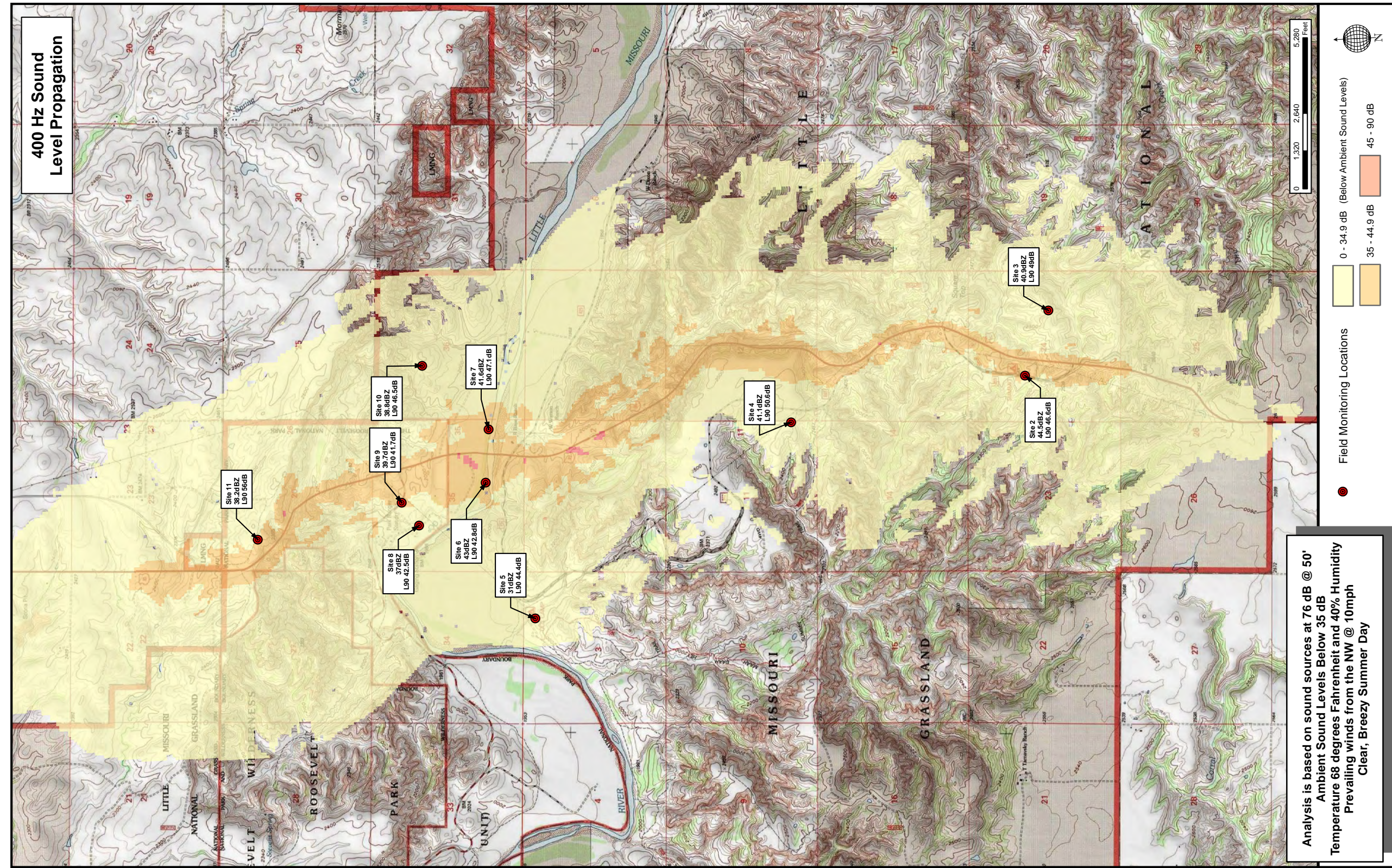


Appendix D. SPreAD Analysis

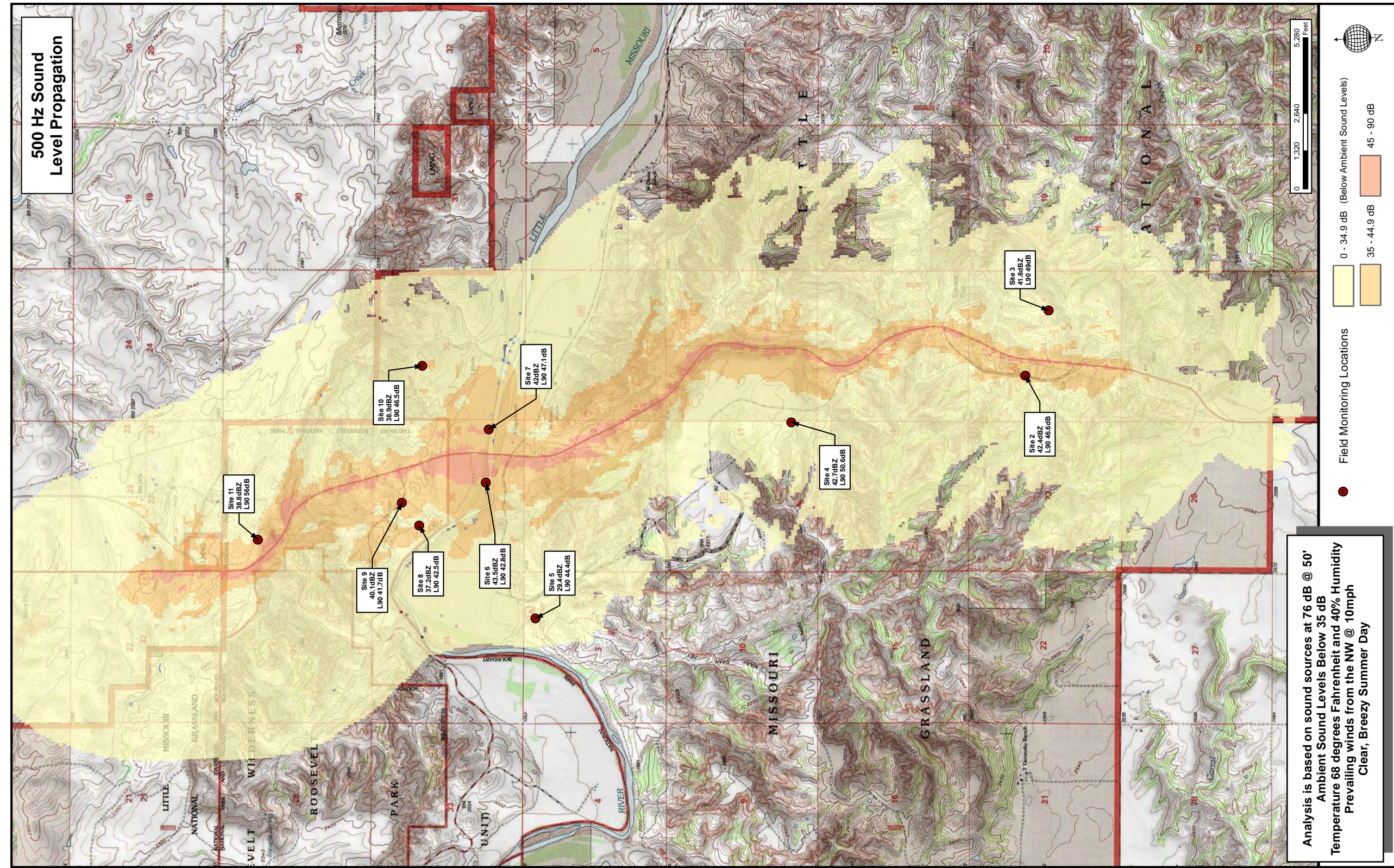
D.1. Traffic Sound Level Propagation Maps D-3
D.2. Long X Bridge Sound Level
Propagation MapsD-13

D.1. Traffic Sound Level Propagation Maps

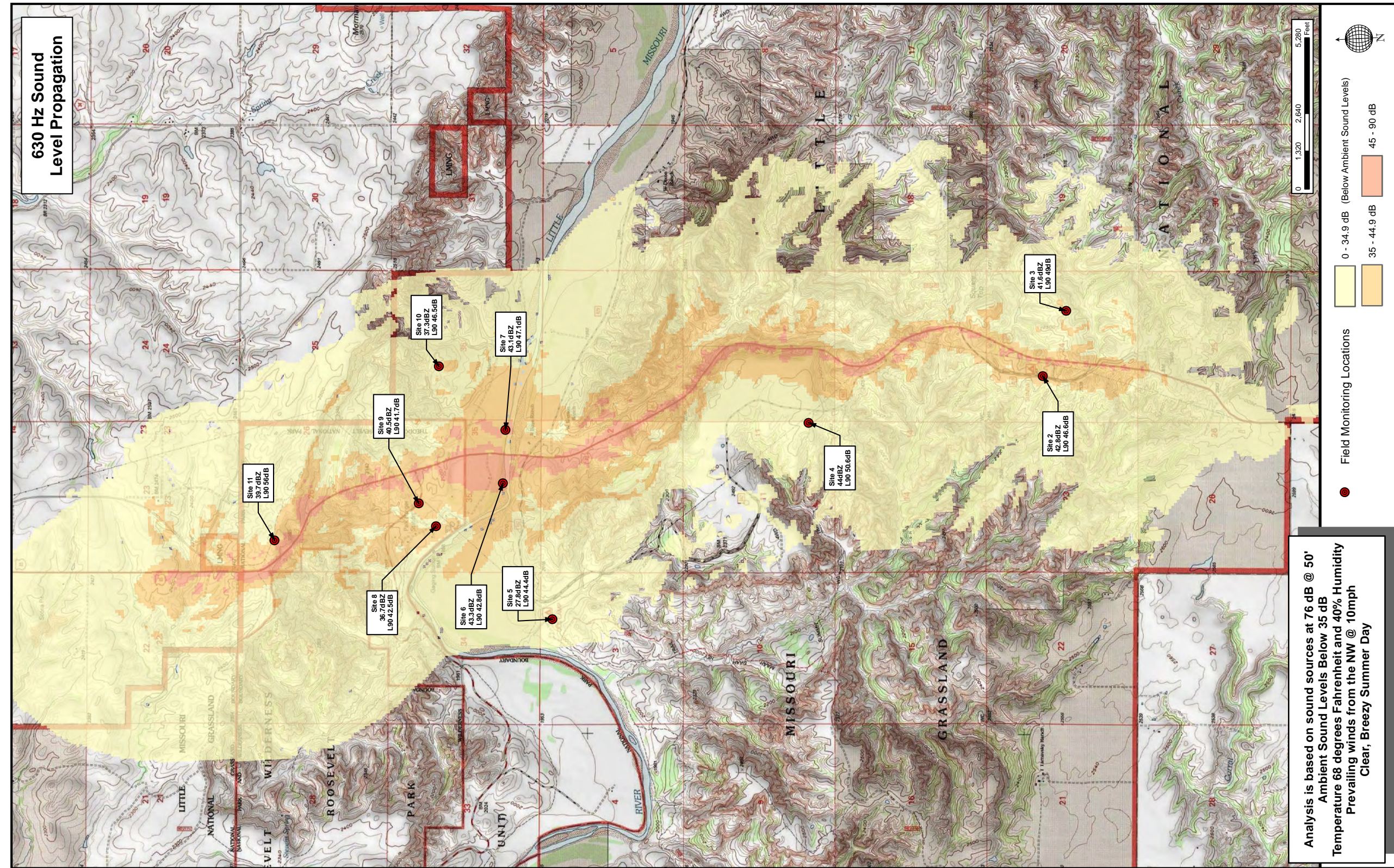
D.1.1. Traffic 400 Hz Sound Level Propagation



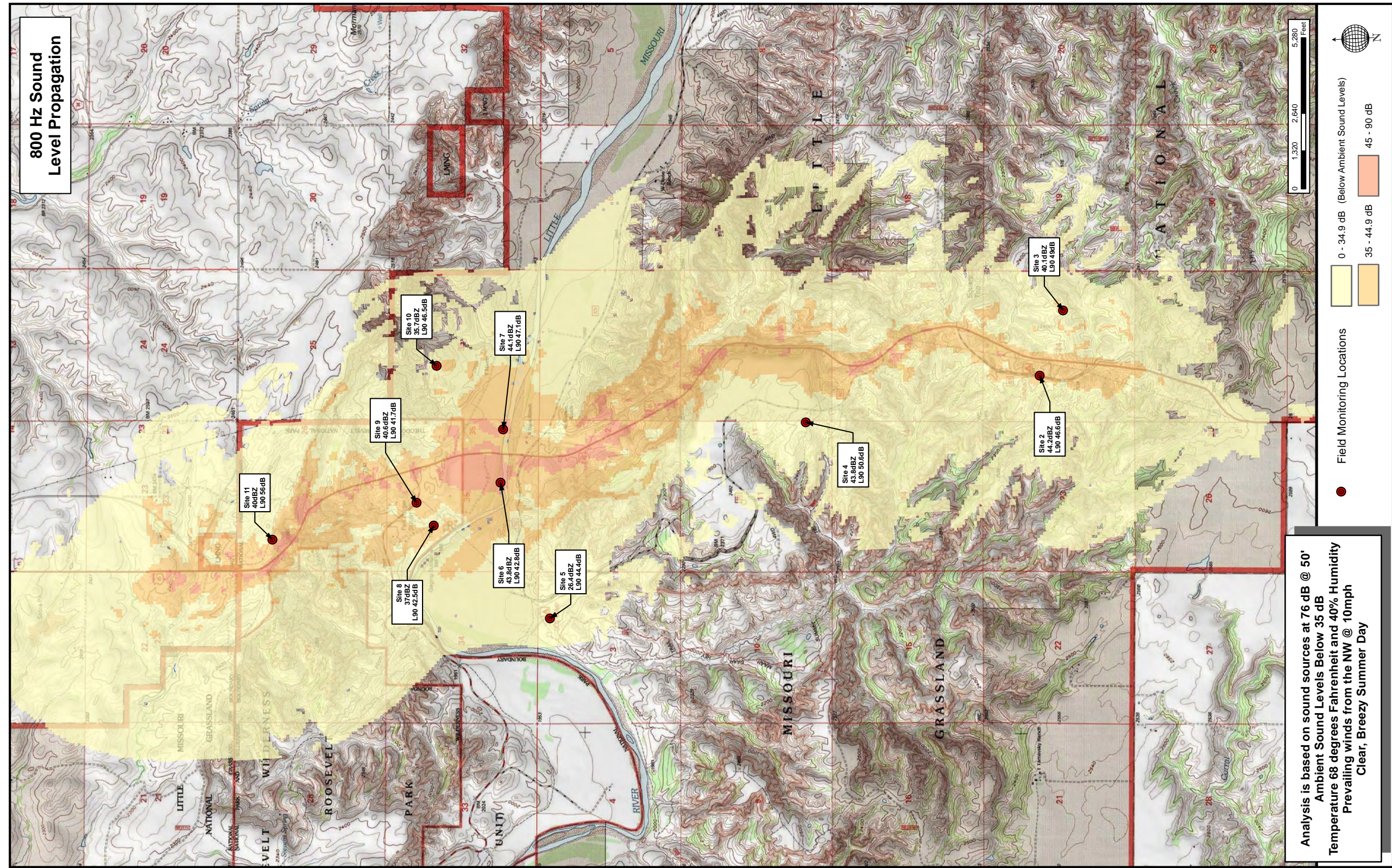
D.1.2. Traffic 500 Hz Sound Level Propagation



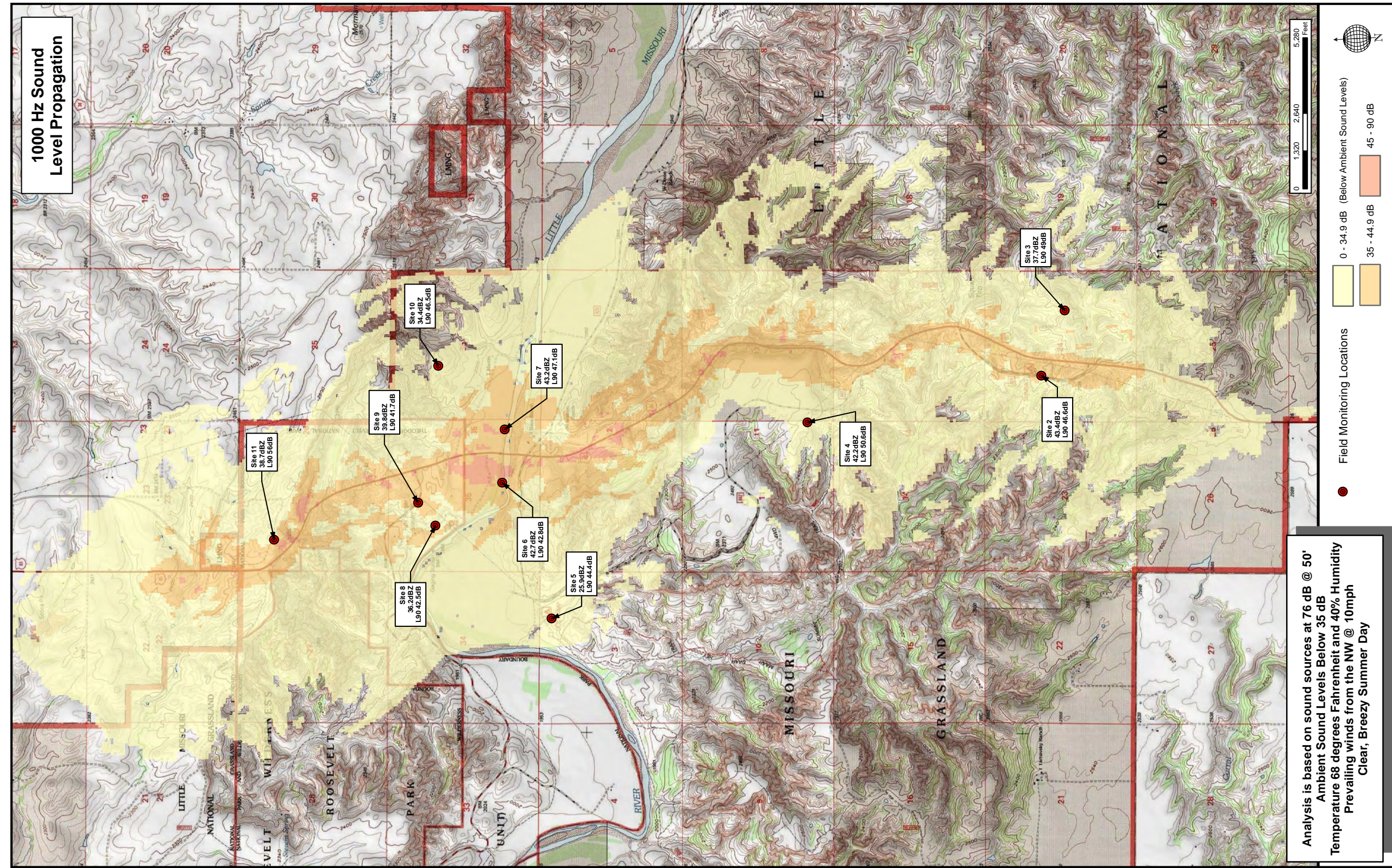
D.1.3. Traffic 630 Hz Sound Level Propagation



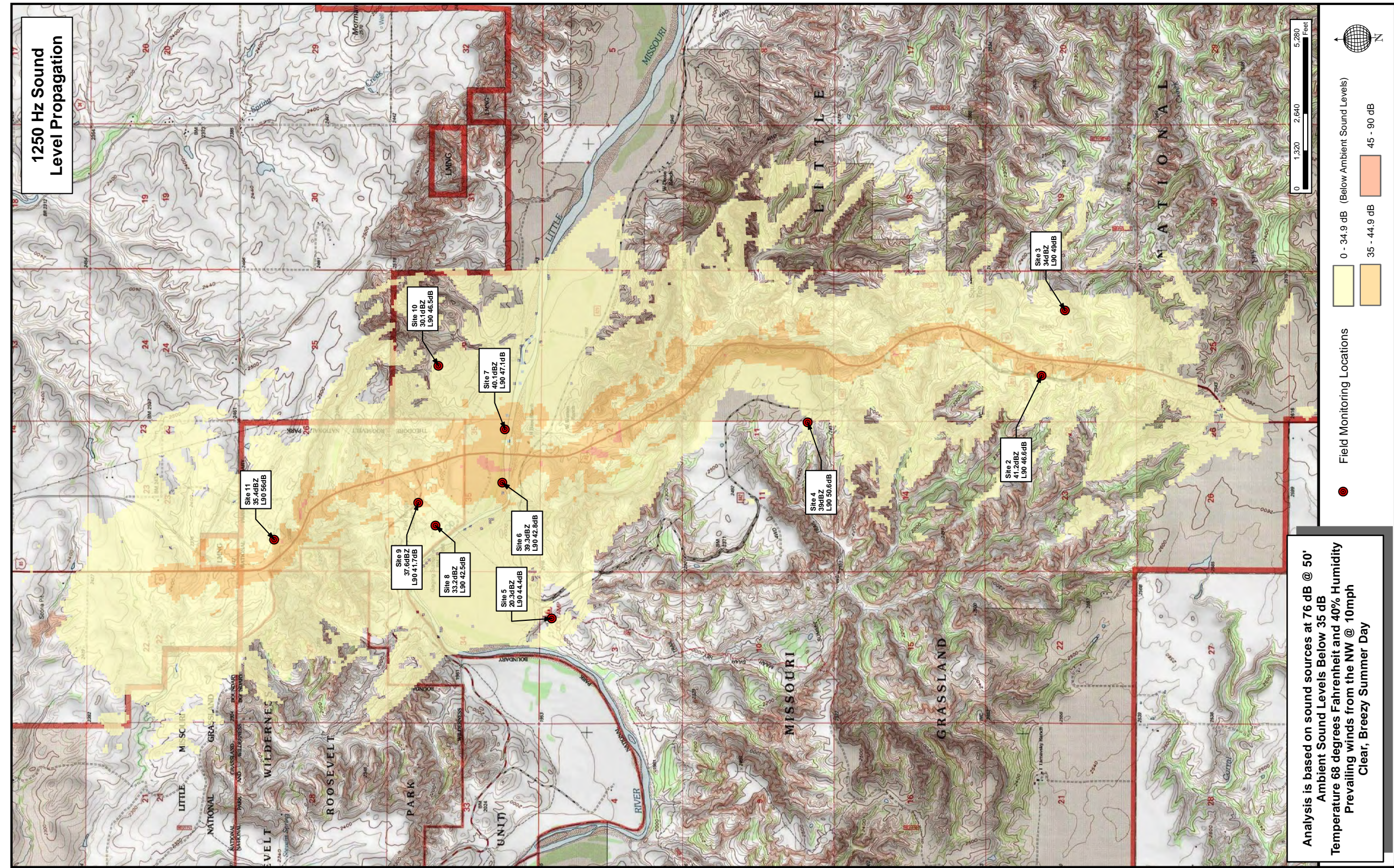
D.1.4. Traffic 800 Hz Sound Level Propagation



