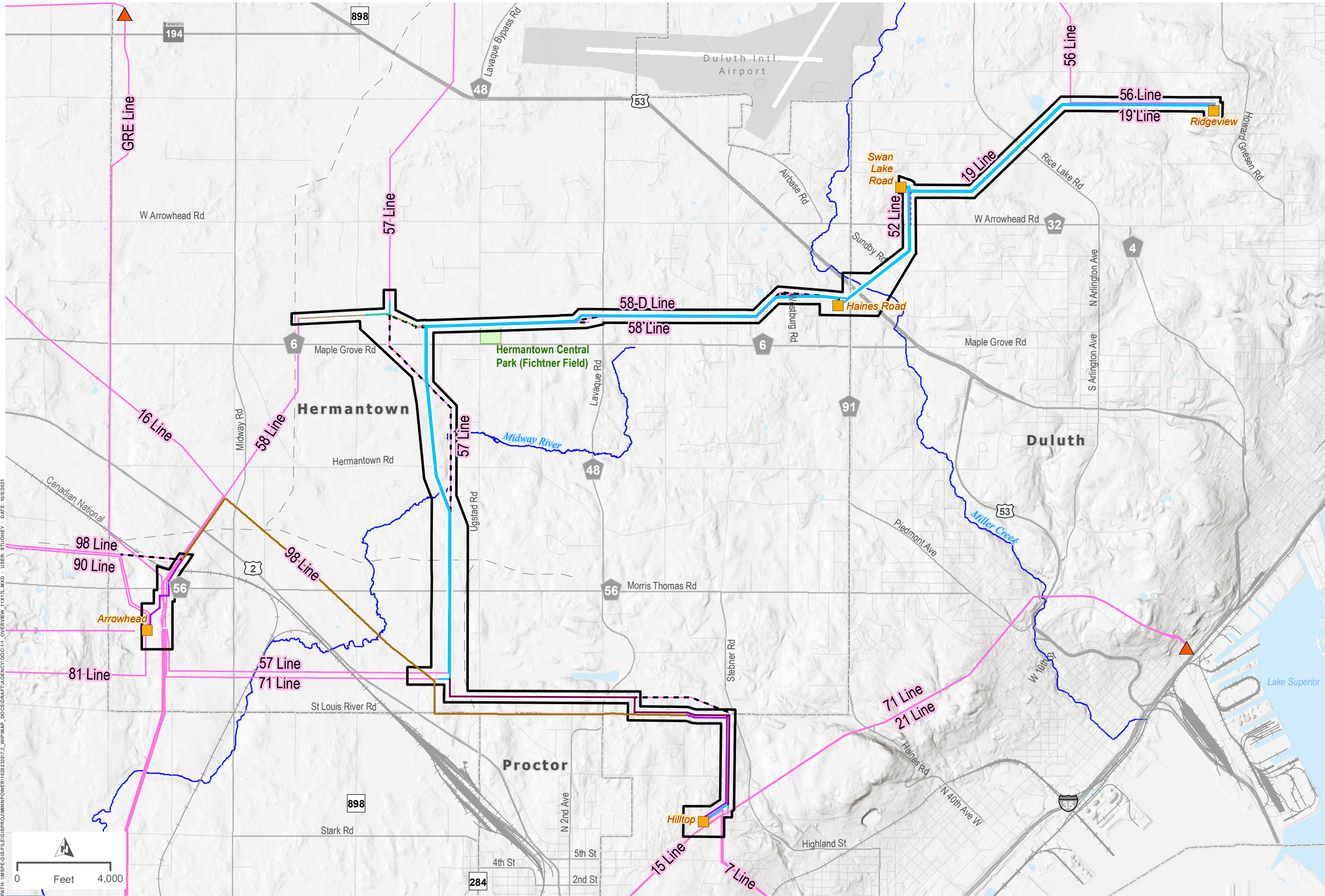


## PROJECT MAPS





- LEGEND**
- Proposed Route
  - Project Substation
  - ▲ Non-Project Substation
  - Relocated Distribution
  - Project 115 kV Transmission Line(s) (Single Circuit)
  - Project 115 kV Transmission Line (Double Circuit)
  - Project 230 kV Transmission Line (Single Circuit)
  - Removed Transmission Line (Realigned)
  - Thermal Upgrades
  - New Underground Fiber
  - Existing Transmission Line
  - Existing Pipeline
  - Waterbody
  - Public Water Watercourse
  - Park
  - Airport
  - Railroad
  - City Boundary

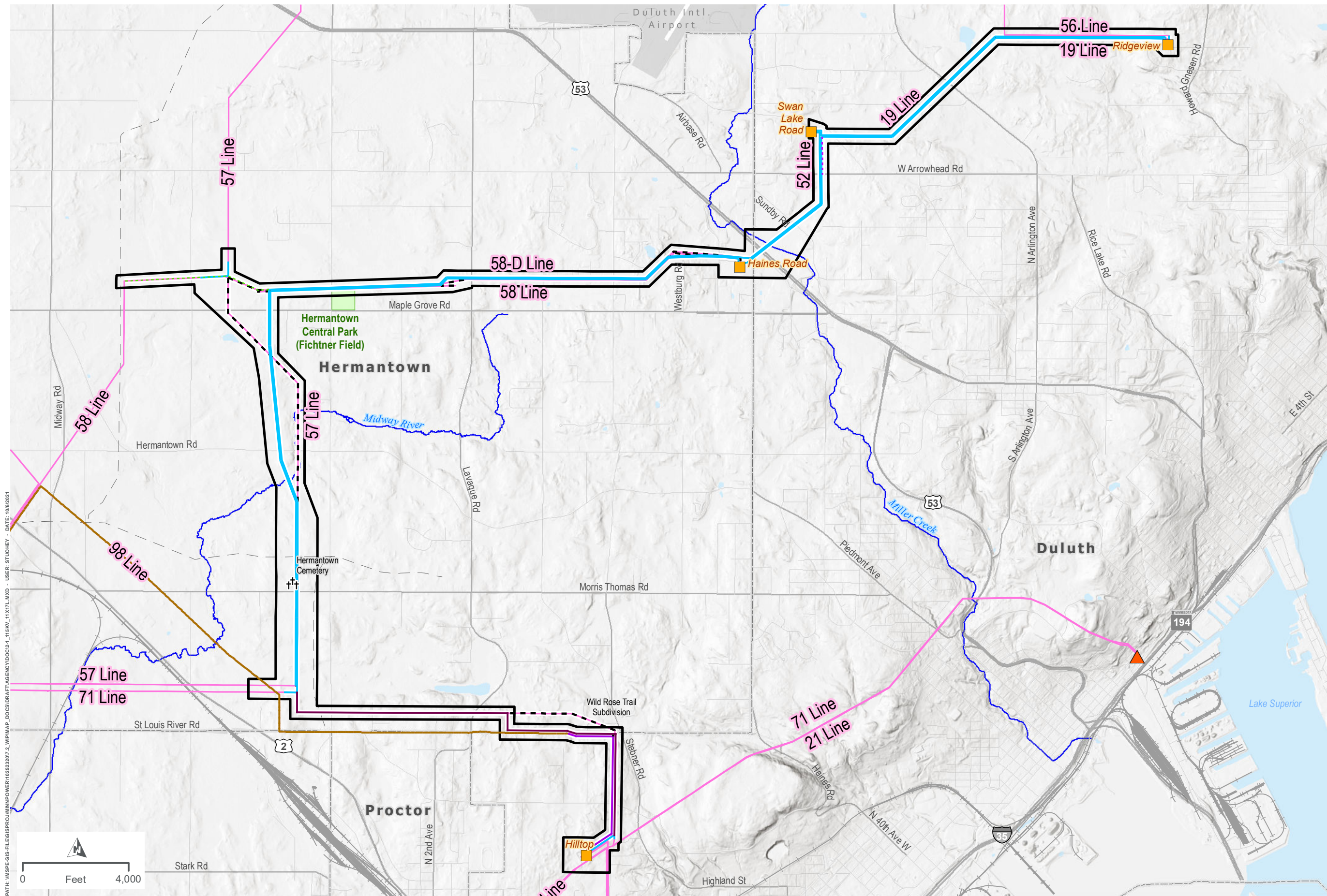
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NOTE: ONLY EXISTING LINE LABELS ARE PROVIDED FOR REFERENCE. FOR FURTHER DEFINITION ON FINAL LINE CONFIGURATIONS AND DESIGNATIONS, SEE MAP 2-4 PROPOSED SYSTEM OVERVIEW OR APPENDIX K-3



