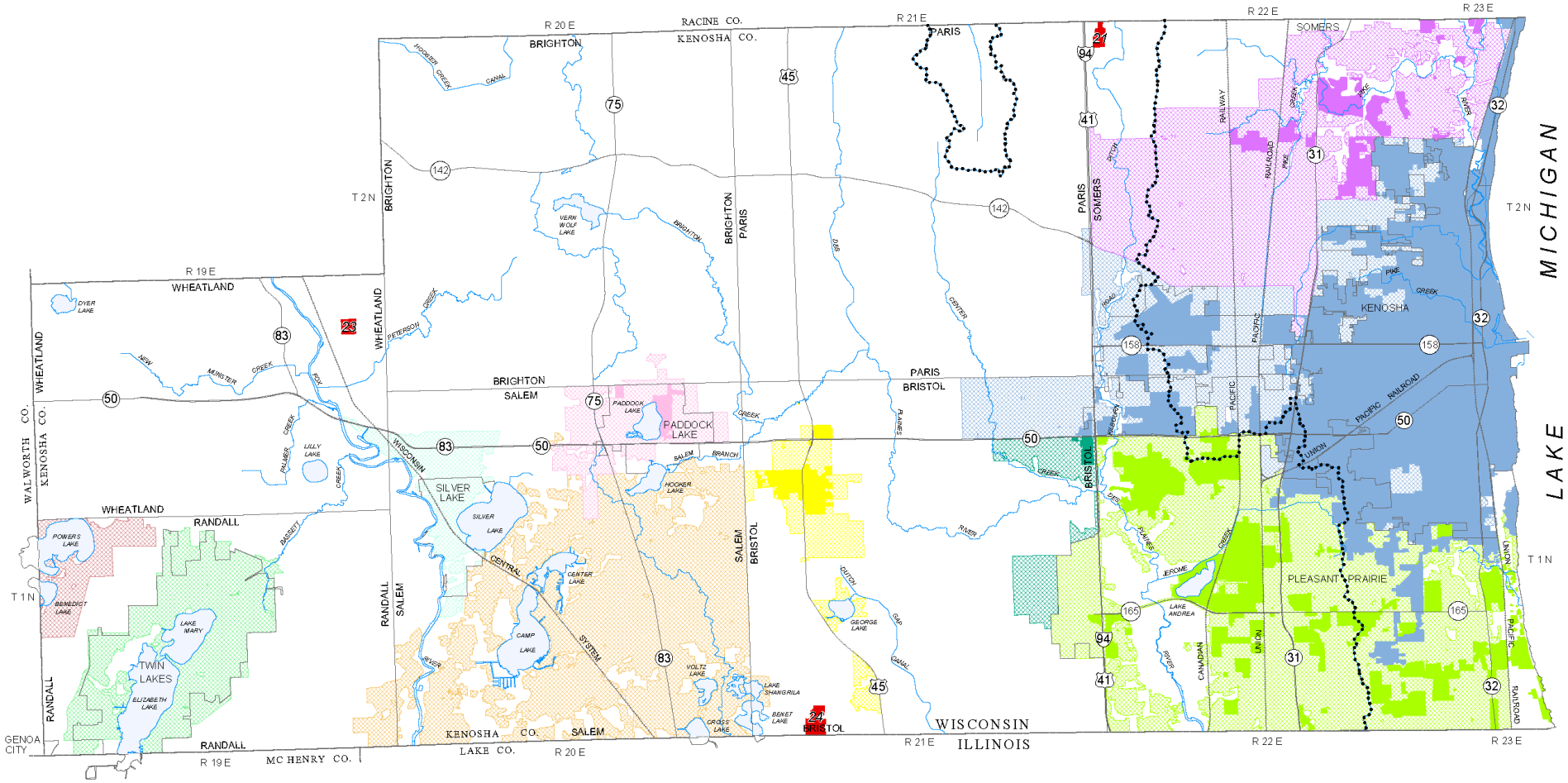
Water Levels in the Sandstone Aquifer (feet above sea level)

2000



Water Levels in the Sandstone Aquifer (feet above sea level)

PROJECTED AREAS SERVED BY MUNICIPAL AND OTHER THAN MUNICIPAL, COMMUNITY WATER SUPPLY SYSTEMS IN KENOSHA COUNTY: 2035



SURFACE WATER-SUPPLIED SYSTEMS IN 2005

2005	2035	
		KENOSHA WATER UTILITY SERVICE AREA
		PLEASANT PRAIRIE WATER UTILITY SERVICE AREA
		TOWN OF SOMERS WATER UTILITY SERVICE AREA
		TOWN OF BRISTOL UTILITY DISTRICT 3
		SUBCONTINENTAL DIVIDE

GROUNDWATER-SUPPLIED SYSTEMS IN 2005-FUTURE RECOMMENDED SOURCES OF SUPPLY ARE NOT YET ESTABLISHED

2005	2035	
		PADDOCK LAKE MUNICIPAL WATER UTILITY SERVICE AREA
		TOWN OF BRISTOL UTILITY DISTRICT 1

NEW WATER SUPPLY SYSTEMS- FUTURE RECOMMENDED SOURCES OF SUPPLY ARE NOT YET ESTABLISHED

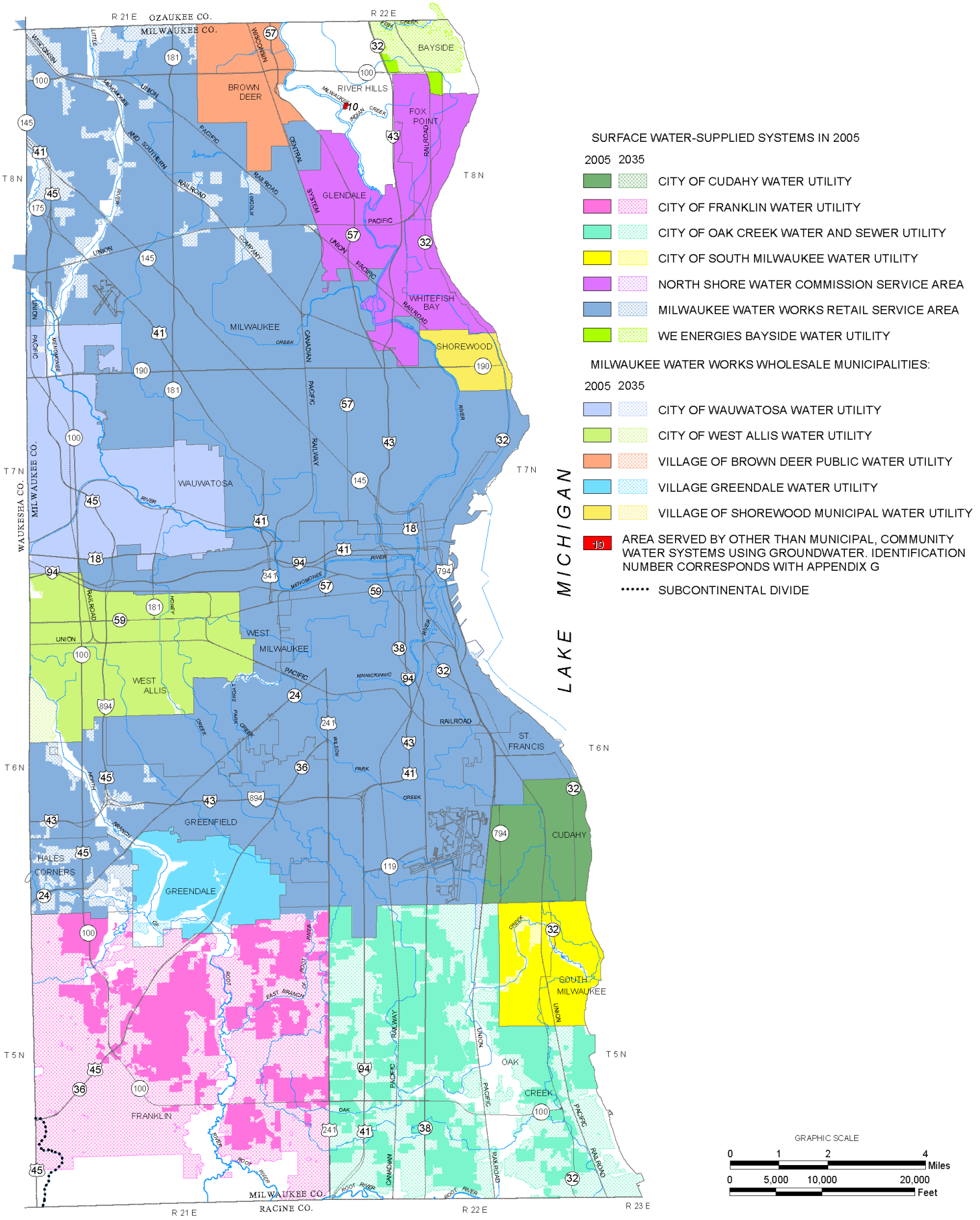
2035	
	POWERS-BENEDICT-TOMBEAU LAKES AREA
	TOWN OF SALEM
	VILLAGE OF SILVER LAKE
	VILLAGE OF TWIN LAKES

23 AREA SERVED BY OTHER THAN MUNICIPAL, COMMUNITY WATER SYSTEMS USING GROUNDWATER. IDENTIFICATION NUMBER CORRESPONDS WITH APPENDIX G

GRAPHIC SCALE
0 1 2 4 Miles
0 5,000 10,000 20,000 Feet

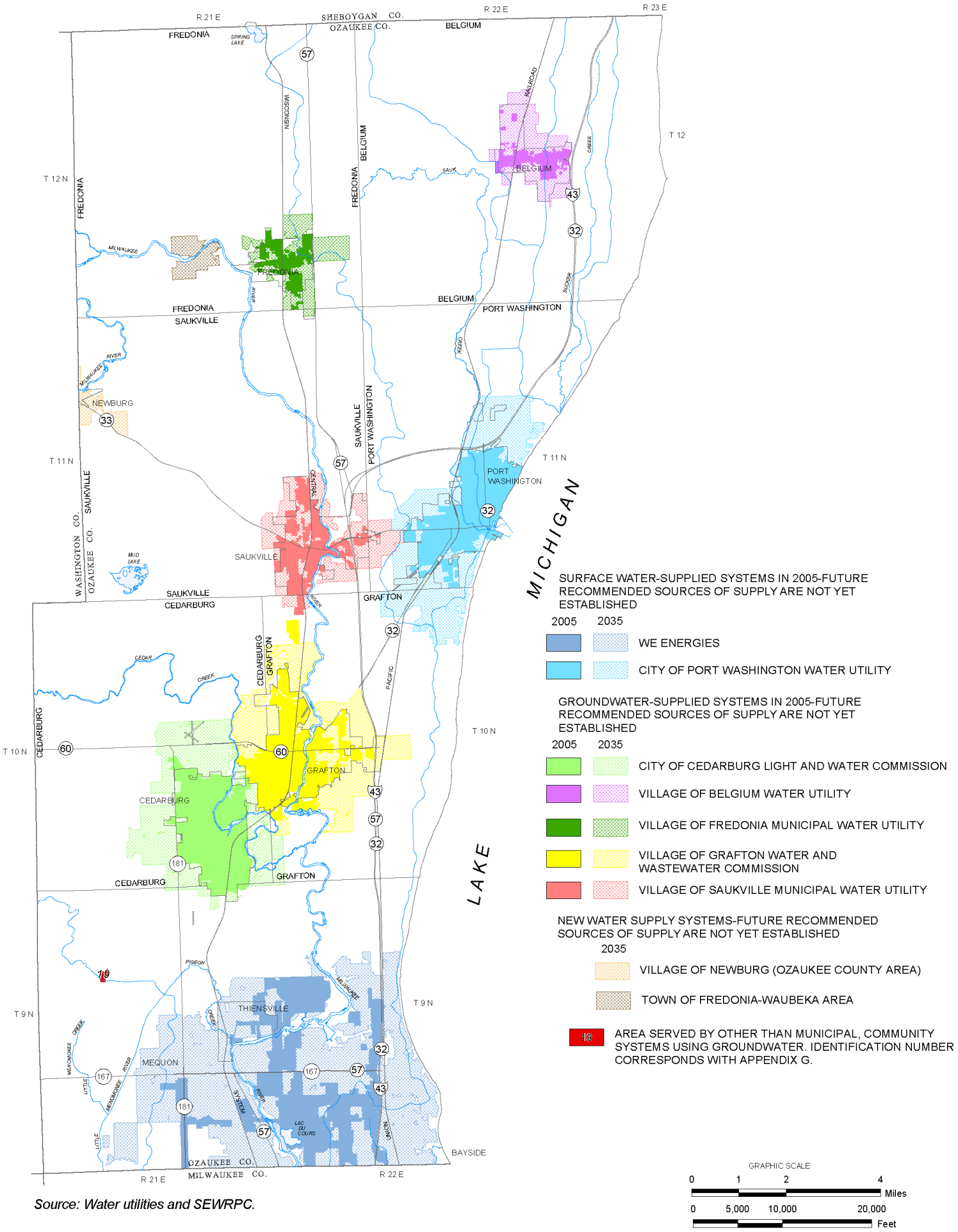
Source: Water utilities and SEWRPC.

PROJECTED AREAS SERVED BY MUNICIPAL AND OTHER THAN MUNICIPAL, COMMUNITY WATER SUPPLY SYSTEMS IN MILWAUKEE COUNTY: 2035



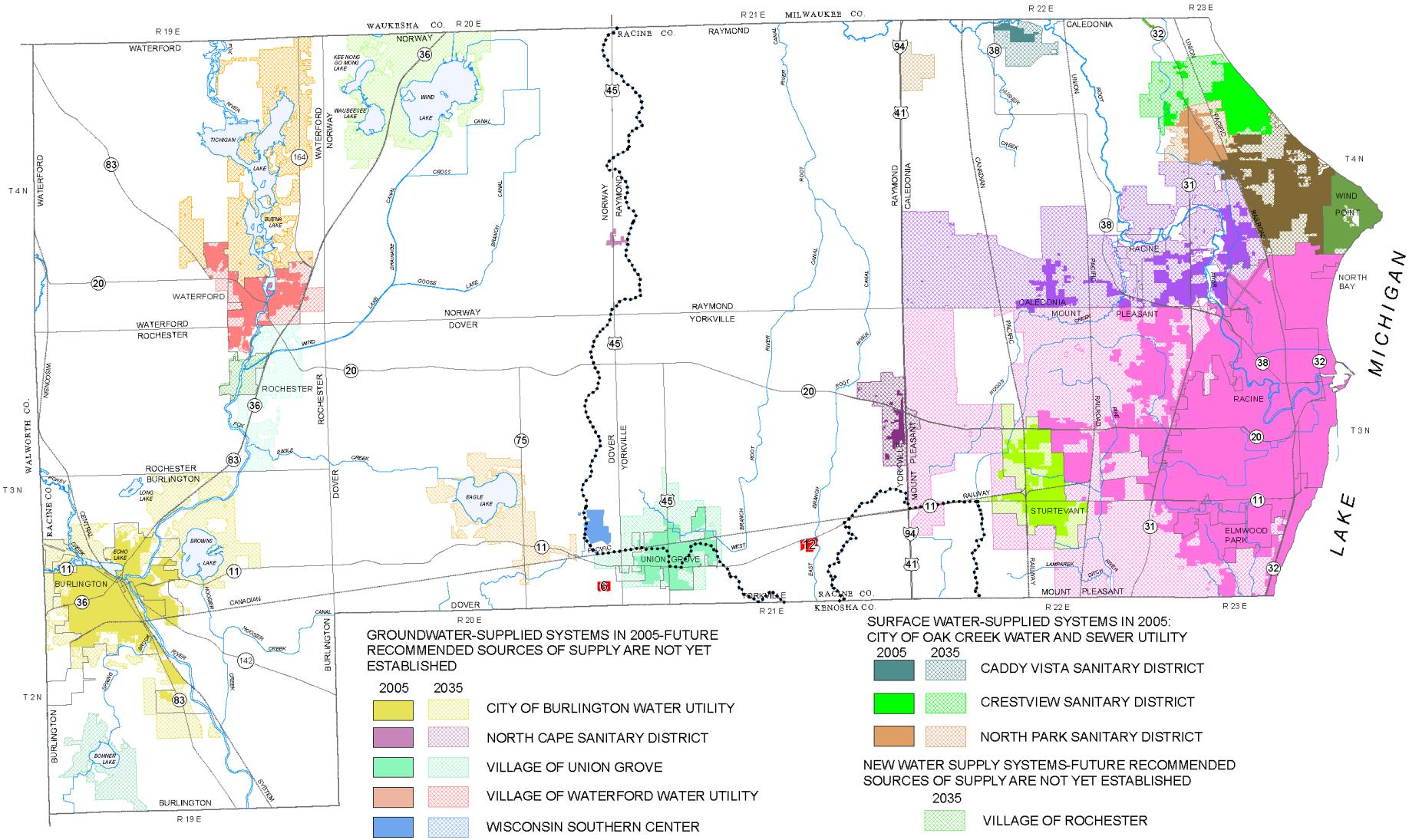
Source: Water utilities and SEWRPC.