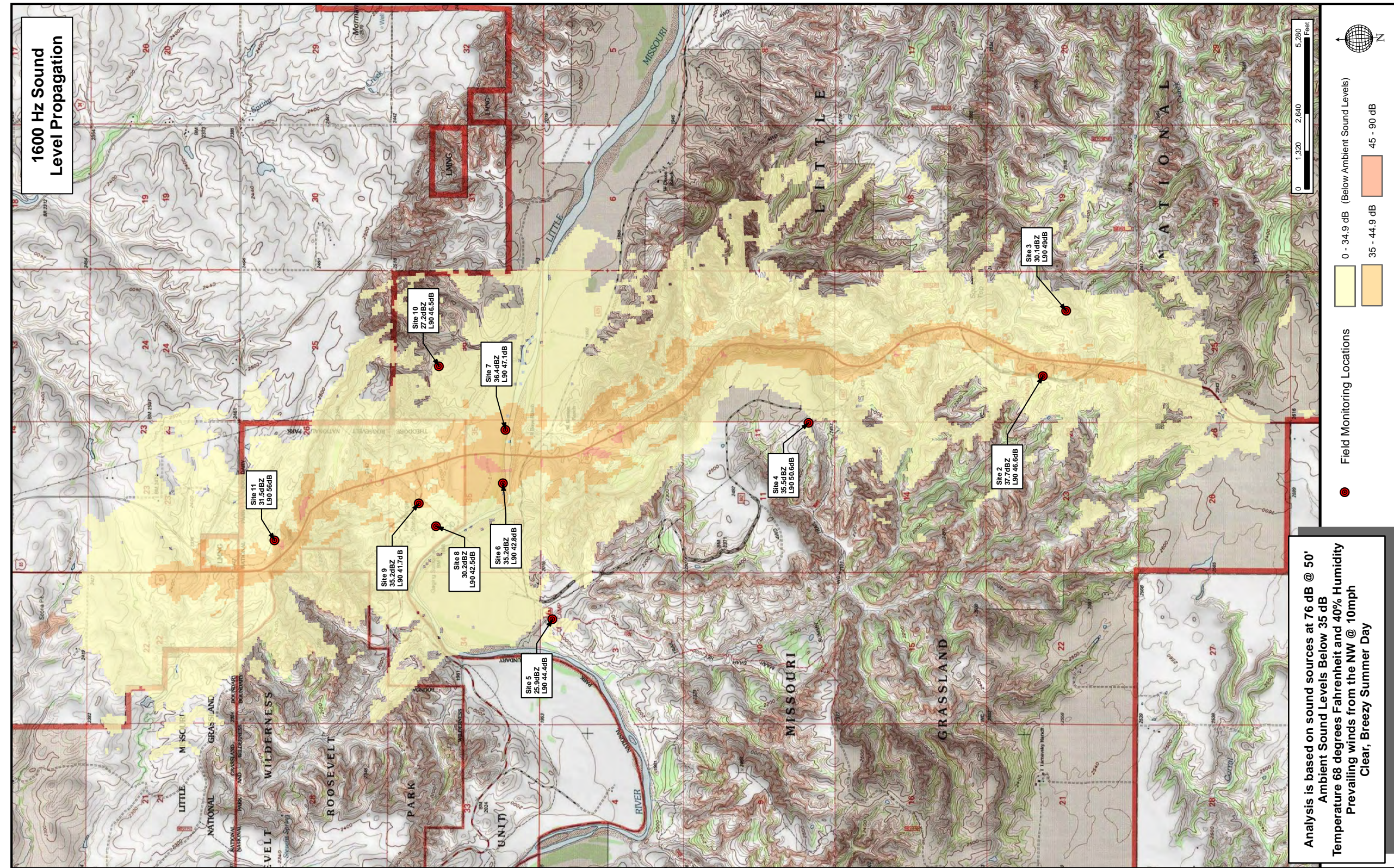
D.1.5. Traffic 1,000 Hz (1 kHz) Hz Sound Level Propagation



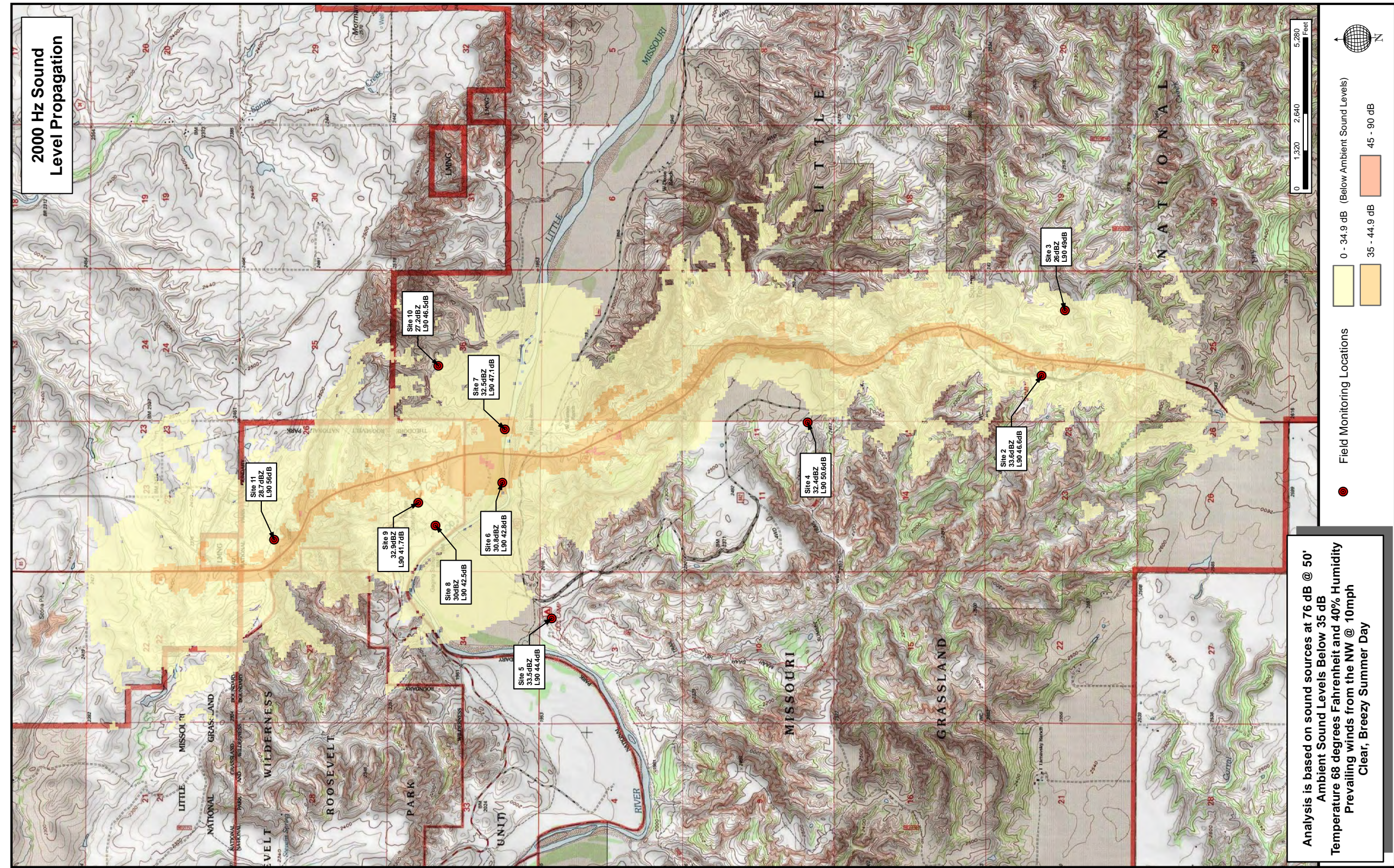
D.1.6. Traffic 1,250 Hz (1.25 kHz) Sound Level Propagation



D.1.7. Traffic 1,600 Hz (1.6 kHz) Hz Sound Level Propagation

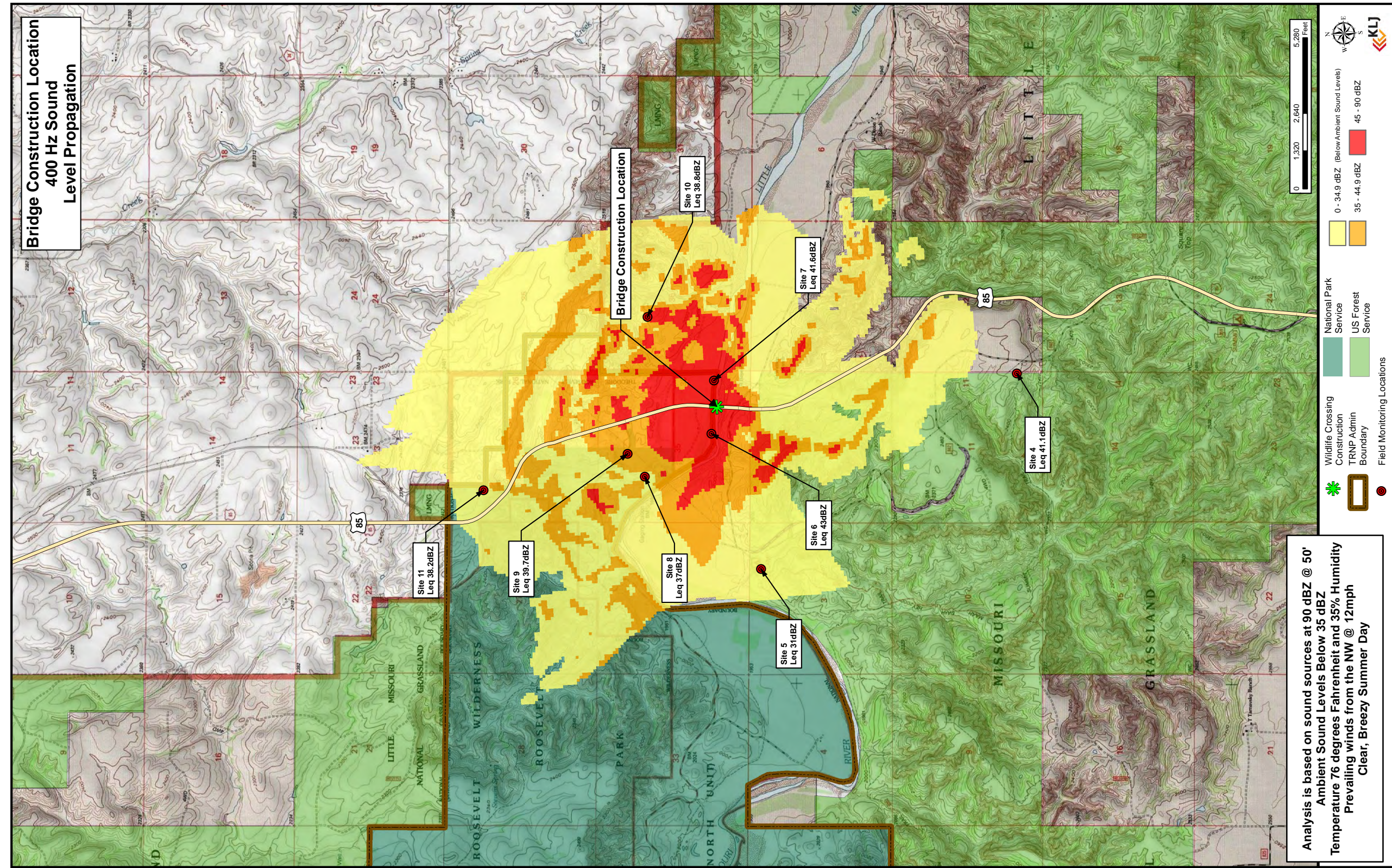


D.1.8. Traffic 2,000 Hz (2 kHz) Sound Level Propagation

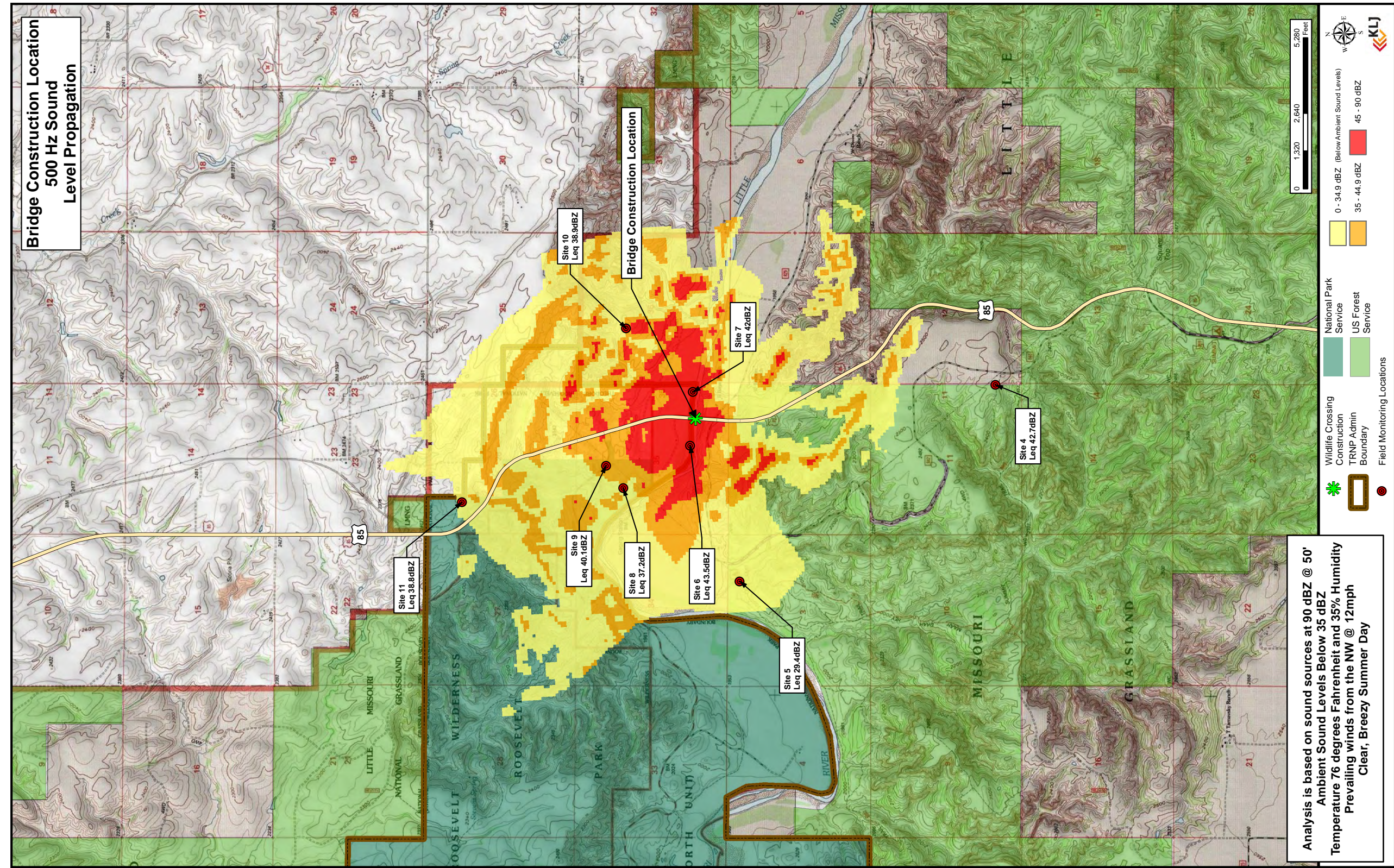


D.2. Long X Bridge Sound Level Propagation Maps

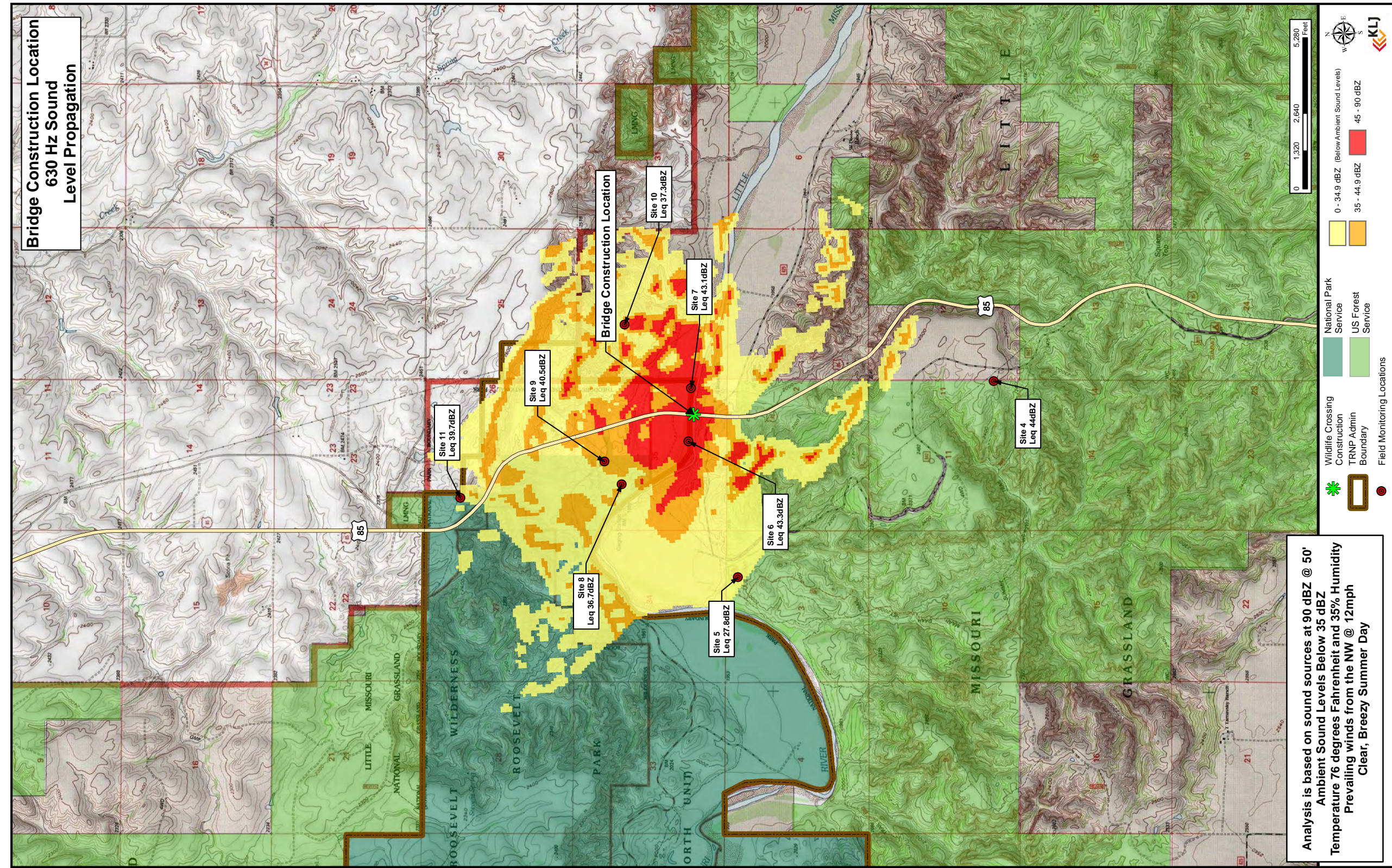
D.2.1. Long X Bridge 400 Hz Sound Level Propagation



D.2.2. Long X Bridge 500 Hz Sound Level Propagation

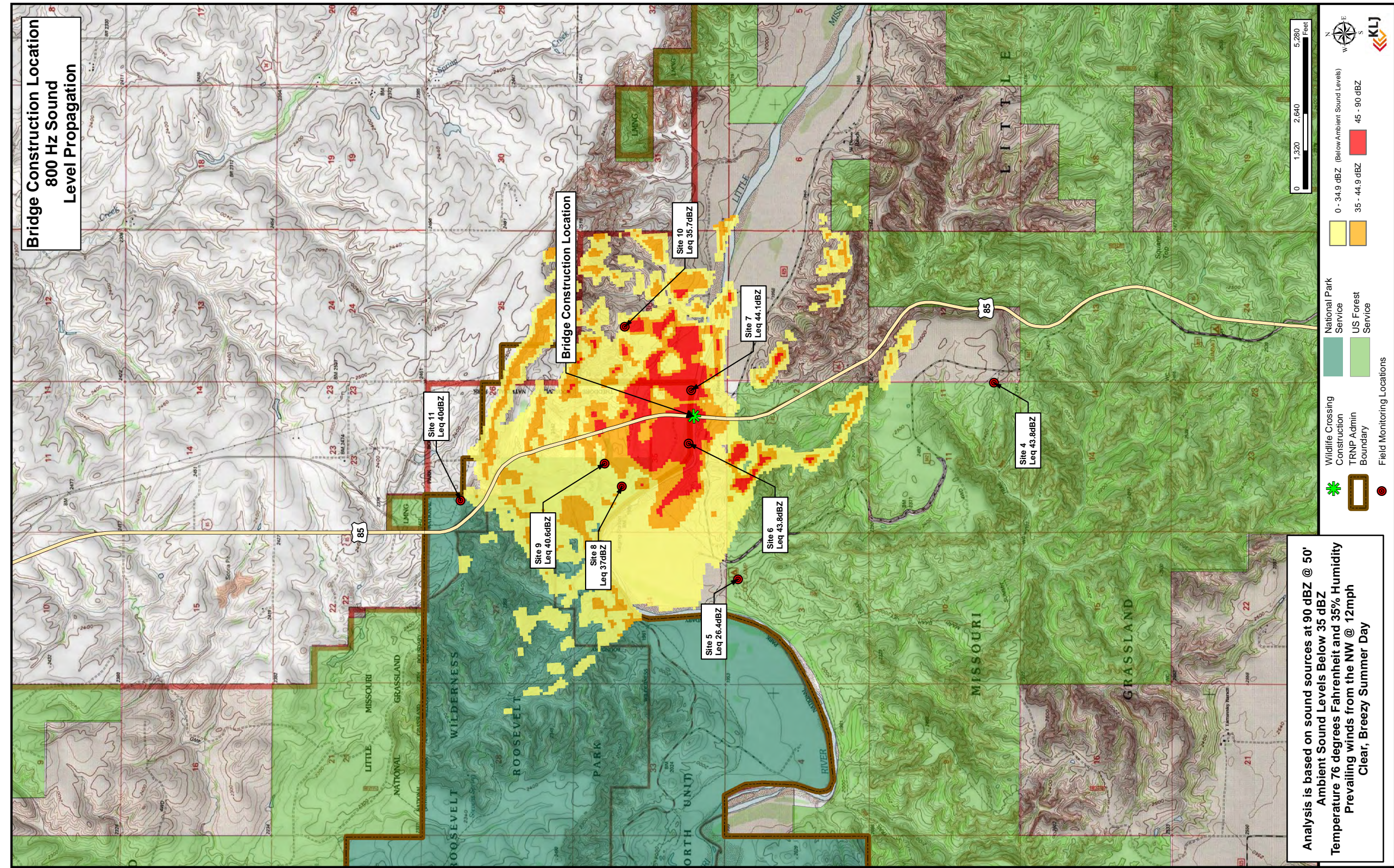


D.2.3. Long X Bridge 630 Hz Sound Level Propagation

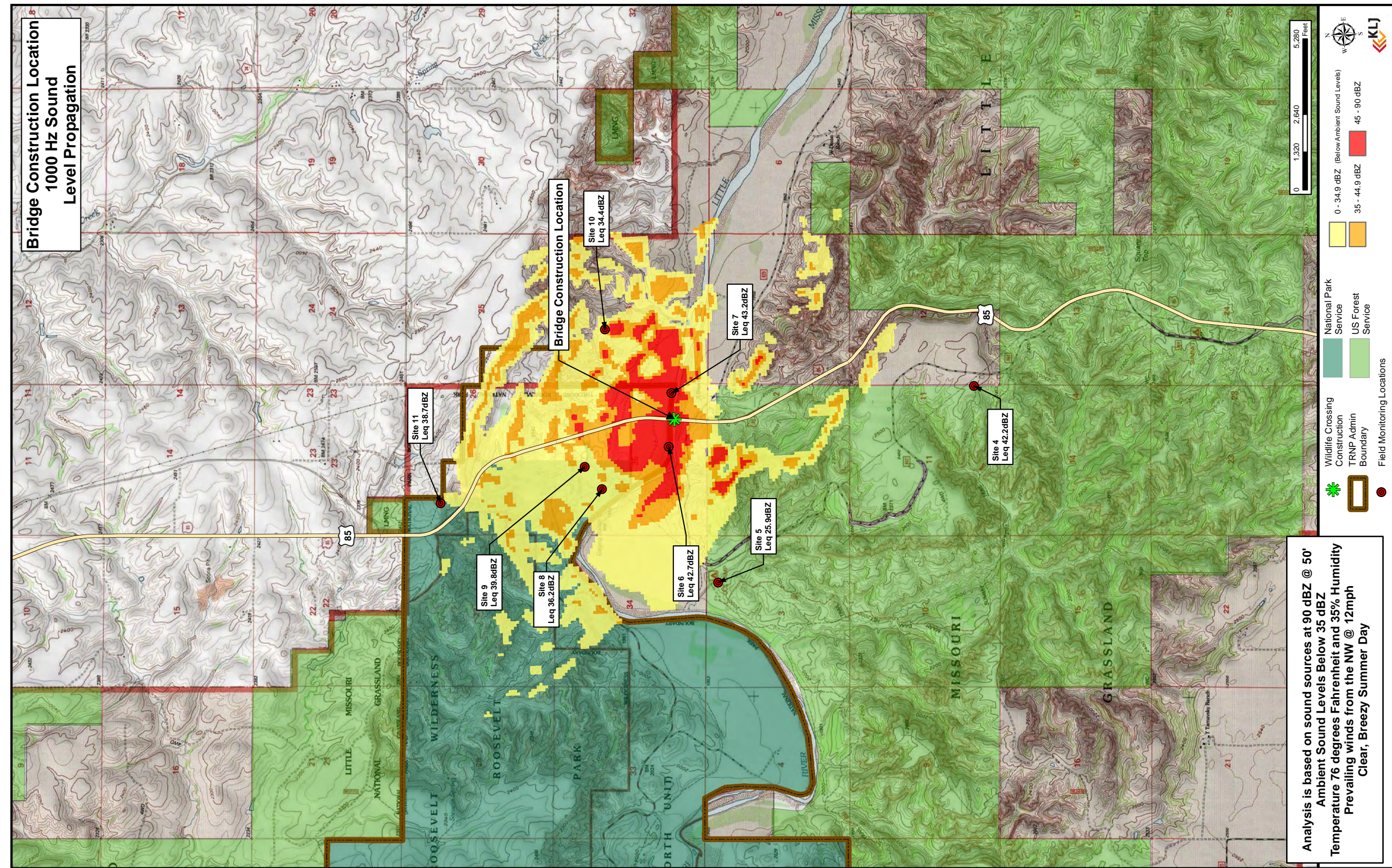


Analysis is based on sound sources at 90 dBZ @ 50'
 Ambient Sound Levels Below 35 dBZ
 Temperature 76 degrees Fahrenheit and 35% Humidity
 Prevailing winds from the NW @ 12mph
 Clear, Breezy Summer Day

