DRAFT 9-2-2020

Maplewood

Oakdale

Lake Elmo

West Lakeland Township

Lakeland Shores

Lakeland

Lake St. Croix Beach

St. Marys Point

Afton

Woodbury

Newport

St. Paul Park

Grey Cloud Island Township

Cottage Grove

Denmark Township

Water network model
- Well
- Tank
- BPS
- PRV
- WTP
- Existing raw water lines

Existing distribution lines
- > 24"
- 18" - 24"
- 14" - 16"
- 10" - 12"
- 6" - 8"
- Known PFAS source
- Community boundary
- Potential projected areas impacted by PFAS by 2040

PFAS results - HI
- 0.00
- 0.00 - 0.249
- 0.25 - 0.499
- 0.50 - 0.749
- 0.75 - 0.999
- ≥1.00
- ≥1.00 - advisory sent
- GAC installed
- GAC install proposed
- Wells replaced with municipal water supply connection
- Wells proposed to be replaced with a municipal water supply connection

MWI well types
- Domestic
- Commercial
- Irrigation
- Community potable
- Non-community potable
- Monitoring & testing
- Other

Notes:
HI - Health Index, as defined by Minnesota Department of Health
GAC - Granular Adctivated Carbon point of entry treatment system
MWI - Minnesota Well Index

Figure E.2.2.1.1 - Community Specific Scenario A
Non-Municipal Well Treatment Map HI > 0

0 1,500 3,000 4,500 9,000 Feet

N

Job No.: 18190022
PM: BH
Date: 9/2/2020
Scale: 1" = 4,500 feet

wood.

Path: G:\Infrastructure\W-WW\01-Projects\2018\18190022 MPCA East Metro MN Water Sys Study\6.0 Background Information\6.2 Maps & GIS Files\00_Community\Community\Regional\ScenA_H10_24x36_20200902.mxd

DRAFT 9-2-2020

Maplewood
Oakdale
Lake Elmo
West Lakeland Township
Lakeland Shores
Lakeland
Lake St. Croix Beach
St. Marys Point
Afton
Woodbury
Newport
St. Paul Park
Grey Cloud Island Township
Cottage Grove
Denmark Township

Water network model
- Well
- Tank
- BPS
- PRV
- WTP
- Existing raw water lines

Existing distribution lines
- > 24"
- 18" - 24"
- 14" - 16"
- 10" - 12"
- 6" - 8"
- Known PFAS source
- Community boundary
- Potential projected areas impacted by PFAS by 2040

PFAS results - HI
- 0.00
- 0.00 - 0.249
- 0.25 - 0.499
- 0.50 - 0.749
- 0.75 - 0.999
- ≥1.00
- ≥1.00 - advisory sent
- GAC installed
- GAC install proposed
- Wells replaced with municipal water supply connection
- Wells proposed to be replaced with a municipal water supply connection

MWI well types
- Domestic
- Commercial
- Irrigation
- Community potable
- Non-community potable
- Monitoring & testing
- Other

Notes:
HI - Health Index, as defined by Minnesota Department of Health
GAC - Granular Adctivated Carbon point of entry treatment system
MWI - Minnesota Well Index

Figure E.2.2.1.2 - Community Specific Scenario A
Non-Municipal Well Treatment Map HI ≥ 1

0 1,500 3,000 4,500 9,000 Feet

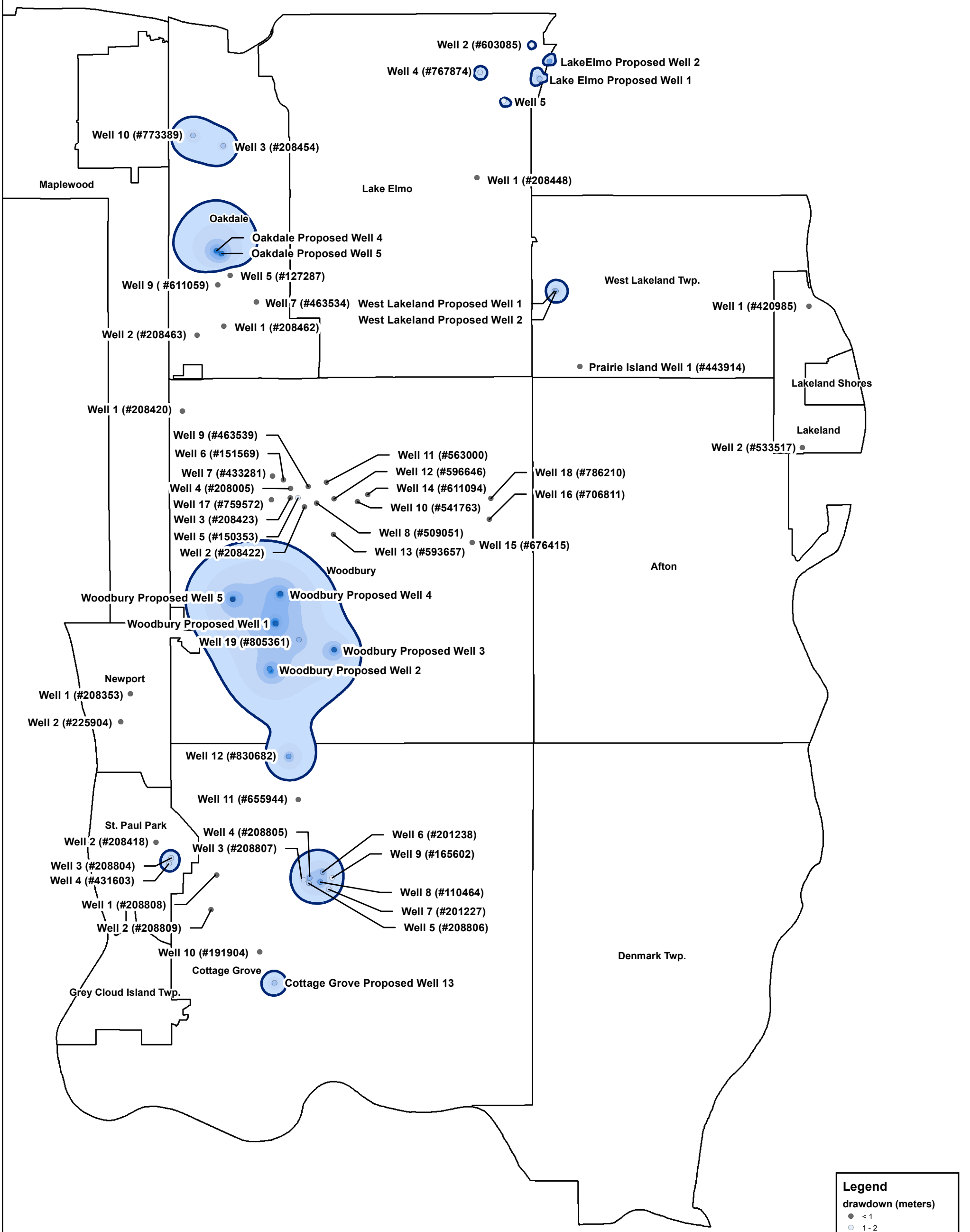
N

Job No.: 18190022
PM: BH
Date: 9/2/2020
Scale: 1" = 4,500 feet

wood.

Path: G:\Infrastructure\W-WW\01-Projects\2018\18190022 MPCA East Metro MN Water Sys Study\6.0 Background Information\6.2 Maps & GIS Files\00_Community\Community\RegionalScenA_H1_24x36_20200902.mxd

DRAFT 9-2-2020



Simulated Drawdown for Jordan Sandstone Aquifer Wet Condition
Community-Specific Scenario A

Figure E.2.2a

0 1 2 Miles

1 in = 1.5 miles

N

DRAFT 9-2-2020

Well 2 (#603085)
LakeElmo Proposed Well 2
Well 4 (#767874)
Lake Elmo Proposed Well 1
Well 5
Well 10 (#773389)
Well 3 (#208454)
Maplewood
Lake Elmo
Well 1 (#208448)
Oakdale
Oakdale Proposed Well 4
Oakdale Proposed Well 5
Well 9 (#611059)
Well 5 (#127287)
West Lakeland Twp.
Well 7 (#463534)
West Lakeland Proposed Well 1
West Lakeland Proposed Well 2
Well 1 (#420985)
Well 2 (#208463)
Well 1 (#208462)
Prairie Island Well 1 (#443914)
Lakeland Shores
Well 1 (#208420)
Lakeland
Well 2 (#533517)
Well 9 (#463539)
Well 6 (#151569)
Well 11 (#563000)
Well 7 (#433281)
Well 12 (#596646)
Well 18 (#786210)
Well 4 (#208005)
Well 14 (#611094)
Well 16 (#706811)
Well 17 (#759572)
Well 10 (#541763)
Well 3 (#208423)
Well 8 (#509051)
Well 5 (#150353)
Well 15 (#676415)
Well 2 (#208422)
Well 13 (#593657)
Afton
Woodbury
Woodbury Proposed Well 5
Woodbury Proposed Well 4
Woodbury Proposed Well 1
Well 19 (#805361)
Woodbury Proposed Well 3
Woodbury Proposed Well 2
Newport
Well 1 (#208353)
Well 2 (#225904)
Well 12 (#830682)
Well 11 (#655944)
St. Paul Park
Well 4 (#208805)
Well 6 (#201238)
Well 2 (#208418)
Well 3 (#208807)
Well 9 (#165602)
Well 3 (#208804)
Well 4 (#431603)
Well 8 (#110464)
Well 1 (#208808)
Well 7 (#201227)
Well 2 (#208809)
Well 5 (#208806)
Well 10 (#191904)
Denmark Twp.
Cottage Grove
Cottage Grove Proposed Well 13
Grey Cloud Island Twp.

Legend

drawdown (meters)
- < 1
- 1 - 2
- 2 - 4
- 4 - 6
- 6 - 8
- 8 - 10
- 10 - 12
- 12 - 14
- 14 - 16
- 16 - 18
- 18 - 20
- 20 -22
- 22 -24
- 24 -26
- 26 - 28
- 1-meter drawdown contour
- community boundaries

Simulated Drawdown for Jordan Sandstone Aquifer Drought Condition
Community-Specific Scenario A

Figure E.2.2b

0 1 2 Miles

1 in = 1.5 miles

N

DRAFT 9-2-2020

Maplewood
Well 10 (#773389)
Well 3 (#208454)
Oakdale
Well 2 (#603085)
Well 4 (#767874)
LakeElmo Proposed Well 2
Lake Elmo Proposed Well 1
W Lake Elmo Well 5
Well 1 (#208448)
Lake Elmo
Oakdale Proposed Well 4
Oakdale Proposed Well 5
Well 5 (#127287)
Well 9 (#611059)
Well 7 (#463534)
West Lakeland Proposed Well 1
West Lakeland Proposed Well 2
West Lakeland Twp.
Well 1 (#420985)
Well 1 (#208462)
Well 2 (#208463)
Prairie Island Well 1 (#443914)
Lakeland Shores
Lakeland
Well 2 (#533517)
Well 1 (#208420)
Well 9 (#463539)
Well 6 (#151569)
Well 7 (#433281)
Well 4 (#208005)
Well 17 (#759572)
Well 3 (#208423)
Well 5 (#150353)
Well 2 (#208422)
Well 11 (#563000)
Well 12 (#596646)
Well 14 (#611094)
Well 10 (#541763)
Well 8 (#509051)
Well 13 (#593657)
Well 18 (#786210)
Well 16 (#706811)
Well 15 (#676415)
Afton
Woodbury
Woodbury Proposed Well 5
Woodbury Proposed Well 4
Woodbury Proposed Well 1
Well 19 (#805361)
Woodbury Proposed Well 3
Woodbury Proposed Well 2
Newport
Well 1 (#208353)
Well 2 (#225904)
Well 12 (#830682)
Well 11 (#655944)
St. Paul Park
Well 4 (#208805)
Well 2 (#208418)
Well 3 (#208807)
Well 3 (#208804)
Well 4 (#431603)
Well 6 (#201238)
Well 9 (#165602)
Well 8 (#110464)
Well 7 (#201227)
Well 5 (#208806)
Well 1 (#208808)
Well 2 (#208809)
Well 10 (#191904)
Cottage Grove
Cottage Grove Proposed Well 13
Grey Cloud Island Twp.
Denmark Twp.

Legend

- Proposed Water Supply Well
- Existing Water Supply Well

PFAS Results - HI

- 0.00
- 0.00 - 0.249
- 0.25 - 0.499
- 0.50 - 0.749
- 0.75 - 0.999
- > 1.00
- Other Well

- East Metro Source
- Community Boundaries
- Quaternary Area of HI>1
- St. Peter Sandstone through Jordan Sandstone Area of HI>1
- Tunnel City Group through Wonewoc Sandstone Area of HI>1
- Jordan Sandstone Layer Pinched Out
- Jordan Sandstone Layer Present

- 10-year Arrow to 2030
- 10-year Arrow to 2040
- Forward Particle Track
- Simulated Groundwater Contours - Jordan Sandstone Aquifer (Meters)

Particle Tracking for Scenario A Under Wet Conditions

Figure E.2.2c

0 1 2 Miles

1 in = 1.5 miles

N

DRAFT 9-2-2020

Maplewood
Well 10 (#773389)
Well 3 (#208454)
Well 2 (#603085)
Well 4 (#767874)
LakeElmo Proposed Well 2
Lake Elmo Proposed Well 1
Well 5
Well 1 (#208448)
Lake Elmo
Oakdale
Oakdale Proposed Well 4
Oakdale Proposed Well 5
Well 5 (#127287)
Well 9 (#611059)
Well 7 (#463534)
West Lakeland Proposed Well 1
West Lakeland Proposed Well 2
Well 1 (#208462)
Well 2 (#208463)
West Lakeland Twp.
Well 1 (#420985)
Prairie Island Well 1 (#443914)
Lakeland Shores
Lakeland
Well 2 (#533517)
Well 1 (#208420)
Well 9 (#463539)
Well 6 (#151569)
Well 7 (#433281)
Well 4 (#208005)
Well 17 (#759572)
Well 3 (#208423)
Well 5 (#150353)
Well 2 (#208422)
Well 11 (#563000)
Well 12 (#596646)
Well 14 (#611094)
Well 10 (#541763)
Well 8 (#509051)
Well 13 (#593657)
Well 18 (#786210)
Well 16 (#706811)
Well 15 (#676415)
Afton
Woodbury
Woodbury Proposed Well 5
Woodbury Proposed Well 4
Woodbury Proposed Well 1
Well 19 (#805361)
Woodbury Proposed Well 3
Woodbury Proposed Well 2
Newport
Well 1 (#208353)
Well 2 (#225904)
Well 12 (#830682)
Well 11 (#655944)
St. Paul Park
Well 2 (#208418)
Well 4 (#208805)
Well 3 (#208807)
Well 3 (#208804)
Well 4 (#431603)
Well 6 (#201238)
Well 9 (#165602)
Well 8 (#110464)
Well 7 (#201227)
Well 5 (#208806)
Well 1 (#208808)
Well 2 (#208809)
Well 10 (#191904)
Cottage Grove
Cottage Grove Proposed Well 13
Grey Cloudlsland Twp.
Denmark Twp.

Legend

- Proposed Water Supply Well
- Existing Water Supply Well

PFAS Results - HI

- 0.00
- 0.00 - 0.249
- 0.25 - 0.499
- 0.50 - 0.749
- 0.75 - 0.999
- > 1.00
- Other Well

- East Metro Source
- Community Boundaries
- Quaternary Area of HI>1
- St. Peter Sandstone through Jordan Sandstone Area of HI>1
- Tunnel City Group through Wonewoc Sandstone Area of HI>1
- Jordan Sandstone Layer Pinched Out
- Jordan Sandstone Layer Present

- 10-year Arrow to 2030
- 10-year Arrow to 2040
- Forward Particle Track
- Simulated Groundwater Contours - Jordan Sandstone Aquifer (Meters)

Particle Tracking for Scenario A Under Normal Conditions

Figure E.2.2d

0 1 2 Miles

1 in = 1.5 miles

N

DRAFT 9-2-2020

Maplewood
Well 10 (#773389)
Well 3 (#208454)
Well 2 (#603085)
Well 4 (#767874)
LakeElmo Proposed Well 2
Lake Elmo Proposed Well 1
Lake Elmo Well 5
Well 1 (#208448)
Lake Elmo
Oakdale
Oakdale Proposed Well 4
Oakdale Proposed Well 5
Well 5 (#127287)
Well 9 (#611059)
Well 7 (#463534)
West Lakeland Proposed Well 1
West Lakeland Proposed Well 2
Well 1 (#208462)
Well 2 (#208463)
West Lakeland Twp.
Well 1 (#420985)
Prairie Island Well 1 (#443914)
Lakeland Shores
Lakeland
Well 2 (#533517)
Well 1 (#208420)
Well 9 (#463539)
Well 6 (#151569)
Well 7 (#433281)
Well 4 (#208005)
Well 17 (#759572)
Well 3 (#208423)
Well 5 (#150353)
Well 2 (#208422)
Well 11 (#563000)
Well 12 (#596646)
Well 14 (#611094)
Well 10 (#541763)
Well 8 (#509051)
Well 13 (#593657)
Well 18 (#786210)
Well 16 (#706811)
Well 15 (#676415)
Woodbury
Afton
Woodbury Proposed Well 5
Woodbury Proposed Well 4
Woodbury Proposed Well 1
Well 19 (#805361)
Woodbury Proposed Well 3
Woodbury Proposed Well 2
Newport
Well 1 (#208353)
Well 2 (#225904)
Well 12 (#830682)
Well 11 (#655944)
St. Paul Park
Well 4 (#208805)
Well 2 (#208418)
Well 3 (#208807)
Well 3 (#208804)
Well 4 (#431603)
Well 6 (#201238)
Well 9 (#165602)
Well 8 (#110464)
Well 7 (#201227)
Well 5 (#208806)
Well 1 (#208808)
Well 2 (#208809)
Well 10 (#191904)
Cottage Grove
Cottage Grove Proposed Well 13
Grey CloudIsland Twp.
Denmark Twp.

