

Attachment D

Wetland Delineation



Memorandum

SRF No. 11925

To: Joe Widing, Senior Planner
From: Emily Deering, Senior Analyst
Date: February 4, 2019
Subject: City of Shakopee/Jackson Township Annexation Area Project

City of Shakopee/Jackson Township Annexation Area Project Wetland Review

Introduction

This memo documents wetland assessment efforts for the City of Shakopee/Jackson Township Annexation Area Project, located in Scott County, Minnesota. Attached as Figures 1 and 2 are the state location map and project area map. The project will provide environmental planning and documentation for the development of the City's southwestern orderly annexation area within Jackson Township.

Methodology

SRF Consulting Group, Inc., on behalf of the City of Shakopee, reviewed off-site data sources including the National Wetland Inventory (NWI), Minnesota Department of Natural Resources (MnDNR) Public Waters Inventory (PWI), Natural Resource Conservation Service (NRCS) soil mapping and hydric soils list, light detection and ranging (LiDAR) two-foot contour data, the U.S. Geological Survey (USGS) topographic map, and recent and historical aerial photography of the project area, prior to completing an off-site Level 1 wetland delineation to document potential wetlands within the proposed project area. Table 1 below summarizes the images and climate conditions at the time the air photos were taken. Exact fly dates are available for Minnesota Geospatial Web Map Service (Mn GEO WMS) images. Only month and year information is available for images available from Google Earth. Climate conditions were calculated using the intersection of West County Road 78 and Old Brick Yard Road as the centroid of the project area.

Table 1. Climate conditions for aerial imagery.

Date Image Taken	Image Source	Climate Condition
March 2006	Google Earth	Normal
April 2006	Google Earth	Normal
April 2011	Google Earth	Normal
May 2012	Google Earth	Normal
September 2013	Google Earth	Normal

Date Image Taken	Image Source	Climate Condition
October 2014	Google Earth	Dry
August 2015	Google Earth	Wet
March 2016	Google Earth	Normal
April 2017	Google Earth	Dry
August 23, 2017	Mn GEO WNS Service	Normal
April 2018	Google Earth	Wet

Climate data source: Minnesota State Climatology Office's Wetland Delineation Precipitation Data Retrieval from a Gridded Database.

Results

The off-site data review found 90 potential wetlands within the wetland review area for the proposed project (Figures 3-11). Soil data, wetland type, and NWI information are summarized in Table 2 below. For wetlands with more than one soil type, all those within the wetland area are provided. The majority of wetlands located in hydric soils occur in subdistricts D and C. There are four DNR public water basins within the review area. There are no DNR public watercourses within the review area. However, the Minnesota River borders the project area along subdistrict D. Eight channels were identified in the review area.

Table 2. Level 1 wetland delineation summary.

Wetland ID	Corwardin	Overlap with NWI	SSURGO Soil	SSURGO Hydric Soil Rating
Wetland 1	PAB1G	Yes	Estherville-Burnsville complex, 12 to 50 percent slopes	5
			Water	0
Wetland 2	PEM2C	Yes	Estherville-Burnsville complex, 12 to 50 percent slopes	5
			Water	0
Wetland 3	PUB4G	Yes	Hayden loam, 12 to 18 percent slopes	0
			Water	0
Wetland 4	PEM1C	Yes	Hayden loam, 0 to 6 percent slopes	0
			Hayden loam, 12 to 18 percent slopes	0
			Hayden loam, 18 to 25 percent slopes	0
			Hayden loam, 6 to 12 percent slopes, moderately eroded	0
			Water	0
			Waukegan silt loam, 2 to 6 percent slopes	0
Wetland 5	PEM2B	Yes	Hayden loam, 0 to 6 percent slopes	0
			Hayden loam, 12 to 18 percent slopes	0
			Water	0
			Waukegan silt loam, 2 to 6 percent slopes	0
Wetland 6	PFO1A	Yes	Hayden loam, 12 to 18 percent slopes	0
			Hayden loam, 6 to 12 percent slopes, moderately eroded	0
			Waukegan silt loam, 2 to 6 percent slopes	0
Wetland 7	PUB4G	Yes	Hayden loam, 18 to 25 percent slopes	0
			Hayden loam, 6 to 12 percent slopes, moderately eroded	0
			Water	0
			Waukegan silt loam, 2 to 6 percent slopes	0
Wetland 8	PUG4B	Yes	Hayden loam, 18 to 25 percent slopes	0
			Water	0
Wetland 9	PEM1B	Yes	Waukegan silt loam, 2 to 6 percent slopes	0
Wetland 10	PAB1G	Yes	Glencoe silty clay loam, 0 to 1 percent slopes	100
Wetland 11	PEM1C	Yes	Glencoe silty clay loam, 0 to 1 percent slopes	100
Wetland 12	PEM2B	Yes	Glencoe silty clay loam, 0 to 1 percent slopes	100
			Hayden loam, 0 to 6 percent slopes	0

Wetland ID	Corwardin	Overlap with NWI	SSURGO Soil	SSURGO Hydric Soil Rating
			Hayden loam, 6 to 12 percent slopes, moderately eroded	0
			Hayden soils, 12 to 18 percent slopes, severely eroded	0
			Waukegan silt loam, 2 to 6 percent slopes	0
Wetland 13	PEM2Af	No	Estherville sandy loam, 0 to 2 percent slopes	6
			Sparta loamy fine sand, 2 to 6 percent slopes	0
			Terril loam, 6 to 12 percent slopes	5
Wetland 14	PEM2Af	No	Dickman sandy loam, 2 to 6 percent slopes	0
			Terril loam, 0 to 2 percent slopes	7
Wetland 15	PEM1Bf	Yes	Terril loam, 0 to 2 percent slopes	7
Wetland 16	PEM2Af	No	Hayden sandy loam, 18 to 25 percent slopes	0
Wetland 17	PEM2Af	No	Hayden sandy loam, 18 to 25 percent slopes	0
Wetland 18	PEM1C	Yes	Waukegan silt loam, 2 to 6 percent slopes	0
Wetland 19	PAB1G	Yes	Hayden loam, 18 to 25 percent slopes	0
			Lester loam, 2 to 6 percent slopes, moderately eroded	0
Wetland 20	PEM1B	No	Lester loam, 6 to 10 percent slopes, moderately eroded	2
Wetland 21	PEM2A	No	Hayden loam, 6 to 12 percent slopes, moderately eroded	0
Wetland 22	PEM2Bf	No	Lester loam, 6 to 10 percent slopes, moderately eroded	2
Wetland 23	PEM2Bf	Yes	Hayden loam, 6 to 12 percent slopes	0
Wetland 24	PEM2Bf	Yes	Waukegan silt loam, 2 to 6 percent slopes	0
Wetland 25	PEM1B	Yes	Lamont sandy loam, 2 to 6 percent slopes	0
Wetland 26	PEM1C	Yes	Glencoe silty clay loam, 0 to 1 percent slopes	100
			Hayden loam, 6 to 12 percent slopes, moderately eroded	0
			Waukegan silt loam, 2 to 6 percent slopes	0
Wetland 27	PEM1Cf	Yes	Glencoe silty clay loam, 0 to 1 percent slopes	100
			Plainfield fine sand, 0 to 2 percent slopes	0
Wetland 28	PEM1Bf	No	Lester loam, 2 to 6 percent slopes, moderately eroded	0
Wetland 29	PEM1Cf	No	Hayden loam, 6 to 12 percent slopes, moderately eroded	0
			Hayden soils, 12 to 18 percent slopes, severely eroded	0
			Lester loam, 2 to 6 percent slopes, moderately eroded	0
Wetland 30	PEM2Bf	No	Water, intermittent	0
Wetland 31	PEM2Bf	No	Lamont sandy loam, 6 to 12 percent slopes	0