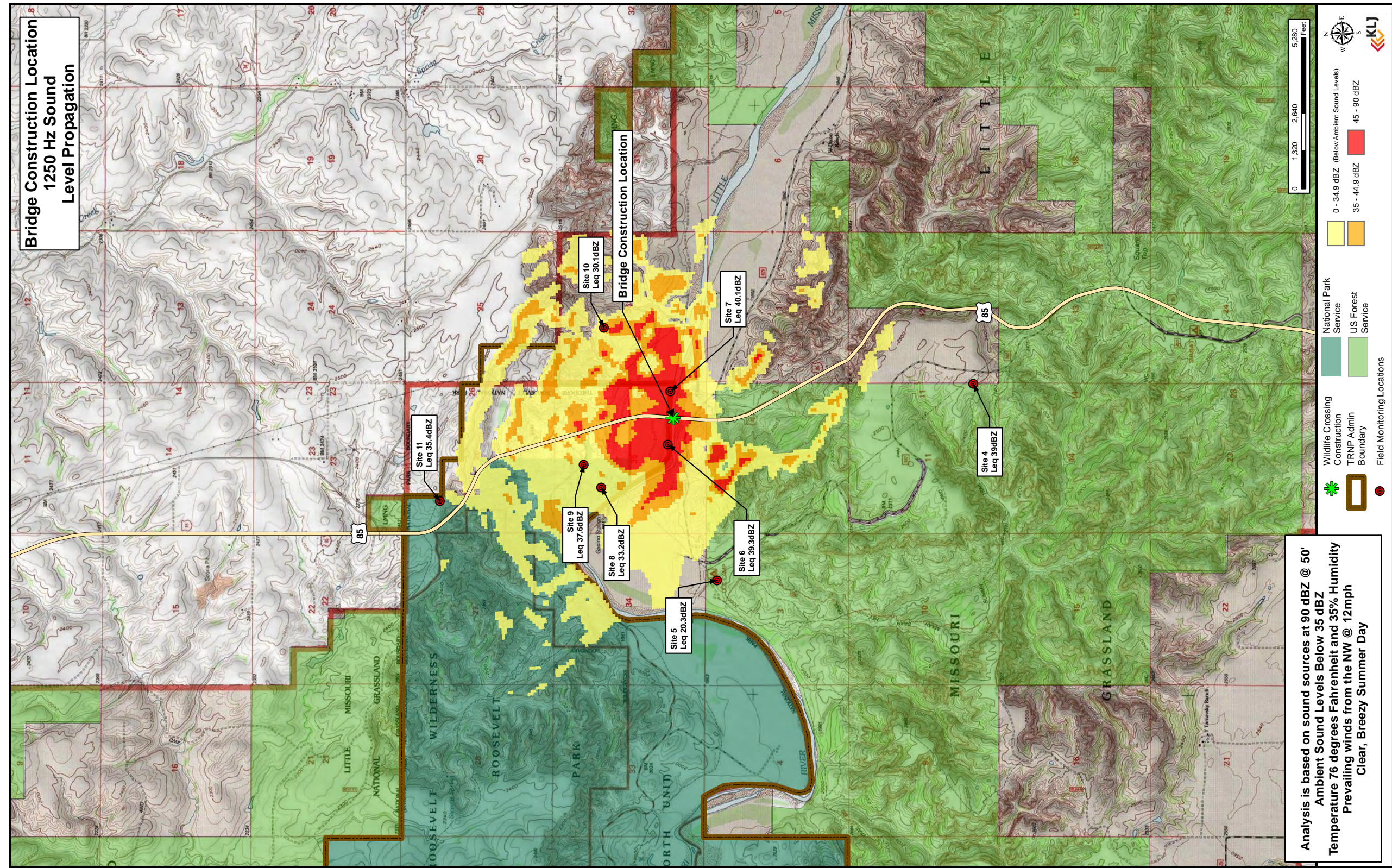
D.2.4. Long X Bridge 800 Hz Sound Level Propagation



D.2.5. Long X Bridge 1,000 Hz (1 kHz) Hz Sound Level Propagation

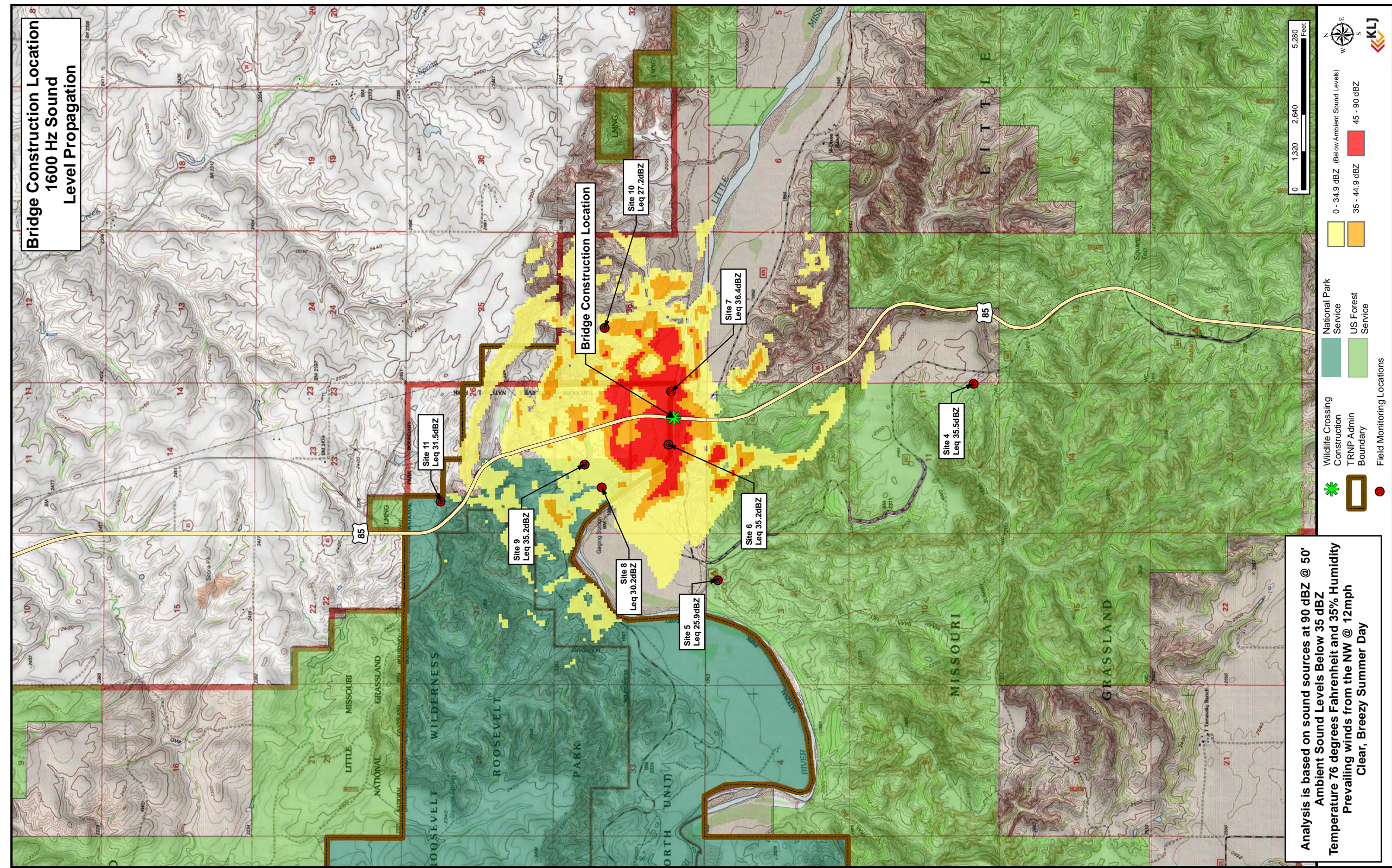


D.2.6. Long X Bridge 1,250 Hz (1.25 kHz) Sound Level Propagation



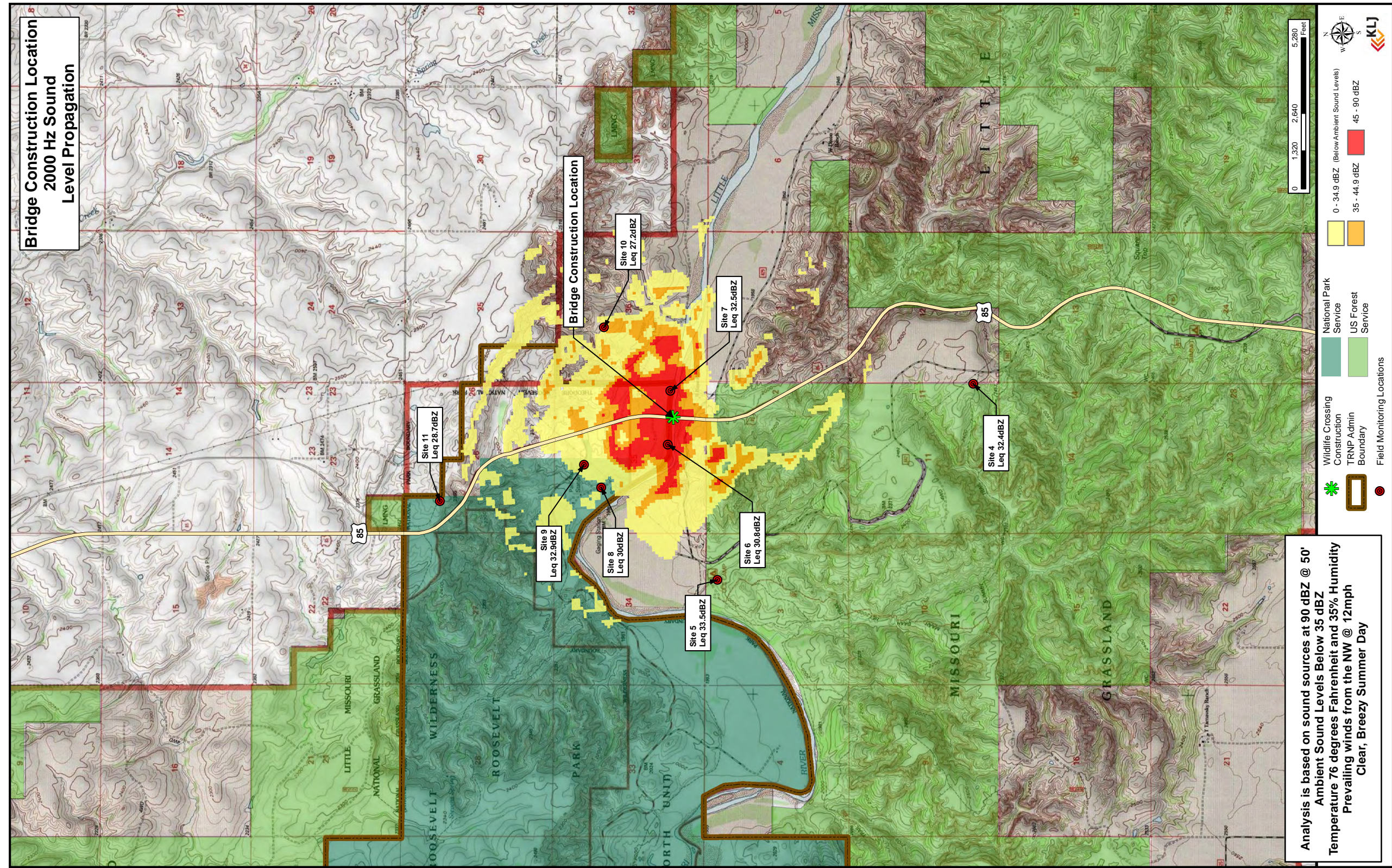
Analysis is based on sound sources at 90 dBZ @ 50' Ambient Sound Levels Below 35 dBZ
 Temperature 76 degrees Fahrenheit and 35% Humidity
 Prevailing winds from the NW @ 12mph
 Clear, Breezy Summer Day

D.2.7. Long X Bridge 1,600 Hz (1.6 kHz) Hz Sound Level Propagation



Analysis is based on sound sources at 90 dBZ @ 50' Ambient Sound Levels Below 35 dBZ
 Temperature 76 degrees Fahrenheit and 35% Humidity
 Prevailing winds from the NW @ 12mph
 Clear, Breezy Summer Day

D.2.8. Long X Bridge 2,000 Hz (2 kHz) Sound Level Propagation



Analysis is based on sound sources at 90 dBZ @ 50' Ambient Sound Levels Below 35 dBZ
 Temperature 76 degrees Fahrenheit and 35% Humidity
 Prevailing winds from the NW @ 12mph
 Clear, Breezy Summer Day

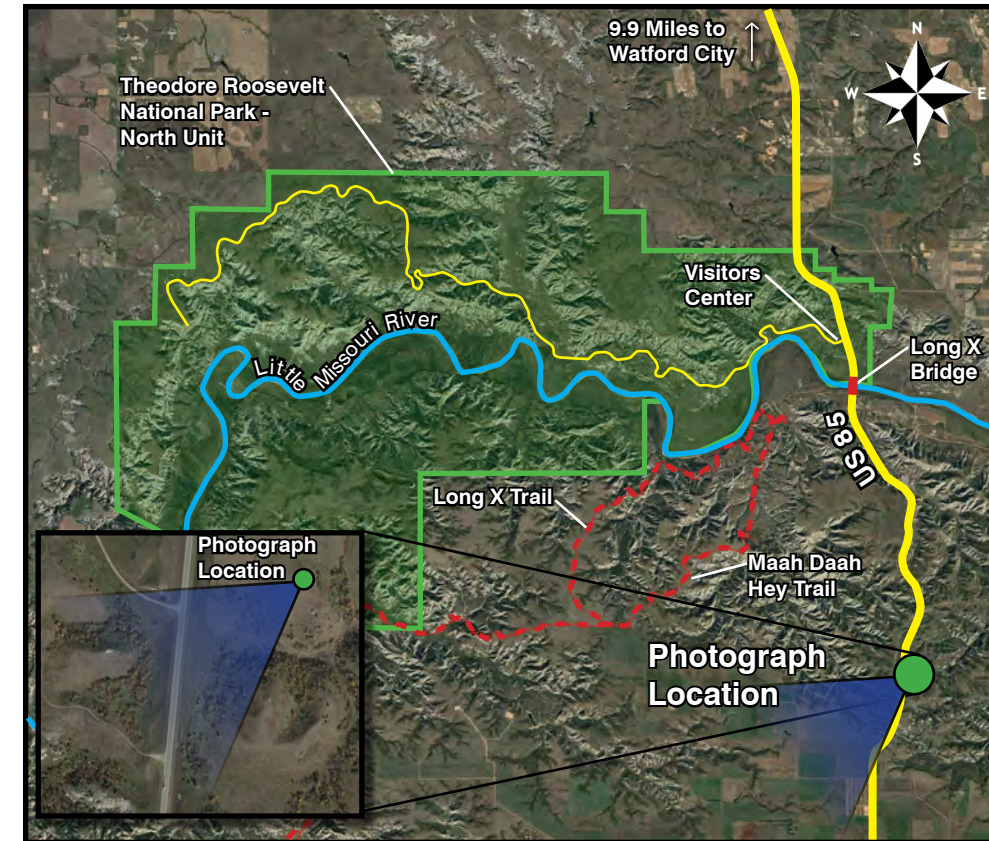
Appendix E. Visual Assessment Results

E.1. Existing Conditions and Simulated Changes	E-3
E.2. Line-of-Sight Models	E-29

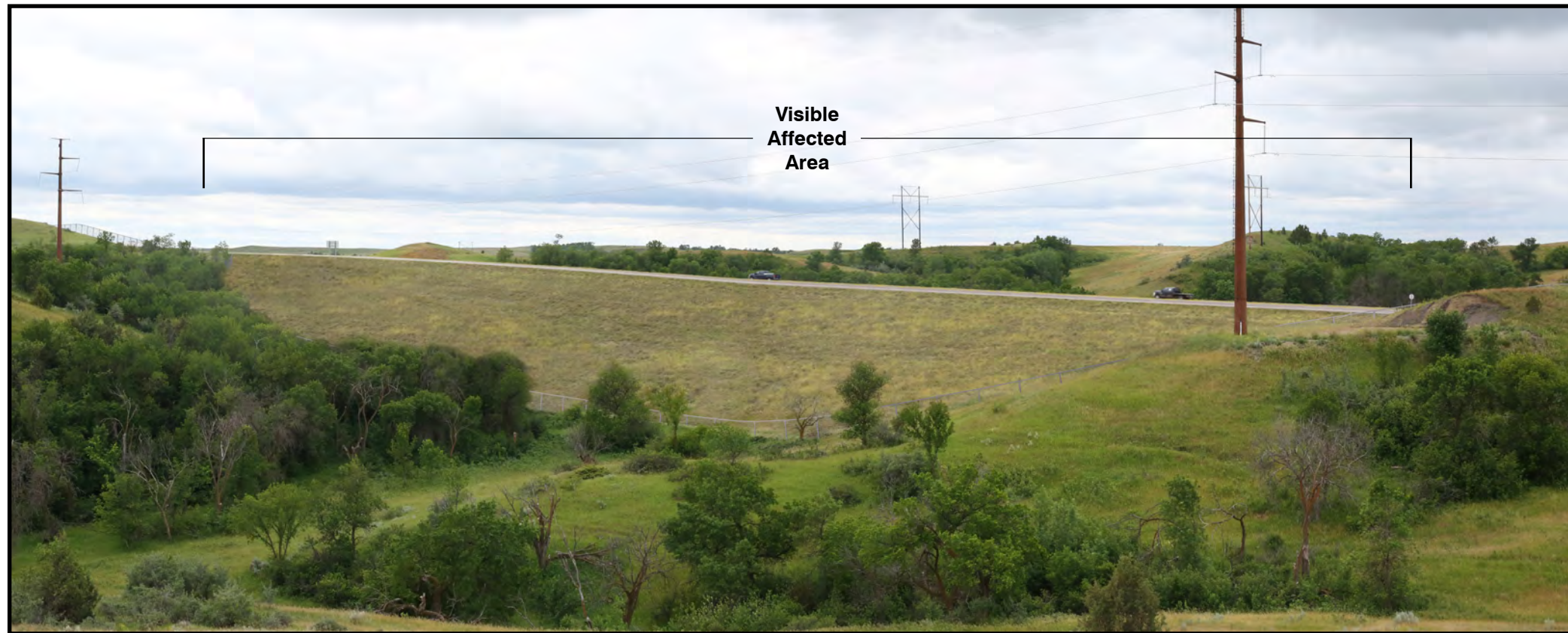
E.1. Existing Conditions and Simulated Changes



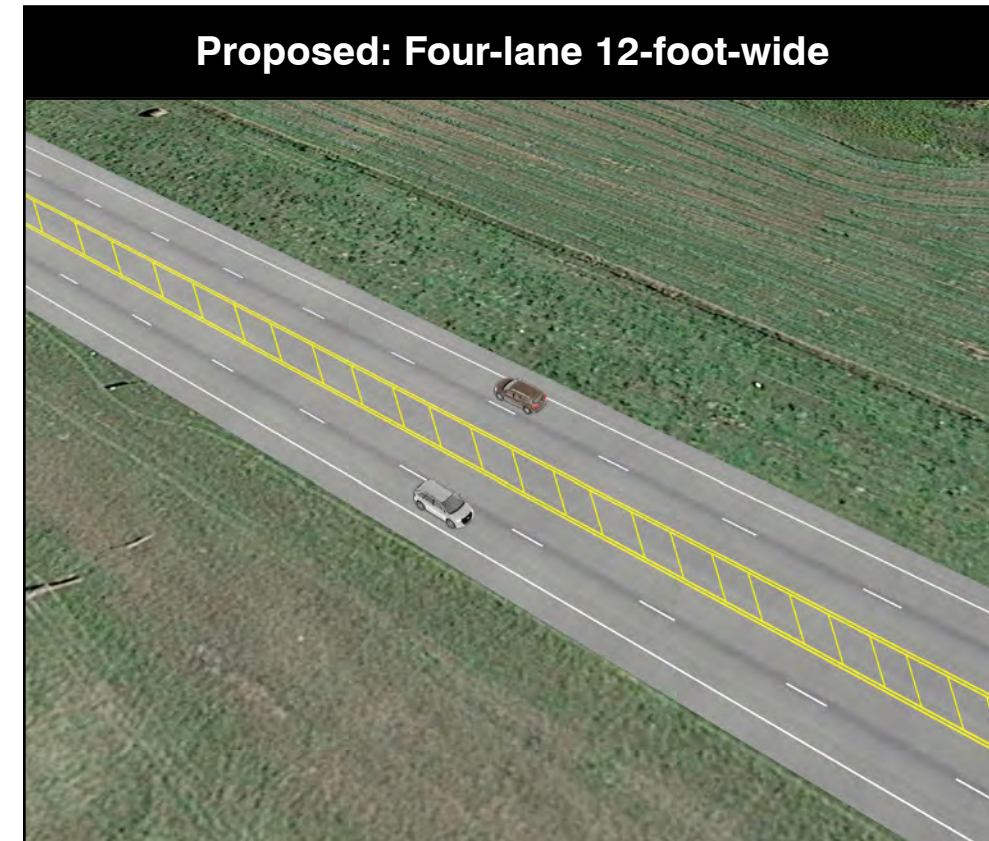
Existing Condition – View southwest from MA 1.31 Backcountry Recreation Non-motorized.



Photograph Location: Viewpoint is approximately 940 feet from US 85.



Simulation – Proposed is visible.

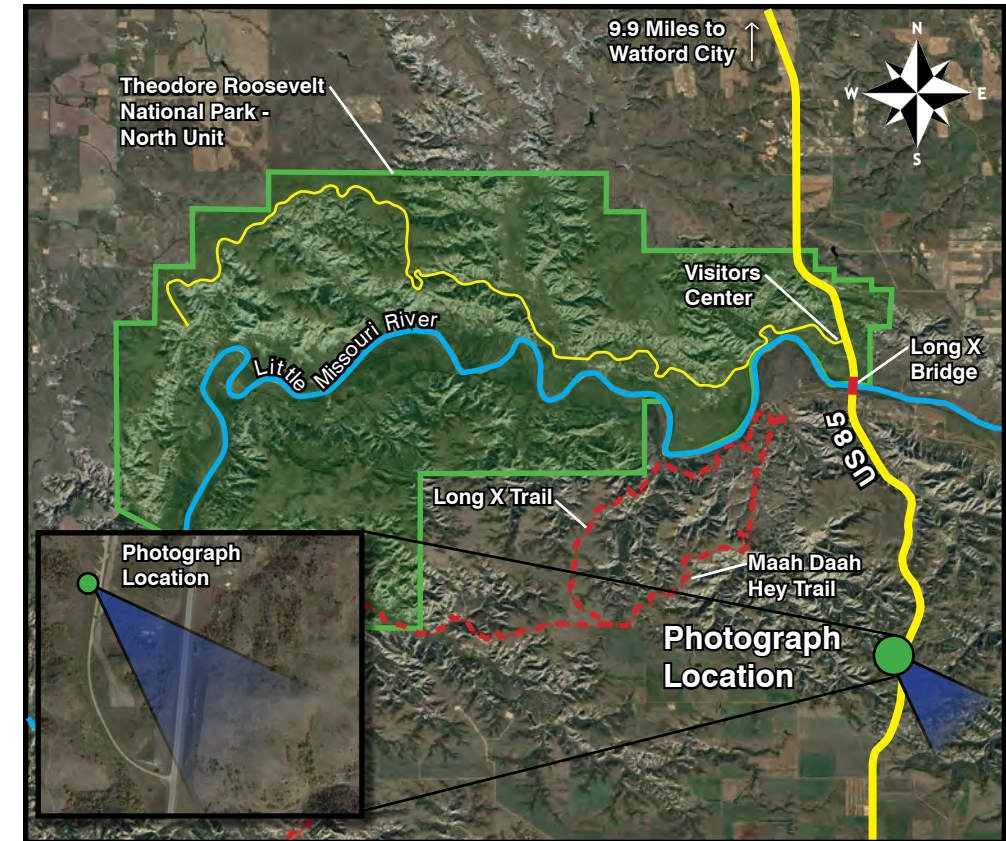


MA 1.31 Backcountry Recreation Non-motorized

Site Conditions: Overcast
 Photo Date and Time: 6-14-17, 11:29 a.m. Focal Length: 50mm
 When printed on 11x17 inch paper, this simulation is meant to be viewed at a distance of 8.8 inches.
 3D models in this simulation were prepared based on preliminary engineering and may change based on final engineering and design.



