TOWN OF FOND DU LAC
FOND DU LAC COUNTY, WISCONSIN

WATER SYSTEM IMPROVEMENTS
RECOMMENDED PLAN

March 25, 2008

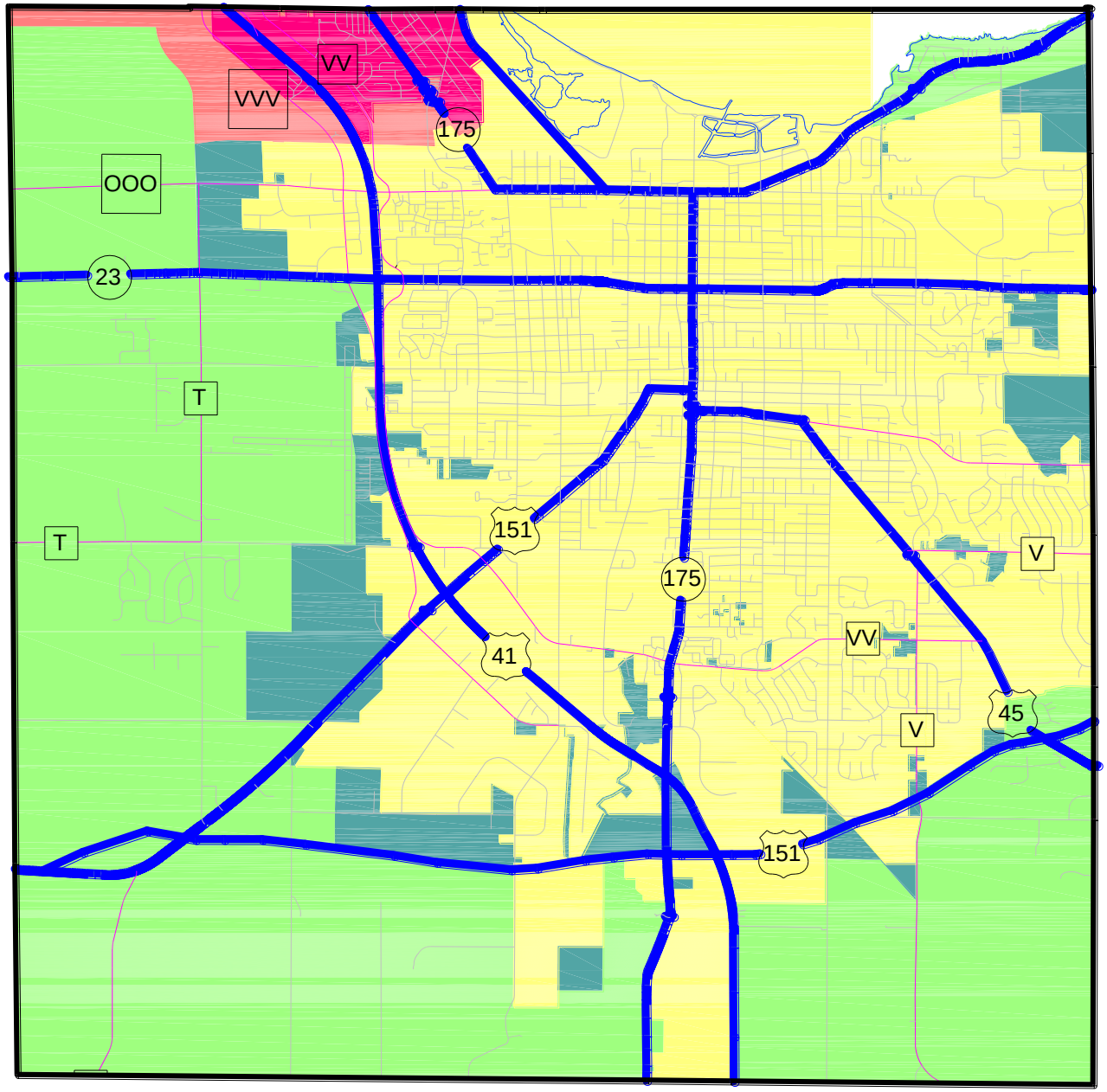
Kaempfer & Associates, Inc.
Consulting Engineers
Oconto Falls, Wisconsin

Presentation Outline

- **Water Supply Study Background Information**
- **Proposed Water Service Area**
- **Preliminary Plan**
- **Recommended Plan**
- **Fond du Lac County Industrial Park**