PROJECTED AREAS SERVED BY MUNICIPAL AND OTHER THAN MUNICIPAL, COMMUNITY WATER SUPPLY SYSTEMS IN OZAUKEE COUNTY: 2035



Source: Water utilities and SEWRPC.

PROJECTED AREAS SERVED BY MUNICIPAL AND OTHER THAN MUNICIPAL, COMMUNITY WATER SUPPLY SYSTEMS IN RACINE COUNTY: 2035



GROUNDWATER-SUPPLIED SYSTEMS IN 2005-FUTURE RECOMMENDED SOURCES OF SUPPLY ARE NOT YET ESTABLISHED

2005	2035	
		CITY OF BURLINGTON WATER UTILITY
		NORTH CAPE SANITARY DISTRICT
		VILLAGE OF UNION GROVE
		VILLAGE OF WATERFORD WATER UTILITY
		WISCONSIN SOUTHERN CENTER
		YORKVILLE UTILITY DISTRICT NO. 1

SURFACE WATER-SUPPLIED SYSTEMS IN 2005: CITY OF RACINE WATER AND WASTEWATER UTILITY

2005	2035	
		CALEDONIA UTILITY DISTRICT NO. 1
		CITY OF RACINE WATER AND WASTEWATER UTILITY
		NORTH PARK SANITARY DISTRICT
		STURTEVANT WATER AND SEWER UTILITY
		VILLAGE OF WIND POINT MUNICIPAL WATER UTILITY

SURFACE WATER-SUPPLIED SYSTEMS IN 2005: CITY OF OAK CREEK WATER AND SEWER UTILITY

2005	2035	
		CADDY VISTA SANITARY DISTRICT
		CRESTVIEW SANITARY DISTRICT
		NORTH PARK SANITARY DISTRICT

NEW WATER SUPPLY SYSTEMS-FUTURE RECOMMENDED SOURCES OF SUPPLY ARE NOT YET ESTABLISHED

2035	
	VILLAGE OF ROCHESTER
	TOWN OF BURLINGTON-BOHNER LAKE AREA
	TOWN OF CALEDONIA AREA
	TOWN OF DOVER-EAGLE LAKE AREA
	TOWN OF NORWAY AREA
	TOWN OF ROCHESTER AREA
	TOWN OF WATERFORD AREA

SUBCONTINENTAL DIVIDE

23 AREA SERVED BY OTHER THAN MUNICIPAL, COMMUNITY SYSTEMS USING GROUNDWATER. IDENTIFICATION NUMBER CORRESPONDS WITH APPENDIX G.

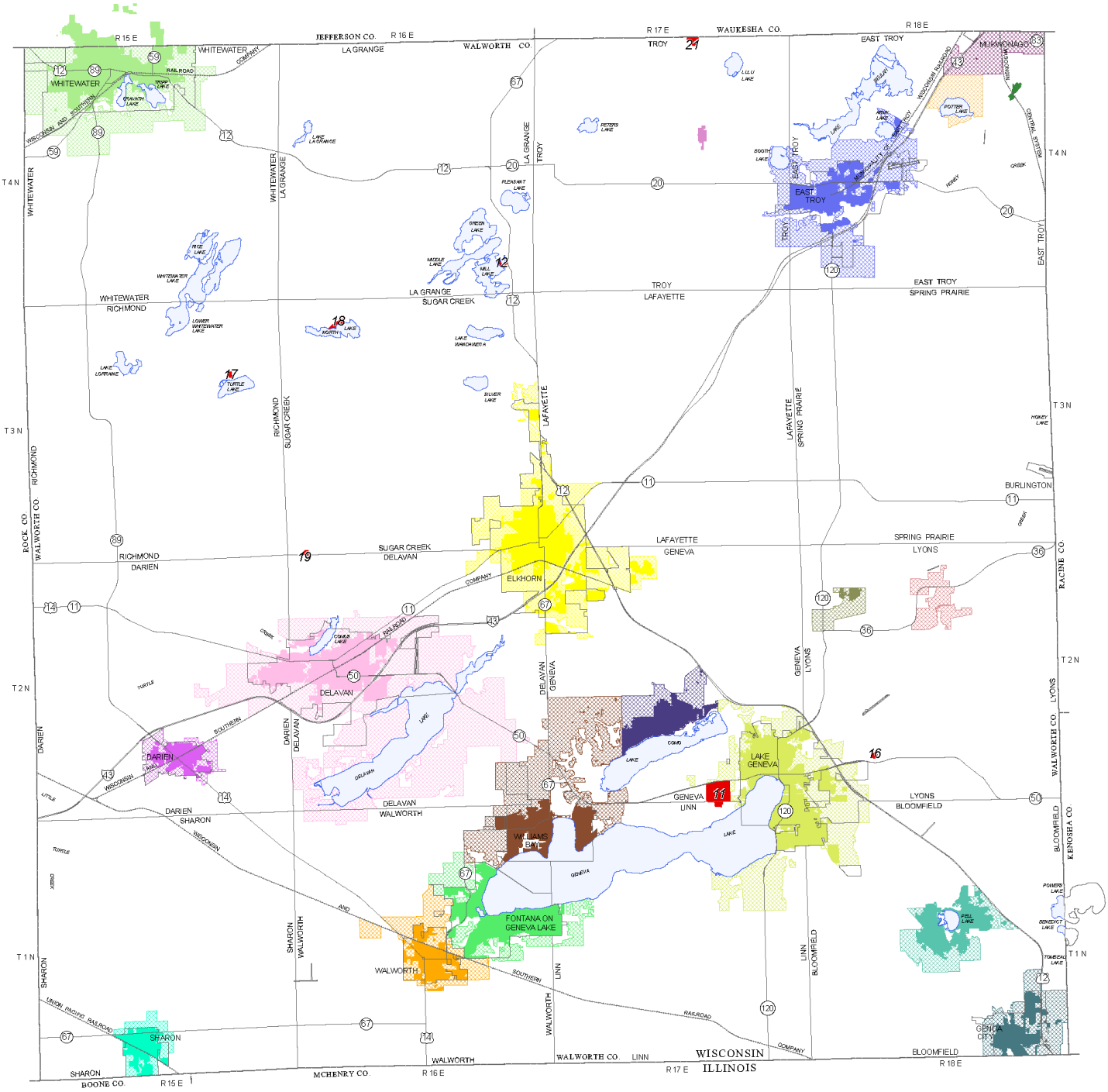
GRAPHIC SCALE

0 1 2 4 Miles

0 5,000 10,000 20,000 Feet

Source: Water utilities and SEWRPC.

PROJECTED AREAS SERVED BY MUNICIPAL AND OTHER THAN MUNICIPAL, COMMUNITY WATER SUPPLY SYSTEMS IN WALWORTH COUNY: 2035



GROUNDWATER-SUPPLIED SYSTEMS IN 2005

2005	2035	
		COUNTRY ESTATES SANITARY DISTRICT
		DARIEN WATER WORKS AND SEWER SYSTEM
		DELAVAN WATER AND SEWERAGE COMMISSION
		ELKHORN LIGHT AND WATER
		FONTANA MUNICIPAL WATER UTILITY
		LAKE COMO SANITARY DISTRICT NO. 1
		LAKE GENEVA MUNICIPAL WATER UTILITY
		PELL LAKE SANITARY DISTRICT NO. 1
		SHARON WATERWORKS AND SEWER SYSTEM
		TOWN OF EAST TROY SANITARY DISTRICT NO. 3
		TROY SANITARY DISTRICT NO. 1
		VILLAGE OF EAST TROY MUNICIPAL WATER UTILITY
		VILLAGE OF GENOA CITY MUNICIPAL WATER UTILITY
		WALWORTH MUNICIPAL WATER AND SEWER UTILITY
		WHITEWATER MUNICIPAL WATER UTILITY
		WILLIAMS BAY MUNICIPAL WATER UTILITY
		MUKWONAGO MUNICIPAL WATER UTILITY

NEW SYSTEMS

- TOWN OF LYONS AREA
- TOWN OF EAST TROY, POTTER LAKE AREA

GRAPHIC SCALE

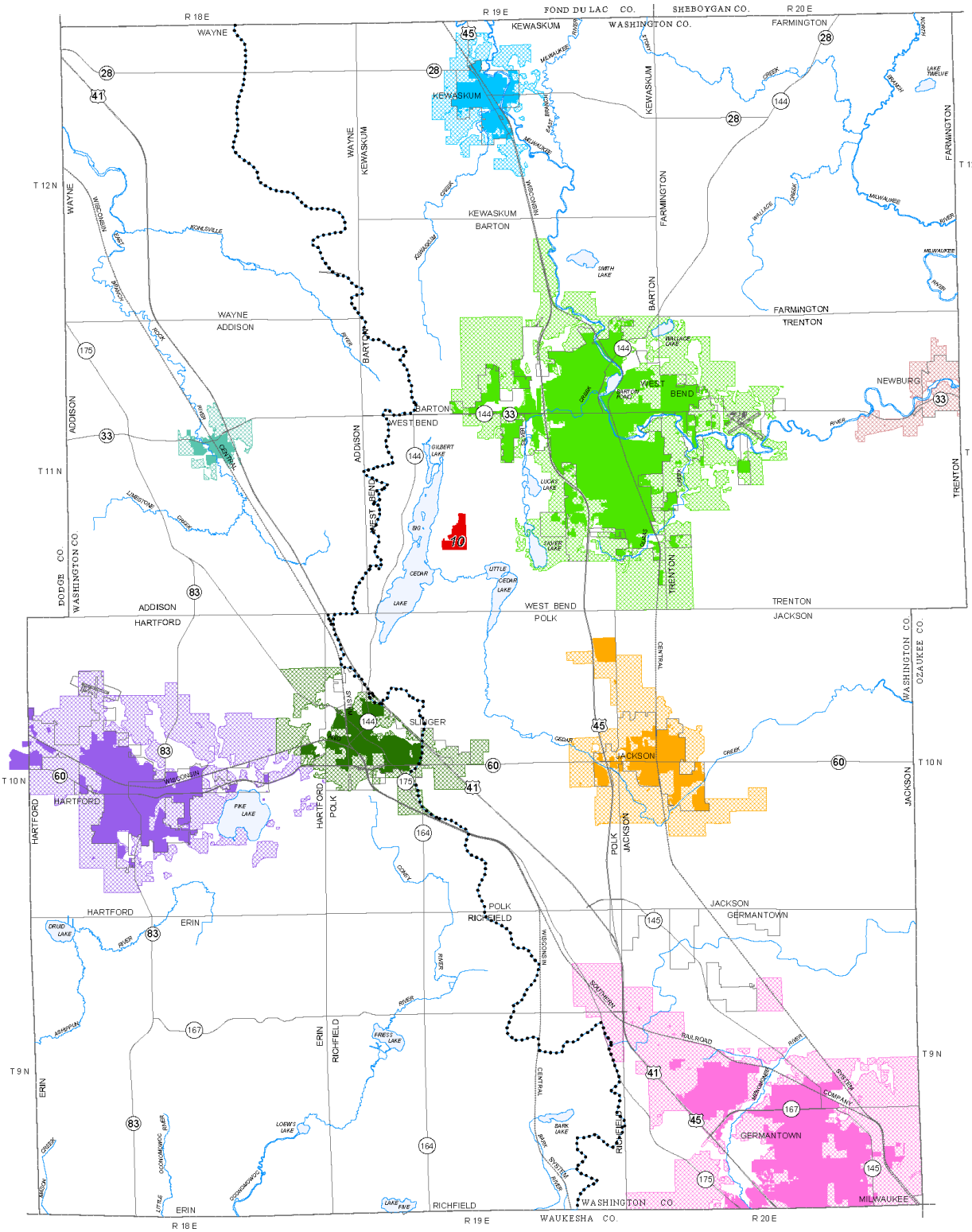
0 1 2 4 Miles

0 5,000 10,000 20,000 Feet

AREA SERVED BY OTHER THAN MUNICIPAL, COMMUNITY WATER SYSTEMS USING GROUNDWATER. IDENTIFICATION NUMBER CORRESPONDS WITH APPENDIX G.

Source: Water utilities and SEWRPC.

PROJECTED AREAS SERVED BY MUNICIPAL AND OTHER THAN MUNICIPAL, COMMUNITY WATER SUPPLY SYSTEMS IN WASHINGTON COUNTY: 2035



GROUNDWATER-SUPPLIED SYSTEMS IN 2005- FUTURE RECOMMENDED SOURCES OF SUPPLY ARE NOT YET ESTABLISHED

2005	2035	
		ALLENTON SANITARY DISTRICT
		CITY OF HARTFORD WATER UTILITIES
		CITY OF WEST BEND WATER UTILITY
		KEWASKUM WATER UTILITY
		SLINGER UTILITIES
		VILLAGE OF GERMANTOWN WATER UTILITY (PORTION OF NEW AREA IN THE TOWN OF RICHFIELD COULD BE A SEPARATE NEW TOWN UTILITY)
		VILLAGE OF JACKSON WATER UTILITY

NEW WATER SUPPLY SYSTEM-FUTURE RECOMMENDED SOURCE OF SUPPLY IS NOT YET ESTABLISHED

2035

VILLAGE OF NEWBURG AREA

SUBCONTINENTAL DIVIDE

AREA SERVED BY OTHER THAN MUNICIPAL, COMMUNITY WATER SYSTEMS USING GROUNDWATER. IDENTIFICATION NUMBER CORRESPONDS WITH APPENDIX G.

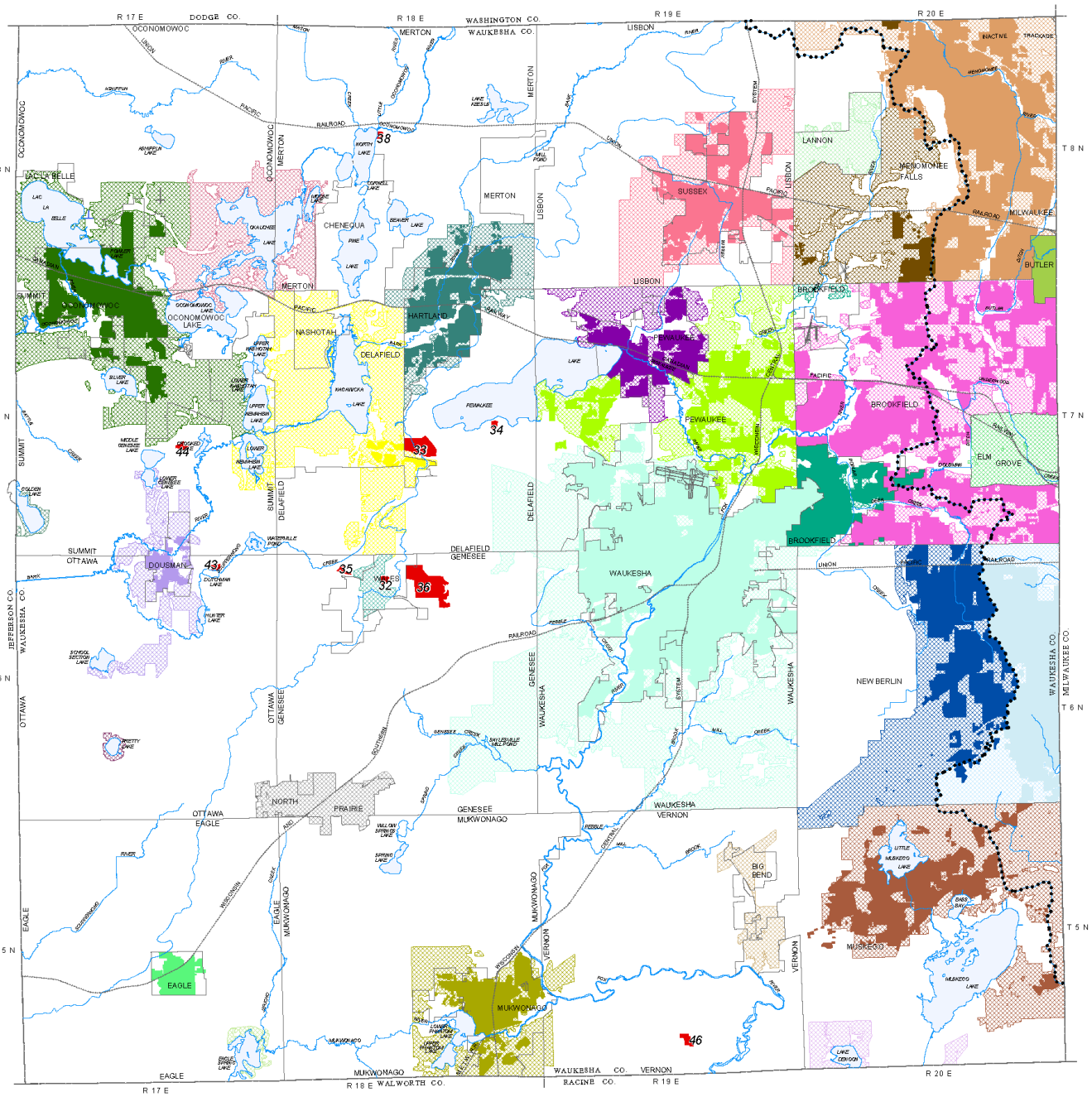
GRAPHIC SCALE

0 1 2 4 Miles

0 5,000 10,000 20,000 Feet

Source: Water utilities and SEWRPC.