Wetland ID	Corwardin	Overlap with NWI	SSURGO Soil	SSURGO Hydric Soil Rating
Wetland 32	PEM2Bf	No	Waukegan silt loam, 2 to 6 percent slopes	0
			Glencoe silty clay loam, 0 to 1 percent slopes	100
			Hayden loam, 6 to 12 percent slopes, moderately eroded	0
			Waukegan silt loam, 2 to 6 percent slopes	0
Wetland 33	PEM2Bf	No	Waukegan silt loam, 2 to 6 percent slopes	0
Wetland 34	PEM1A	Yes	Hayden loam, 6 to 12 percent slopes, moderately eroded	0
			Water, intermittent	0
			Waukegan silt loam, 2 to 6 percent slopes	0
Wetland 35	PEM1A	Yes	Glencoe silty clay loam, 0 to 1 percent slopes	100
			Hayden loam, 12 to 18 percent slopes	0
			Hayden loam, 18 to 25 percent slopes	0
			Glencoe silty clay loam, 0 to 1 percent slopes	100
Wetland 36	PEM2Bf	No	Glencoe silty clay loam, 0 to 1 percent slopes	100
Wetland 37	PEM2Bf	No	Hayden loam, 6 to 12 percent slopes, moderately eroded	0
			Hayden loam, 12 to 18 percent slopes	0
Wetland 38	PEM1B	Yes	Hayden loam, 6 to 12 percent slopes	0
			Hayden loam, 6 to 12 percent slopes	0
			Hayden loam, 6 to 12 percent slopes, moderately eroded	0
			Lamont sandy loam, 2 to 6 percent slopes	0
			Waukegan silt loam, 2 to 6 percent slopes	0
			Hayden loam, 6 to 12 percent slopes, moderately eroded	0
Wetland 39	PFO6B	Yes	Waukegan silt loam, 2 to 6 percent slopes	0
			Hayden loam, 6 to 12 percent slopes, moderately eroded	0
Wetland 40	PFO1B	Yes	Waukegan silt loam, 2 to 6 percent slopes	0
Wetland 41	PEM1Bx	No	Estherville sandy loam, 0 to 2 percent slopes	6
Wetland 42	PEM1C	Yes	Hayden loam, 0 to 6 percent slopes	0
			Hayden loam, 25 to 35 percent slopes	0
Wetland 43	PEM2B	No	Estherville loam and sandy loam, 2 to 6 percent slopes, moderately eroded	0
			Terril loam, 0 to 2 percent slopes	7
			Wadena loam, 2 to 6 percent slopes	0
Wetland 44	PEM1Cx	No	Estherville loam and sandy loam, 2 to 6 percent slopes, moderately eroded	0
			Wadena loam, 2 to 6 percent slopes	0
Wetland 45	PEM1Bx	No	Wadena loam, 2 to 6 percent slopes	0

Wetland ID	Corwardin	Overlap with NWI	SSURGO Soil	SSURGO Hydric Soil Rating
Wetland 46	PEM1Gx	Yes	Estherville loam and sandy loam, 2 to 6 percent slopes, moderately eroded	0
			Terril loam, 0 to 2 percent slopes	7
Wetland 47	PEM1Bx	No	Sparta fine sand, 2 to 6 percent slopes	0
Wetland 48	PEM1Fx	No	Sparta fine sand, 0 to 2 percent slopes	0
Wetland 49	PEM1Fx	No	Sparta fine sand, 0 to 2 percent slopes	0
Wetland 50	PEM1Hx	Yes	Estherville sandy loam, 2 to 6 percent slopes	1
			Salida gravelly sandy loam, 0 to 6 percent slopes	0
			Schapville silty clay loam, 12 to 17 percent slopes, moderately eroded	0
			Terril loam, 2 to 6 percent slopes	8
Wetland 51	PEM1Gx	Yes	Schapville silty clay loam, 12 to 17 percent slopes, moderately eroded	0
			Terril loam, 2 to 6 percent slopes	8
Wetland 52	PEM1Gx	Yes	Schapville silty clay loam, 12 to 17 percent slopes, moderately eroded	0
			Terril loam, 2 to 6 percent slopes	8
			Water	0
Wetland 53	PEM2Ax	Yes	Schapville silty clay loam, 12 to 17 percent slopes, moderately eroded	0
Wetland 54	PEM1Fx	Yes	Port Byron silt loam, 0 to 2 percent slopes	0
Wetland 55	PEM1Ax	Yes	Port Byron silt loam, 0 to 2 percent slopes	0
			Schapville silty clay loam, 12 to 17 percent slopes, moderately eroded	0
			Terril loam, 2 to 6 percent slopes	8
			Terril loam, 6 to 12 percent slopes	5
			Wadena loam, 2 to 6 percent slopes	0
Wetland 56	PEM1Hx	Yes	Estherville loam and sandy loam, 2 to 6 percent slopes, moderately eroded	0
			Tama-Downs complex, driftless, 0 to 2 percent slopes	0
Wetland 57	PEM1Fx	No	Copaston silt loam, 0 to 2 percent slopes	15
			Schapville silty clay loam, 12 to 17 percent slopes, moderately eroded	0
Wetland 58	PEM2Bx	No	Copaston silt loam, 0 to 2 percent slopes	15
			Schapville silty clay loam, 12 to 17 percent slopes, moderately eroded	0
Wetland 59	PEM2Bx	No	Copaston silt loam, 0 to 2 percent slopes	15
Wetland 60	PEM1Fx	No	Copaston silt loam, 0 to 2 percent slopes	15
Wetland 61	PEM1Kx	No	Tama-Downs complex, driftless, 0 to 2 percent slopes	0
Wetland 62	PEM1F	Yes	Alluvial land, medium textured, well drained	0

