Section 3
Proposed Project

SECTION 3

Proposed Project

The proposed project for the City of Waukesha's future water supply is a Lake Michigan water supply with return flow to Underwood Creek. A Lake Michigan water supply would be obtained from one of three potential suppliers: the Cities of Milwaukee, Oak Creek, or Racine. The final water supplier will be determined through contract negotiations, that are currently in progress and that will determine the final project that will be implemented. The unsuccessful suppliers will then become alternatives to the proposed project and they will not be implemented. The proposed project includes return flow to Underwood Creek for the selected water supplier.

The proposed project will provide 10.9 million gallons per day (mgd) to meet future average day water supply demand of the City's projected water service area as delineated by the local planning authority, the Southeastern Wisconsin Regional Planning Commission (SEWRPC). The City of Waukesha water supply needs have been documented in the Water Supply Service Area Plan (Appendix B of the Application) and are summarized below.

Information on each of the potential Lake Michigan water suppliers and the Underwood Creek return flow are included below. A detailed evaluation of the environmental effects is included in Section 5 of this document. A side by side comparison of environmental effects of the proposed project and alternatives to the proposed project is included in Section 6 of this document.

3.1 Water Supply

The water supply will be obtained from Lake Michigan regardless of the specific supplier. Each supplier is a municipal water utility operating adjacent to Lake Michigan that has facilities in place to withdraw water from Lake Michigan and treat it to drinking water quality standards. Each supplier has provided a letter of resolution to the City of Waukesha indicating their willingness to negotiate an agreement for the sale of water (see the Water Supply Service Area Plan, Appendix B in the Application). New facilities in the form of a booster pump station and pipeline are needed to supply water to the City of Waukesha.

Once the City of Waukesha receives the water, the water will be used as Waukesha's primary municipal water supply. After receiving a Lake Michigan water supply, the City of Waukesha's groundwater water supply wells will no longer be used, although the wells may be maintained as an emergency backup should the primary Lake Michigan supply temporarily become unavailable.

The main difference between potential Lake Michigan water suppliers is the pipeline alignment to convey the water into the City of Waukesha. Each of the three potential water suppliers is described below.

3.1.1 Lake Michigan Intake

Each of the Lake Michigan suppliers has an existing intake from Lake Michigan. No changes would occur to any of the existing intakes under the proposed project. The raw water from the Lake Michigan intake at each supplier is pumped to the municipal drinking water treatment plant for treatment to drinking water standards.

3.1.2 Water Supply Treatment

The existing treatment plant capacity in the City of Milwaukee, Oak Creek and Racine would be used to supply drinking water to the City of Waukesha. Once the Lake Michigan raw water reaches the treatment plant, it is treated to meet drinking water standards. All potential water suppliers have available treatment capacity to serve the City of Waukesha's existing water supply needs.

3.1.3 Supply Pipeline

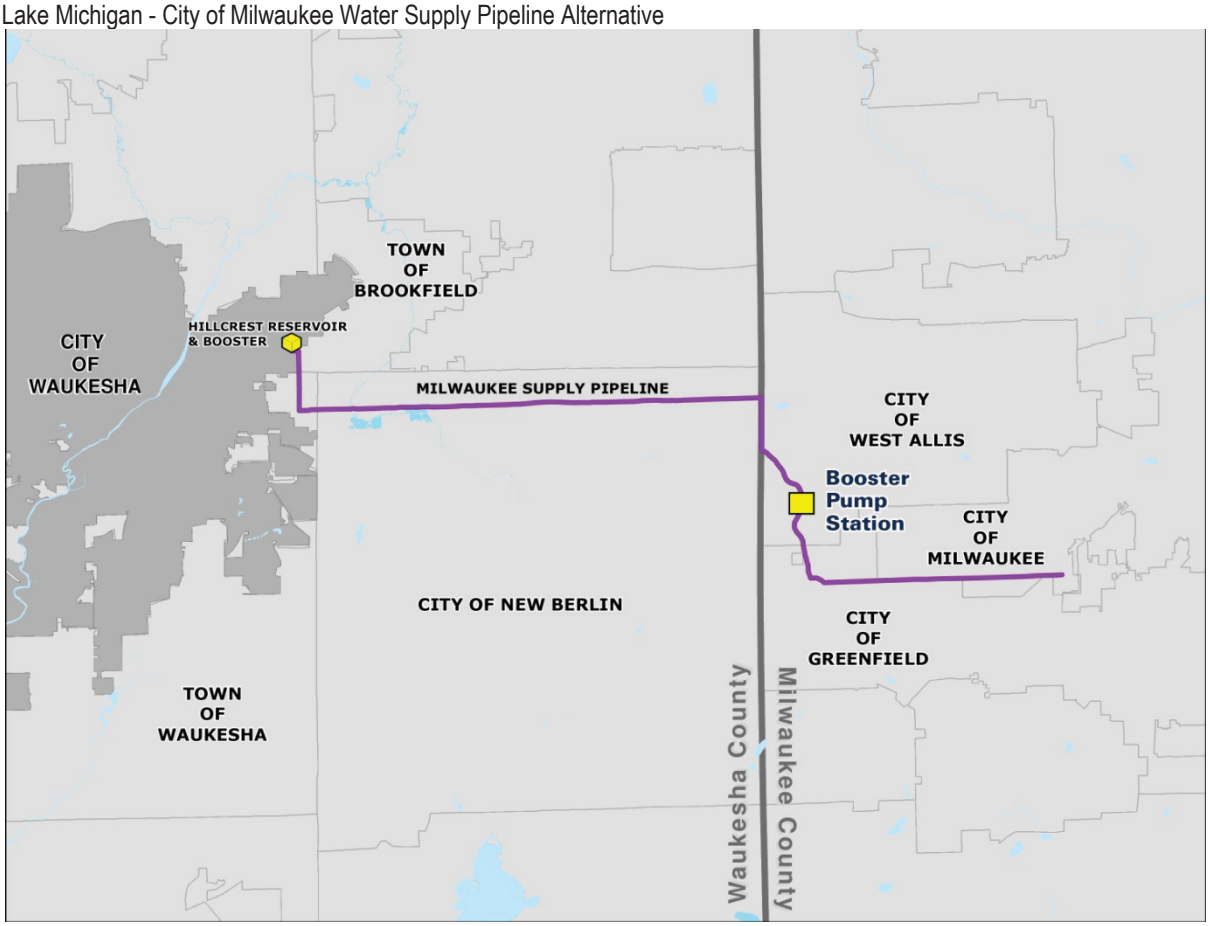
The infrastructure needed to convey the drinking water from the Lake Michigan supplier to the City of Waukesha consists of a booster pump station and a pipeline. The water supply pipeline would connect to the City of Milwaukee, Oak Creek or Racine existing distribution system and would convey the water to the City of Waukesha's Hillcrest drinking water reservoir for distribution throughout the City of Waukesha. The booster pump station and pipeline needs vary by supplier as discussed below.

3.1.3.1 City of Milwaukee

This alternative includes a connection to the City of Milwaukee's distribution system near 60th Street and Howard Avenue. This location is assumed because there is a large transmission main nearby. From this connection, a 36-inch pipeline would head west and follow City and Milwaukee County streets for about 6 miles. Along this segment a booster pump station would be constructed. From the booster pump station, the pipeline would continue west for about 6 miles along a utility corridor. The last segment of pipe (about 1 mile) would continue on City streets and lightly developed areas with a connection at the Hillcrest reservoir.

Figure 3-1 and Attachment 3-1 show the pipeline alignment for this alternative and the other Lake Michigan alternatives.

FIGURE 3-1
Lake Michigan - City of Milwaukee Water Supply Pipeline Alternative



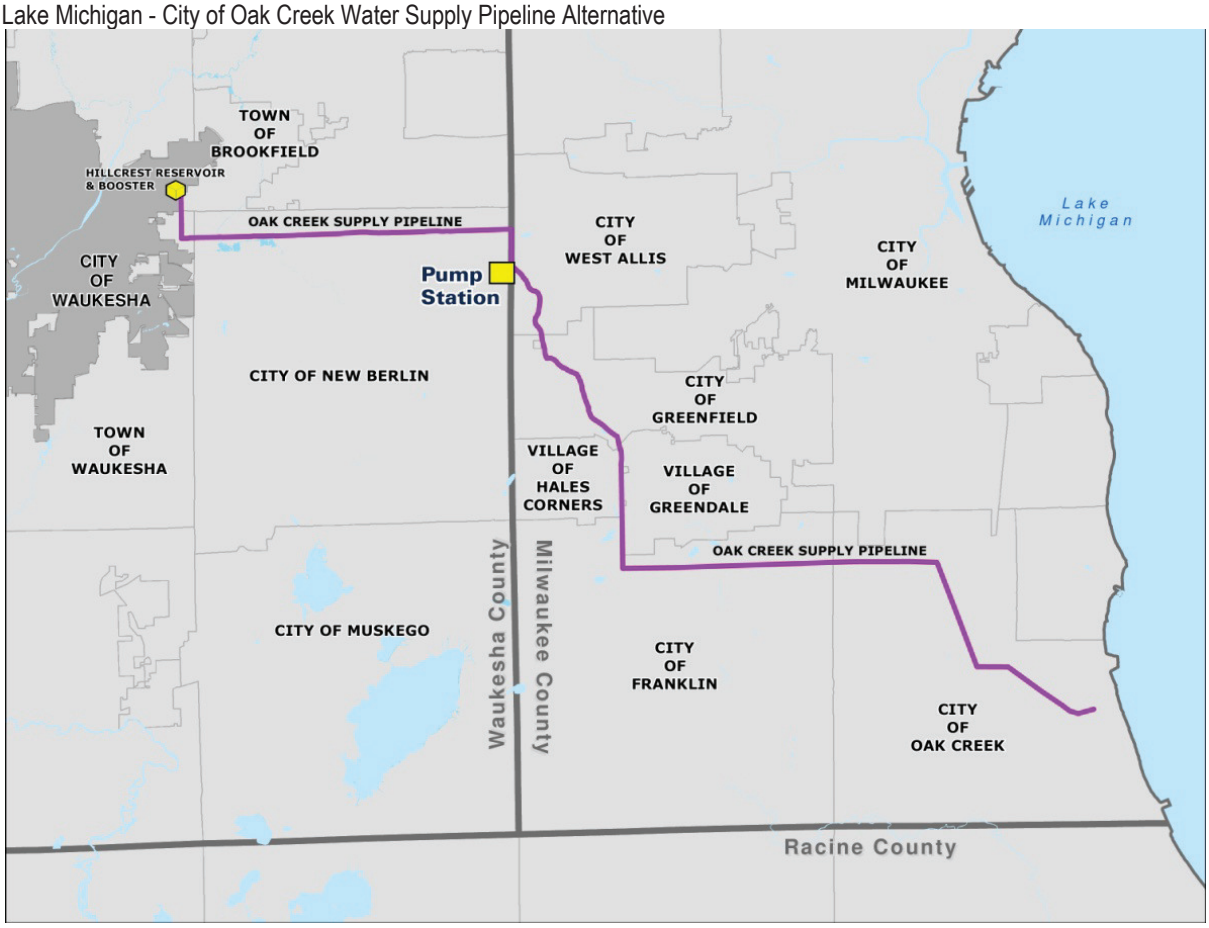
3.1.3.2 City of Oak Creek

This alternative includes a connection to the City of Oak Creek's distribution system near the water treatment plant. A location close to the water treatment plant is assumed because there are no large transmission mains further west with sufficient capacity to serve the City of Waukesha. A pump station would be constructed at the existing water treatment plant.

From this connection, a 36-inch pipeline would head west and follow utility corridors and City and Milwaukee County streets for about 15 miles. A booster pump is assumed to be constructed along this segment of pipeline. The remaining 10 miles of pipeline is the same as the City of Milwaukee supply where it follows City and County streets and a utility corridor. The same as the City of Milwaukee supply, a City of Oak Creek supply would connect at the Hillcrest reservoir.

Figure 3-2 and Attachment 3-1 show the pipeline alignment for this alternative.

FIGURE 3-2
Lake Michigan - City of Oak Creek Water Supply Pipeline Alternative



3.1.3.3 City of Racine

This alternative includes a connection to the City of Racine's distribution system near Hwy C and Newman Road. A pump station would be constructed at the connection point to the City of Racine. This location is assumed because there is an existing water reservoir nearby.

From this connection, a 36-inch pipeline would head west and follow city, state and county roads, and utility corridors for the entire distance. A booster pump station would be constructed along the alignment. The last 2 miles of the alignment are the same as the Cities of Milwaukee and Oak Creek alignments, where it follows a utility corridor for about 1 mile and city streets and lightly developed areas for the final mile before its connection at the Hillcrest reservoir.

Figure 3-3 and Attachment 3-1 show the pipeline alignment for this alternative. Table 3-1 includes a summary of the pipe size and length anticipated for the proposed project.

FIGURE 3-3
Lake Michigan - City of Racine Water Supply Pipeline Alternative

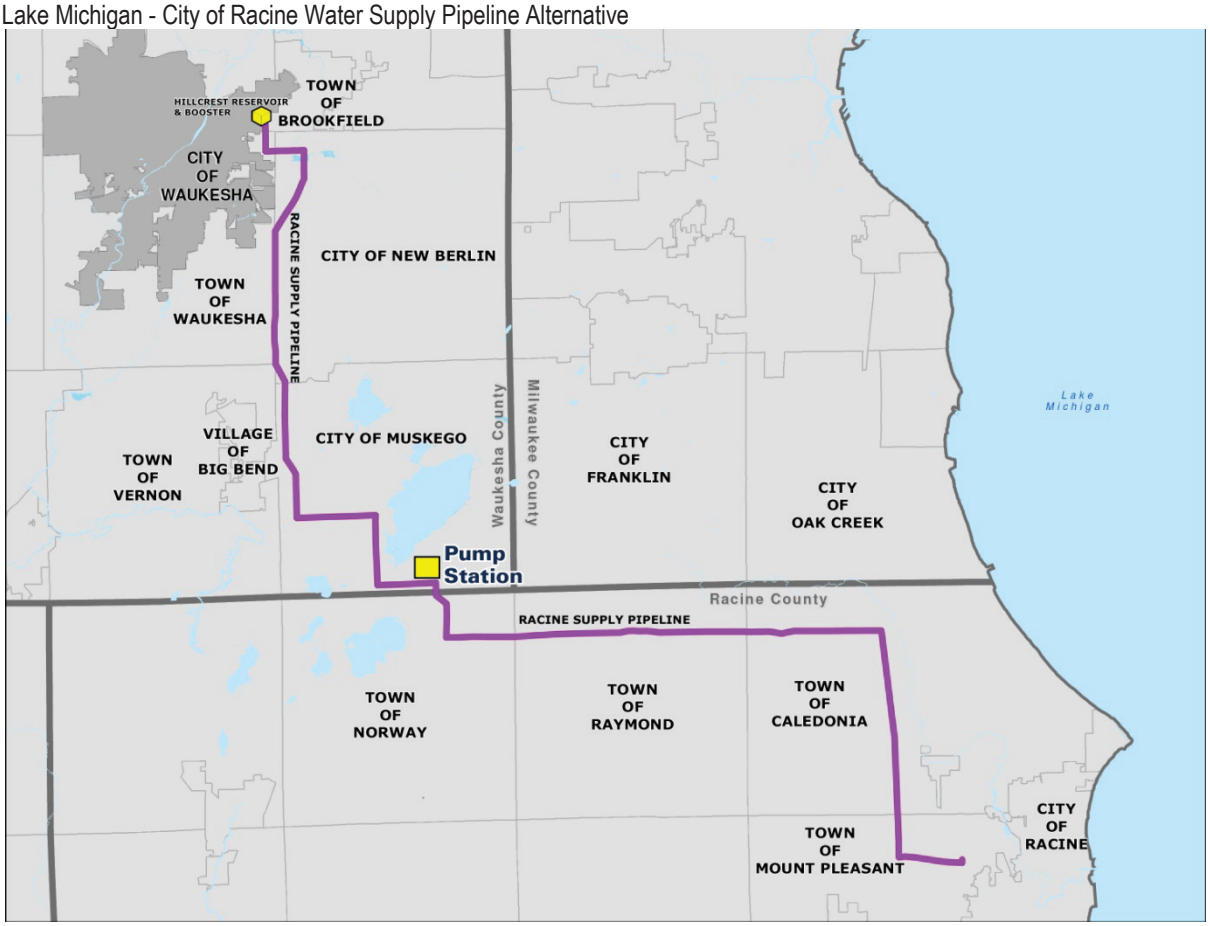


TABLE 3-1
Proposed Project Pipeline Facilities

Alternative	Diameter (inches)	Length (miles)	Counties
Lake Michigan Water Supply			
Lake Michigan (City of Milwaukee)	36	15	Milwaukee and Waukesha
Lake Michigan (City of Oak Creek)	36	27	Milwaukee and Waukesha
Lake Michigan (City of Racine)	36	38	Racine and Waukesha
Return Flow for Lake Michigan Supply			
Underwood Creek to Lake Michigan	36	11.5	Milwaukee and Waukesha

3.1.4 Water Distribution and Use

3.1.4.1 Water Demand Forecasts

Water demand forecasts for the City of Waukesha water supply service area were developed on the basis of the delineated water supply service area, population projections

for the service area, historic water use by customer class, and the expansion of the City's water conservation program.

3.1.4.2 Water Supply Service Area

The City of Waukesha presently provides water service to the City and limited properties that are located outside the city limits. For long-range water supply planning, SEWRPC delineated the City of Waukesha water supply service area that includes nearby parts of neighboring communities. The water supply service area includes 3.7 percent of the City of Pewaukee, 9 percent of the Town of Delafield, 14.9 percent of the Town of Genesee, and 83.6 percent of the Town of Waukesha. One reason the areas are candidates for future municipal water service is because of past private well contamination by pathogens, pollution, and naturally occurring elements in the groundwater. If there is a need and a request for public water service, the City's municipal water system may be expanded to serve the areas that are currently served by private wells and septic systems. To the extent practical, the water supply service area is consistent with the City's delineated sewer service area.

The City of Waukesha water supply service area is shown in Figure 3-4. It represents the full development land use envisioned in the Waukesha County Comprehensive Plan. Full development, or build-out, condition is projected to occur sometime around 2050, based on historical state population trends. SEWRPC prepared population projections for the water supply service area including 85,800 people in 2028, 88,500 people in 2035, and an ultimate build-out population of 97,400 people (Figure 3-5). The projections are based on municipal estimates from the State of Wisconsin Department of Administration and multiple planning factors, including but not limited to land use, household size, demographic trends, and community development plans. Additional details of the water supply service area are included in the Water Supply Service Area Plan (Appendix B of the Application).

3.1.4.3 Water Conservation Applied Across the Water Service Area

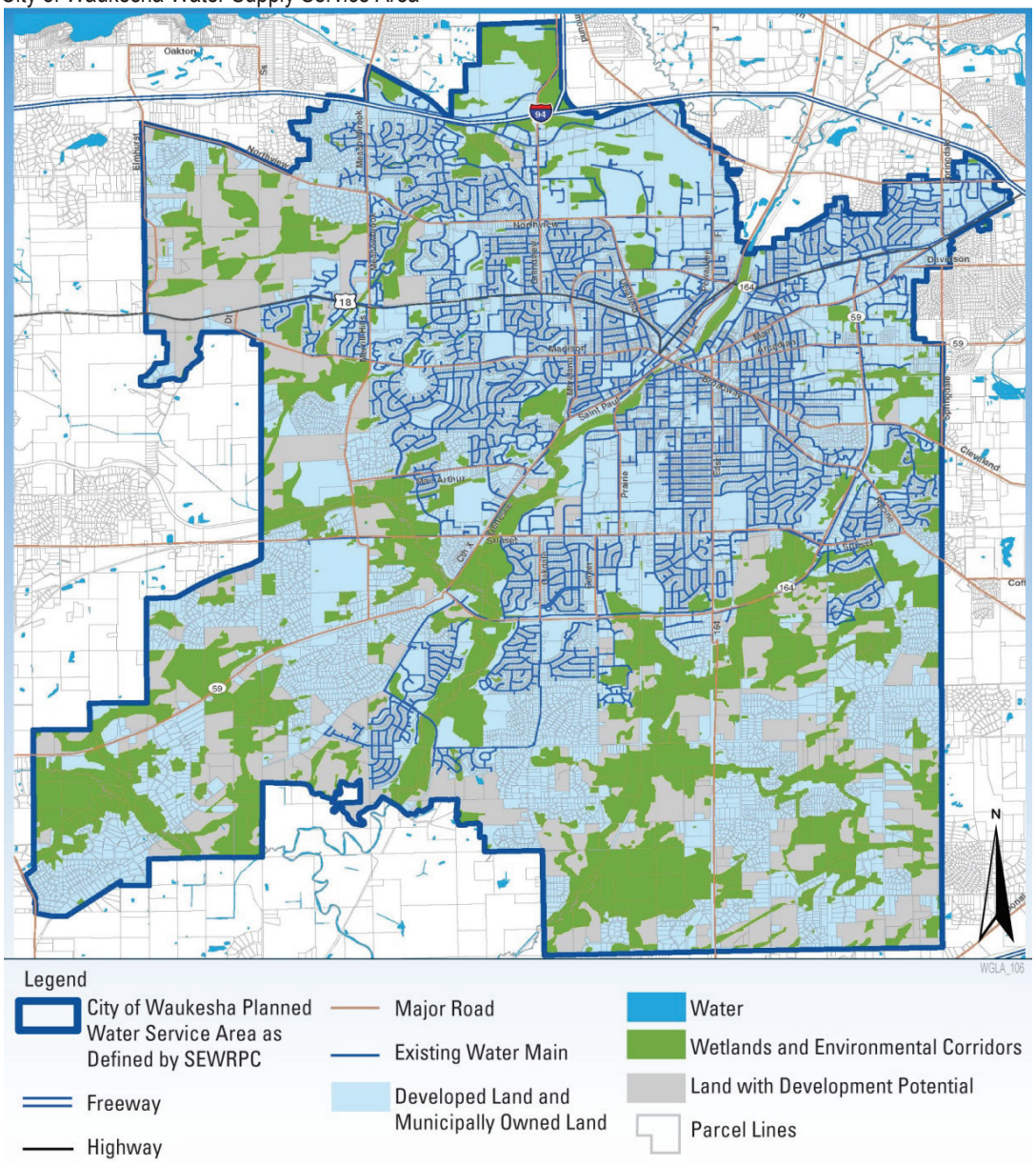
The water conservation measures implemented by the City apply to all of its customers, whether they are located within city limits or not. Under current water service rules regulated by the Wisconsin Public Service Commission (PSC), all customers are subject to the City's conservation measures, including the water rate schedule, outdoor water use restrictions, and financial incentives to install water-saving toilets. If water service is extended to areas outside the City, customers will be required to adhere to the City's conservation program as established in the service rules as well as in future service contracts. The City will provide water conservation public education to new customers and make available information, services and incentives to help its customers use water wisely.

3.1.4.4 Historical Water Use

Figure 3-6 and Table 3-2 summarize water use by customer class and historical water consumption for the period 1999 to 2010. Residential customers, including multi-family residential customers, consistently represent the City's largest customer class. The City's residential population increased about 12 percent between 1999 and 2010. Since 1999, water use by single-family residential customers has decreased by 8.6 percent. Over this same period, total water pumping decreased 19.4 percent.

Since adoption of the 2006 Water Conservation and Protection Plan additional focus was provided on water use efficiency. This is evidenced by the greater than 14 percent reduction in total pumping from wells between 2005 and 2010. Some water use reduction may be attributed to weak economic conditions and seasonal rainfall over the same period; however, some of the water saved can be attributed to water conservation education, regulation, and incentives. Additional details of historical water use and conservation are included in the Water Supply Service Area Plan (Appendix B of the Application).