WATER SUPPLY STUDY BACKGROUND INFORMATION

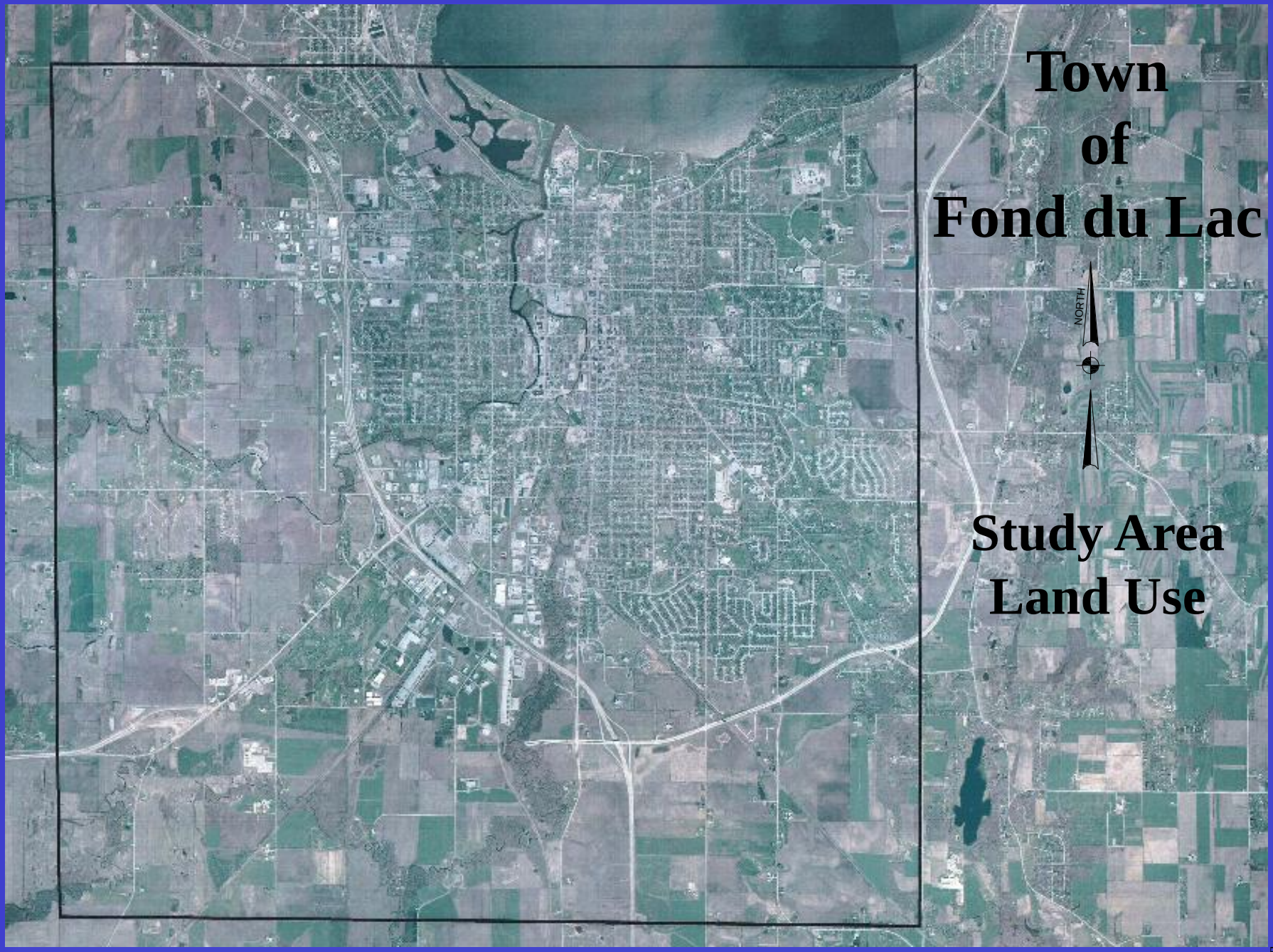
Study Area



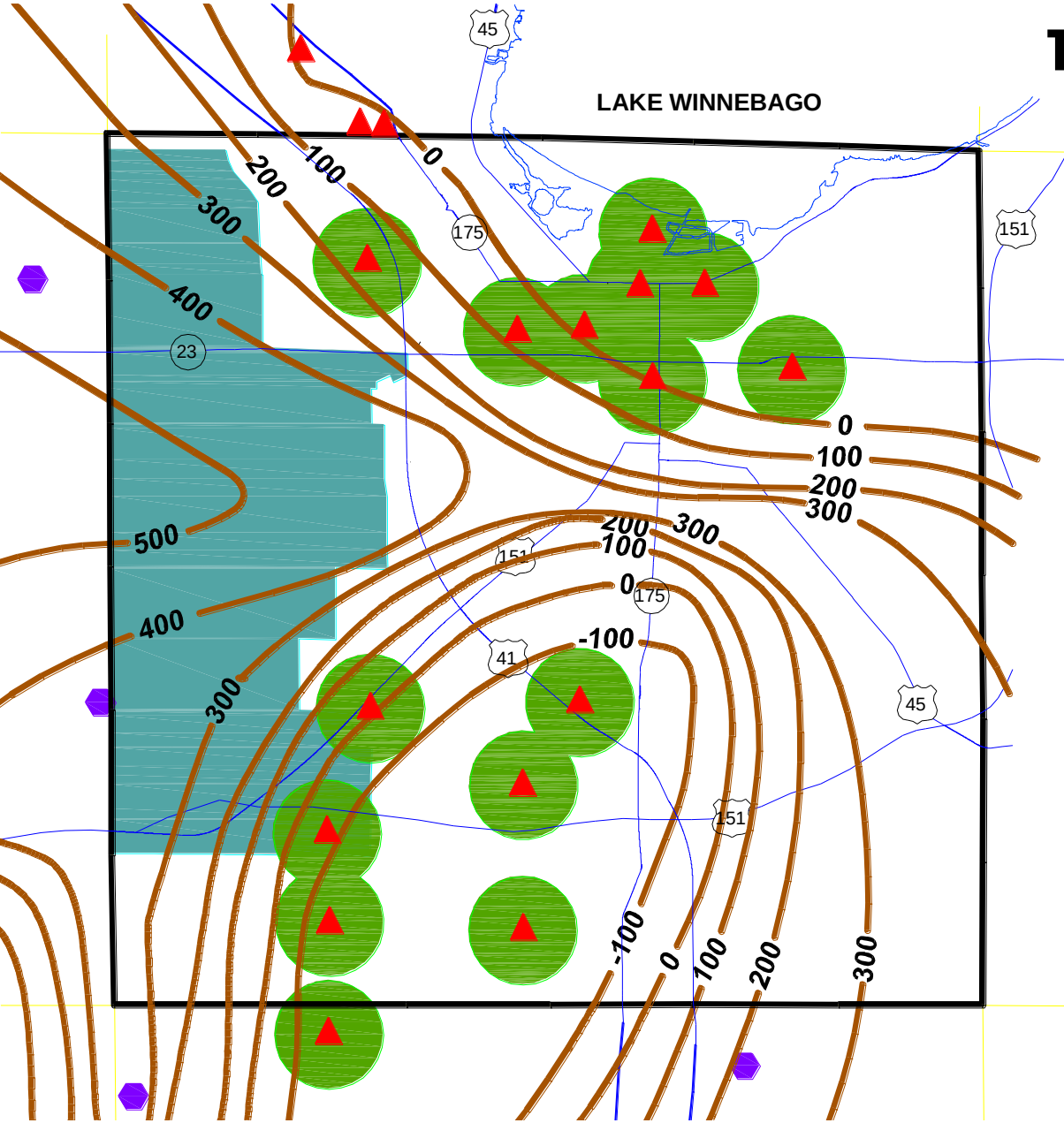
NORTH

LEGEND

- STUDY AREA BOUNDARY
- TOWN OF FOND DU LAC
- CITY OF FOND DU LAC
- VILLAGE OF NORTH FOND DU LAC
- CITY GROWTH AREA
- VILLAGE GROWTH AREA


Town
of
Fond du Lac
NORTH
Study Area
Land Use

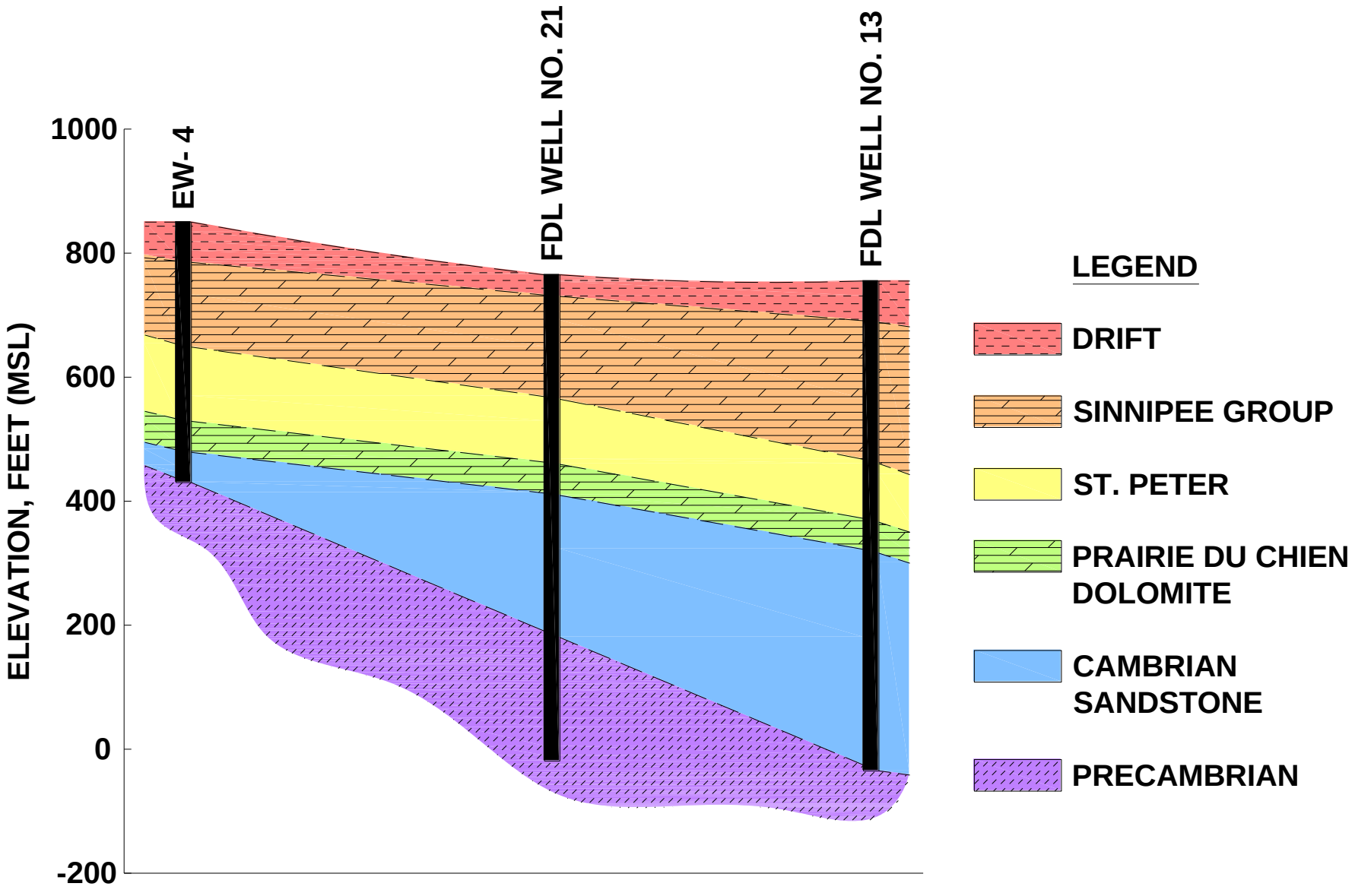
TOWN OF FOND DU LAC
HYDROGEOLOGY



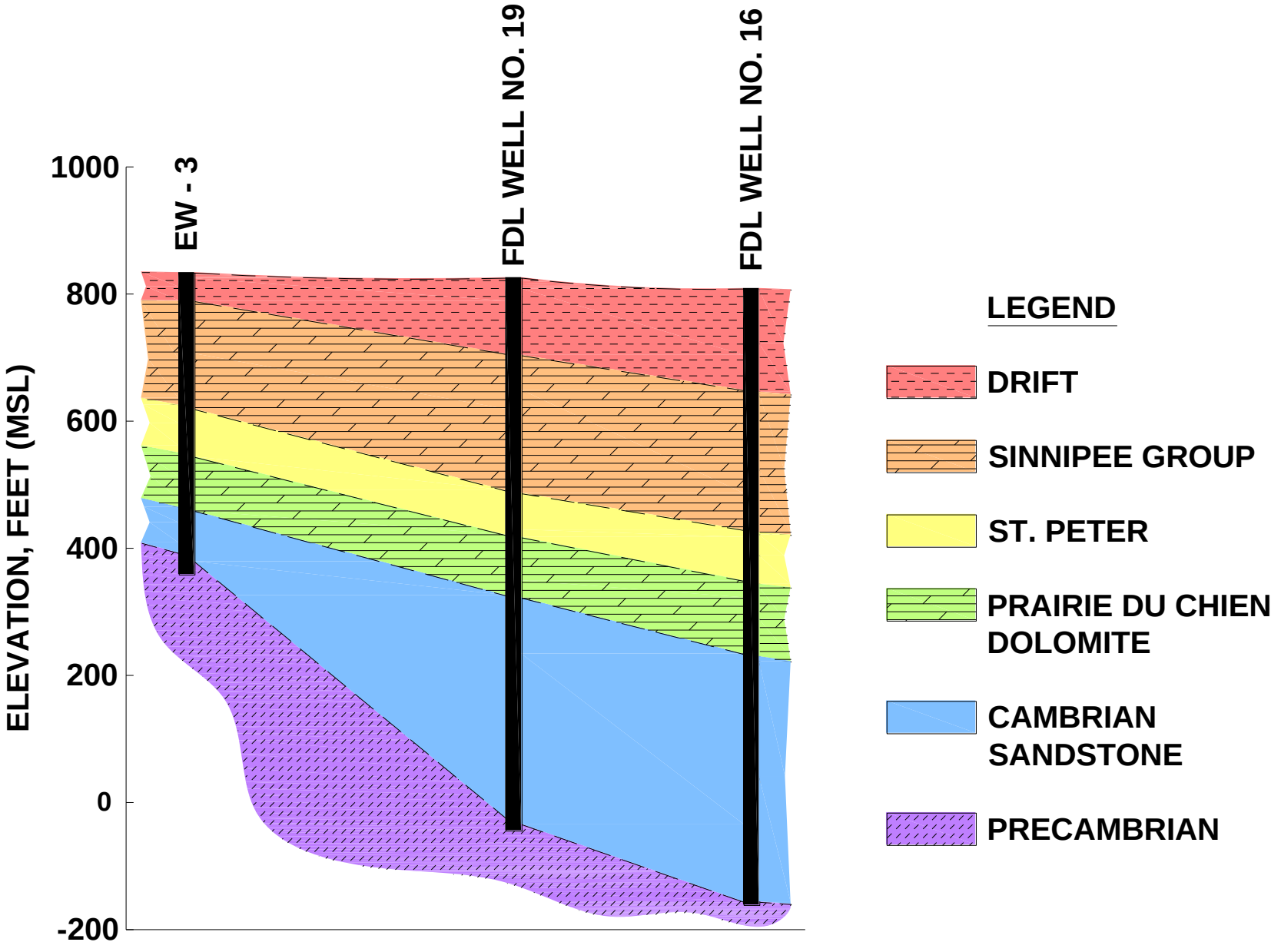
LEGEND

- STUDY AREA BOUNDARY
- PROPOSED WATER SERVICE AREA
- EXISTING CITY OF FOND DU LAC WELL SITES
- PRECAMBRIAN ROCK SURFACE CONTOURS
- MUNICIPAL PRODUCTION WELL
- FOND DU LAC EXPLORATORY WELL