Wetland ID	Corwardin	Overlap with NWI	SSURGO Soil	SSURGO Hydric Soil Rating
			Dakota fine sandy loam, 12 to 17 percent slopes, moderately eroded	0
			Oshawa silty clay loam	95
Wetland 63	PEM1F	Yes	Alluvial land, medium textured, well drained	0
			Racine and Ostrander silt loams, 0 to 1 percent slopes	0
Wetland 64	PEM1A	Yes	Alluvial land, 0 to 2 percent slopes	0
Wetland 65	PEM1A	Yes	Alluvial land, medium textured, well drained	0
Wetland 66	PEM1A	Yes	Alluvial land, 0 to 2 percent slopes	0
			Dakota fine sandy loam, 12 to 17 percent slopes, moderately eroded	0
Wetland 67	PSS1C	Yes	Alluvial land, 0 to 2 percent slopes	0
			Dakota fine sandy loam, 12 to 17 percent slopes, moderately eroded	0
			Oshawa silty clay loam	95
Wetland 68	PFO1A	Yes	Alluvial land, 0 to 2 percent slopes	0
			Alluvial land, medium textured, well drained	0
			Dakota fine sandy loam, 12 to 17 percent slopes, moderately eroded	0
			Oshawa silty clay loam	95
			Racine and Ostrander silt loams, 0 to 1 percent slopes	0
			Tama-Downs complex, driftless, 0 to 2 percent slopes	0
			Terril loam, 12 to 18 percent slopes	0
			Water	0
Wetland 69	PUBH	Yes	Water	0
Wetland 70	PUBH	Yes	Oshawa silty clay loam	95
			Water	0
Wetland 71	PAB1G	Yes	Racine and Ostrander silt loams, 0 to 1 percent slopes	0
			Water	0
Wetland 72	L2ABH	Yes	Water	0
Wetland 73	PEM2A	Yes	Alluvial land, 0 to 2 percent slopes	0
			Alluvial land, medium textured, well drained	0
			Dakota fine sandy loam, 12 to 17 percent slopes, moderately eroded	0
Wetland 74	PEM1A	Yes	Alluvial land, 0 to 2 percent slopes	0
			Alluvial land, 2 to 6 percent slopes	0
Wetland 75	PEM1F	Yes	Water	0

Wetland ID	Corwardin	Overlap with NWI	SSURGO Soil	SSURGO Hydric Soil Rating
Wetland 76	PEM1F	Yes	Marshan silty clay loam	90
			Water	0
Wetland 77	PEM1Cd	Yes	Dakota fine sandy loam, 12 to 17 percent slopes, moderately eroded	0
			Marshan silty clay loam	90
			Oshawa silty clay loam	95
			Water	0
Wetland 78	PFO1A	Yes	Alluvial land, 0 to 2 percent slopes	0
			Alluvial land, 2 to 6 percent slopes	0
			Dakota fine sandy loam, 12 to 17 percent slopes, moderately eroded	0
			Marshan silty clay loam	90
			Oshawa silty clay loam	95
Wetland 79	PEM1Af	Yes	Water	0
			Dakota fine sandy loam, 12 to 17 percent slopes, moderately eroded	0
Wetland 80	PSS1A	Yes	Oshawa silty clay loam	95
			Dakota fine sandy loam, 12 to 17 percent slopes, moderately eroded	0
Wetland 81	PEM1A	Yes	Oshawa silty clay loam	95
			Dakota fine sandy loam, 12 to 17 percent slopes, moderately eroded	0
			Marshan silty clay loam	90
			Oshawa silty clay loam	95
			Racine and Ostrander silt loams, 0 to 1 percent slopes	0
			Schapville silty clay loam, 12 to 17 percent slopes, moderately eroded	0
			Tama-Downs complex, driftless, 0 to 2 percent slopes	0
Wetland 82	PEM1C	Yes	Water	0
			Oshawa silty clay loam	95
			Racine and Ostrander silt loams, 0 to 1 percent slopes	0
Wetland 83	PEM1F	Yes	Water	0
			Alluvial land, medium textured, well drained	0
Wetland 84	PEM1F	Yes	Racine and Ostrander silt loams, 0 to 1 percent slopes	0
			Racine and Ostrander silt loams, 0 to 1 percent slopes	0
Wetland 85	PEM2A	Yes	Alluvial land, 0 to 2 percent slopes	0
			Alluvial land, medium textured, well drained	0

Wetland ID	Corwardin	Overlap with NWI	SSURGO Soil	SSURGO Hydric Soil Rating
			Oshawa silty clay loam	95
			Racine and Ostrander silt loams, 0 to 1 percent slopes	0
			Tama-Downs complex, driftless, 0 to 2 percent slopes	0
			Water	0
Wetland 86	PEM1A	Yes	Dakota fine sandy loam, 12 to 17 percent slopes, moderately eroded	0
			Oshawa silty clay loam	95
Wetland 87	PFO1A/PEM1A	Yes	Alluvial land, 0 to 2 percent slopes	0
			Dakota fine sandy loam, 12 to 17 percent slopes, moderately eroded	0
Wetland 88	PFO2A/PEM2A	Yes	Alluvial land, medium textured, well drained	0
Wetland 89	PFO2A/PEM2A	Yes	Alluvial land, medium textured, well drained	0
Wetland 90	PFO2A/PEM2A	Yes	Alluvial land, 0 to 2 percent slopes	0
			Alluvial land, medium textured, well drained	0
			Dakota fine sandy loam, 12 to 17 percent slopes, moderately eroded	0

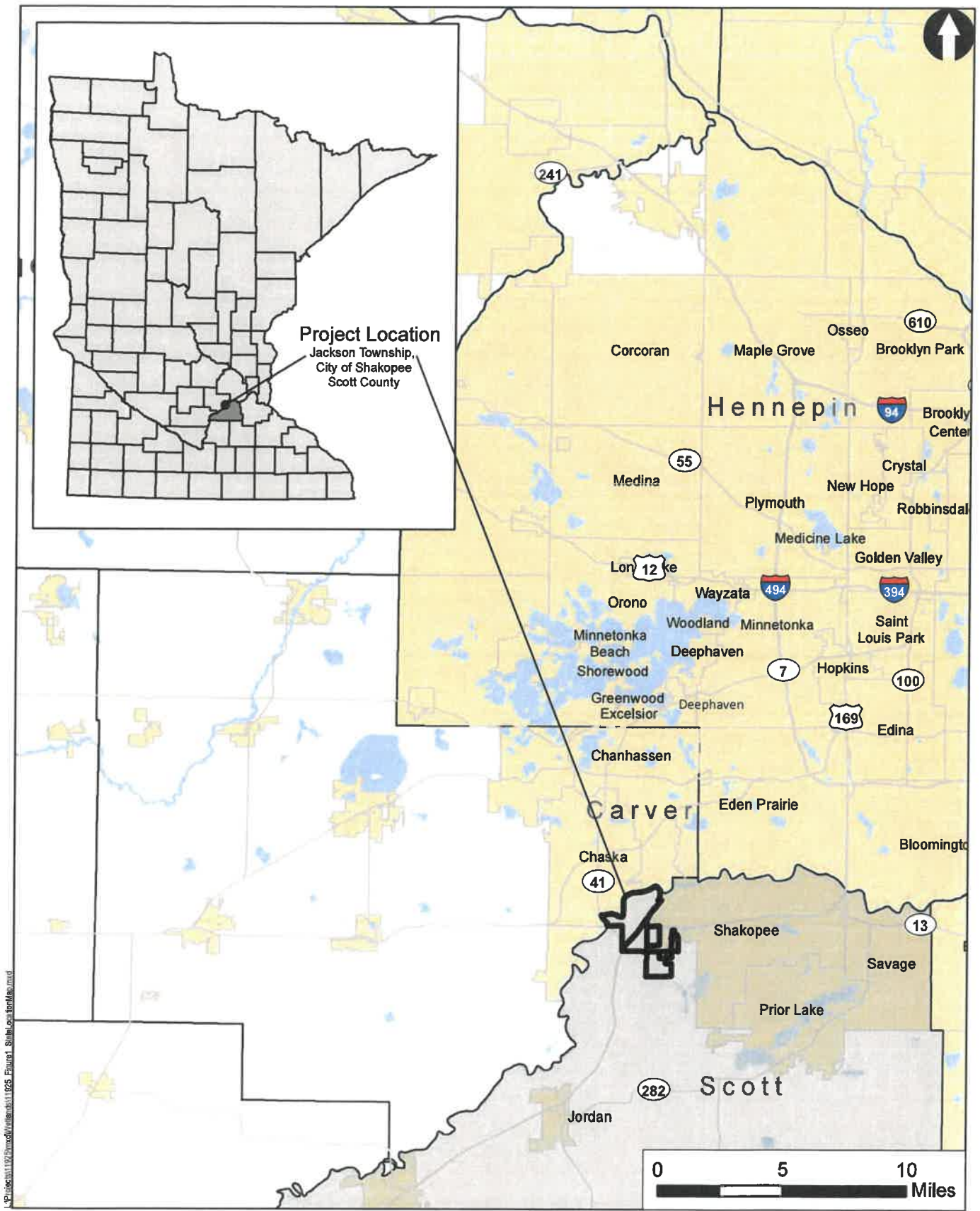
The delineated potential wetland boundaries are based primarily on a combination of aerial interpretation, NWI mapping, and contours (Figures 12-20). In general, the elevation decreases from east to west within the project area. The project area is situated within diverse land uses. Subdistrict D consists of natural floodplain, farmland, commercial properties, sand and gravel operations, and a pocket of residential development. Subdistricts A, B, C, E, and F are comprised of farmland, rural residences, and sections of undisturbed forest. The western portion of subdistrict B also contains commercial development. Subdistrict G contains residential development. Wetland types vary by subdistrict. Farmed wetlands are present in subdistricts A and C. Subdistricts B and D contain a mix of wetland basins and wetlands excavated from human activities. Unfarmed wetland basins exist in subdistricts E and F. No wetlands were identified in subdistrict G.