PROJECTED AREAS SERVED BY MUNICIPAL AND OTHER THAN MUNICIPAL, COMMUNITY WATER SUPPLY SYSTEMS IN WAUKESHA COUNTY: 2035



GROUNDWATER-SUPPLIED SYSTEMS IN 2005-FUTURE RECOMMENDED SOURCES OF SUPPLY ARE NOT YET ESTABLISHED

2005	2035	
		CITY OF BROOKFIELD MUNICIPAL WATER UTILITY
		DELAFIELD MUNICIPAL WATER UTILITY
		CITY OF MUSKEGO PUBLIC WATER UTILITY
		CITY OF NEW BERLIN WATER UTILITY
		CITY OF OCONOMOWOC UTILITIES
		CITY OF PEWAUKEE WATER UTILITY
		CITY OF WAUKESHA WATER UTILITY (PORTION OF NEW AREA IN TOWN OF GENESSEE COULD BE A NEW TOWN UTILITY DISTRICT)
		VILLAGE OF EAGLE MUNICIPAL WATER UTILITY
		DOUSMAN WATER UTILITY
		HARTLAND MUNICIPAL WATER UTILITY
		VILLAGE OF MENOMONEE FALLS WATER UTILITY
		MUKWONAGO MUNICIPAL WATER UTILITY
		PRAIRIE VILLAGE WATER TRUST
		VILLAGE OF PEWAUKEE WATER UTILITY
		SUSSEX VILLAGE HALL AND WATER UTILITY
		BROOKFIELD SANITARY DISTRICT NO. 4

SURFACE WATER-SUPPLIED SYSTEMS IN 2005-FUTURE RECOMMENDED SOURCES OF SUPPLY ARE NOT YET ESTABLISHED

2005	2035	
		VILLAGE OF BUTLER PUBLIC WATER UTILITY
		VILLAGE OF MENOMONEE FALLS WATER UTILITY
		CITY OF NEW BERLIN WATER UTILITY

NEW WATER SUPPLY SYSTEMS-FUTURE RECOMMENDED SOURCES OF SUPPLY ARE NOT YET ESTABLISHED

2035	
	VILLAGE OF BIG BEND
	VILLAGE OF ELM GROVE
	VILLAGE OF LANNON AREA
	VILLAGE OF WALES AREA
	TOWN OF EAGLE-EAGLE SPRING LAKE AREA
	TOWN OF MUKWONAGO-RAINBOW SPRINGS AREA
	TOWN OF NORWAY-WIND LAKE AREA
	TOWN OF OCONOMOWOC-OKAUCHEE LAKE AREA
	TOWN OF OTTOWA-PRETTY LAKE AREA
	TOWN OF SUMMIT-GOLDEN LAKE AREA

SUBCONTINENTAL DIVIDE

28 AREA SERVED BY OTHER THAN MUNICIPAL, COMMUNITY SYSTEMS USING GROUNDWATER. IDENTIFICATION NUMBER CORRESPONDS WITH APPENDIX G.

GRAPHIC SCALE

0 1 2 4 Miles

0 5,000 10,000 20,000 Feet

Source: Water utilities and SEWRPC.

Water Conservation Measures Envisioned Under the Alternative and Preliminary Recommended Water Supply Plan

Base Level Program (1,589,800 persons) Providing a 4% reduction in average day demand, and from 6 to 10% reduction in maximum day demand. Utilities using Lake Michigan with none or modest supply infrastructure needs.

- Water supply efficiency actions, such as leak detection and repair, water production system refinement, system audits
- Moderate level of public I & E
- Outdoor watering restrictions for residential users

Intermediate Level Program (501,500 persons) Providing a 6 to 8% reduction in average day demand, and a 12 to 14% reduction in maximum day demand. Utilities using groundwater supply with no major problems and with supply infrastructure needs or using new surface water supplies with significant infrastructure needs.

- All components of low level program
- Higher level public I & E
- Plumbing retrofits (shower heads, toilet displacement device kits)
- Water conservation rate structure revision and outdoor watering restrictions

Advanced Level Program (184,700 persons) Providing a 10% reduction in average day demand, and an 18% reduction in maximum day demand. Utilities using groundwater supply with aquifer problems and infrastructure needs or using new surface water supplies and new return flow required with major infrastructure needs.

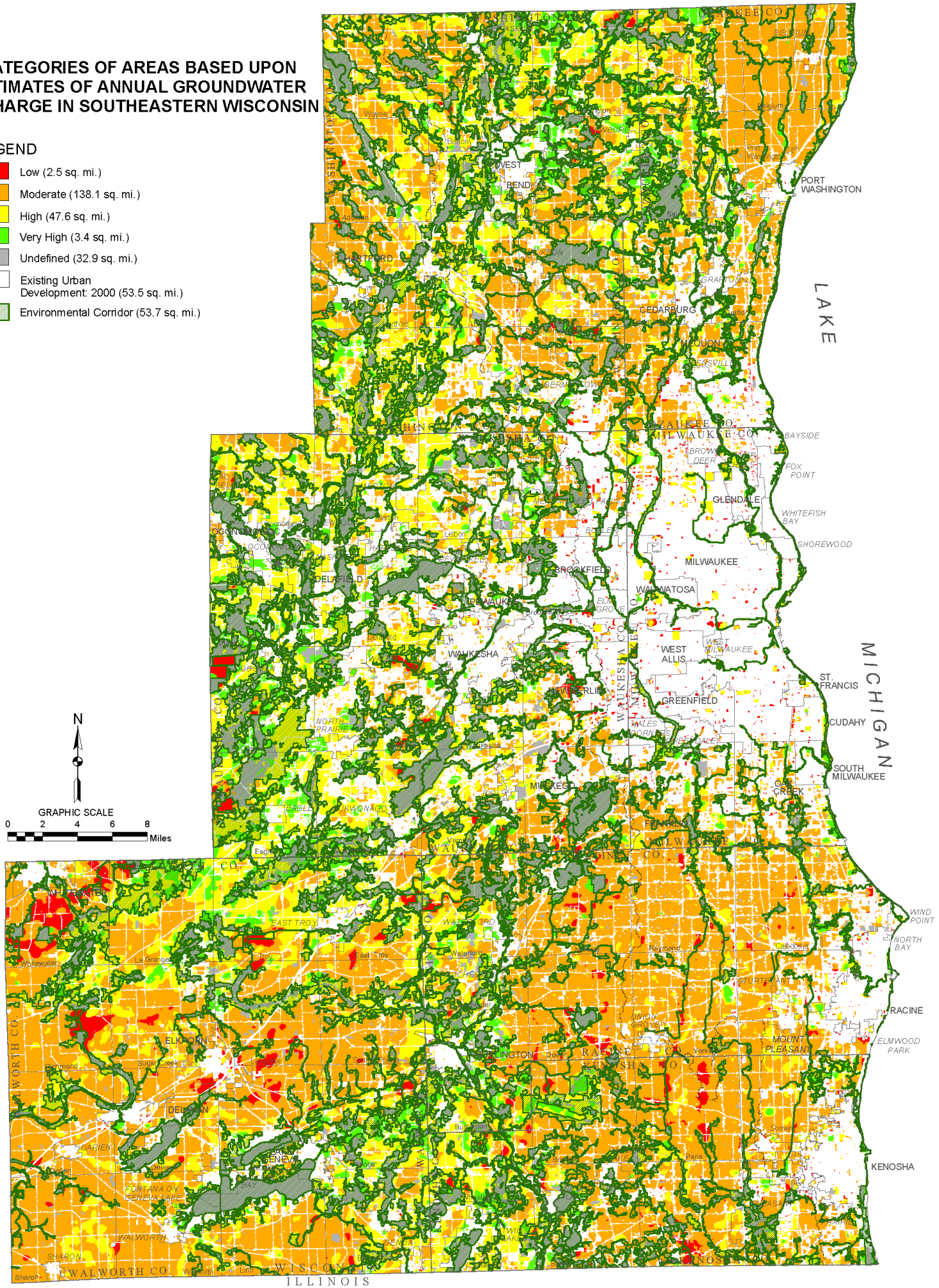
- All components of intermediate level program
- Plumbing fixture management (toilet, washing machine, and water softener replacement rebates)
- More aggressive rate structure and outdoor watering restrictions

High Level Program (Evaluated and not included in regional plan recommendations – may be considered on a local utility specific basis) Providing a 25 to 35% reduction in average day demand, and a 30 to 50% reduction in maximum day demand

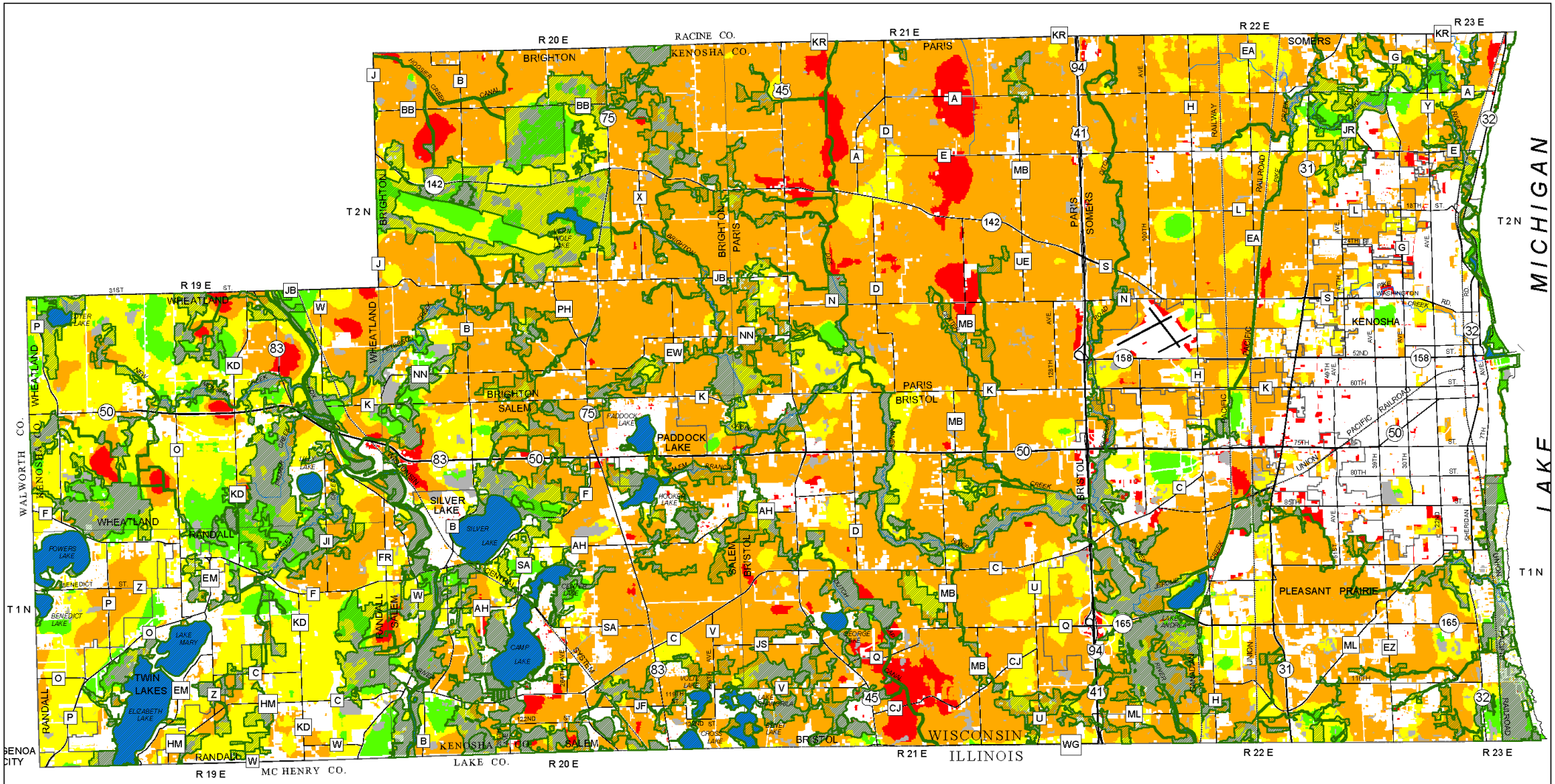
- All components of advanced level program
- Rain Harvesting
- Greywater Reuse System

Note: The measures noted are intended to serve as a guide for local utilities to develop utility specific programs. All programs would be designed to meet requirements of the Compact and State regulations under development. Additional measures may be applicable if needed to meet sewerage system protection or stormwater management objectives.

CATEGORIES OF AREAS BASED UPON ESTIMATES OF ANNUAL GROUNDWATER RECHARGE IN SOUTHEASTERN WISCONSIN



Source: Wisconsin Geological and Natural History Survey and SEWRPC.