FIGURE 3-4
City of Waukesha Water Supply Service Area



Source: Adapted from Water Supply Service Area for the City of Waukesha and Environs, Waukesha County, Wisconsin, SEWRPC, December 2008

FIGURE 3-5
City of Waukesha Water Supply Service Area Plan Population Projections

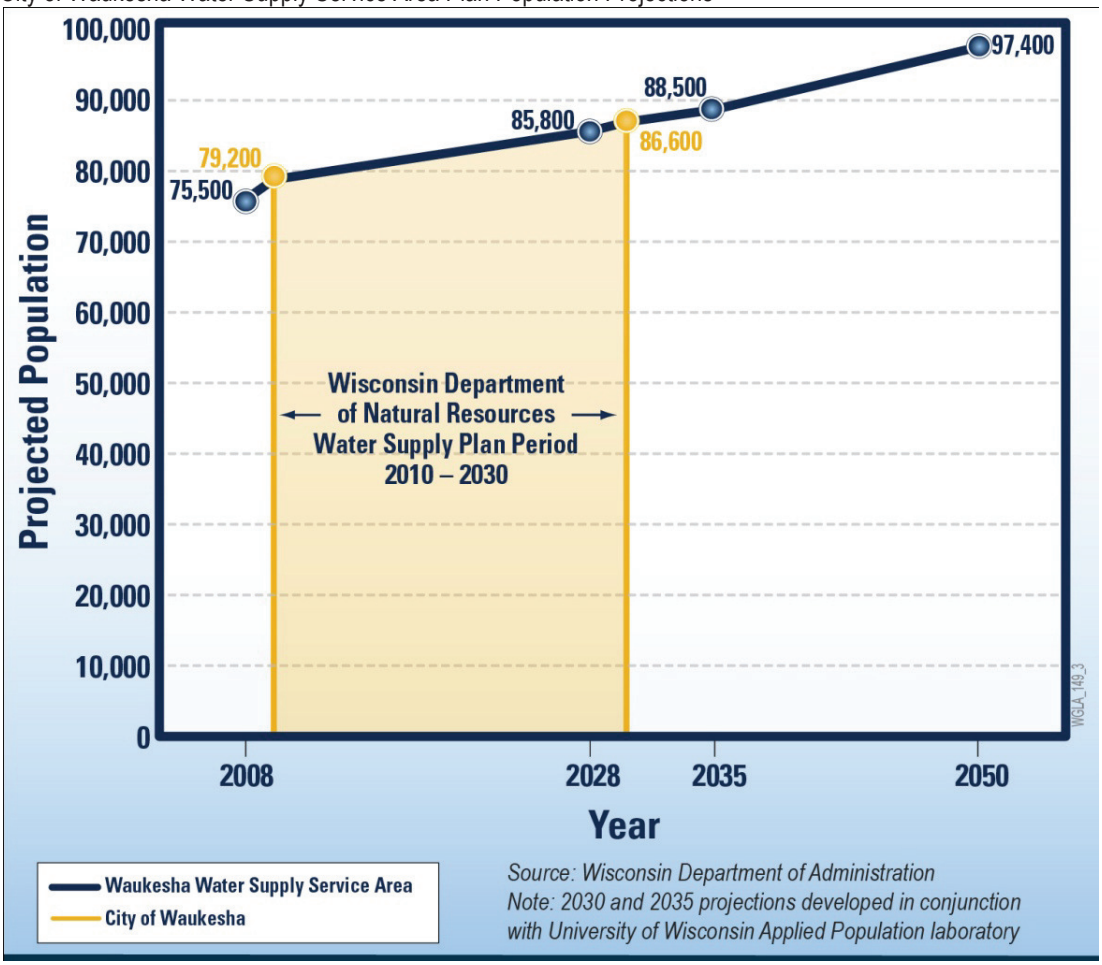


FIGURE 3-6
Annual Water Use Trend by Customer Class: Waukesha Water Utility

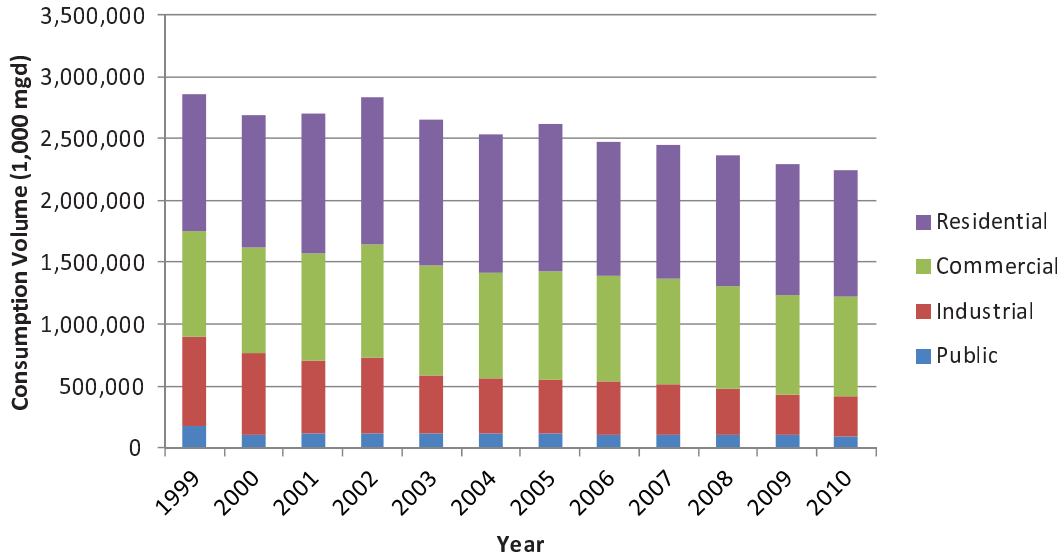


TABLE 3-2
City of Waukesha Historical Annual Water Consumption

Year	Residential	Commercial	Industrial	Public	Total Water Sales	Total Pumpage	Water Used but not Sold	Unaccounted for Water	Unaccounted for Water, %
2010	1,016,670	801,974	326,289	93,491	2,238,164	2,437,964	47,113	152,687	6
2009	1,054,288	806,736	325,667	99,619	2,286,310	2,479,895	27,930	165,655	7
2008	1,056,650	827,543	382,413	99,646	2,366,252	2,530,964	37,879	126,833	4
2007	1,086,542	846,566	404,079	110,532	2,447,719	2,618,682	3,791	167,172	6
2006	1,077,127	858,062	424,603	109,846	2,469,638	2,620,450	14,676	136,136	5
2005	1,193,851	874,418	428,518	120,126	2,616,913	2,831,510	5,054	209,543	7
2004	1,117,325	854,624	435,004	121,601	2,528,554	2,698,980	6,169	164,257	6
2003	1,176,115	895,850	461,885	120,071	2,653,921	2,795,859	3,228	138,710	5
2002	1,185,745	914,138	612,856	119,173	2,831,912	2,953,216	21,540	99,764	3
2001	1,128,475	874,030	586,552	114,492	2,703,549	2,821,969	37,909	80,511	3
2000	1,067,184	848,664	660,364	108,873	2,685,085	2,836,141	19,057	131,630	5
1999	1,112,499	847,914	722,097	177,408	2,859,918	3,028,414	n/a	168,496	6

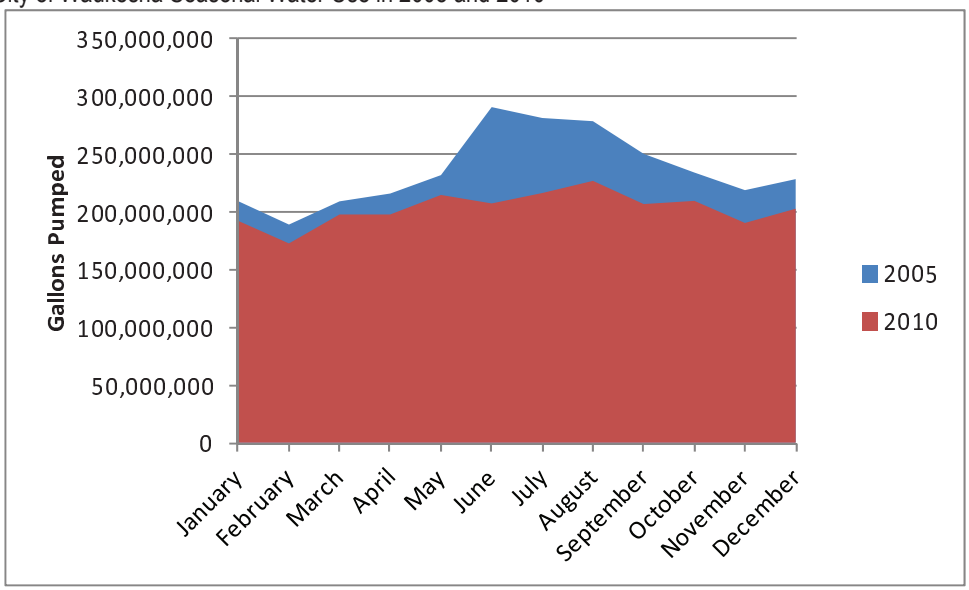
Note: Consumption volume values are given in 1,000 gallons.

3.1.4.5 Variations in Customer Demand.

Water demand varies and is typically influenced by several factors including precipitation, temperature, economic conditions, personal income, and community conservation goals. While reductions in water use in wet and cool years or increases in water use associated with higher personal income may be observed, correlating how the factors affect one another is not a straightforward process. Quantification and disaggregation of the effect of variables such as weather (especially temperature and rainfall), economic conditions, and public awareness on water use require extensive data collection and analysis. Results of the City's review of available water use-related data indicating trends that provide insights into long-range water demand forecasts are described below.

3.1.4.5.1 Seasonal Variation in Water Demand. Seasonal water use patterns provide helpful information regarding water use in the City's water service area. Figure 3-7 presents monthly water use in 2005 (before the 2006 Water Conservation and Protection Plan) and in 2010. In 2006, the City adopted a municipal ordinance restricting lawn and landscape irrigation to no more than 2 days per week between May 1 and October 1. Since Waukesha's water conservation ordinance has been in effect, seasonal peak water demands have declined significantly. While the City must plan for a peak pumping season from May through September, its water demand forecasts for the future assume the City will continue to restrict peak season outdoor water use.

FIGURE 3-7
City of Waukesha Seasonal Water Use in 2005 and 2010



Source: City of Waukesha Annual Report to the Wisconsin Public Service Commission, 2010

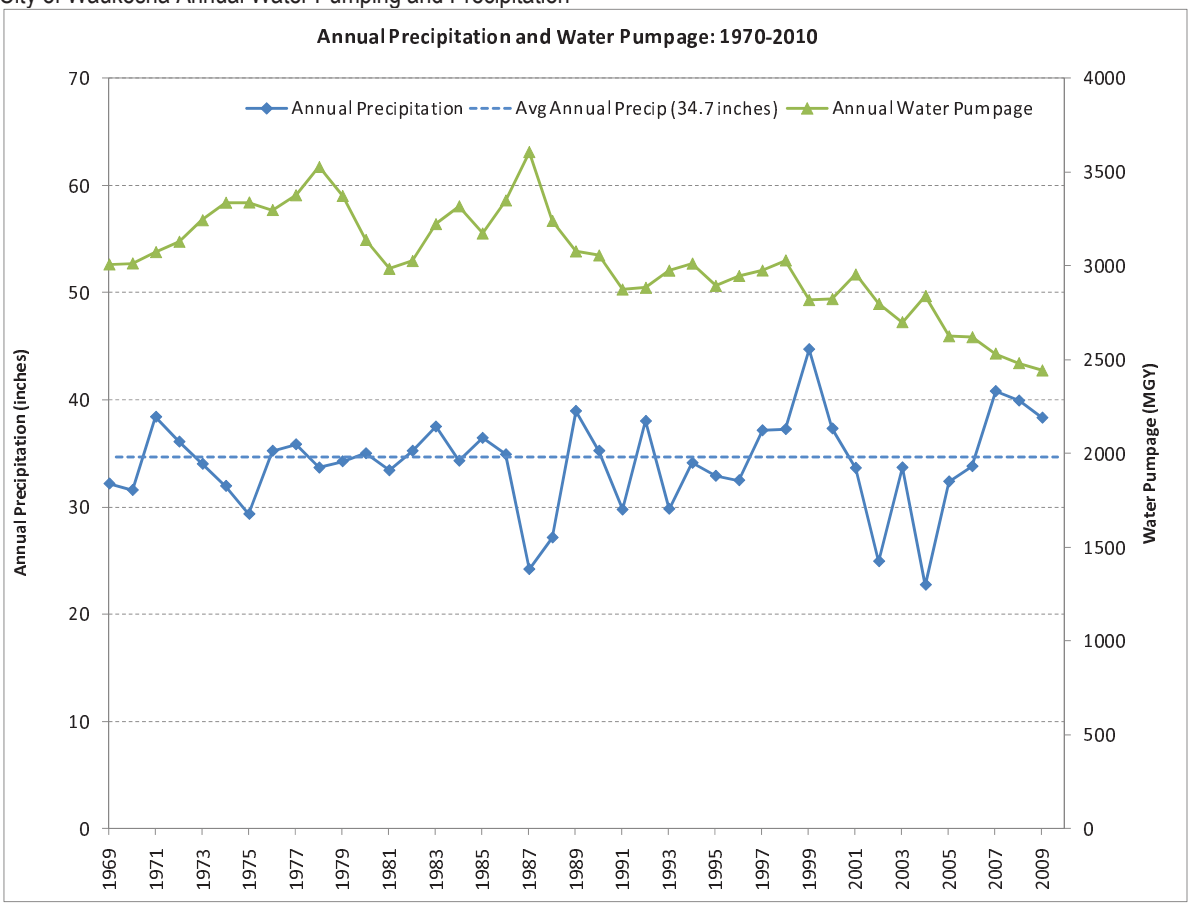
3.1.4.5.2 Water Demand Variation with Precipitation. Local climate conditions (such as temperature and wind) and precipitation events (duration, number, and intensity of rainfall and snow) vary widely throughout the year and from year-to year. To some extent, their effect on water use can be observed. In Waukesha, for example, some years that experienced

high precipitation correlate with reduced demands, such as 2008 through 2010, as shown in Figure 3-8, while in other years they do not.

To look for high-level water use trends, the City reviewed the annual water pumpage and precipitation data over the past 40 years, summarized in Figure 3-8. The data indicate a declining trend in the volume of water pumped to meet City demand. This trend may be attributed to many factors, including new water conserving appliances required by code since the mid 1990s, the City's water conservation measures, and the recent economic downturn. The data also illustrate that water demand in the City increases in years of below-average rainfall.

Even though the City receives an average of 34.7 inches of precipitation annually and has implemented a conservation program, it must plan for periods of abnormally dry to moderate drought conditions or high temperatures when water demands may increase or supplies may be constrained. Sound engineering practice requires planning for potential droughts to ensure adequate water supply availability to meet essential water needs, such as those for residential sanitation, firefighting, economic stability, system maintenance, and other similar requirements.

FIGURE 3-8
City of Waukesha Annual Water Pumping and Precipitation



3.1.4.5.3 Water Demand Variation due to Economic Conditions. During the economic downturn of the last several years, water use in the City has declined. In fact, water use, both in terms of volume and water use intensity, is at historic low levels. During a weak economy, discretionary water use typically declines, and customers make changes in their behavior, processes, appliances, and equipment to use water more efficiently. In recent years, the City's commercial and industrial customers have implemented water use efficiency measures to reduce or maintain the cost of providing their services and products. With respect to long-term planning, the City considers the impacts of economic cycles transitory. That is, when economic conditions improve during the future planning period, the forces that restrain growth and water use will be removed and water demand will return to higher levels and gradually increase with future growth. Thus, in such a future planning horizon, growth in the commercial and industrial water use sectors is expected to occur at a faster rate than for the residential sector.

3.1.4.5.4 Diurnal Variation in Customer Demand. Table 3-3 summarizes historical variation in average day and maximum day demand over the past 10 years, with the ratio of the annual maximum day to average day water pumpage ranging from a low of 1.31 to 1.66.

TABLE 3-3
City of Waukesha Maximum and Average Daily Flow, 1999–2010

Year	Average Day Pumpage (mgd)	Maximum Day Pumpage (mgd)	Maximum Pumpage Date	Ratio of Maximum to Average Day
2010	6.69	8.65	08/28	1.29
2009	6.79	9.35	08/04	1.38
2008	6.91	9.93	08/19	1.43
2007	7.17	9.79	07/24	1.36
2006	7.18	10.23	07/18	1.42
2005	7.76	12.87	06/23	1.66
2004	7.39	10.48	09/13	1.42
2003	7.66	11.67	08.22	1.52
2002	8.09	12.78	07/17	1.58
2001	7.73	12.53	07/09	1.62
2000	7.72	10.15	06/27	1.31
1999	8.30	11.59	07/07	1.40

Source: City of Waukesha operating data.

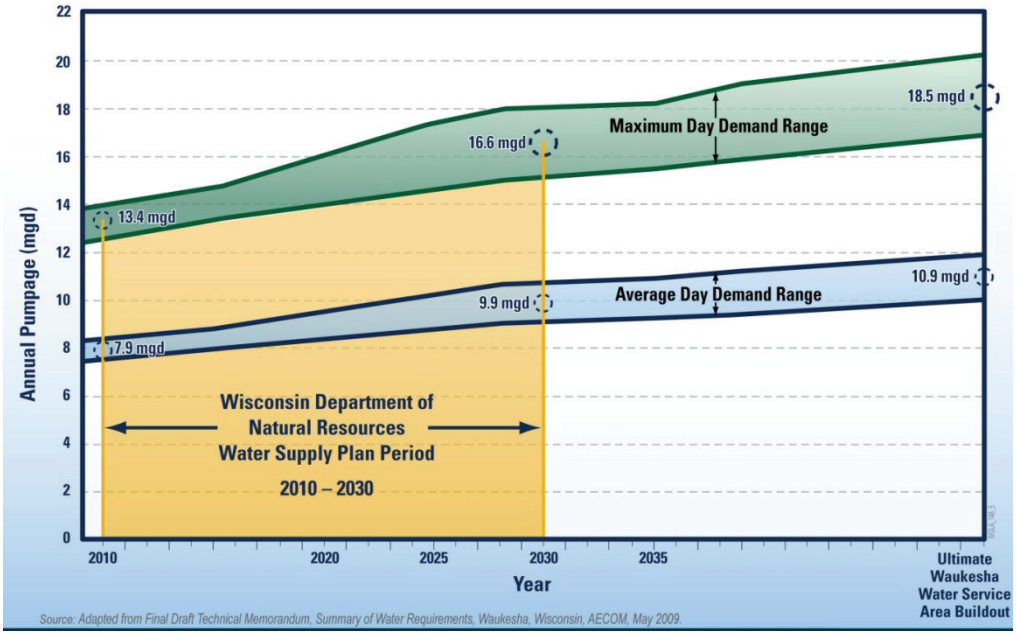
Based on analysis of the City's pumpage data for a 40-year period (1970 to 2010), the maximum day to average day pumping factor used for water system facility design is 1.68. The analysis of this system performance metric is included in an attachment to the Water Supply Service Area Plan, Appendix B of the Application. An attachment to the Water Supply Service Area Plan indicates the appropriate average to peak day ratio used for long-term planning and design (1.68) reflects that value with a 98 percent confidence level (that is, probability) that the actual peak day pumping will be of equal or lesser value. This value

is just slightly higher than the average to peak ratio in 2005. Although average to peak ratio appears to be trending downward since 2005, it is unknown how much of the decrease is due to reliable long-term water use efficiency and how much is due to rainfall, the economy, and other factors.

3.1.5 Water Demand Forecasts

As part of its 2006 water system master plan, the City prepared water demand forecasts. These were updated in 2009 to reflect updated water service area population projections and City water use after implementation of conservation measures. The Summary of Water Requirements attachment to the Water Supply Service Area Plan (Appendix B of the Application) contains the analysis of future water demands used during the planning process. Figure 3-9 shows the average day and maximum day water demand projections.

FIGURE 3-9
City of Waukesha Water Supply Service Area Water Demand Forecasts



The future water demand forecasts are based on the following major assumptions:

- The City's water conservation program is maintained and expanded to meet long-term conservation goals and customer needs.
- If water conservation measures are not in place, the estimated increase in water demand from 2009 levels is forecast to be 0.5 mgd in 2030 and 1 mgd in 2050. That is, without water conservation, the projected average day demand would be 10.4 mgd in 2030 and 11.9 mgd in 2050.
- The target 10 percent savings of 1 mgd average day flow by 2050 complies with *A Regional Water Supply Plan for Southeastern Wisconsin* (SEWRPC, 2010), which evaluated

several levels of water conservation ranging from 4 to 10 percent reductions of average daily demand.

- The ranges of future water forecasts shown in Figure 3-9 were determined by applying water use intensity factors, water savings from conservation, and some contingency to address uncertainty associated in long-term water supply planning for the project population. The uncertainties considered include drought, changes in customer class (particularly the number and type of commercial and industrial users), and prevailing economic conditions.

3.2 Return Flow

The Compact and Wisconsin State Statutes § 281.346 require return flow for the Lake Michigan water supply equal to the volume of the withdrawal, less an allowance for consumptive use. The City of Waukesha has developed a return flow management plan to go beyond those requirements and return 100 percent of the withdrawn water over a management period (see Section 5 of the Application for details of the return flow management plan). The return flow will be from treated wastewater from the City's wastewater treatment plant (WWTP).

The proposed project includes return flow to Underwood Creek, a tributary to Lake Michigan. The return flow pipeline would convey treated wastewater from the City of Waukesha's WWTP to Underwood Creek in Waukesha County (Brookfield, Wisconsin). The City's existing WWTP would provide treatment and a new return flow pump station would be constructed to pump the return flow to Underwood Creek. The City has conducted water quality modeling to understand the water quality impacts to Underwood Creek and Menomonee River associated with return flow (see Appendix I of the Application).

Discharge to the Fox River would continue for volumes greater than that withdrawn from the Lake Michigan basin because the City's wastewater treatment plant generally receives more wastewater than drinking water supplied to its customers. Therefore, the City's Fox River outfall would be utilized consistent with the management plan outlined in Section 5 of the Application. For example, the Fox River outfall would be utilized when flooding conditions are observed in Underwood Creek. Section 5 of the Application and supporting appendixes summarize the return flow management plan and the decision flow charts for when wastewater will flow to either the Fox River or Underwood Creek. A new pipeline is not needed for a discharge to the Fox River.

3.2.1 Wastewater Treatment

The City of Waukesha's WWTP is an activated sludge treatment facility with tertiary dual media filtration (sand and anthracite) and ultraviolet (UV) light disinfection. The plant consistently produces high quality effluent that has very low BOD (biochemical oxygen demand), TSS (total suspended solids), NH_3-N (ammonia) and TP (total phosphorus) that meets all of its permit requirements. The City of Waukesha's WWTP currently discharges to the Fox River, which is in the Mississippi River watershed. The proposed project would require a new pump station, return flow pipeline, and outfall for the return flow to Underwood Creek, a tributary to Lake Michigan.

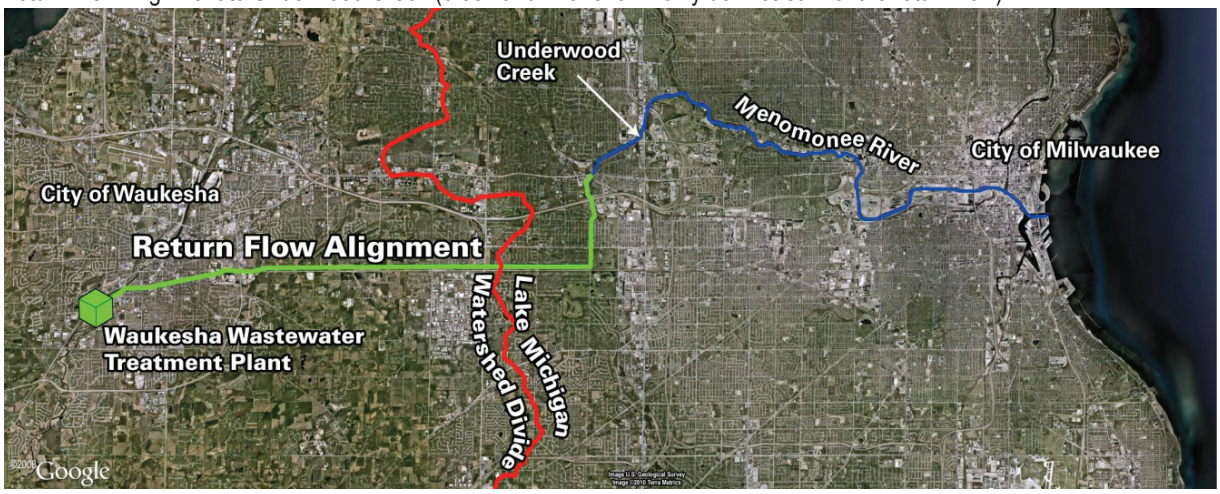
The City has recently completed a Wastewater Treatment Facility Plan[1] that identified improvements and WWTP expansion projects for the next 20 years. Included in that plan were provisions for UV disinfection and reaeration improvements. An amendment to that facility plan (Appendix E in the Application) was developed that identified improvements required for a return flow to Underwood Creek. Most notably is a return flow pump station that would be located at the City's WWTP to return treated wastewater.

3.2.2 Return Flow Pipeline

A screening level layout was developed for the return flow pipeline (Figure 3-10 and Attachment 3-1). It begins at the City of Waukesha WWTP, and proceeds north and east through a City park and along an alley and minor streets for about 1.3 miles. The pipeline continues east for another 1.3 miles following an abandoned railroad corridor planned for a future recreational trail, where it joins with a utility corridor and bike trail and runs for another 7 miles. The pipeline continues north 1.9 miles along a street and bike path until it ends near the confluence of the north and south branch of Underwood Creek, near Bluemound Road. In total, the pipeline consists of about 11.5 miles of 36-inch pipe.

FIGURE 3-10

Return Flow Alignment to Underwood Creek (creek and river shown only downstream of the return flow)



3.2.3 Effluent Discharge

The Wisconsin Pollutant Discharge Elimination System (WPDES) permit for the City of Waukesha WWTP is effective until December 31, 2012. The WPDES permit is included as an attachment to Appendix E in the Application. The WWTP is an activated sludge treatment facility with tertiary dual media filtration (sand and anthracite) and ultraviolet light disinfection. The plant consistently produces high quality effluent that has very low BOD (biochemical oxygen demand), TSS (total suspended solids), NH_3-N (ammonia) and TP (total phosphorus). The WWTP meets all of its permit requirements and is committed to doing so when a new permit is issued.