Legend

- Proposed Water Supply Well
- Existing Water Supply Well

PFAS Results - HI

- 0.00
- 0.00 - 0.249
- 0.25 - 0.499
- 0.50 - 0.749
- 0.75 - 0.999
- > 1.00
- Other Well

- East Metro Source
- Community Boundaries
- Quaternary Area of HI>1
- St. Peter Sandstone through Jordan Sandstone Area of HI>1
- Tunnel City Group through Wonewoc Sandstone Area of HI>1
- Jordan Sandstone Layer Pinched Out
- Jordan Sandstone Layer Present

- 10-year Arrow to 2030
- 10-year Arrow to 2040
- Forward Particle Track
- Simulated Groundwater Contours - Jordan Sandstone Aquifer (Meters)

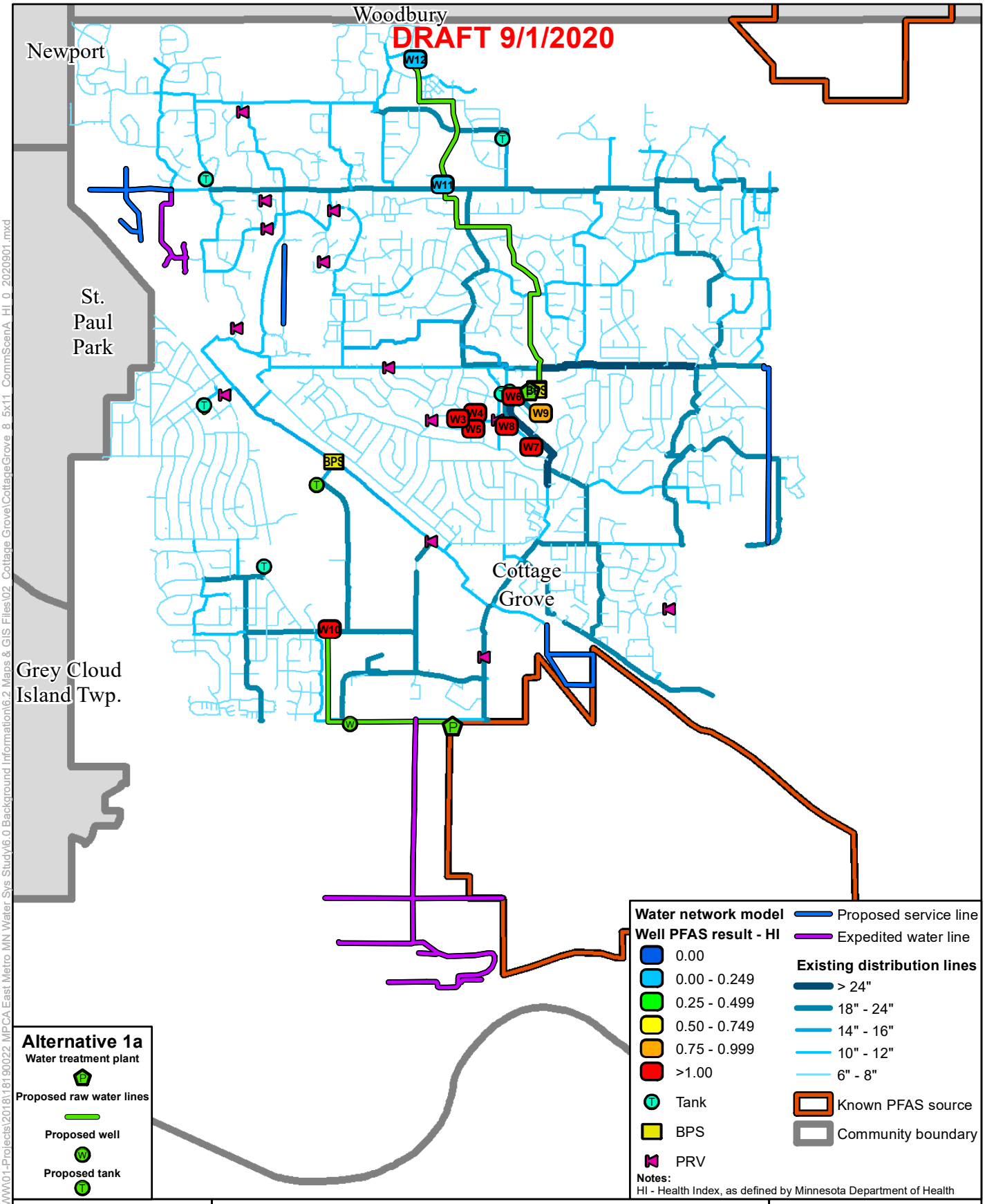
Particle Tracking for Scenario A Under Drought Conditions

Figure E.2.2e

0 1 2 Miles

1 in = 1.5 miles

N



Job No.	18190022
PM:	BH
Date:	9/1/2020
Scale:	1" = 0.75 miles

Figure E.2.2.2.1 - Cottage Grove Community Specific Scenario A HI > 0

N

0 0.25 0.5 0.75 1.5 Miles

wood.

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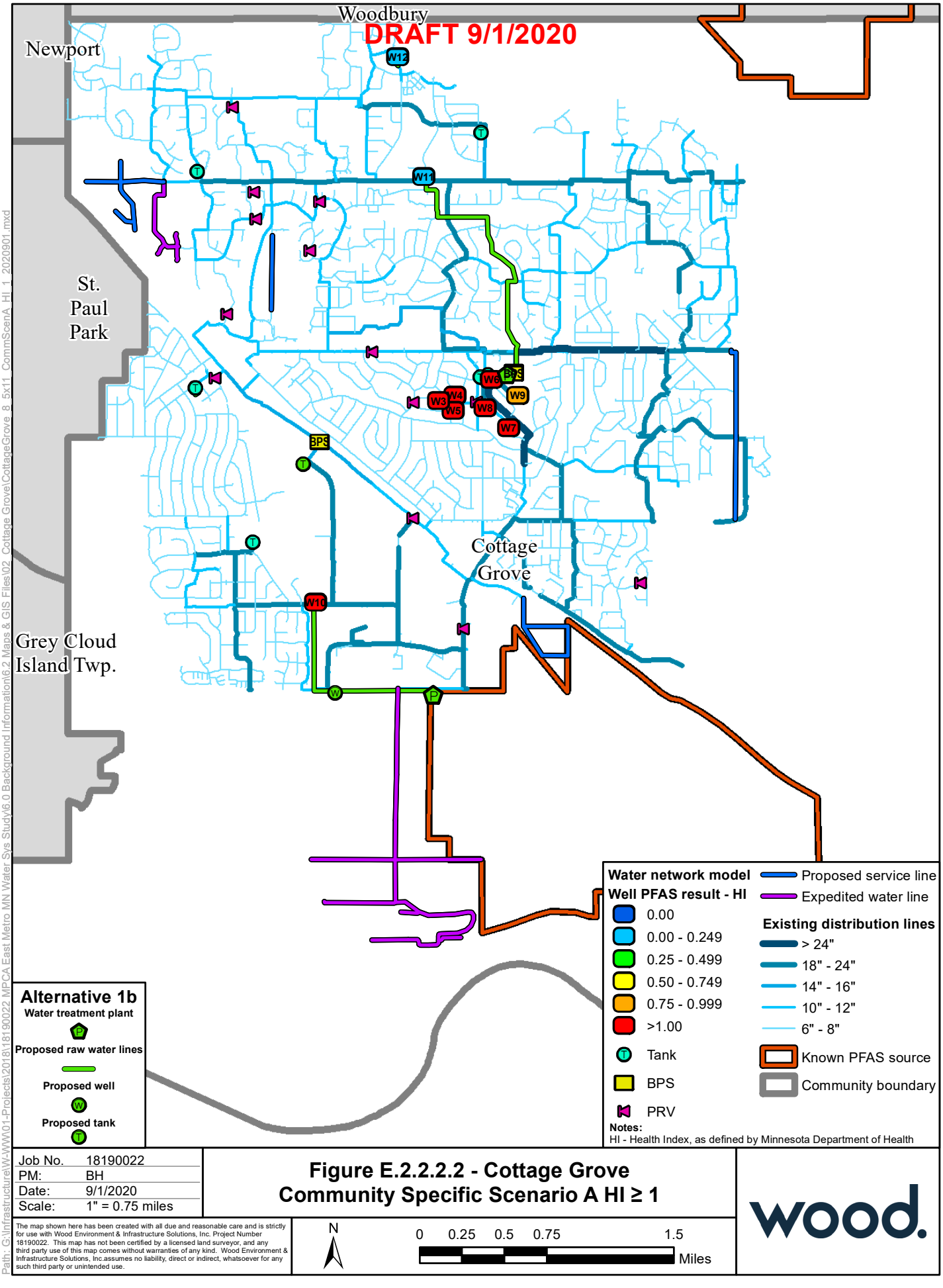
Woodbury
DRAFT 9/1/2020
Newport
St. Paul Park
Cottage Grove
Grey Cloud Island Twp.
W11
W6
W9
W3
W4
W5
W8
W7
BPS
W10
Alternative 1b
Water treatment plant
Proposed raw water lines
Proposed well
Proposed tank
Water network model
Well PFAS result - HI
0.00
0.00 - 0.249
0.25 - 0.499
0.50 - 0.749
0.75 - 0.999
>1.00
Tank
BPS
PRV
Proposed service line
Expedited water line
Existing distribution lines
> 24"
18" - 24"
14" - 16"
10" - 12"
6" - 8"
Known PFAS source
Community boundary
Notes:
HI - Health Index, as defined by Minnesota Department of Health
Job No. 18190022
PM: BH
Date: 9/1/2020
Scale: 1" = 0.75 miles
Figure E.2.2.2.2 - Cottage Grove
Community Specific Scenario A HI ≥ 1
N
0 0.25 0.5 0.75 1.5
Miles
wood.
The map shown here has been created with all due and reasonable care and is strictly for use with Wood Environment & Infrastructure Solutions, Inc. Project Number 18190022. This map has not been certified by a licensed land surveyor, and any third party use of this map comes without warranties of any kind. Wood Environment & Infrastructure Solutions, Inc.assumes no liability, direct or indirect, whatsoever for any such third party or unintended use.
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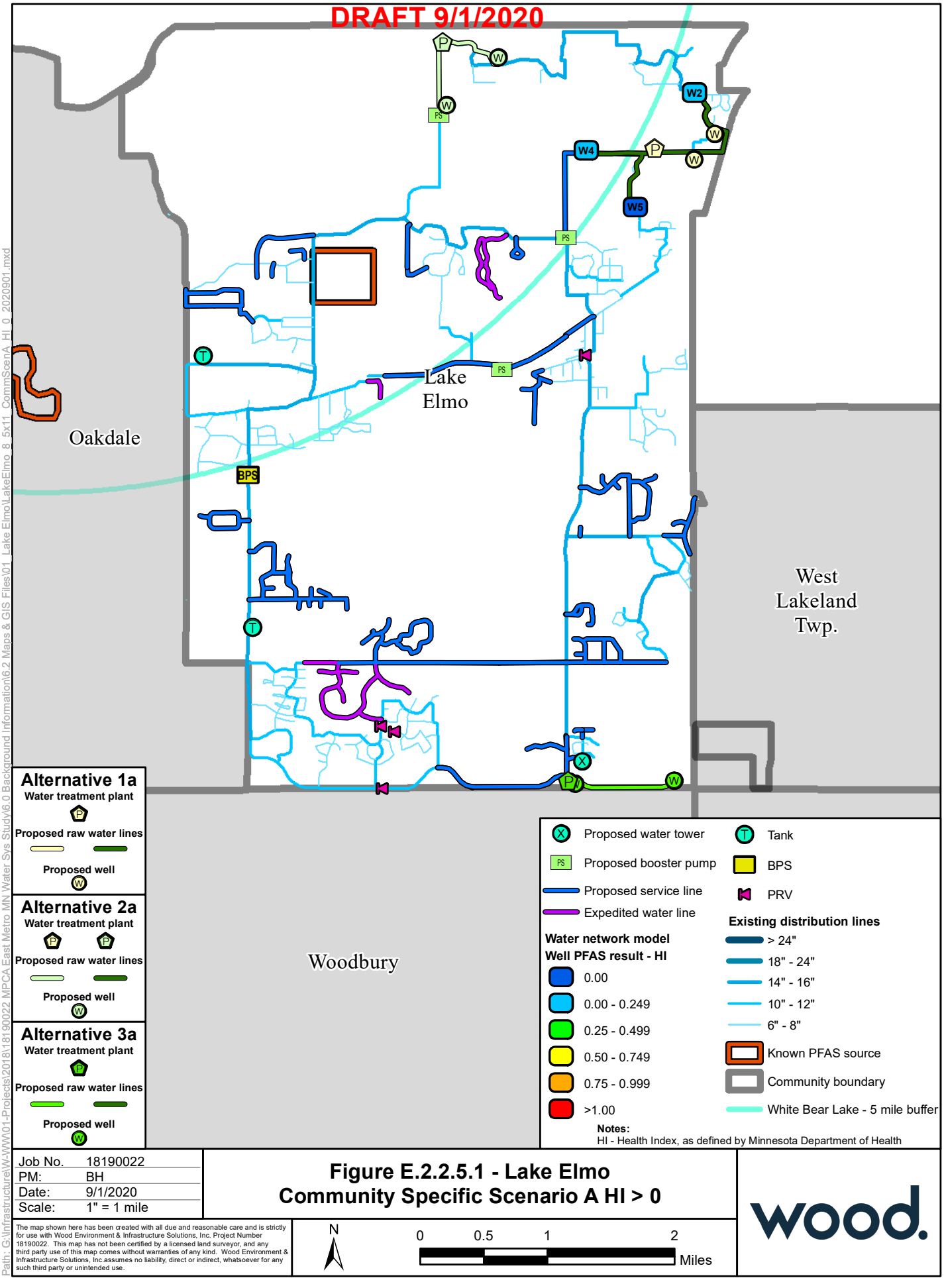
DRAFT 9/1/2020
Oakdale
Lake Elmo
West Lakeland Twp.
Woodbury
W2
W4
W5
BPS
PS
Alternative 1a
Water treatment plant
Proposed raw water lines
Proposed well
Alternative 2a
Water treatment plant
Proposed raw water lines
Proposed well
Alternative 3a
Water treatment plant
Proposed raw water lines
Proposed well
Proposed water tower
Proposed booster pump
Proposed service line
Expedited water line
Tank
BPS
PRV
Existing distribution lines
> 24"
18" - 24"
14" - 16"
10" - 12"
6" - 8"
Known PFAS source
Community boundary
White Bear Lake - 5 mile buffer
Water network model
Well PFAS result - HI
0.00
0.00 - 0.249
0.25 - 0.499
0.50 - 0.749
0.75 - 0.999
>1.00
Notes:
HI - Health Index, as defined by Minnesota Department of Health
Job No. 18190022
PM: BH
Date: 9/1/2020
Scale: 1" = 1 mile
Figure E.2.2.5.1 - Lake Elmo
Community Specific Scenario A HI > 0
N
0 0.5 1 2
Miles
wood.
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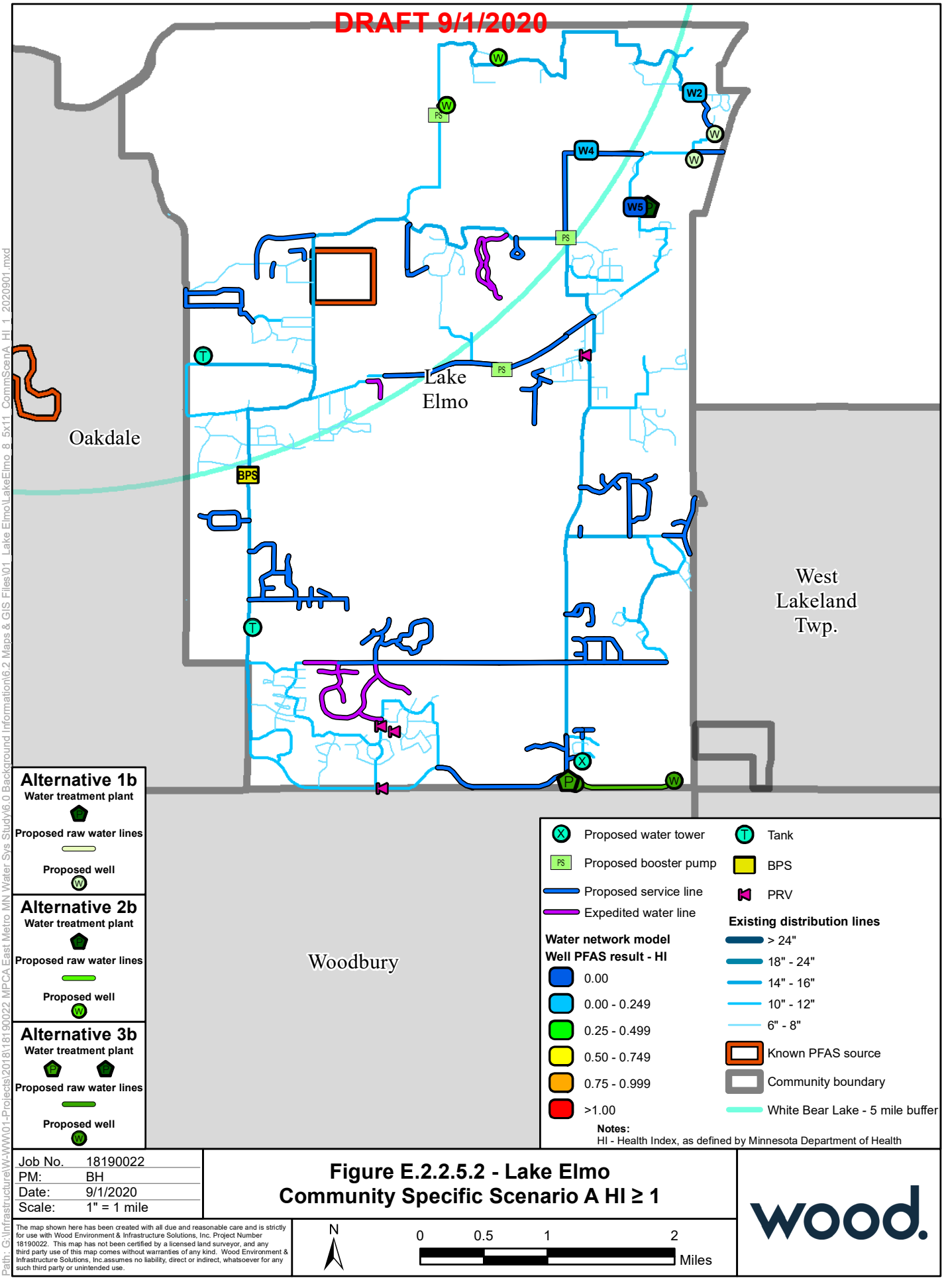
DRAFT 9/1/2020
Oakdale
Lake Elmo
West Lakeland Twp.
Woodbury
W
W2
W4
W5
PS
BPS
T
X
P
Alternative 1b
Water treatment plant
Proposed raw water lines
Proposed well
Alternative 2b
Water treatment plant
Proposed raw water lines
Proposed well
Alternative 3b
Water treatment plant
Proposed raw water lines
Proposed well
Proposed water tower
Proposed booster pump
Proposed service line
Expedited water line
Water network model
Well PFAS result - HI
0.00
0.00 - 0.249
0.25 - 0.499
0.50 - 0.749
0.75 - 0.999
>1.00
Tank
BPS
PRV
Existing distribution lines
> 24"
18" - 24"
14" - 16"
10" - 12"
6" - 8"
Known PFAS source
Community boundary
White Bear Lake - 5 mile buffer
Notes:
HI - Health Index, as defined by Minnesota Department of Health
Job No. 18190022
PM: BH
Date: 9/1/2020
Scale: 1" = 1 mile
Figure E.2.2.5.2 - Lake Elmo
Community Specific Scenario A HI ≥ 1
N
0 0.5 1 2
Miles
wood.
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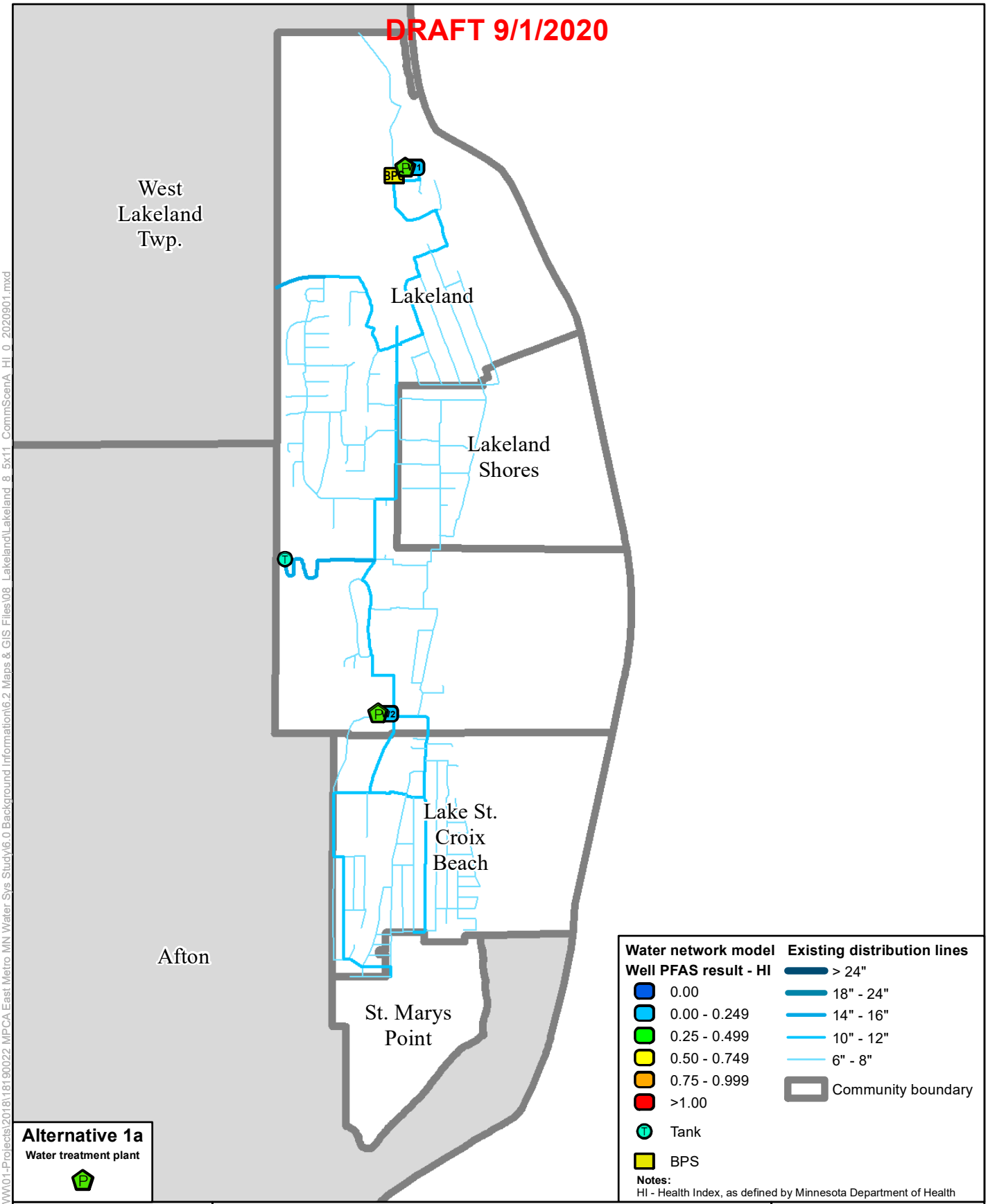