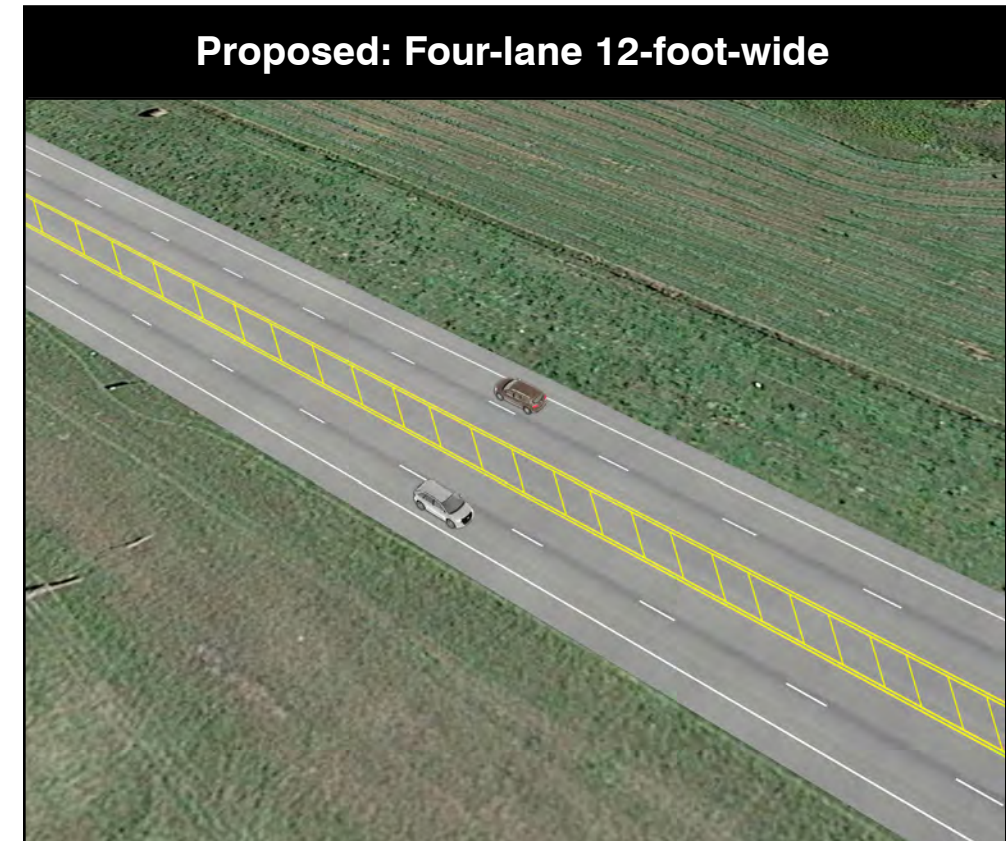
Existing Condition – View southeast from Summit Campground.



Photograph Location: Viewpoint is approximately 900 feet from US 85.



Simulation – Proposed is visible.

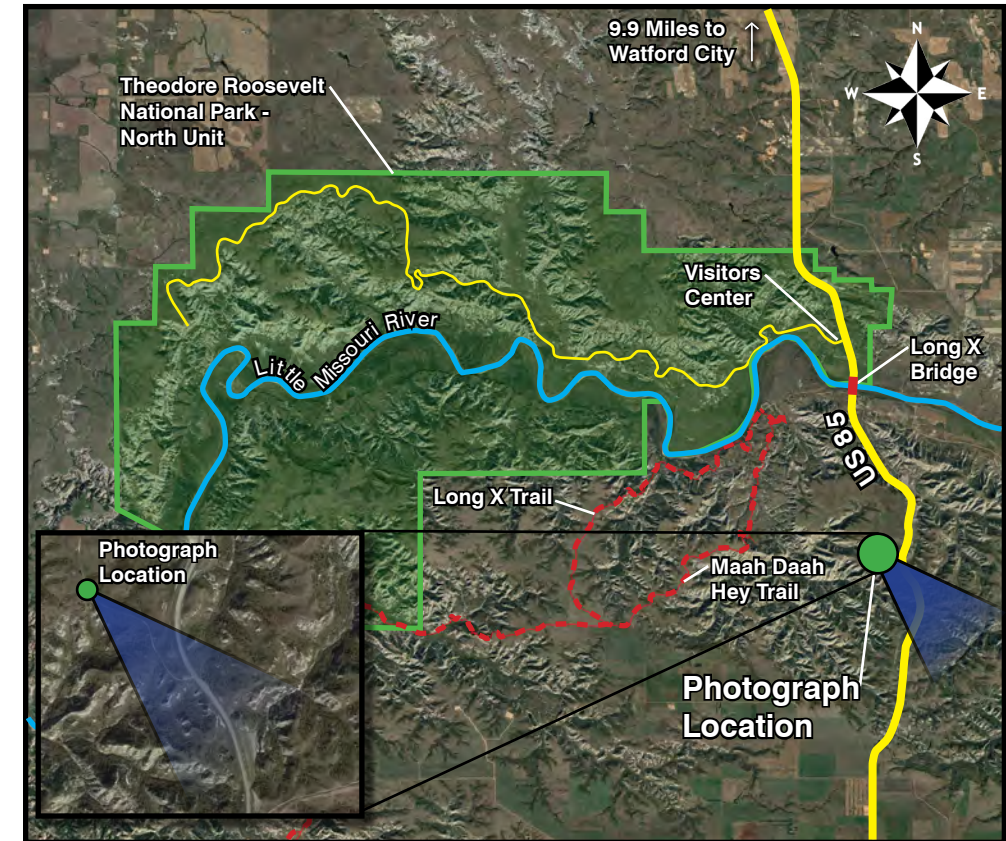


Summit Campground

Site Conditions: Overcast
 Photo Date and Time: 6-14-17, 11:13 a.m. Focal Length: 50mm
 When printed on 11x17 inch paper, this simulation is meant to be viewed at a distance of 15 inches.
 3D models in this simulation were prepared based on preliminary engineering and may change based on final engineering and design.



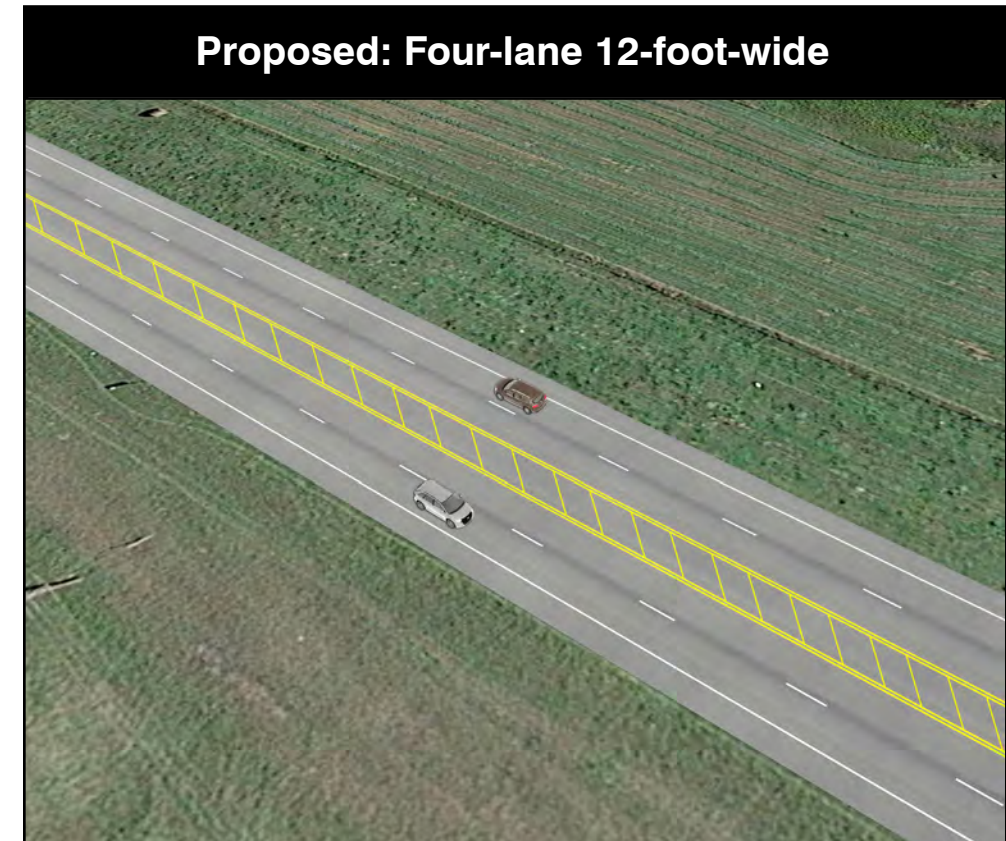
Existing Condition – View southeast from MA 1.2a Suitable for Wilderness.



Photograph Location: Viewpoint is approximately 0.5 miles from US 85.



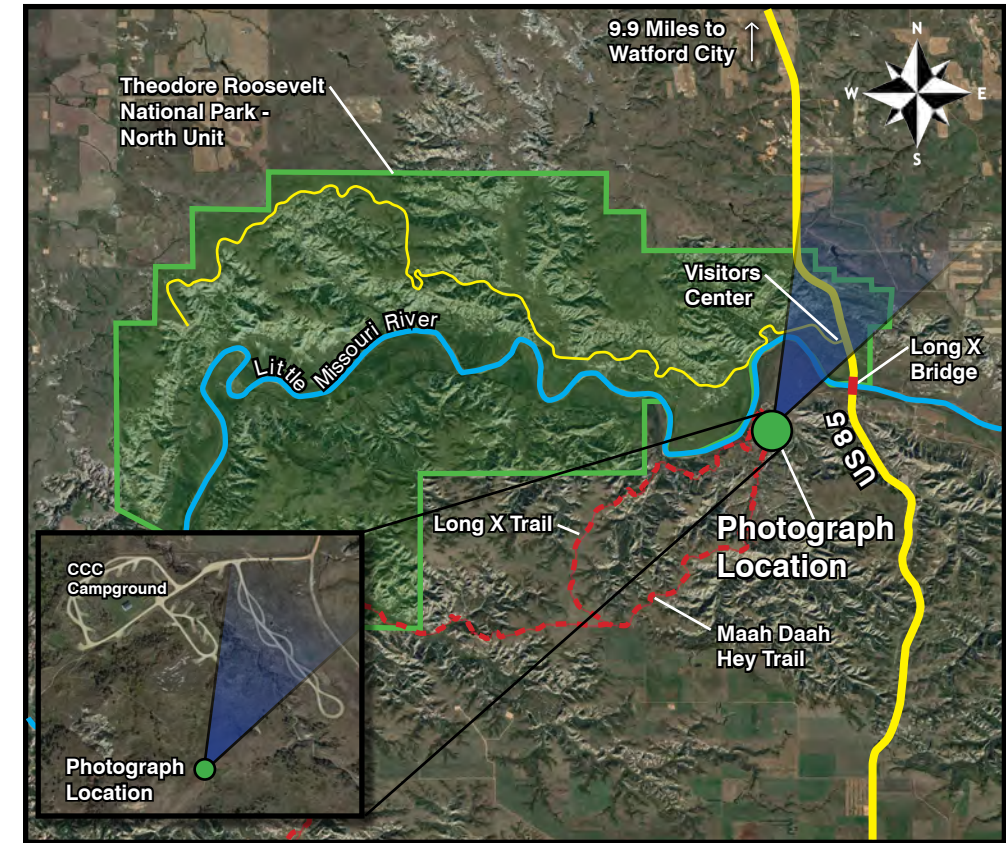
Simulation – Proposed is visible.



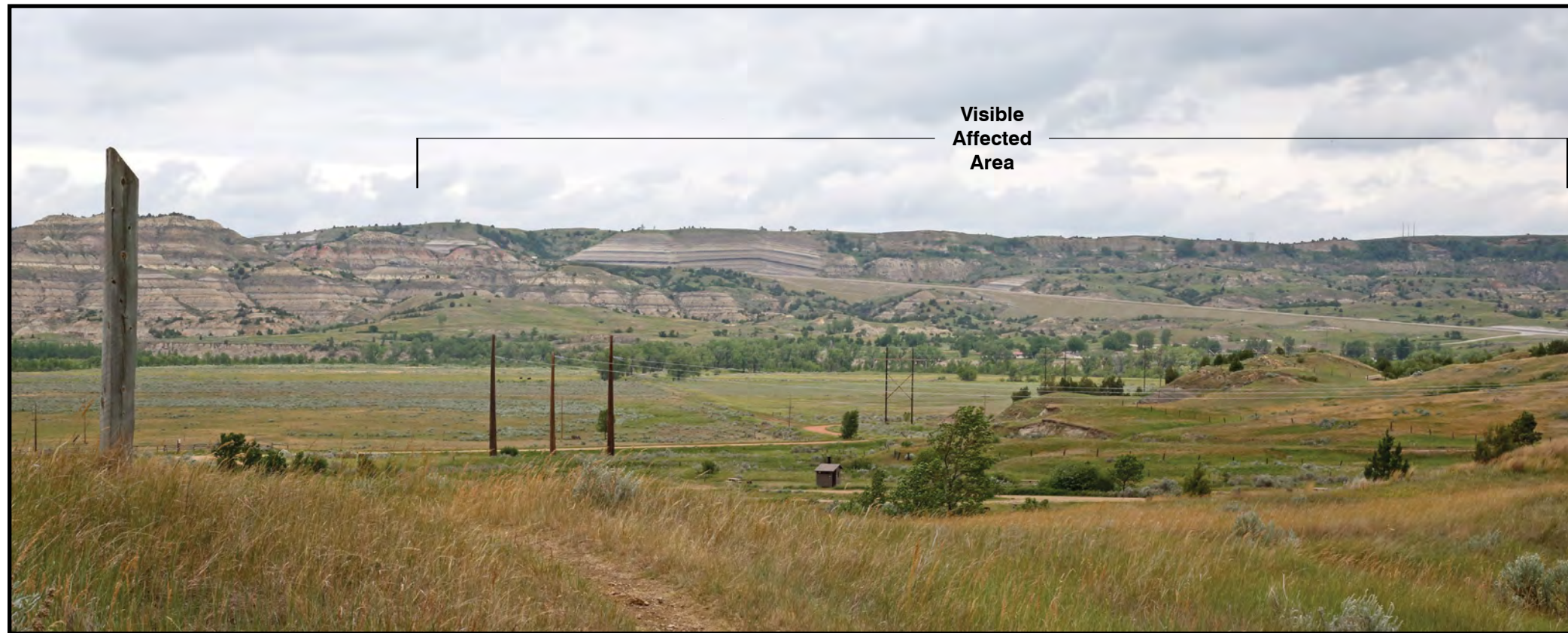
Site Conditions: Partly Cloudy
 Photo Date and Time: 6-15-17, 4:13 p.m. Focal Length: 50mm
 When printed on 11x17 inch paper, this simulation is meant to be viewed at a distance of 15 inches.
 3D models in this simulation were prepared based on preliminary engineering and may change based on final engineering and design.



Existing Condition – View northeast from Maah Daah Hey Trail towards CCC Campground.



Photograph Location: Viewpoint is approximately 1.75 miles from US 85.



Simulation – Proposed is visible.

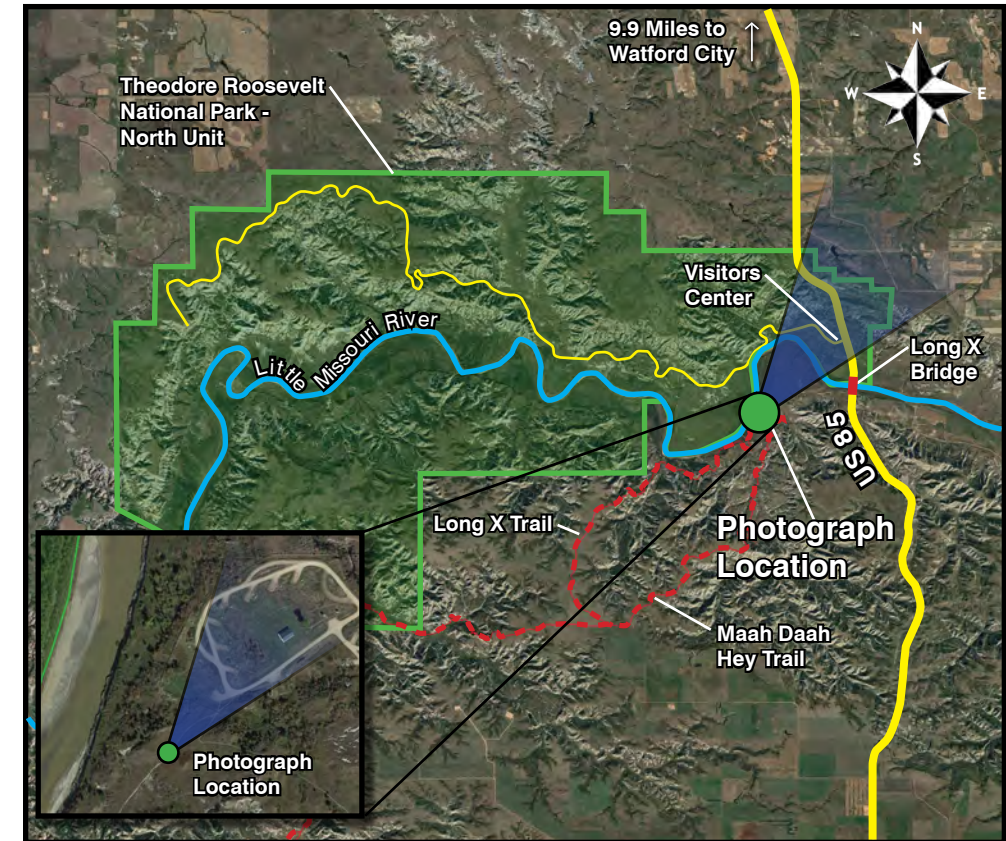


Proposed: Four-lane 12-foot-wide

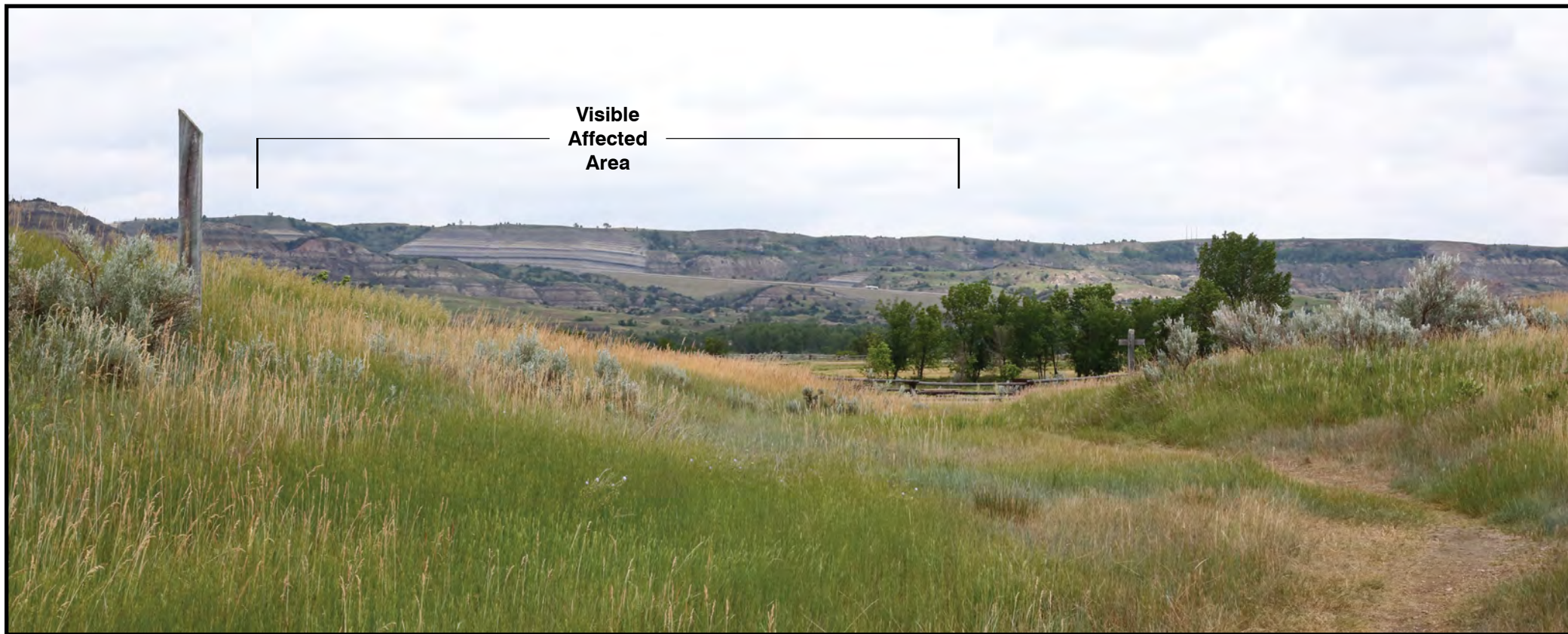
Site Conditions: Overcast - Moderately Hazy
 Photo Date and Time: 6-14-17, 3:43 p.m. Focal Length: 50mm
 When printed on 11x17 inch paper, this simulation is meant to be viewed at a distance of 15 inches.
 3D models in this simulation were prepared based on preliminary engineering and may change based on final engineering and design.



Existing Condition – View northeast from Long X Trail towards CCC Campground.



Photograph Location: Viewpoint is approximately 1.75 miles from US 85.



Simulation – Proposed is visible.



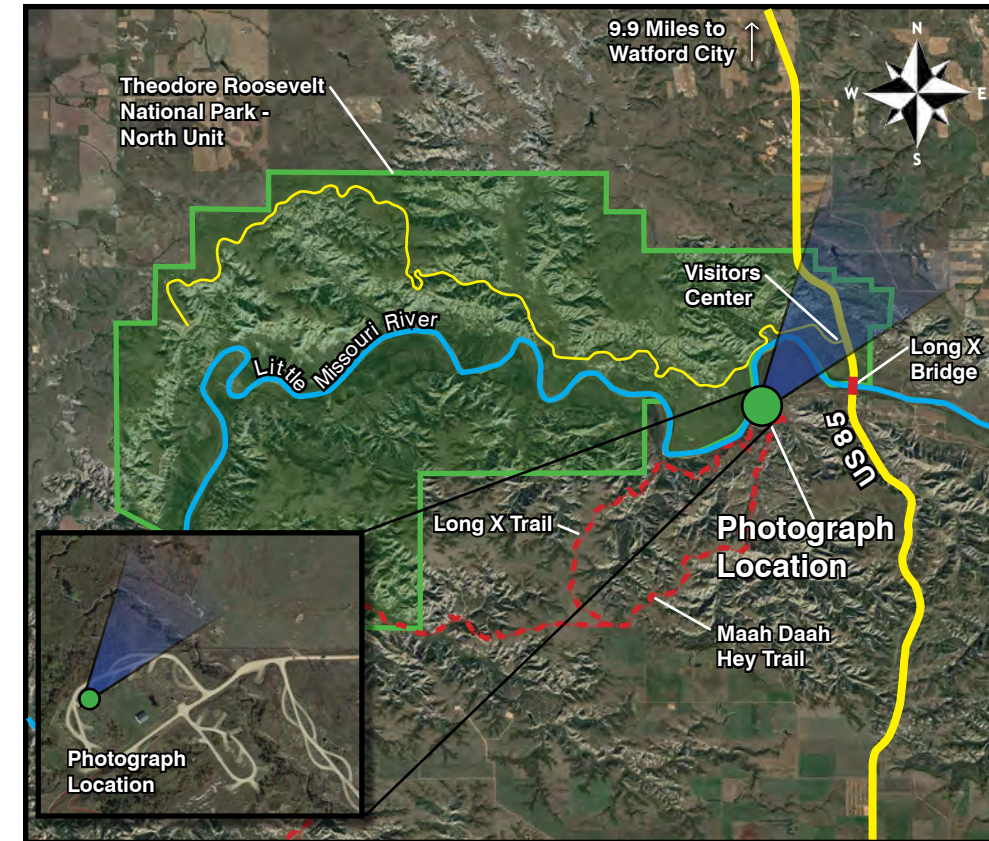
Proposed: Four-lane 12-foot-wide

Long X Trail

Site Conditions: Overcast - Moderately Hazy
 Photo Date and Time: 6-14-17, 12:55 p.m. Focal Length: 50mm
 When printed on 11x17 inch paper, this simulation is meant to be viewed at a distance of 15 inches.
 3D models in this simulation were prepared based on preliminary engineering and may change based on final engineering and design.