**DULUTH LOOP PROJECT OVERVIEW**  
**DULUTH LOOP RELIABILITY PROJECT**



- LEGEND**
- Proposed Route
  - Project Substation
  - ▲ Non-Project Substation
  - Relocated Distribution
  - Project 115 kV Transmission Line(s) (Single Circuit)
  - Project 115 kV Transmission Line (Double Circuit)
  - Project 230 kV Transmission Line (Single Circuit)
  - Removed Transmission Line (Realigned)
  - Thermal Upgrades
  - New Underground Fiber
  - Existing Transmission Line
  - Existing Pipeline
  - Park
  - †† Cemetery
  - Waterbody
  - Public Water Watercourse
  - Airport
  - City Boundary

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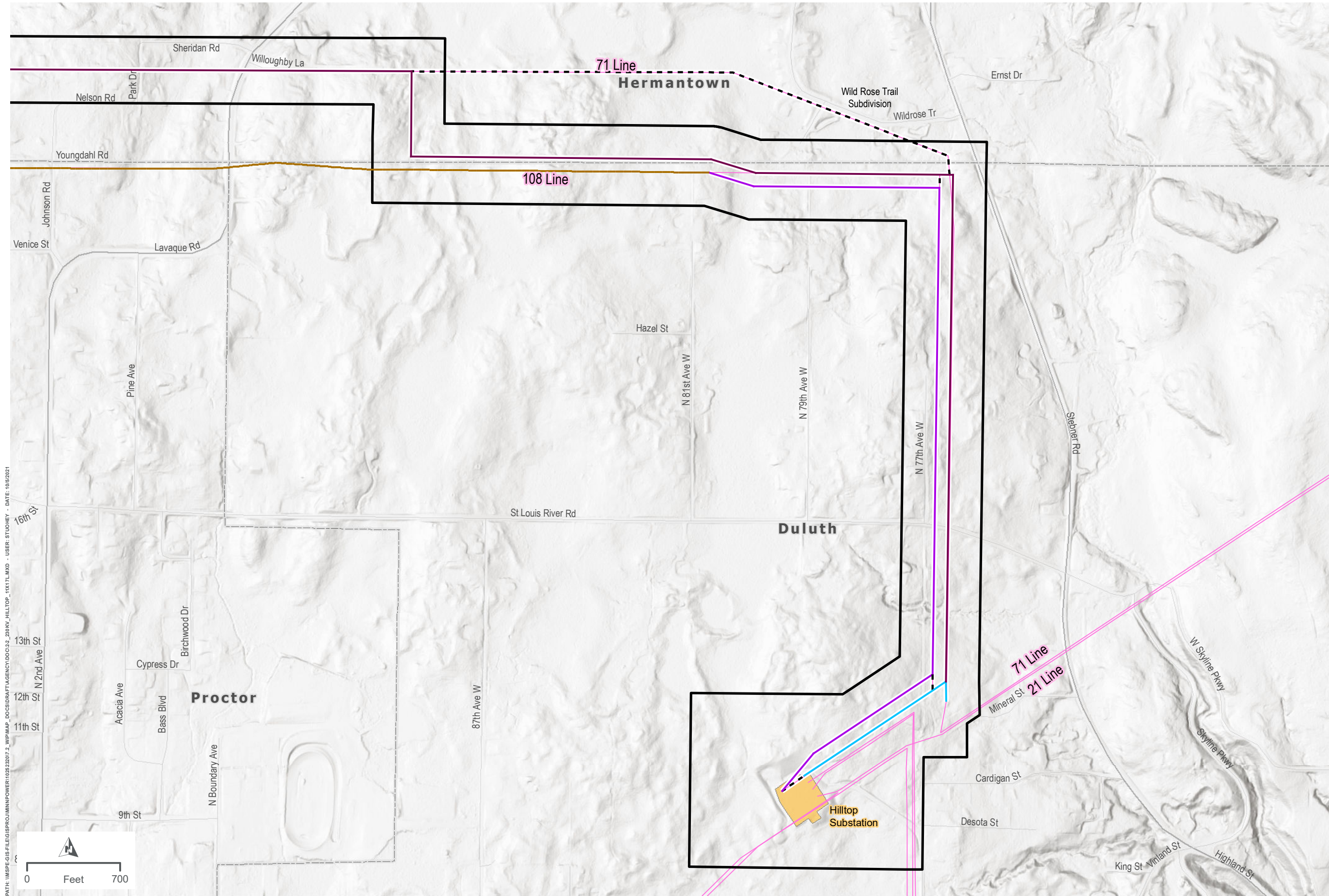
NOTE: ONLY EXISTING LINE LABELS ARE PROVIDED FOR REFERENCE. FOR FURTHER DEFINITION ON FINAL LINE CONFIGURATIONS AND DESIGNATIONS, SEE MAP 2-4 PROPOSED SYSTEM OVERVIEW OR APPENDIX K-3



**PROPOSED 115 KV ROUTE  
DULUTH LOOP RELIABILITY PROJECT**

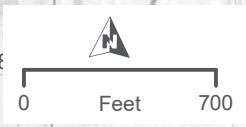
MAP 2-1

MPUC Docket No. E015/CN-21-140  
MPUC Docket No. E015/TL-21-141



- LEGEND**
- Hilltop Substation
  - Proposed Route
  - Project 115 kV Transmission Line(s) (Single Circuit)
  - Project 115 kV Transmission Line (Double Circuit)
  - Project 230 kV Transmission Line (Single Circuit)
  - Removed Transmission Line (Realigned)
  - Thermal Upgrades
  - Existing Transmission Line
  - City Boundary