Job No.	18190022
PM:	BH
Date:	9/1/2020
Scale:	1" = 3,000 feet

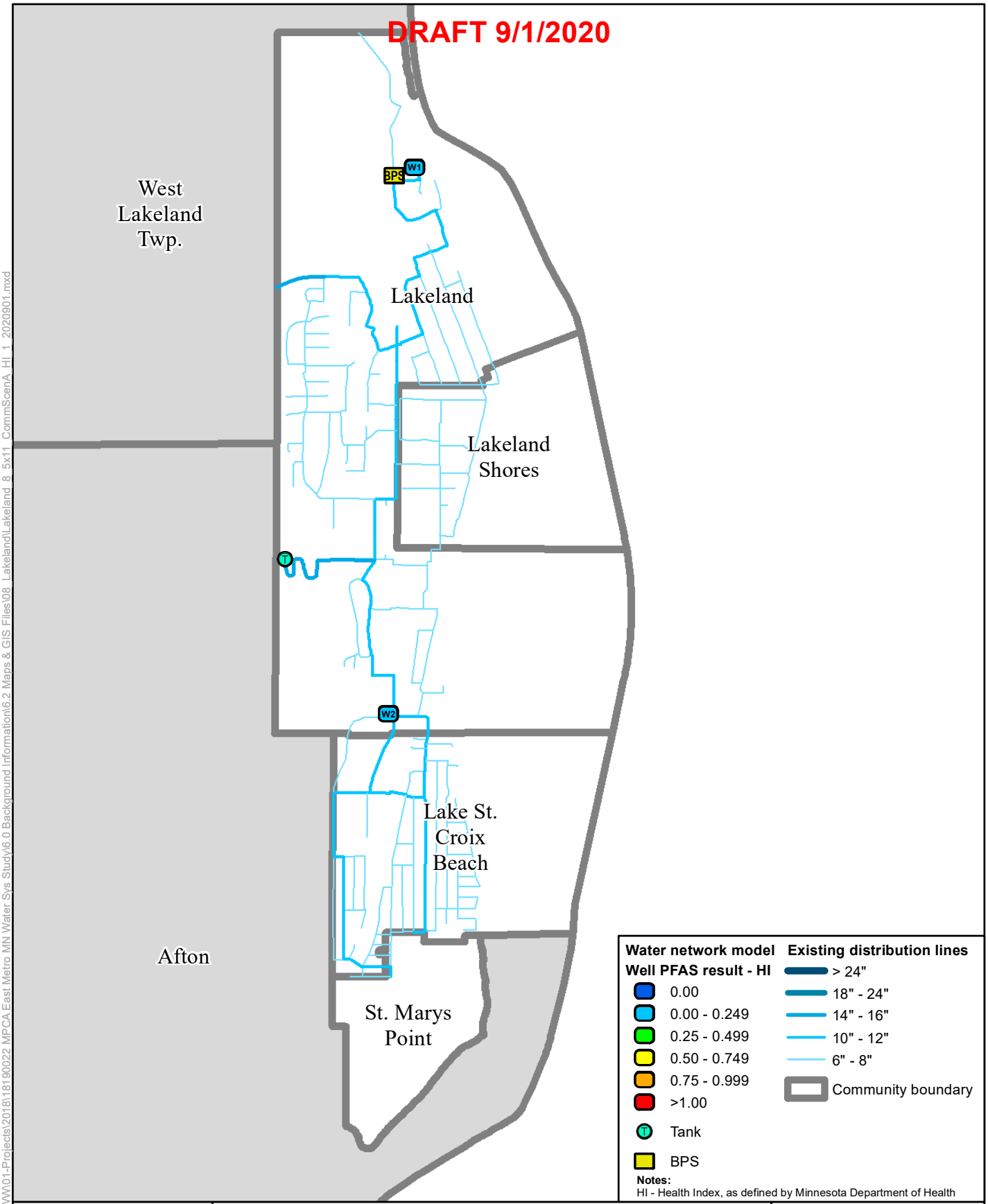
Figure E.2.2.6.1 - Lakeland, Lakeland Shores, Lake St. Croix Beach, and St. Mary's Point Community Specific Scenario A HI > 0

N

0 1,000 2,000 3,000 6,000 Feet

wood.

Path: G:\Infrastructure\W-WM\01-Projects\2018\18190022 MPCA East Metro MN Water Sys Study\6.0 Background Information\6.2 Maps & GIS Files\08_Lakeland\Lakeland_8_5x11_CommScenA_HI_0_20200901.mxd



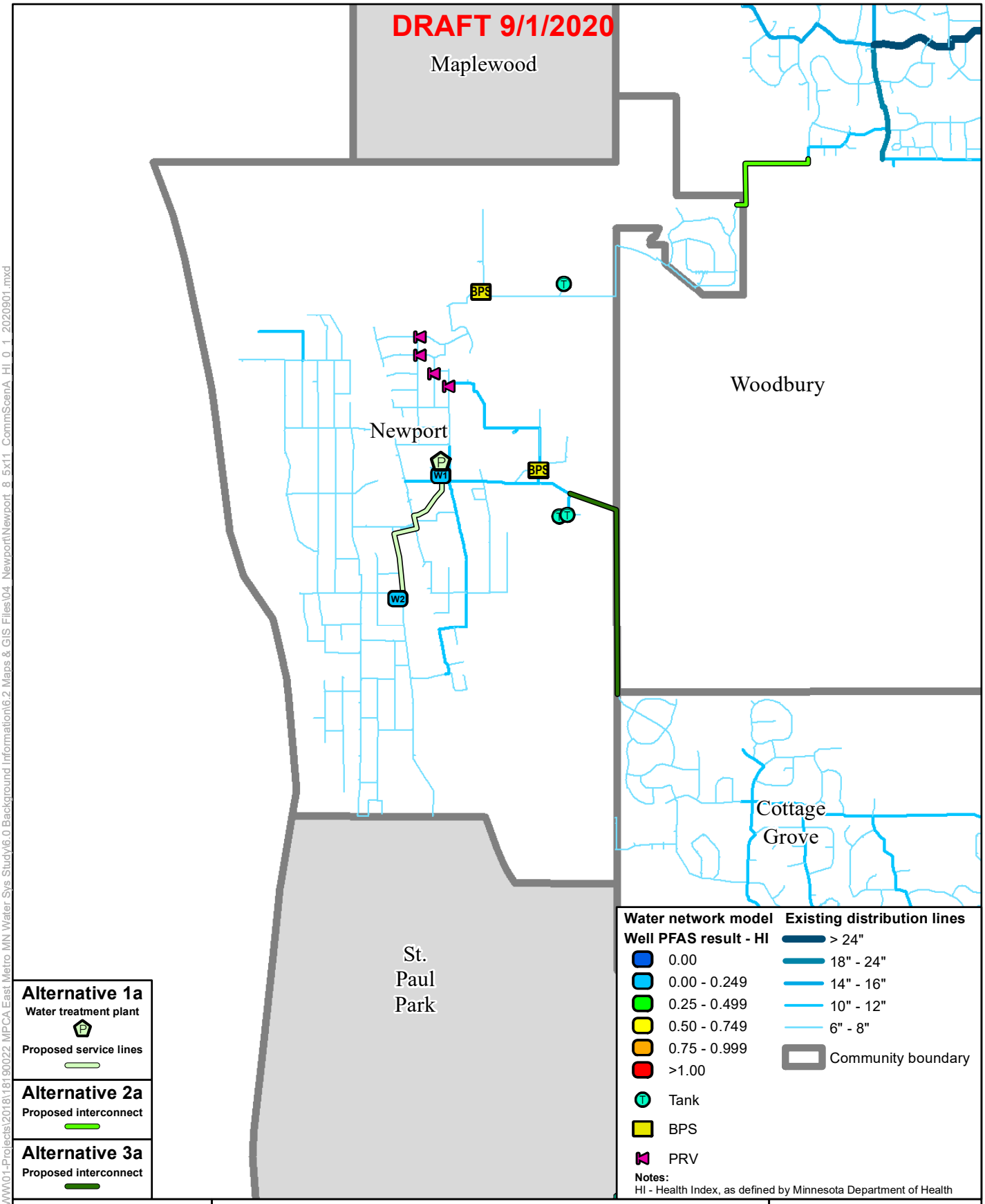
Job No.	18190022
PM:	BH
Date:	9/1/2020
Scale:	1" = 3,000 feet

Figure E.2.2.6.2 - Lakeland, Lakeland Shores, Lake St. Croix Beach, and St. Mary's Point Community Specific Scenario A HI ≥ 1

N

0 1,000 2,000 3,000 6,000 Feet

wood.