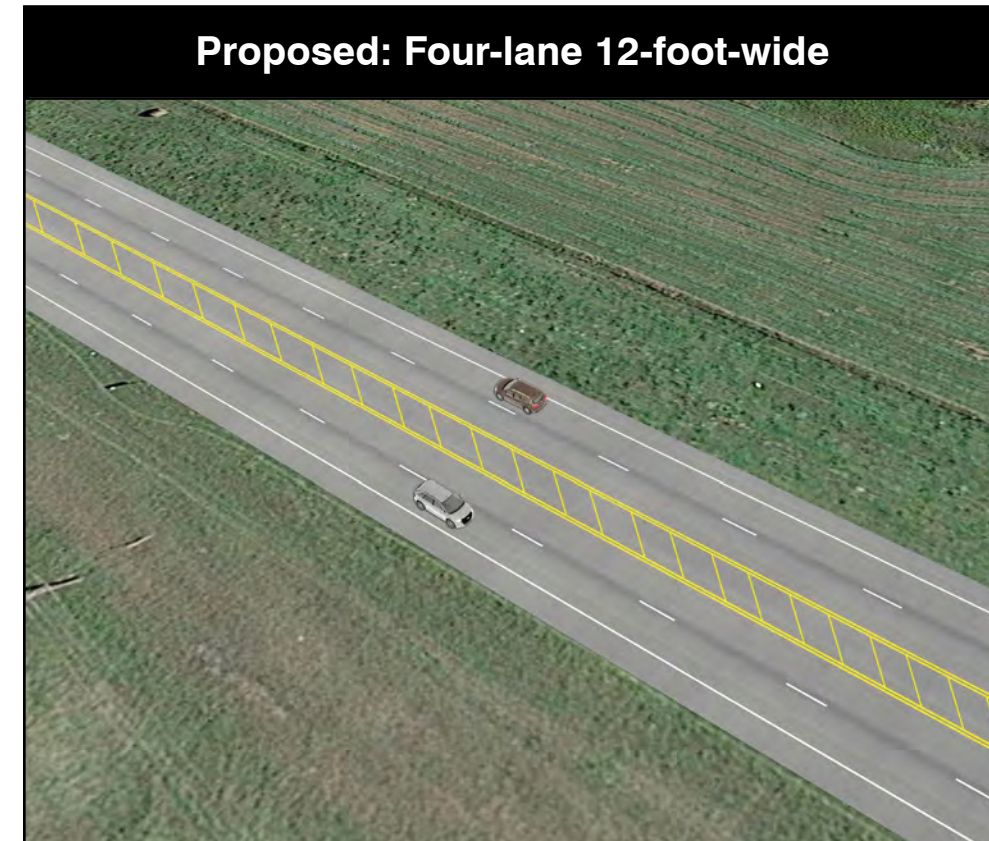
Existing Condition – View northeast from CCC Campground.



Photograph Location: Viewpoint is approximately 1.6 miles from US 85.



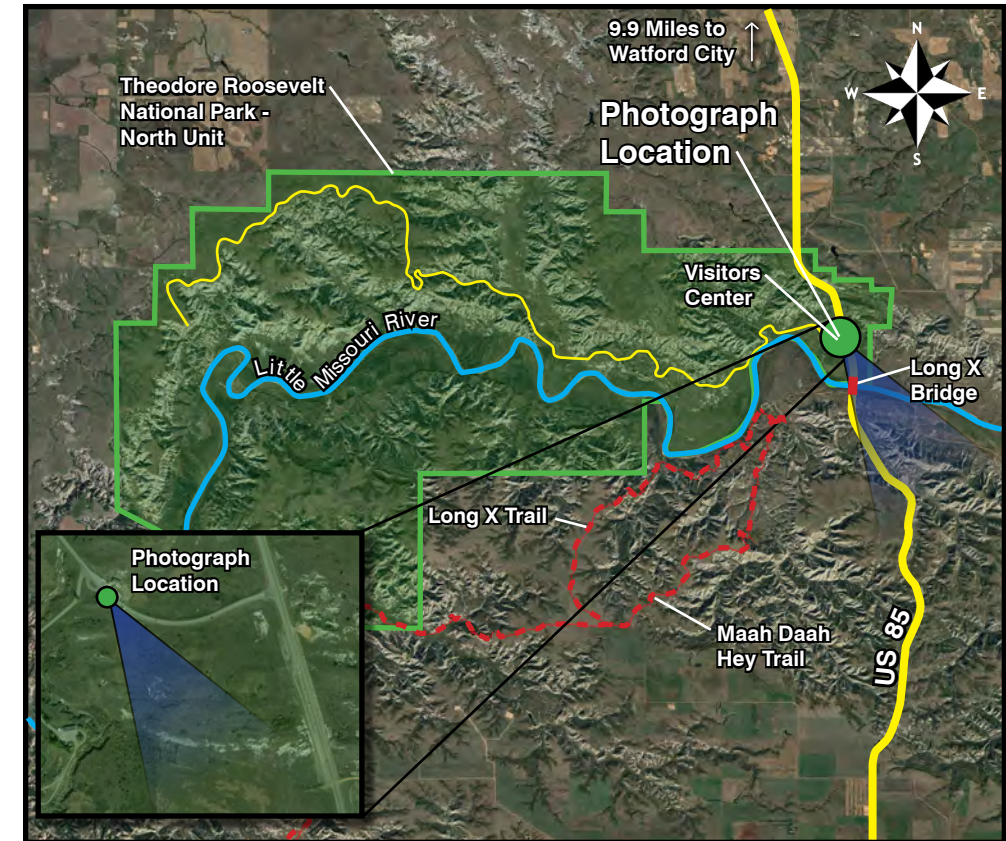
Simulation – Proposed is visible.



Site Conditions: Overcast
 Photo Date and Time: 6-14-17, 12:43 p.m. Focal Length: 50mm
 When printed on 11x17 inch paper, this simulation is meant to be viewed at a distance of 15 inches.
 3D models in this simulation were prepared based on preliminary engineering and may change based on final engineering and design.



Existing Condition – View southeast from Temporary Administrative Center within Theodore Roosevelt National Park - North Unit.



Photograph Location: Viewpoint is approximately 0.7 miles from Long X Bridge.



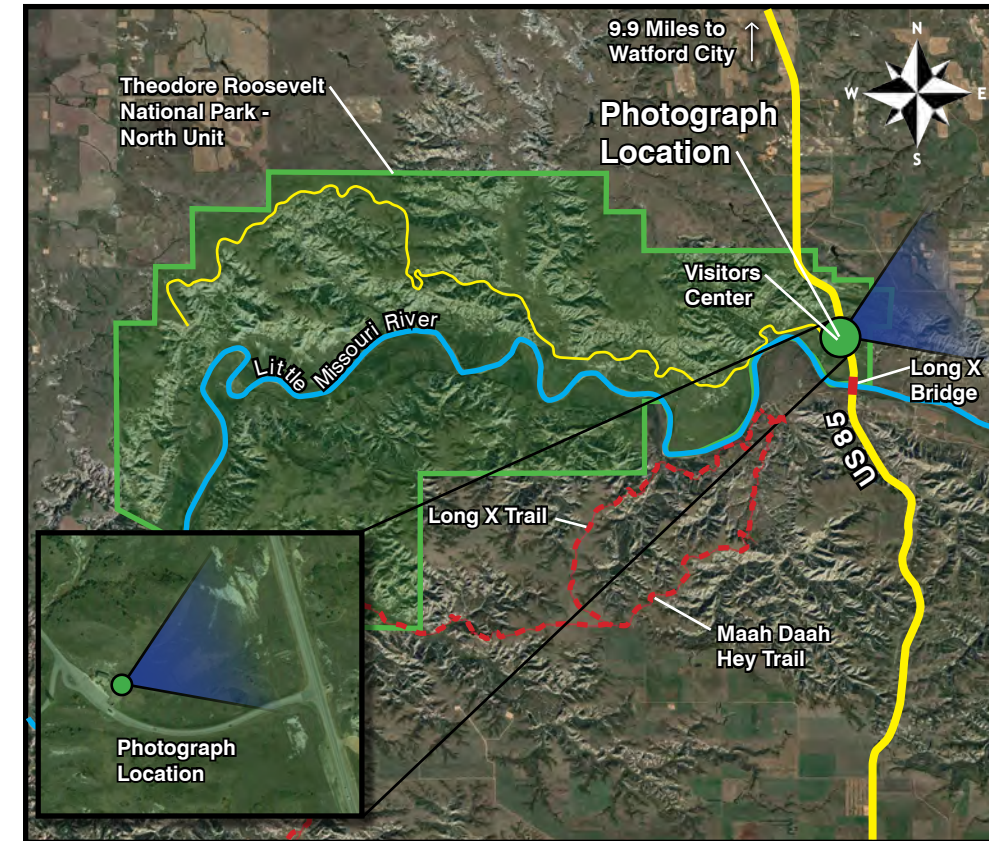
Simulation – Proposed is visible.



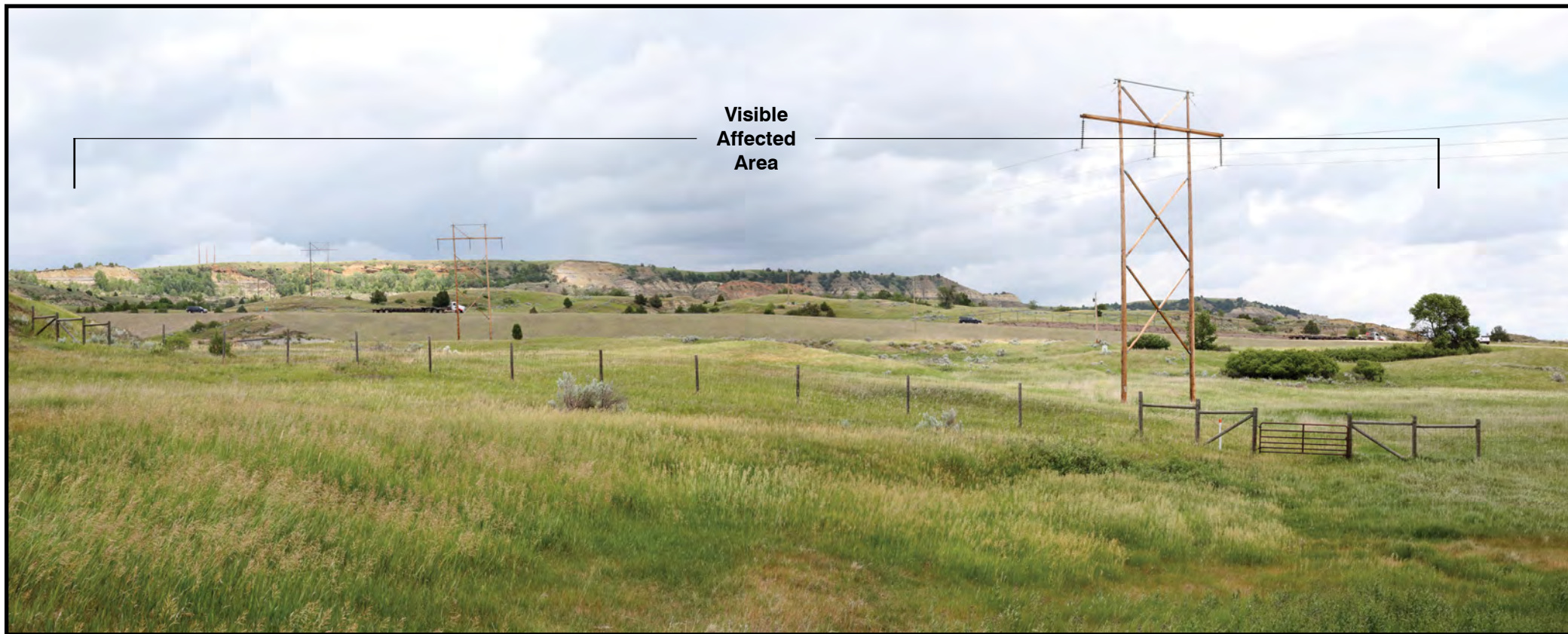
Site Conditions: Overcast - Moderately Hazy
 Photo Date and Time: 6-14-17, 2:08 p.m. Focal Length: 50mm
 When printed on 11x17 inch paper, this simulation is meant to be viewed at a distance of 15 inches.
 3D models in this simulation were prepared based on preliminary engineering and may change based on final engineering and design.



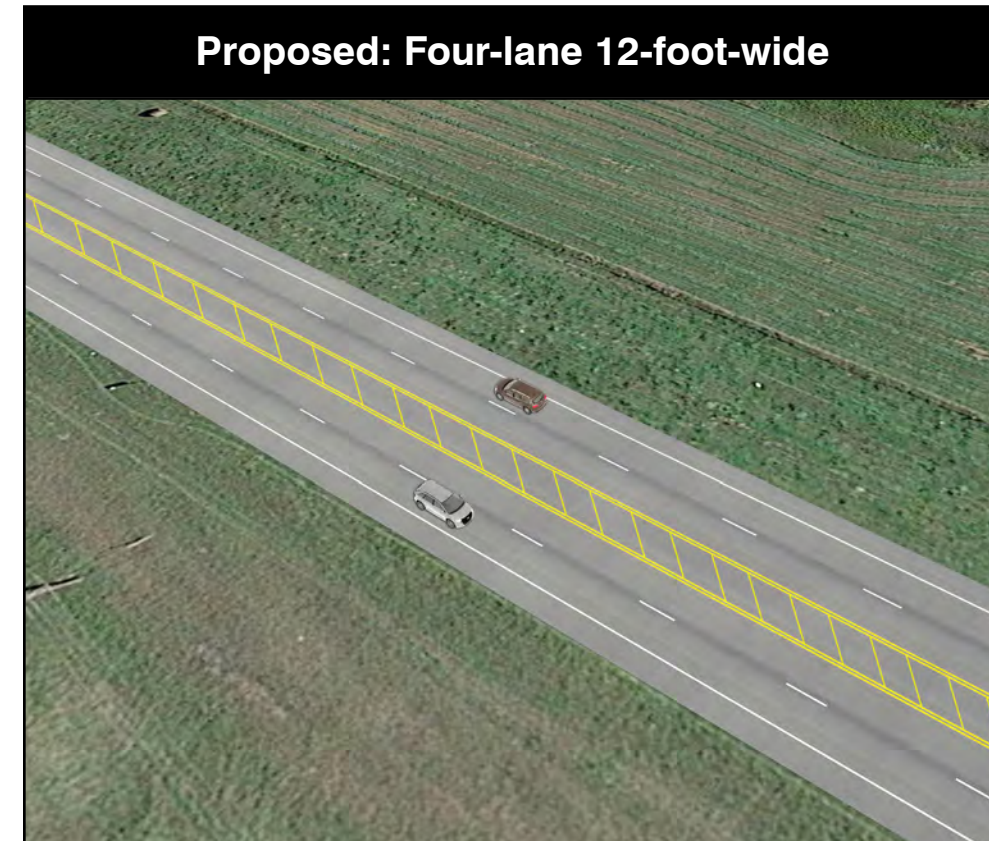
Existing Condition – View northeast from Future Visitors Center within Theodore Roosevelt National Park - North Unit.



Photograph Location: Viewpoint is approximately 0.2 miles from US 85.



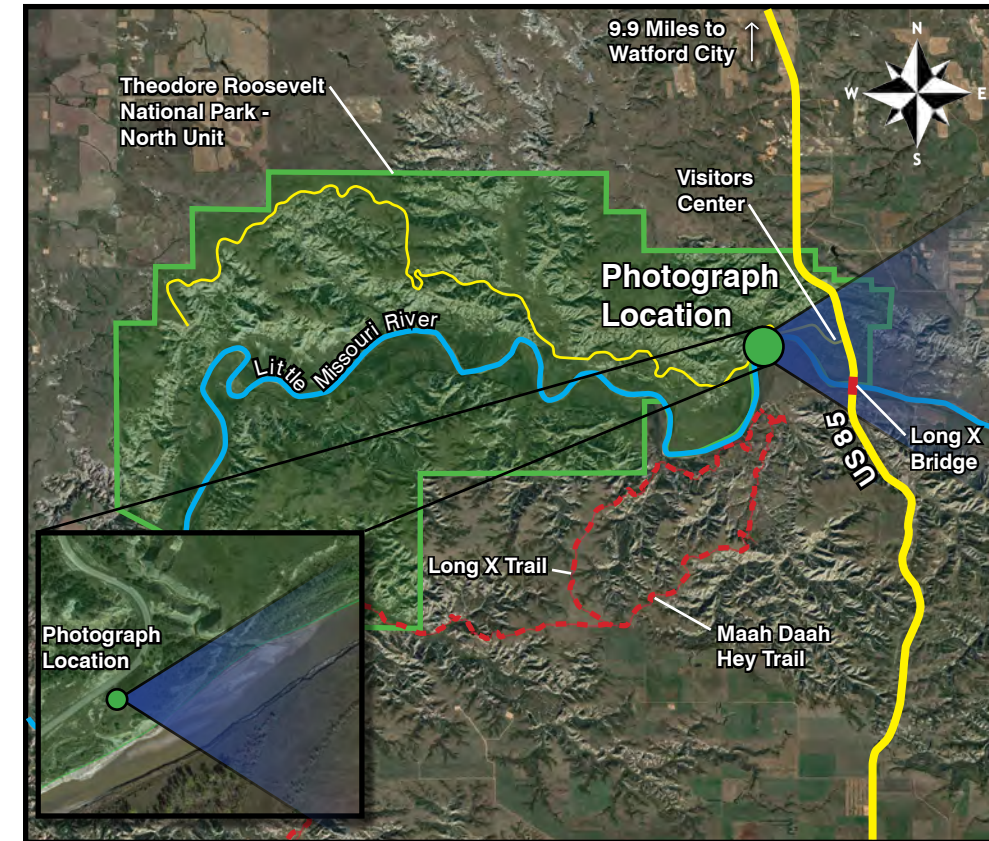
Simulation – Proposed is visible.



Site Conditions: Overcast
 Photo Date and Time: 6-14-17, 2:28 p.m. Focal Length: 50mm
 When printed on 11x17 inch paper, this simulation is meant to be viewed at a distance of 8.3 inches.
 3D models in this simulation were prepared based on preliminary engineering and may change based on final engineering and design.



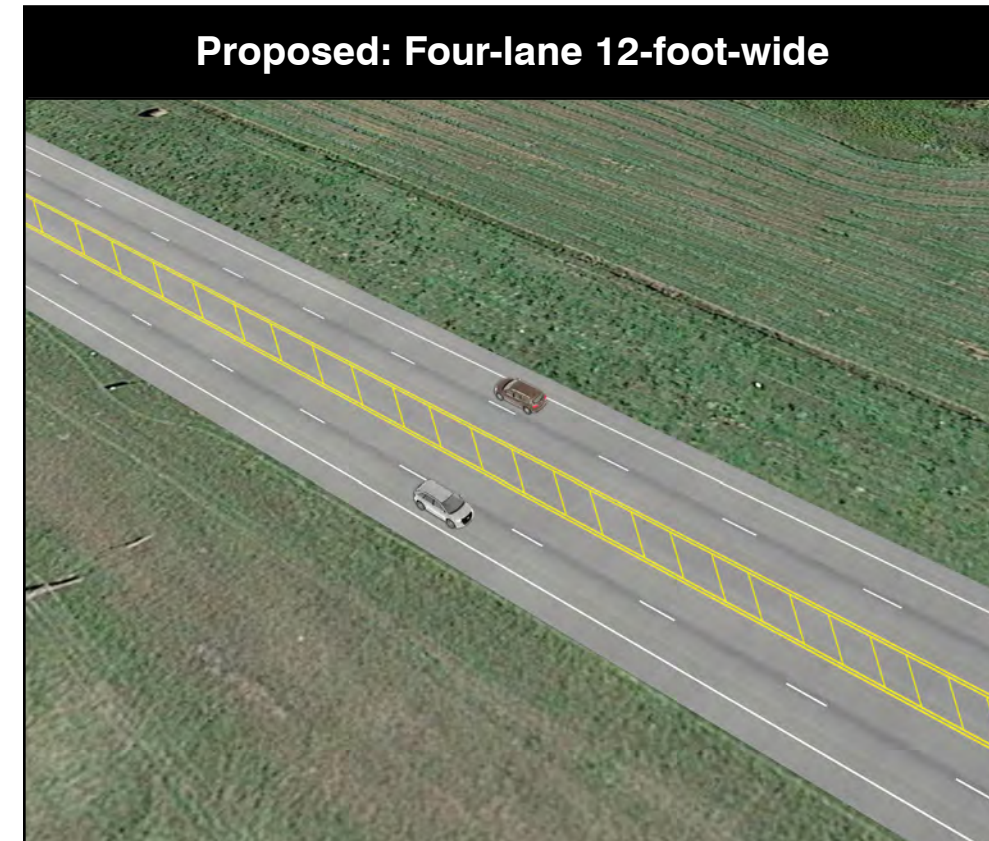
Existing Condition – View east from River Overlook within Theodore Roosevelt National Park - North Unit.



Photograph Location: Viewpoint is approximately 1.1 miles from US 85.



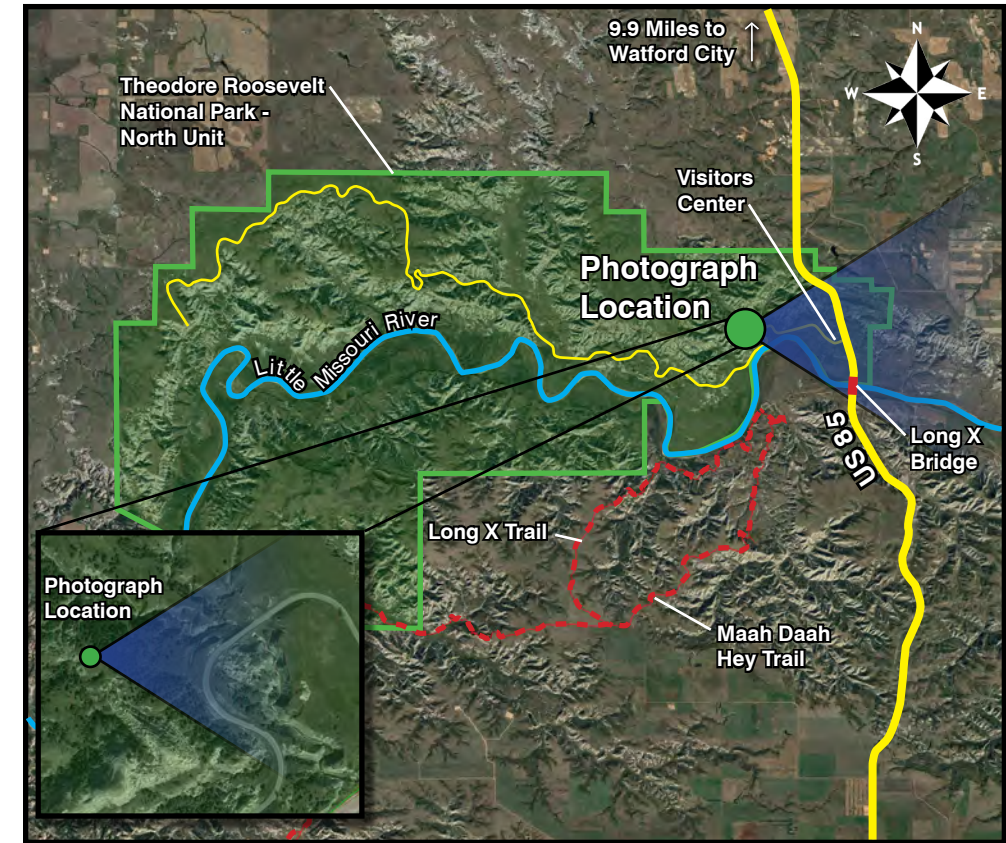
Simulation – Proposed is visible.