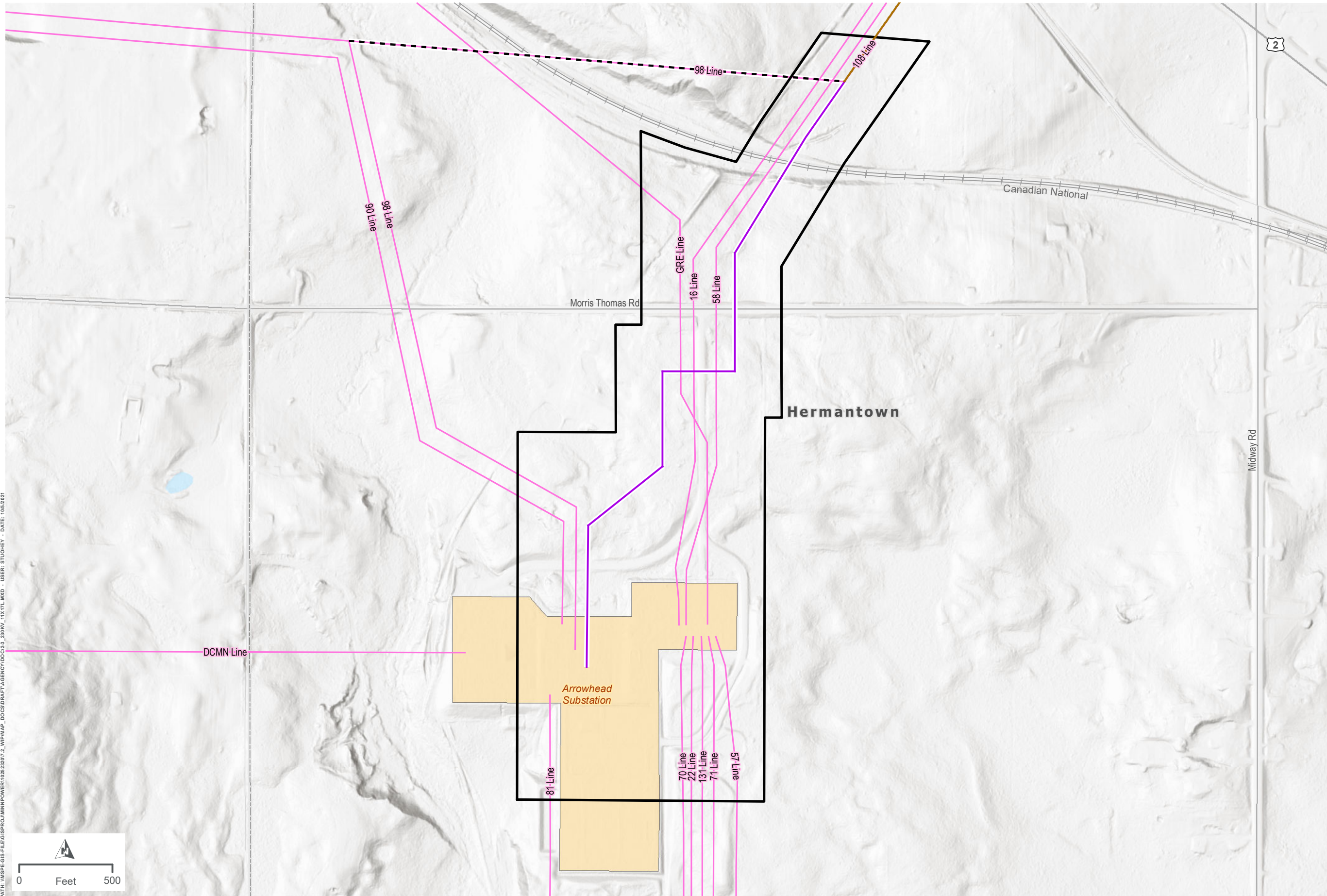
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NOTE: ONLY EXISTING LINE LABELS ARE PROVIDED FOR REFERENCE. FOR FURTHER DEFINITION ON FINAL LINE CONFIGURATIONS AND DESIGNATIONS, SEE MAP 2-4 PROPOSED SYSTEM OVERVIEW OR APPENDIX K-3

**PROPOSED 115 KV ROUTE INTO HILLTOP SUBSTATION  
DULUTH LOOP RELIABILITY PROJECT**





Project Location

**LEGEND**

- Arrowhead Substation
- Proposed Route
- Project 230 kV Transmission Line (Single Circuit)
- Removed Transmission Line (Realigned)
- Thermal Upgrades
- Existing Transmission Line
- Waterbody
- Railroad
- City Boundary

PATH: \\MSPE-GIS-FILE\GIS\PROJECTS\POWER\102822017\_2\_WIP\MAP\_DOCS\DRIFT\AGENCY\DCG\23\_200KV\_11X17L.MXD - USER: STUOHEY - DATE: 10/6/2021



NOTE: ONLY EXISTING LINE LABELS ARE PROVIDED FOR REFERENCE. FOR FURTHER DEFINITION ON FINAL LINE CONFIGURATIONS AND DESIGNATIONS, SEE MAP 2-4 PROPOSED SYSTEM OVERVIEW OR APPENDIX K-3