Job No.	18190022
PM:	BH
Date:	9/1/2020
Scale:	1" = 0.5 miles

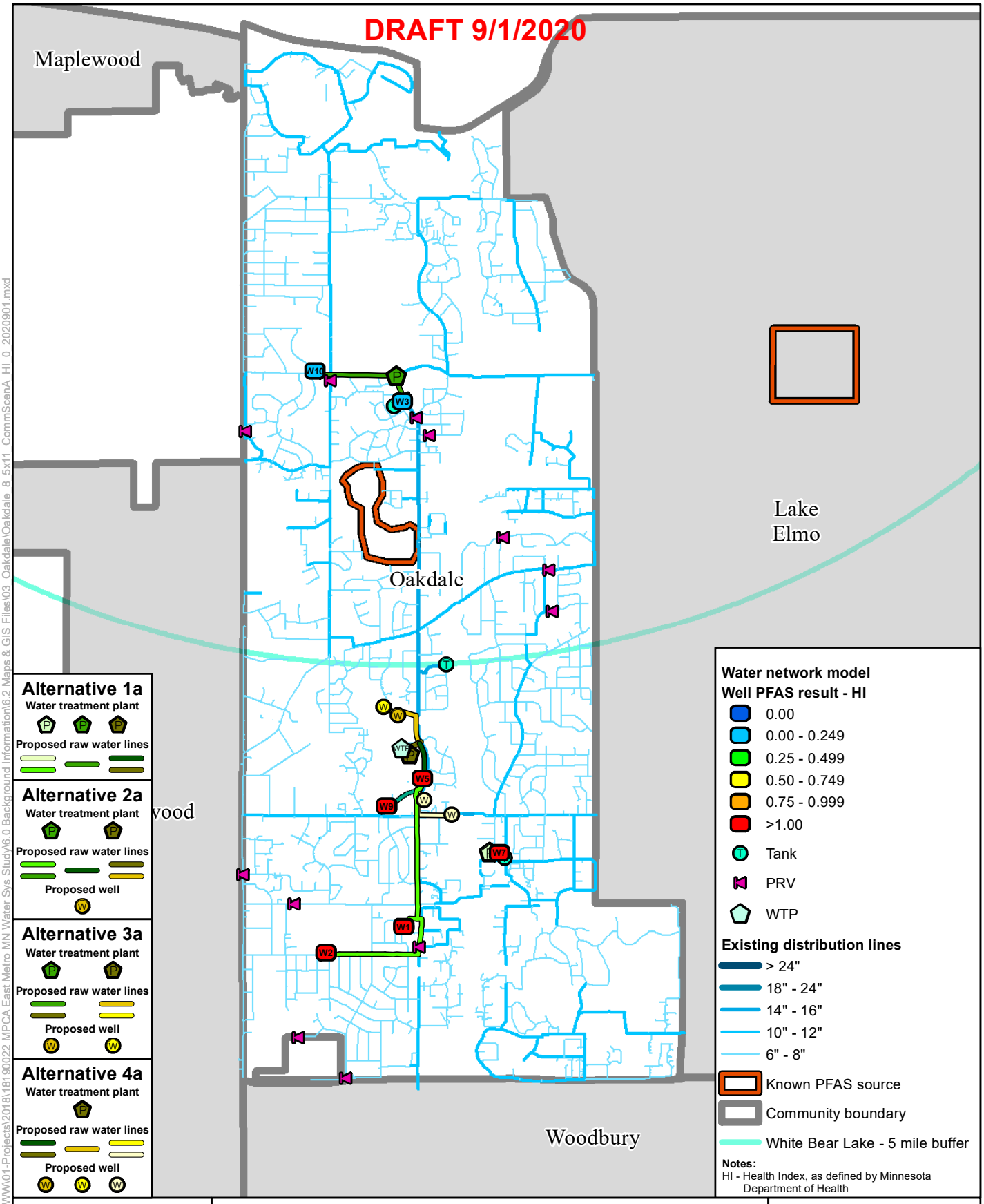
Figure E.2.2.8.1 - Newport
Community Specific Scenario A HI > 0 & HI ≥ 1

N

0 0.25 0.5 1 Miles

wood.

Path: G:\Infrastructure\W-WM001-Projects\2018\18190022 MPCA East Metro MN Water Sys Study\6.0 Background Information\6.2 Maps & GIS Files\04_Newport\Newport_8_5x11_CommScenA_HI_0_1_2020901.mxd



Job No.	18190022
PM:	BH
Date:	9/1/2020
Scale:	1" = 0.75 miles

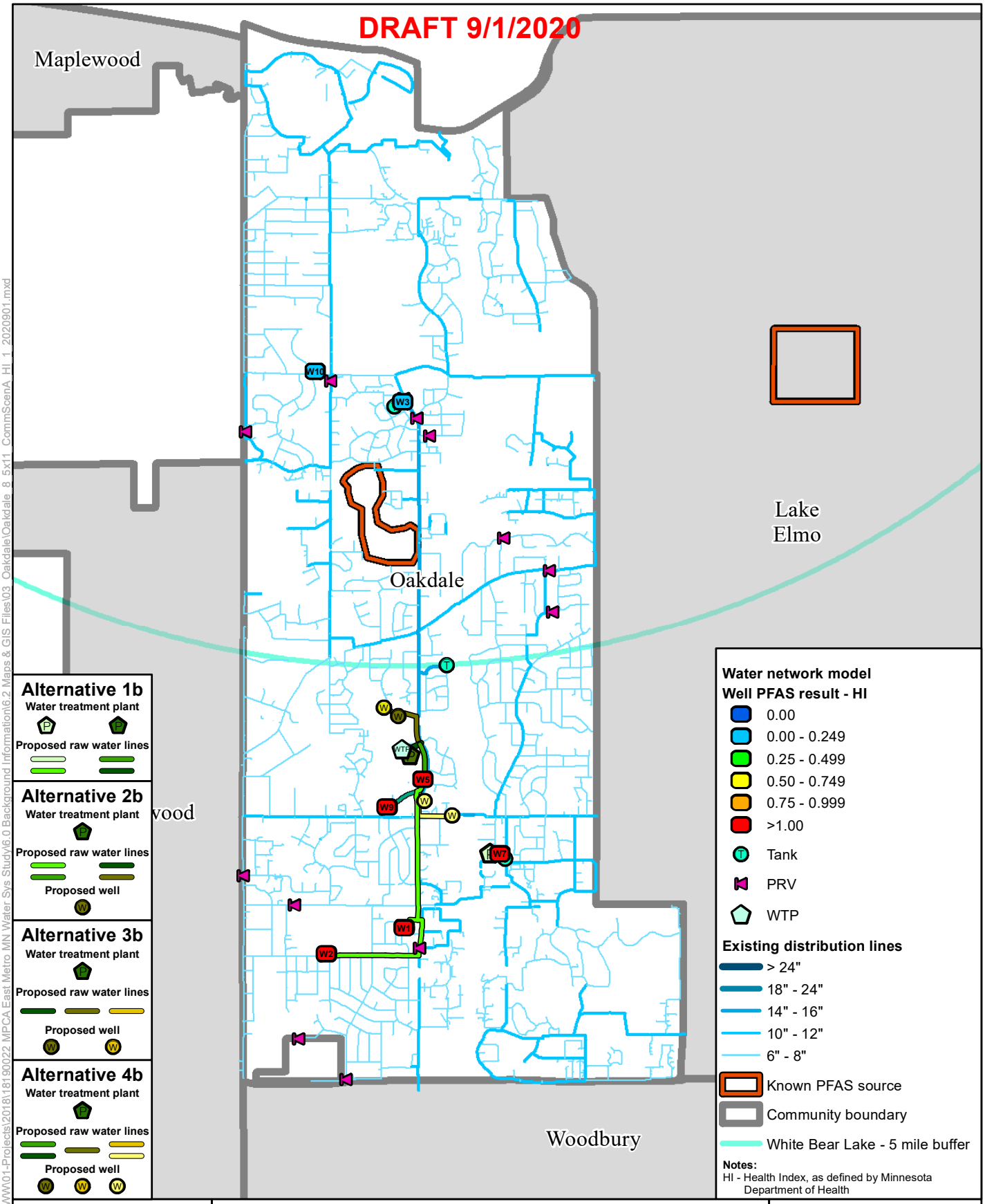
Figure E.2.2.9.1 - Oakdale
Community Specific Scenario A HI > 0

N

0 0.25 0.5 0.75 1.5 Miles

wood.

Path: G:\Infrastructure\W-WM\01-Projects\2018\18190022 MPCA East Metro MN Water Sys Study\6.0 Background Information\6.2 Maps & GIS Files\03_Oakdale\Oakdale_8_5x11_CommScenA_HI_0_2020901.mxd



Job No.	18190022
PM:	BH
Date:	9/1/2020
Scale:	1" = 0.75 miles

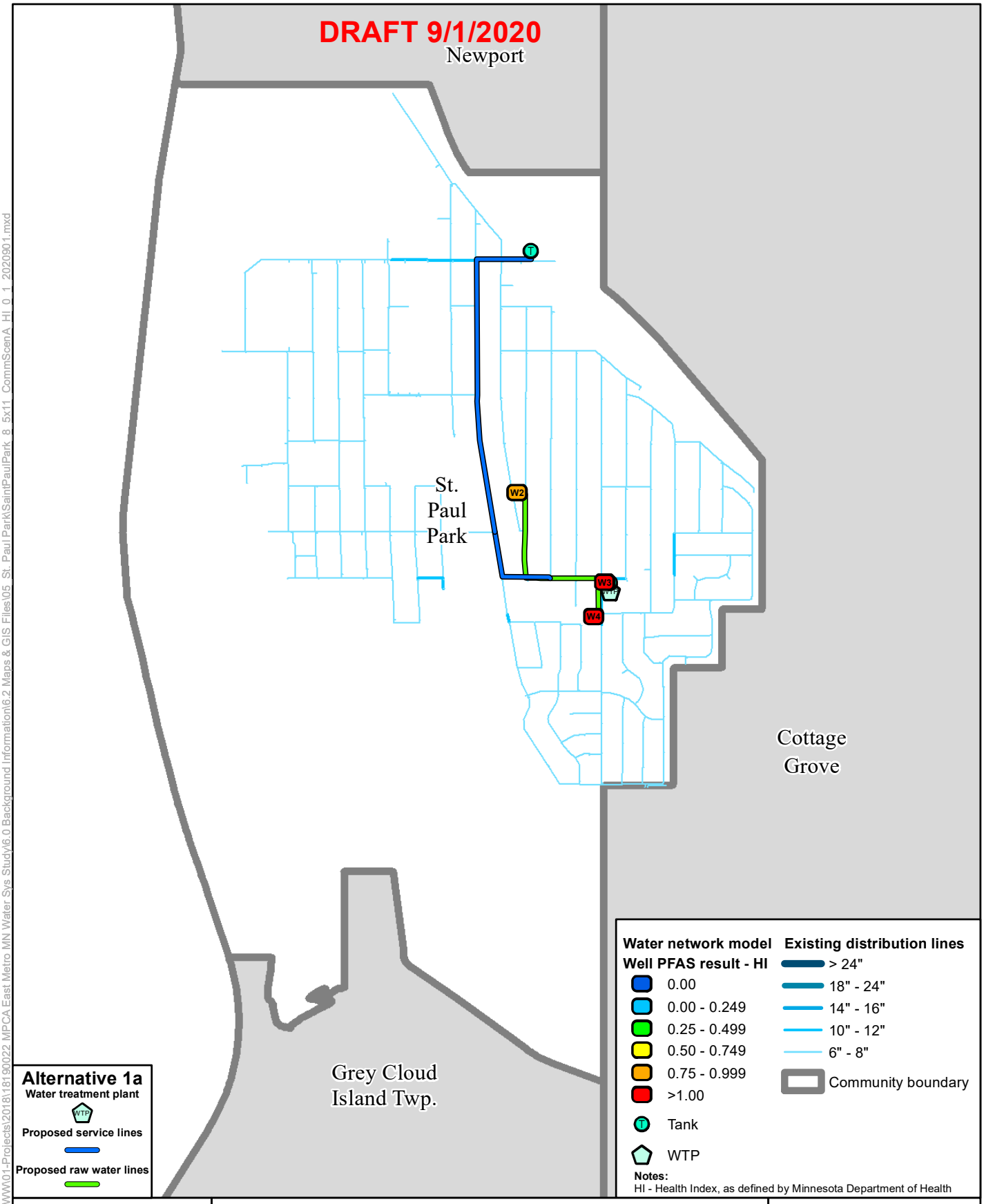
Figure E.2.2.9.2 - Oakdale
Community Specific Scenario A HI ≥ 1

N

0 0.25 0.5 0.75 1.5 Miles

wood.

Path: G:\Infrastructure\WW\001-Projects\2018\18190022 MPCA East Metro MN Water Sys Study\6.0 Background Information\6.2 Maps & GIS Files\03_Oakdale\Oakdale_8_5x11_CommScenA_HI_1_20200901.mxd



Job No.	18190022
PM:	BH
Date:	9/1/2020
Scale:	1" = 2,000 feet

Figure E.2.2.11.1 - St. Paul Park
Community Specific Scenario A HI > 0 & HI ≥ 1

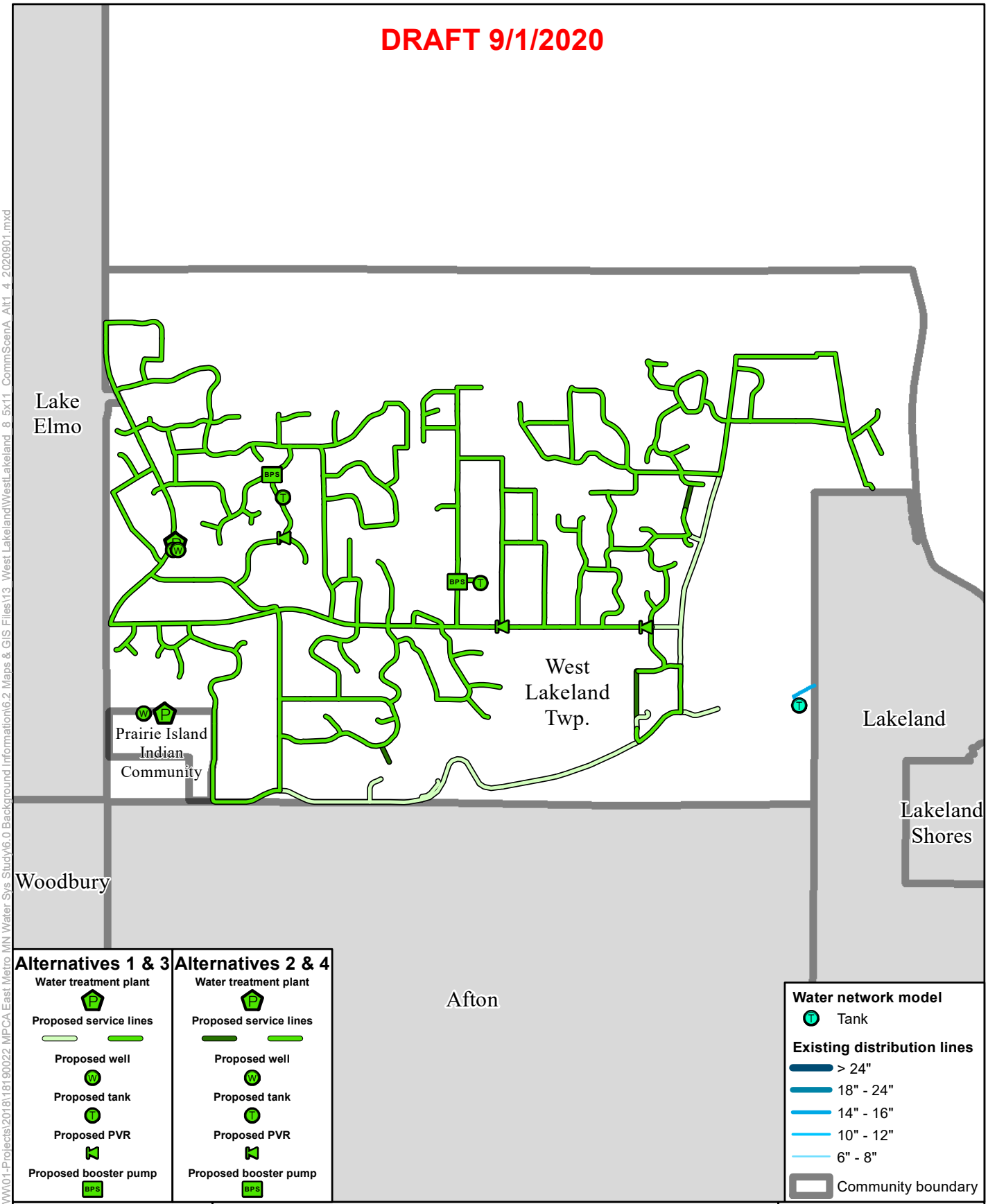
N

0 1,000 2,000 4,000 Feet

wood.