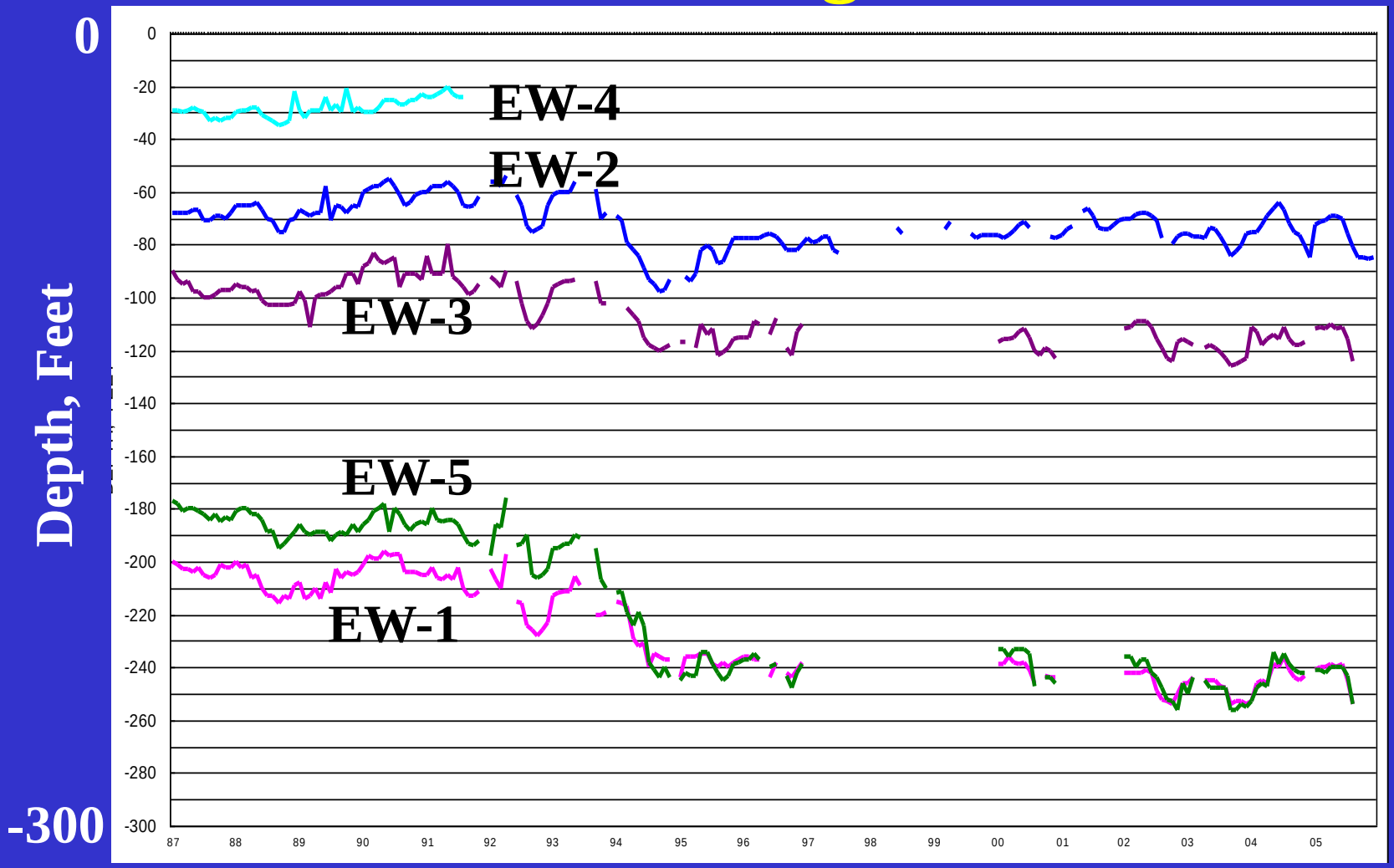
East-West Geologic Cross Section-1



East-West Geologic Cross Section-2



Exploratory Well Water Level Monitoring 1987 Through 2005



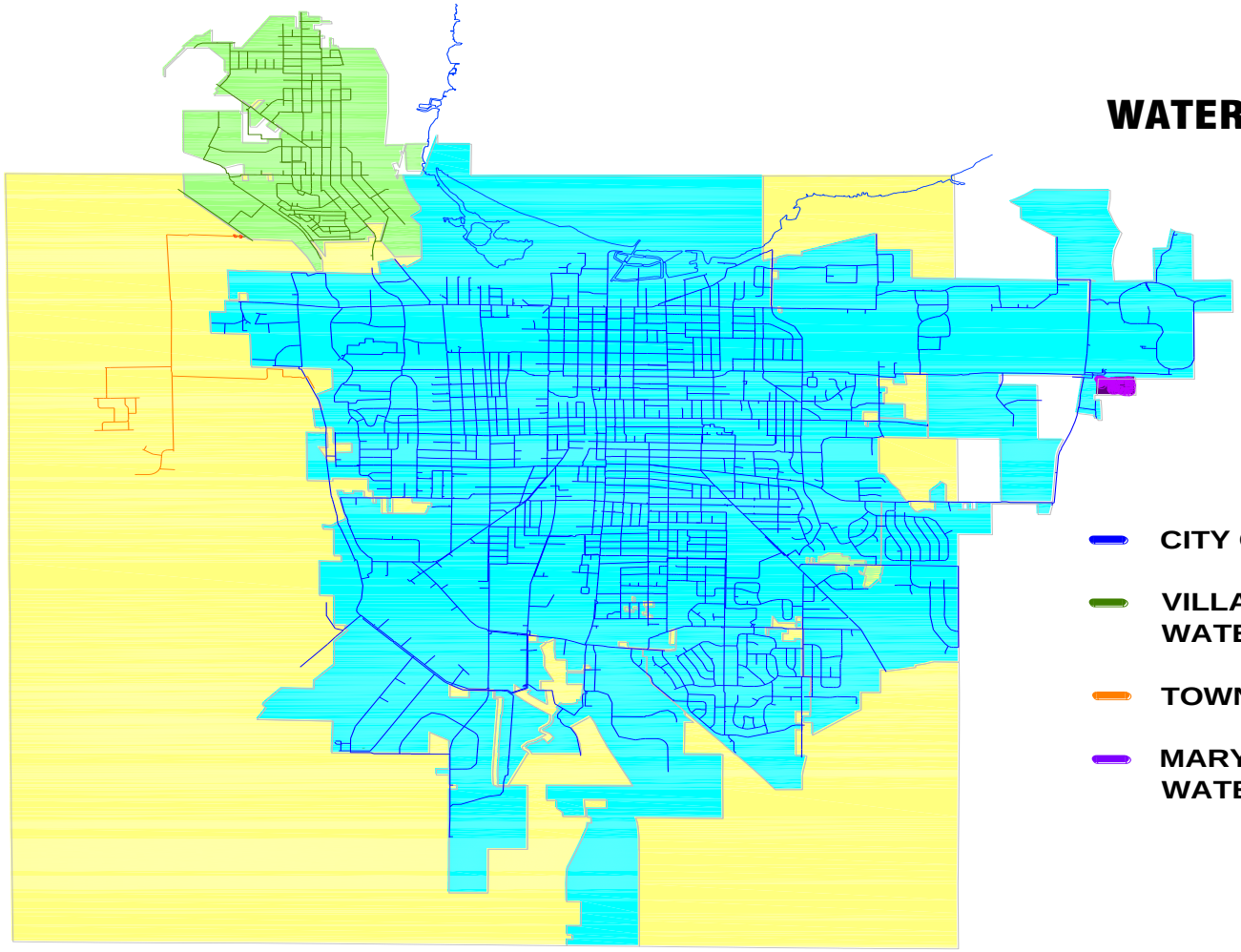
Groundwater Characteristics

Characteristic	Well			Standards	
	FDL-19	FDL-21	EW-3	MCL (c)	SS (d)
Inorganic Characteristics					
Alkalinity, Total ($CaCO_3$), mg/l	158	233	--	--	--
Arsenic, mg/l	0.0079	<0.002	--	0.0100	--
Barium, mg/l	0.051	0.064	--	2.0	--
Cadmium, mg/l	<0.00009	<0.0001	--	0.005	--
Calcium, mg/l	96	119	58	--	--
Chloride, mg/l	170	130	3.0	--	250
Chromium, mg/l	<0.0004	<0.0004	--	0.1	--
Fluoride, mg/l	0.39	0.43	0.62	4.0	2.0
Hardness, Total ($CaCO_3$), mg/l	362	449	268	--	--
Iron, mg/l	0.11	0.33	0.26	--	0.3
Lead, mg/l	<0.00073	0.005	--	0.015 (b)	--
Magnesium, mg/l	30	37	30	--	--
Manganese, mg/l	0.062	0.068	0.030	--	0.050
$NO_3 + NO_2$, mg/l	<0.0046	<0.0046	--	10	--
Sodium, mg/l	56	40	5	--	--
Sulfate, mg/l	110	110	22	--	250
Total Solids, mg/l	500 (a)	798	475 (a)	--	500
Radiological Characteristics					
Gross Alpha, pCi/l	32	31	13	15	--
Combined Radium, pCi/l	9.9	11.6	8.7	5	--
Uranium, ug/l	4.7	1.8	NT	30	--
Radon, pCi/l	472	NT	NT	--	--