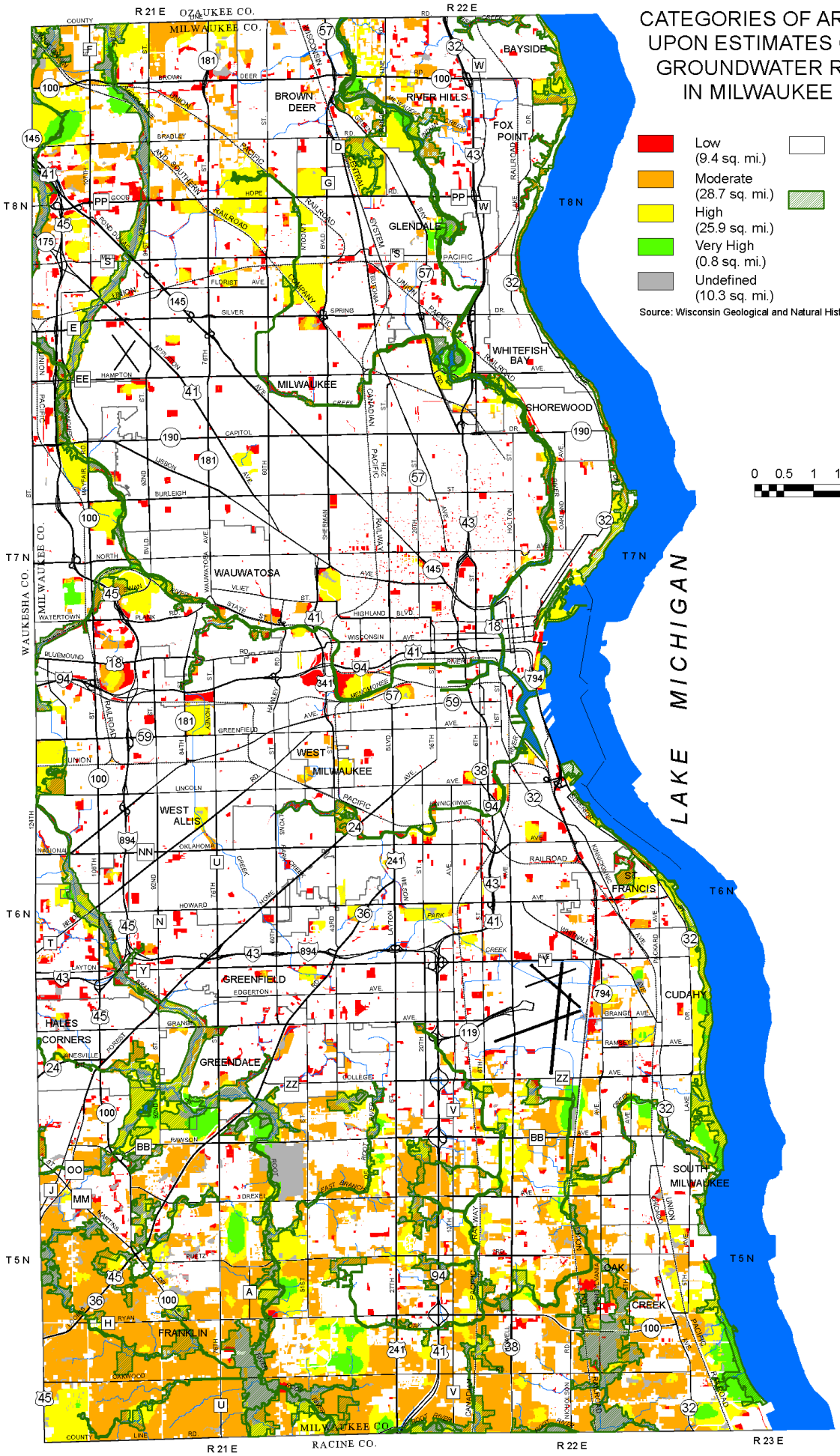
CATEGORIES OF AREAS BASED UPON ESTIMATES OF ANNUAL GROUNDWATER RECHARGE IN KENOSHA COUNTY

- Low (2.5 sq. mi.)
- Moderate (138.1 sq. mi.)
- High (47.6 sq. mi.)
- Very High (3.4 sq. mi.)
- Undefined (32.9 sq. mi.)
- Existing Urban Development: 2000 (53.5 sq. mi.)
- Environmental Corridor (53.7 sq. mi.)

Source: Wisconsin Geological and Natural History Survey and SEWRPC.

0 0.5 1 1.5 2 Miles

CATEGORIES OF AREAS BASED UPON ESTIMATES OF ANNUAL GROUNDWATER RECHARGE IN MILWAUKEE COUNTY



Low (9.4 sq. mi.)

Moderate (28.7 sq. mi.)

High (25.9 sq. mi.)

Very High (0.8 sq. mi.)

Undefined (10.3 sq. mi.)

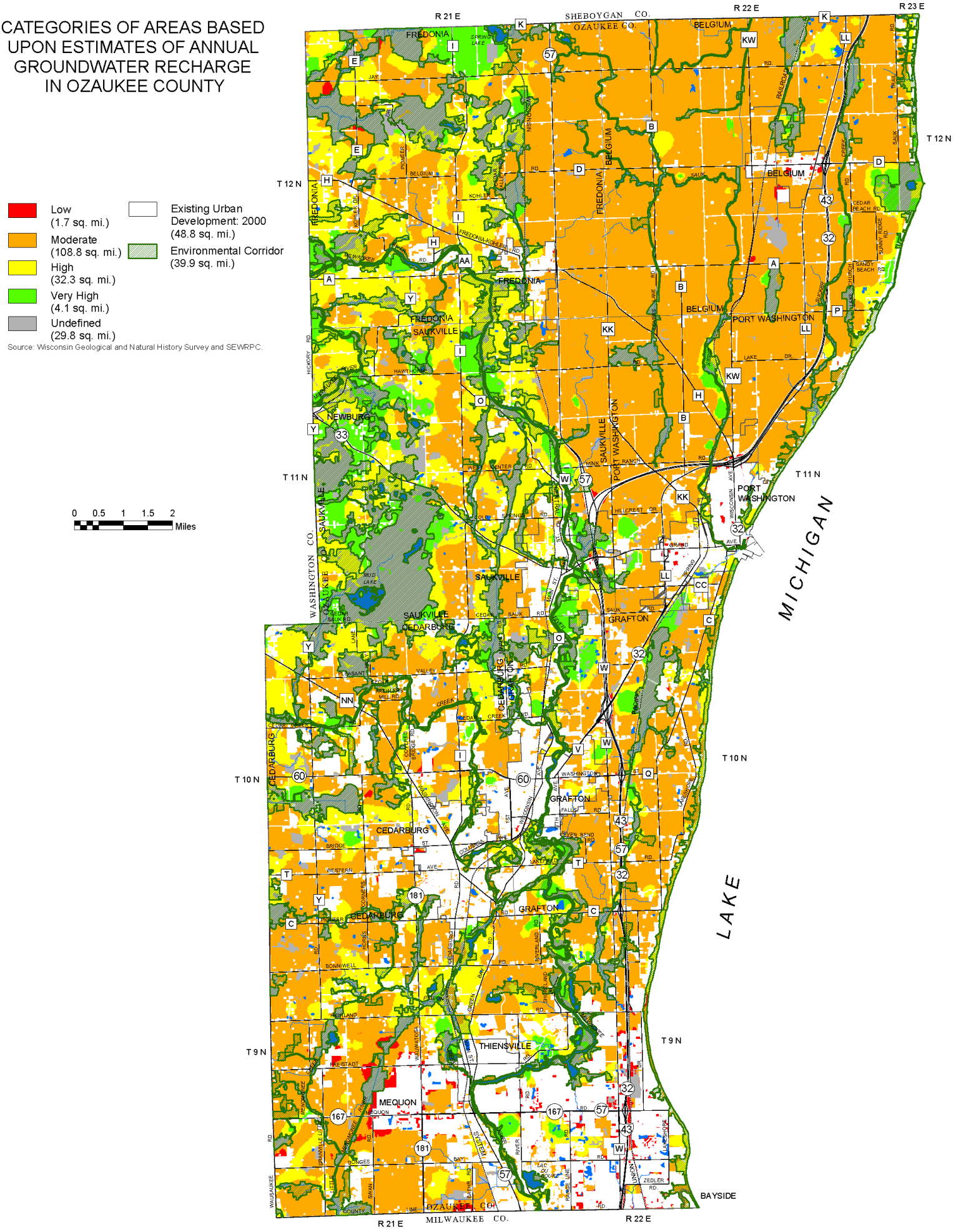
Existing Urban Development: 2000 (167.2 sq. mi.)

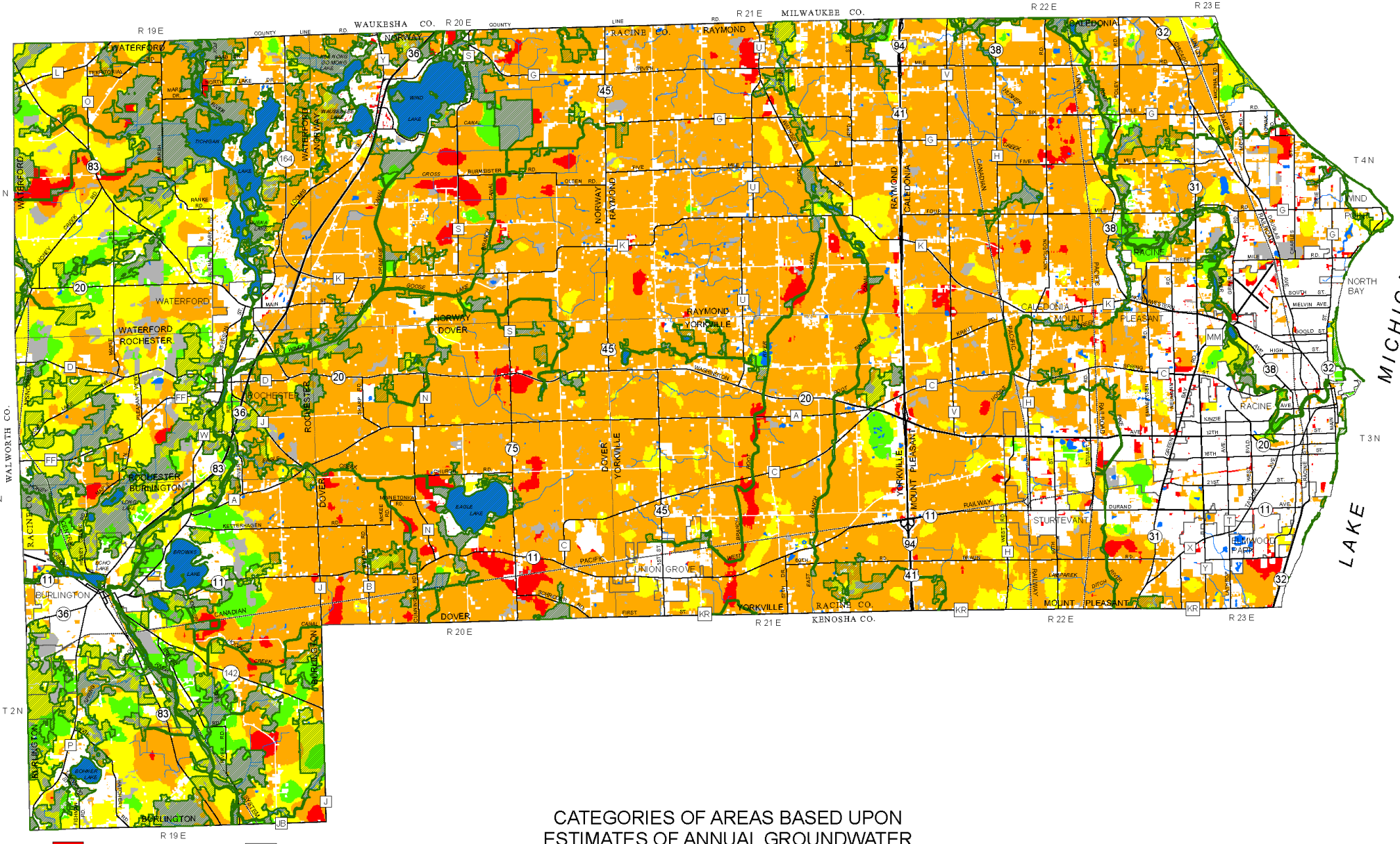
Environmental Corridor (19.8 sq. mi.)

Source: Wisconsin Geological and Natural History Survey and SEWRPC.

0 0.5 1 1.5 2 Miles

CATEGORIES OF AREAS BASED UPON ESTIMATES OF ANNUAL GROUNDWATER RECHARGE IN OZAUKEE COUNTY



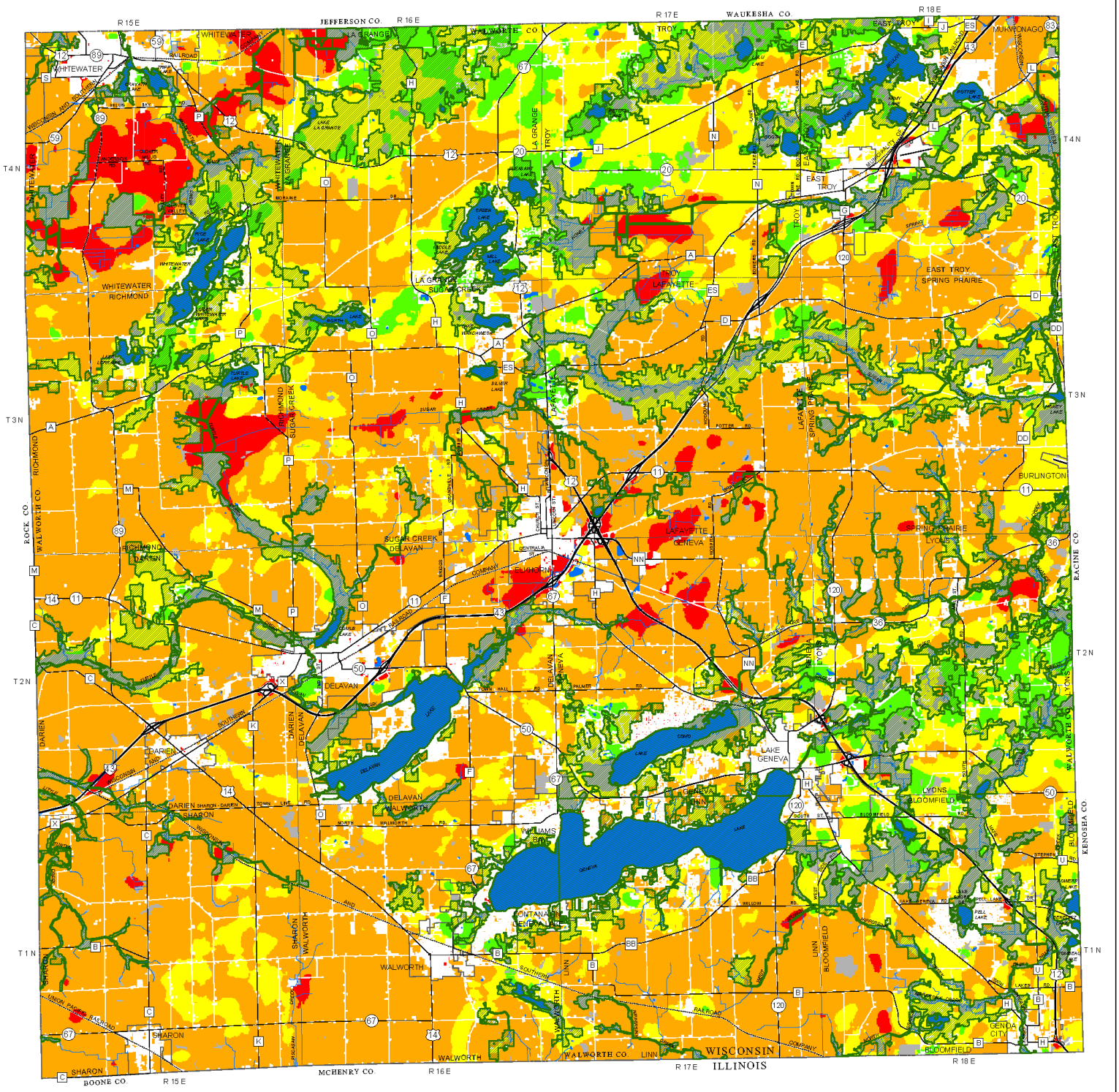


CATEGORIES OF AREAS BASED UPON ESTIMATES OF ANNUAL GROUNDWATER RECHARGE IN RACINE COUNTY

- Low (8.1 sq. mi)
- Moderate (181.4 sq. mi.)
- High (44.5 sq. mi.)
- Very High (4.3 sq. mi.)
- Undefined (34.2 sq. mi.)
- Existing Urban Development: 2000 (67.8 sq. mi.)
- Environmental Corridor (46.3 sq. mi.)

0 0.5 1 1.5 2 Miles

Source: Wisconsin Geological and Natural History Survey and SEWRPC.