Path: G:\Infrastructure\W-WM001-Projects\2018\18190022 MPCA East Metro MN Water Sys Study\6.0 Background Information\6.2 Maps & GIS Files\05_St. Paul Park\SaintPaulPark_8_5x11_CommScenA_HI_0_1_20200901.mxd

DRAFT 9/1/2020



Alternatives 1 & 3
- Water treatment plant
- Proposed service lines
- Proposed well
- Proposed tank
- Proposed PVR
- Proposed booster pump

Alternatives 2 & 4
- Water treatment plant
- Proposed service lines
- Proposed well
- Proposed tank
- Proposed PVR
- Proposed booster pump

Water network model
- Tank

Existing distribution lines
- > 24"
- 18" - 24"
- 14" - 16"
- 10" - 12"
- 6" - 8"
- Community boundary

Job No.	18190022
PM:	BH
Date:	9/1/2020
Scale:	1" = 0.75 miles

Figure E.2.2.12.1 - West Lakeland Township and Prairie Island Indian Community, Community Specific Scenario A HI>0 & HI≥1 for Alternatives 1, 2, 3, and 4

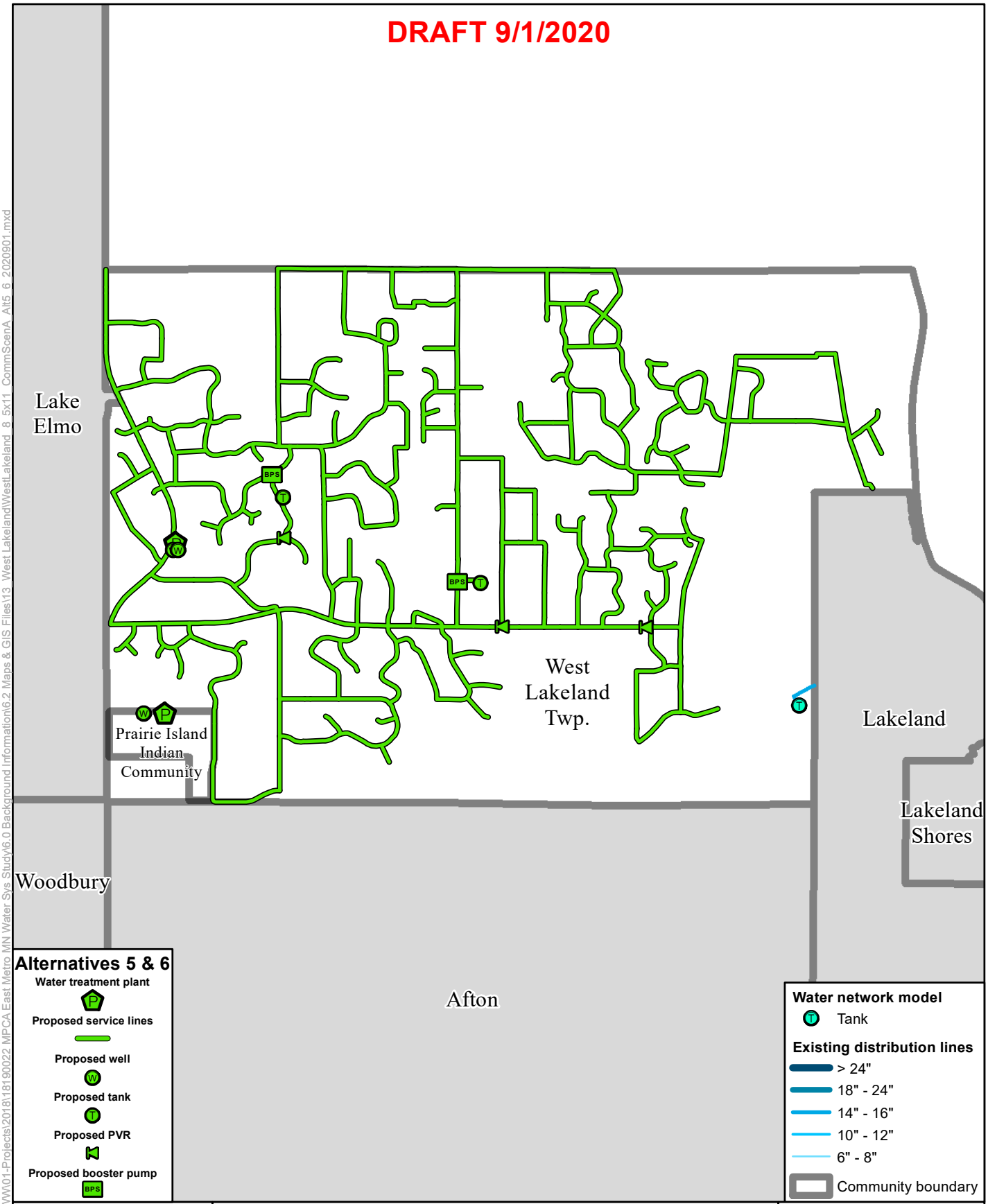
N

0 0.25 0.5 0.75 1.5 Miles

wood.

Path: G:\Infrastructure\W-WM001-Projects\2018\18190022 MPCA East Metro MN Water Sys Study\6.0 Background Information\6.2 Maps & GIS Files\13_West Lakeland\WestLakeland_8_5x11_CommScenA_Alt1_4_2020901.mxd

DRAFT 9/1/2020



Alternatives 5 & 6

- Water treatment plant
- Proposed service lines
- Proposed well
- Proposed tank
- Proposed PVR
- Proposed booster pump

Water network model

- Tank

Existing distribution lines

- > 24"
- 18" - 24"
- 14" - 16"
- 10" - 12"
- 6" - 8"
- Community boundary

Job No.	18190022
PM:	BH
Date:	9/1/2020
Scale:	1" = 0.75 miles

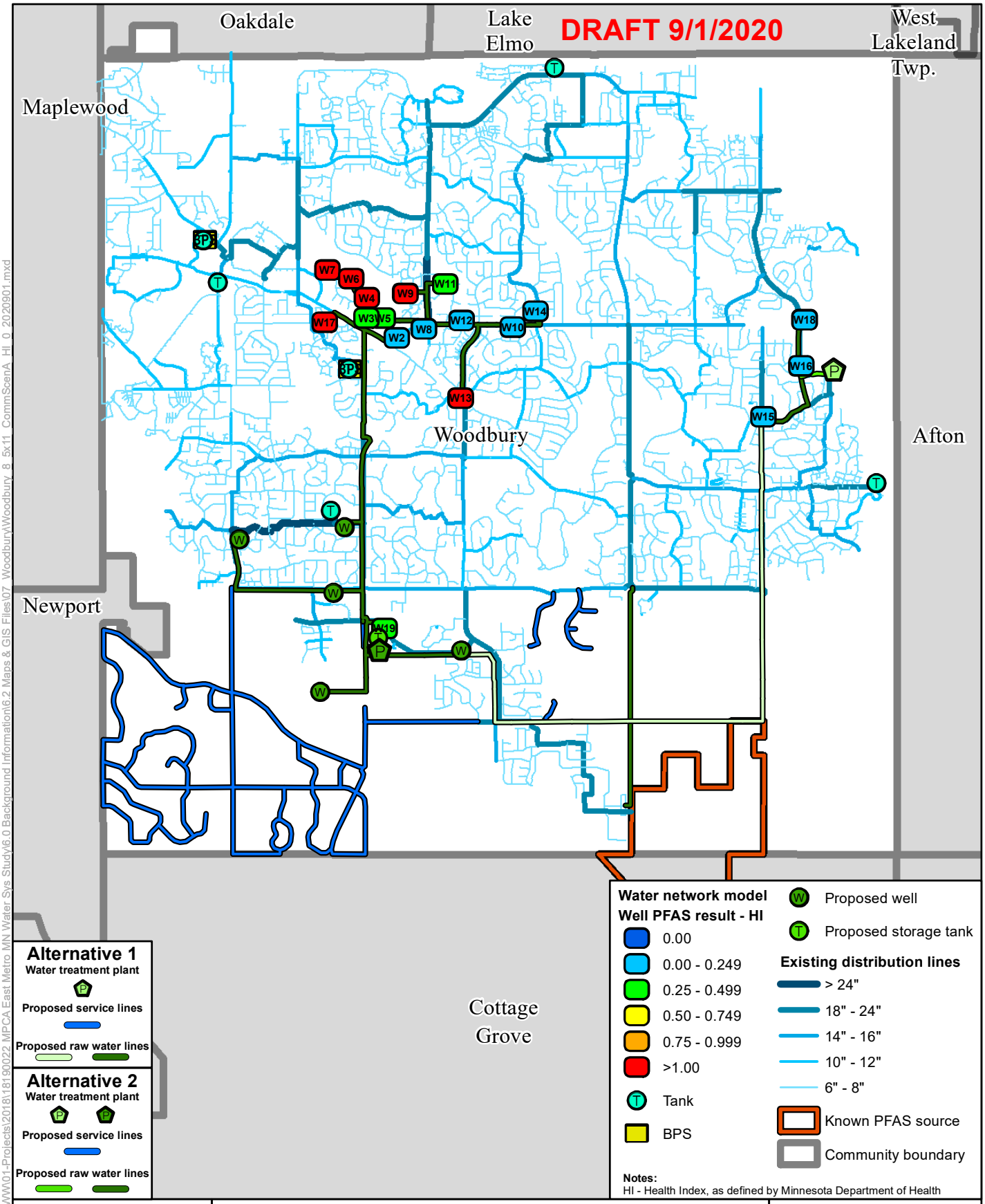
Figure E.2.2.12.2 - West Lakeland Township and Prairie Island Indian Community, Community Specific Scenario A HI>0 & HI≥1 for Alternatives 5 and 6

N

0 0.25 0.5 0.75 1.5 Miles

wood.

Path: G:\Infrastructure\W-WM001-Projects\2018\18190022 MPCA East Metro MN Water Sys Study\6.0 Background Information\6.2 Maps & GIS Files\13_West Lakeland\WestLakeland_8_5x11_CommScenA_Alt5_6_2020901.mxd



Job No.	18190022
PM:	BH
Date:	9/1/2020
Scale:	1" = 1 mile

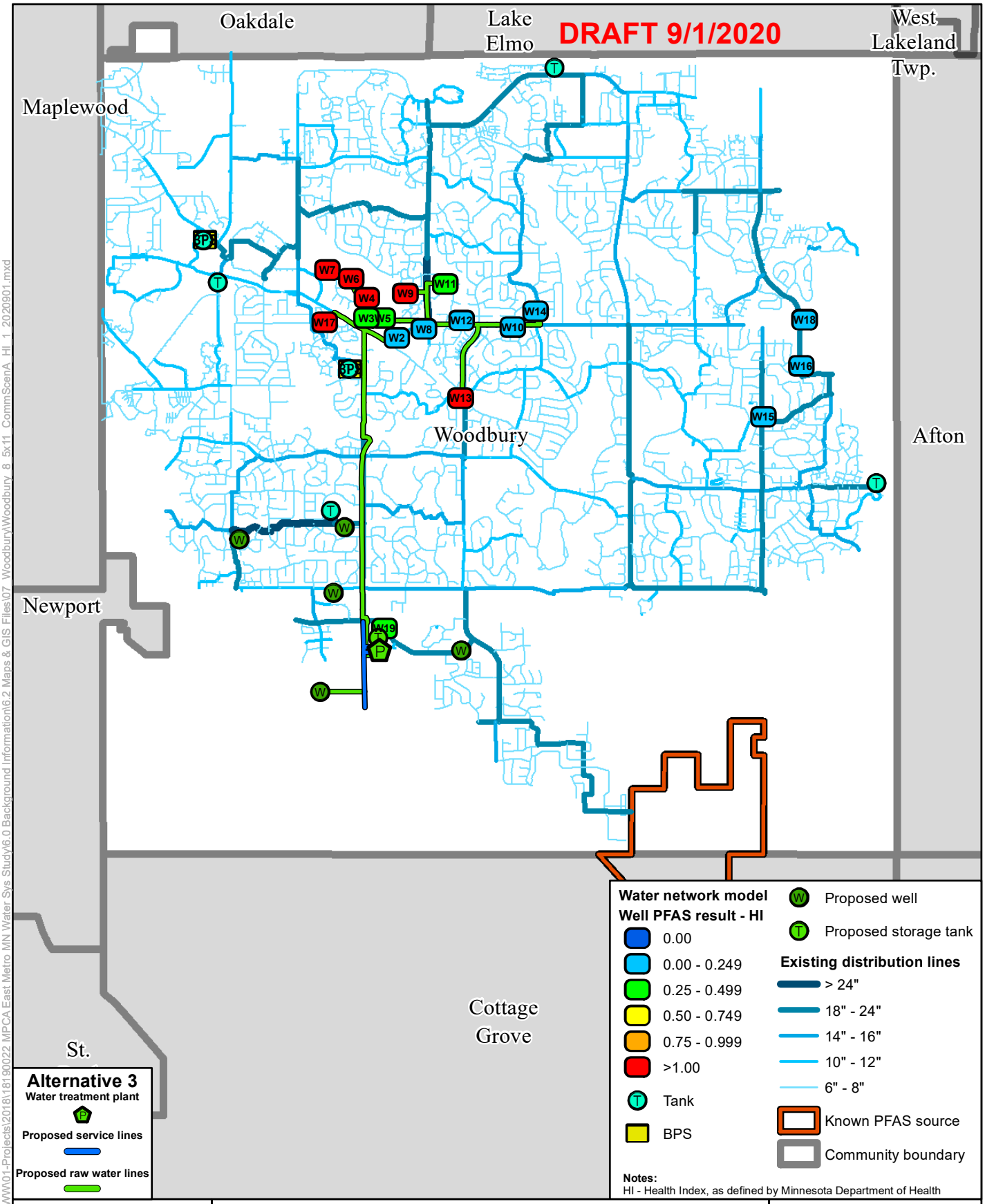
Figure E.2.2.13.1 - Woodbury
Community Specific Scenario A HI > 0

N

0 0.5 1 2 Miles

wood.

Path: G:\Infrastructure\W-WM001-Projects\2018\18190022 MPCA East Metro MN Water Sys Study\6.0 Background Information\6.2 Maps & GIS Files\07_Woodbury\Woodbury_8_5x11_CommScenA_HI_0_20200901.mxd



Job No.	18190022
PM:	BH
Date:	9/1/2020
Scale:	1" = 1 mile

Figure E.2.2.13.2 - Woodbury
Community Specific Scenario A HI ≥ 1

N

0 0.5 1 2 Miles

wood.

Path: G:\Infrastructure\W-WM001-Projects\2018\18190022 MPCA East Metro MN Water Sys Study\6.0 Background Information\6.2 Maps & GIS Files\07_Woodbury\Woodbury_8_5x11_CommScenA_HI_1_20200901.mxd

DRAFT 9-2-2020

Maplewood

Oakdale

Lake Elmo

West Lakeland Township

Lakeland Shores

Lakeland

Lake St. Croix Beach

St. Marys Point

Afton

Woodbury

Newport

St. Paul Park

Grey Cloud Island Township

Cottage Grove

Denmark Township

Water network model

- Well
- Tank
- BPS
- PRV
- WTP
- Existing raw water lines

Existing distribution lines

- > 24"
- 18" - 24"
- 14" - 16"
- 10" - 12"
- 6" - 8"
- Known PFAS source
- Community boundary
- Potential projected areas impacted by PFAS by 2040

PFAS results - HI

- 0.00
- 0.00 - 0.249
- 0.25 - 0.499
- 0.50 - 0.749
- 0.75 - 0.999
- ≥1.00
- ≥1.00 - advisory sent
- GAC installed
- GAC install proposed
- Wells replaced with municipal water supply connection
- Wells proposed to be replaced with a municipal water supply connection

MWI well types

- Domestic
- Commercial
- Irrigation
- Community potable
- Non-community potable
- Monitoring & testing
- Other

Notes:
HI - Health Index, as defined by Minnesota Department of Health
GAC - Granular Adctivated Carbon point of entry treatment system
MWI - Minnesota Well Index

Figure E.2.3.1.1 - Community Specific Scenario B
Non-Municipal Well Treatment Map HI > 0

0 1,500 3,000 4,500 9,000 Feet

N

Job No.: 18190022
PM: BH
Date: 9/2/2020
Scale: 1" = 4,500 feet

wood.