Conclusions and Recommendations

Completion of a Level 2 (field) wetland delineation may find that the wetlands should be classified differently; however, more conservative / protective classifications have been used for this preliminary offsite review. This Level 1 (office) wetland delineation is intended for planning-level use only. SRF recommends a Level 2 (field) wetland delineation and agency coordination prior to any construction activity within the review area.

Attached:

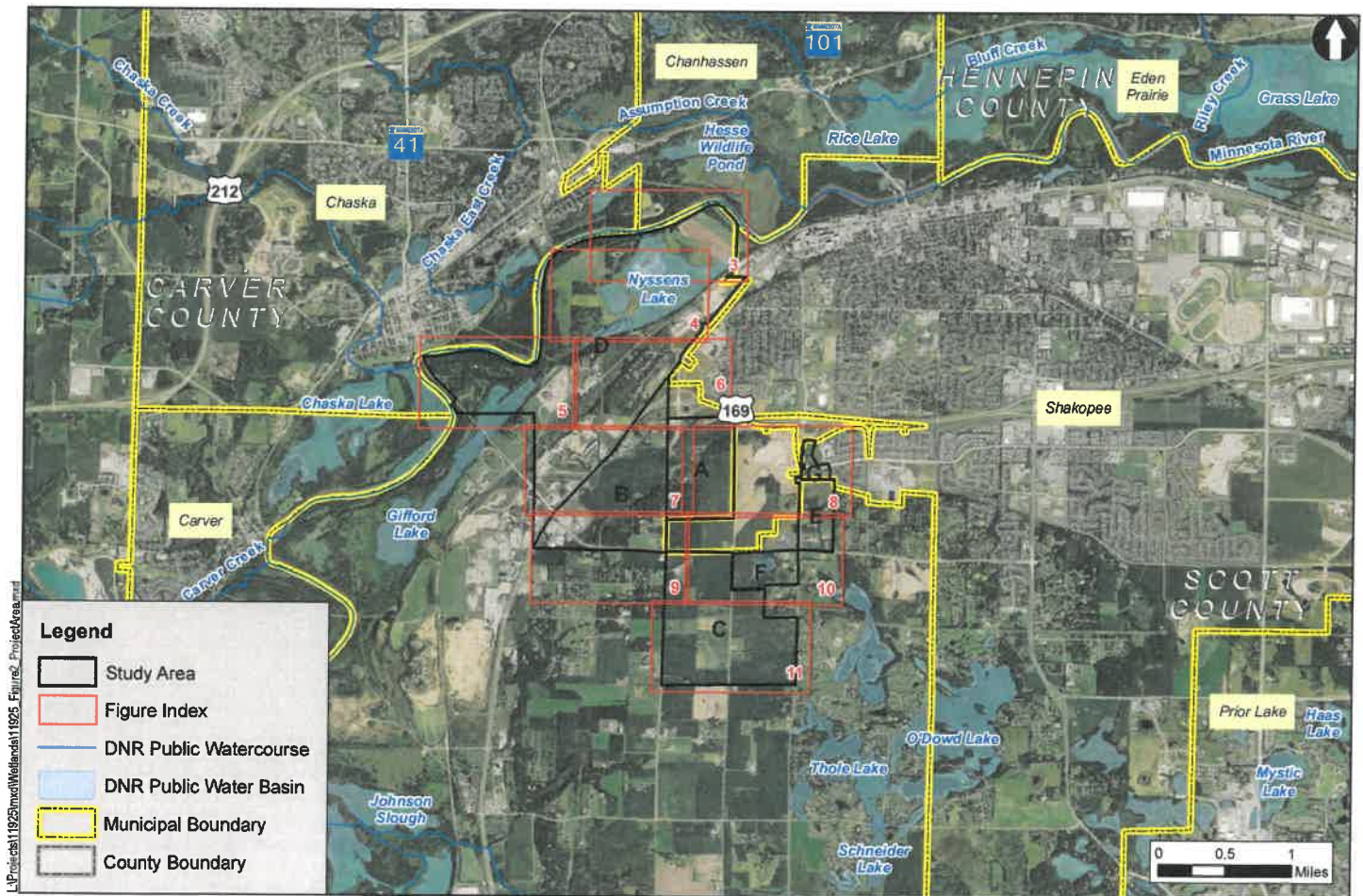
- Figure 1: Project Location Map
- Figure 2: Project Area Map
- Figures 3-11: Level 1 Wetland Delineation
- Figures 12-20: LiDAR 2-Foot Contours
- Aerial Imagery Precipitation Worksheets