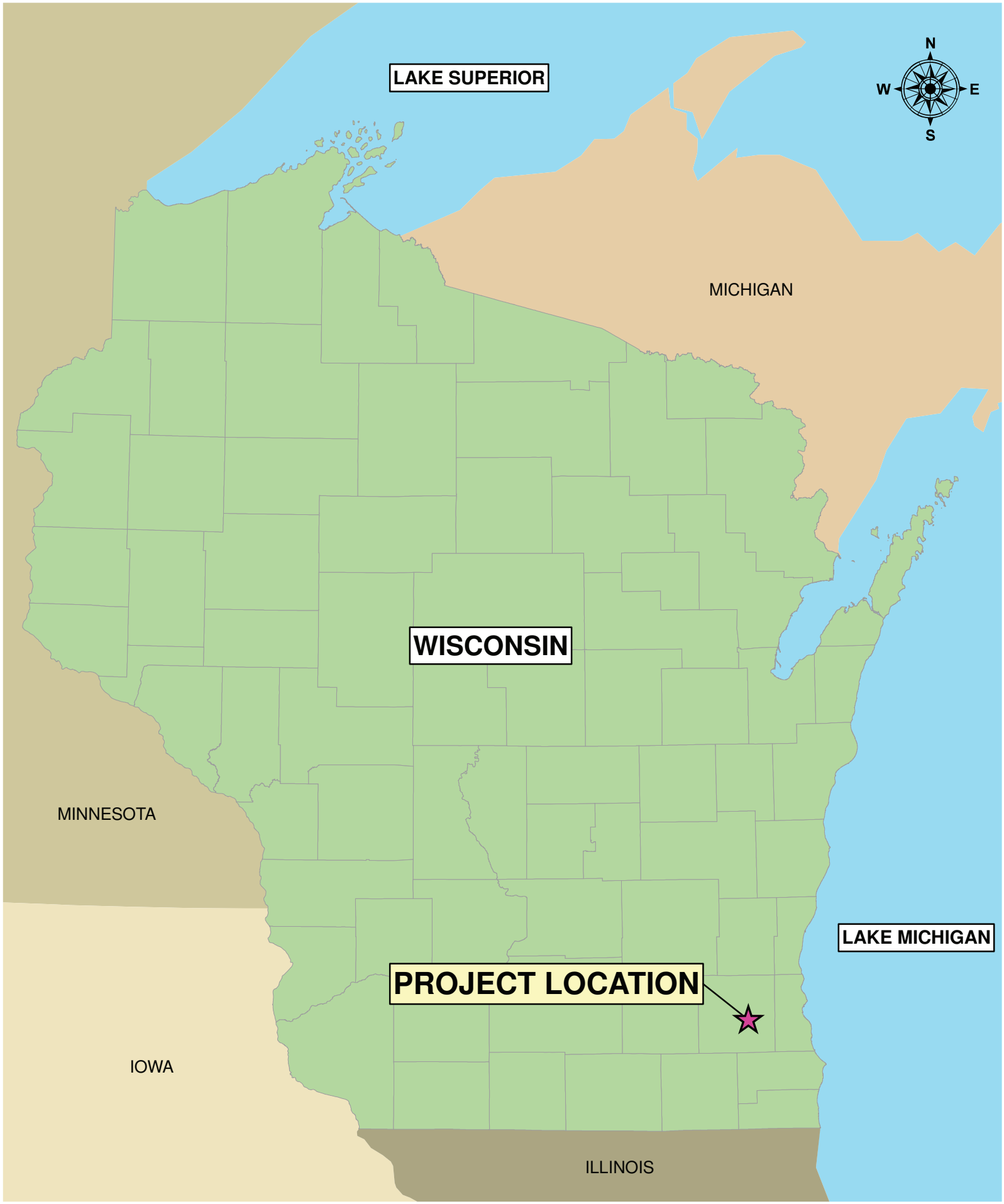
[1] Strand Associates. 2011. *City of Waukesha Wastewater Treatment Facility Plan*.

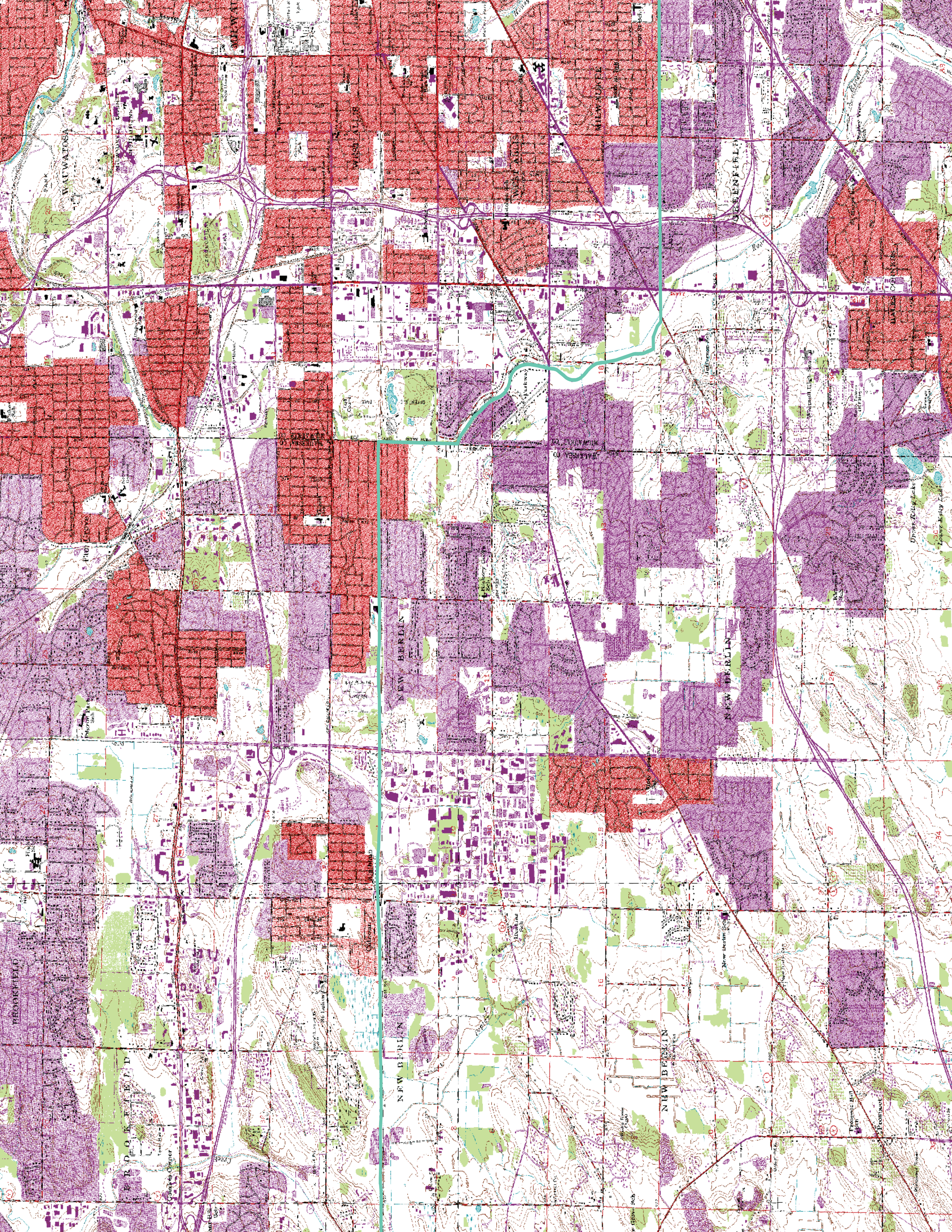
The City is anticipating lower effluent limits for TP. The WDNR has not provided the City with revised limits, however the City has completed their WWTP facility planning assuming a new effluent limit could equal 0.075 mg/L (compared to the current limit of 1.0 mg/L and recent average annual historic performance of 0.16 mg/L). The assumed new limit is equal to the water quality criteria for the Fox River and Underwood Creek at the discharge locations (NR 102). Based on the historic performance of the WWTP, the City is anticipating an effluent TP limit of less than 0.5 mg/L in the next permit renewal. The City will not have to make any modifications to their treatment operations to meet this limit because as summarized in Appendixes E and the Return Flow Alternatives Summary in Appendix F of the Application, the historic annual average effluent TP concentration has been 0.16 mg/L.[2]

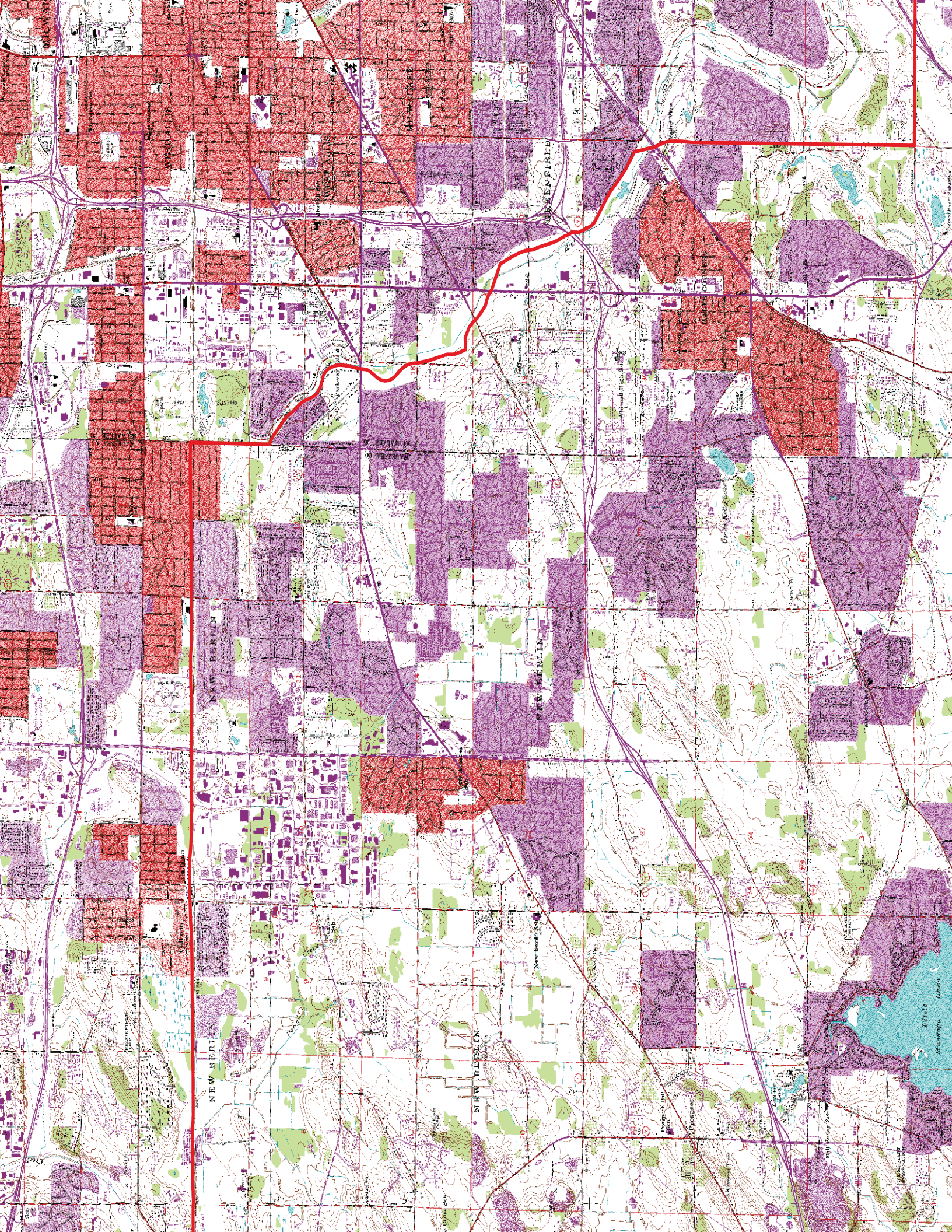
The WDNR has adapted new thermal rules (NR 102 and 106) for the protection and propagation of aquatic life that applies to WPDES permit holders discharging to surface waters. In preparation for this new rule, the City has been collecting effluent temperature data for over a year. The City will meet WDNR thermal discharge requirements following the rules and applicable guidance regardless of a discharge to the Fox River or Underwood Creek.

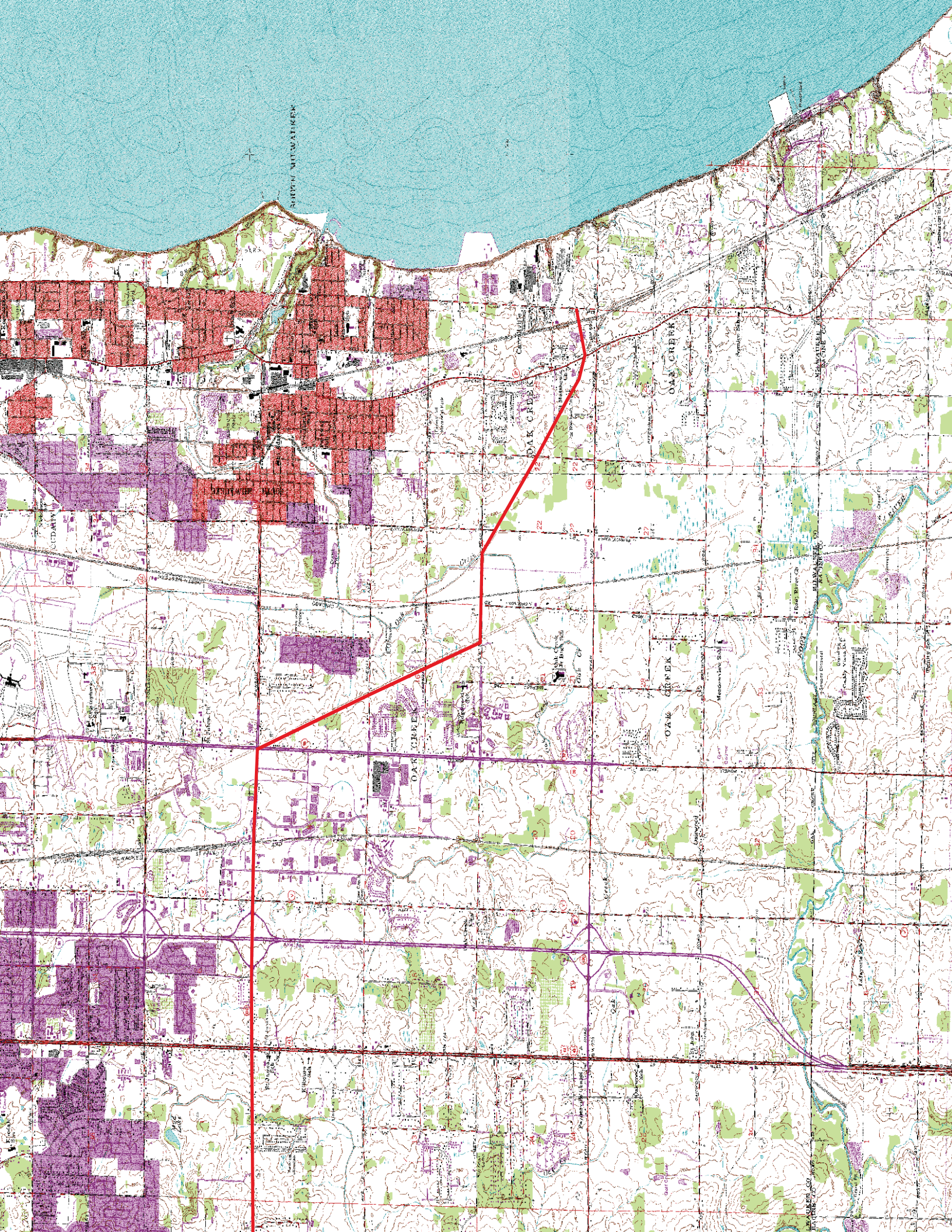
[2] Based on WWTP effluent data between October 1, 2002 and August 31, 2009.

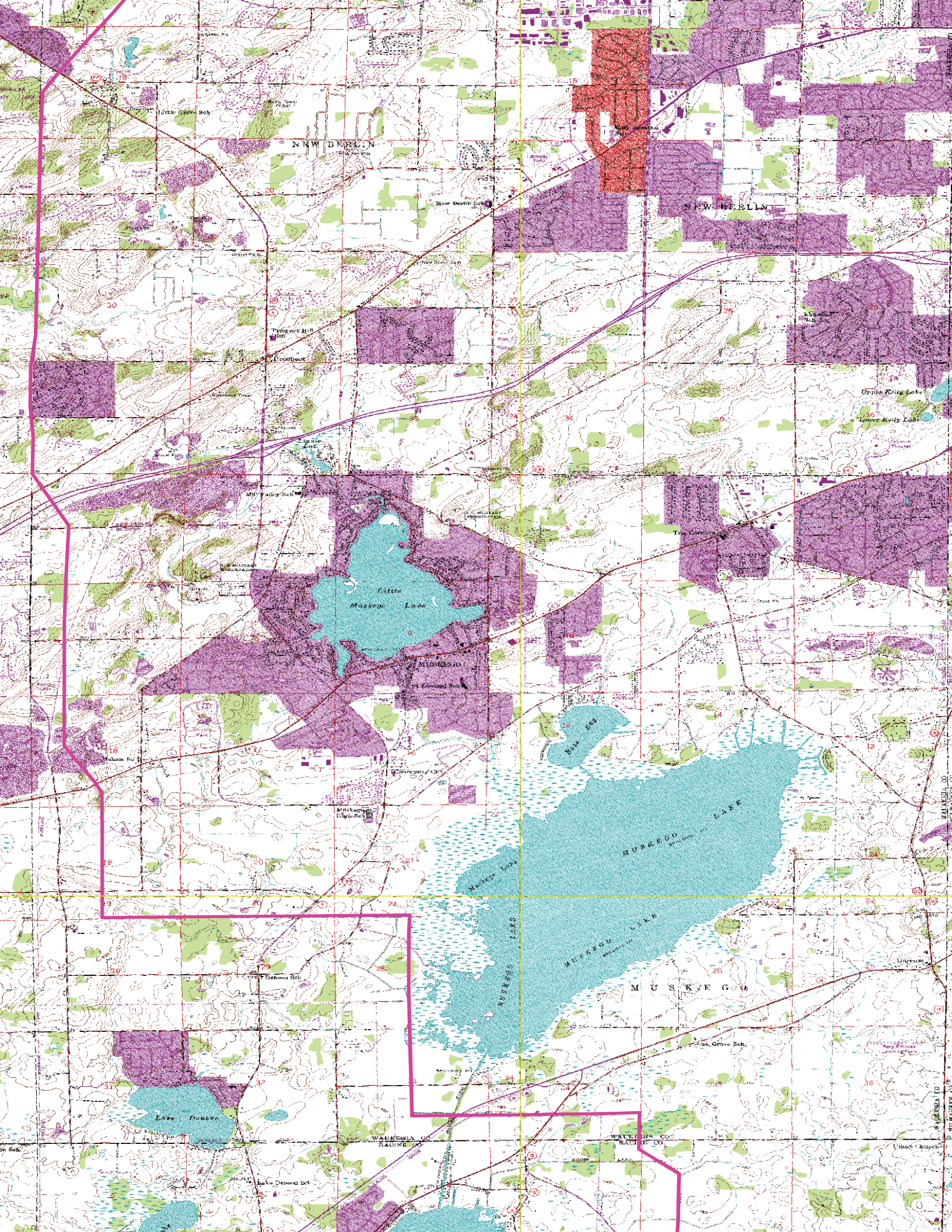
Attachment 3-1
Proposed Project Alignment Maps