**PROPOSED 230 KV ROUTE  
DULUTH LOOP RELIABILITY PROJECT**

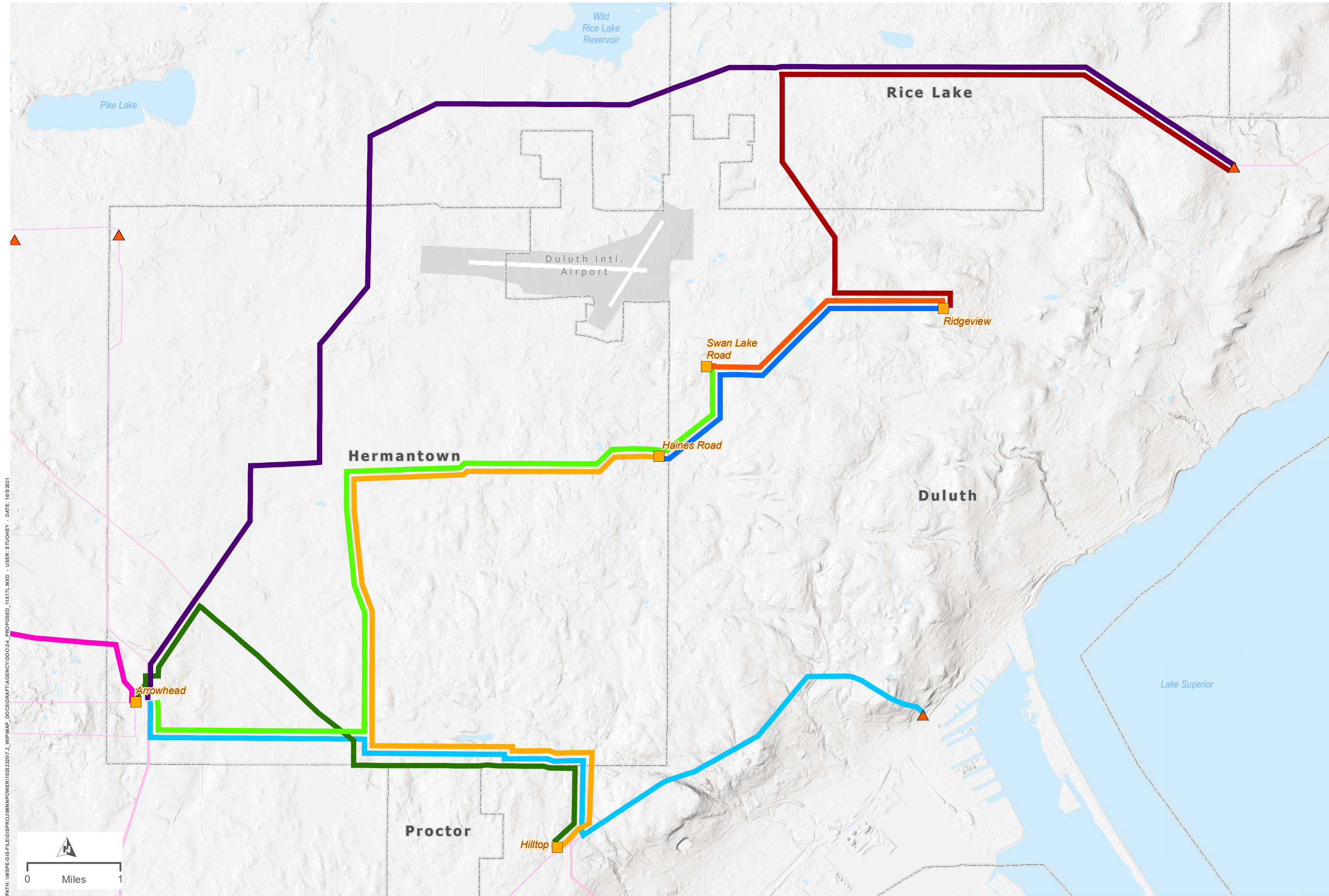


MAP 2-3

MPUC Docket No. E015/CN-21-140

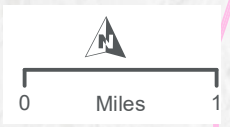
MPUC Docket No. E015/TL-21-141

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- LEGEND**
- Project Substation
  - ▲ Non-Project Substation
  - 19 Line
  - 52 Line
  - 56 Line
  - 57 Line
  - 58 Line
  - 71 Line\*
  - 98 Line
  - 108 Line
  - 176 Line\*
  - Existing Transmission Line
  - Waterbody
  - Airport
  - City Boundary

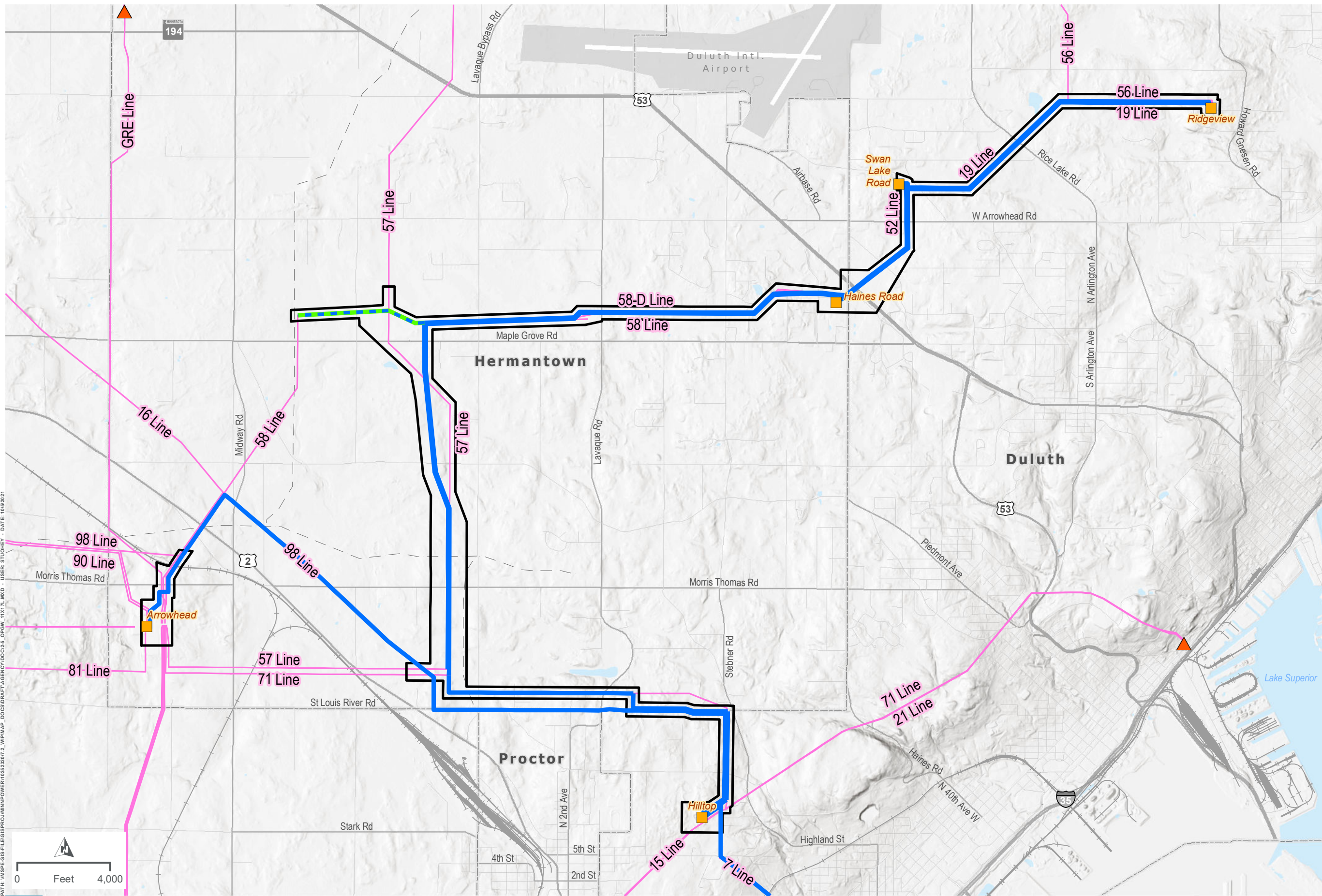
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\*NOTE: A PORTION OF 176 LINE WILL BE CONSTRUCTED AS A DOUBLE CIRCUIT WITH 71 LINE.  
 \*\*TRANSMISSION SYSTEM IS NOT SHOWN TO SCALE\*\*



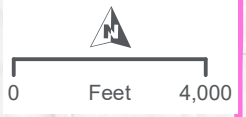
**PROPOSED SYSTEM OVERVIEW  
 DULUTH LOOP RELIABILITY PROJECT**



Project Location

- LEGEND**
- Construct Underground OPGW
  - Replace OPGW
  - - - Removed OPGW
  - Proposed Route
  - Project Substation
  - ▲ Non-Project Substation
  - Existing Transmission Line
  - Existing Pipeline
  - Waterbody
  - Airport
  - City Boundary

PATH: \\MSPE-GIS-FILE\GIS\PROJECT\MINNPOWER\102822017\_2\_WIP\MAP\_DOCS\DATA\TAGENC\100024\_OPGW\_11X17L.MXD - USER: STUOHEY - DATE: 10/26/2021