State Location Map

City of Shakopee/Jackson Township Annexation Area
City of Shakopee

Figure 1



Project Area / Index Map

City of Shakopee/Jackson Township Annexation Area
City of Shakopee

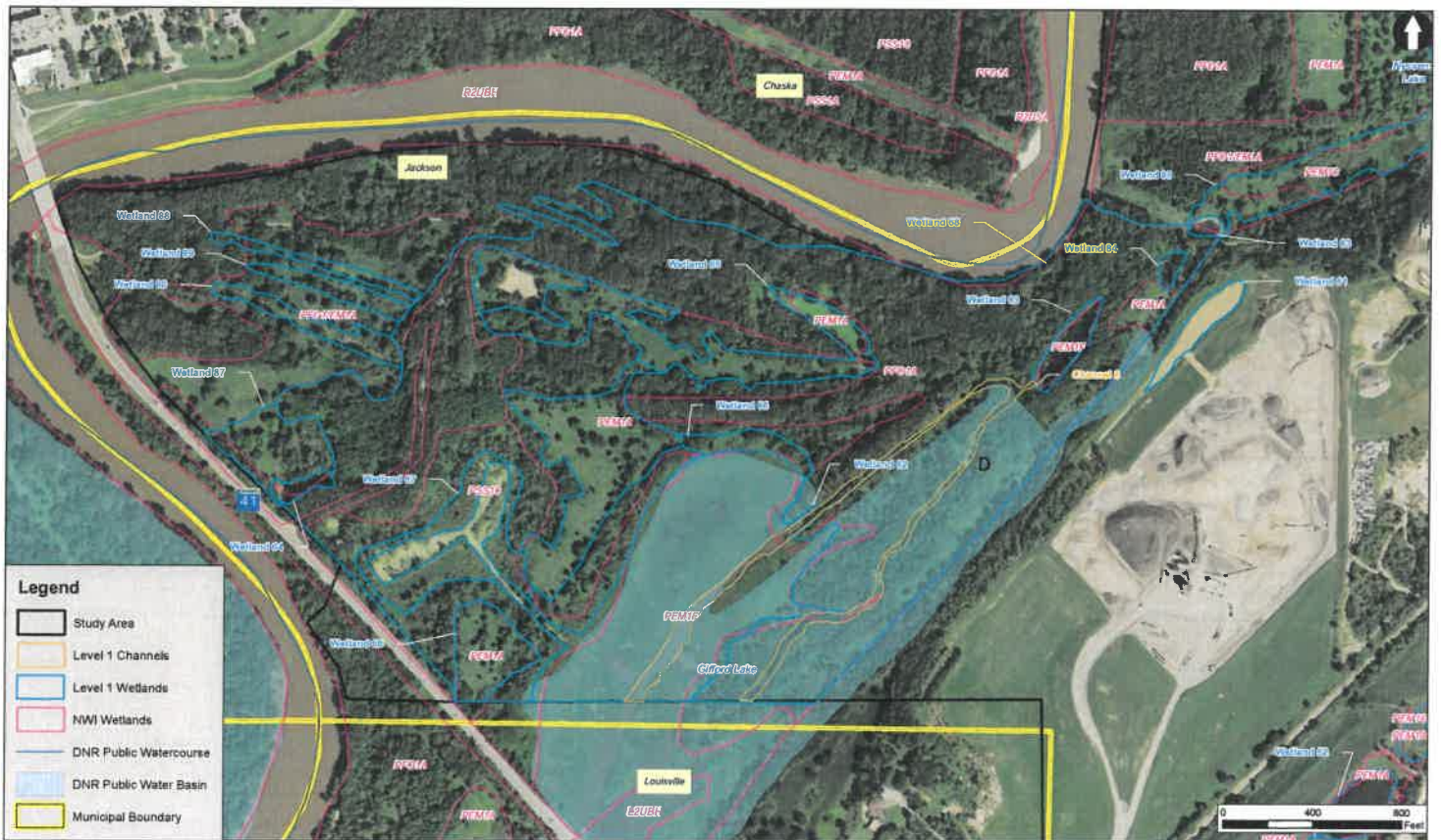
Figure 2



Level 1 Wetland Delineation
 City of Shakopee/Jackson Township Annexation Area
 City of Shakopee

Figure 3





Level 1 Wetland Delineation
City of Shakopee/Jackson Township Annexation Area
City of Shakopee

Figure 5



Level 1 Wetland Delineation
 City of Shakopee/Jackson Township Annexation Area
 City of Shakopee

Figure 6



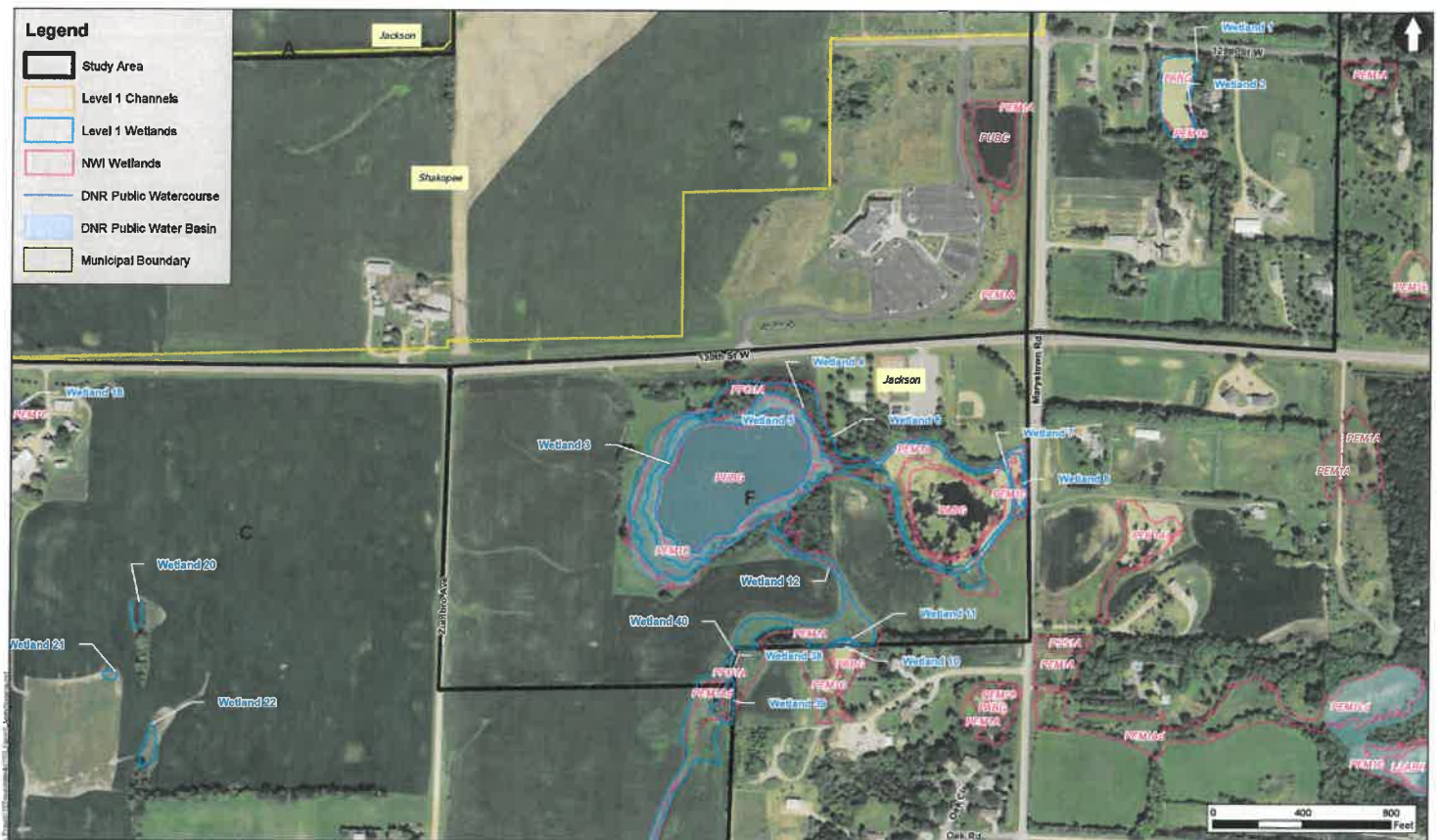
Level 1 Wetland Delineation
 City of Shakopee/Jackson Township Annexation Area
 City of Shakopee