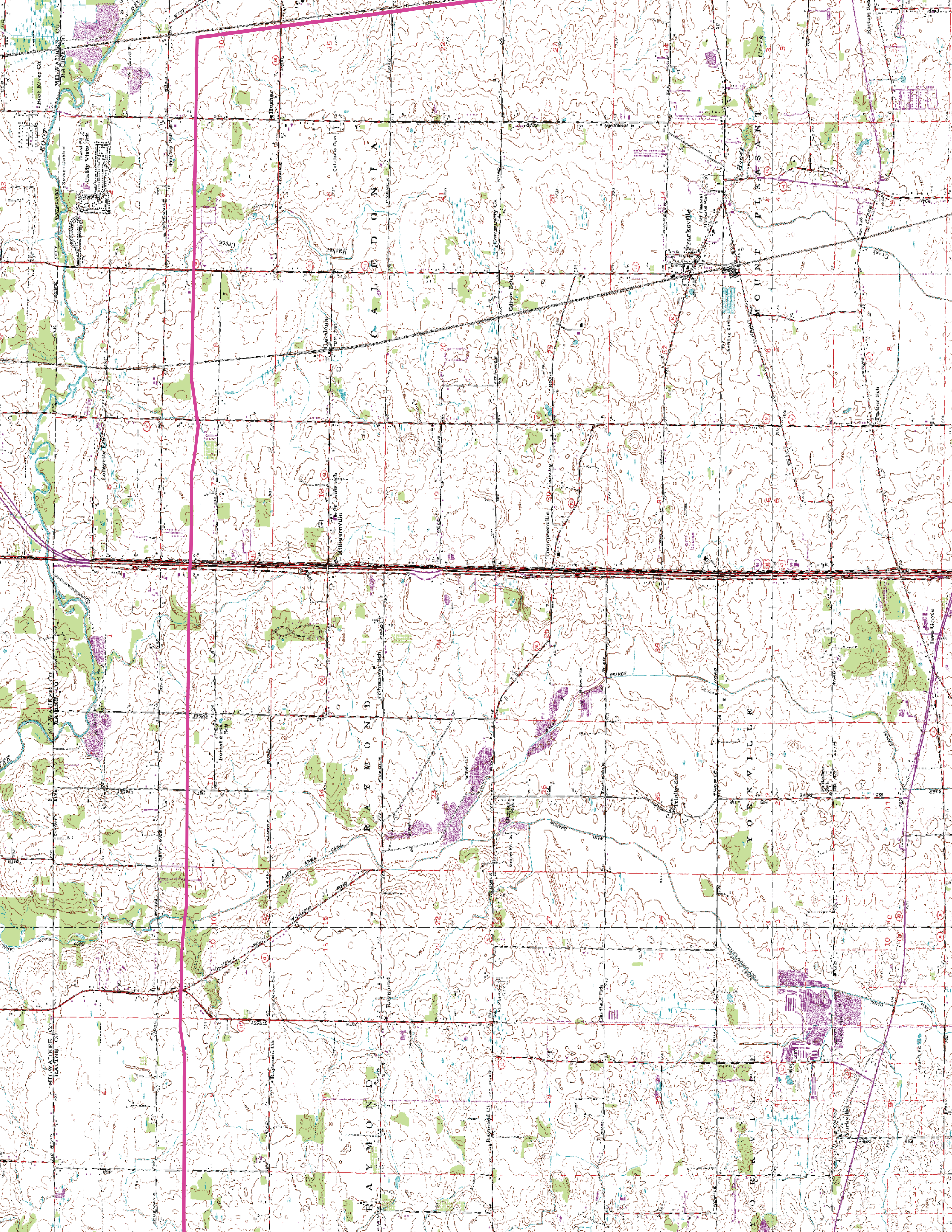

LAKE SUPERIOR
N
W
E
S
MICHIGAN
WISCONSIN
MINNESOTA
LAKE MICHIGAN
PROJECT LOCATION
IOWA
ILLINOIS

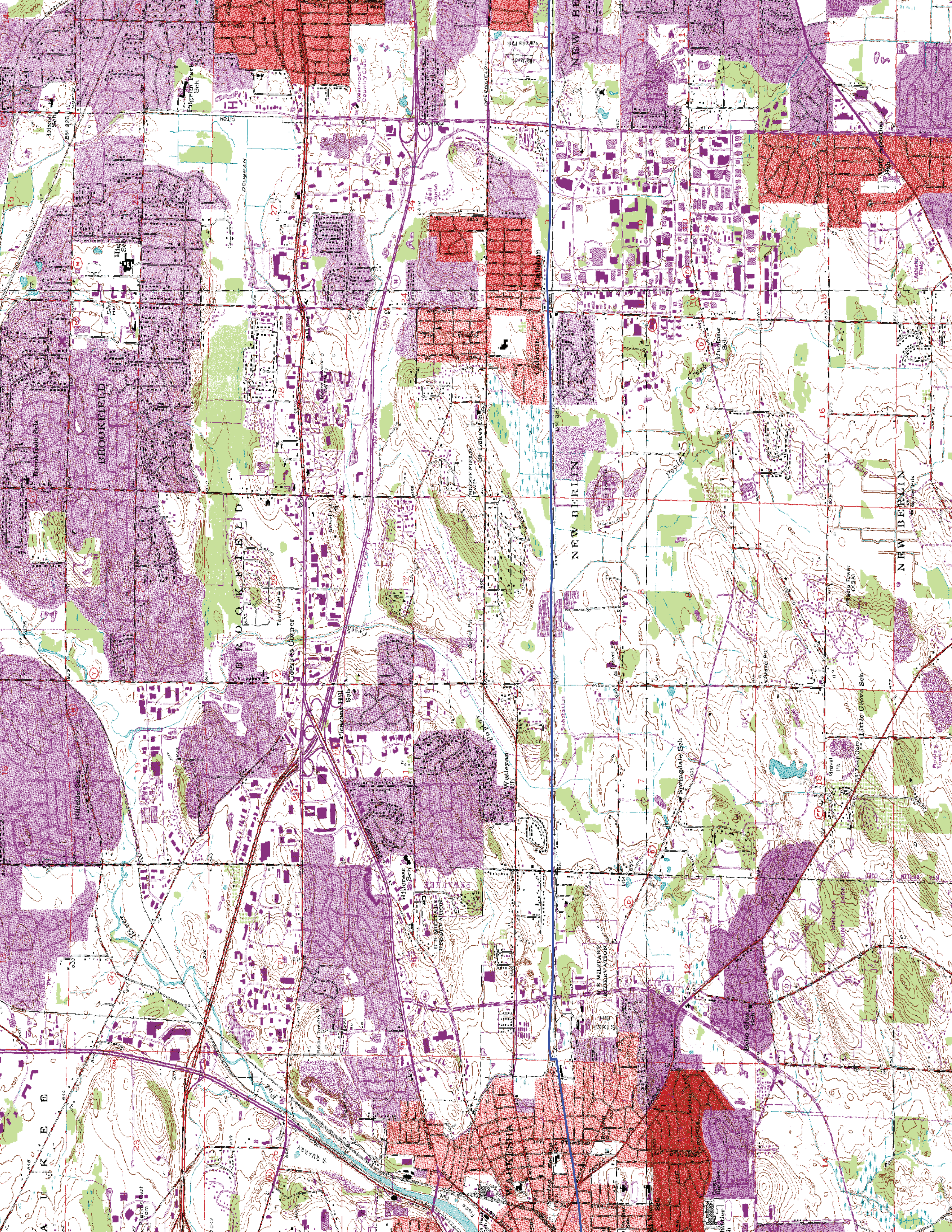

WAUWATOSA
NEW BERLIN
BROOKFIELD


NEW BERLIN
NEW BERLIN
NEW BERLIN
GREENFIELD
Lake Michigan

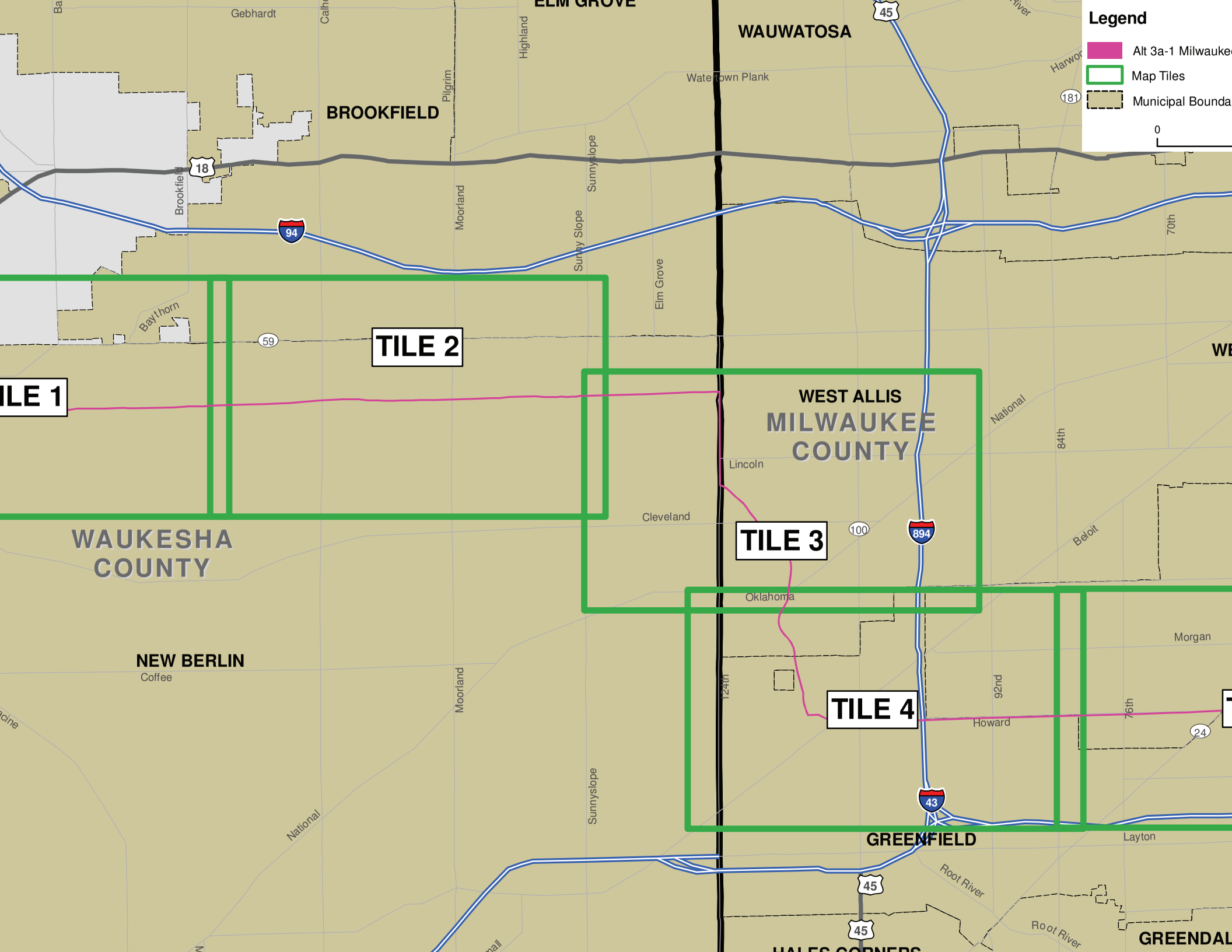

OAK CREEK
OAK CREEK
OAK CREEK
MILWAUKEE COUNTY
MILWAUKEE


NEW BERLIN
NEW BERLIN
Little Grove Sch
New Berlin Sch
Pleasant Hill Sch
Crestwood
Upper Kelly Lake
Lower Kelly Lake
Mill Valley Sch
Little Muskego Lake
MUSKEGO
Muskego Sch
Bass Bay
MUSKEGO LAKE
Muskego Lake
MUSKEGO LAKES
MUSKEGO
Denoon Sch
Grove Sch
Lake Duncan
WAUKESHA CO
RACINE CO
Lake Denoon Sch
Union Church

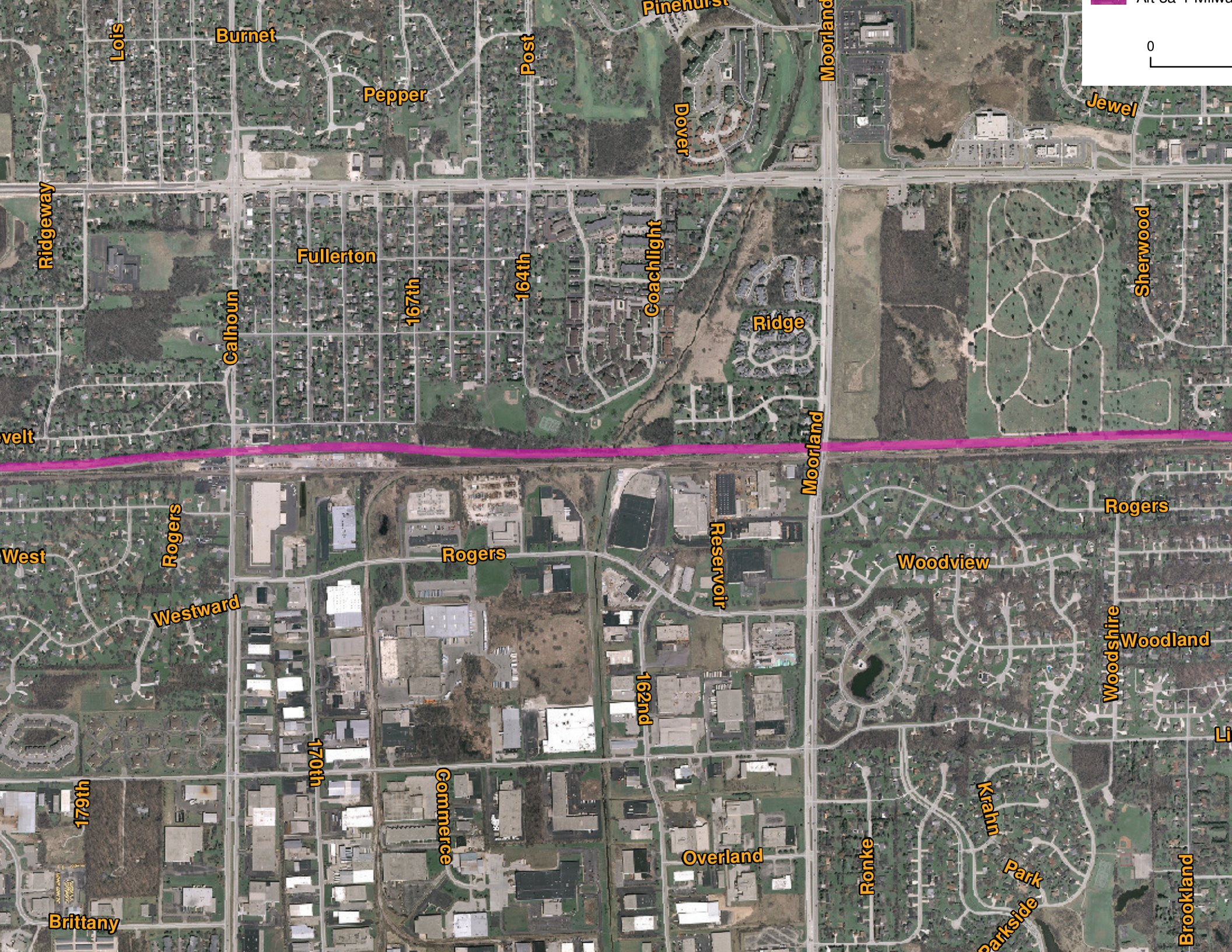

CALEDONIA
MOUNT PLEASANT
RAYMOND
YORKVILLE
Franksville

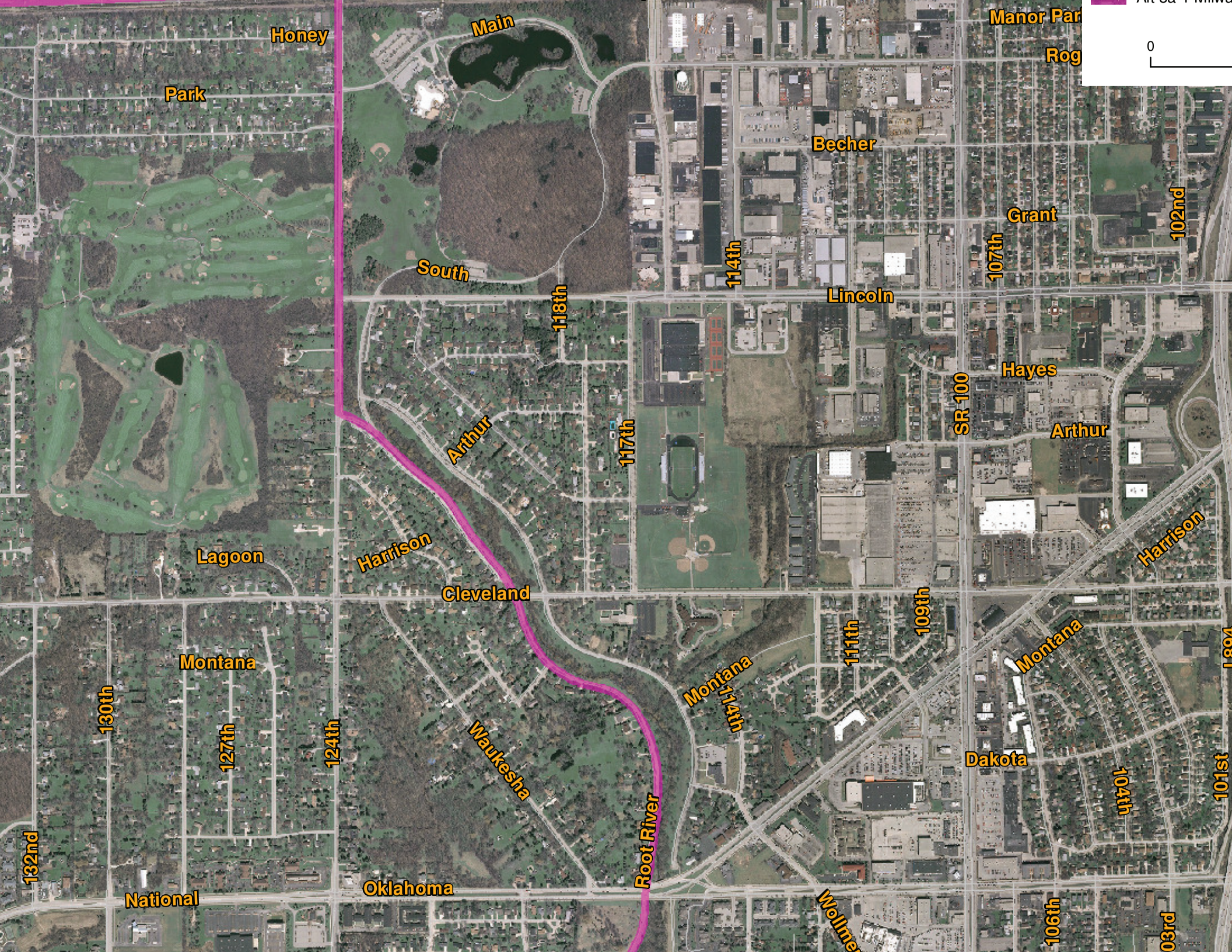


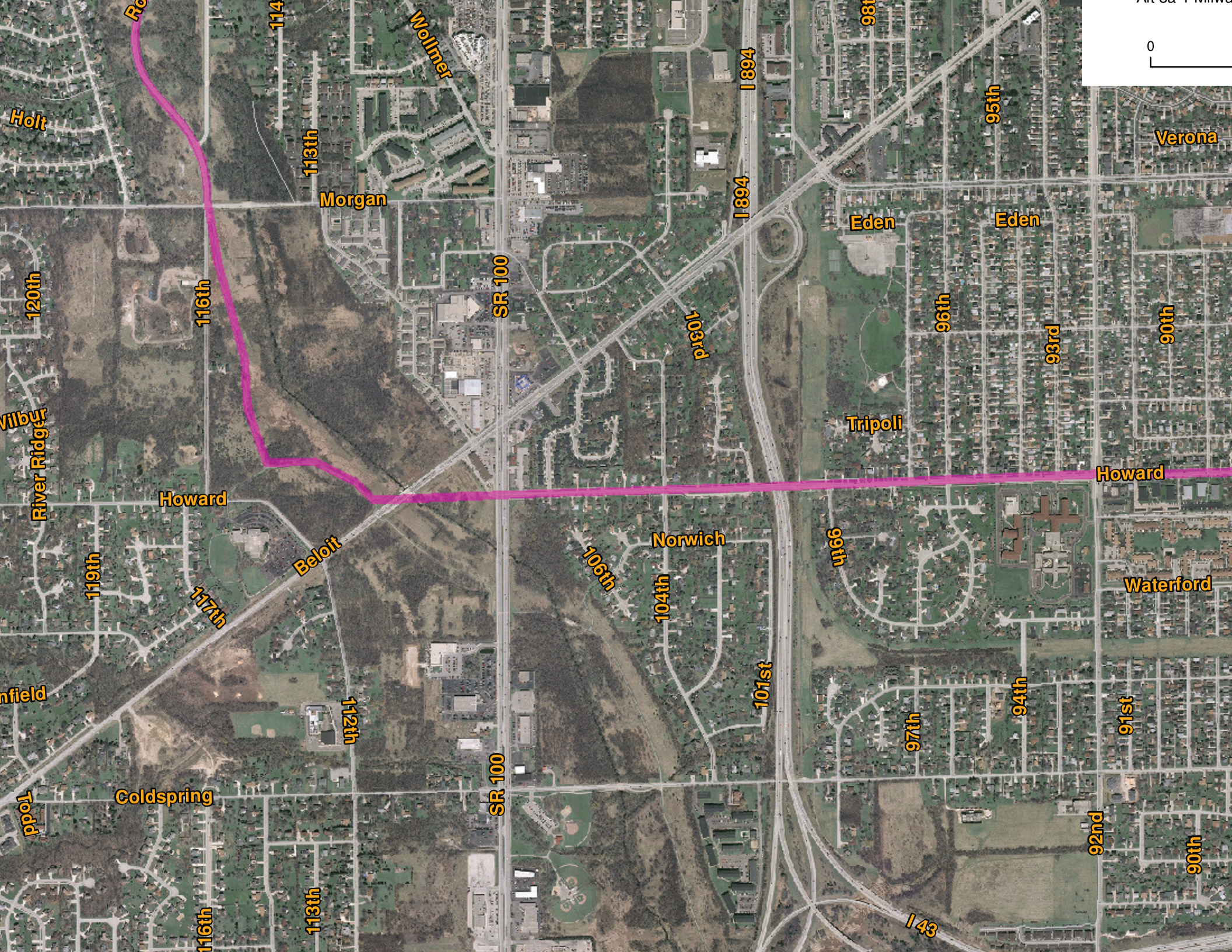
BROOKFIELD
NEW BERLIN
WAUKESHA

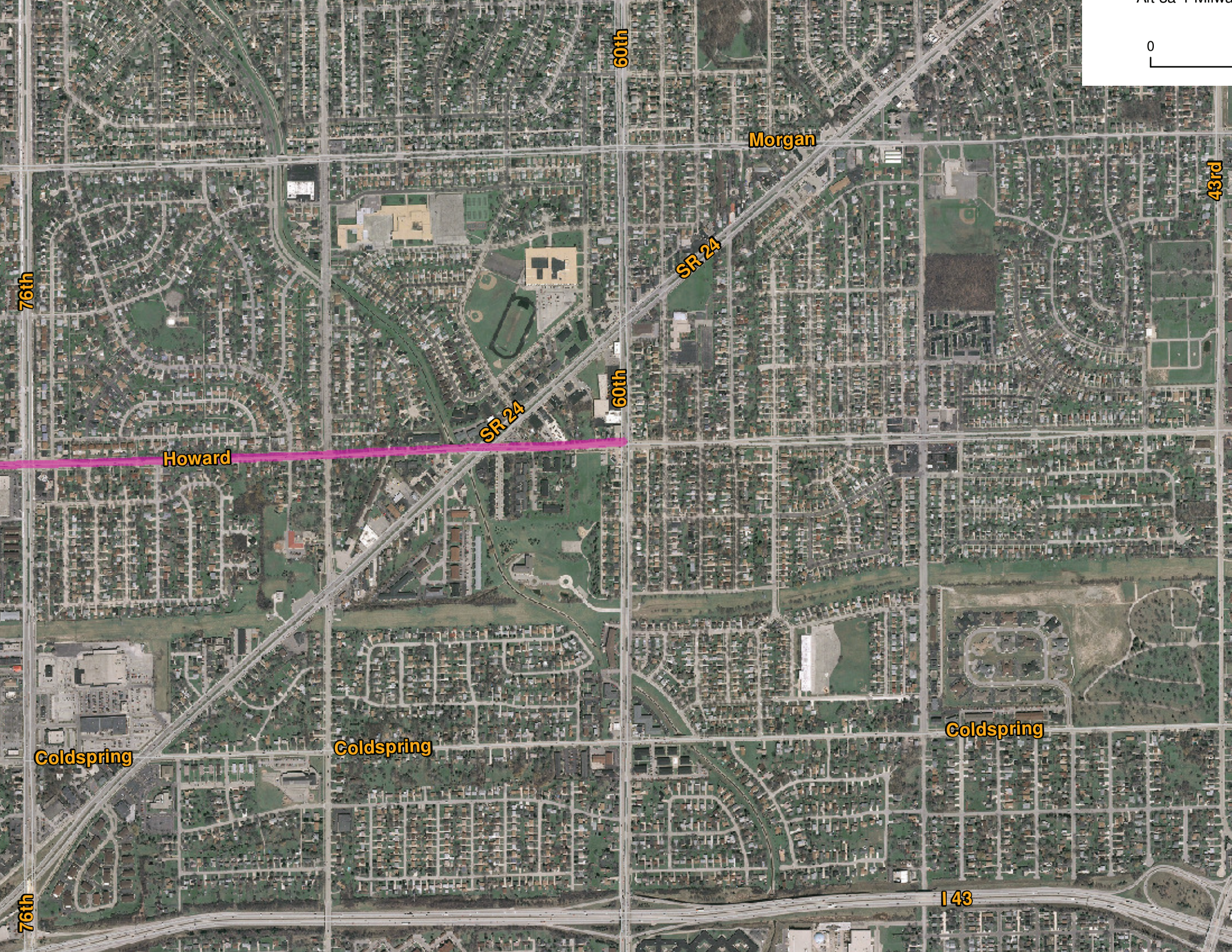

Legend
Alt 3a-1 Milwauke
Map Tiles
Municipal Bounda
0
TILE 1
TILE 2
TILE 3
TILE 4
WAUKESHA COUNTY
MILWAUKEE COUNTY
BROOKFIELD
WAUWATOSA
WEST ALLIS
NEW BERLIN
GREENFIELD
ELM GROVE
Gebhardt
Pilgrim
Highland
Waterown Plank
Brookfield
Moorland
Sunny Slope
Sunnyslope
Elm Grove
Baythorn
Lincoln
Cleveland
Oklahoma
Howard
Morgan
Layton
National
84th
92nd
76th
70th
124th
Beloit
Root River
18
94
59
100
894
43
45
24
181

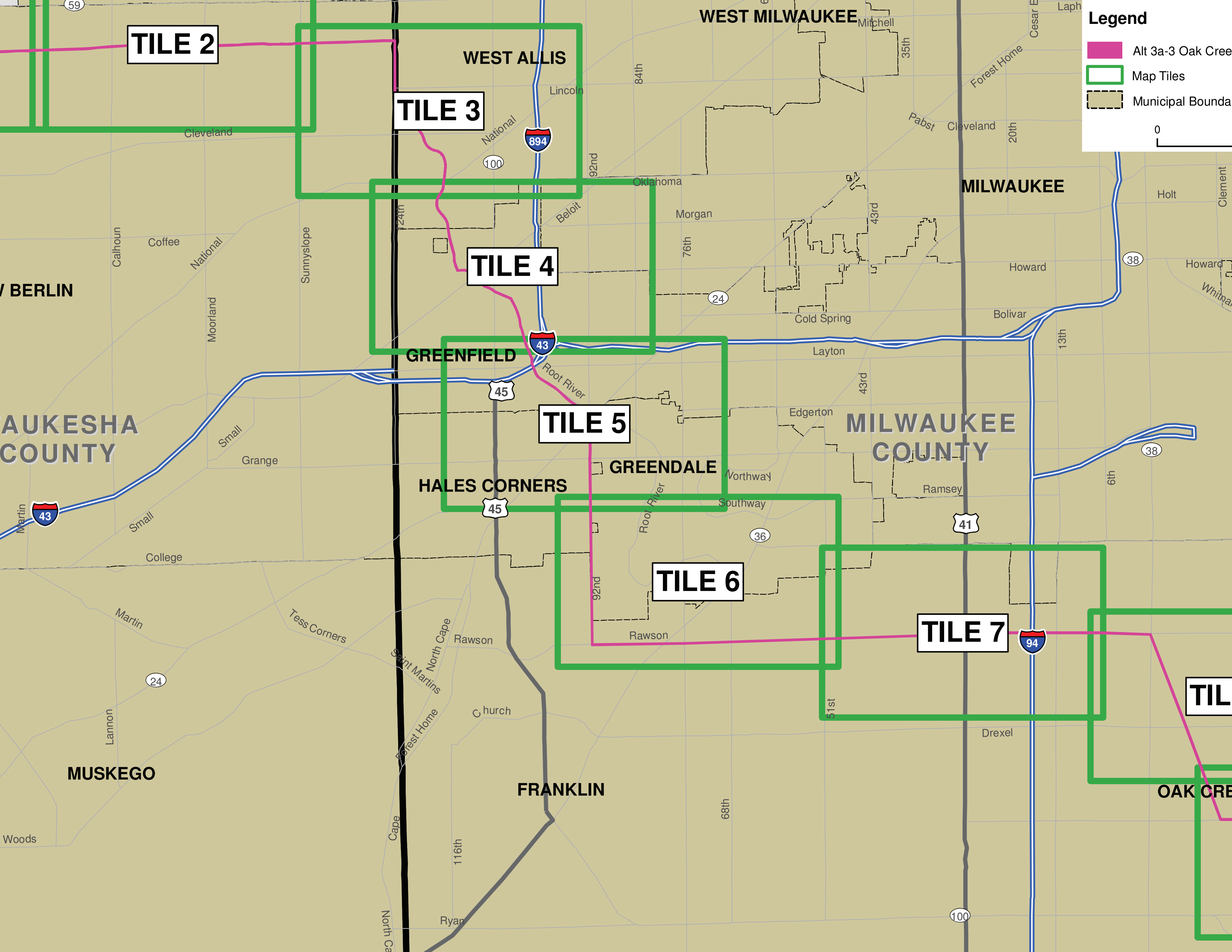
Ashbourne
Pinecrest
Norwood
Westwoods
Avondale
Barker
Downie
SR 65
Lilly
Danny
Johnson
Sunnycrest
Cologne
Greenhill
Craftsman
Springdale
Broadale
Pioneer
Anoka
Ridge
Plateau
0