Path: G:\Infrastructure\WW\01-Projects\2018\18190022 MPCA East Metro MN Water Sys Study\6.0 Background Information\6.2 Maps & GIS Files\00_Community\Community\RegionalScenB_HI0_24x36_20200902.mxd

DRAFT 9-2-2020

Maplewood
Oakdale
Lake Elmo
West Lakeland Township
Lakeland Shores
Lakeland
Lake St. Croix Beach
St. Marys Point
Afton
Woodbury
Newport
St. Paul Park
Grey Cloud Island Township
Cottage Grove
Denmark Township

Water network model
- Well
- Tank
- BPS
- PRV
- WTP
- Existing raw water lines

Existing distribution lines
- > 24"
- 18" - 24"
- 14" - 16"
- 10" - 12"
- 6" - 8"
- Known PFAS source
- Community boundary
- Potential projected areas impacted by PFAS by 2040

PFAS results - HI
- 0.00
- 0.00 - 0.249
- 0.25 - 0.499
- 0.50 - 0.749
- 0.75 - 0.999
- ≥1.00
- ≥1.00 - advisory sent
- GAC installed
- GAC install proposed
- Wells replaced with municipal water supply connection
- Wells proposed to be replaced with a municipal water supply connection

MWI well types
- Domestic
- Commercial
- Irrigation
- Community potable
- Non-community potable
- Monitoring & testing
- Other

Notes:
HI - Health Index, as defined by Minnesota Department of Health
GAC - Granular Adctivated Carbon point of entry treatment system
MWI - Minnesota Well Index

Figure E.2.3.1.2 - Community Specific Scenario B
Non-Municipal Well Treatment Map HI ≥ 1

0 1,500 3,000 4,500 9,000 Feet

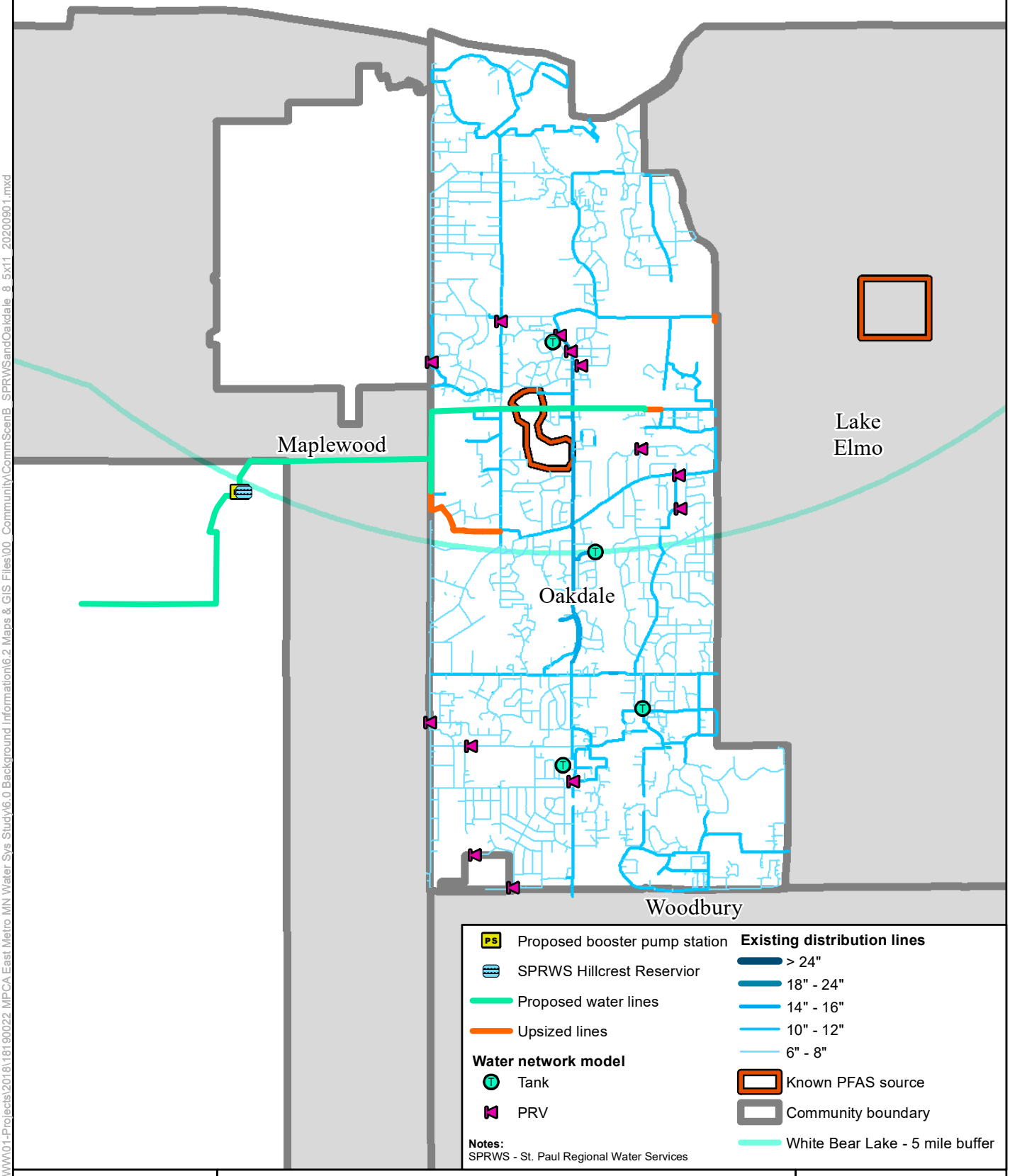
N

Job No.: 18190022
PM: BH
Date: 9/2/2020
Scale: 1" = 4,500 feet

wood.

Path: G:\Infrastructure\W-WW\01-Projects\2018\18190022 MPCA East Metro MN Water Sys Study\6.0 Background Information\6.2 Maps & GIS Files\00_Community\Community\RegionalScenB_H1_24x36_20200902.mxd

DRAFT 9/1/2020



PS Proposed booster pump station

SPRWS Hillcrest Reservior

Proposed water lines

Upsized lines

Water network model

Tank

PRV

Existing distribution lines

> 24"

18" - 24"

14" - 16"

10" - 12"

6" - 8"

Known PFAS source

Community boundary

White Bear Lake - 5 mile buffer

Notes:
SPRWS - St. Paul Regional Water Services

Job No.	18190022
PM:	BH
Date:	9/1/2020
Scale:	1" = 5,000 feet

Figure E.2.3.1.3 - SPRWS and Oakdale Community Specific Scenario B

N

0 2,500 5,000 10,000 Feet

wood.

Path: G:\Infrastructure\W-WW\01-Projects\2018\18190022 MPCA East Metro MN Water Sys Study\6.0 Background Information\6.2 Maps & GIS Files\00_Community\CommScenB_SPRWSandOakdale_8_5x11_20200901.mxd

DRAFT 9-2-2020

Maplewood
Oakdale
Lake Elmo
West Lakeland Township
Lakeland Shores
Lakeland
Lake St. Croix Beach
St. Marys Point
Afton
Woodbury
Newport
St. Paul Park
Grey Cloud Island Township
Cottage Grove
Denmark Township

Water network model
- Well
- Tank
- BPS
- PRV
- WTP
- Existing raw water lines

Existing distribution lines
- > 24"
- 18" - 24"
- 14" - 16"
- 10" - 12"
- 6" - 8"
- Known PFAS source
- Community boundary
- Potential projected areas impacted by PFAS by 2040

PFAS results - HI
- 0.00
- 0.00 - 0.249
- 0.25 - 0.499
- 0.50 - 0.749
- 0.75 - 0.999
- ≥1.00
- ≥1.00 - advisory sent
- GAC installed
- GAC install proposed
- Wells replaced with municipal water supply connection
- Wells proposed to be replaced with a municipal water supply connection

MWI well types
- Domestic
- Commercial
- Irrigation
- Community potable
- Non-community potable
- Monitoring & testing
- Other

Notes:
HI - Health Index, as defined by Minnesota Department of Health
GAC - Granular Adctivated Carbon point of entry treatment system
MWI - Minnesota Well Index

Figure E.2.3.1.4 - Community Specific Scenario C
Non-Municipal Well Treatment Map HI > 0

0 1,500 3,000 4,500 9,000 Feet

N

Job No.: 18190022
PM: BH
Date: 9/2/2020
Scale: 1" = 4,500 feet

wood.

Path: G:\Infrastructure\W-WW\01-Projects\2018\18190022 MPCA East Metro MN Water Sys Study\6.0 Background Information\6.2 Maps & GIS Files\00_Community\Community\RegionalScenC_H10_24x36_20200902.mxd

DRAFT 9-2-2020

Maplewood
Oakdale
Lake Elmo
West Lakeland Township
Lakeland Shores
Lakeland
Lake St. Croix Beach
St. Marys Point
Afton
Woodbury
Newport
St. Paul Park
Grey Cloud Island Township
Cottage Grove
Denmark Township

Water network model
- Well
- Tank
- BPS
- PRV
- WTP
- Existing raw water lines

Existing distribution lines
- > 24"
- 18" - 24"
- 14" - 16"
- 10" - 12"
- 6" - 8"
- Known PFAS source
- Community boundary
- Potential projected areas impacted by PFAS by 2040

PFAS results - HI
- 0.00
- 0.00 - 0.249
- 0.25 - 0.499
- 0.50 - 0.749
- 0.75 - 0.999
- ≥1.00
- ≥1.00 - advisory sent
- GAC installed
- GAC install proposed
- Wells replaced with municipal water supply connection
- Wells proposed to be replaced with a municipal water supply connection

MWI well types
- Domestic
- Commercial
- Irrigation
- Community potable
- Non-community potable
- Monitoring & testing
- Other

Notes:
HI - Health Index, as defined by Minnesota Department of Health
GAC - Granular Adctivated Carbon point of entry treatment system
MWI - Minnesota Well Index

Figure E.2.3.1.5 - Community Specific Scenario C
Non-Municipal Well Treatment Map HI ≥ 1

0 1,500 3,000 4,500 9,000 Feet

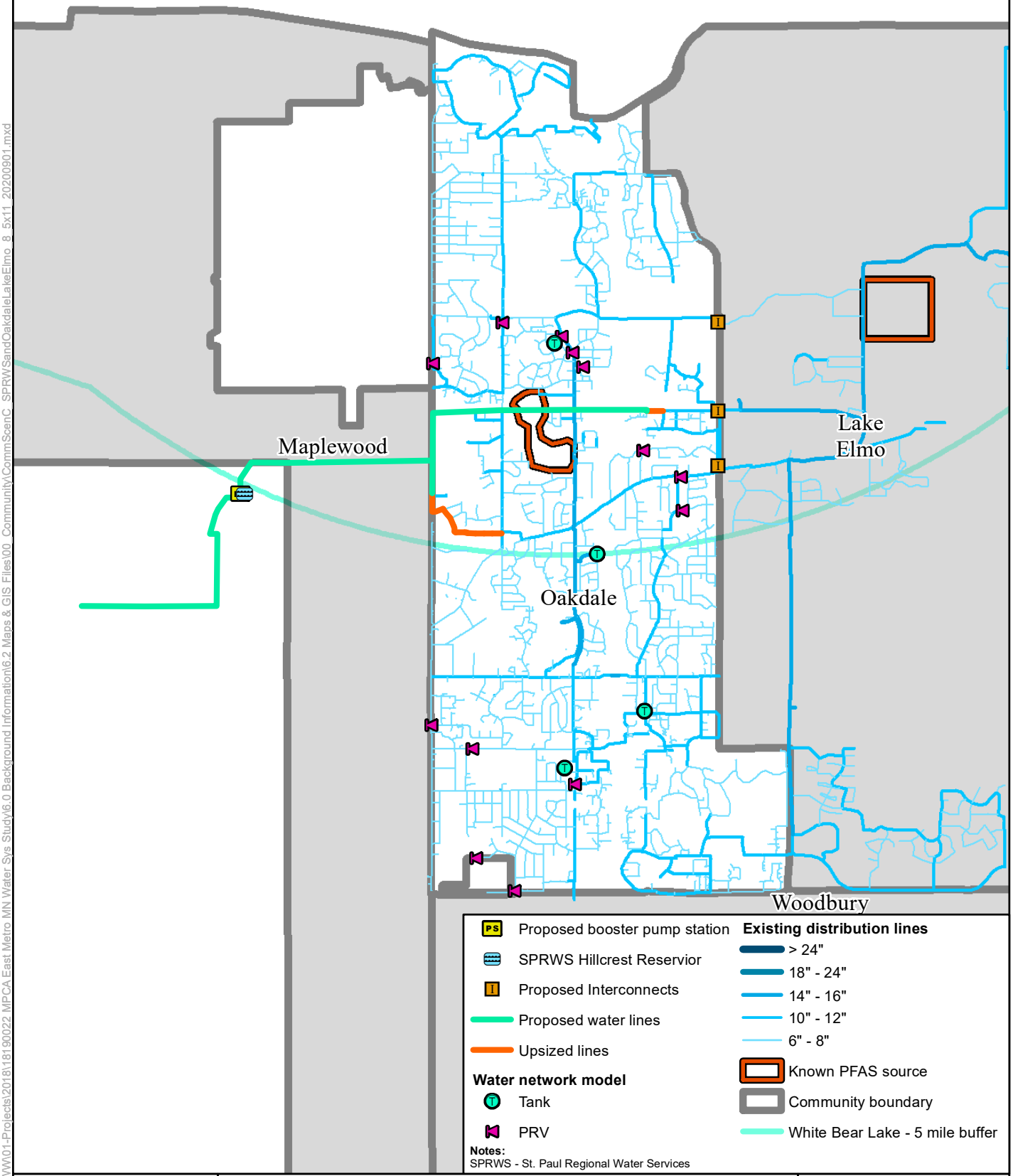
N

Job No.: 18190022
PM: BH
Date: 9/2/2020
Scale: 1" = 4,500 feet

wood.

Path: G:\Infrastructure\W-WW\01-Projects\2018\18190022 MPCA East Metro MN Water Sys Study\6.0 Background Information\6.2 Maps & GIS Files\00_Community\Community\RegionalScenC_H1_24x36_20200902.mxd

DRAFT 9/1/2020



Job No.	18190022
PM:	BH
Date:	9/1/2020
Scale:	1" = 5,000 feet

Figure E.2.3.1.6 - SPRWS and Oakdale/Lake Elmo Community Specific Scenario C

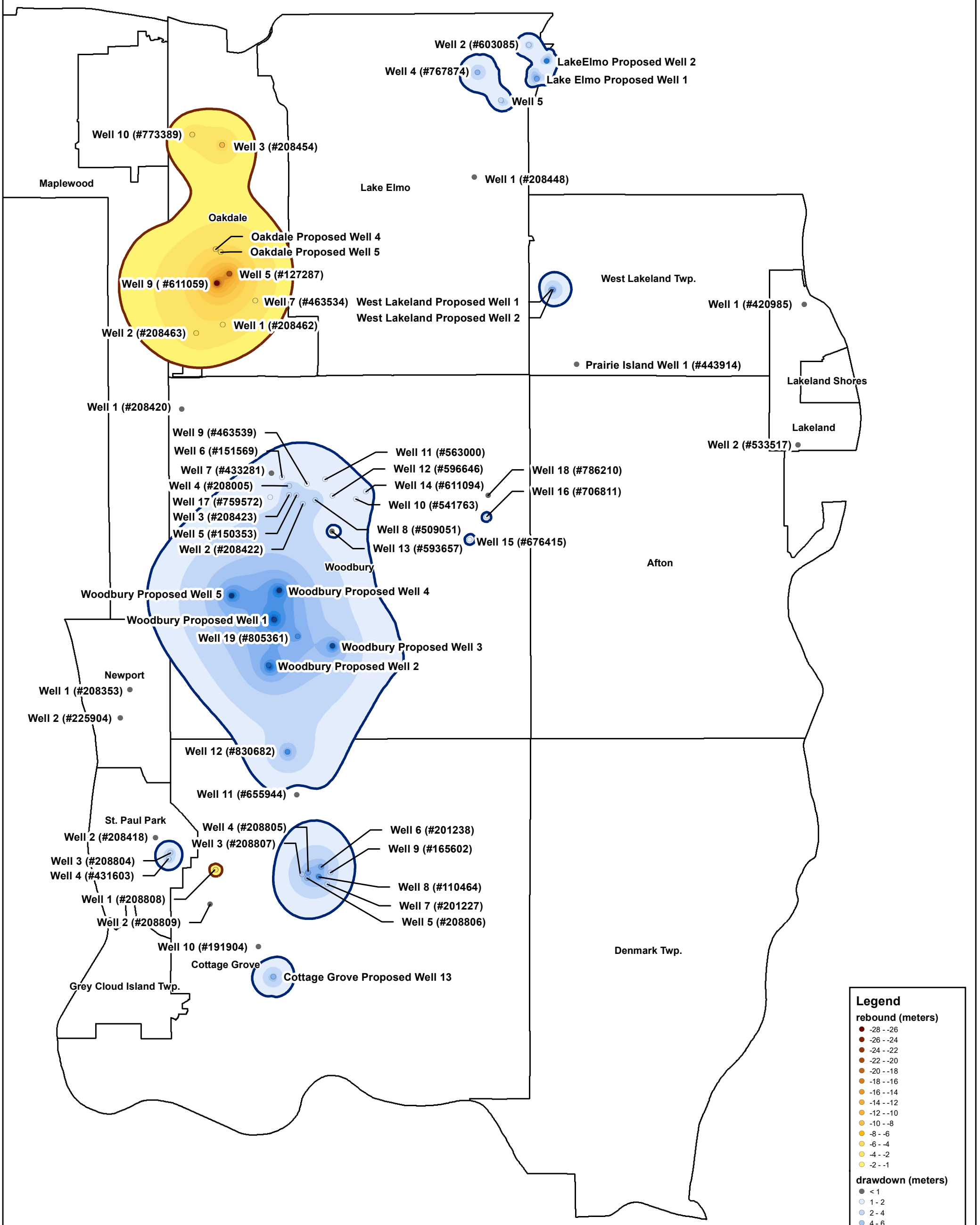
N

0 2,500 5,000 10,000 Feet

wood.

Path: G:\Infrastructure\W-WM\01-Projects\2018\18190022 MPCA East Metro MN Water Sys Study\6.0 Background Information\6.2 Maps & GIS Files\00_Community\CommScenC_SPRWSandOakdaleLakeElmo_8_5x11_20200901.mxd

DRAFT 9-2-2020



Simulated Drawdown for Jordan Sandstone Aquifer Drought Condition
Community-Specific Scenario B

Figure E.2.3.6.1

0 1 2 Miles

1 in = 1.5 miles

N

DRAFT 9-2-2020

Well 2 (#603085)
LakeElmo Proposed Well 2
Well 4 (#767874)
Lake Elmo Proposed Well 1
Well 5
Well 10 (#773389)
Well 3 (#208454)
Maplewood
Well 1 (#208448)
Lake Elmo
Oakdale
Oakdale Proposed Well 4
Oakdale Proposed Well 5
Well 9 (#611059)
Well 5 (#127287)
Well 7 (#463534)
West Lakeland Proposed Well 1
West Lakeland Proposed Well 2
West Lakeland Twp.
Well 1 (#420985)
Well 2 (#208463)
Well 1 (#208462)
Prairie Island Well 1 (#443914)
Lakeland Shores
Well 1 (#208420)
Lakeland
Well 2 (#533517)
Well 9 (#463539)
Well 6 (#151569)
Well 11 (#563000)
Well 7 (#433281)
Well 12 (#596646)
Well 18 (#786210)
Well 4 (#208005)
Well 14 (#611094)
Well 16 (#706811)
Well 17 (#759572)
Well 10 (#541763)
Well 3 (#208423)
Well 8 (#509051)
Well 5 (#150353)
Well 15 (#676415)
Well 2 (#208422)
Well 13 (#593657)
Afton
Woodbury
Woodbury Proposed Well 5
Woodbury Proposed Well 4
Woodbury Proposed Well 1
Well 19 (#805361)
Woodbury Proposed Well 3
Woodbury Proposed Well 2
Newport
Well 1 (#208353)
Well 2 (#225904)
Well 12 (#830682)
Well 11 (#655944)
St. Paul Park
Well 4 (#208805)
Well 6 (#201238)
Well 2 (#208418)
Well 3 (#208807)
Well 9 (#165602)
Well 3 (#208804)
Well 4 (#431603)
Well 8 (#110464)
Well 1 (#208808)
Well 7 (#201227)
Well 2 (#208809)
Well 5 (#208806)
Well 10 (#191904)
Denmark Twp.
Cottage Grove
Cottage Grove Proposed Well 13
Grey Cloud Island Twp.