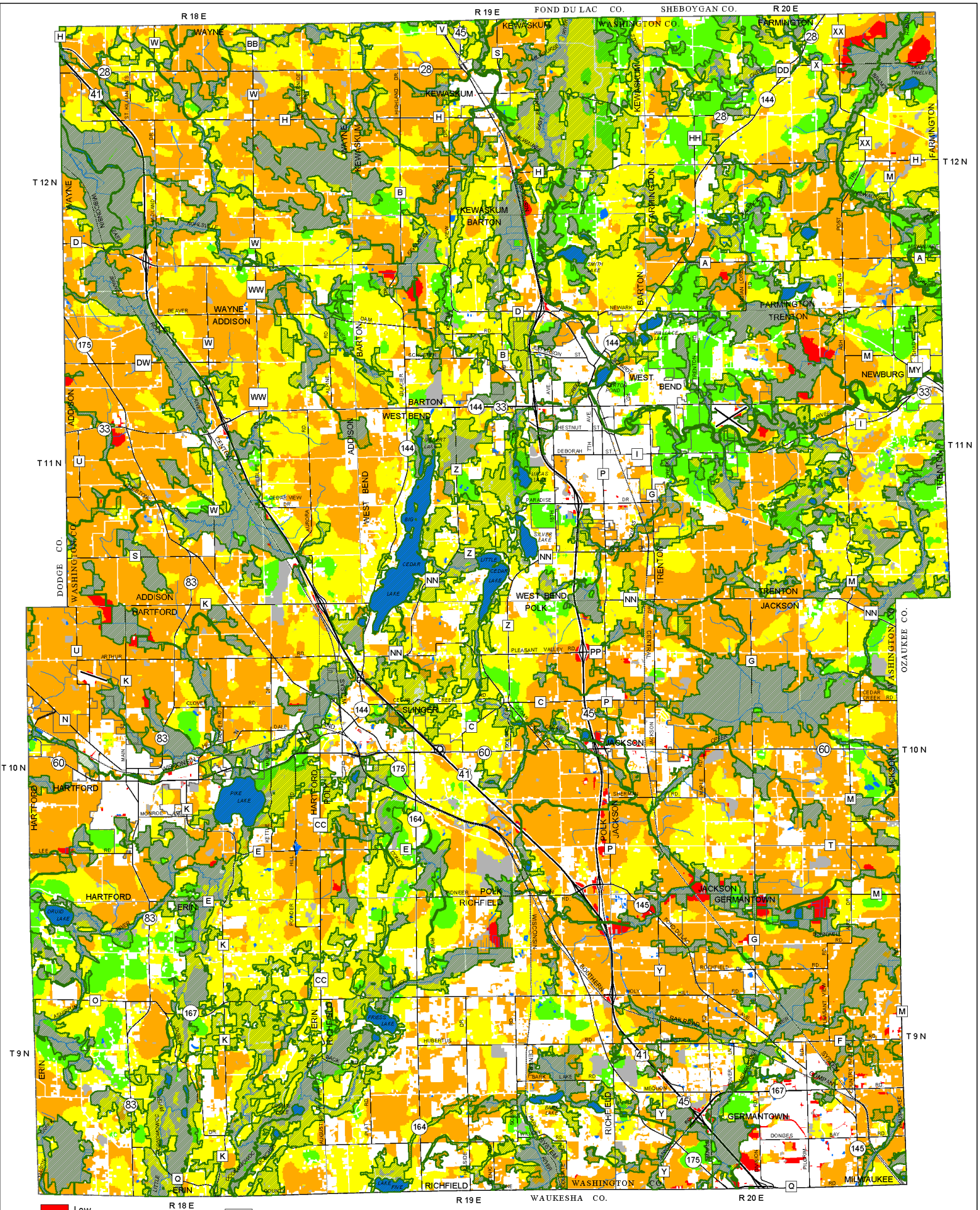


CATEGORIES OF AREAS BASED UPON ESTIMATES OF ANNUAL GROUNDWATER RECHARGE IN WALWORTH COUNTY

- Low (38.3 sq. mi.)
- Moderate (278.2 sq. mi.)
- High (113.5 sq. mi.)
- Very High (18.2 sq. mi.)
- Undefined (65.6 sq. mi.)
- Existing Urban Development: 2000 (62.3 sq. mi.)
- Environmental Corridor (113.8 sq. mi.)

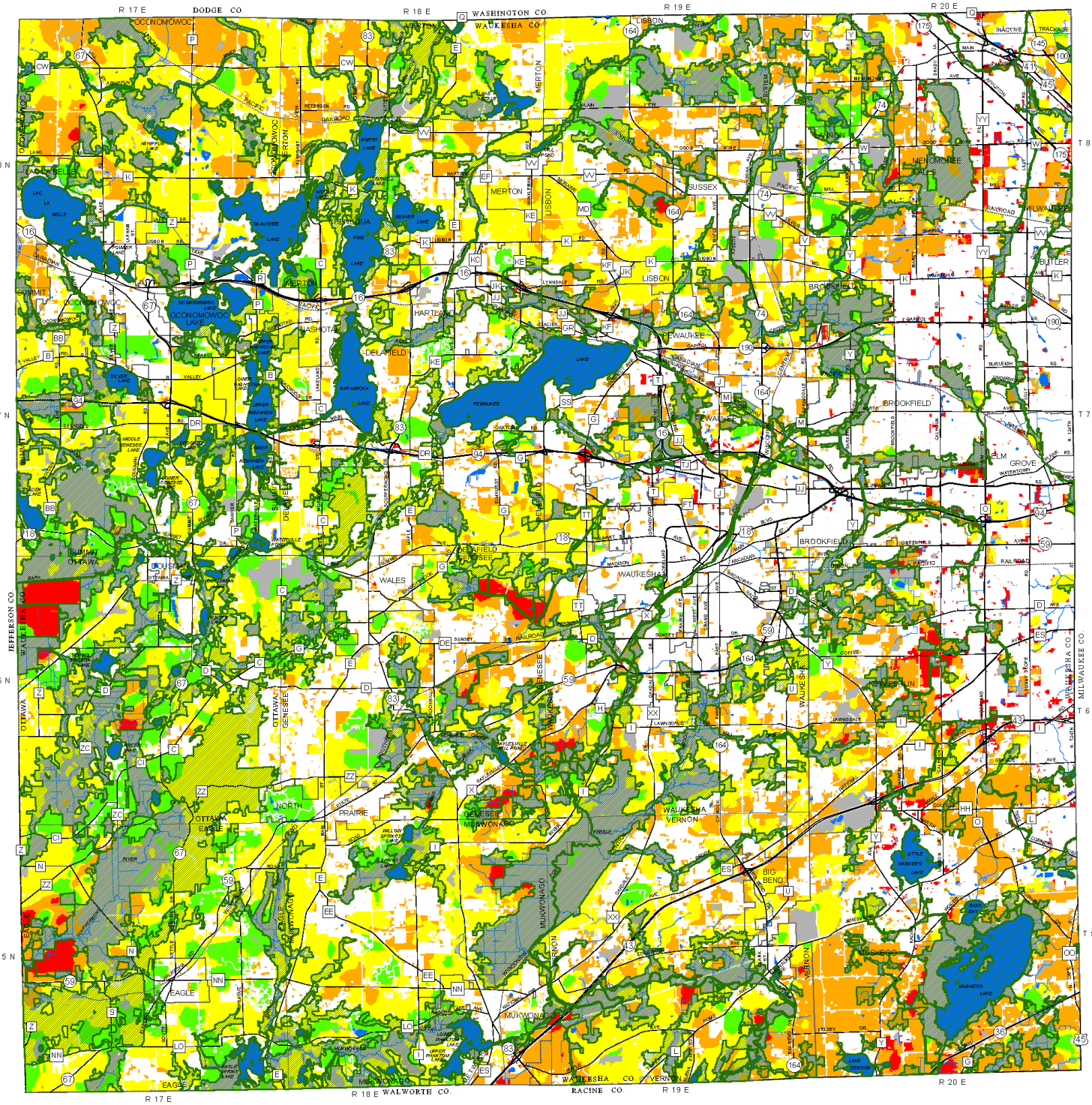
0 0.5 1 1.5 2 Miles

Source: Wisconsin Geological and Natural History Survey and SEWRPC.



CATEGORIES OF AREAS BASED UPON ESTIMATES OF ANNUAL GROUNDWATER RECHARGE IN WASHINGTON COUNTY

Source: Wisconsin Geological and Natural History Survey and SEWRPC.



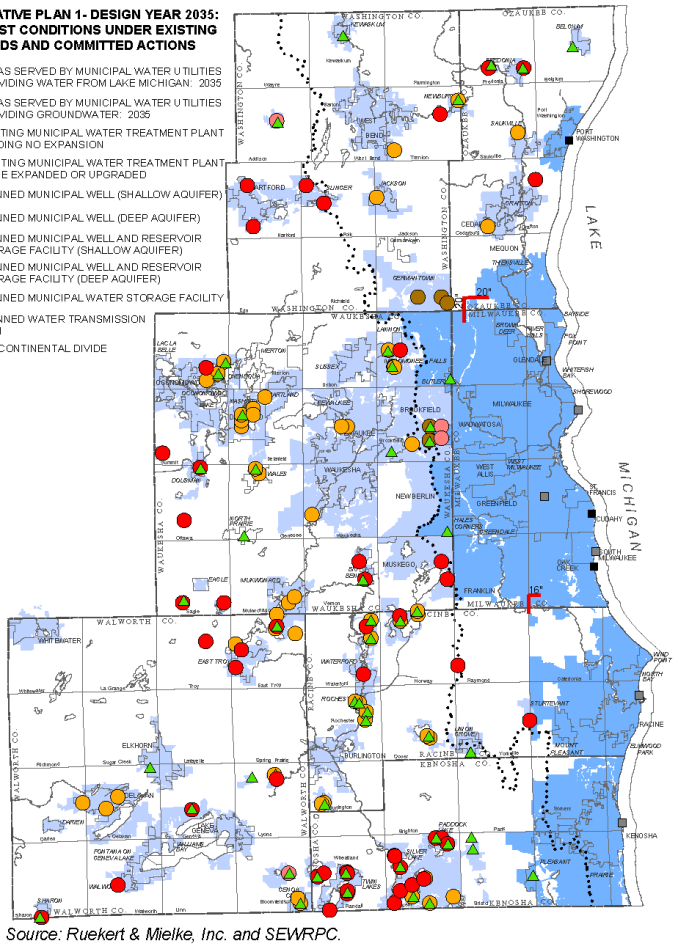
CATEGORIES OF AREAS BASED UPON ESTIMATES OF ANNUAL GROUNDWATER RECHARGE IN WAUKESHA COUNTY

Source: Wisconsin Geological and Natural History Survey and SEWRPC.

ALTERNATIVE WATER SUPPLY PLANS FOR SOUTHEASTERN WISCONSIN: 2035

ALTERNATIVE PLAN 1- DESIGN YEAR 2035: FORECAST CONDITIONS UNDER EXISTING TRENDS AND COMMITTED ACTIONS

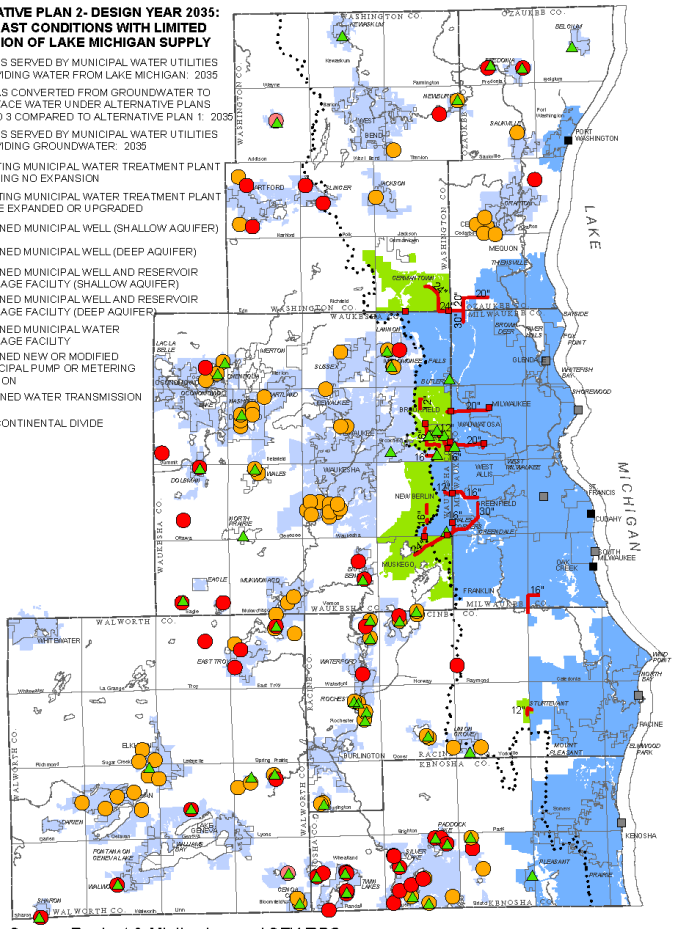
- AREAS SERVED BY MUNICIPAL WATER UTILITIES PROVIDING WATER FROM LAKE MICHIGAN: 2035
- AREAS SERVED BY MUNICIPAL WATER UTILITIES PROVIDING GROUNDWATER: 2035
- EXISTING MUNICIPAL WATER TREATMENT PLANT NEEDING NO EXPANSION
- EXISTING MUNICIPAL WATER TREATMENT PLANT TO BE EXPANDED OR UPGRADED
- PLANNED MUNICIPAL WELL (SHALLOW AQUIFER)
- PLANNED MUNICIPAL WELL (DEEP AQUIFER)
- PLANNED MUNICIPAL WELL AND RESERVOIR STORAGE FACILITY (SHALLOW AQUIFER)
- PLANNED MUNICIPAL WELL AND RESERVOIR STORAGE FACILITY (DEEP AQUIFER)
- PLANNED MUNICIPAL WATER STORAGE FACILITY
- PLANNED WATER TRANSMISSION MAIN
- SUBCONTINENTAL DIVIDE



Source: Ruekert & Mielke, Inc. and SEWRPC.

ALTERNATIVE PLAN 2- DESIGN YEAR 2035: FORECAST CONDITIONS WITH LIMITED EXPANSION OF LAKE MICHIGAN SUPPLY

- AREAS SERVED BY MUNICIPAL WATER UTILITIES PROVIDING WATER FROM LAKE MICHIGAN: 2035
- AREAS CONVERTED FROM GROUNDWATER TO SURFACE WATER UNDER ALTERNATIVE PLANS 2 AND 3 COMPARED TO ALTERNATIVE PLAN 1: 2035
- AREAS SERVED BY MUNICIPAL WATER UTILITIES PROVIDING GROUNDWATER: 2035
- EXISTING MUNICIPAL WATER TREATMENT PLANT NEEDING NO EXPANSION
- EXISTING MUNICIPAL WATER TREATMENT PLANT TO BE EXPANDED OR UPGRADED
- PLANNED MUNICIPAL WELL (SHALLOW AQUIFER)
- PLANNED MUNICIPAL WELL (DEEP AQUIFER)
- PLANNED MUNICIPAL WELL AND RESERVOIR STORAGE FACILITY (SHALLOW AQUIFER)
- PLANNED MUNICIPAL WELL AND RESERVOIR STORAGE FACILITY (DEEP AQUIFER)
- PLANNED MUNICIPAL WATER STORAGE FACILITY
- PLANNED NEW OR MODIFIED MUNICIPAL PUMP OR METERING STATION
- PLANNED WATER TRANSMISSION MAIN
- SUBCONTINENTAL DIVIDE



Source: Ruekert & Mielke, Inc. and SEWRPC.

ALTERNATIVE PLAN 3 - DESIGN YEAR 2035 GROUNDWATER RECHARGE FACILITIES

SHALLOW AQUIFER RECHARGE FACILITIES

RAINFALL INFILTRATION FACILITIES
MILLION GALLONS PER YEAR (MGY)

- 0.1 - 5.0
- 5.1 - 10.0
- 10.1 - 15.0
- 15.1 - 20.0
- 20.1 - 25.0

WASTEWATER TREATMENT PLANT EFFLUENT INFILTRATION FACILITIES
MILLION GALLONS PER YEAR (MGY)

- 146
- 584
- 1,460
- 1,825

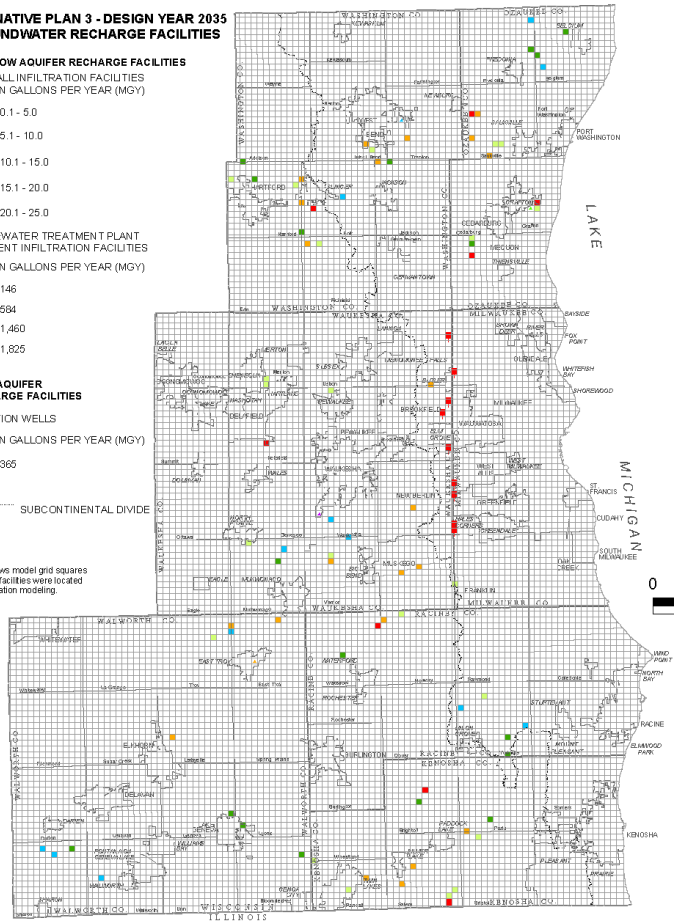
DEEP AQUIFER RECHARGE FACILITIES

INJECTION WELLS
MILLION GALLONS PER YEAR (MGY)

- 365

SUBCONTINENTAL DIVIDE

NOTE:
Map shows model grid squares in which facilities were located for simulation modeling.