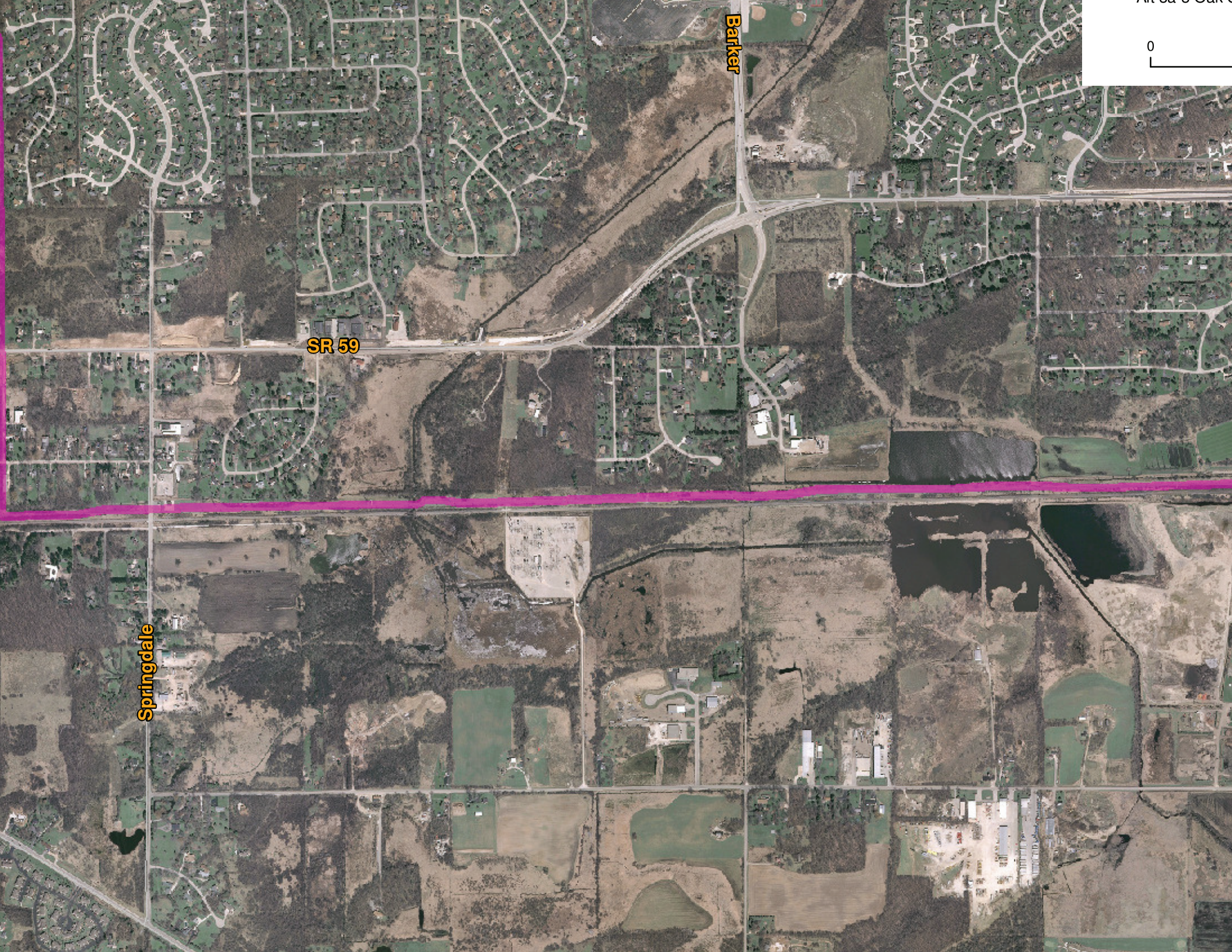

Lois
Burnet
Pepper
Post
Pinehurst
Dover
Moorland
Jewel
Ridgeway
Fullerton
Calhoun
167th
164th
Coachlight
Ridge
Sherwood
velt
Moorland
Rogers
West
Rogers
Rogers
Reservoir
Woodview
Westward
Woodshire
Woodland
162nd
170th
179th
Commerce
Overland
Ronke
Krahn
Park
Parkside
Brookland
Brittany
0

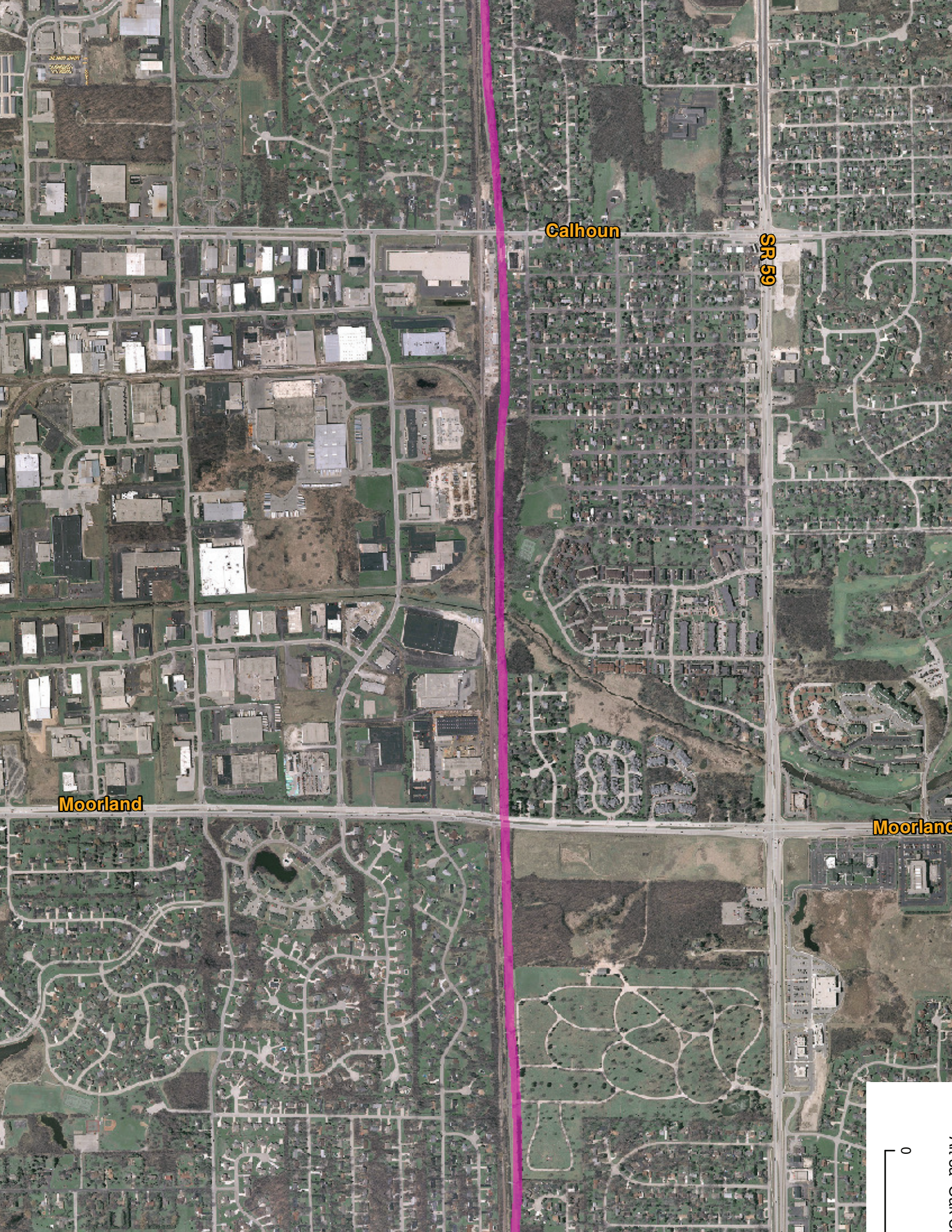

Honey
Main
Manor Par
Rog
0
Park
Becher
Grant
102nd
South
114th
107th
Lincoln
118th
Hayes
SR 100
Arthur
117th
Arthur
Harrison
Lagoon
Harrison
Cleveland
109th
111th
Montana
Montana
Montana
114th
130th
127th
124th
Waukesha
Dakota
104th
101st
132nd
Root River
Oklahoma
National
Wollmer
106th
03rd

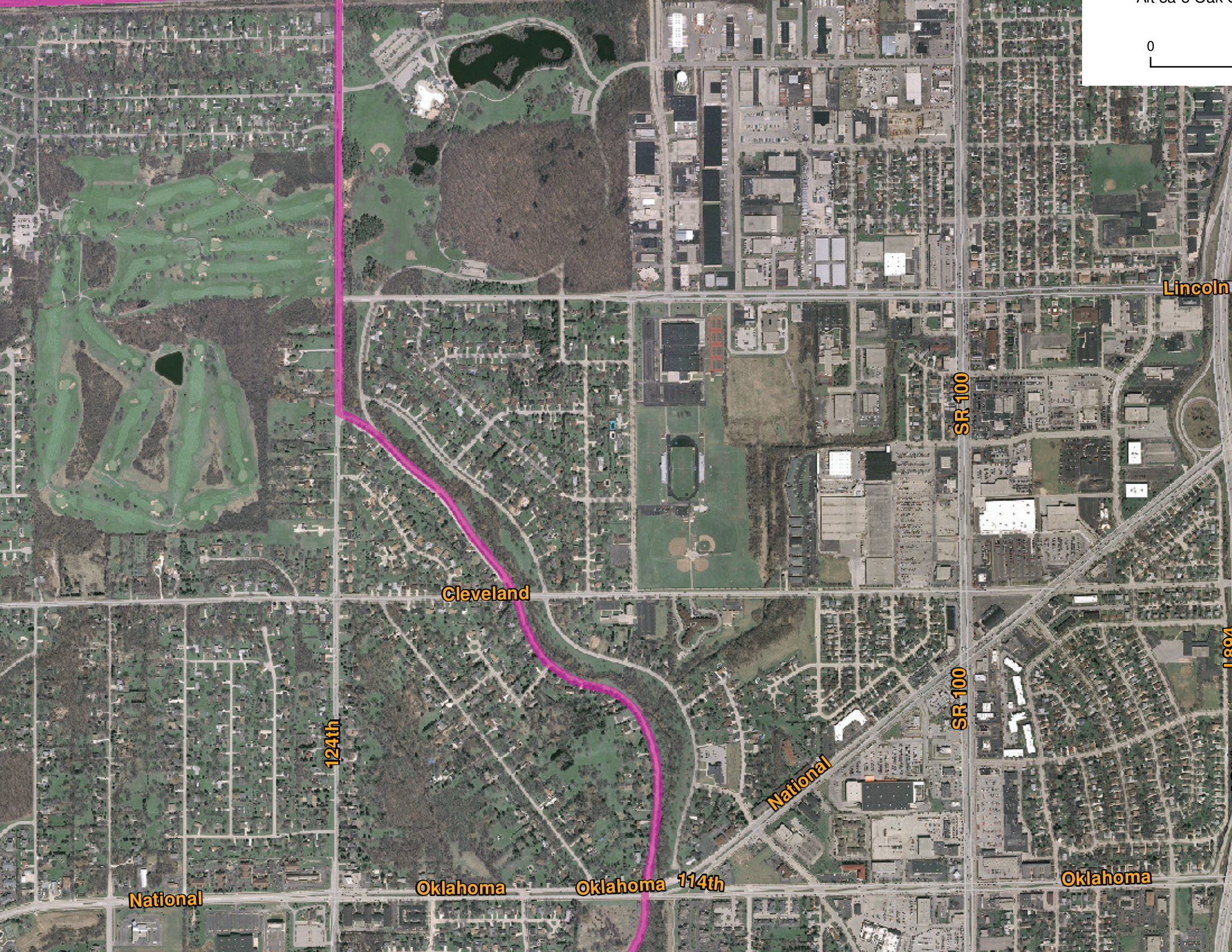

Holt
Morgan
Eden
Eden
Verona
Tripoli
Howard
Howard
Norwich
Waterford
Coldspring
Beloit
River Ridge
Wilbur
Todd
nfield
SR 100
SR 100
I 894
I 894
I 43
120th
119th
117th
116th
116th
113th
113th
112th
106th
104th
103rd
101st
99th
98th
97th
96th
95th
94th
93rd
92nd
91st
90th
90th
0

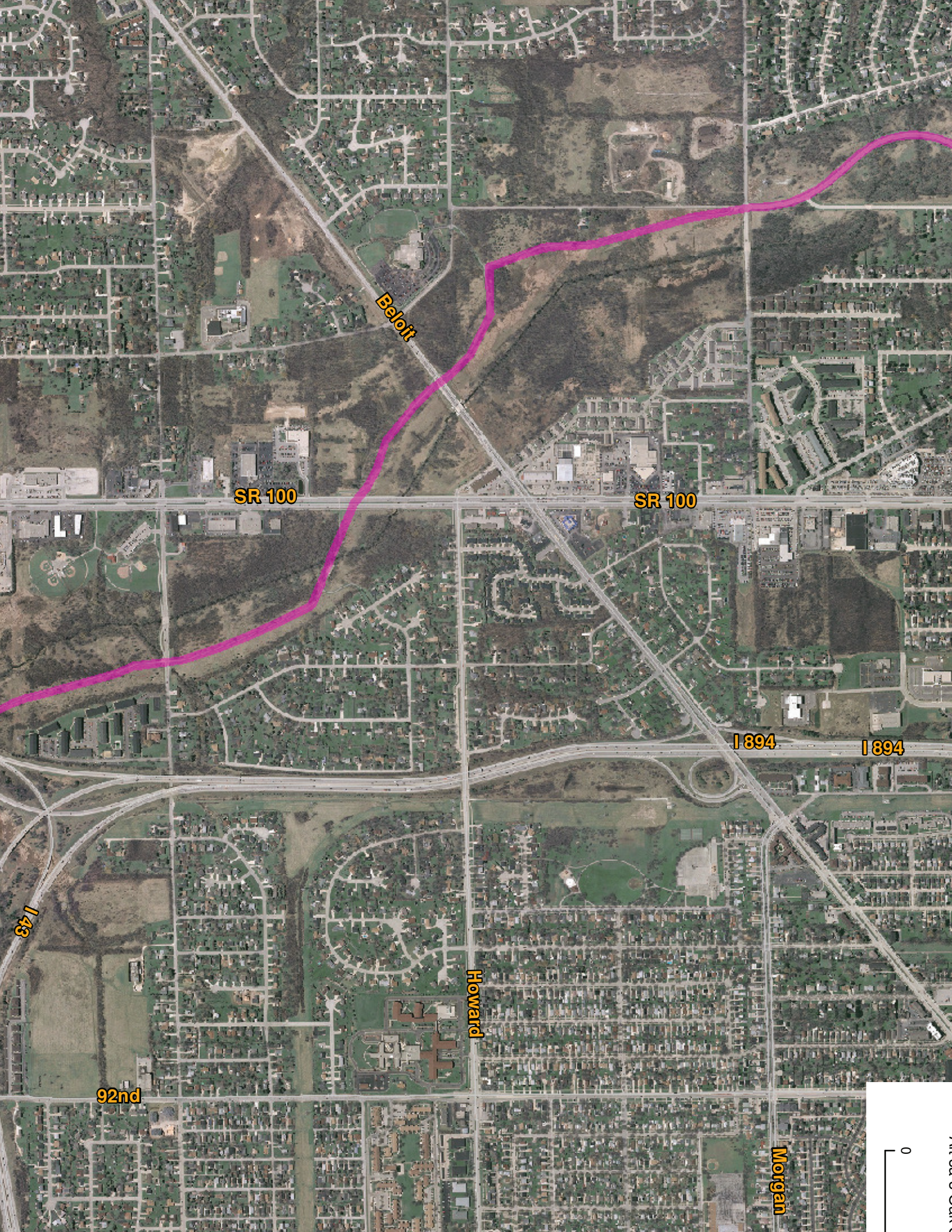

60th
Morgan
43rd
76th
SR 24
60th
SR 24
Howard
Coldspring
Coldspring
Coldspring
76th
I 43

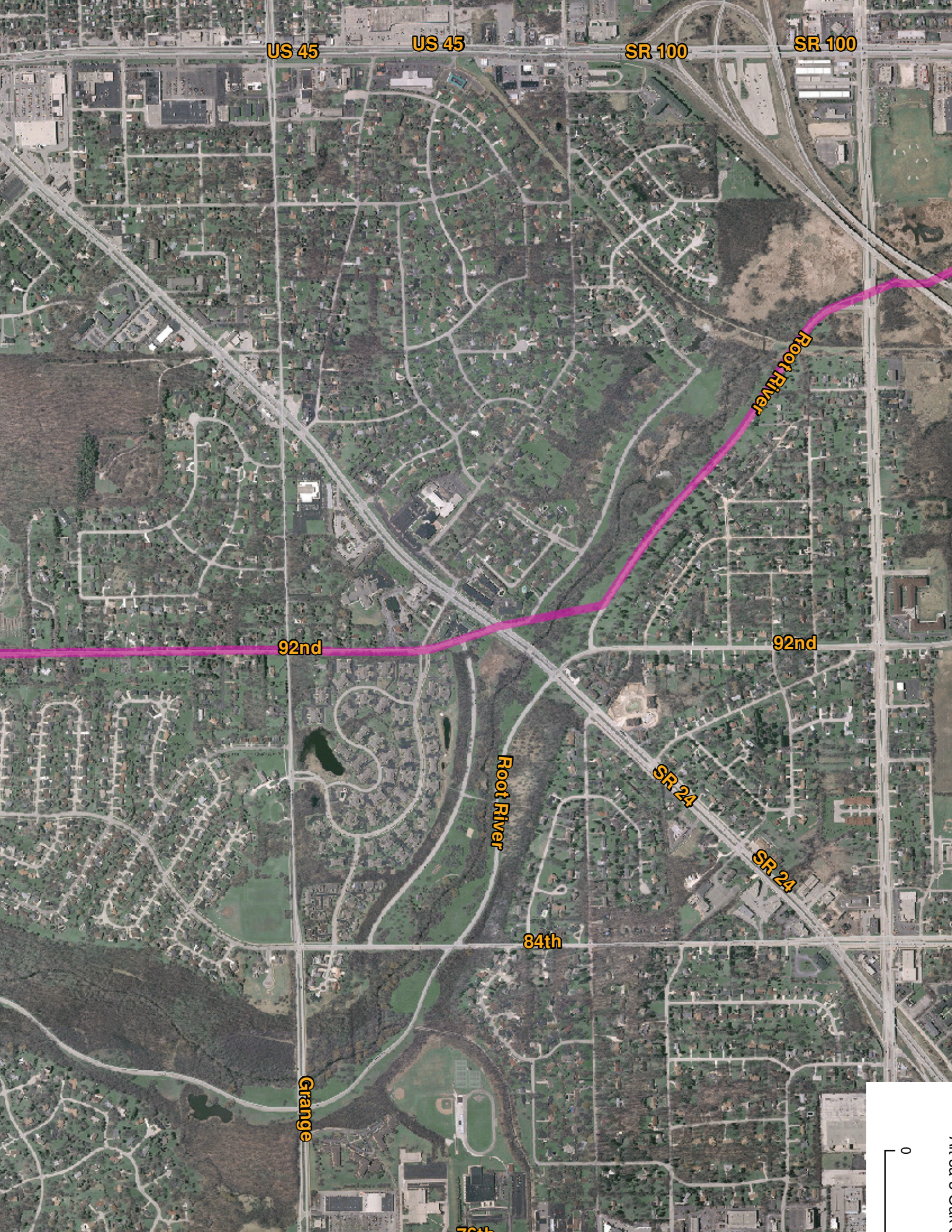

Legend
Alt 3a-3 Oak Cree
Map Tiles
Municipal Bounda
0
TILE 2
TILE 3
TILE 4
TILE 5
TILE 6
TILE 7
TIL
WEST MILWAUKEE
WEST ALLIS
MILWAUKEE
GREENFIELD
GREENDALE
HALES CORNERS
FRANKLIN
MUSKEGO
OAK CRE
MILWAUKEE COUNTY
AUKESHA COUNTY
BERLIN
Cleveland
Lincoln
National
Oklahoma
Beloit
Morgan
Howard
Bolivar
Cold Spring
Layton
Edgerton
Ramsey
Northway
Southway
Root River
Rawson
Drexel
Grange
College
Small
Coffee
Calhoun
Moorland
Sunnyslope
Lannon
Martin
Tess Corners
North Cape
Saint Martins
Forest Home
Church
Cape
Ryan
Woods
Holt
Clement
Pabst
Mitchell
124th
116th
92nd
84th
76th
68th
51st
43rd
35th
20th
13th
6th