Figure 7



Level 1 Wetland Delineation
 City of Shakopee/Jackson Township Annexation Area
 City of Shakopee

Figure 8



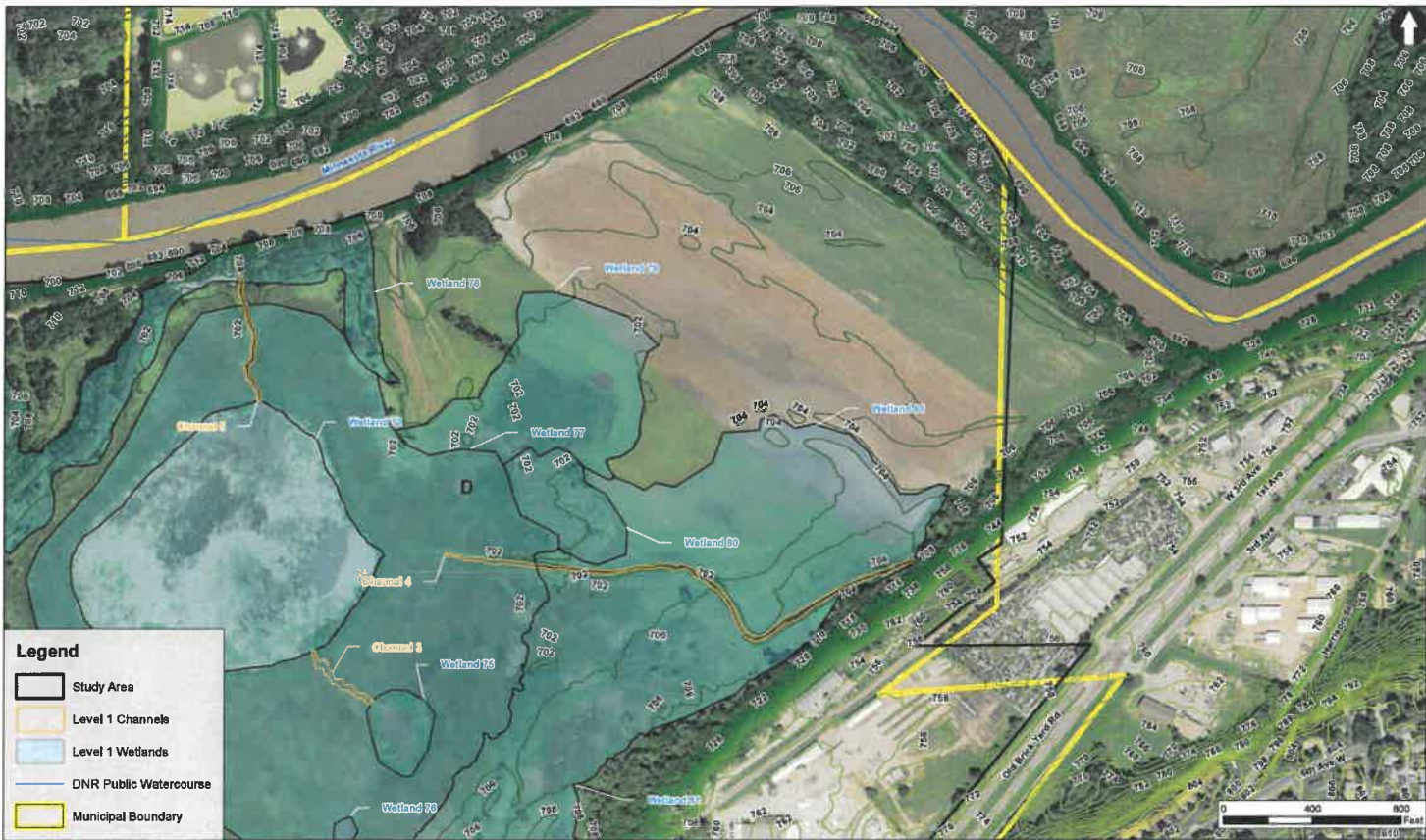
Level 1 Wetland Delineation
 City of Shakopee/Jackson Township Annexation Area
 City of Shakopee

Figure 10



Level 1 Wetland Delineation
 City of Shakopee/Jackson Township Annexation Area
 City of Shakopee

Figure 11



LiDAR Two-Foot Contours
City of Shakopee/Jackson Township Annexation Area
City of Shakopee

Figure 12



LiDAR Two-Foot Contours
City of Shakopee/Jackson Township Annexation Area
City of Shakopee

Figure 13



LiDAR Two-Foot Contours
City of Shakopee/Jackson Township Annexation Area
City of Shakopee