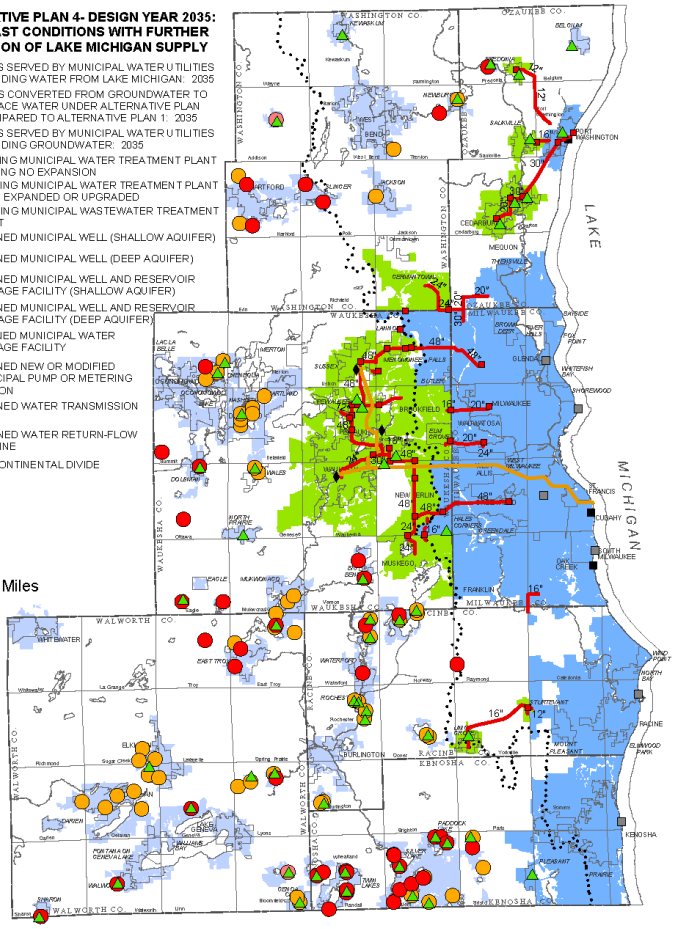


Source: SEWRPC.

ALTERNATIVE PLAN 4- DESIGN YEAR 2035: FORECAST CONDITIONS WITH FURTHER EXPANSION OF LAKE MICHIGAN SUPPLY

- AREAS SERVED BY MUNICIPAL WATER UTILITIES PROVIDING WATER FROM LAKE MICHIGAN: 2035
- AREAS CONVERTED FROM GROUNDWATER TO SURFACE WATER UNDER ALTERNATIVE PLAN 4 COMPARED TO ALTERNATIVE PLAN 1: 2035
- AREAS SERVED BY MUNICIPAL WATER UTILITIES PROVIDING GROUNDWATER: 2035
- EXISTING MUNICIPAL WATER TREATMENT PLANT NEEDING NO EXPANSION
- EXISTING MUNICIPAL WATER TREATMENT PLANT TO BE EXPANDED OR UPGRADED
- EXISTING MUNICIPAL WASTEWATER TREATMENT PLANT
- PLANNED MUNICIPAL WELL (SHALLOW AQUIFER)
- PLANNED MUNICIPAL WELL (DEEP AQUIFER)
- PLANNED MUNICIPAL WELL AND RESERVOIR STORAGE FACILITY (SHALLOW AQUIFER)
- PLANNED MUNICIPAL WELL AND RESERVOIR STORAGE FACILITY (DEEP AQUIFER)
- PLANNED MUNICIPAL WATER STORAGE FACILITY
- PLANNED NEW OR MODIFIED MUNICIPAL PUMP OR METERING STATION
- PLANNED WATER TRANSMISSION MAIN
- PLANNED WATER RETURN-FLOW PIPELINE
- SUBCONTINENTAL DIVIDE

0 5 10 Miles

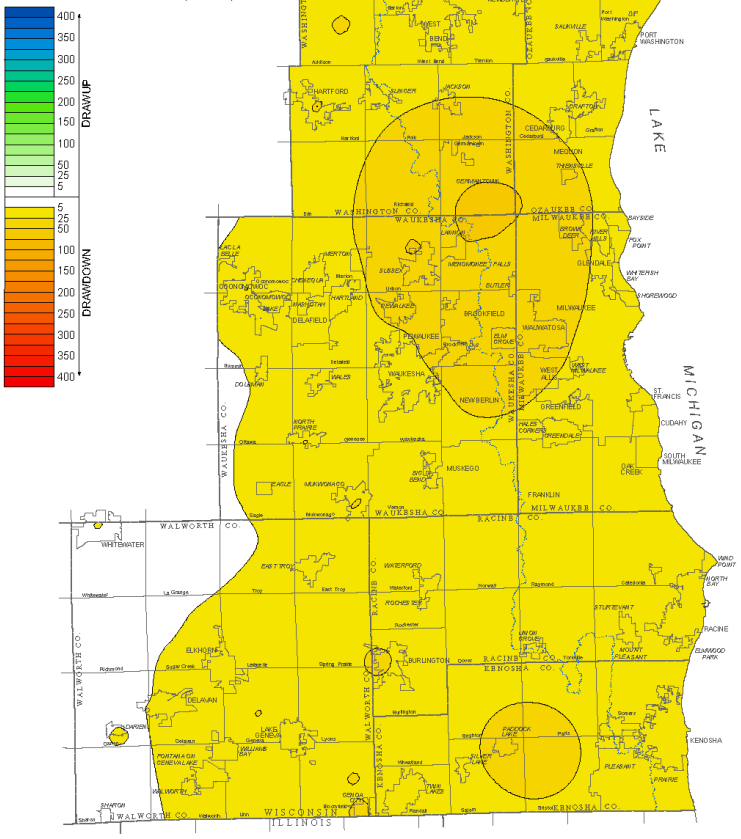


Source: Ruekert & Mielke, Inc. and SEWRPC.

CONDITIONS IN THE DEEP AQUIFER ASSOCIATED WITH ALTERNATIVE WATER SUPPLY PLANS

ALTERNATIVE PLAN 1

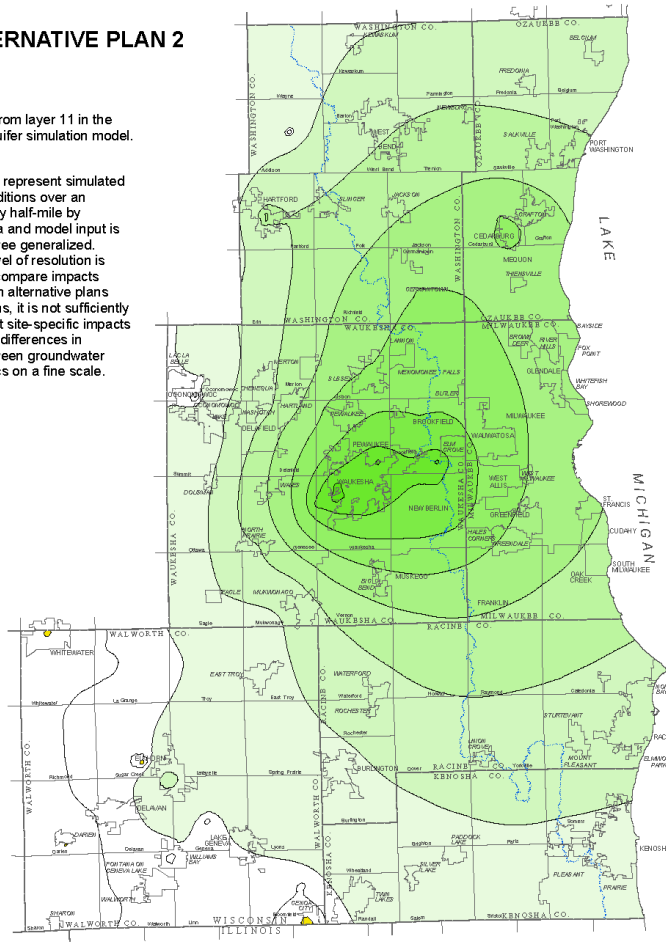
CHANGE RELATIVE
TO 2005 CONDITIONS (FEET)



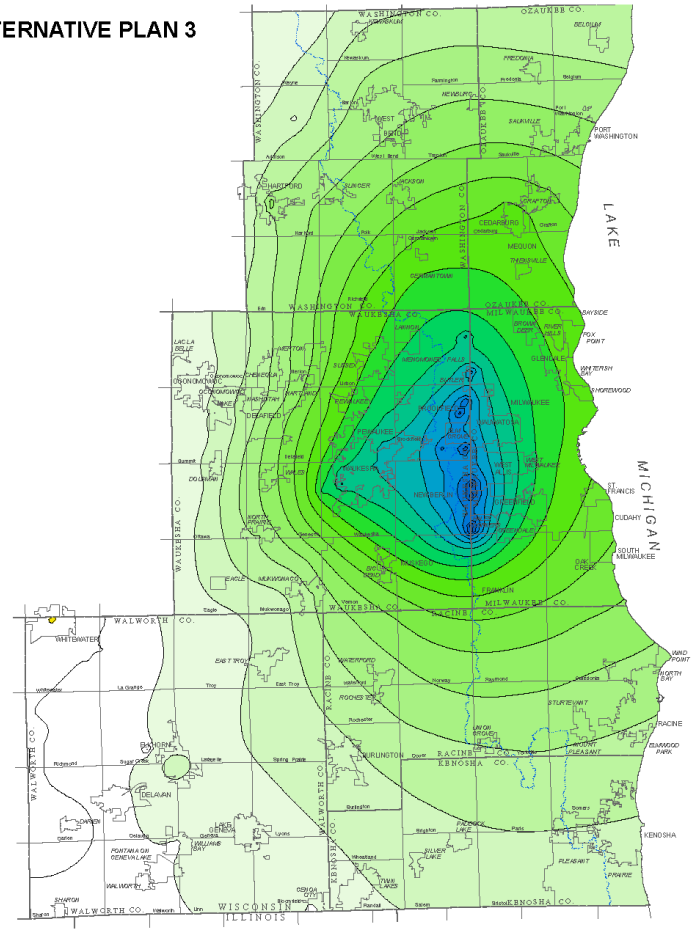
ALTERNATIVE PLAN 2

Note:
Results are from layer 11 in the Regional Aquifer simulation model.

Note:
Model nodes represent simulated average conditions over an approximately half-mile by half-mile area and model input is to some degree generalized. While this level of resolution is sufficient to compare impacts resulting from alternative plans and conditions, it is not sufficiently fine to predict site-specific impacts or to resolve differences in impacts between groundwater characteristics on a fine scale.



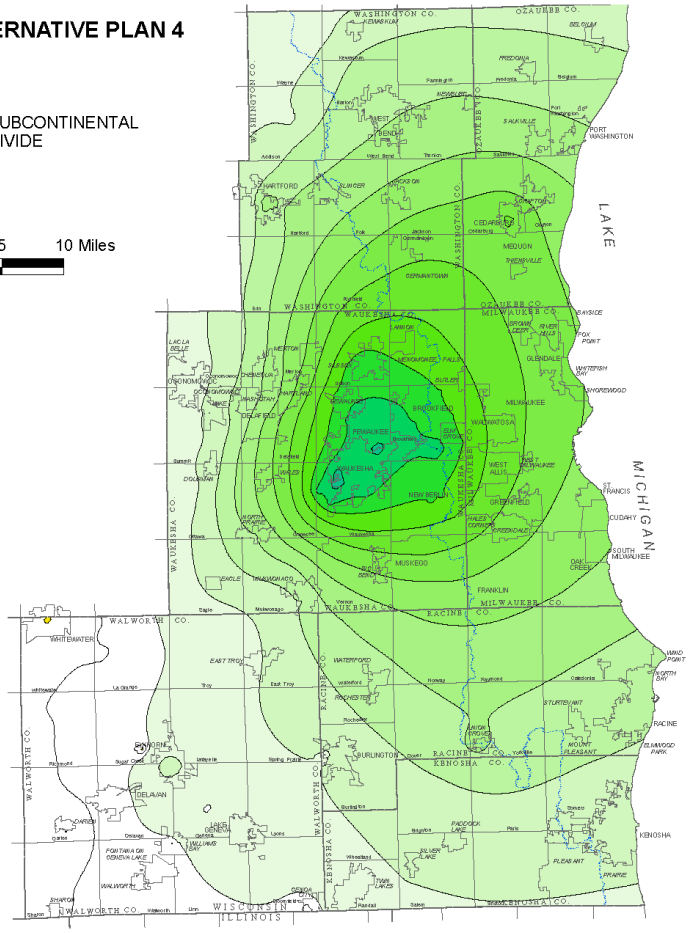
ALTERNATIVE PLAN 3



ALTERNATIVE PLAN 4

SUBCONTINENTAL DIVIDE

0 5 10 Miles



Source: U.S. Geological Survey.