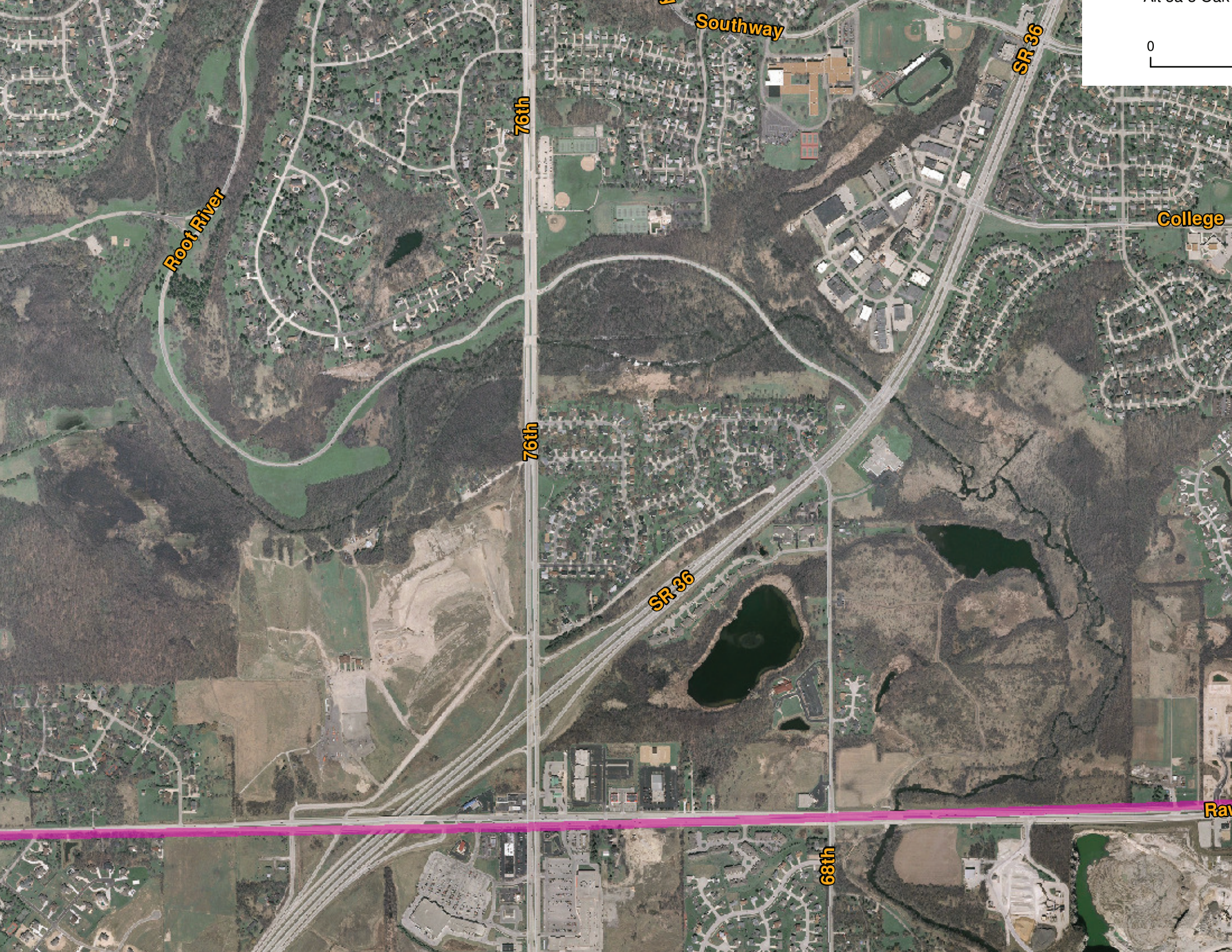

Barker
SR 59
Springdale
0

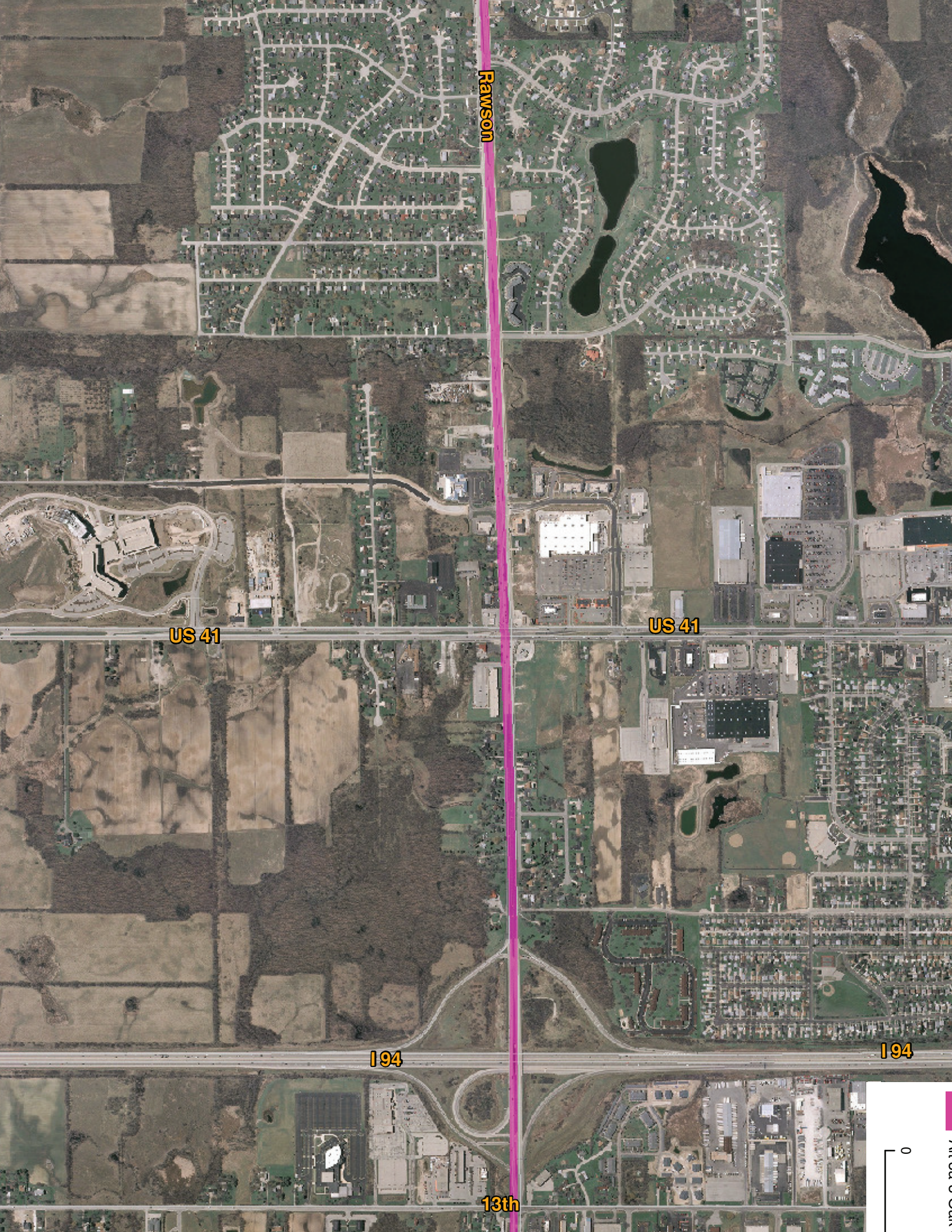

Calhoun
SR 59
Moorland
Moorland
0

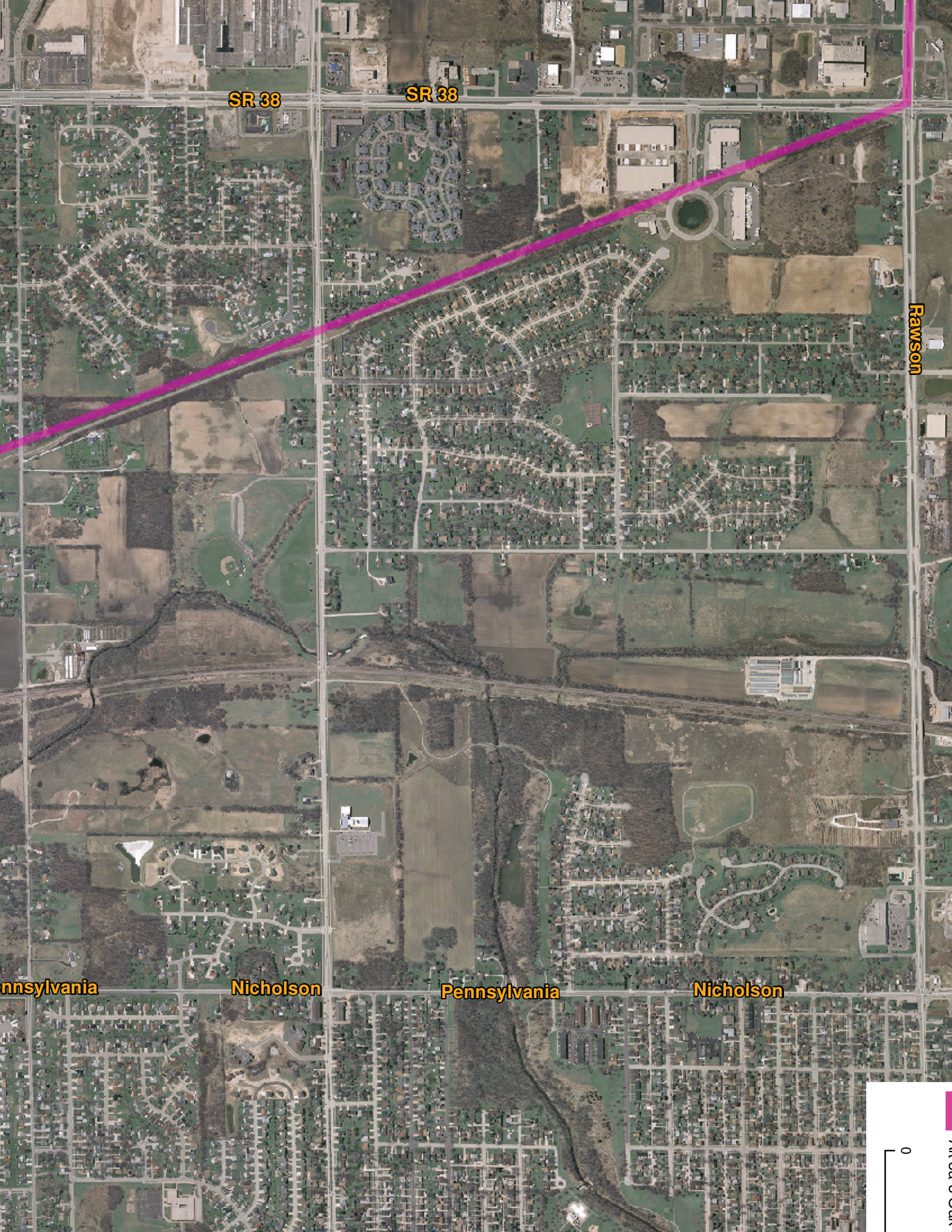

0
Lincoln
SR 100
Cleveland
SR 100
124th
National
National
Oklahoma
Oklahoma
114th
Oklahoma

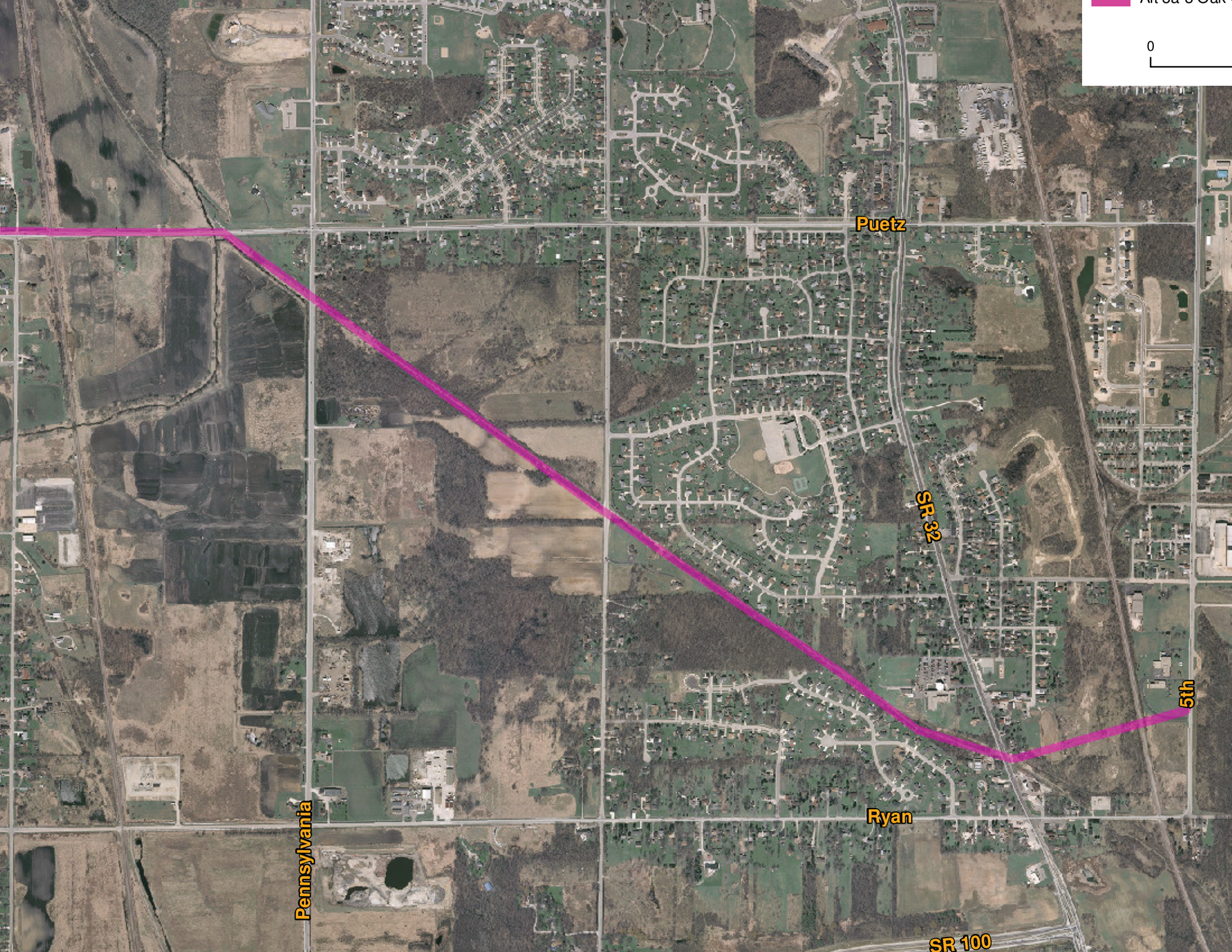

Beloit
SR 100
SR 100
I 894
I 894
I 43
Howard
92nd
Morgan

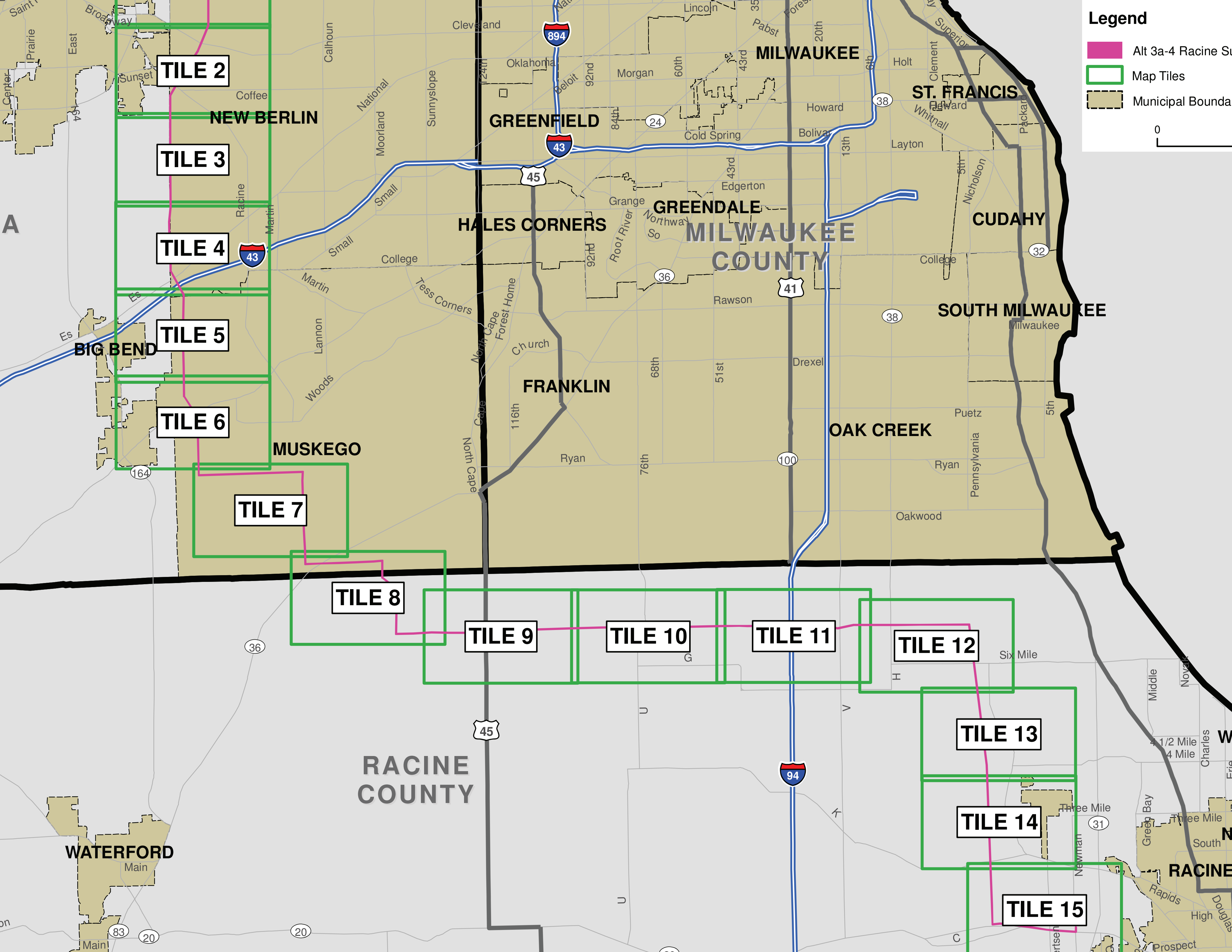

US 45
US 45
SR 100
SR 100
Root River
92nd
92nd
Root River
SR 24
SR 24
84th
Grange


Southway
SR 36
76th
Root River
College
76th
SR 36
68th


Rawson
US 41
US 41
I 94
I 94
13th


SR 38
SR 38
Rawson
nnsylvania
Nicholson
Pennsylvania
Nicholson
0


0
Puetz
SR 32
5th
Ryan
Pennsylvania
SR 100


Legend
Alt 3a-4 Racine Su
Map Tiles
Municipal Bounda
0
TILE 2
TILE 3
TILE 4
TILE 5
TILE 6
TILE 7
TILE 8
TILE 9
TILE 10
TILE 11
TILE 12
TILE 13
TILE 14
TILE 15
MILWAUKEE COUNTY
RACINE COUNTY
MILWAUKEE
ST. FRANCIS
CUDAHY
SOUTH MILWAUKEE
GREENFIELD
GREENDALE
HALES CORNERS
FRANKLIN
OAK CREEK
NEW BERLIN
MUSKEGO
BIG BEND
WATERFORD
RACINE
894
43
45
41
94
24
36
38
32
100
164
20
83
31