Figure 14



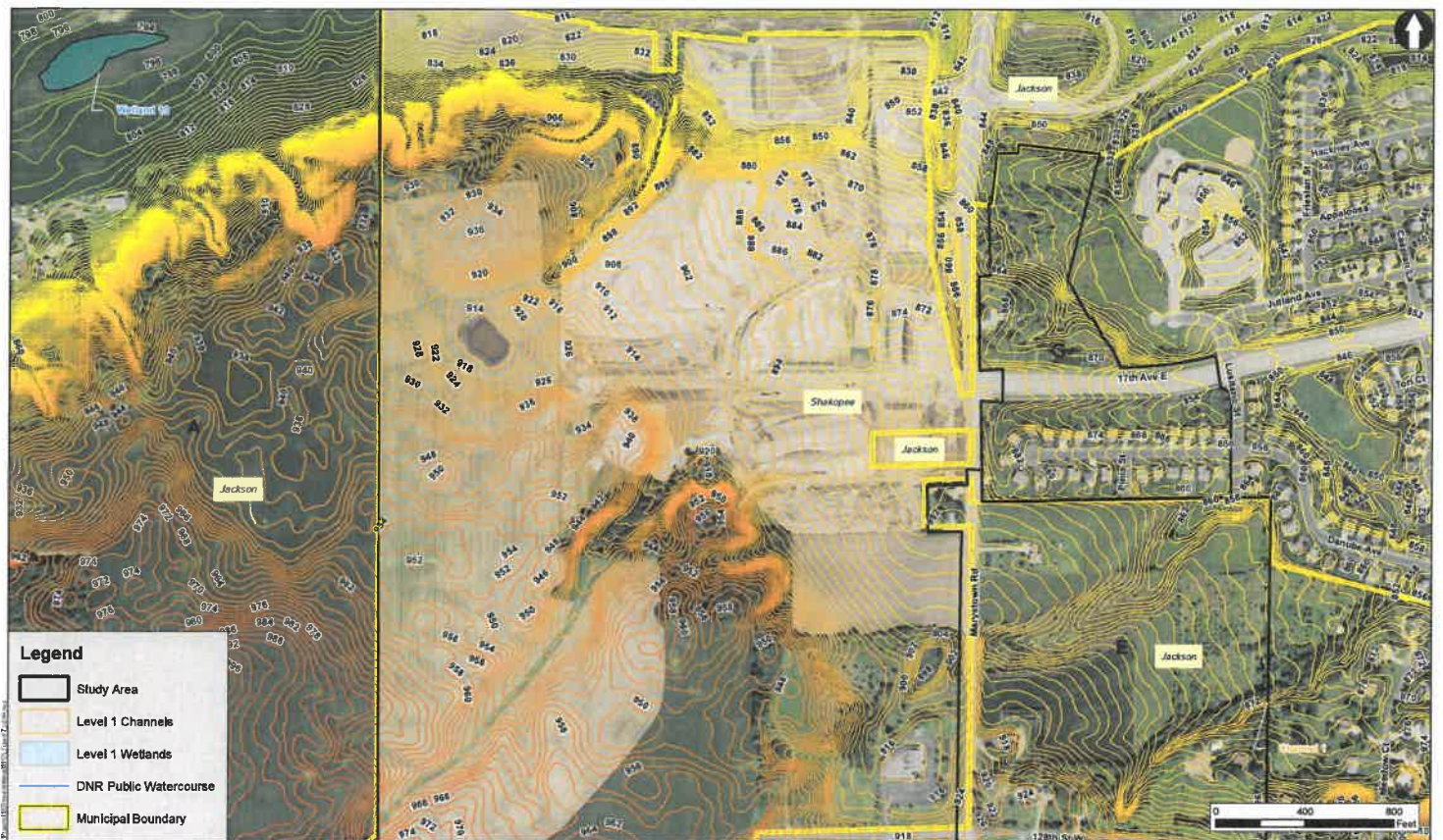
LiDAR Two-Foot Contours
 City of Shakopee/Jackson Township Annexation Area
 City of Shakopee

Figure 15



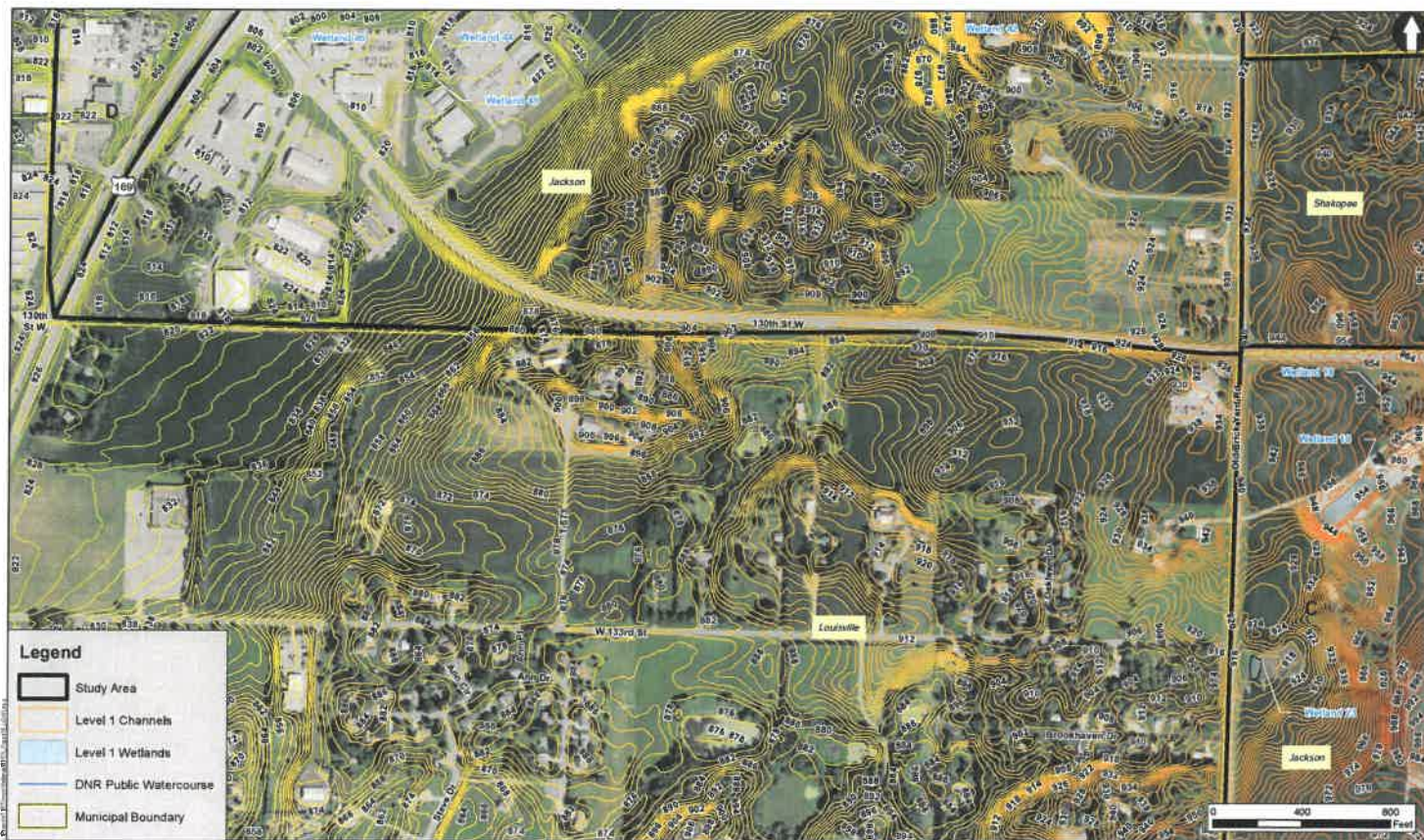
LiDAR Two-Foot Contours
 City of Shakopee/Jackson Township Annexation Area
 City of Shakopee