PRELIMINARY DRAFT

AQUIFER SIMULATION MODEL NODES WITH MORE THAN 10 PERCENT BASEFLOW DEPLETION OR BASEFLOW AUGMENTATION BETWEEN 2005 AND 2035 UNDER CONDITIONS ASSOCIATED WITH ALTERNATIVE WATER SUPPLY PLANS: 2035

ALTERNATIVE 1

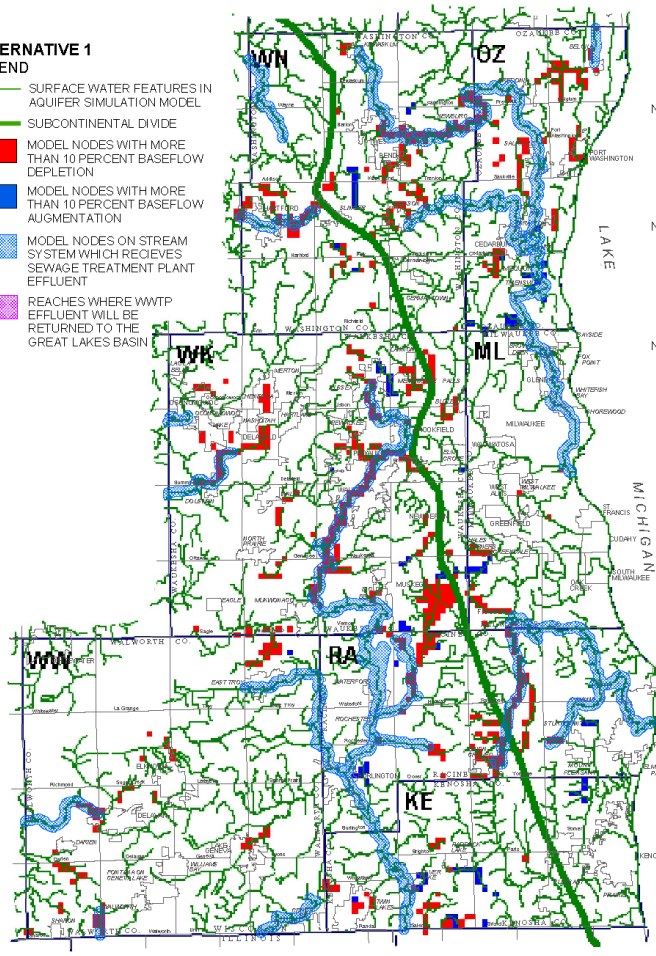
LEGEND

- SURFACE WATER FEATURES IN AQUIFER SIMULATION MODEL
- SUBCONTINENTAL DIVIDE
- MODEL NODES WITH MORE THAN 10 PERCENT BASEFLOW DEPLETION
- MODEL NODES WITH MORE THAN 10 PERCENT BASEFLOW AUGMENTATION
- MODEL NODES ON STREAM SYSTEM WHICH RECIEVES SEWAGE TREATMENT PLANT EFFLUENT
- REACHES WHERE WWTP EFFLUENT WILL BE RETURNED TO THE GREAT LAKES BASIN

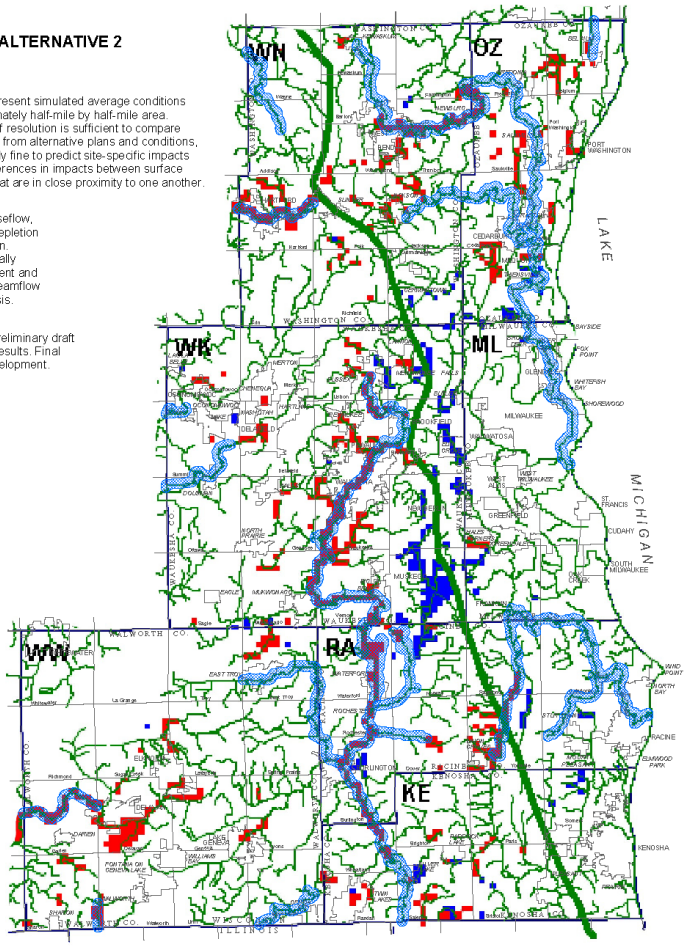
Note: Model nodes represent simulated average conditions over an approximately half-mile by half-mile area. While this level of resolution is sufficient to compare impacts resulting from alternative plans and conditions, it is not sufficiently fine to predict site-specific impacts or to resolve differences in impacts between surface water features that are in close proximity to one another.

Note: Results show baseflow, not streamflow depletion and augmentation. Baseflow is typically between 10 percent and 50 percent of streamflow on an annual basis.

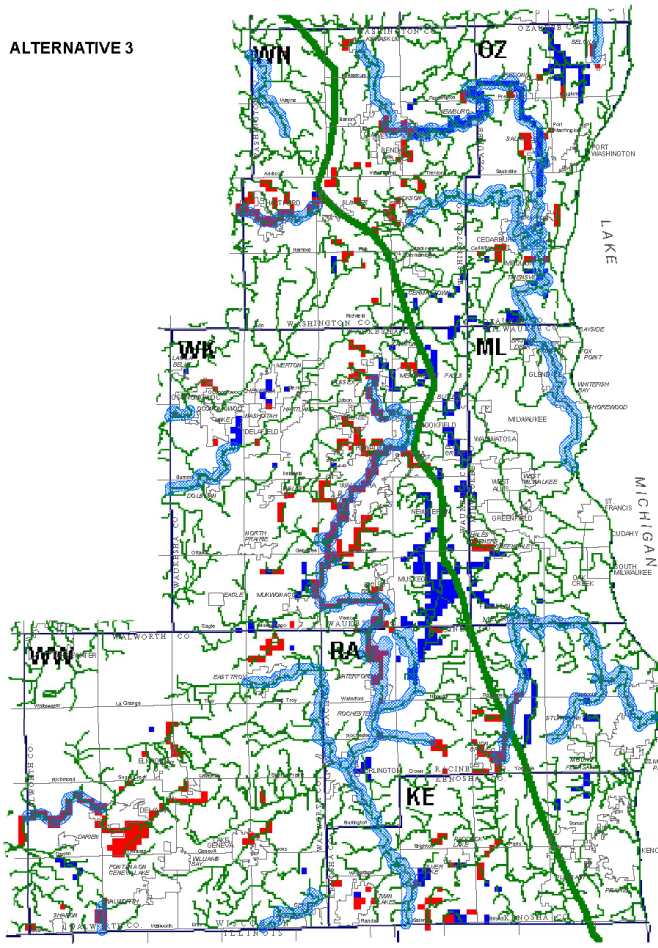
Note: This is a rough preliminary draft to show model results. Final maps are in development.



ALTERNATIVE 2

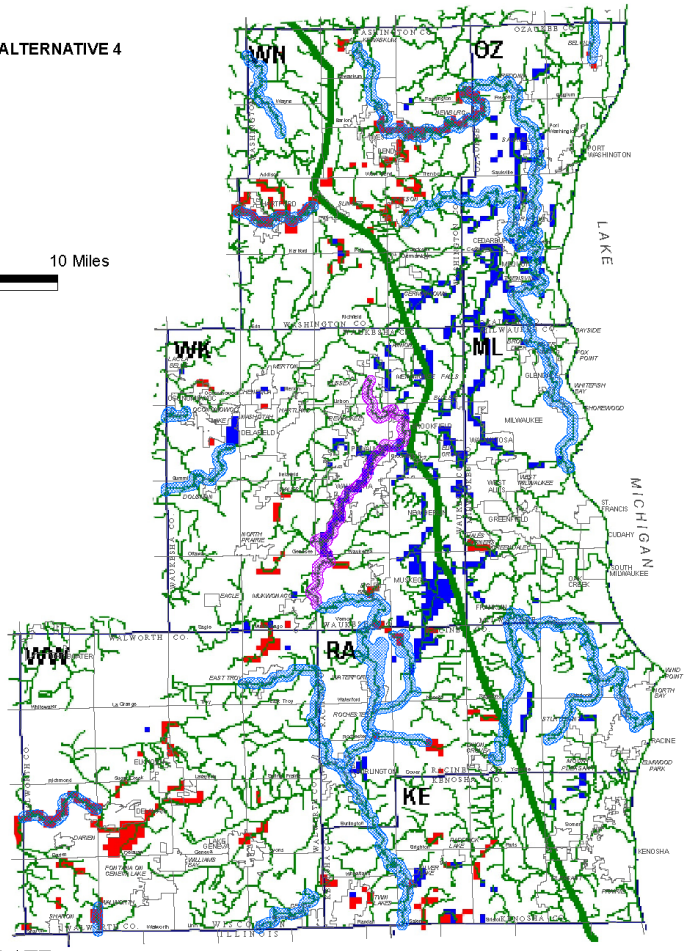


ALTERNATIVE 3



0 5 10 Miles

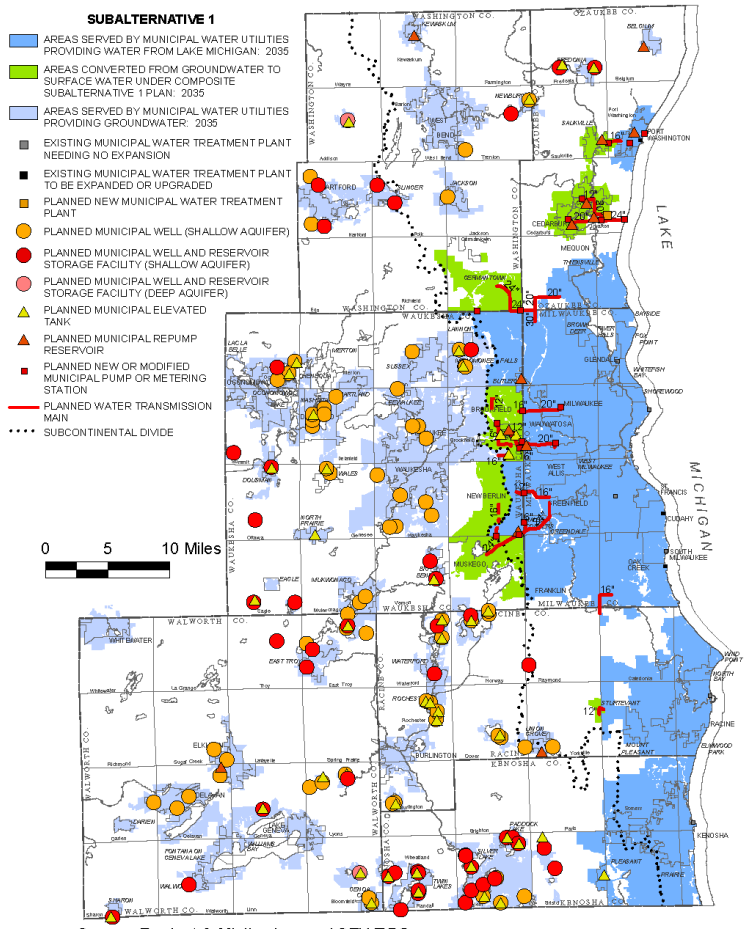
ALTERNATIVE 4



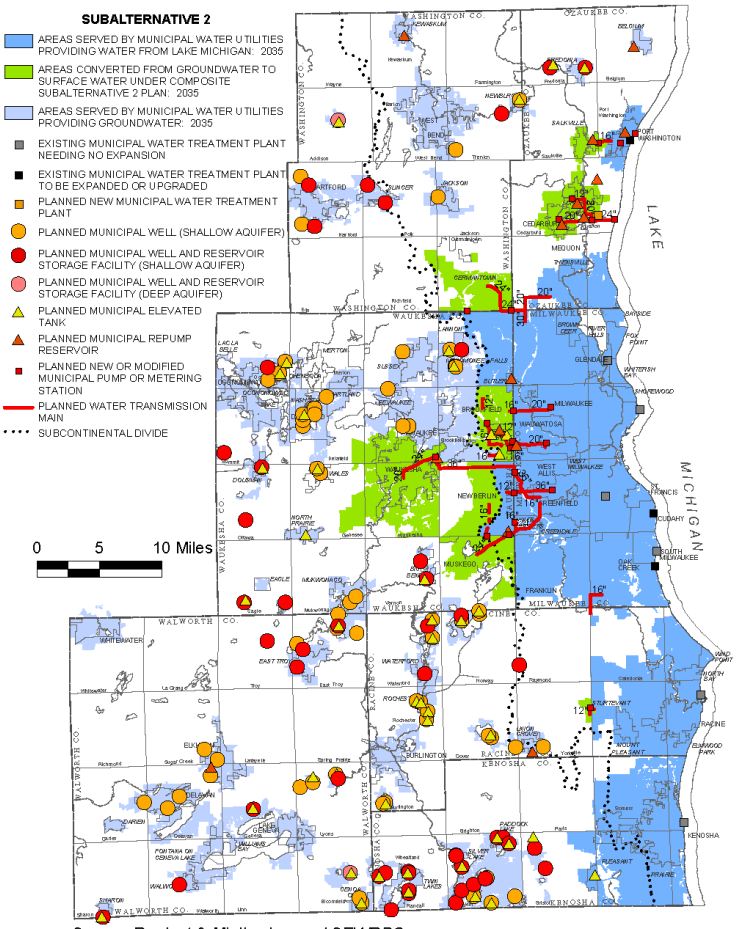
Source: U.S. Geological Survey.

PRELIMINARY DRAFT

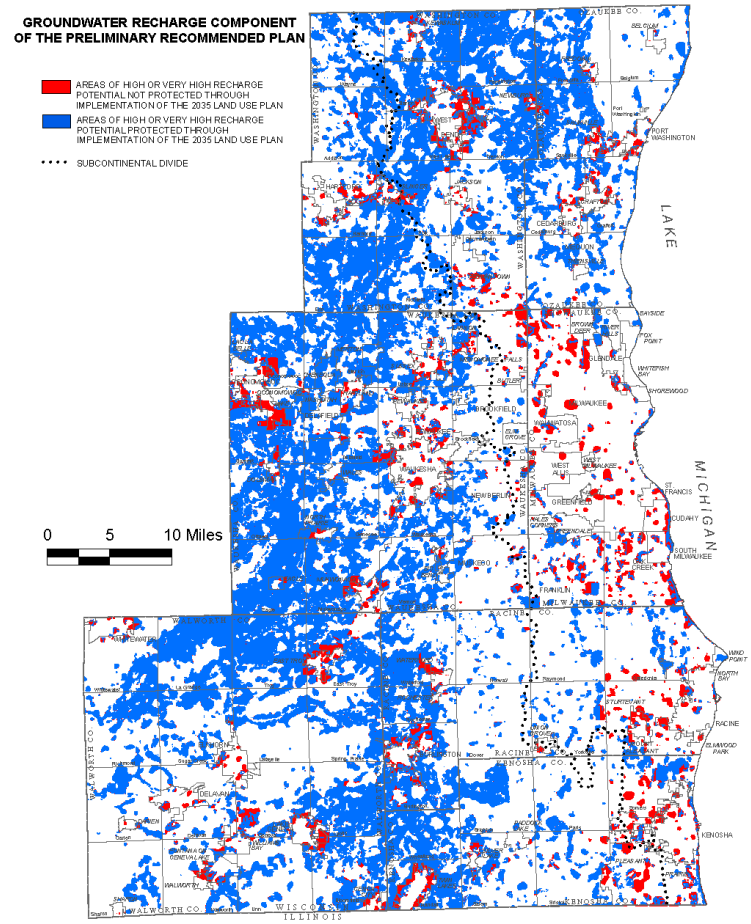
COMPOSITE WATER SUPPLY PLAN FOR SOUTHEASTERN WISCONSIN: 2035



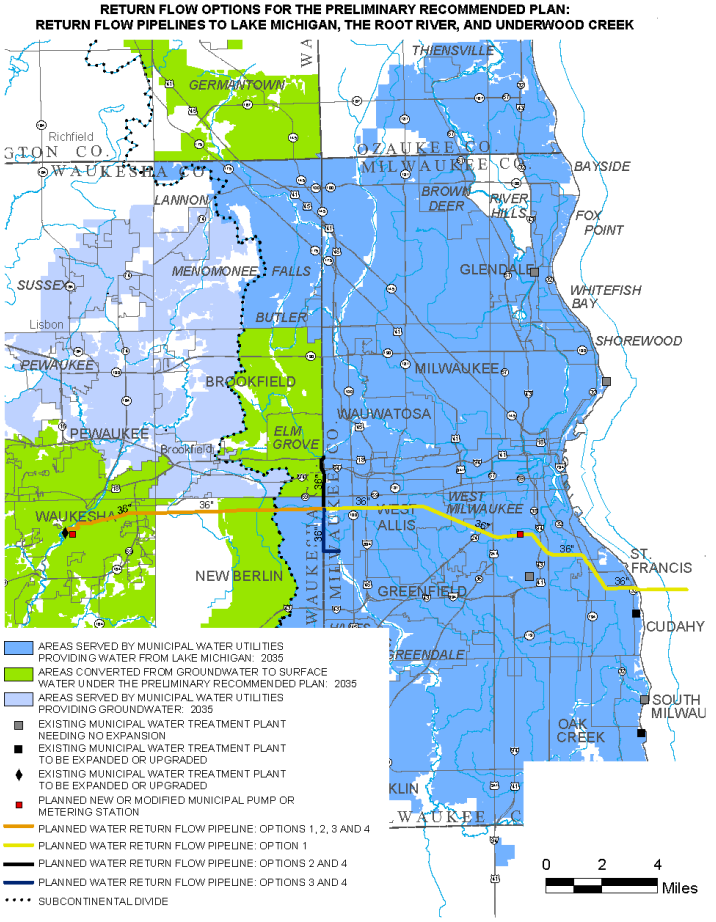
Source: Ruekert & Mielke, Inc. and SEWRPC.