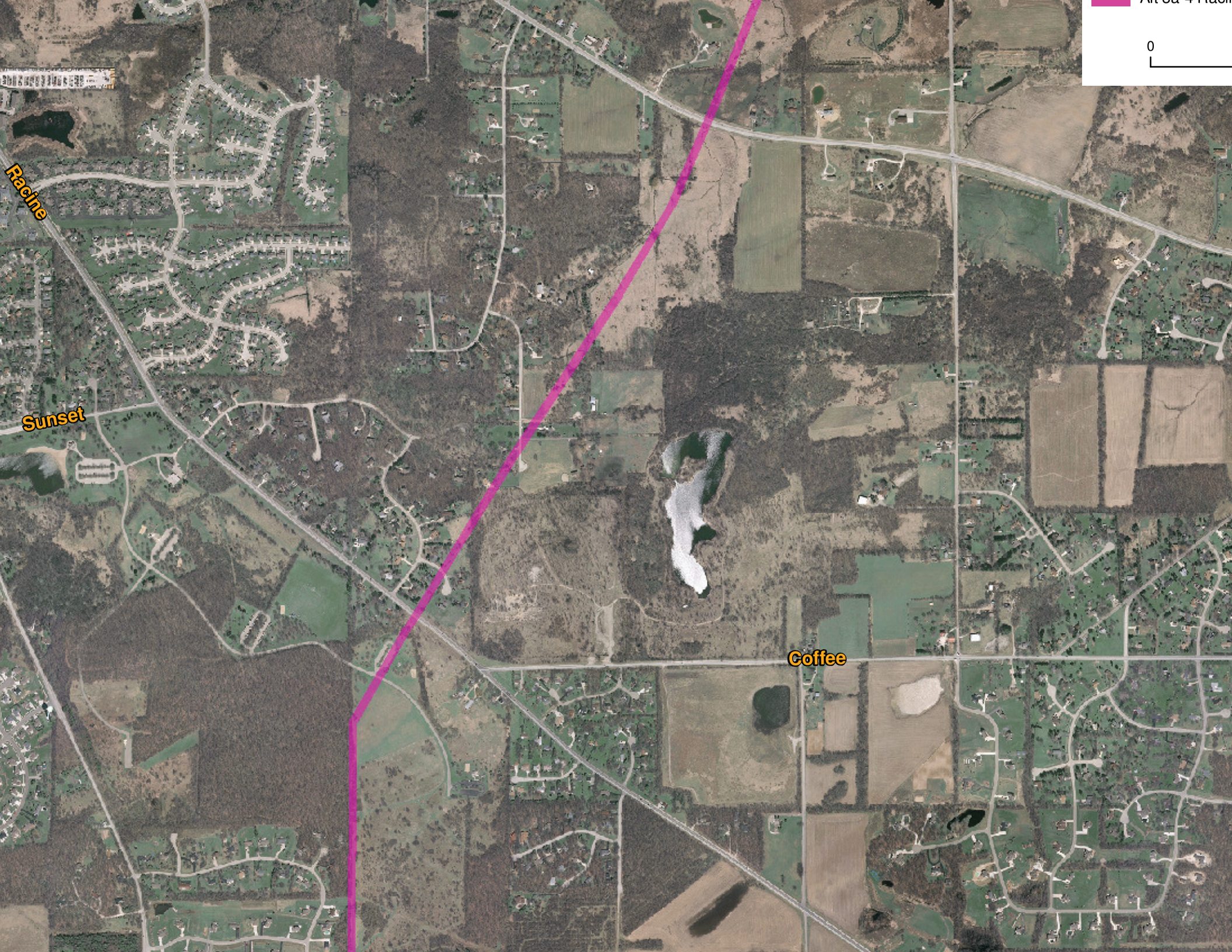
Area 4 Addition

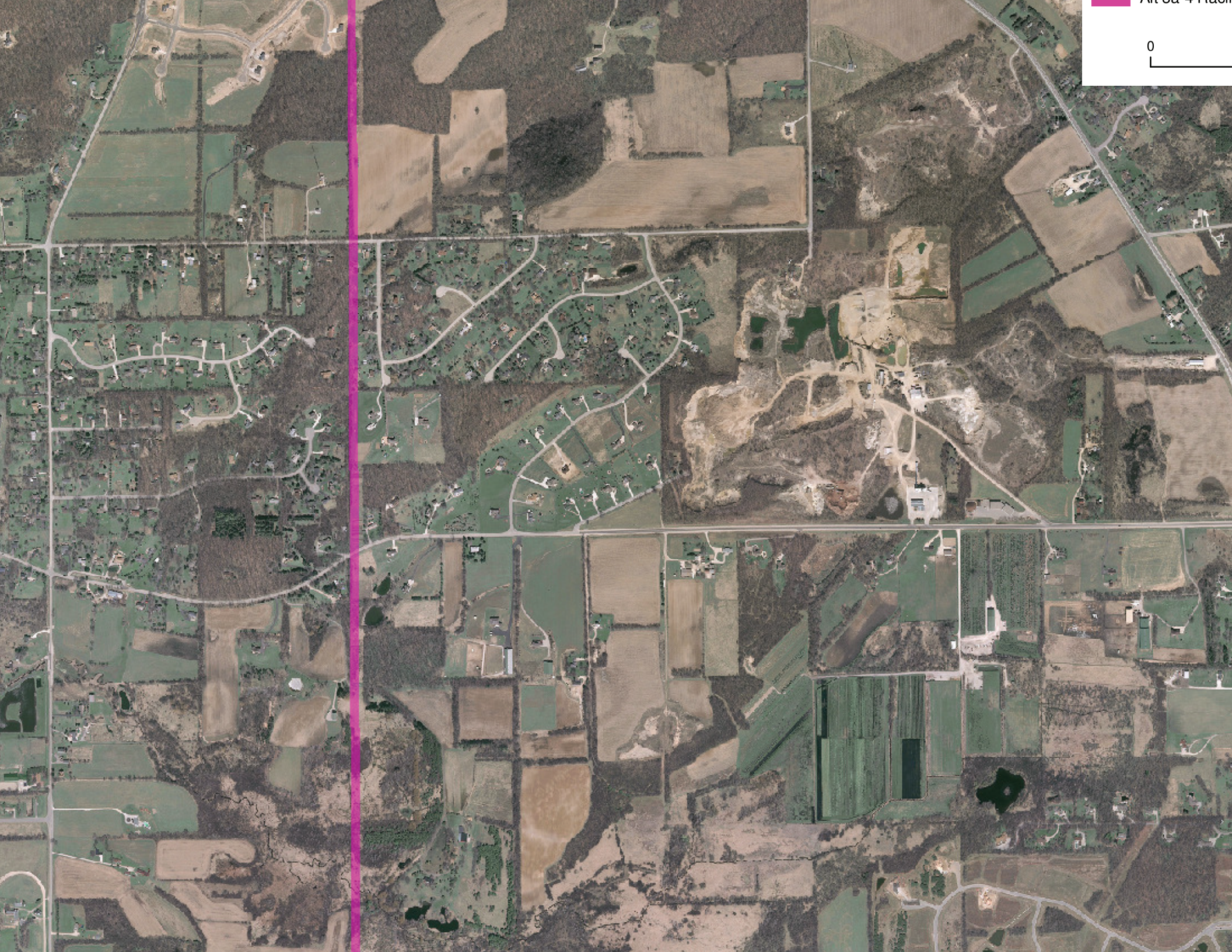
0

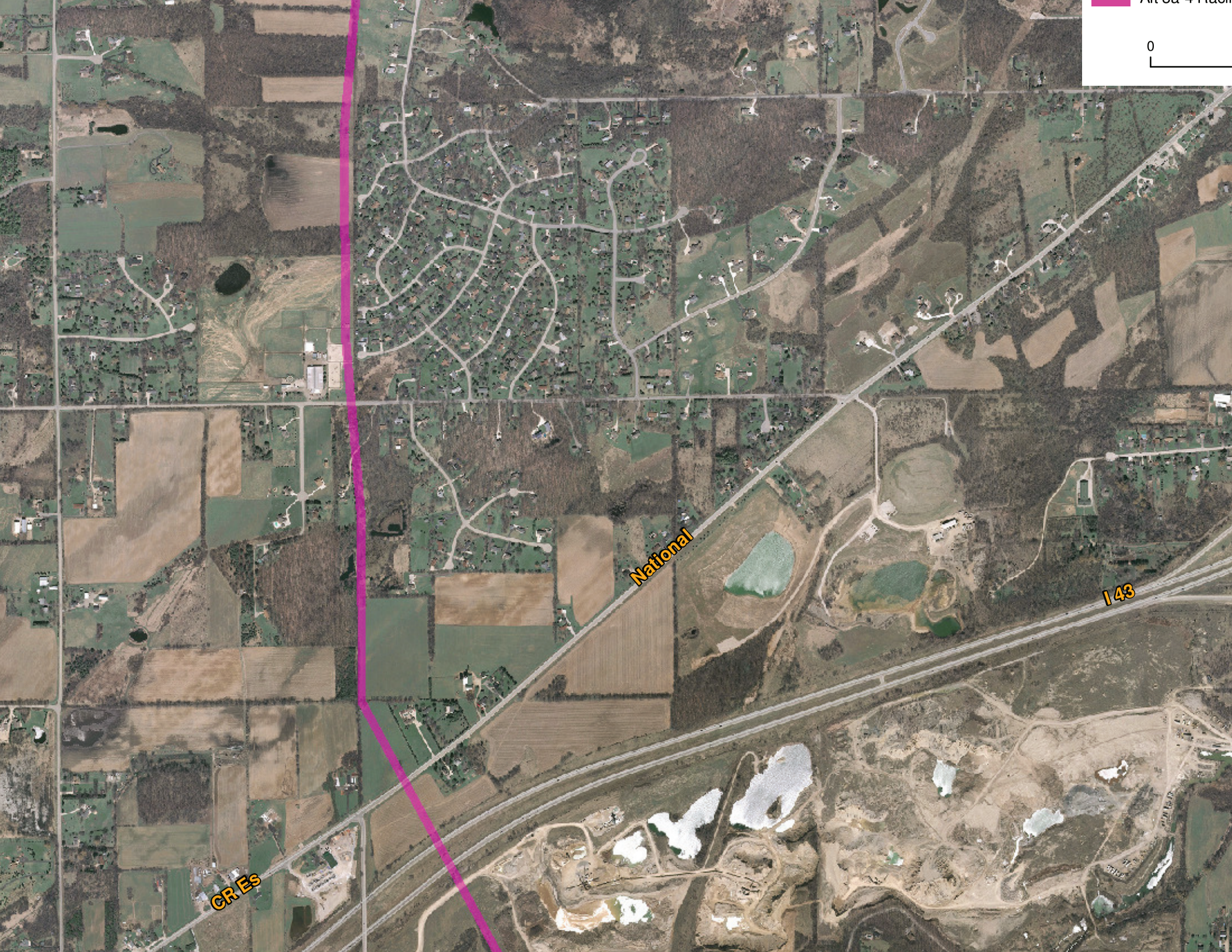
Barker

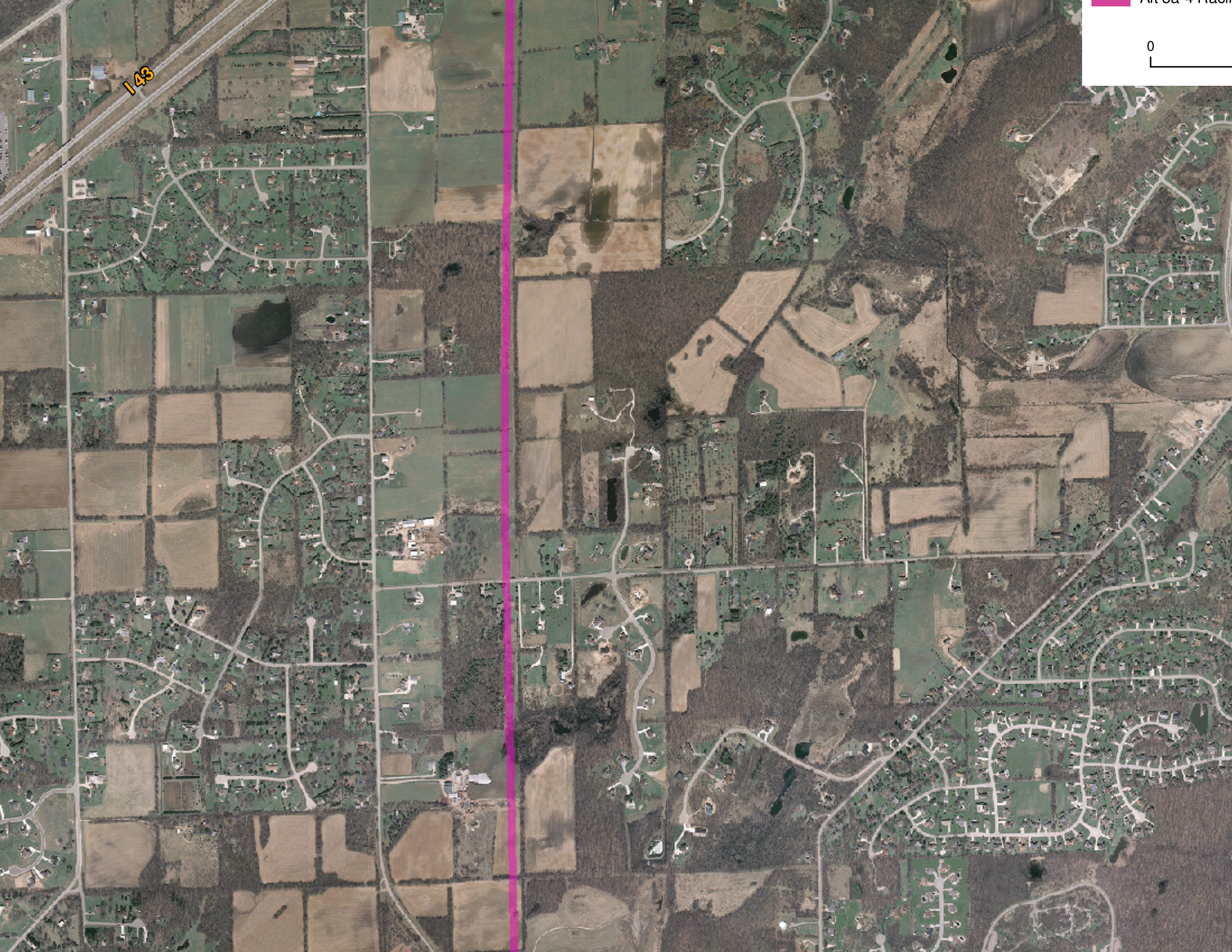
SR 59

Springdale

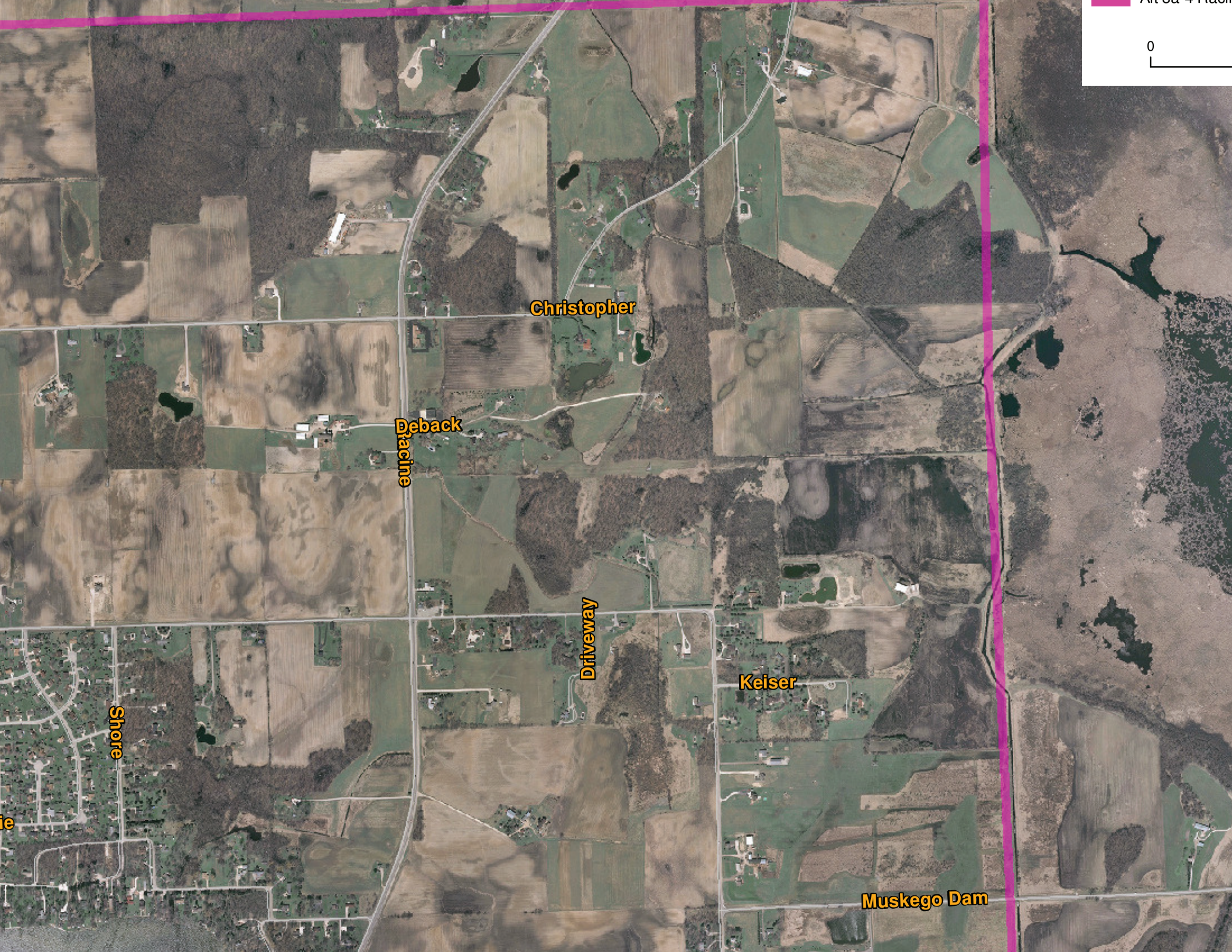

Racine
Sunset
Coffee
0


Alt 3a-4 Radi
0

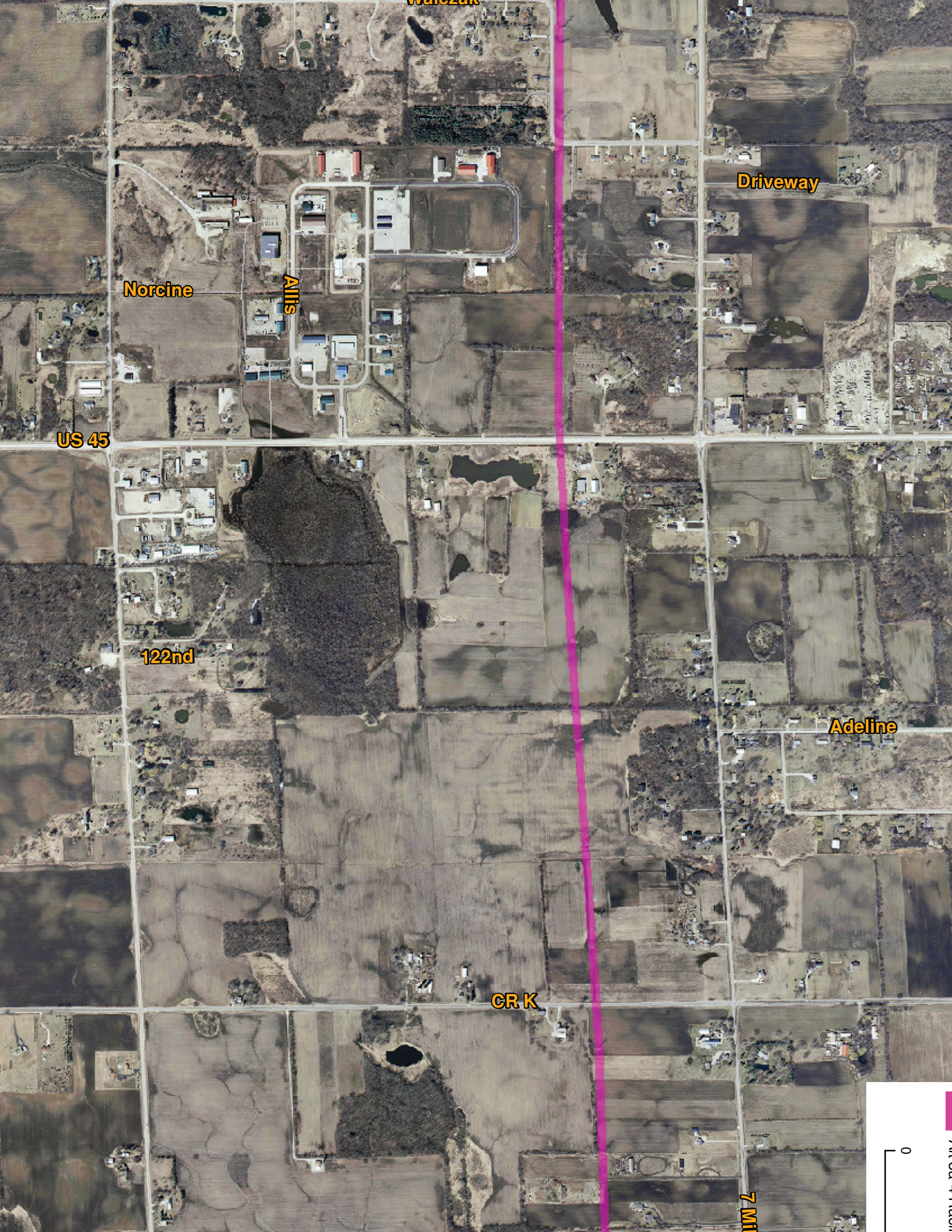

0
National
I 43
CR Es

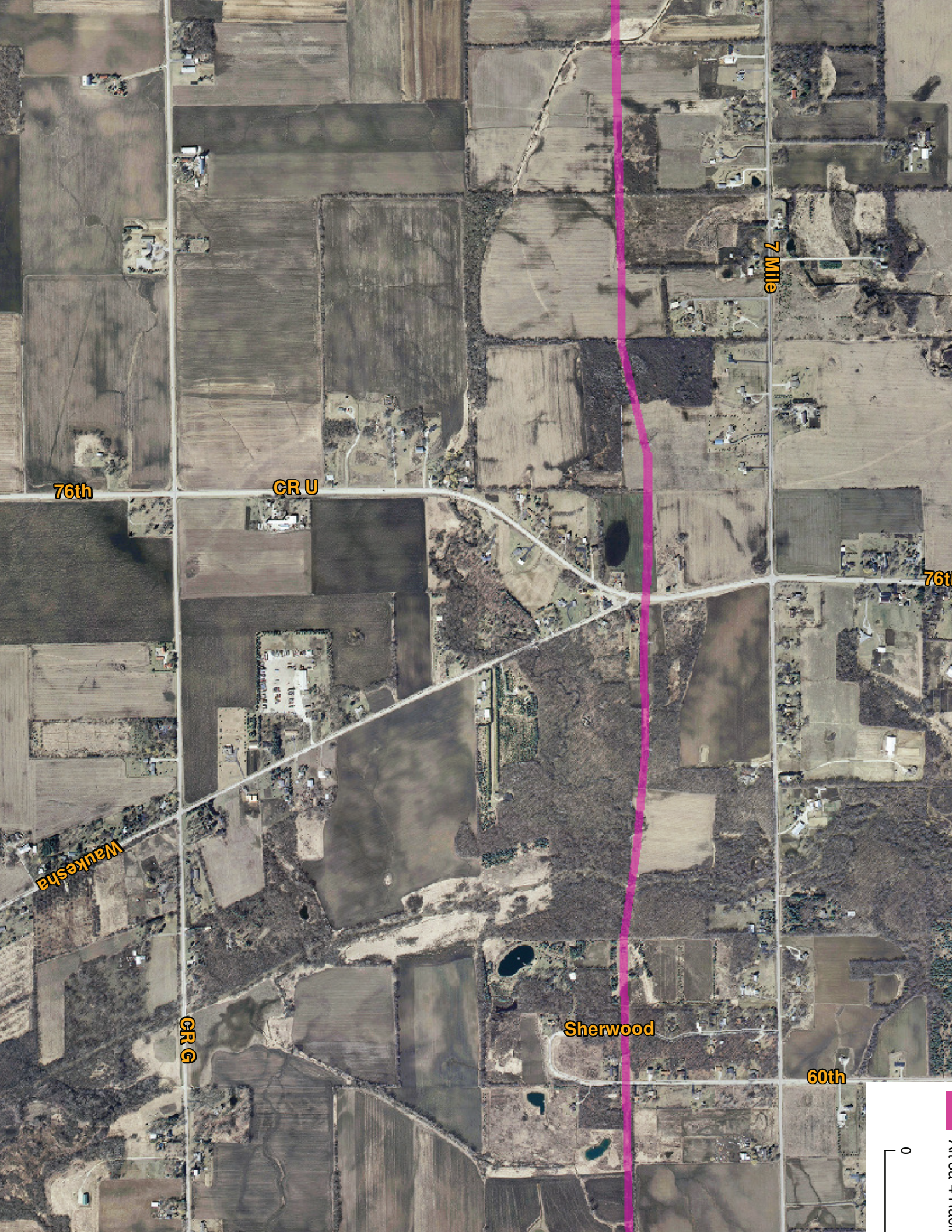

I 43
0

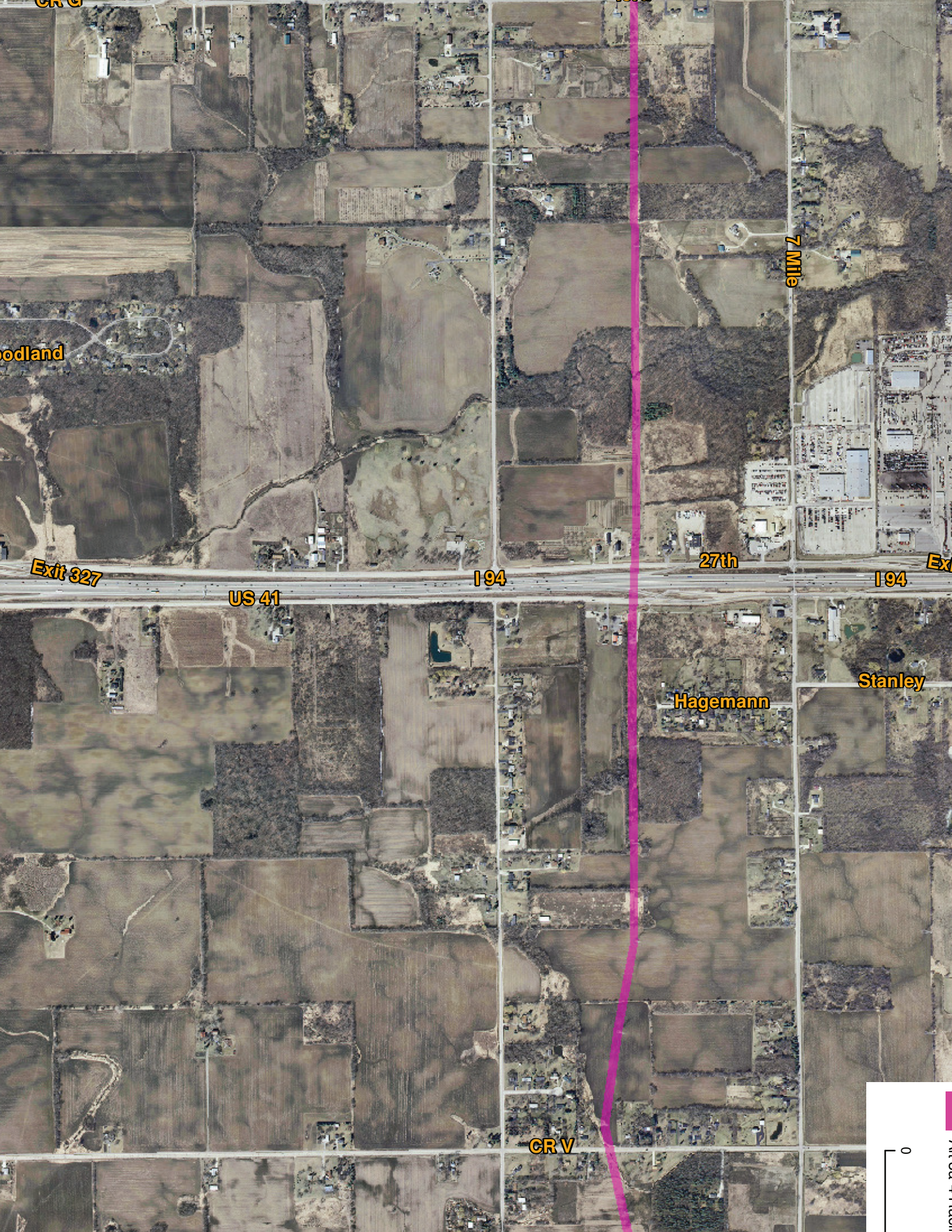

Janesville
CR L
0

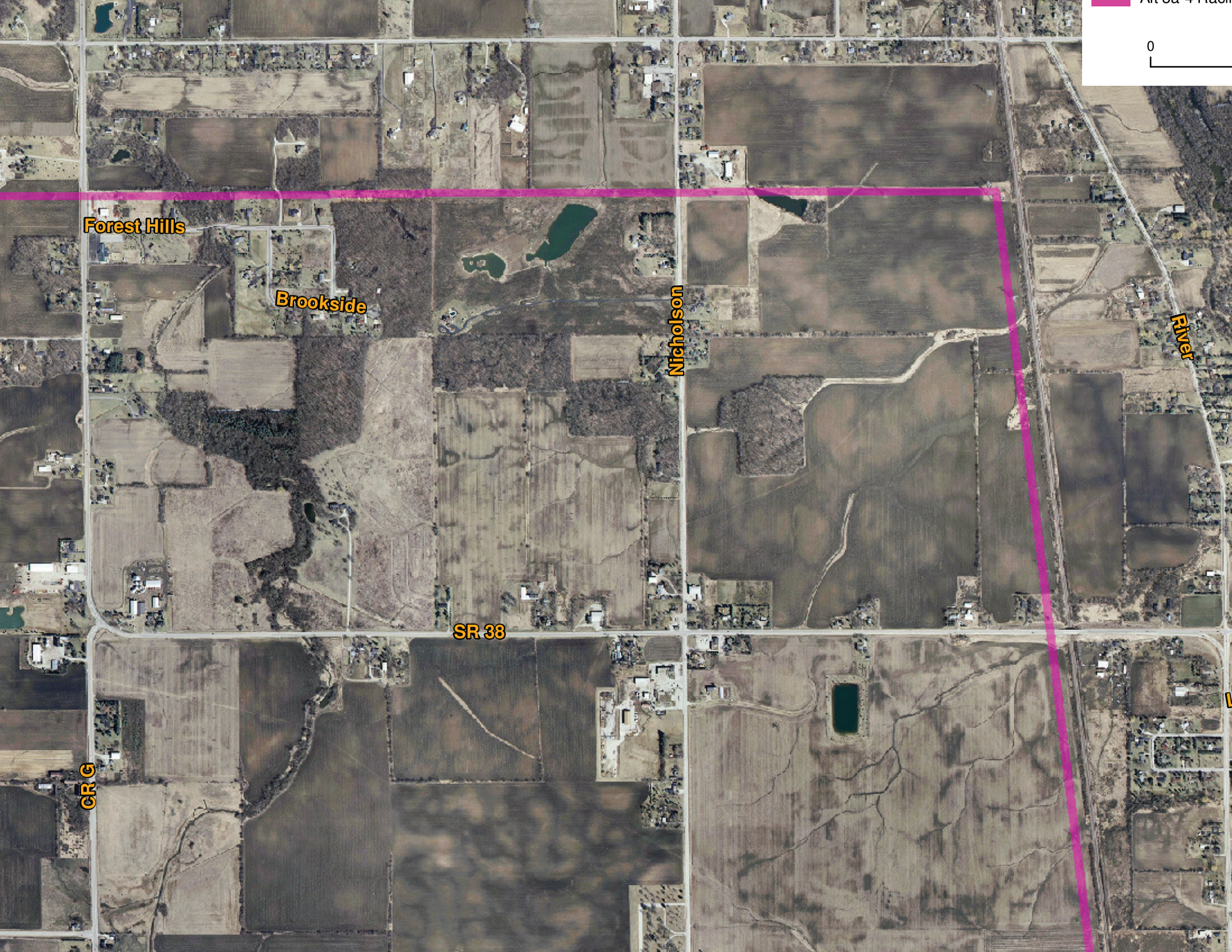

0
Christopher
Deback
Racine
Driveway
Keiser
Shore
Muskego Dam


0
Union Church
CR S
Loomis
Sadler
Wind Lake
Willow
Rasmussen
Kurtz
7 Mile

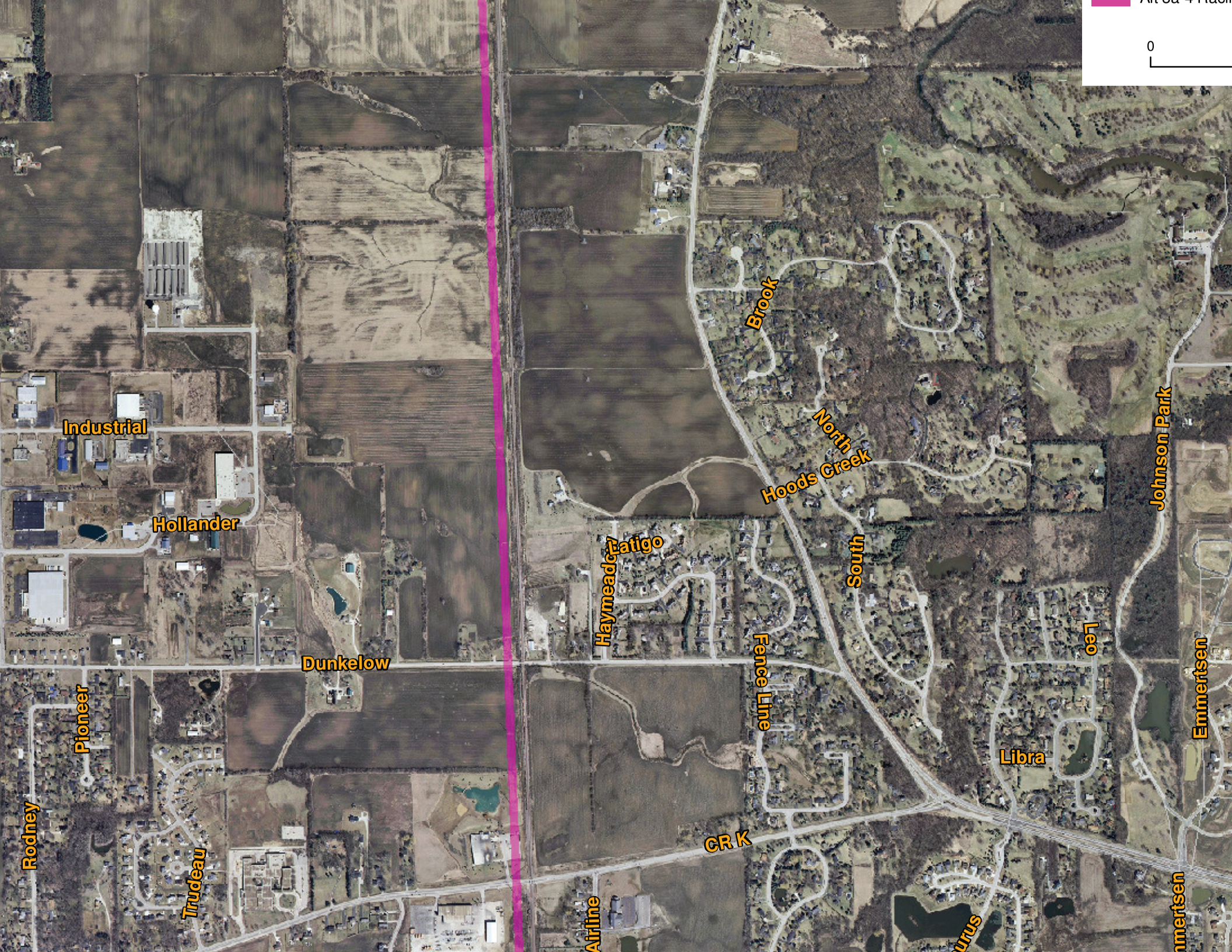

Walczak
Driveway
Norcine
Allis
US 45
122nd
Adeline
CR K
7 Mi
0

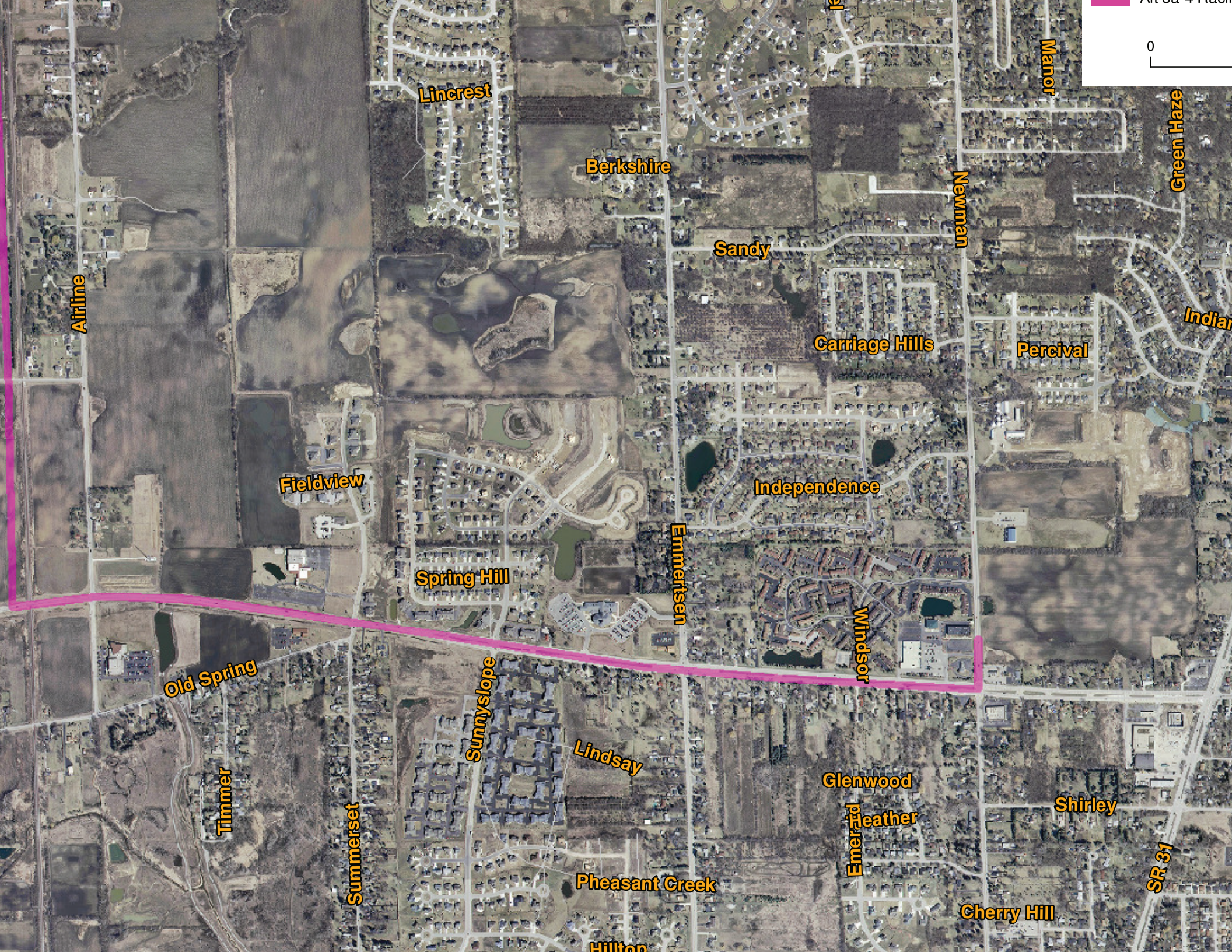

7 Mile
76th
CR U
76t
Waukesha
CR G
Sherwood
60th

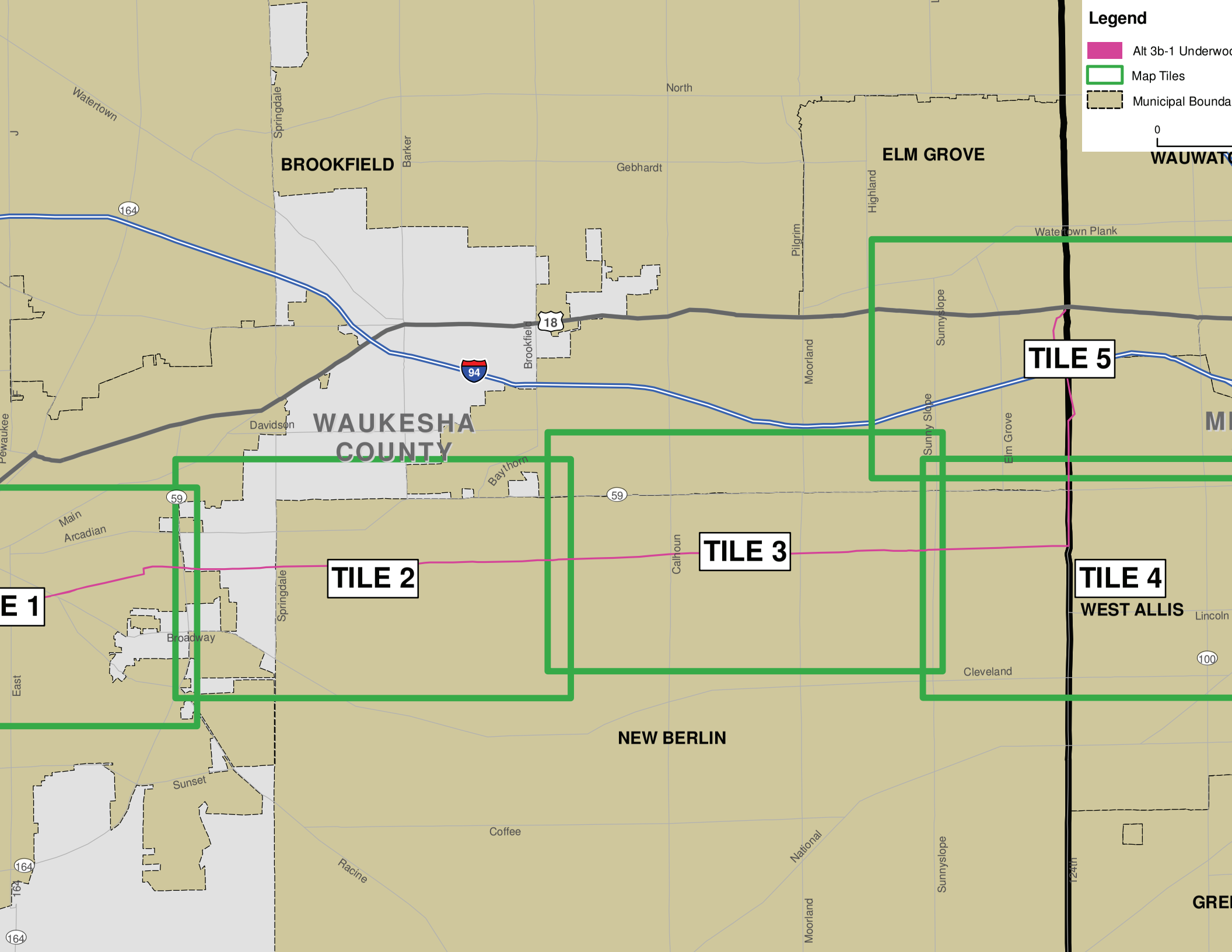

CR G
7 Mile
odland
Exit 327
US 41
I 94
27th
I 94
Stanley
Hagemann
CR V
0

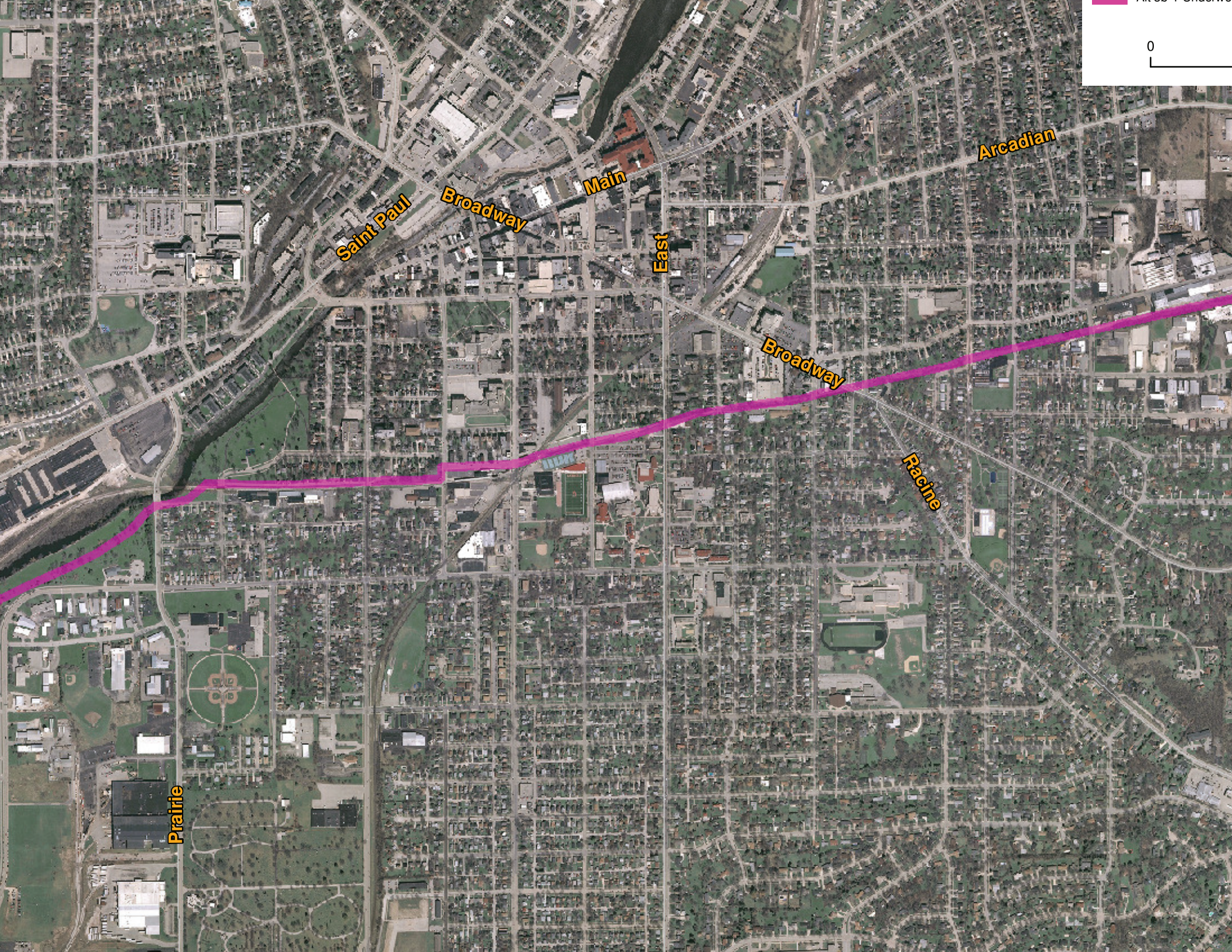

Alt 3a-4 Facil
0
Forest Hills
Brookside
Nicholson
River
SR 38
CR G

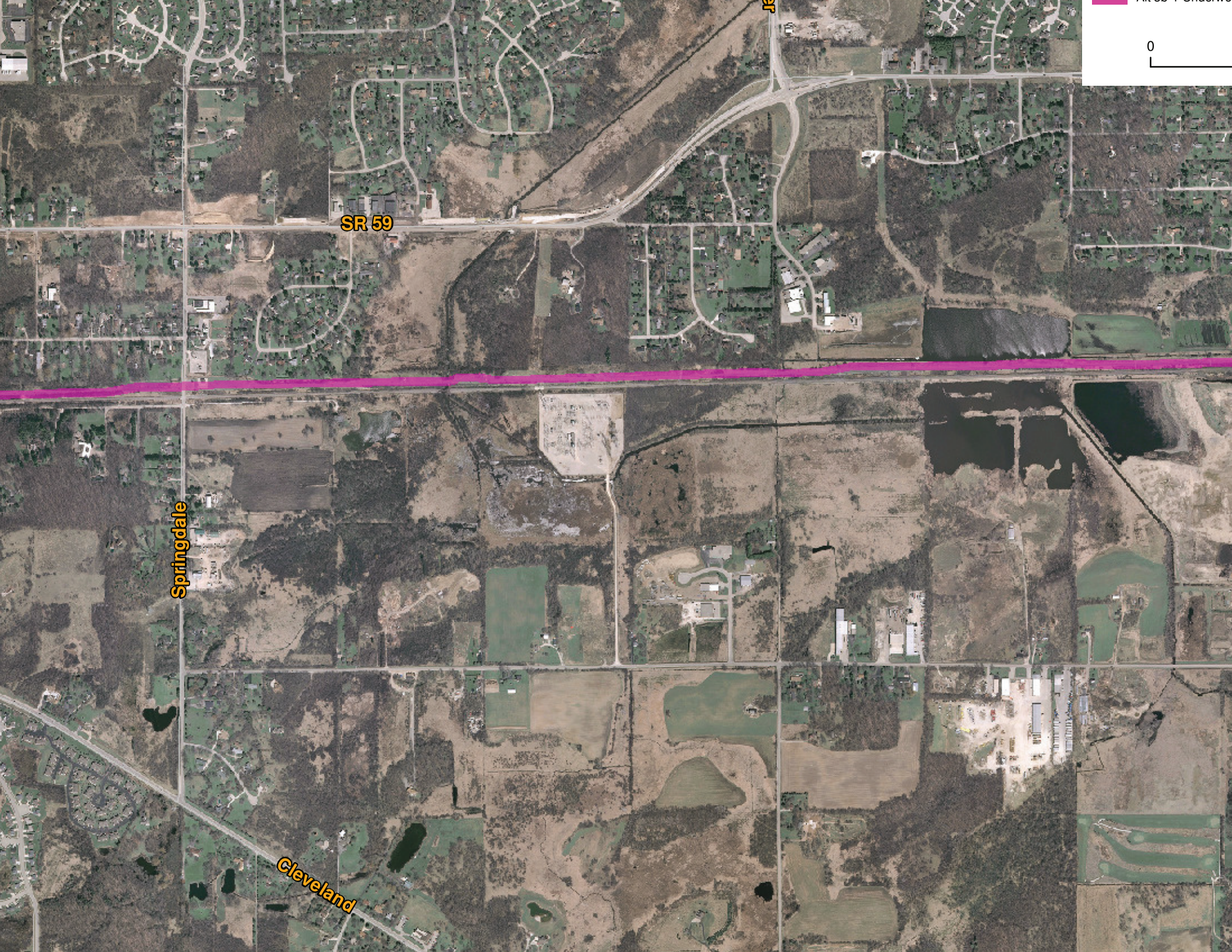
Area of Attack
0
Short
Agatha
Old Farm
River Hills
Alexander
SR 38