Site Conditions: Moderately Sunny
 Photo Date and Time: 6-15-17, 2:59 p.m. Focal Length: 50mm
 When printed on 11x17 inch paper, this simulation is meant to be viewed at a distance of 9.5 inches.
 3D models in this simulation were prepared based on preliminary engineering and may change based on final engineering and design.



Existing Condition – View east from Buckhorn Trail within Theodore Roosevelt National Park - North Unit.



Photograph Location: Viewpoint is approximately 1.25 miles from US 85.



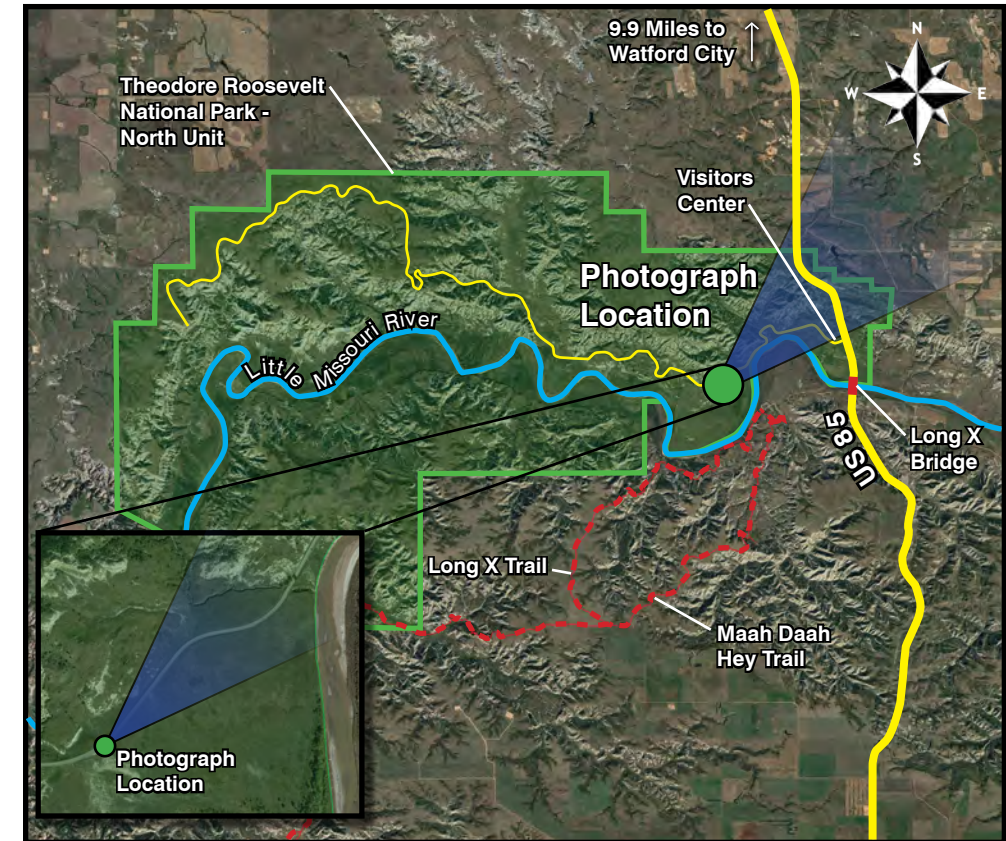
Simulation – Proposed is visible.



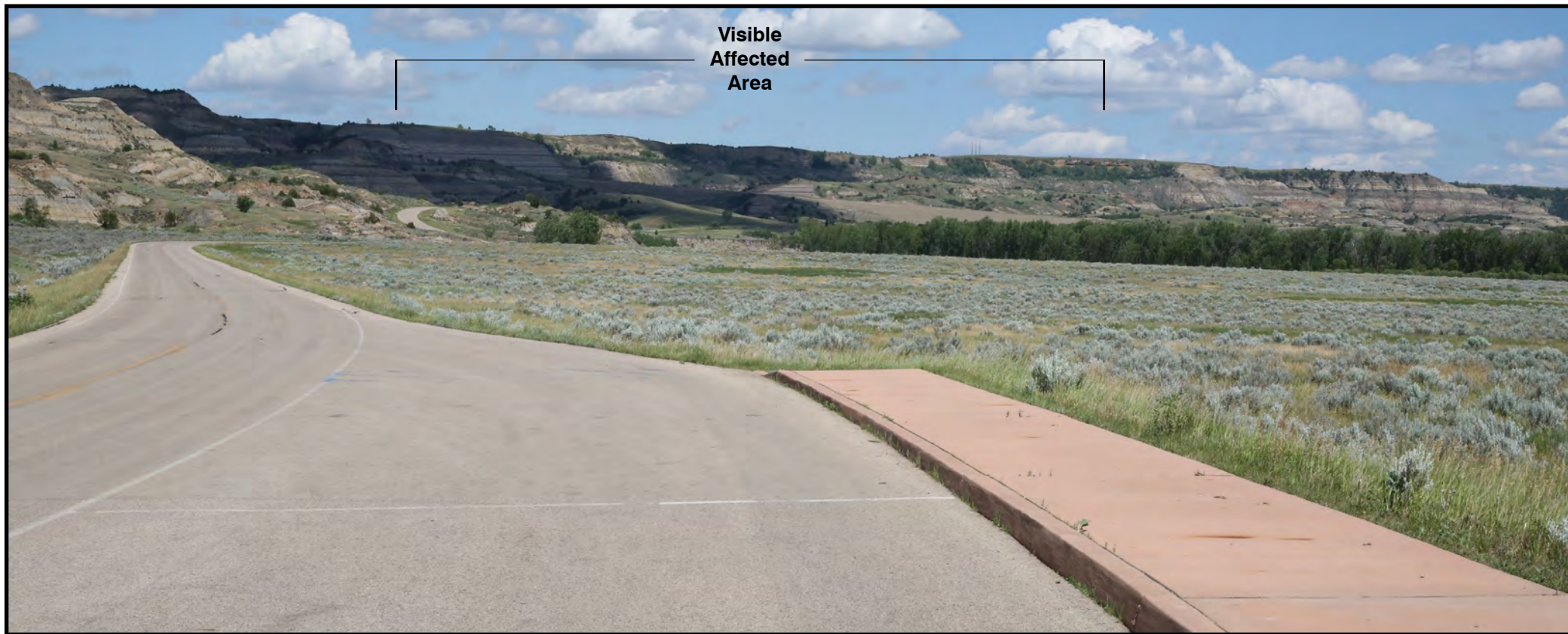
Site Conditions: Moderately Sunny
 Photo Date and Time: 6-15-17, 3:21 p.m. Focal Length: 50mm
 When printed on 11x17 inch paper, this simulation is meant to be viewed at a distance of 8.5 inches.
 3D models in this simulation were prepared based on preliminary engineering and may change based on final engineering and design.



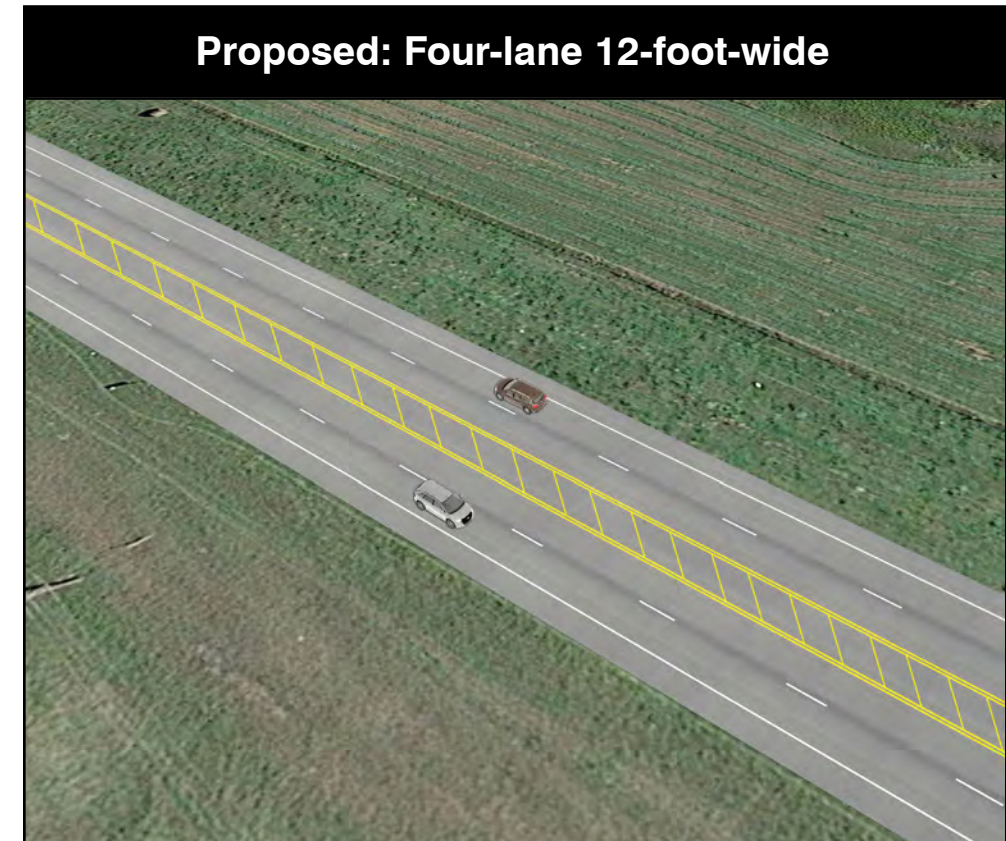
Existing Condition – View northeast from Longhorn Pullout within Theodore Roosevelt National Park - North Unit.



Photograph Location: Viewpoint is approximately 1.8 miles from US 85.



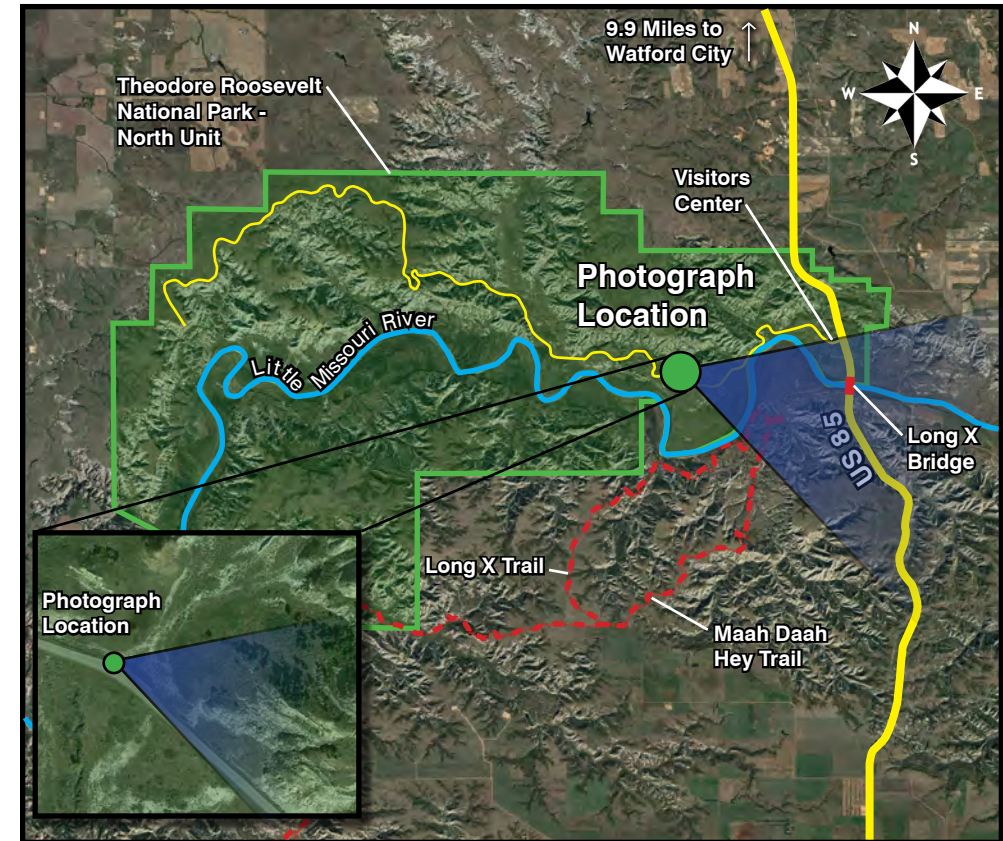
Simulation – Proposed is visible.



Site Conditions: Moderately Sunny
 Photo Date and Time: 6-15-17, 2:41 p.m. Focal Length: 50mm
 When printed on 11x17 inch paper, this simulation is meant to be viewed at a distance of 15 inches.
 3D models in this simulation were prepared based on preliminary engineering and may change based on final engineering and design.



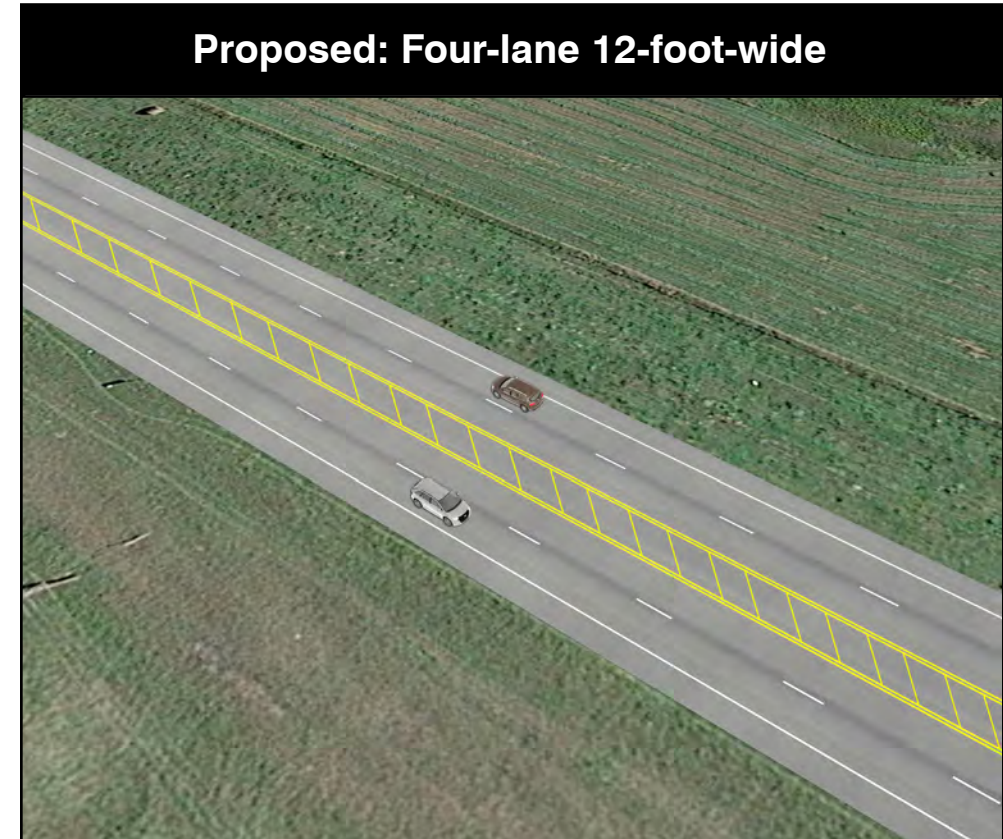
Existing Condition – View east from Slump Block Pullout within Theodore Roosevelt National Park - North Unit.



Photograph Location: Viewpoint is approximately 2.3 miles from US 85.



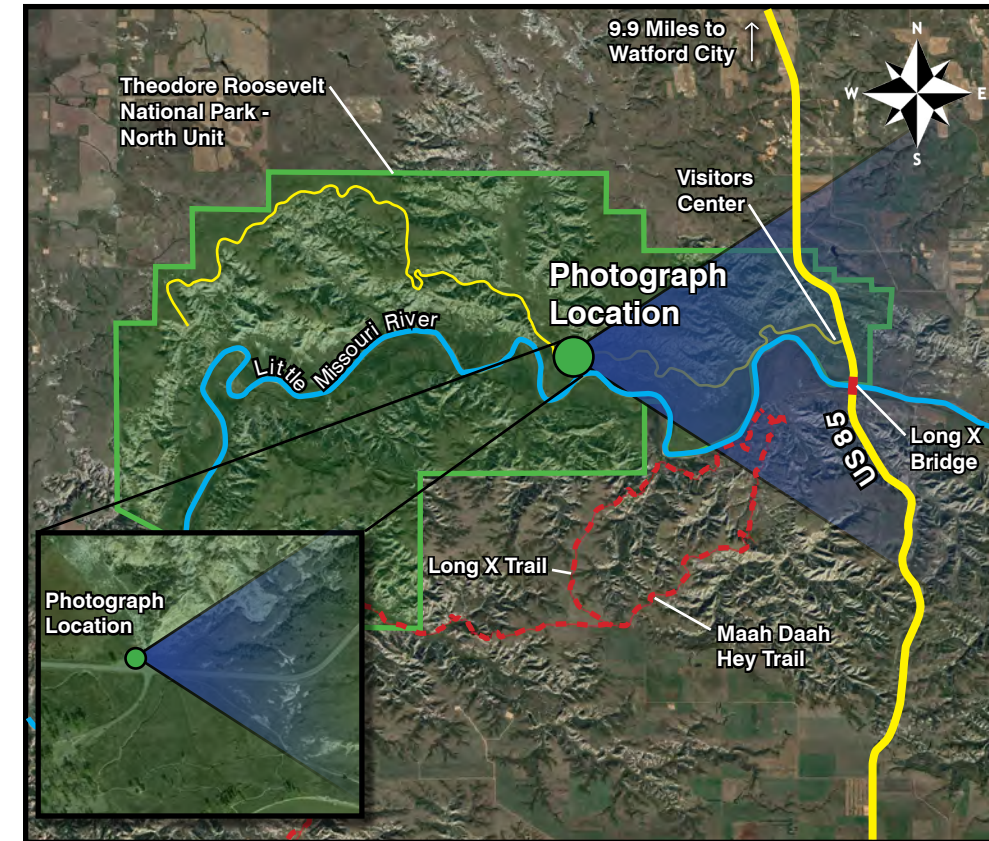
Simulation – Proposed is completely obstructed by terrain.



Site Conditions: Overcast - Moderately Hazy
 Photo Date and Time: 6-15-17, 2:32 p.m. Focal Length: 50mm
 When printed on 11x17 inch paper, this simulation is meant to be viewed at a distance of 9.6 inches.
 3D models in this simulation were prepared based on preliminary engineering and may change based on final engineering and design.



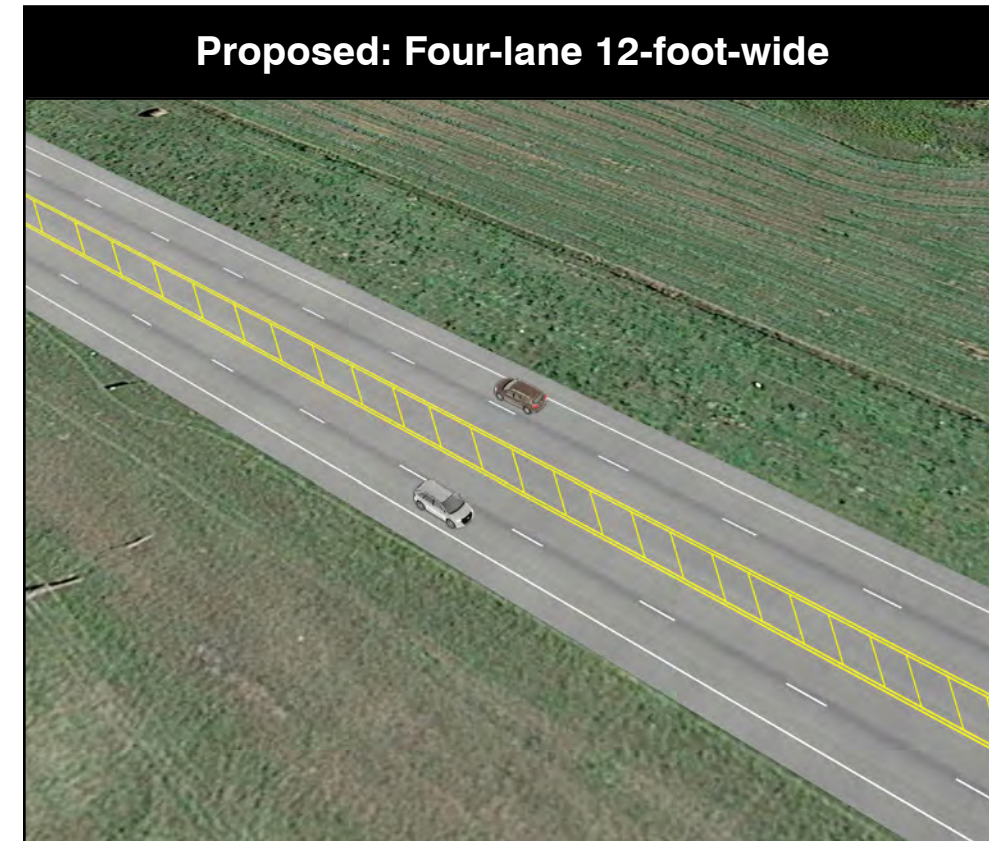
Existing Condition – View east from Cannonball Concretions Pullout within Theodore Roosevelt National Park - North Unit.



Photograph Location: Viewpoint is approximately 3.7 miles from US 85.



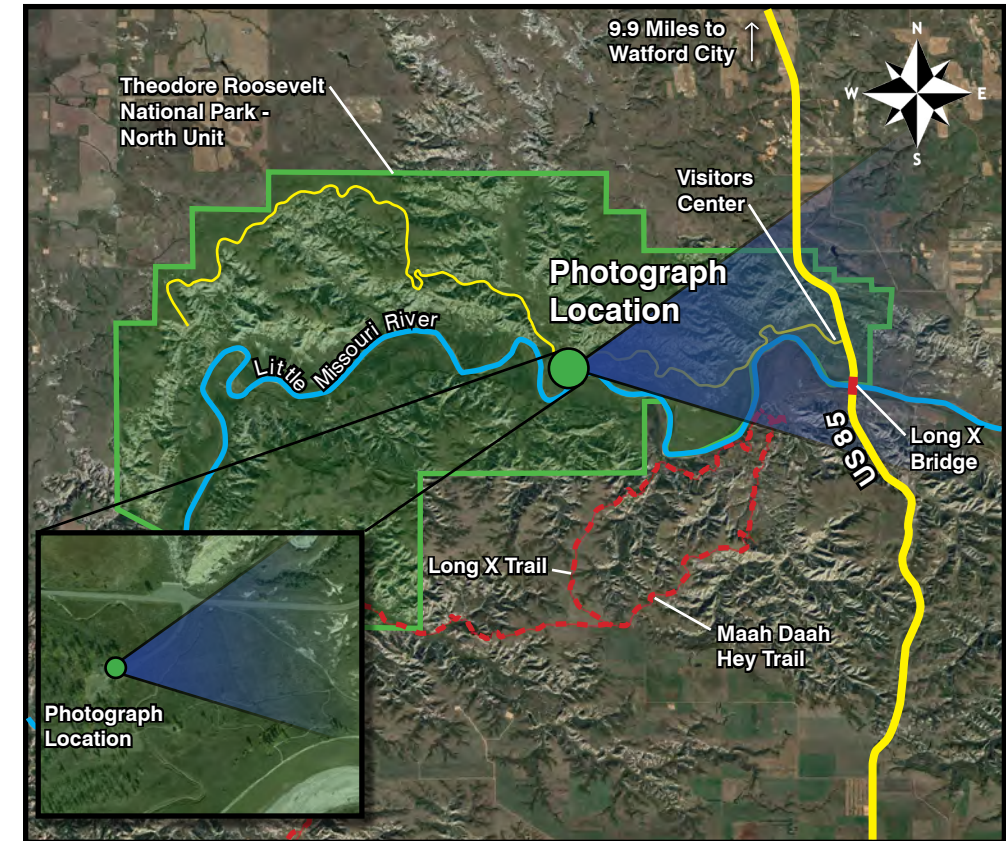
Simulation – Proposed is completely obstructed by terrain.