Legend

1-meter rebound contour
- -22 - -20
- -20 - -18
- -18 - -16
- -16 - -14
- -14 - -12
- -12 - - 10
- -10 - -8
- -8 - -6
- -6 - -4
- -4 - -2
- -2 - -1

1-meter drawdown contour
- < 1
- 1 - 2
- 2 - 4
- 4 - 6
- 6 - 8
- 8 - 10
- 10 - 12
- 12 - 14
- 14 - 16
- 16 - 18

1-meter rebound contour
1-meter drawdown contour
community boundaries

Simulated Drawdown for Jordan Sandstone Aquifer Wet Condition
Community-Specific Scenario B

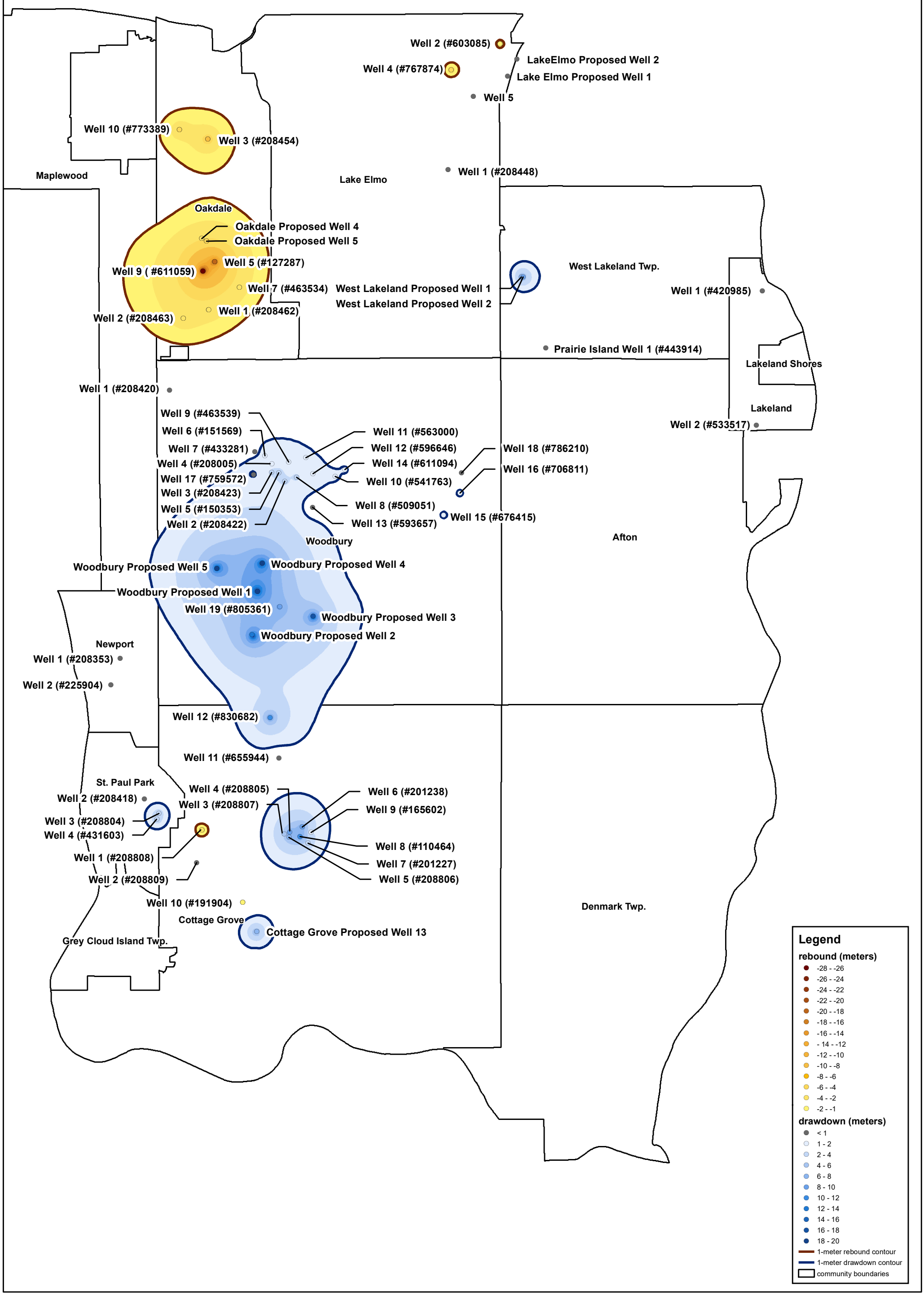
Figure E.2.3.6.2

0 1 2 Miles

1 in = 1.5 miles

N

DRAFT 9-2-2020



Simulated Drawdown for Jordan Sandstone Aquifer Drought Condition
Community-Specific Scenario C

Figure E.2.3.6.3

0 1 2 Miles

1 in = 1.5 miles

N

DRAFT 9-2-2020

Well 2 (#603085)
Well 4 (#767874)
LakeElmo Proposed Well 2
Lake Elmo Proposed Well 1
Well 5
Well 10 (#773389)
Well 3 (#208454)
Maplewood
Lake Elmo
Well 1 (#208448)
Oakdale
Oakdale Proposed Well 4
Oakdale Proposed Well 5
Well 5 (#127287)
Well 9 (#611059)
Well 7 (#463534)
West Lakeland Proposed Well 1
West Lakeland Proposed Well 2
West Lakeland Twp.
Well 1 (#420985)
Well 1 (#208462)
Well 2 (#208463)
Prairie Island Well 1 (#443914)
Lakeland Shores
Well 1 (#208420)
Lakeland
Well 2 (#533517)
Well 9 (#463539)
Well 6 (#151569)
Well 7 (#433281)
Well 4 (#208005)
Well 17 (#759572)
Well 3 (#208423)
Well 5 (#150353)
Well 2 (#208422)
Well 11 (#563000)
Well 12 (#596646)
Well 14 (#611094)
Well 10 (#541763)
Well 18 (#786210)
Well 16 (#706811)
Well 8 (#509051)
Well 13 (#593657)
Well 15 (#676415)
Afton
Woodbury
Woodbury Proposed Well 5
Woodbury Proposed Well 4
Woodbury Proposed Well 1
Well 19 (#805361)
Woodbury Proposed Well 3
Woodbury Proposed Well 2
Newport
Well 1 (#208353)
Well 2 (#225904)
Well 12 (#830682)
Well 11 (#655944)
St. Paul Park
Well 2 (#208418)
Well 4 (#208805)
Well 3 (#208807)
Well 6 (#201238)
Well 9 (#165602)
Well 3 (#208804)
Well 4 (#431603)
Well 8 (#110464)
Well 1 (#208808)
Well 7 (#201227)
Well 2 (#208809)
Well 5 (#208806)
Well 10 (#191904)
Denmark Twp.
Cottage Grove
Cottage Grove Proposed Well 13
Grey Cloud Island Twp.

Legend

rebound (meters)
-22 - -20
-20 - -18
-18 - -16
-16- -14
-14 - -12
-12 - -10
-10 - -8
-8 - -6
-6 - -4
-4 - -2
-2 - -1

drawdown (meters)
< 1
1 - 2
2 - 4
4 - 6
6 - 8
8 - 10
10 - 12
12 - 14
14 - 16
16- 18

1-meter rebound contour
1-meter drawdown contour
community boundaries

Simulated Drawdown for Jordan Sandstone Aquifer Wet Condition
Community-Specific Scenario C

Figure E.2.3.6.4

0 1 2 Miles

1 in = 1.5 miles

N

DRAFT 9-2-2020

Maplewood
Well 10 (#773389)
Well 3 (#208454)
Well 2 (#603085)
Well 4 (#767874)
LakeElmo Proposed Well 2
Lake Elmo Proposed Well 1
Well 5
Well 1 (#208448)
Lake Elmo
Oakdale
Oakdale Proposed Well 4
Oakdale Proposed Well 5
Well 5 (#127287)
Well 9 (#611059)
Well 7 (#463534)
West Lakeland Proposed Well 1
West Lakeland Proposed Well 2
Well 1 (#208462)
Well 2 (#208463)
West Lakeland Twp.
Well 1 (#420985)
Prairie Island Well 1 (#443914)
Lakeland Shores
Lakeland
Well 2 (#533517)
Well 1 (#208420)
Well 9 (#463539)
Well 6 (#151569)
Well 7 (#433281)
Well 4 (#208005)
Well 17 (#759572)
Well 3 (#208423)
Well 5 (#150353)
Well 2 (#208422)
Well 11 (#563000)
Well 12 (#596646)
Well 14 (#611094)
Well 10 (#541763)
Well 8 (#509051)
Well 13 (#593657)
Well 18 (#786210)
Well 16 (#706811)
Well 15 (#676415)
Woodbury
Afton
Woodbury Proposed Well 5
Woodbury Proposed Well 4
Woodbury Proposed Well 1
Well 19 (#805361)
Woodbury Proposed Well 3
Woodbury Proposed Well 2
Newport
Well 1 (#208353)
Well 2 (#225904)
Well 12 (#830682)
Well 11 (#655944)
St. Paul Park
Well 4 (#208805)
Well 2 (#208418)
Well 3 (#208807)
Well 3 (#208804)
Well 4 (#431603)
Well 6 (#201238)
Well 9 (#165602)
Well 8 (#110464)
Well 7 (#201227)
Well 5 (#208806)
Well 1 (#208808)
Well 2 (#208809)
Well 10 (#191904)
Cottage Grove
Cottage Grove Proposed Well 13
Grey Cloud Island Twp.
Denmark Twp.

Legend

- Proposed Water Supply Well
- Existing Water Supply Well

PFAS Results - HI

- 0.00
- 0.00 - 0.249
- 0.25 - 0.499
- 0.50 - 0.749
- 0.75 - 0.999
- > 1.00
- Other Well

- East Metro Source
- Community Boundaries
- Quaternary Area of HI>1
- St. Peter Sandstone through Jordan Sandstone Area of HI>1
- Tunnel City Group through Wonewoc Sandstone Area of HI>1
- Jordan Sandstone Layer Pinched Out
- Jordan Sandstone Layer Present

- 10-year Arrow to 2030
- 10-year Arrow to 2040
- Forward Particle Track
- Simulated Groundwater Contours - Jordan Sandstone Aquifer (Meters)

Particle Tracking for Scenario B Under Wet Conditions

Figure E.2.3.6.5

0 1 2 Miles

1 in = 1.5 miles

N

DRAFT 9-2-2020

Maplewood
Well 10 (#773389)
Well 3 (#208454)
Oakdale
Lake Elmo
Well 2 (#603085)
LakeElmo Proposed Well 2
Well 4 (#767874)
Lake Elmo Proposed Well 1
Well 5
Well 1 (#208448)
Oakdale Proposed Well 4
Oakdale Proposed Well 5
Well 5 (#127287)
Well 9 (#611059)
Well 7 (#463534)
West Lakeland Proposed Well 1
West Lakeland Proposed Well 2
Well 1 (#208462)
Well 2 (#208463)
West Lakeland Twp.
Well 1 (#420985)
Prairie Island Well 1 (#443914)
Lakeland Shores
Lakeland
Well 2 (#533517)
Well 1 (#208420)
Well 9 (#463539)
Well 6 (#151569)
Well 7 (#433281)
Well 4 (#208005)
Well 17 (#759572)
Well 3 (#208423)
Well 5 (#150353)
Well 2 (#208422)
Well 11 (#563000)
Well 12 (#596646)
Well 14 (#611094)
Well 10 (#541763)
Well 8 (#509051)
Well 13 (#593657)
Well 18 (#786210)
Well 16 (#706811)
Well 15 (#676415)
Afton
Woodbury
Woodbury Proposed Well 5
Woodbury Proposed Well 4
Woodbury Proposed Well 1
Well 19 (#805361)
Woodbury Proposed Well 3
Woodbury Proposed Well 2
Newport
Well 1 (#208353)
Well 2 (#225904)
Well 12 (#830682)
Well 11 (#655944)
St. Paul Park
Well 4 (#208805)
Well 2 (#208418)
Well 3 (#208807)
Well 3 (#208804)
Well 4 (#431603)
Well 1 (#208808)
Well 2 (#208809)
Well 6 (#201238)
Well 9 (#165602)
Well 8 (#110464)
Well 7 (#201227)
Well 5 (#208806)
Well 10 (#191904)
Cottage Grove
Cottage Grove Proposed Well 13
Grey Cloudlsland Twp.
Denmark Twp.

Legend

- Proposed Water Supply Well
- Existing Water Supply Well

PFAS Results - HI

- 0.00
- 0.00 - 0.249
- 0.25 - 0.499
- 0.50 - 0.749
- 0.75 - 0.999
- > 1.00
- Other Well

- East Metro Source
- Community Boundaries
- Quaternary Area of HI>1
- St. Peter Sandstone through Jordan Sandstone Area of HI>1
- Tunnel City Group through Wonewoc Sandstone Area of HI>1
- Jordan Sandstone Layer Pinched Out
- Jordan Sandstone Layer Present

- 10-year Arrow to 2030
- 10-year Arrow to 2040
- Forward Particle Track
- Simulated Groundwater Contours - Jordan Sandstone Aquifer (Meters)

Particle Tracking for Scenario B Under Normal Conditions

Figure E.2.3.6.6

0 1 2 Miles

1 in = 1.5 miles

N

DRAFT 9-2-2020

Maplewood
Well 10 (#773389)
Well 3 (#208454)
Well 2 (#603085)
LakeElmo Proposed Well 2
Well 4 (#767874)
Lake Elmo Proposed Well 1
Well 5
Well 1 (#208448)
Lake Elmo
Oakdale
Oakdale Proposed Well 4
Oakdale Proposed Well 5
Well 5 (#127287)
Well 9 (#611059)
Well 7 (#463534)
West Lakeland Proposed Well 1
West Lakeland Proposed Well 2
Well 1 (#208462)
Well 2 (#208463)
West Lakeland Twp.
Well 1 (#420985)
Prairie Island Well 1 (#443914)
Lakeland Shores
Lakeland
Well 2 (#533517)
Well 1 (#208420)
Well 9 (#463539)
Well 6 (#151569)
Well 7 (#433281)
Well 4 (#208005)
Well 17 (#759572)
Well 3 (#208423)
Well 5 (#150353)
Well 2 (#208422)
Well 11 (#563000)
Well 12 (#596646)
Well 14 (#611094)
Well 10 (#541763)
Well 8 (#509051)
Well 13 (#593657)
Well 18 (#786210)
Well 16 (#706811)
Well 15 (#676415)
Woodbury
Afton
Woodbury Proposed Well 5
Woodbury Proposed Well 4
Woodbury Proposed Well 1
Well 19 (#805361)
Woodbury Proposed Well 3
Woodbury Proposed Well 2
Newport
Well 1 (#208353)
Well 2 (#225904)
Well 12 (#830682)
Well 11 (#655944)
St. Paul Park
Well 2 (#208418)
Well 4 (#208805)
Well 3 (#208807)
Well 6 (#201238)
Well 9 (#165602)
Well 3 (#208804)
Well 4 (#431603)
Well 8 (#110464)
Well 7 (#201227)
Well 1 (#208808)
Well 5 (#208806)
Well 2 (#208809)
Well 10 (#191904)
Cottage Grove
Grey Cloud Island Twp.
Cottage Grove Proposed Well 13
Denmark Twp.