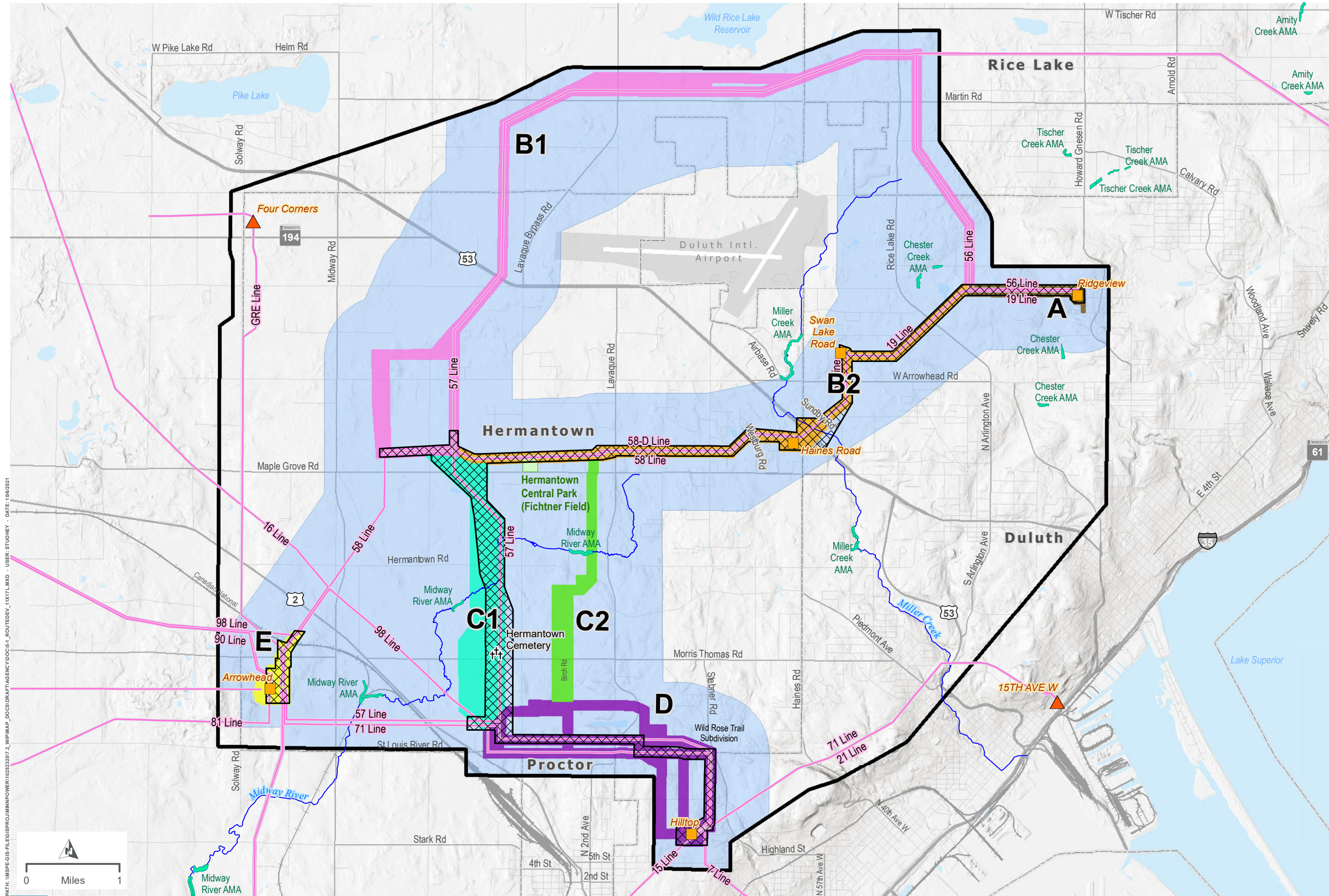


NOTE: ONLY EXISTING LINE LABELS ARE PROVIDED FOR REFERENCE. FOR FURTHER DEFINITION ON FINAL LINE CONFIGURATIONS AND DESIGNATIONS, SEE MAP 2-4 PROPOSED SYSTEM OVERVIEW OR APPENDIX K-3  
LIMITS OF NEW AND/OR REPLACEMENT OF FIBER OPTIC ON THE TRANSMISSION LINES MAY BE ADJUSTED OR REDUCED AS APPROPRIATE PENDING FINAL ENGINEERING.



**COMMUNICATIONS INFRASTRUCTURE MODIFICATIONS  
DULUTH LOOP RELIABILITY PROJECT**

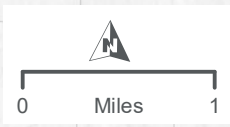




- LEGEND**
- Study Area
  - Study Corridor
  - Route Alternative**
  - Segment A (Brown)
  - Segment B1 (Pink)
  - Segment B2 (Orange)
  - Segment C1 (Teal)
  - Segment C2 (Green)
  - Segment D (Purple)
  - Segment E (Yellow)
  - Proposed Route
  - Existing Transmission Line
  - Project Substation
  - Non-Project Substation
  - Aquatic Management Area
  - Waterbody
  - Public Water Watercourse
  - School / College / University
  - Park
  - Cemetery
  - Airport
  - Railroad

NOTE: ONLY EXISTING LINE LABELS ARE PROVIDED FOR REFERENCE. FOR FURTHER DEFINITION ON FINAL LINE CONFIGURATIONS AND DESIGNATIONS, SEE MAP 2-4 PROPOSED SYSTEM OVERVIEW OR APPENDIX K-3

PATH: \\MSPE-GIS-FILES\GIS\PROJECTS\2017\2\_WIP\MAP\_DOCS\DRIFT\AGENCY\DOC\1\_ROUTEDEV\_1\1117.LMXD - USER: STUDIOEY - DATE: 10/6/2021