Site Conditions: Clear - Sunny
 Photo Date and Time: 6-15-17, 1:11 p.m. Focal Length: 50mm
 When printed on 11x17 inch paper, this simulation is meant to be viewed at a distance of 8.2 inches.
 3D models in this simulation were prepared based on preliminary engineering and may change based on final engineering and design.



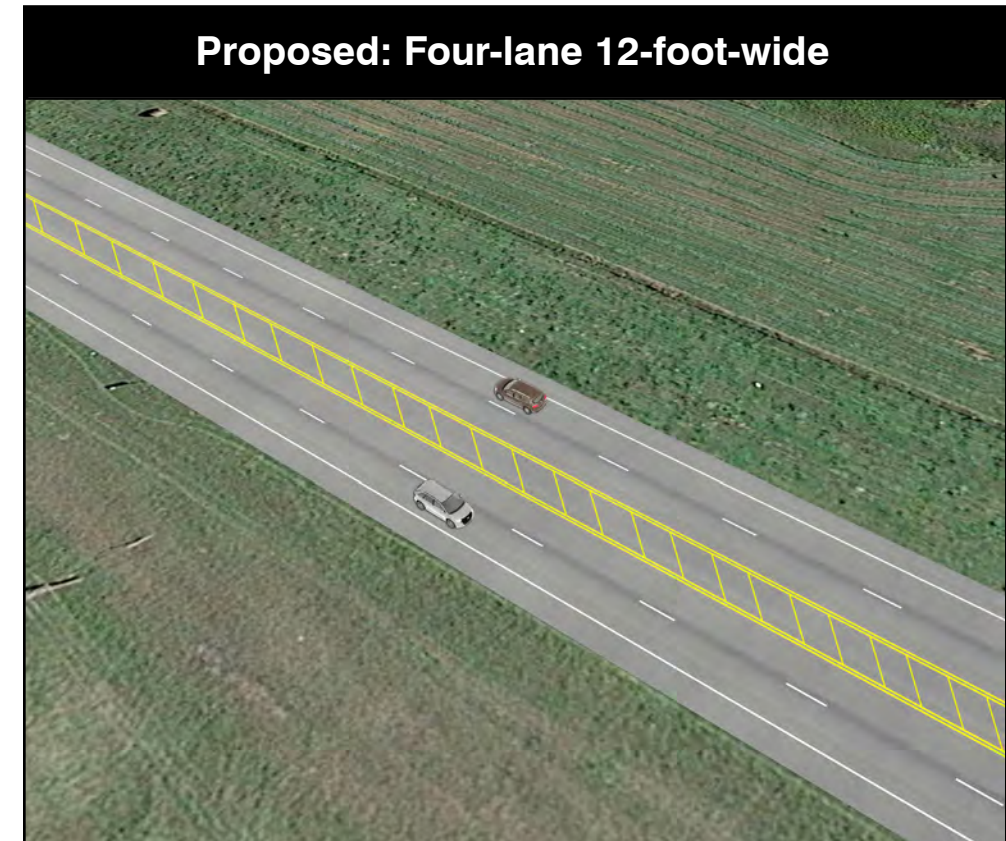
Existing Condition – View east from Juniper Campground entrance within Theodore Roosevelt National Park - North Unit.



Photograph Location: Viewpoint is approximately 3.8 miles from US 85.



Simulation – Proposed is completely obstructed by vegetation and terrain.

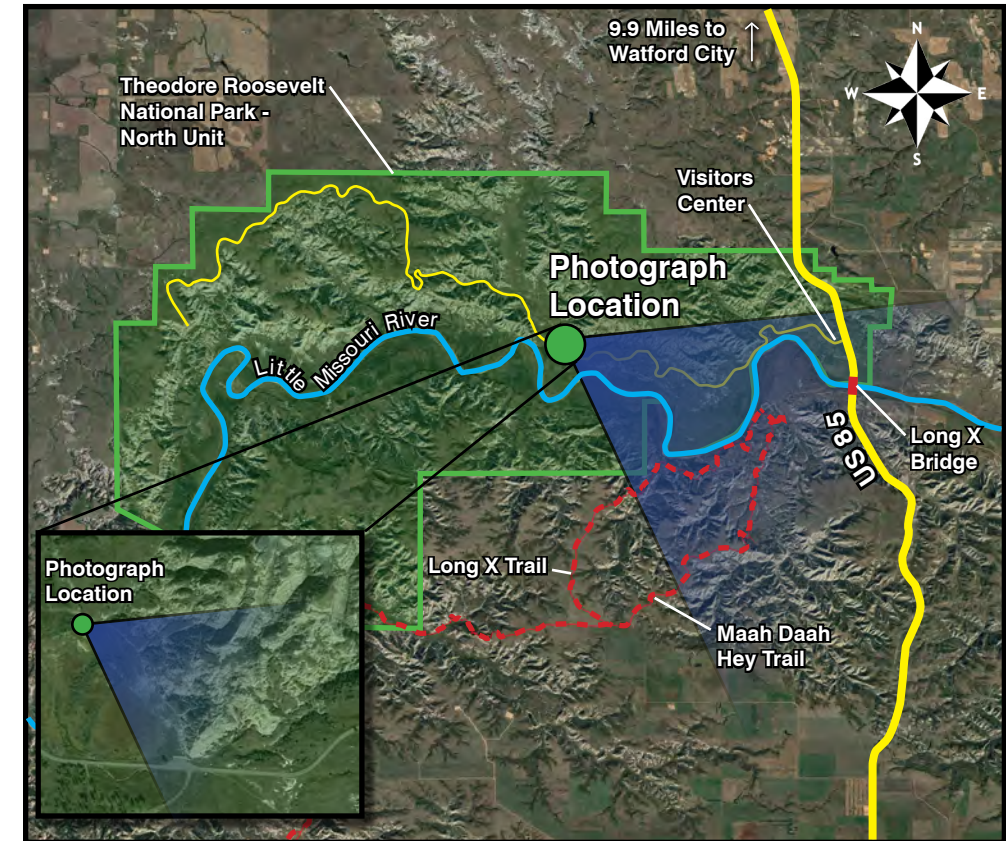


Site Conditions: Clear - Sunny
 Photo Date and Time: 6-15-17, 2:04 p.m. Focal Length: 50mm
 When printed on 11x17 inch paper, this simulation is meant to be viewed at a distance of 10.9 inches.
 3D models in this simulation were prepared based on preliminary engineering and may change based on final engineering and design.

Theodore Roosevelt National Park - North Unit - Juniper Campground Entrance



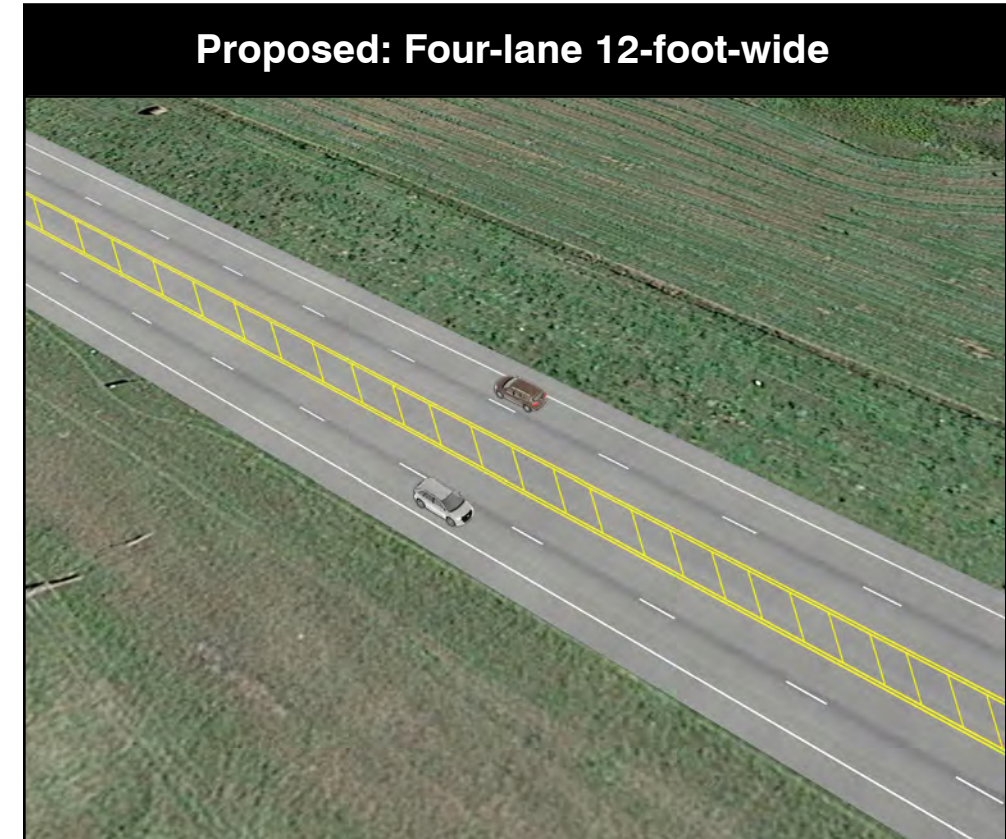
Existing Condition – View southeast from Buckhorn Trail within Theodore Roosevelt National Park - North Unit.



Photograph Location: Viewpoint is approximately 3.9 miles from US 85.



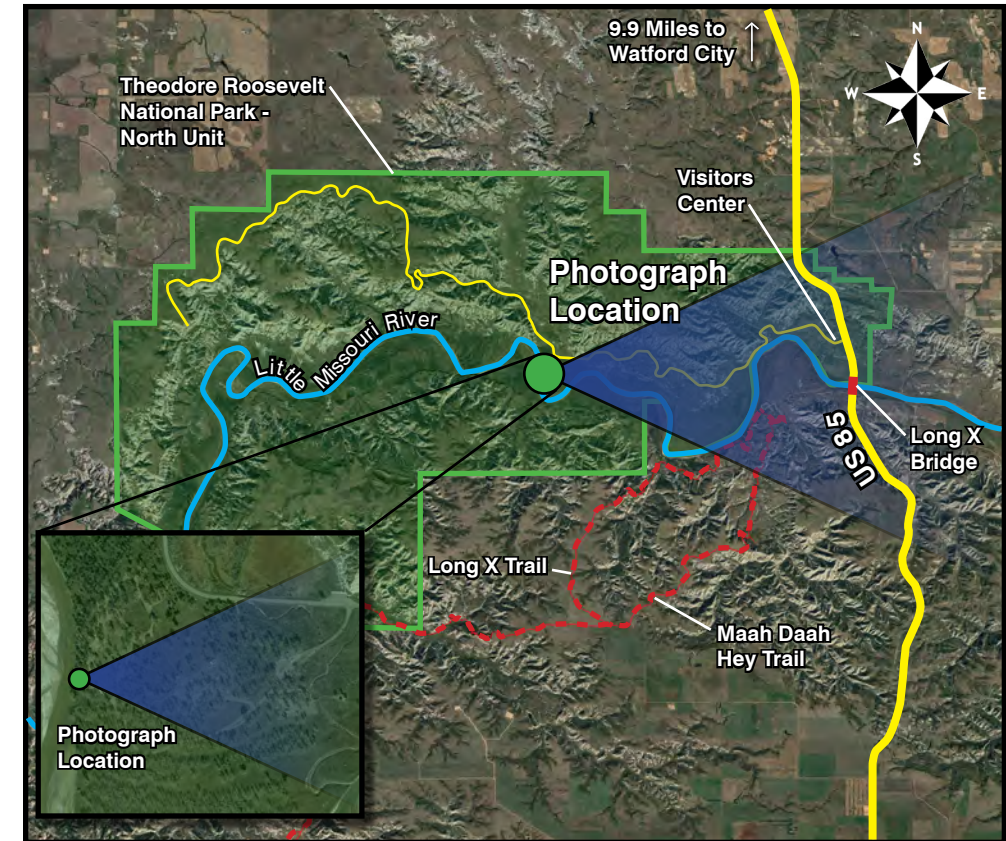
Simulation – Proposed is completely obstructed by vegetation and terrain.



Site Conditions: Clear - Sunny
 Photo Date and Time: 6-15-17, 1:36 p.m. Focal Length: 50mm
 When printed on 11x17 inch paper, this simulation is meant to be viewed at a distance of 7.5 inches.
 3D models in this simulation were prepared based on preliminary engineering and may change based on final engineering and design.



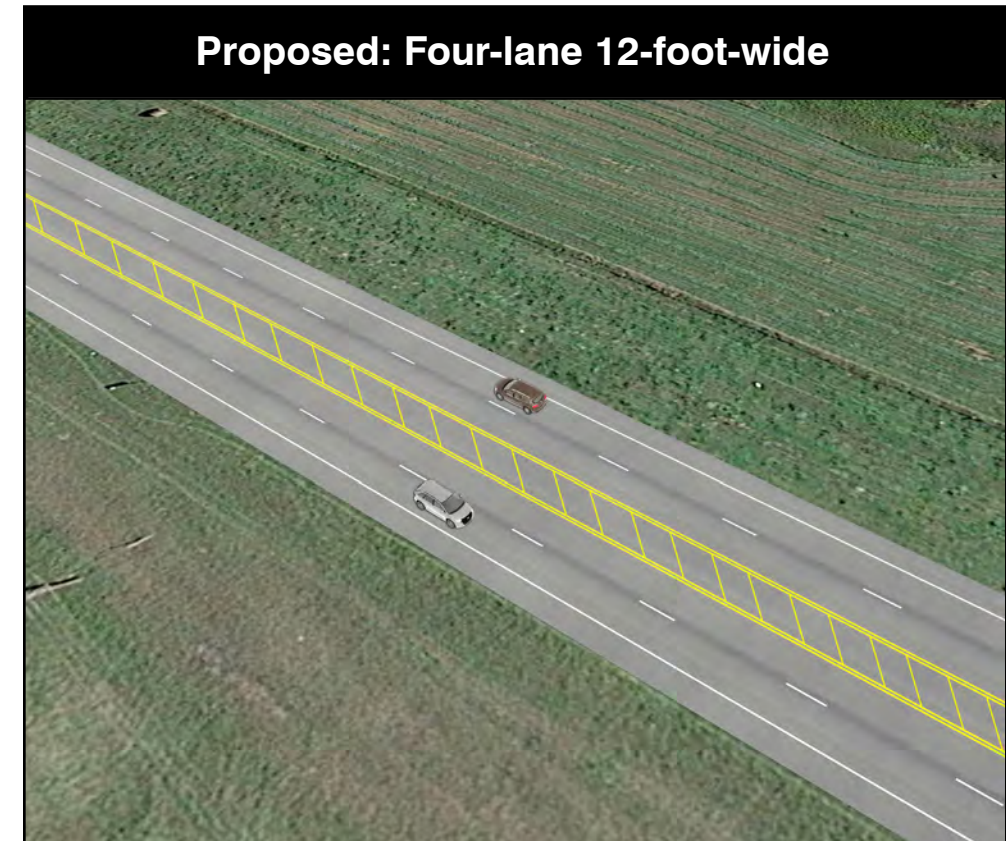
Existing Condition – View east from Achenbach Trail in Juniper Campground within Theodore Roosevelt National Park - North Unit.



Photograph Location: Viewpoint is approximately 4.1 miles from US 85.



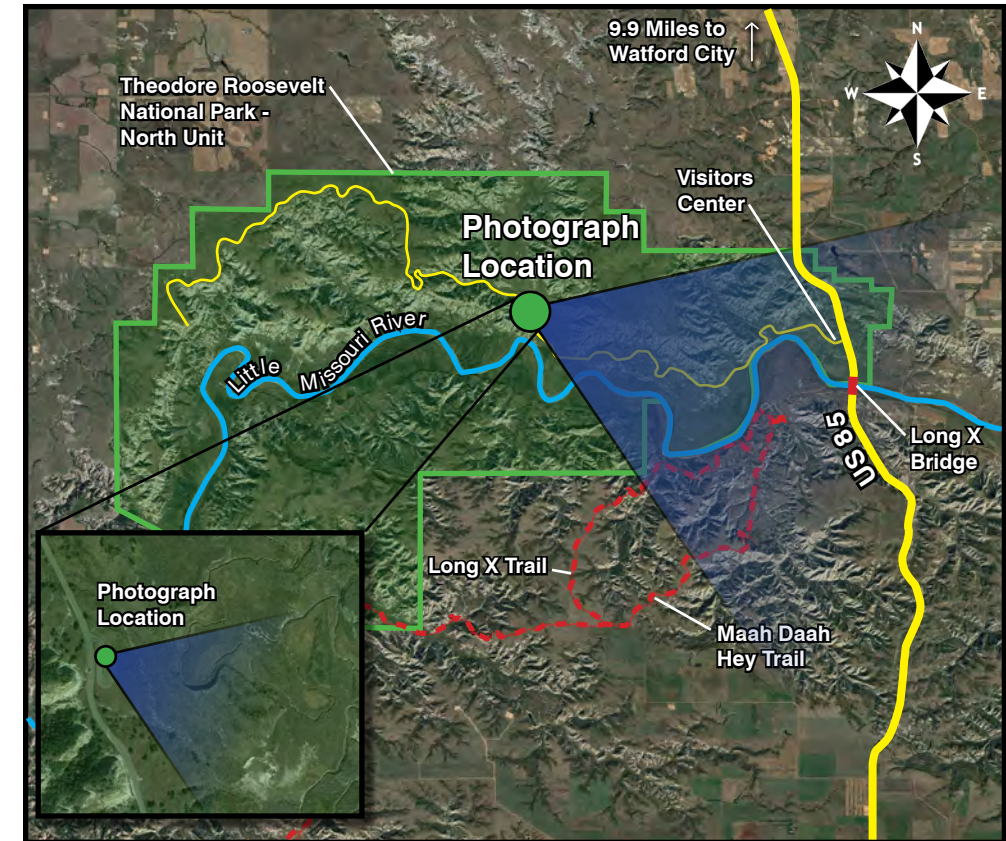
Simulation – Proposed is completely obstructed by vegetation and terrain.



Site Conditions: Clear - Sunny
 Photo Date and Time: 6-15-17, 2:19 p.m. Focal Length: 50mm
 When printed on 11x17 inch paper, this simulation is meant to be viewed at a distance of 11.5 inches.
 3D models in this simulation were prepared based on preliminary engineering and may change based on final engineering and design.



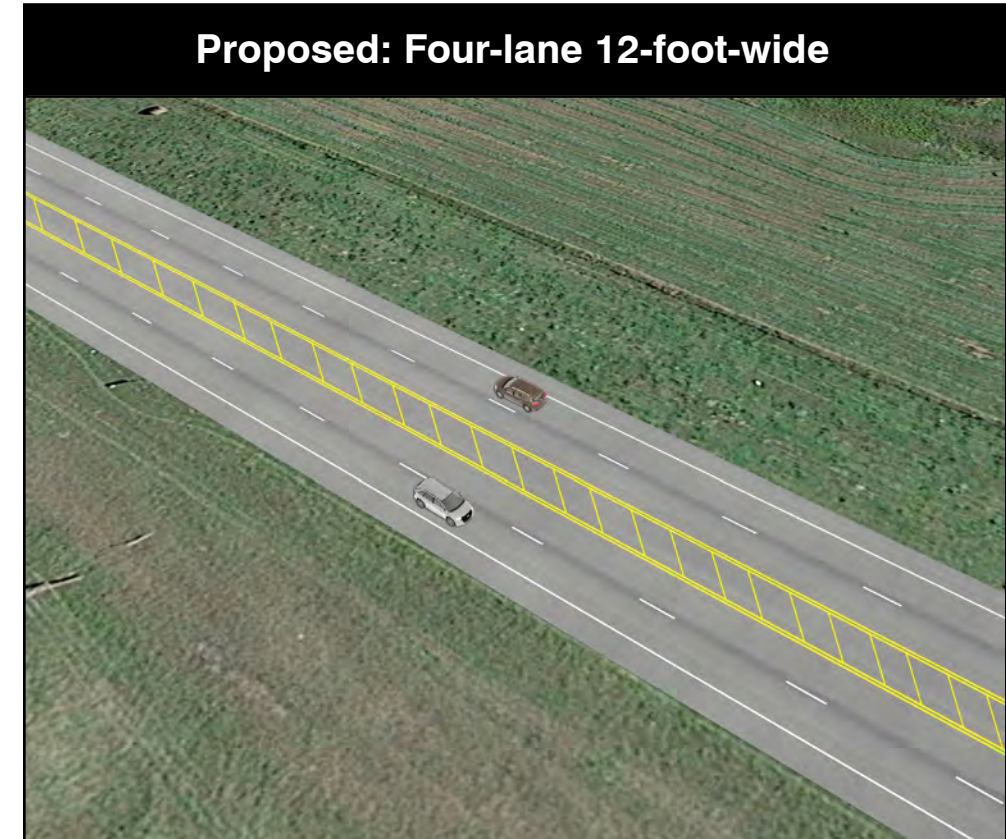
Existing Condition – View east from Long X Trail Pullout within Theodore Roosevelt National Park - North Unit.



Photograph Location: Viewpoint is approximately 4.4 miles from US 85.



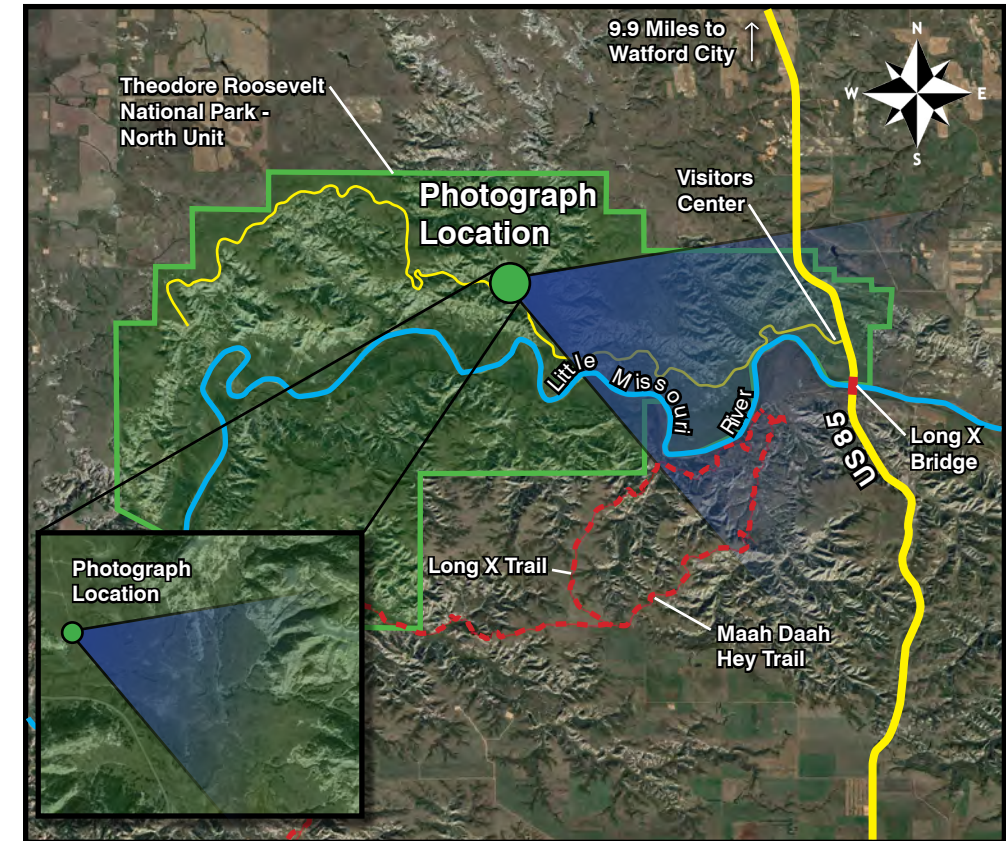
Simulation – Proposed is completely obstructed by terrain.



Site Conditions: Clear - Sunny
 Photo Date and Time: 6-15-17, 1:02 p.m. Focal Length: 50mm
 When printed on 11x17 inch paper, this simulation is meant to be viewed at a distance of 7.8 inches.
 3D models in this simulation were prepared based on preliminary engineering and may change based on final engineering and design.