River

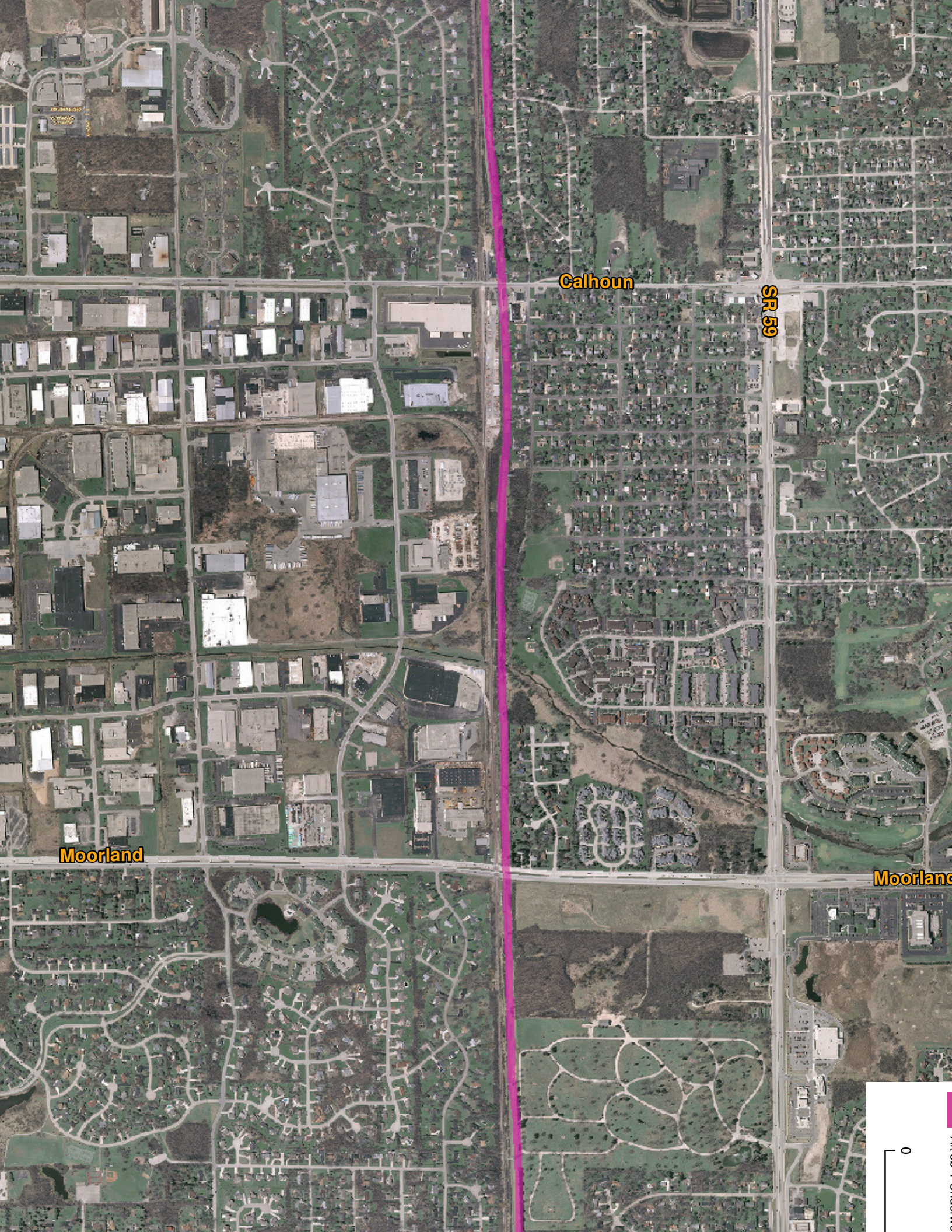

0
Brook
North
Hoods Creek
Johnson Park
Industrial
Hollander
Haymeadow
Fatigo
South
Dunkelow
Fence Line
Leo
Emmertsen
Pioneer
Libra
Rodney
Trudeau
CR K
Airline
Taurus
Emmertsen

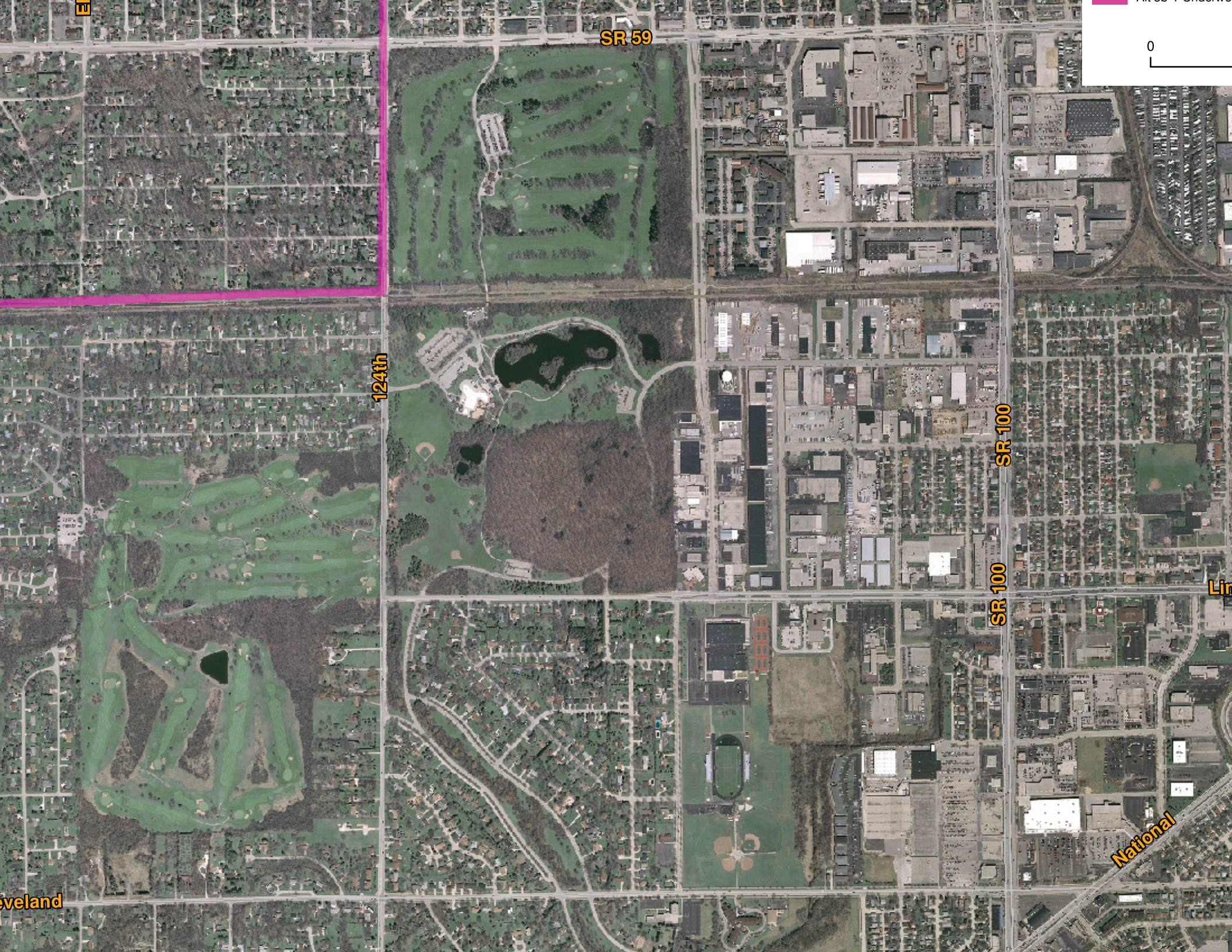

Lincrest
Berkshire
Sandy
Airline
Newman
Manor
Green Haze
Carriage Hills
Percival
Fieldview
Independence
Spring Hill
Emmertsen
Windsor
Old Spring
Sunnyslope
Lindsay
Timmer
Summerset
Glenwood
Shirley
Heather
Emerald
SR 31
Pheasant Creek
Cherry Hill
0

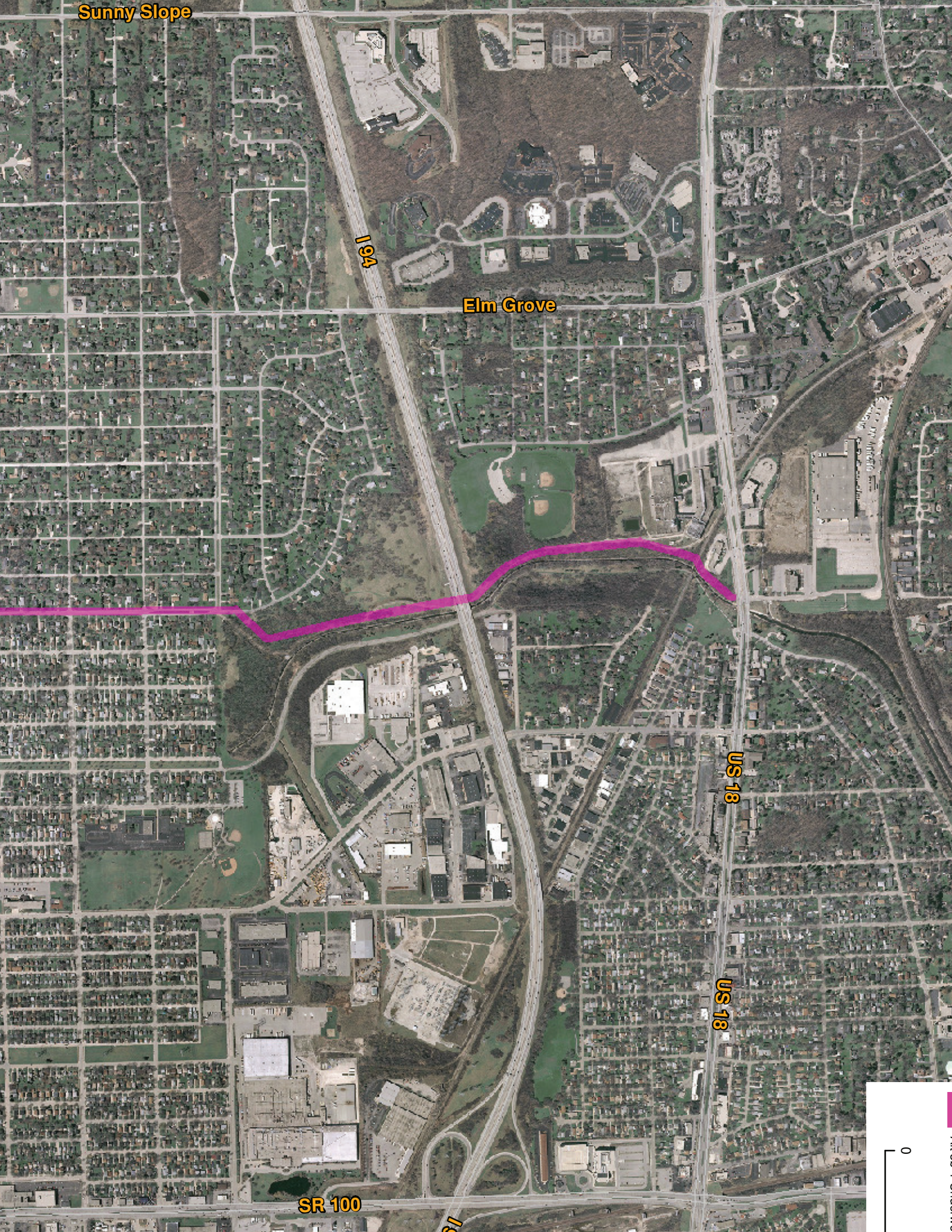

Legend
Alt 3b-1 Underwoo
Map Tiles
Municipal Bounda
0
TILE 1
TILE 2
TILE 3
TILE 4
TILE 5
BROOKFIELD
ELM GROVE
WAUKESHA COUNTY
NEW BERLIN
WEST ALLIS
North
Gebhardt
Watertown Plank
Davidson
Baythorn
Main
Arcadian
Broadway
Sunset
Coffee
Racine
Cleveland
Lincoln
Springdale
Barker
Pilgrim
Highland
Moorland
Sunnyslope
Sunny Slope
Elm Grove
Calhoun
National
124th
Brookfield
Watertown
Pewaukee
East
94
18
59
164
100


0
Arcadian
Main
Broadway
Saint Paul
East
Broadway
Racine
Prairie


SR 59
Springdale
Cleveland
0


Calhoun
SR 59
Moorland
Moorland


SR 59
124th
SR 100
SR 100
National
0


Sunny Slope
I 94
Elm Grove
US 18
US 18
SR 100