(a) Estimated from chemical characteristics
(b) Action Level
(c) Maximum Contaminant Level
(d) Secondary Standard

NT - Not Tested

WATER SYSTEM OWNERSHIP

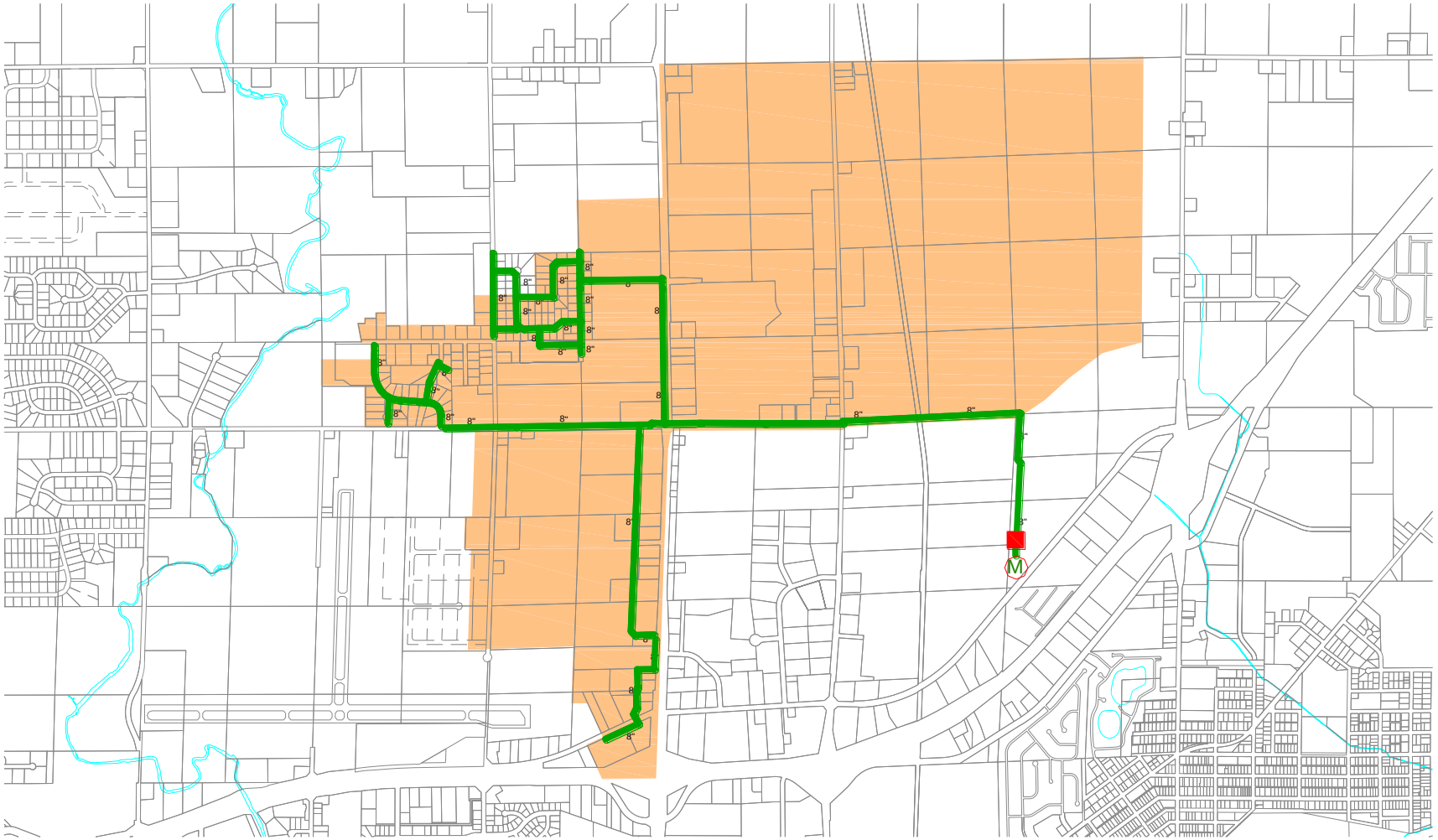


NORTH

LEGEND

- CITY OF FOND DU LAC WATER MAIN
- VILLAGE OF NORTH FOND DU LAC WATER MAIN
- TOWN OF FOND DU LAC WATER MAIN
- MARY HILL PARK SANITARY DISTRICT WATER MAIN