Legend

- Proposed Water Supply Well
- Existing Water Supply Well

PFAS Results - HI

- 0.00
- 0.00 - 0.249
- 0.25 - 0.499
- 0.50 - 0.749
- 0.75 - 0.999
- > 1.00
- Other Well

- East Metro Source
- Community Boundaries
- Quaternary Area of HI>1
- St. Peter Sandstone through Jordan Sandstone Area of HI>1
- Tunnel City Group through Wonewoc Sandstone Area of HI>1
- Jordan Sandstone Layer Pinched Out
- Jordan Sandstone Layer Present

- 10-year Arrow to 2030
- 10-year Arrow to 2040
- Forward Particle Track
- Simulated Groundwater Contours - Jordan Sandstone Aquifer (Meters)

Particle Tracking for Scenario B Under Drought Conditions

Figure E.2.3.6.7

0 1 2 Miles

1 in = 1.5 miles

N

DRAFT 9-2-2020

Maplewood
Well 10 (#773389)
Well 3 (#208454)
Oakdale
Oakdale Proposed Well 4
Oakdale Proposed Well 5
Well 5 (#127287)
Well 9 (#611059)
Well 7 (#463534)
Well 1 (#208462)
Well 2 (#208463)
Well 1 (#208420)
Well 2 (#603085)
LakeElmo Proposed Well 2
Well 4 (#767874)
Lake Elmo Proposed Well 1
Well 5
Well 1 (#208448)
Lake Elmo
West Lakeland Twp.
West Lakeland Proposed Well 1
West Lakeland Proposed Well 2
Well 1 (#420985)
Prairie Island Well 1 (#443914)
Lakeland Shores
Lakeland
Well 2 (#533517)
Well 9 (#463539)
Well 6 (#151569)
Well 7 (#433281)
Well 4 (#208005)
Well 17 (#759572)
Well 3 (#208423)
Well 5 (#150353)
Well 2 (#208422)
Well 11 (#563000)
Well 12 (#596646)
Well 14 (#611094)
Well 10 (#541763)
Well 8 (#509051)
Well 13 (#593657)
Well 18 (#786210)
Well 16 (#706811)
Well 15 (#676415)
Woodbury
Afton
Woodbury Proposed Well 5
Woodbury Proposed Well 4
Woodbury Proposed Well 1
Well 19 (#805361)
Woodbury Proposed Well 3
Woodbury Proposed Well 2
Newport
Well 1 (#208353)
Well 2 (#225904)
Well 12 (#830682)
Well 11 (#655944)
St. Paul Park
Well 4 (#208805)
Well 2 (#208418)
Well 3 (#208807)
Well 3 (#208804)
Well 4 (#431603)
Well 1 (#208808)
Well 2 (#208809)
Well 6 (#201238)
Well 9 (#165602)
Well 8 (#110464)
Well 7 (#201227)
Well 5 (#208806)
Denmark Twp.
Well 10 (#191904)
Cottage Grove
Cottage Grove Proposed Well 13
Grey Cloud Island Twp.

Legend

- Proposed Water Supply Well
- Existing Water Supply Well

PFAS Results - HI

- 0.00
- 0.00 - 0.249
- 0.25 - 0.499
- 0.50 - 0.749
- 0.75 - 0.999
- > 1.00
- Other Well

- East Metro Source
- Community Boundaries
- Quaternary Area of HI>1
- St. Peter Sandstone through Jordan Sandstone Area of HI>1
- Tunnel City Group through Wonewoc Sandstone Area of HI>1
- Jordan Sandstone Layer Pinched Out
- Jordan Sandstone Layer Present

- 10-year Arrow to 2030
- 10-year Arrow to 2040
- Forward Particle Track
- Simulated Groundwater Contours - Jordan Sandstone Aquifer (Meters)

Particle Tracking for Scenario C Under Wet Conditions

Figure E.2.3.6.8

0 1 2 Miles

1 in = 1.5 miles

N

DRAFT 9-2-2020

Maplewood
Well 10 (#773389)
Well 3 (#208454)
Oakdale
Well 2 (#603085)
LakeElmo Proposed Well 2
Well 4 (#767874)
Lake Elmo Proposed Well 1
Well 5
Well 1 (#208448)
Lake Elmo
Oakdale Proposed Well 4
Oakdale Proposed Well 5
Well 5 (#127287)
Well 9 (#611059)
Well 7 (#463534)
West Lakeland Proposed Well 1
West Lakeland Proposed Well 2
Well 1 (#208462)
Well 2 (#208463)
West Lakeland Twp.
Well 1 (#420985)
Prairie Island Well 1 (#443914)
Lakeland Shores
Lakeland
Well 2 (#533517)
Well 1 (#208420)
Well 9 (#463539)
Well 6 (#151569)
Well 7 (#433281)
Well 4 (#208005)
Well 17 (#759572)
Well 3 (#208423)
Well 5 (#150353)
Well 2 (#208422)
Well 11 (#563000)
Well 12 (#596646)
Well 14 (#611094)
Well 10 (#541763)
Well 8 (#509051)
Well 13 (#593657)
Well 18 (#786210)
Well 16 (#706811)
Well 15 (#676415)
Afton
Woodbury
Woodbury Proposed Well 5
Woodbury Proposed Well 4
Woodbury Proposed Well 1
Well 19 (#805361)
Woodbury Proposed Well 3
Woodbury Proposed Well 2
Newport
Well 1 (#208353)
Well 2 (#225904)
Well 12 (#830682)
Well 11 (#655944)
St. Paul Park
Well 4 (#208805)
Well 2 (#208418)
Well 3 (#208807)
Well 6 (#201238)
Well 9 (#165602)
Well 3 (#208804)
Well 4 (#431603)
Well 8 (#110464)
Well 1 (#208808)
Well 7 (#201227)
Well 2 (#208809)
Well 5 (#208806)
Well 10 (#191904)
Cottage Grove
Cottage Grove Proposed Well 13
Grey Cloud Island Twp.
Denmark Twp.

Legend

- Proposed Water Supply Well
- Existing Water Supply Well

PFAS Results - HI

- 0.00
- 0.00 - 0.249
- 0.25 - 0.499
- 0.50 - 0.749
- 0.75 - 0.999
- > 1.00
- Other Well

- East Metro Source
- Community Boundaries
- Quaternary Area of HI>1
- St. Peter Sandstone through Jordan Sandstone Area of HI>1
- Tunnel City Group through Wonewoc Sandstone Area of HI>1
- Jordan Sandstone Layer Pinched Out
- Jordan Sandstone Layer Present

- 10-year Arrow to 2030
- 10-year Arrow to 2040
- Forward Particle Track
- Simulated Groundwater Contours - Jordan Sandstone Aquifer (Meters)

Particle Tracking for Scenario C Under Normal Conditions

Figure E.2.3.6.9

0 1 2 Miles

1 in = 1.5 miles

N

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Maplewood
Well 10 (#773389)
Well 3 (#208454)
Well 2 (#603085)
Well 4 (#767874)
LakeElmo Proposed Well 2
Lake Elmo Proposed Well 1
Well 5
Well 1 (#208448)
Lake Elmo
Oakdale
Oakdale Proposed Well 4
Oakdale Proposed Well 5
Well 5 (#127287)
Well 9 (#611059)
Well 7 (#463534)
West Lakeland Proposed Well 1
West Lakeland Proposed Well 2
Well 1 (#208462)
Well 2 (#208463)
West Lakeland Twp.
Well 1 (#420985)
Prairie Island Well 1 (#443914)
Lakeland Shores
Lakeland
Well 2 (#533517)
Well 1 (#208420)
Well 9 (#463539)
Well 6 (#151569)
Well 7 (#433281)
Well 4 (#208005)
Well 17 (#759572)
Well 3 (#208423)
Well 5 (#150353)
Well 2 (#208422)
Well 11 (#563000)
Well 12 (#596646)
Well 14 (#611094)
Well 10 (#541763)
Well 8 (#509051)
Well 13 (#593657)
Well 18 (#786210)
Well 16 (#706811)
Well 15 (#676415)
Woodbury
Afton
Woodbury Proposed Well 5
Woodbury Proposed Well 4
Woodbury Proposed Well 1
Well 19 (#805361)
Woodbury Proposed Well 3
Woodbury Proposed Well 2
Newport
Well 1 (#208353)
Well 2 (#225904)
Well 12 (#830682)
Well 11 (#655944)
St. Paul Park
Well 2 (#208418)
Well 4 (#208805)
Well 3 (#208807)
Well 3 (#208804)
Well 4 (#431603)
Well 1 (#208808)
Well 2 (#208809)
Well 6 (#201238)
Well 9 (#165602)
Well 8 (#110464)
Well 7 (#201227)
Well 5 (#208806)
Denmark Twp.
Well 10 (#191904)
Cottage Grove
Cottage Grove Proposed Well 13
Grey Cloud Island Twp.

Legend

- Proposed Water Supply Well
- Existing Water Supply Well

PFAS Results - HI

- 0.00
- 0.00 - 0.249
- 0.25 - 0.499
- 0.50 - 0.749
- 0.75 - 0.999
- > 1.00
- Other Well

- East Metro Source
- Community Boundaries
- Quaternary Area of HI>1
- St. Peter Sandstone through Jordan Sandstone Area of HI>1
- Tunnel City Group through Wonewoc Sandstone Area of HI>1
- Jordan Sandstone Layer Pinched Out
- Jordan Sandstone Layer Present

- 10-year Arrow to 2030
- 10-year Arrow to 2040
- Forward Particle Track
- Simulated Groundwater Contours - Jordan Sandstone Aquifer (Meters)

Particle Tracking for Scenario C Under Drought Conditions

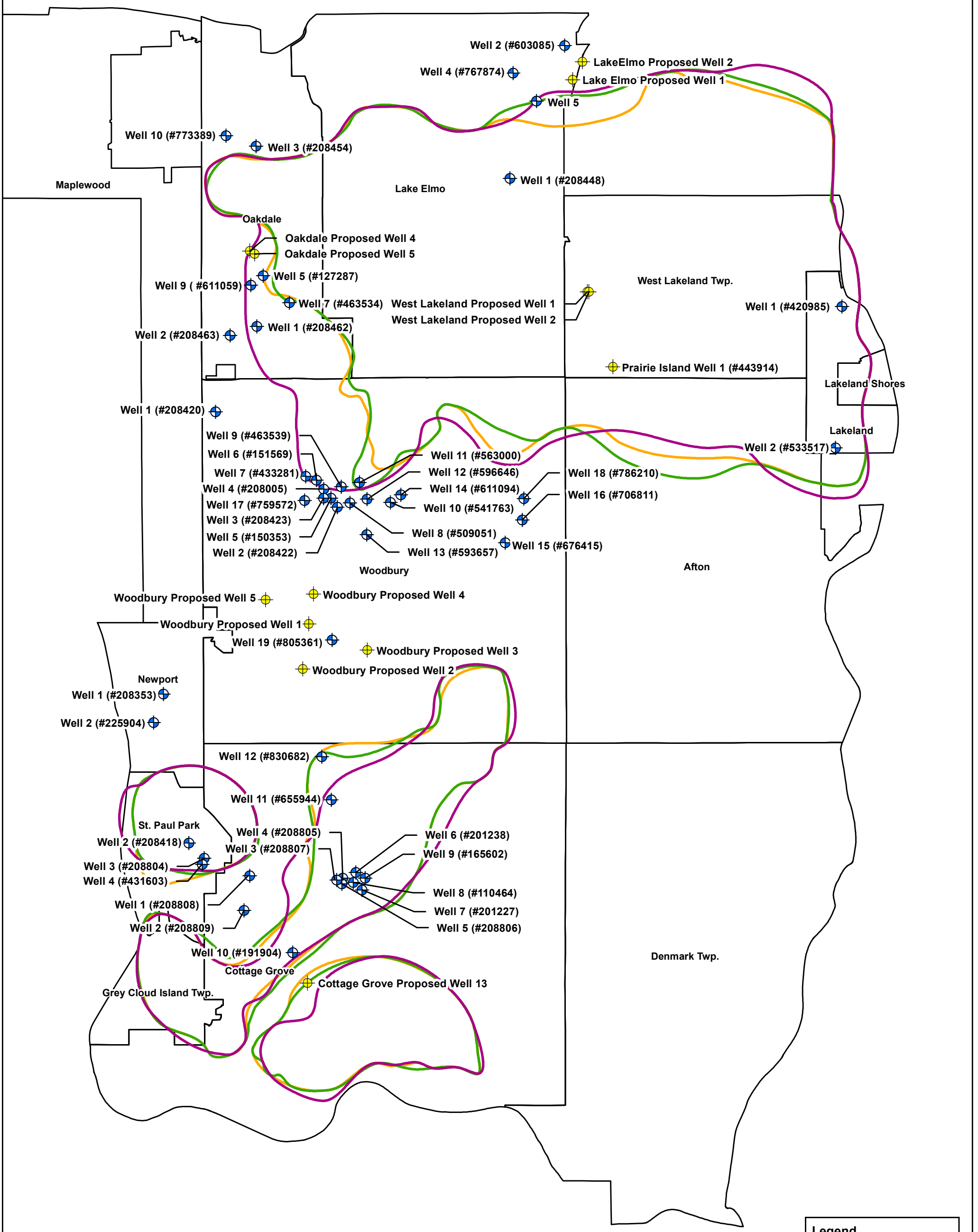
Figure E.2.3.6.10

0 1 2 Miles

1 in = 1.5 miles

N

DRAFT 9-2-2020



Community-Specific Scenario Comparison

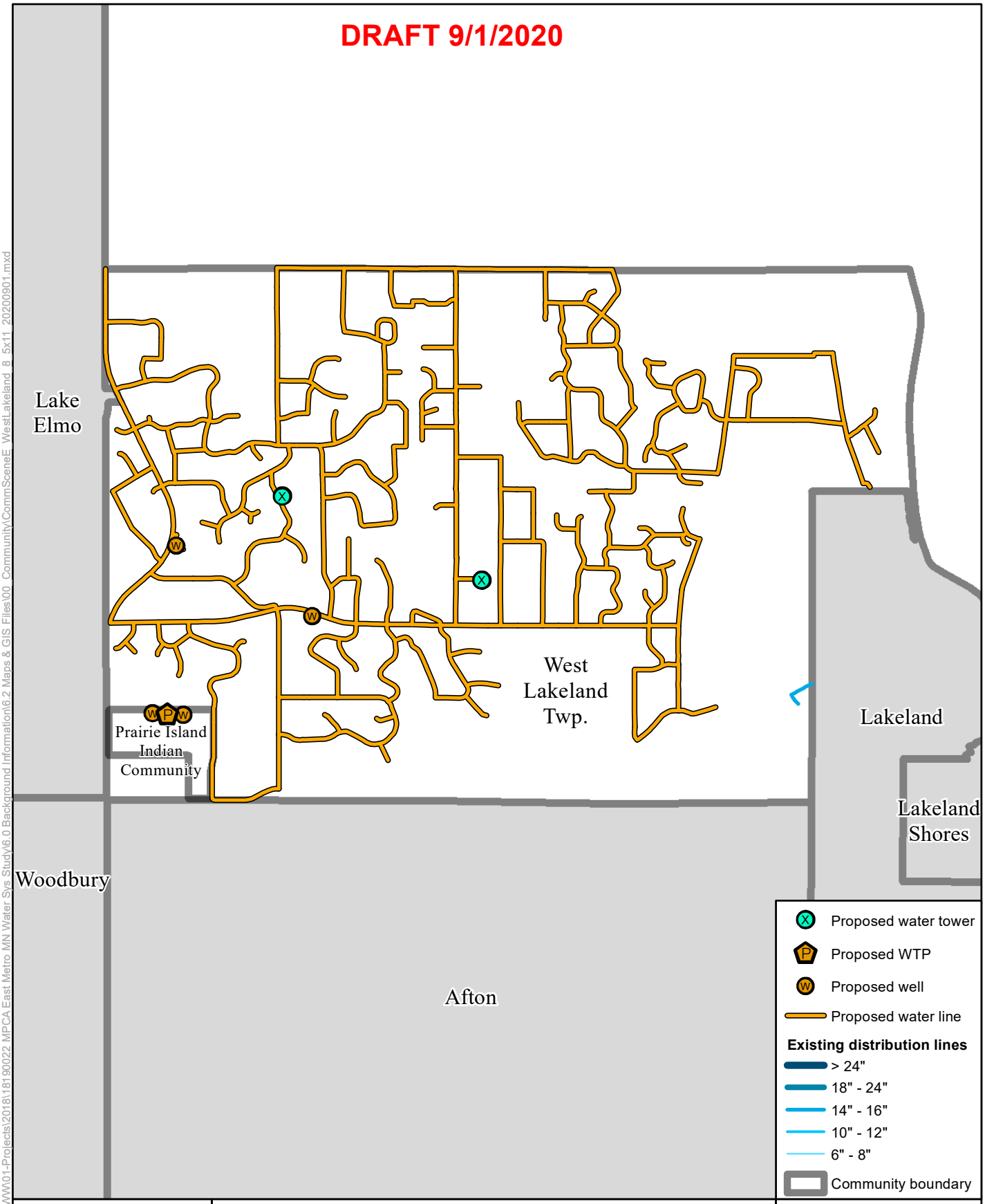
Figure E.2.3.6.11

0 1 2 Miles

1 in = 1.5 miles

N

DRAFT 9/1/2020



Job No.	18190022
PM:	BH
Date:	9/1/2020
Scale:	1" = 0.75 miles

Figure E.2.4.1 - West Lakeland Township and Prairie Island Indian Community Community Specific Scenario E

N

0 0.25 0.5 0.75 1.5 Miles

wood.

Path: G:\Infrastructure\W-WM\01-Projects\2018\18190022 MPCA East Metro MN Water Sys Study\6.0 Background Information\6.2 Maps & GIS Files\00_Community\CommSceneE_WestLakeland_8_5x11_20200901.mxd