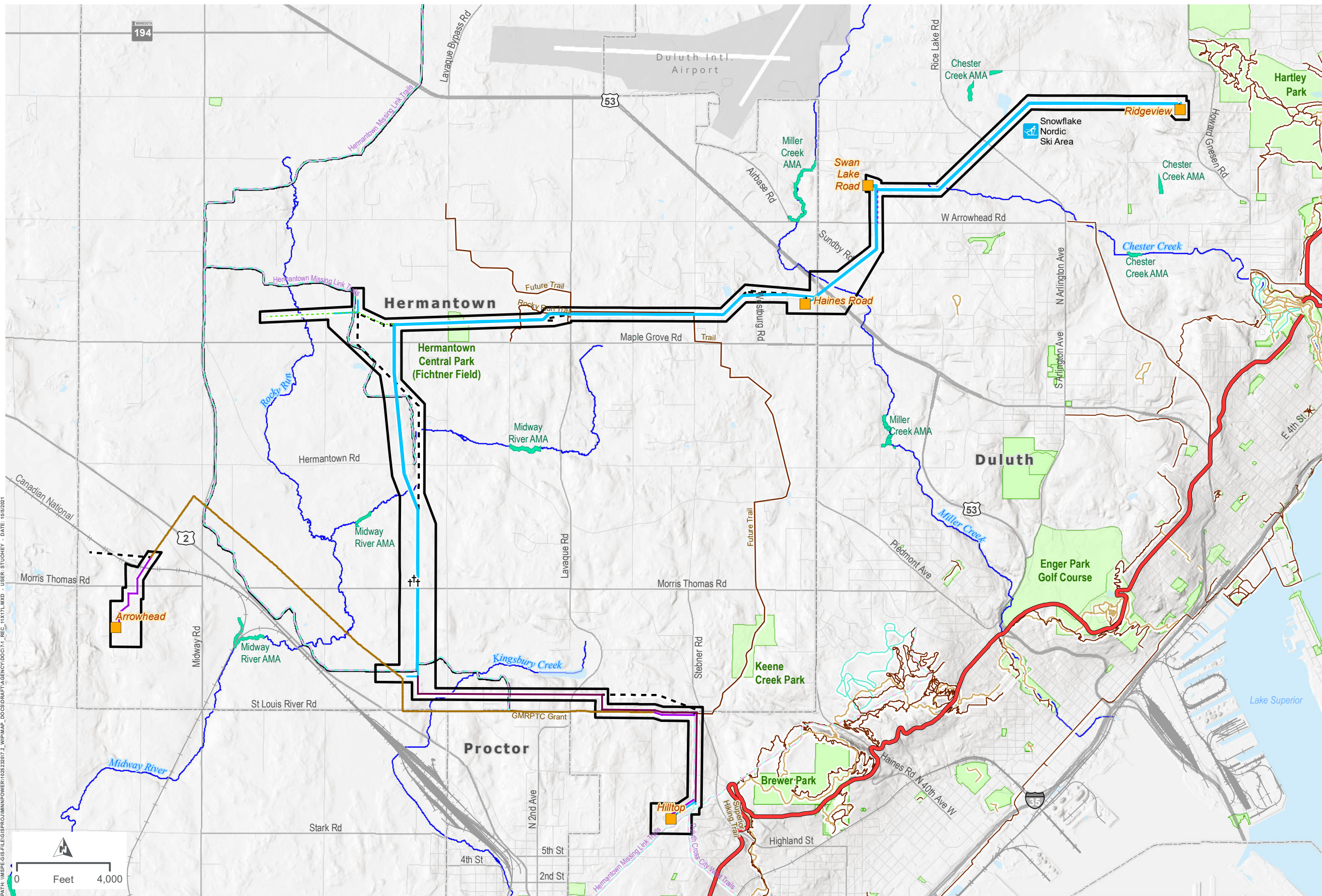


**ROUTE DEVELOPMENT  
DULUTH LOOP RELIABILITY PROJECT**

MAP 5-1

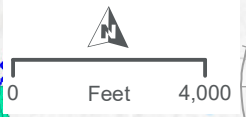
MPUC Docket No. E015/CN-21-140

MPUC Docket No. E015/TL-21-141



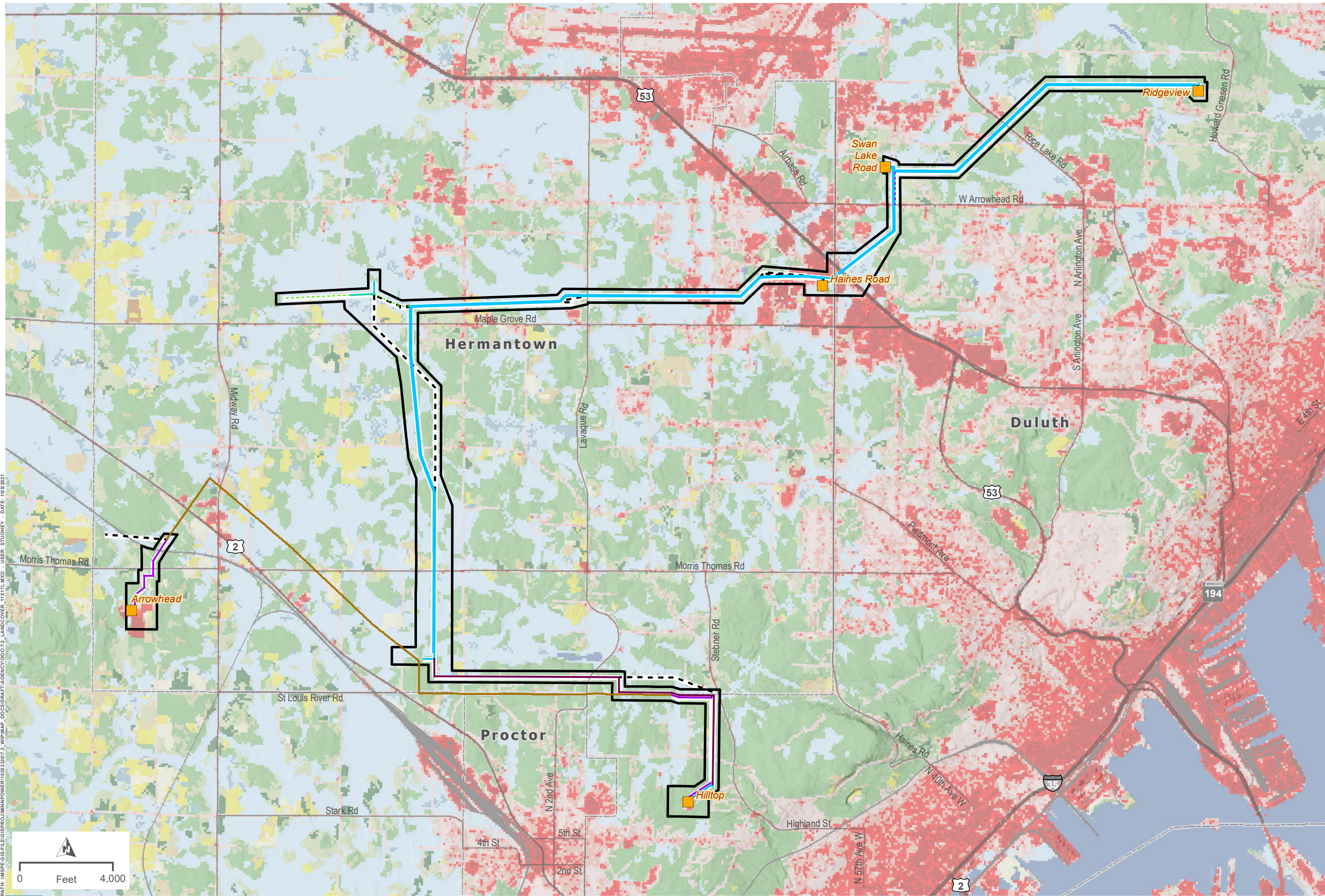
- LEGEND**
- Proposed Route
  - Project Substation
  - Relocated Distribution
  - Project 115 kV Transmission Line(s) (Single Circuit)
  - Project 115 kV Transmission Line (Double Circuit)
  - Project 230 kV Transmission Line (Single Circuit)
  - Removed Transmission Line (Realigned)
  - Thermal Upgrades
  - New Underground Fiber
- Designated Trail**
- Hiking Trail
  - Multipurpose Trail (Existing/Future)
  - Snowmobile Trail
  - Cross Country Ski Trail
  - Skyline Parkway
  - Aquatic Management Area
  - Park / Golf Course
  - Ski Area
  - Cemetery
  - Public Water Watercourse
  - Waterbody
  - Airport
  - City Boundary

PATH: \\MSPE-GIS-FILE\GIS\PROJECT\MINNPOWER\102822017\_2\_WIP\MAP\_DOCS\DATA\TAGENCY\DOCT1\_REC\_11\X17L.MXD - USER: STUOHNEY - DATE: 10/02/2021