Existing Water System

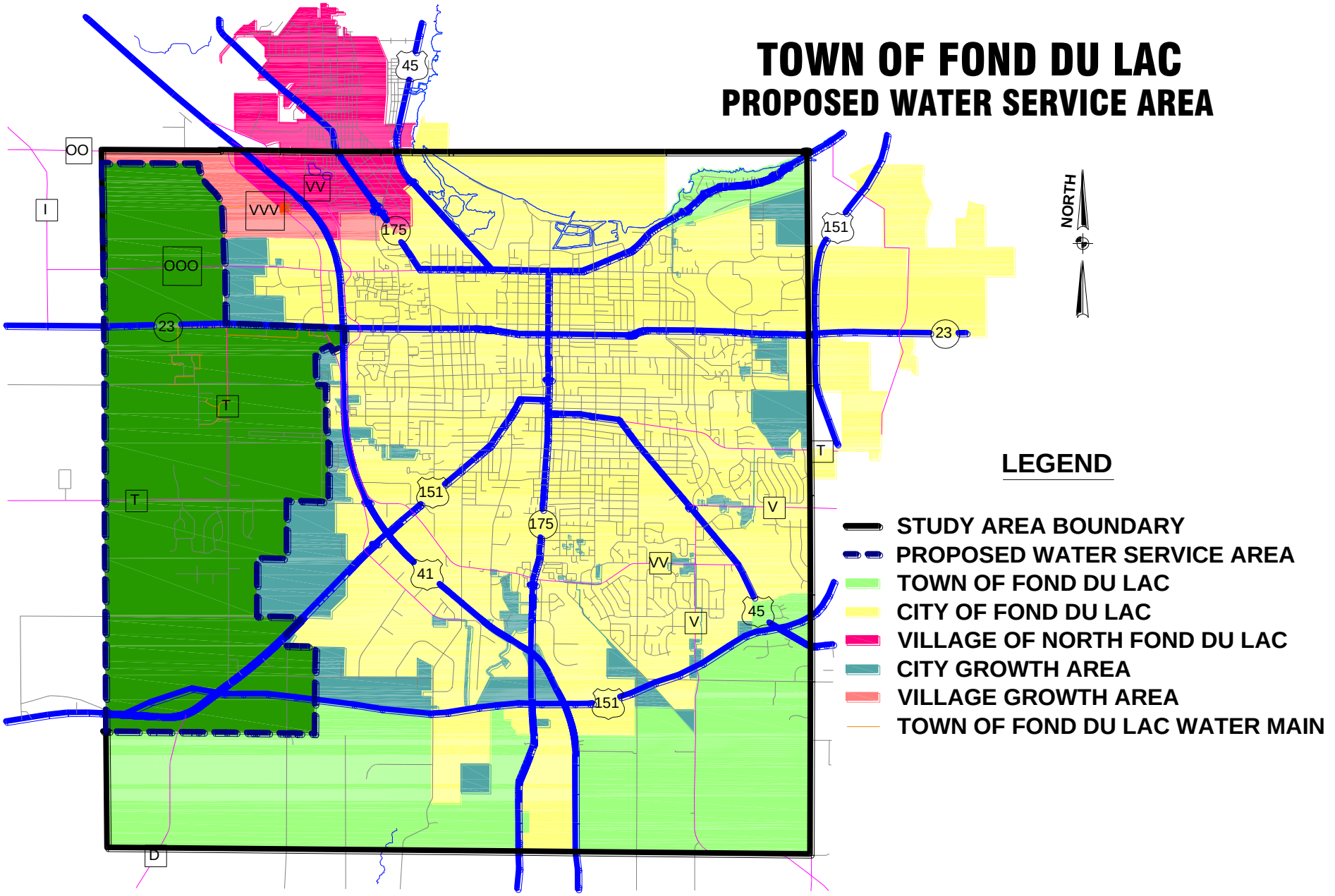


LEGEND

- EXISTING WATER SERVICE AREA
- TOWN OF FOND DU LAC EXISTING WATER MAIN
- BOOSTER PUMP STATION
- METER STATION

PROPOSED WATER SERVICE AREA

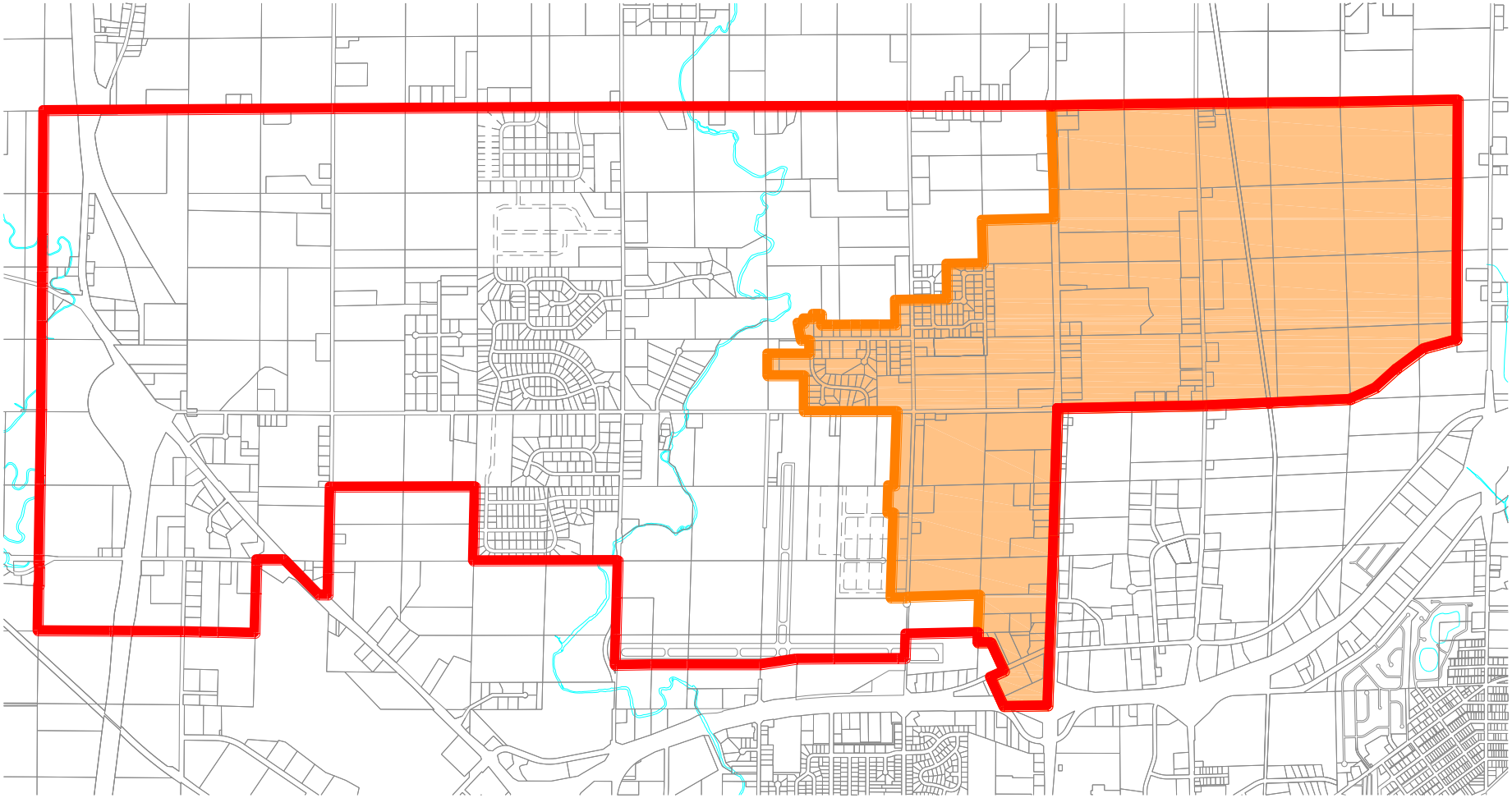
TOWN OF FOND DU LAC
PROPOSED WATER SERVICE AREA



LEGEND

- STUDY AREA BOUNDARY
- PROPOSED WATER SERVICE AREA
- TOWN OF FOND DU LAC
- CITY OF FOND DU LAC
- VILLAGE OF NORTH FOND DU LAC
- CITY GROWTH AREA
- VILLAGE GROWTH AREA
- TOWN OF FOND DU LAC WATER MAIN

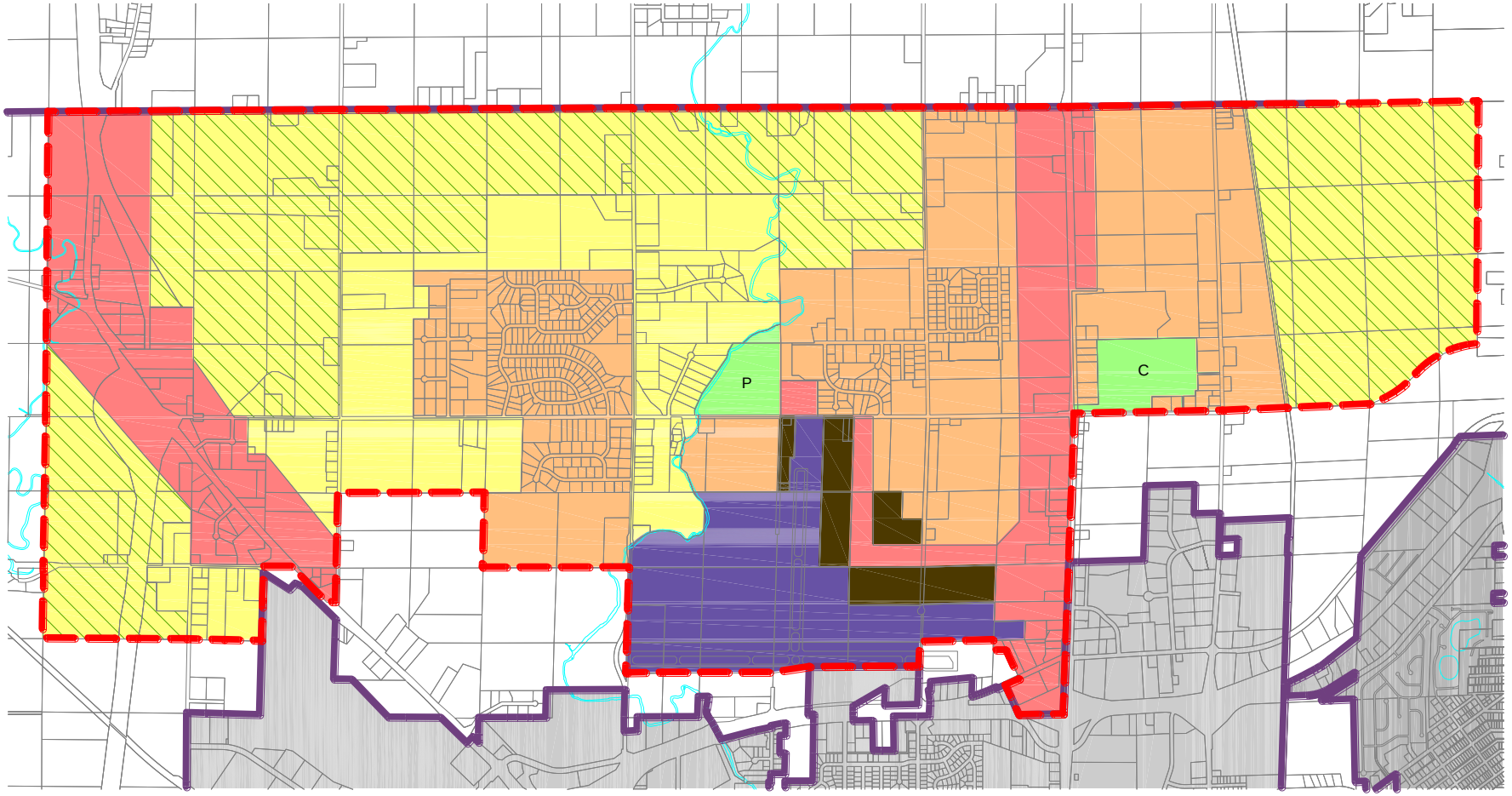
Proposed and Existing Water Service Area



Proposed Water Service Area Characteristics

- **The proposed water service area would be approximately 4,840 acres (7.6 square miles).**
- **The proposed water service area contains about 350 properties served by private wells.**
- **The proposed water service area contains about 150 properties served by the municipal water system.**
- **The population of the proposed water service planning area is about 1,250 persons.**

Proposed Water Service Area
Land Use Plan



LEGEND

- PROPOSED WATER SERVICE AREA
- TOWN OF FOND DU LAC
- INCORPORATED AREA
- AGRICULTURAL
- AGRICULTURAL TRANSITION
- AIRPORT
- PARK - P / CEMETERY - C
- COMMERCIAL / OFFICE
- INDUSTRIAL
- RESIDENTIAL RURAL
- RESIDENTIAL SEWERED

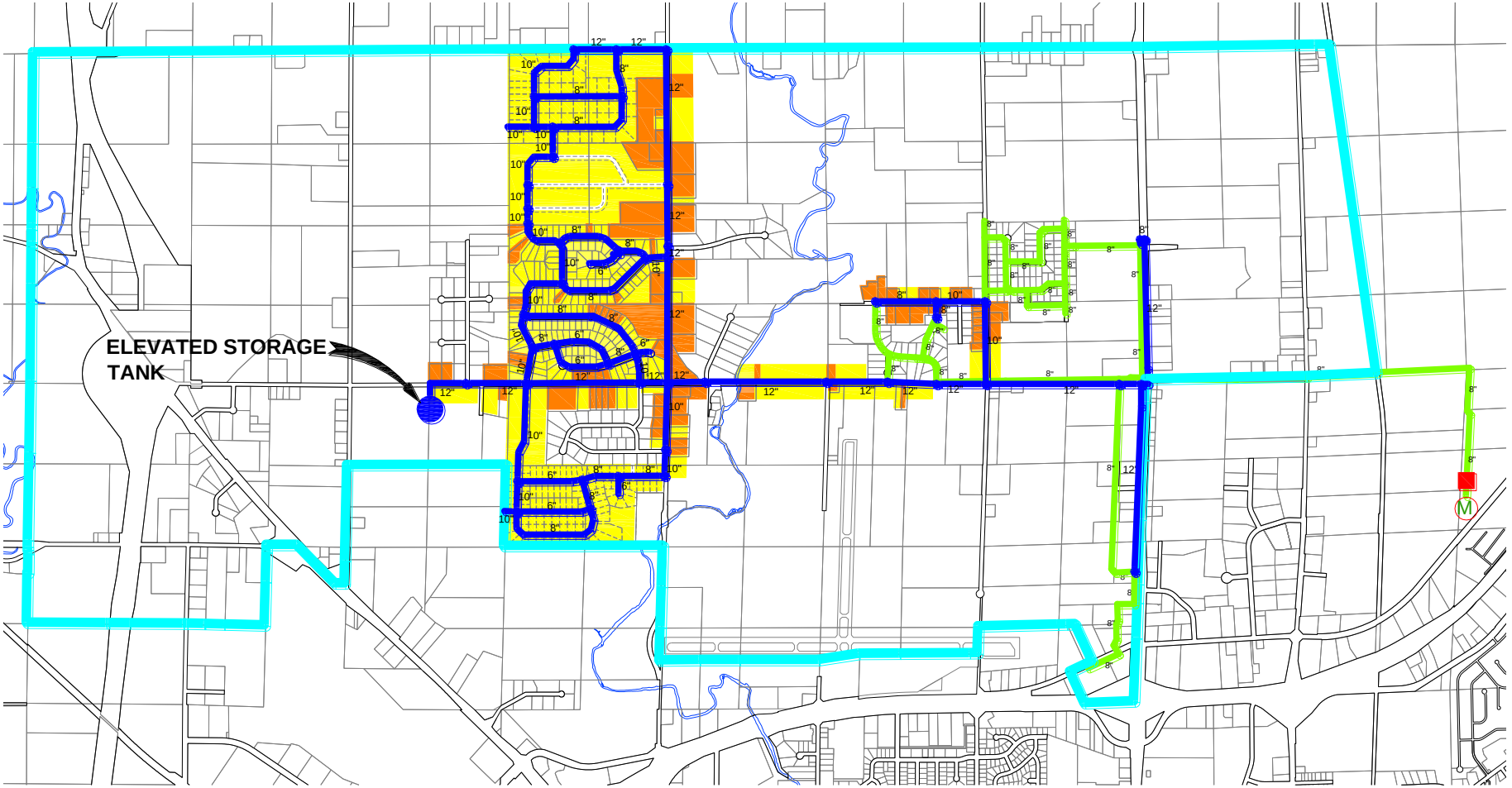
Proposed Water Service Area Land Use Plan Characteristics