Source: Ruekert & Mielke, Inc. and SEWRPC.



Source: U.S. Geological Survey.



Source: Ruekert & Mielke, Inc. and SEWRPC.

GROUNDWATER AND SURFACE WATER CONDITIONS ASSOCIATED WITH SUBALTERNATIVES TO THE PRELIMINARY RECOMMENDED PLAN: 2035

CONDITIONS IN THE DEEP AQUIFER

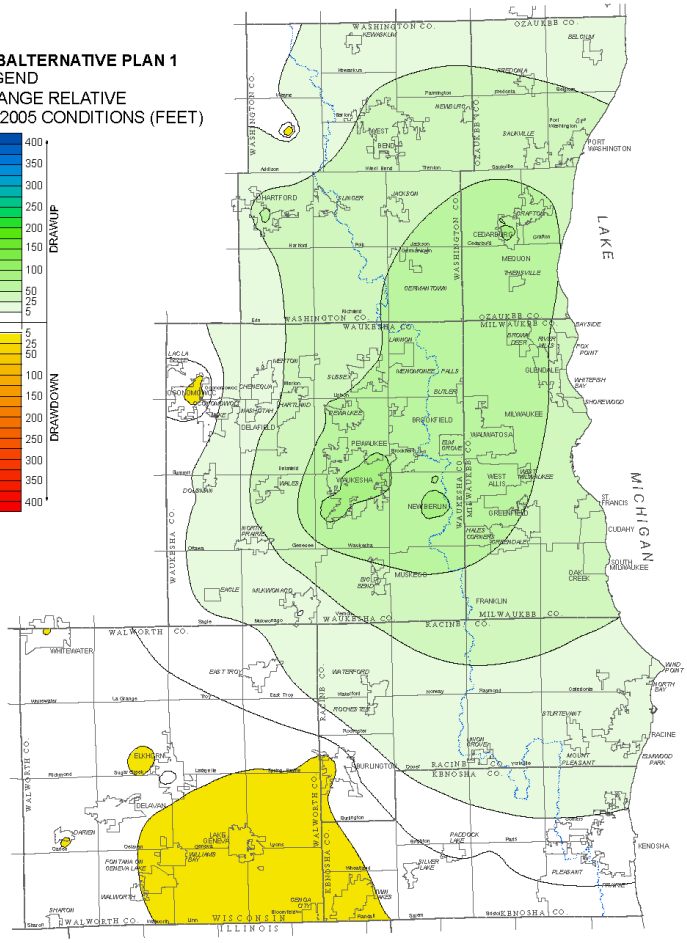
SUBALTERNATIVE PLAN 1

LEGEND

CHANGE RELATIVE TO 2005 CONDITIONS (FEET)

DRAWUP: 400, 350, 300, 250, 200, 150, 100, 50, 25, 5

DRAWDOWN: 5, 25, 50, 100, 150, 200, 250, 300, 350, 400



SUBALTERNATIVE PLAN 2

Note:
Results are from layer 11 in the Regional Aquifer simulation model.

Note:
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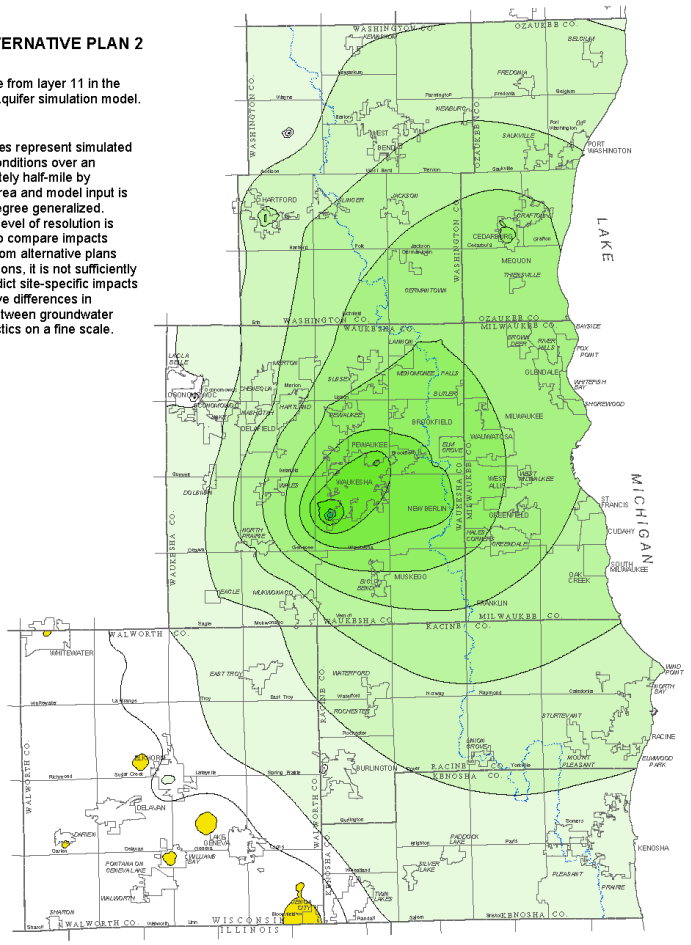
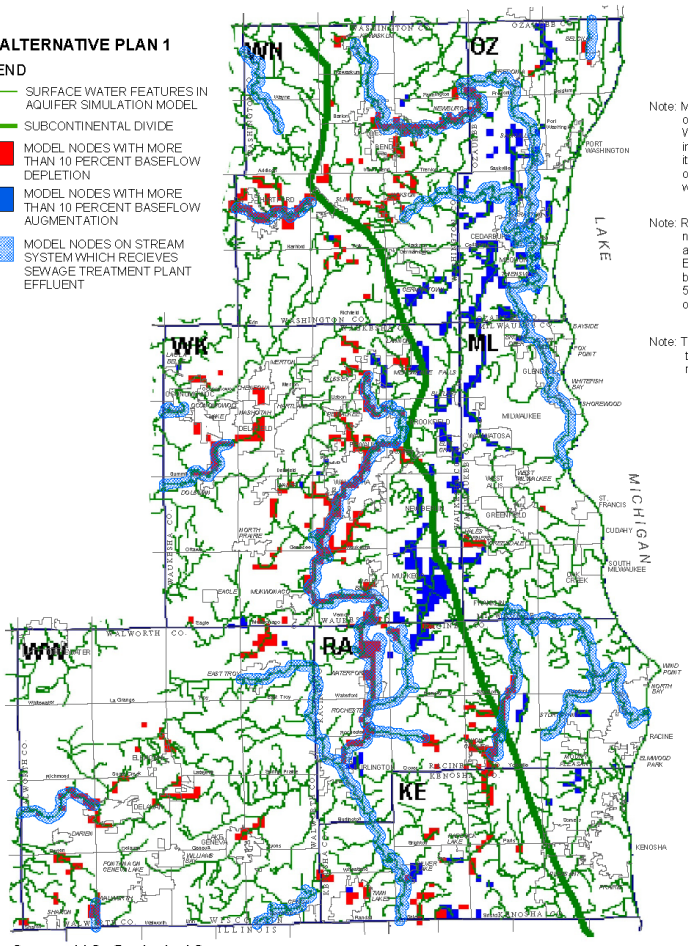


AQUIFER SIMULATION MODEL NODES WITH MORE THAN 10 PERCENT BASEFLOW DEPLETION OR BASEFLOW AUGMENTATION

SUBALTERNATIVE PLAN 1

LEGEND

- SURFACE WATER FEATURES IN AQUIFER SIMULATION MODEL
- SUBCONTINENTAL DIVIDE
- MODEL NODES WITH MORE THAN 10 PERCENT BASEFLOW DEPLETION
- MODEL NODES WITH MORE THAN 10 PERCENT BASEFLOW AUGMENTATION
- MODEL NODES ON STREAM SYSTEM WHICH RECIEVES SEWAGE TREATMENT PLANT EFFLUENT



SUBALTERNATIVE PLAN 2

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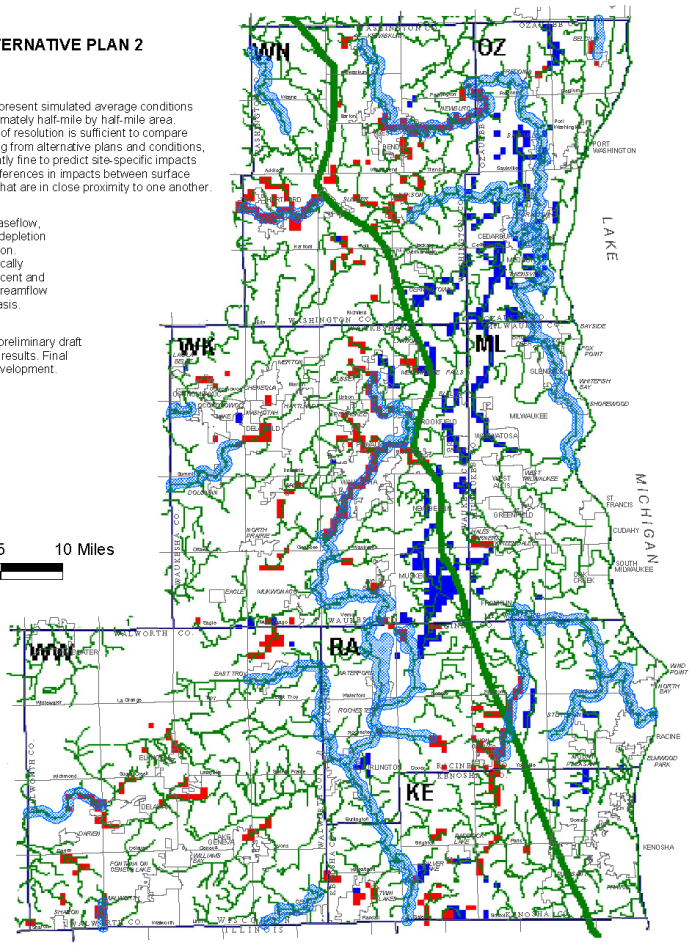
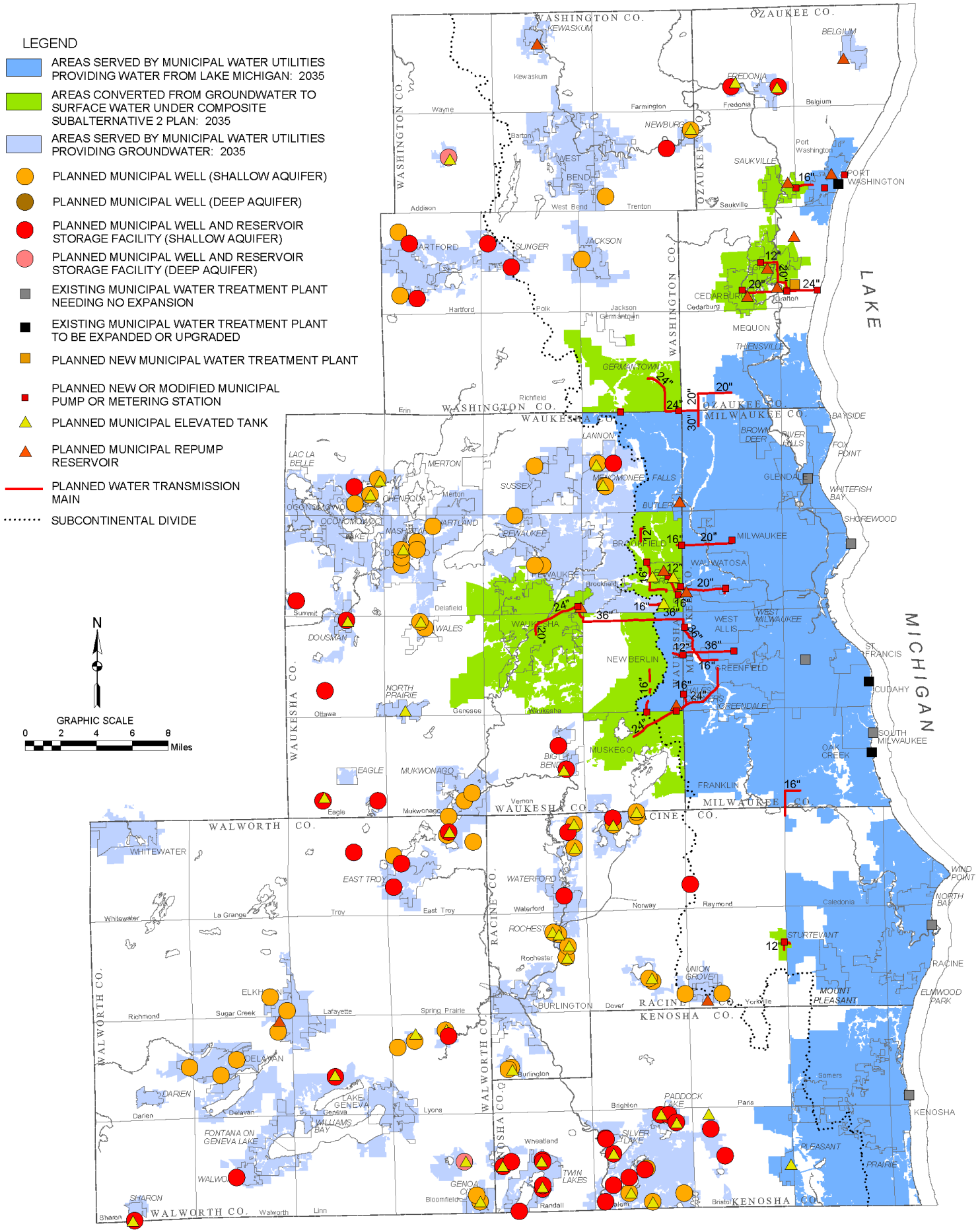
0 5 10 Miles



Source: U.S. Geological Survey.

PRELIMINARY RECOMMENDED REGIONAL WATER SUPPLY PLAN 2035: INTERMEDIATE EXPANSION OF LAKE MICHIGAN SUPPLY



Source: Ruekert & Mielke, Inc. and SEWRPC.

ENVIRONMENTAL JUSTICE AND WATER SUPPLY PLANNING

What is Environmental Justice?

- Executive Order 12898, February 11, 1994: "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," which reinforces the nondiscrimination provisions of Title VI of the Civil Rights Act of 1964.

Three Fundamental Environmental Justice Principles… Related to Minority and Low-Income Populations:

- To avoid, minimize, or mitigate disproportionately high and adverse effects of decisions.
- To ensure full and fair participation in decision-making.
- To prevent denial, reduction, or significant delay in benefits (receiving proportionate share).

How does Environmental Justice Affect Regional Planning?

- Planning organizations like SEWRPC need to conduct planning that embodies Environmental Justice principles and evaluate plan recommendations to determine whether plans are balanced.
  - Fairly share burdens and benefits of recommendations across society, particularly with respect to minority and low-income populations.
- For decades, SEWRPC has advanced planning concepts and recommendations supporting a more sustainable Region:
  - Preserve and enhance the Region's natural environment.
  - Preserve prime agricultural land.
  - Encourage a more efficient, centralized regional land development pattern.
  - Encourage a more balanced, multi-modal transportation system.
- These principles lead to plans that help achieve Environmental Justice, in part because urban communities and neighborhoods can remain vital.

SEWRPC's Environmental Justice (EJ) Task Force

- In 2007, the Commission formed an EJ Task Force comprised of 15 representatives of minority, low-income, and special needs populations from throughout southeastern Wisconsin.
- The Task Force is a nontraditional means to generate additional ideas and further broaden input, which may benefit minority and low-income populations, and others.
- Among important activities, the EJ Task Force reviews and comments upon regional planning documents, particularly at draft or scoping stages.
  - Specific focus on the effects of plans on EJ populations and whether and how the benefits and burdens of those plans are shared.

What We Have Heard So Far from the EJ Task Force?

- Comments that communities which receive Lake Michigan water from the City of Milwaukee in accord with implementation of a regional water supply plan should in turn fully implement other elements of regional plans:
  - Transportation (Public Transit)
  - Land Use
  - Housing