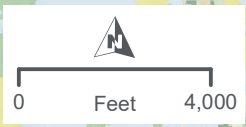
**RECREATION OVERVIEW**  
**DULUTH LOOP RELIABILITY PROJECT**

MAP 7-1

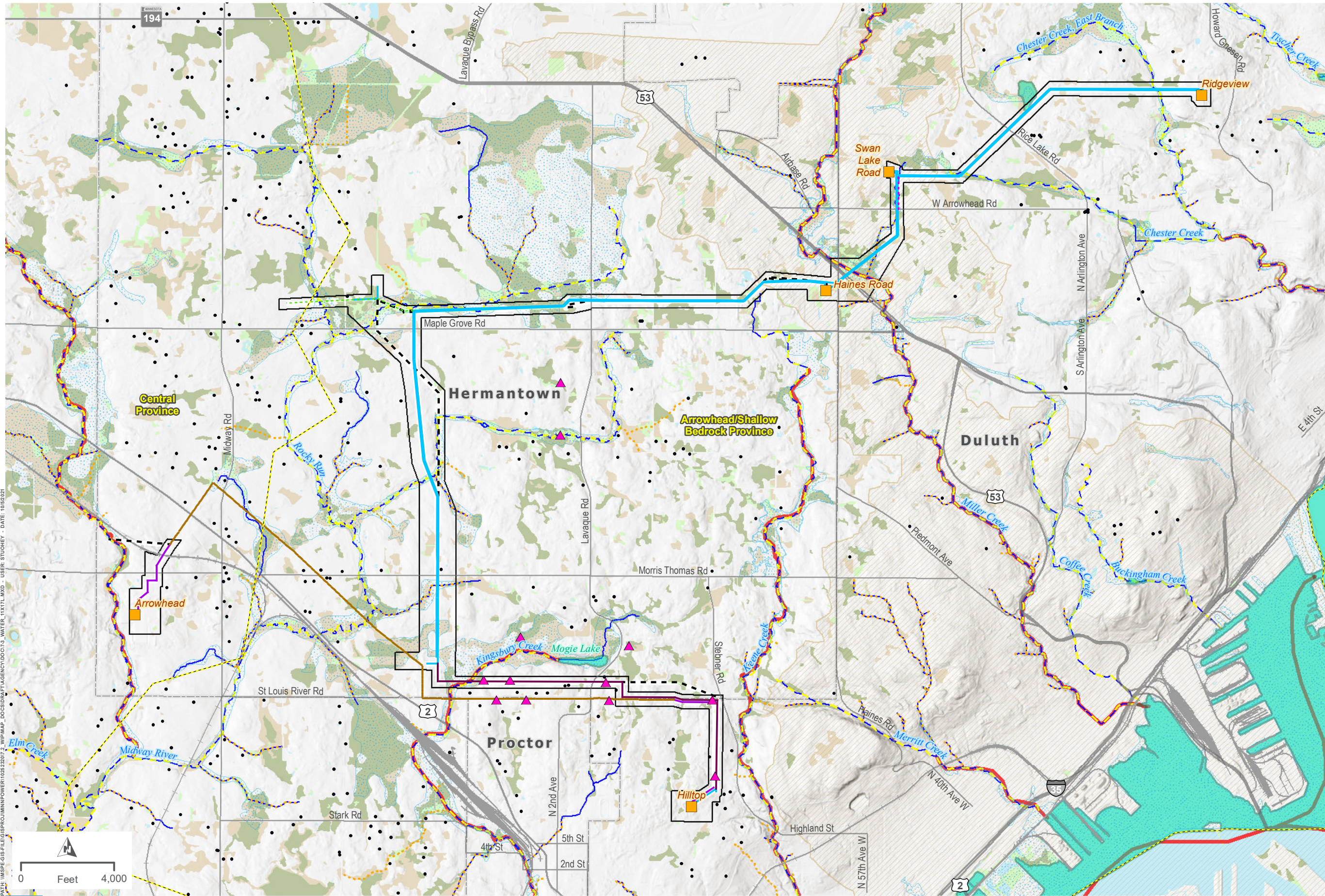


- LEGEND**
- Proposed Route
  - Project Substation
  - Relocated Distribution
  - Project 115 kV Transmission Line(s) (Single Circuit)
  - Project 115 kV Transmission Line (Double Circuit)
  - Project 230 kV Transmission Line (Single Circuit)
  - Removed Transmission Line (Realigned)
  - Thermal Upgrades
  - New Underground Fiber
  - Open Water
  - Developed, Open Space
  - Developed, Low Intensity
  - Developed, Medium Intensity
  - Developed, High Intensity
  - Barren Land
  - Deciduous Forest
  - Evergreen Forest
  - Mixed Forest
  - Shrub/Scrub
  - Grassland/Herbaceous
  - Pasture/Hay
  - Cultivated Crops
  - Woody Wetlands
  - Emergent Herbaceous Wetlands
  - City Boundary

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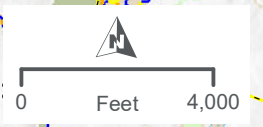


**LAND COVER**  
**DULUTH LOOP RELIABILITY PROJECT**



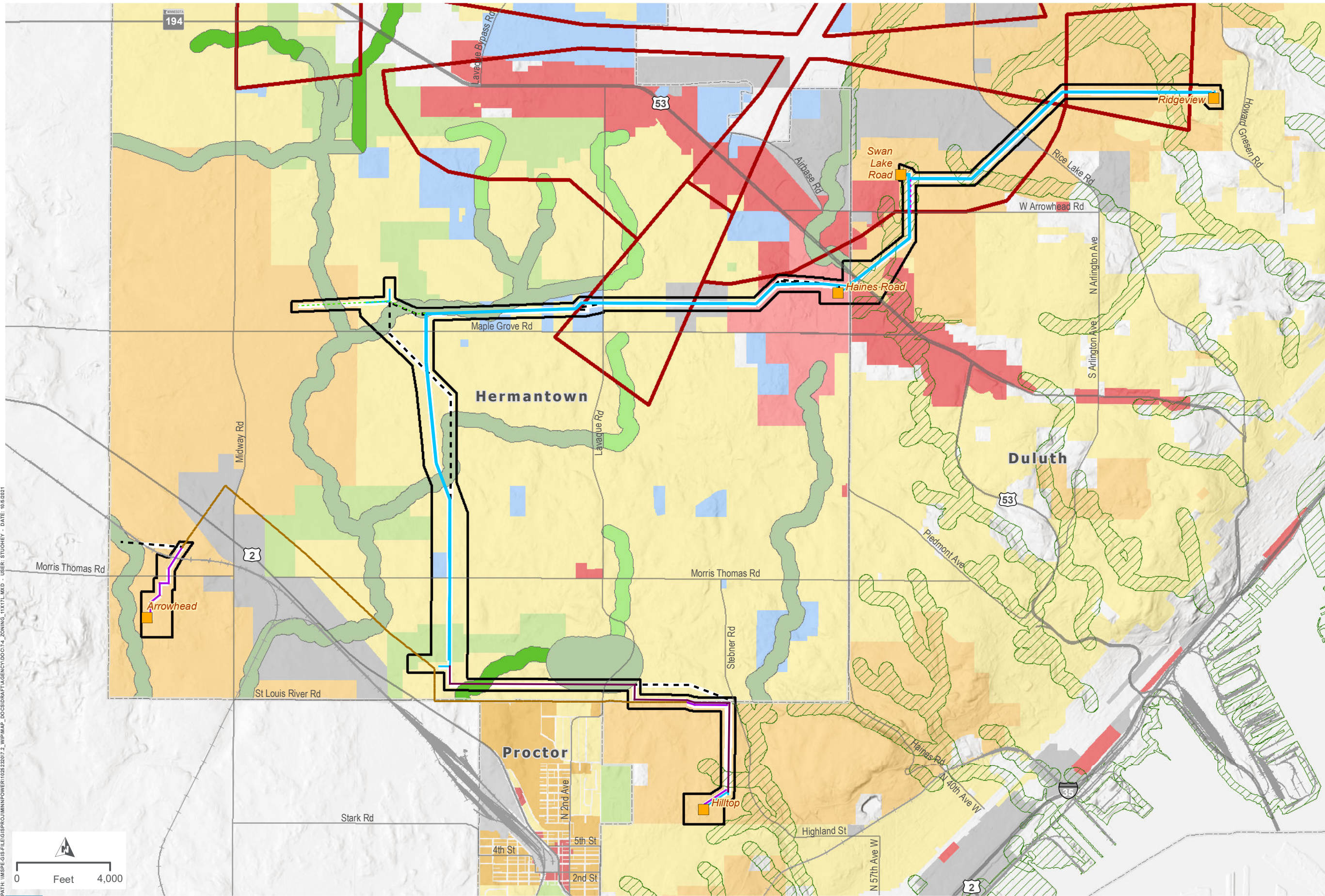
- LEGEND**
- Proposed Route
  - Project Substation
  - Relocated Distribution
  - Project 115 kV Transmission Line(s) (Single Circuit)
  - Project 115 kV Transmission Line (Double Circuit)
  - Project 230 kV Transmission Line (Single Circuit)
  - Removed Transmission Line (Realigned)
  - Thermal Upgrades
  - New Underground Fiber
  - Private Well
  - Impaired Water
  - Public Water Basin/Wetland
  - Public Water Watercourse
  - FEMA Floodplain
  - National Wetlands Inventory**
    - Freshwater Emergent Wetland
    - Freshwater Forested Wetland
    - Freshwater Shrub Wetland
    - Freshwater Pond; Lake; Riverine
  - Designated Trout Stream
  - Protected Tributary to Designated Trout Stream
  - Unmapped Tributary
  - Groundwater Province
  - Saint Louis River Watershed
  - City Boundary