- **Land use plan includes:**
  - **1,800 acres of residential land use**
  - **850 acres of commercial land use**
  - **80 acres of industrial land use**

- **Ultimate population of water service planning area, based on proposed land use, is 6,000 to 9,000 persons.**

PRELIMINARY PLAN

Preliminary Water Distribution System Plan



Preliminary Water Distribution System Plan Cost Summary

	Description	Total Cost
Phase 1	Transmission Main	$1,524,600
	Distribution System	
	North Distribution System Pipeline	$245,500
	South Distribution System Pipeline	$743,300
	Water Services	$552,000
	Elevated Storage Tank	$929,250
Phase 2	Transmission Main	$570,500
	Distribution System	
	West Distribution System	$474,200
	East Distribution System	$552,600
	Water Services	$394,000
	Subtotal, Phase 1	$3,994,650
	Subtotal, Phase 2	$1,991,300
	Total Cost	$5,985,950

RECOMMENDED PLAN

Objectives of Recommended Plan

- **Expand water system to increase available fire flow so it is adequate for residential, commercial, and industrial development.**
- **Upgrade the system so it is adequate to accommodate future residential, commercial, and industrial development.**
- **Improve the reliability of the existing water system by eliminating dead end water mains with looped water mains and providing two sources to supply the water distribution system by adding an elevated storage tank.**

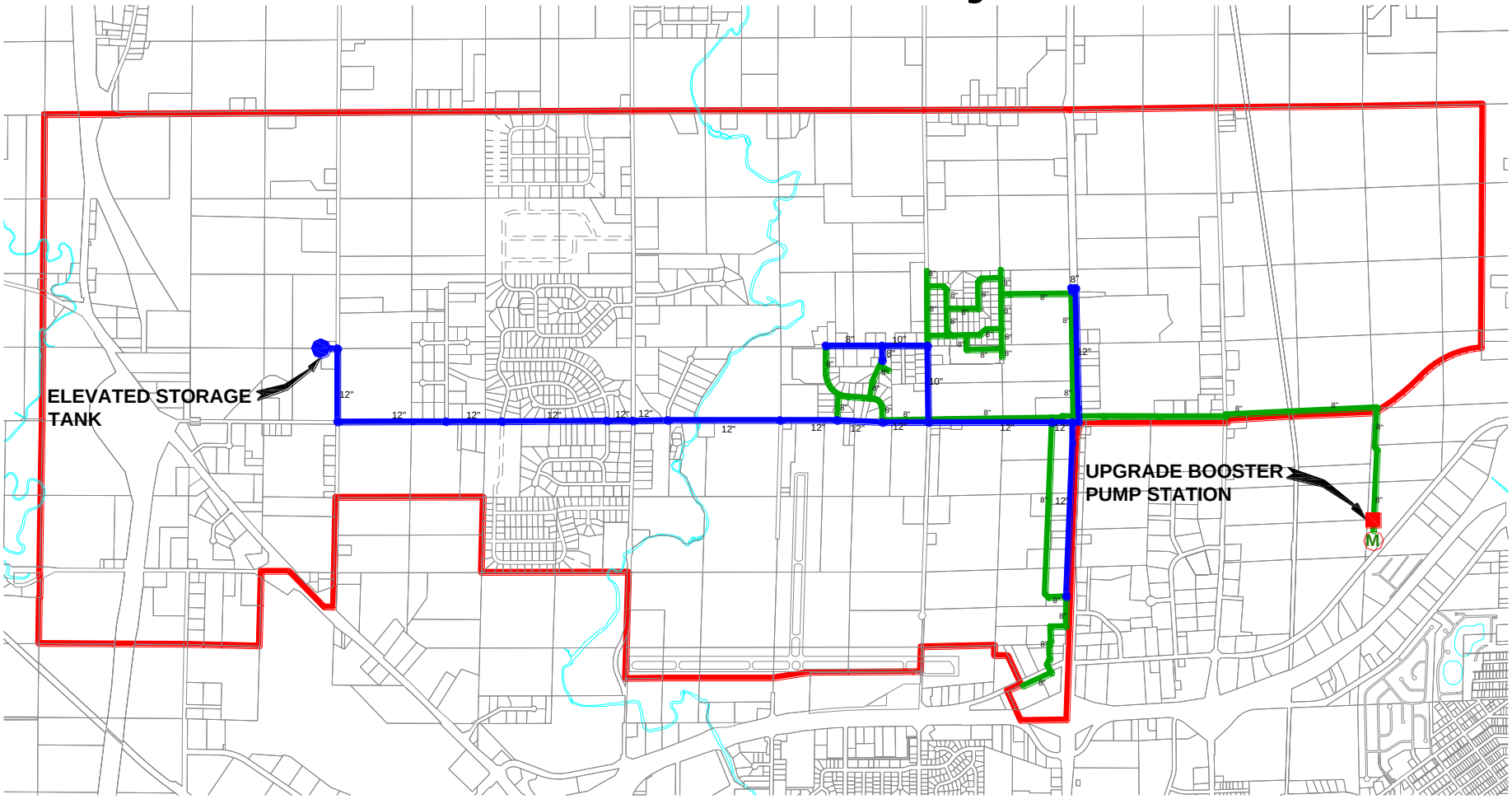
Scope of Recommended Plan

- **Make municipal water service available to approximately 40 occupied properties and approximately 25 vacant properties.**
- **Provides available fire flow of 2,000 gpm to the majority of the water system customers.**
- **Correct deficiencies in existing municipal water distribution system.**

Recommended Plan Project Elements

- **Construct 250,000 gallon elevated storage tank in southern portion of proposed water service area.**
- **Construct 12-inch diameter transmission mains on Esterbrook Road and STH '23'**
- **Construct 8-inch and 10-inch diameter distribution mains on Forest Ave., Dixon Rd., and Burch Ct.**

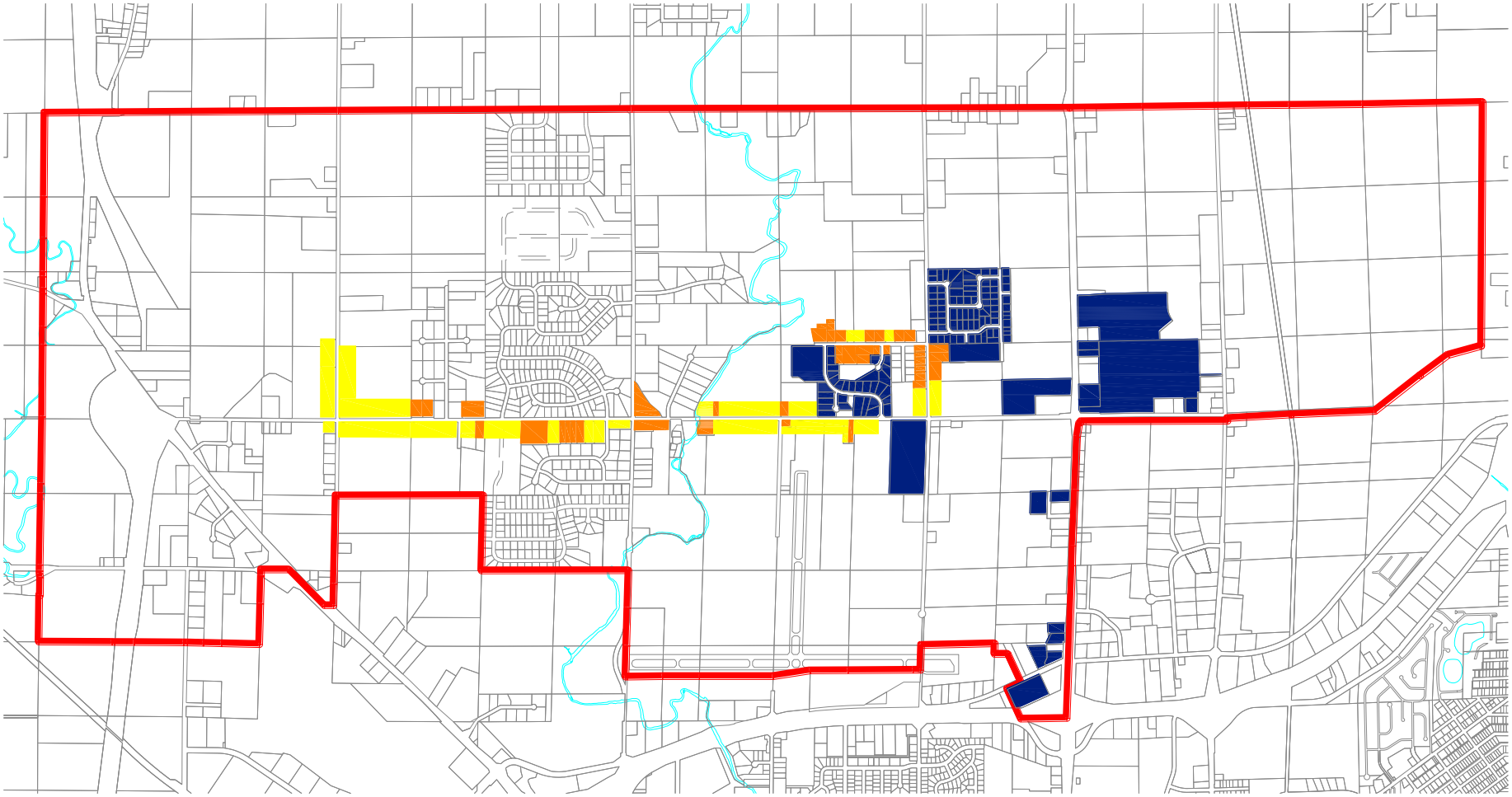
Recommended Water System Plan



LEGEND

- PROPOSED WATER SERVICE AREA BOUNDARY
- TOWN OF FOND DU LAC EXISTING WATER MAIN
- TOWN OF FOND DU LAC PROPOSED WATER MAIN