Figure 16



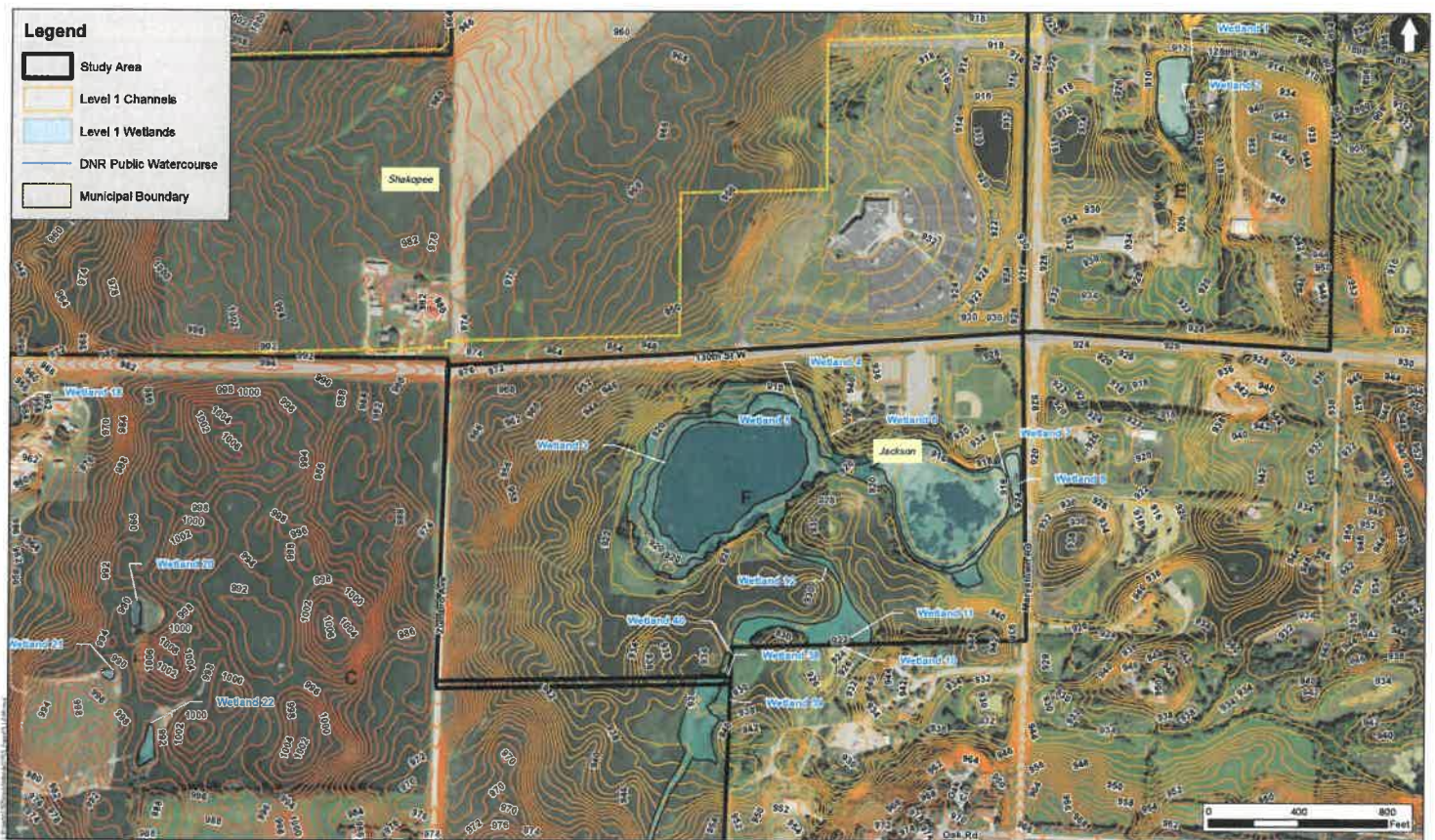
LiDAR Two-Foot Contours
 City of Shakopee/Jackson Township Annexation Area
 City of Shakopee

Figure 17



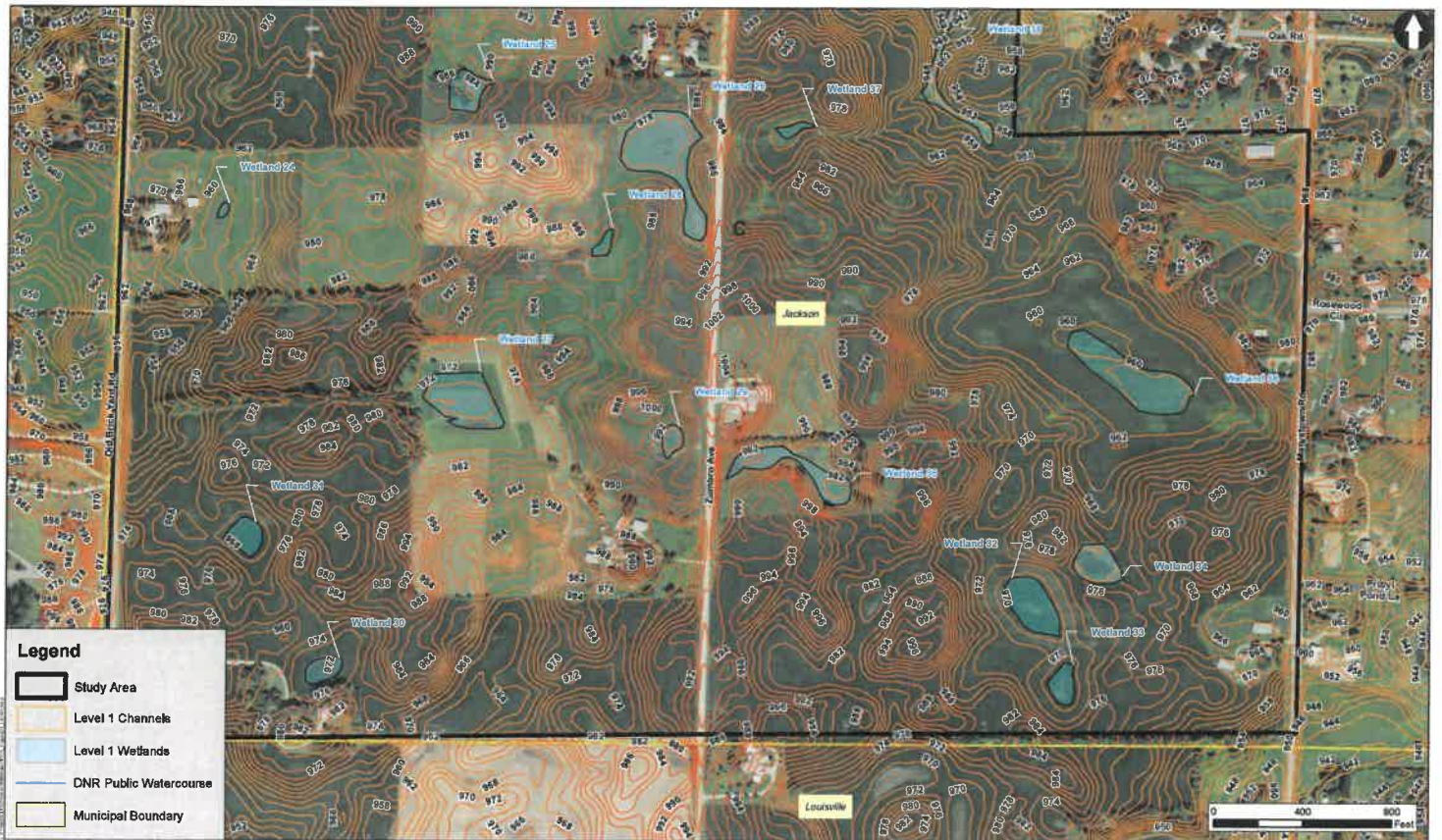
LiDAR Two-Foot Contours
City of Shakopee/Jackson Township Annexation Area
City of Shakopee

Figure 18



LiDAR Two-Foot Contours
 City of Shakopee/Jackson Township Annexation Area
 City of Shakopee

Figure 19



LiDAR Two-Foot Contours
 City of Shakopee/Jackson Township Annexation Area
 City of Shakopee

Figure 20