PATH: \\MSPE-GIS-FILE\GIS\PROJECT\MINPOWER\102822017\_2\_WIP\MAP\_DOCS\DATA\AGENCY\DOCT3\_WATER\_11X17L.MXD - USER: STUOHNEY - DATE: 10/02/2021



**WATER RESOURCES**  
**DULUTH LOOP RELIABILITY PROJECT**

MAP 7-3



- LEGEND**
- Proposed Route
  - Substation
  - Relocated Distribution
  - Project 115 kV Transmission Line(s) (Single Circuit)
  - Project 115 kV Transmission Line (Double Circuit)
  - Project 230 kV Transmission Line (Single Circuit)
  - Removed Transmission Line (Realigned)
  - Thermal Upgrades
  - New Underground Fiber
  - Airport Safety Zone C
  - Duluth Shoreland Management Zone
- Hermantown Shoreland Overlay**
- General Development
  - Natural Environment
  - Recreational Development
- Zoning Classification**
- Business and Light Manufacturing
  - Commercial
  - Hermantown Marketplace
  - Open Space
  - Public
  - Low Density Residential
  - Rural Residential
  - City Boundary

PATH: \\MSPE-GIS-FILE\GIS\PROJ\MINPOWER\102822017\_2\_WIP\MAP\_DOCS\DATA\AGENCY\DOCG14\_ZONING\_11X17L.MXD - USER: STUOHNEY - DATE: 10/6/2021



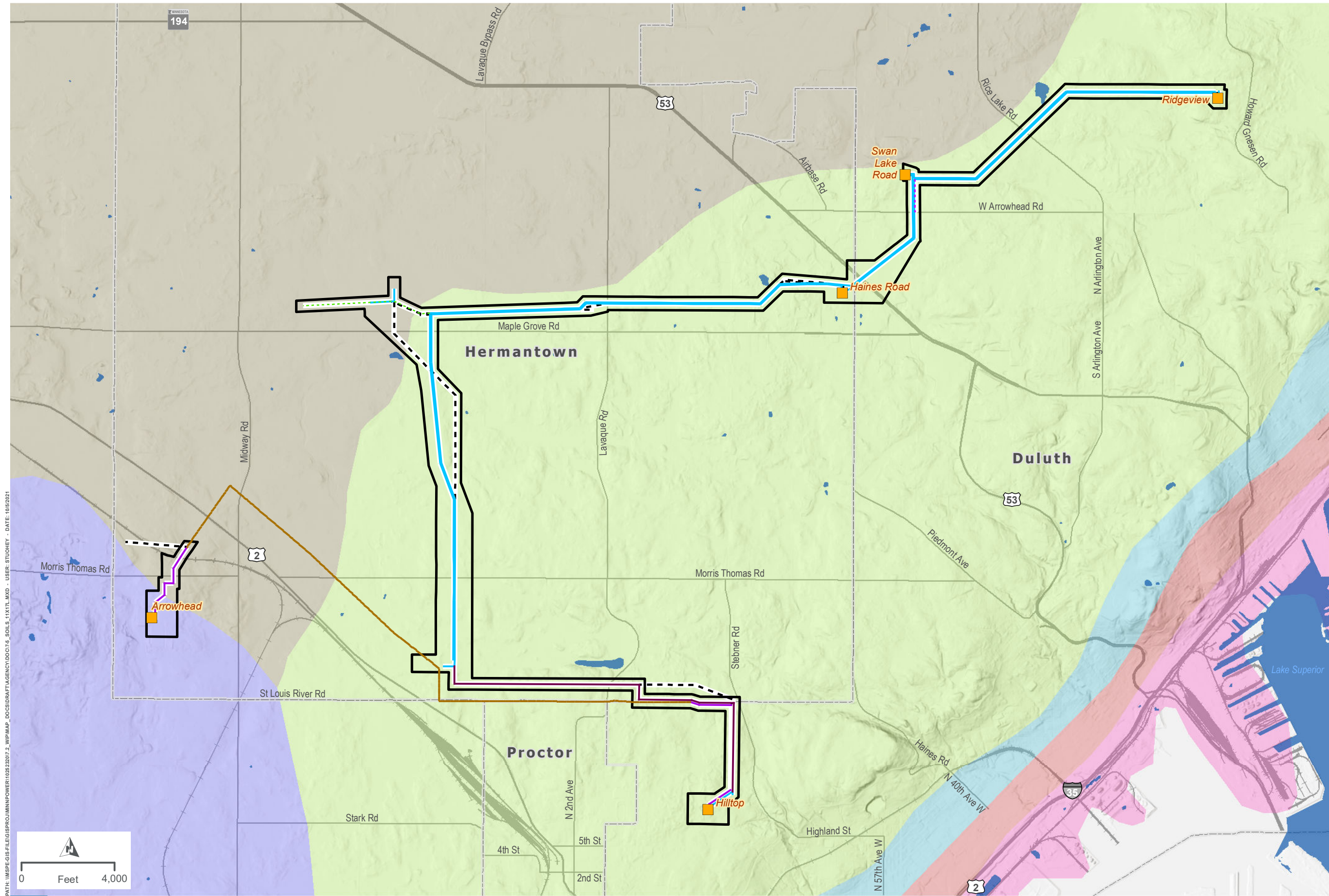
**ZONING CLASSIFICATIONS  
DULUTH LOOP RELIABILITY PROJECT**

MAP 7-4

MPUC Docket No. E015/CN-21-140

MPUC Docket No. E015/TL-21-141

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- LEGEND**
- Proposed Route
  - Project Substation
  - Relocated Distribution
  - Project 115 kV Transmission Line(s) (Single Circuit)
  - Project 115 kV Transmission Line (Double Circuit)
  - Project 230 kV Transmission Line (Single Circuit)
  - Removed Transmission Line (Realigned)
  - Thermal Upgrades
  - New Underground Fiber
- Soil Associations**
- Dusler-Duluth (s3677)
  - Hermantown-Ahmeek (s3676)
  - Hermantown-Finland (s3672)
  - Insula-Conic (s3673)
  - Rudyard-Ontonagon-Be... (s8701)
  - Sartell (s3694)
  - Waterbody
  - City Boundary

PATH: \\MSPE-GIS-FILE\GIS\PROJECT\MINNPOWER\102822017.2\_WIP\MAP\_DOCS\DIRT\AGENCY\DOCS\74\_SOILS\_11X17L.MXD - USER: STUOHEY - DATE: 10/5/2017



**SOIL RESOURCES  
DULUTH LOOP RELIABILITY PROJECT**

MAP 7-5

MPUC Docket No. E015/CN-21-140

MPUC Docket No. E015/TL-21-141