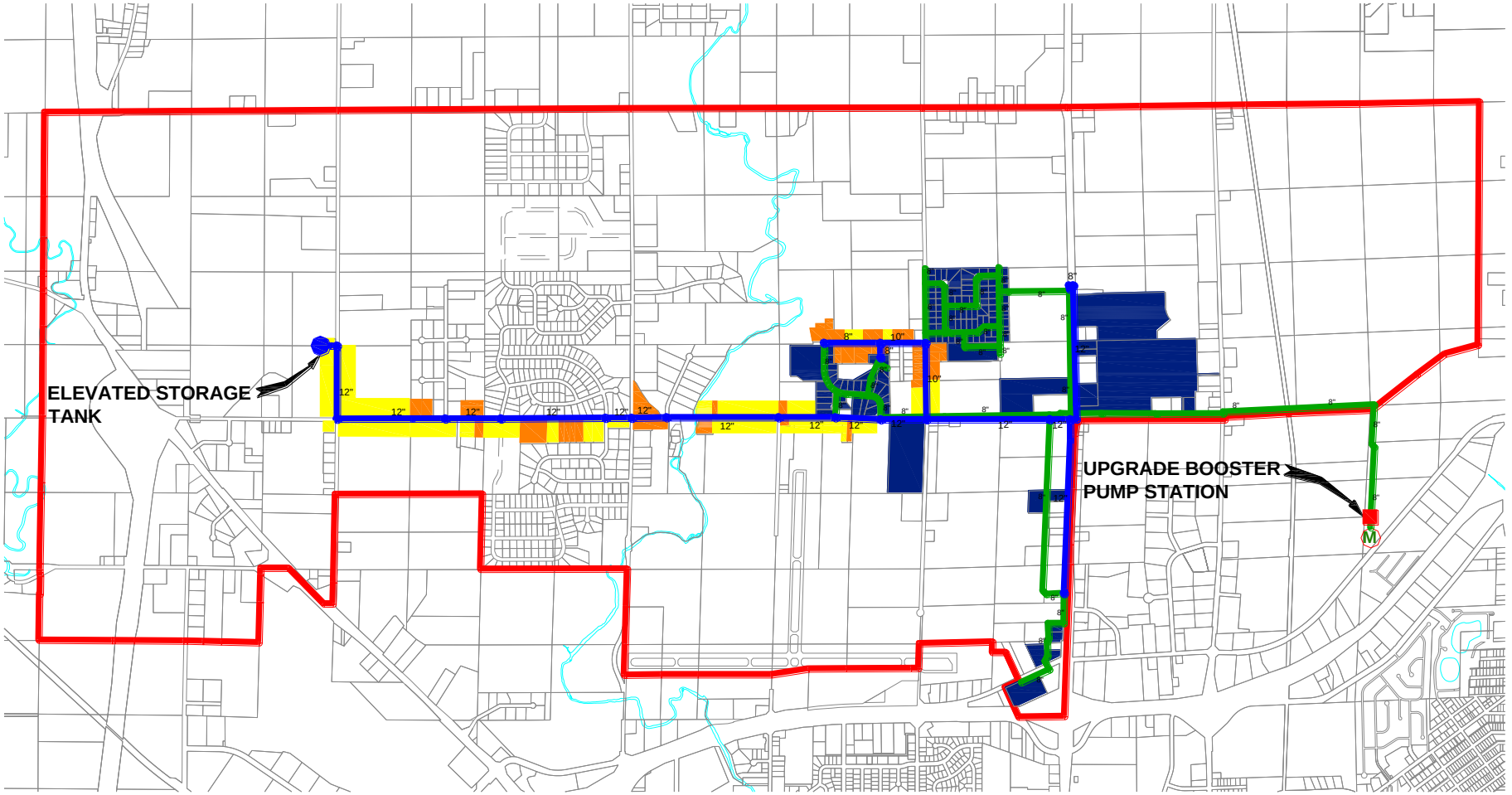
Properties to be Served



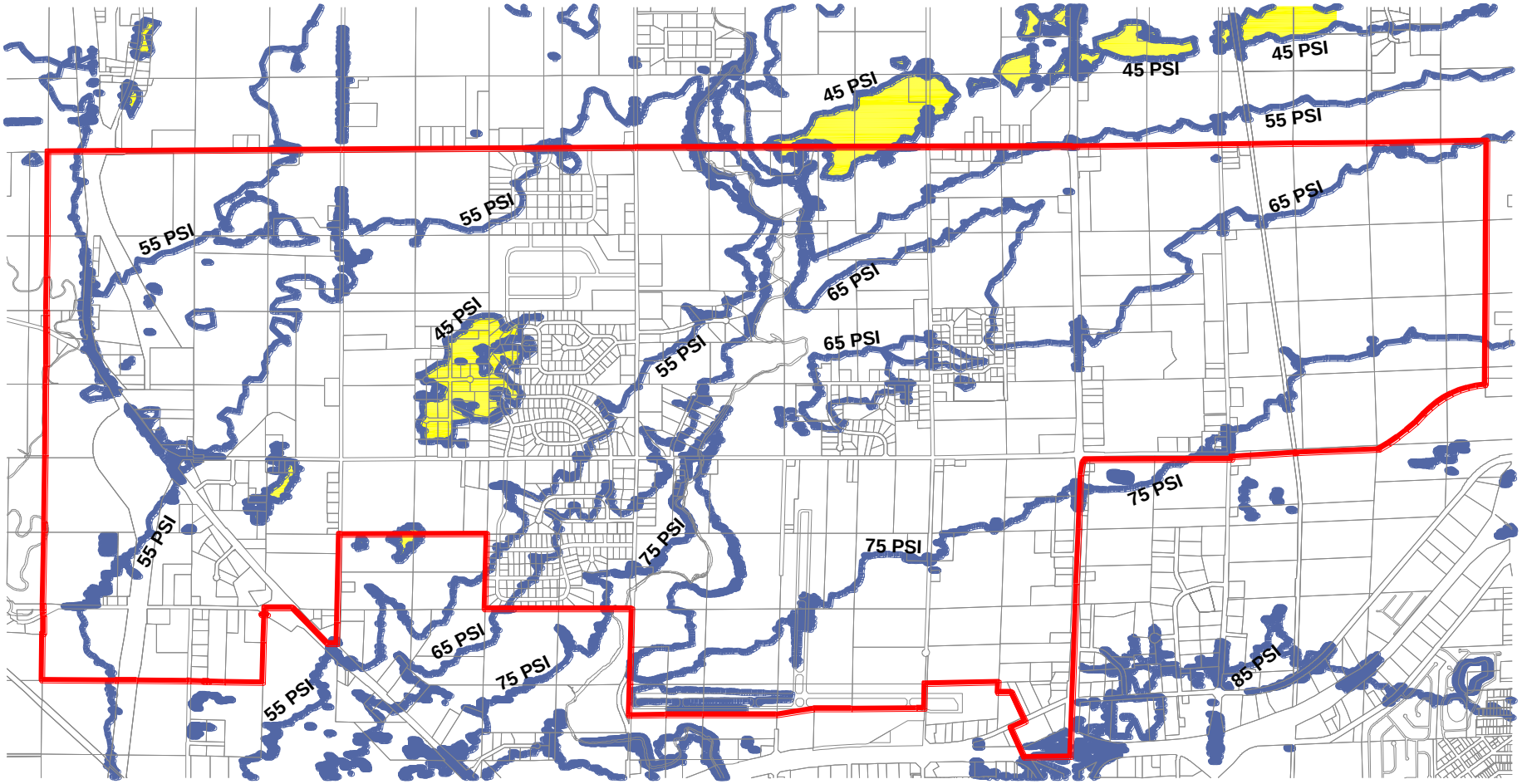
LEGEND

- PROPOSED WATER SERVICE AREA BOUNDARY
- VACANT PROPERTY TO BE SERVED
- OCCUPIED PROPERTY TO BE SERVED
- OCCUPIED PROPERTY SERVED BY PUBLIC WATER SYSTEM

Water System Plan and Properties to be Served



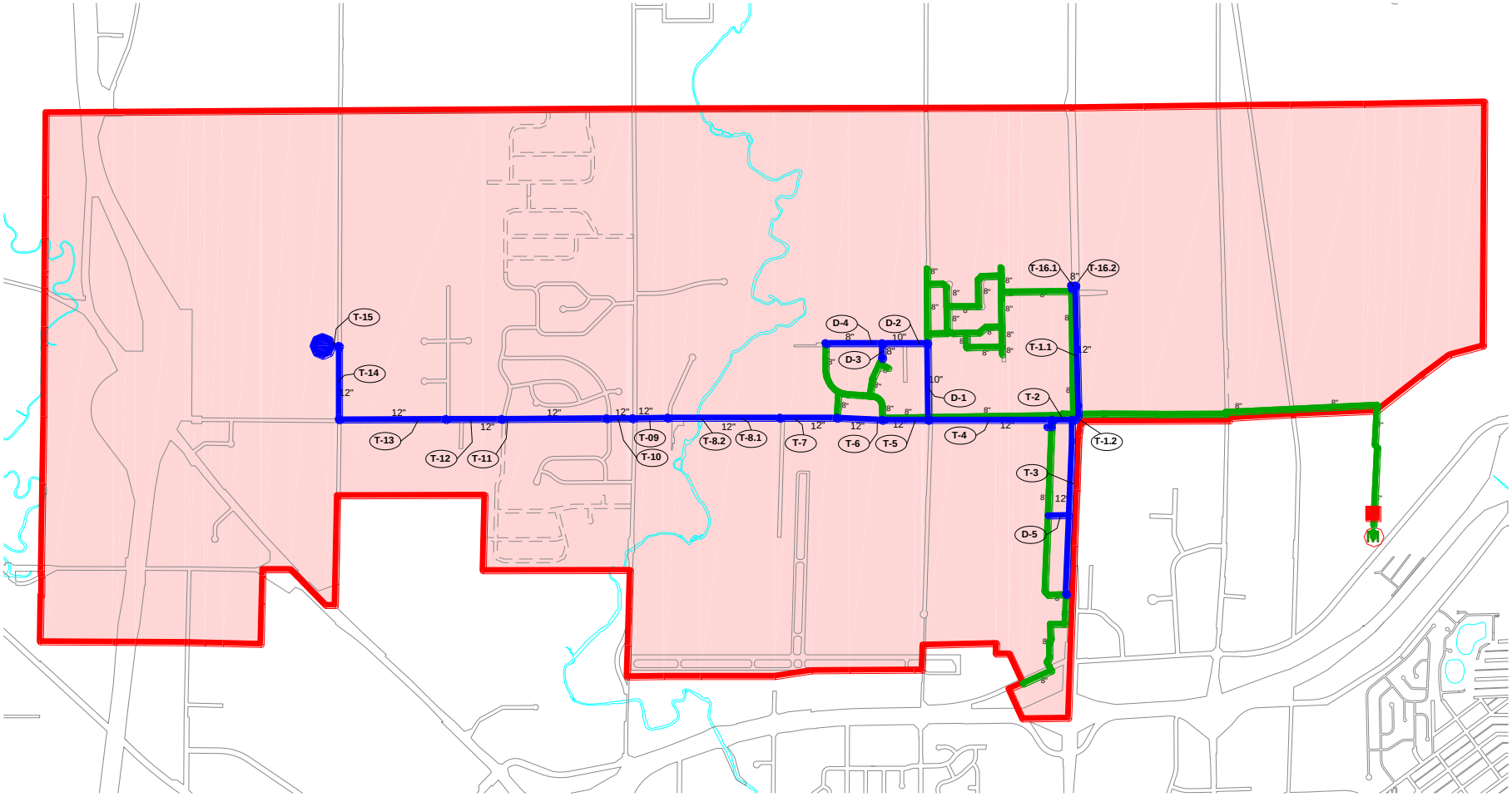
Static Pressure Contours



LEGEND

- PROPOSED WATER SERVICE AREA
- STATIC PRESSURE CONTOUR AT OVERFLOW ELEVATION OF 965.00
- MARGINAL PRESSURE 35 - 45 PSI
- INADEQUATE PRESSURE < 35 PSI

Recommended Water System Plan Elements



LEGEND

- PROPOSED WATER SERVICE AREA
- TOWN OF FOND DU LAC PROPOSED WATER MAIN
- BOOSTER PUMP STATION
- TOWN OF FOND DU LAC EXISTING WATER MAIN
- PROPOSED ELEVATED STORAGE TANK
- METERING STATION

Summary of Recommended Plan Projected Project Costs

Description	Total Cost
Transmission System Mains	$1,737,200
Distribution System Mains	$236,500
Water Services	$108,700
Upgrade Booster Pump Station & SCADA System	$65,000
Elevated Storage Tank	$929,250
Total Project Cost	$3,076,650

Potential Method for Allocation of Recommended Plan Projected Project Costs

	Cost Allocation, Dollars			
Item	Town	Utility District	Assessment	Total
Transmission System Mains	$347,440	$1,134,960	$254,800	$1,737,200
Distribution System Mains	--	--	$236,500	$236,500
Water Services	--	--	$108,700	$108,700
BPS & SCADA	--	$65,000	--	$65,000
Elevated Storage Tank	$232,313	$696,938	--	$929,250
Total	$579,753	$1,896,897	$600,000	$3,076,650

Connection Requirements Under Consideration

- **Vacant property adjacent to water main - connection required when property is developed.**
- **Occupied property adjacent to water main – connection is not required. Property owner has the option of obtaining municipal water service.**

Variation in Benefits for Water Service Area Properties

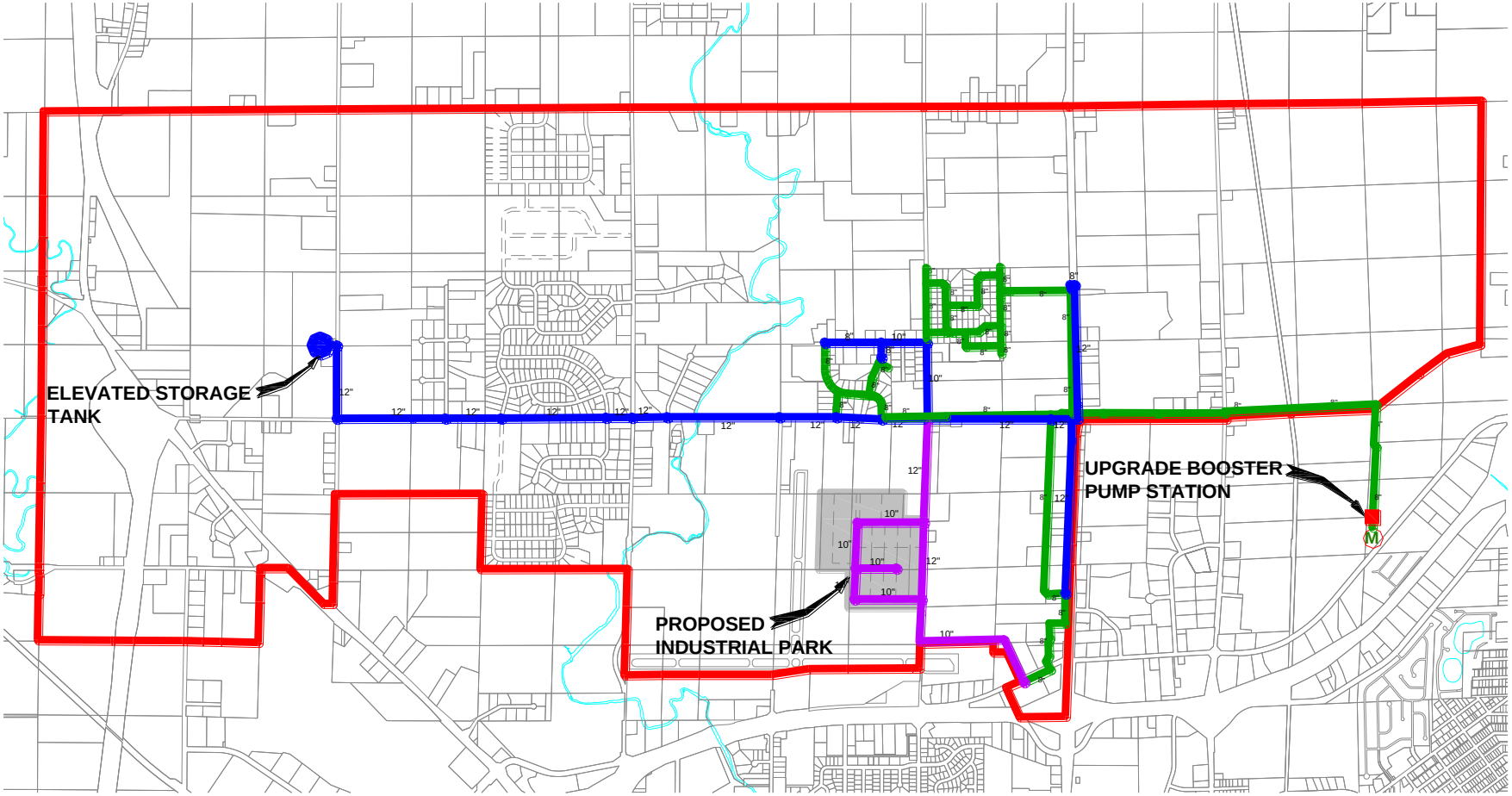
- **Vacant property on water system**
  - **Water service**
  - **Directly improved fire protection – fire hydrant**
- **Occupied property on water system**
  - **Immediate ability to obtain water service**
  - **Directly improved fire protection – fire hydrant**
- **Vacant or occupied property not on water system**
  - **Future ability to obtain water service**
  - **Indirectly improved fire protection – closer more reliable water supply**

Benefits of Recommended Project

- **Protects existing private wells and eliminates need for future shared wells.**
- **Improves fire protection and reduces home insurance costs.**
- **Improves water quality for residents who switch from a private well to the municipal water system.**
- **Makes public water service available to existing residents using private wells if needed in the future.**
- **Makes public water service with adequate fire protection available to support commercial and industrial development.**

FOND DU LAC COUNTY INDUSTRIAL PARK

Industrial Park Water Service Plan



LEGEND

- PROPOSED WATER SERVICE AREA BOUNDARY
- TOWN OF FOND DU LAC EXISTING WATER MAIN
- TOWN OF FOND DU LAC PROPOSED INDUSTRIAL PARK WATER MAIN
- TOWN OF FOND DU LAC PROPOSED WATER MAIN