Existing Condition – View east from Buckhorn Trail within Theodore Roosevelt National Park - North Unit.



Photograph Location: Viewpoint is approximately 4.7 miles from US 85.



Simulation – Proposed is completely obstructed by terrain.

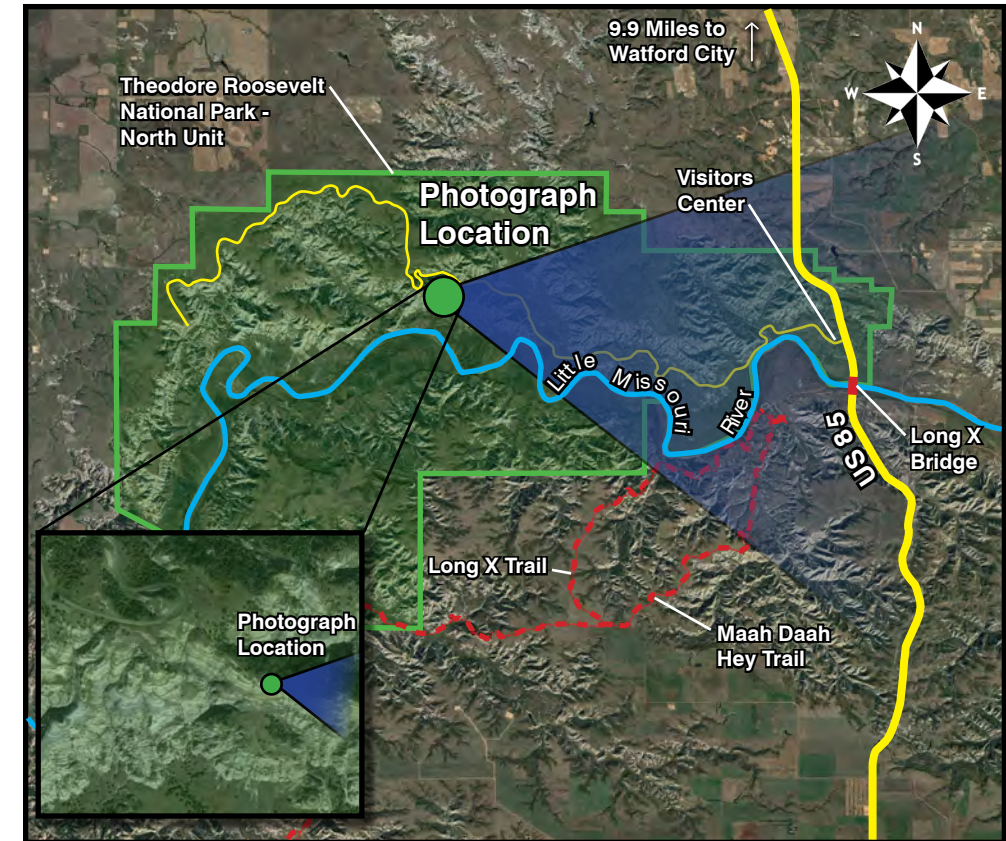


Proposed: Four-lane 12-foot-wide

Site Conditions: Clear - Sunny
 Photo Date and Time: 6-15-17, 12:38 p.m. Focal Length: 50mm
 When printed on 11x17 inch paper, this simulation is meant to be viewed at a distance of 9.4 inches.
 3D models in this simulation were prepared based on preliminary engineering and may change based on final engineering and design.



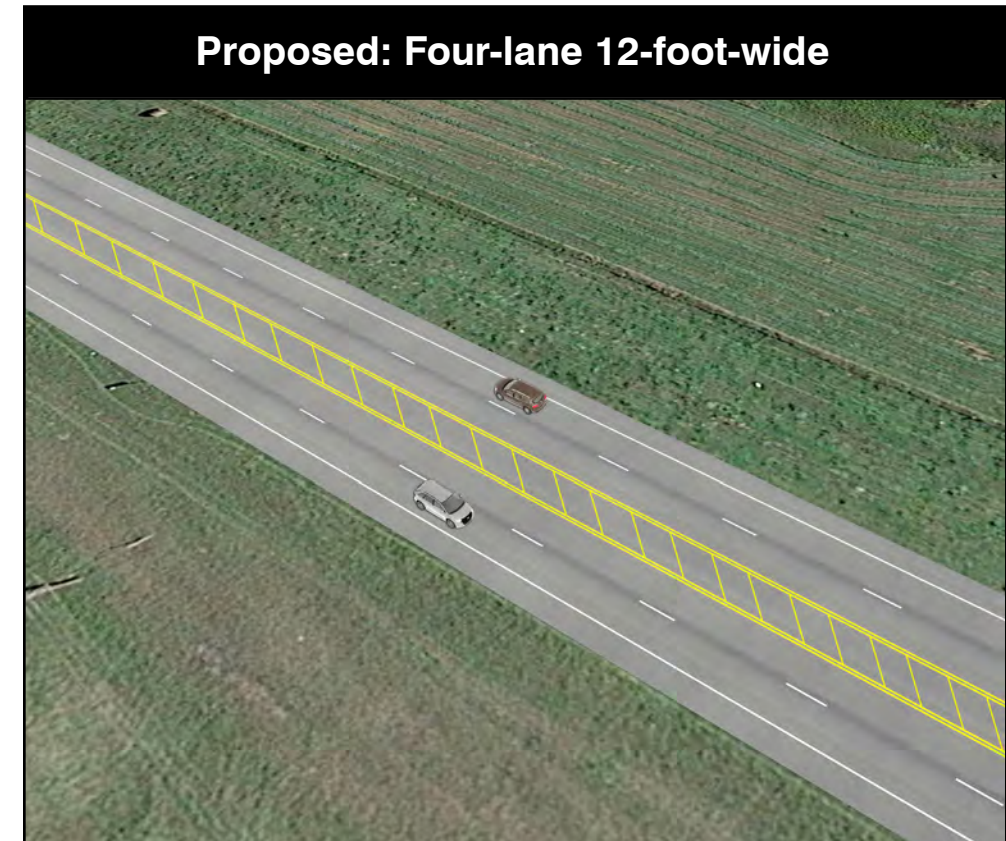
Existing Condition – View east from North Achenbach Overlook within Theodore Roosevelt National Park - North Unit.



Photograph Location: Viewpoint is approximately 5.6 miles from US 85.



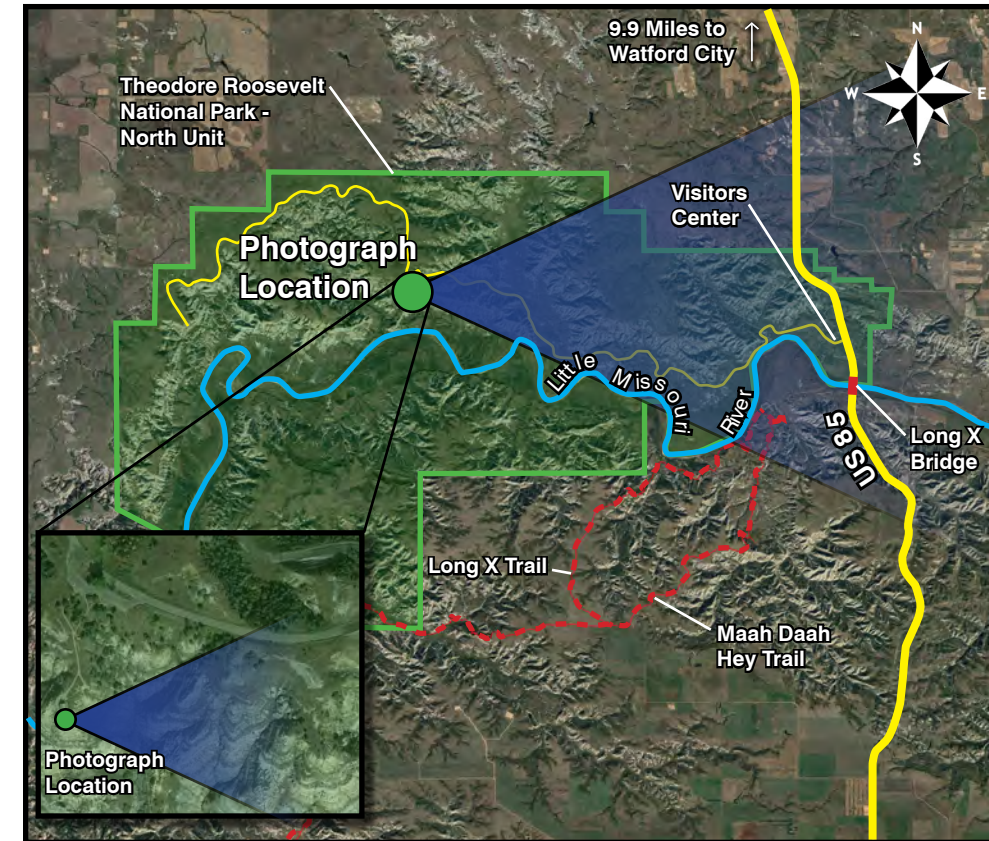
Simulation – Proposed is completely obstructed by terrain.



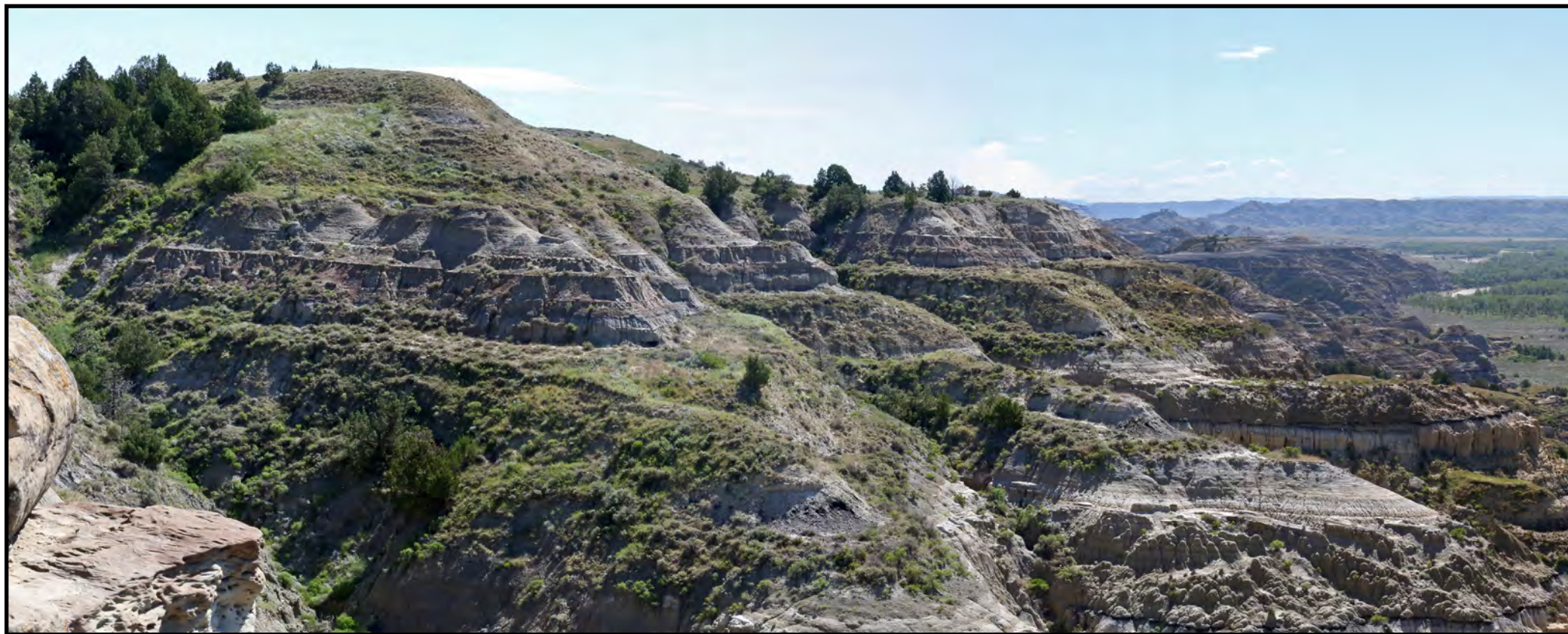
Site Conditions: Sunny - Slight Haze
 Photo Date and Time: 6-15-17, 11:56 a.m. Focal Length: 50mm
 When printed on 11x17 inch paper, this simulation is meant to be viewed at a distance of 9.9 inches.
 3D models in this simulation were prepared based on preliminary engineering and may change based on final engineering and design.



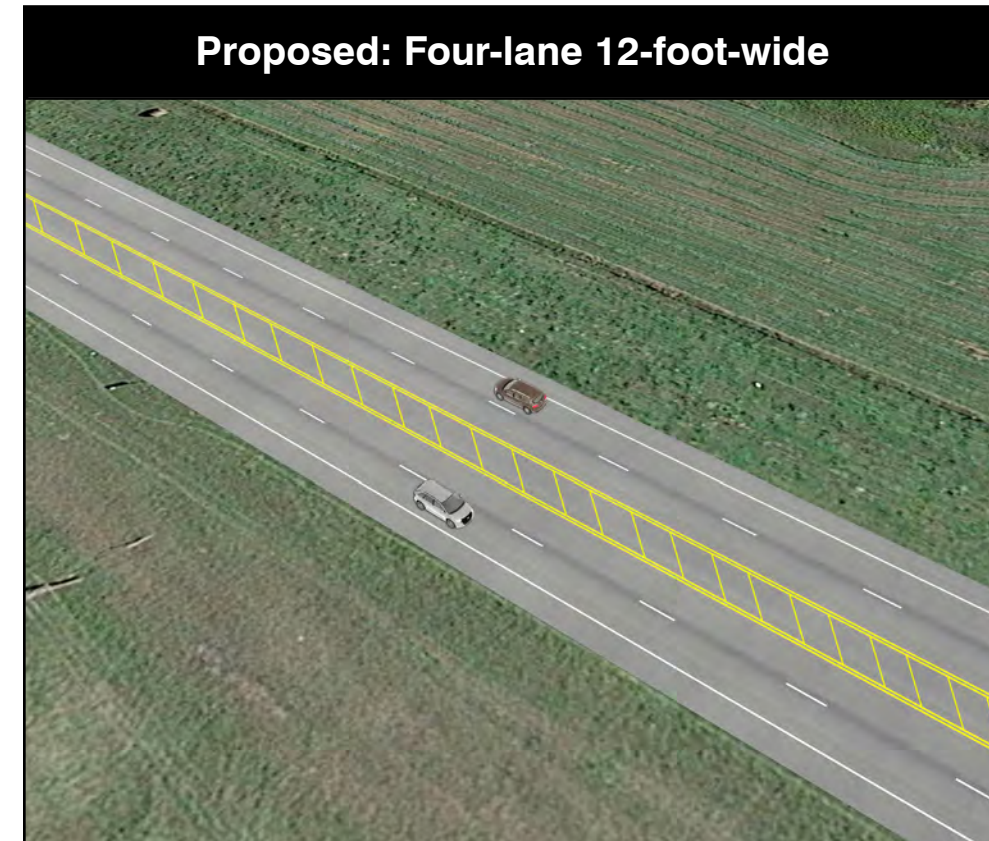
Existing Condition – View east from River Bend Overlook viewing shelter within Theodore Roosevelt National Park - North Unit.



Photograph Location: Viewpoint is approximately 5.9 miles from US 85.



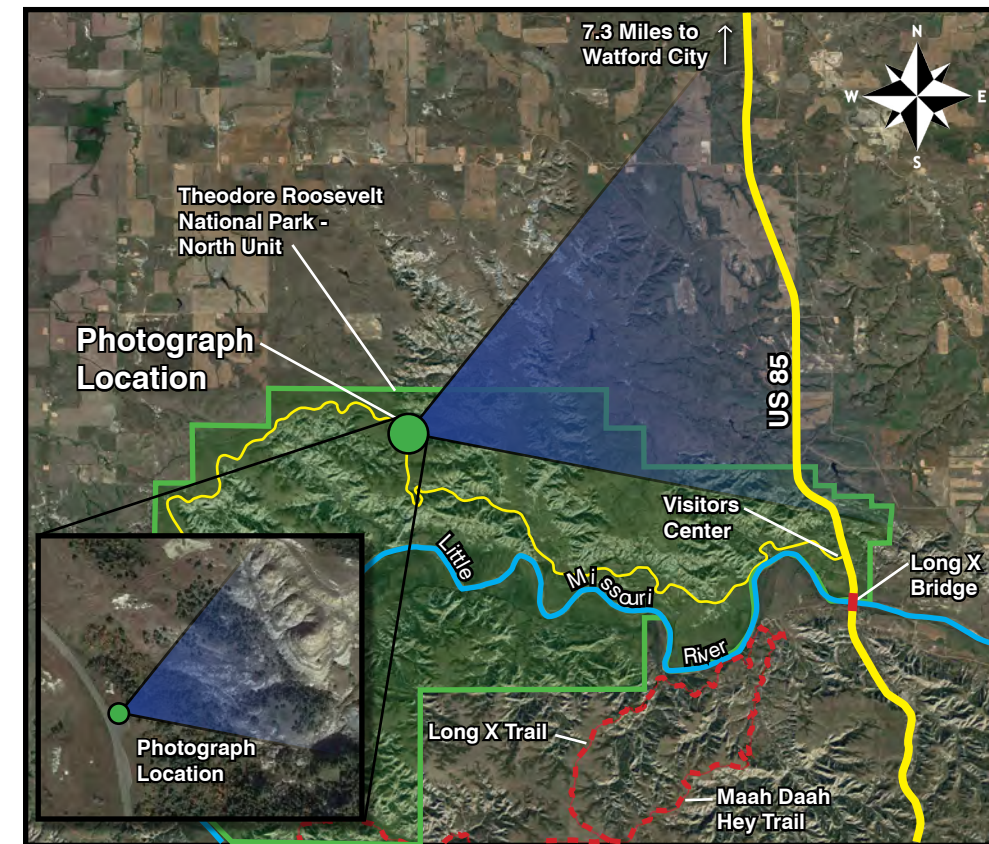
Simulation – Proposed is completely obstructed by terrain.



Site Conditions: Sunny - Slightly Hazy
 Photo Date and Time: 6-15-17, 11:20 a.m. Focal Length: 50mm
 When printed on 11x17 inch paper, this simulation is meant to be viewed at a distance of 11.5 inches.
 3D models in this simulation were prepared based on preliminary engineering and may change based on final engineering and design.



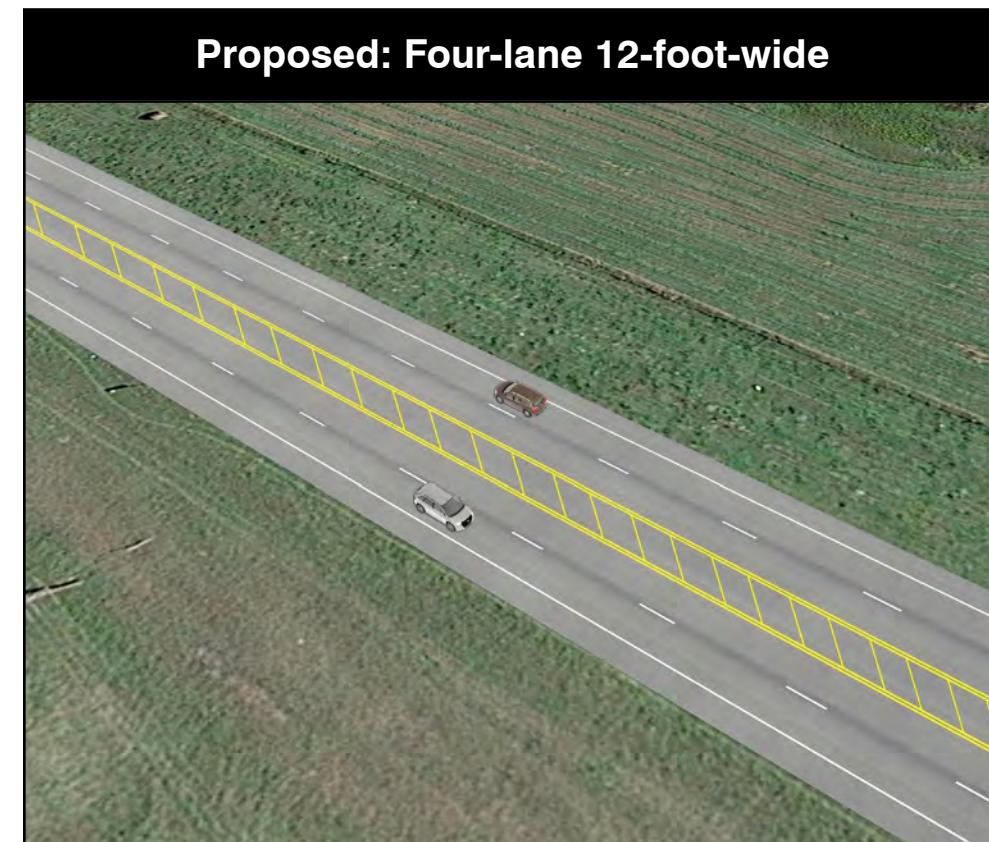
Existing Condition – View northeast from Bentonitic Clay Overlook within Theodore Roosevelt National Park - North Unit.



Photograph Location: Viewpoint is approximately 5.3 miles from US 85.



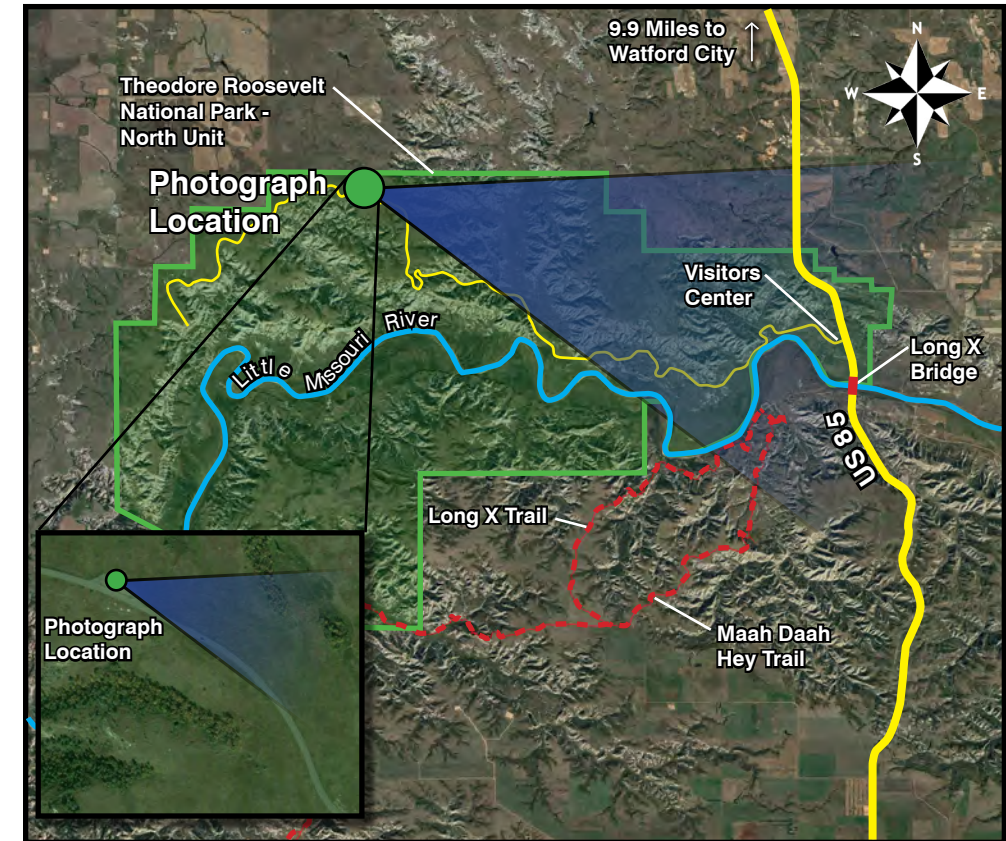
Simulation – Proposed is visible.



Site Conditions: Overcast
 Photo Date and Time: 6-14-17, 4:44 p.m. Focal Length: 50mm
 When printed on 11x17 inch paper, this simulation is meant to be viewed at a distance of 8.9 inches.
 3D models in this simulation were prepared based on preliminary engineering and may change based on final engineering and design.



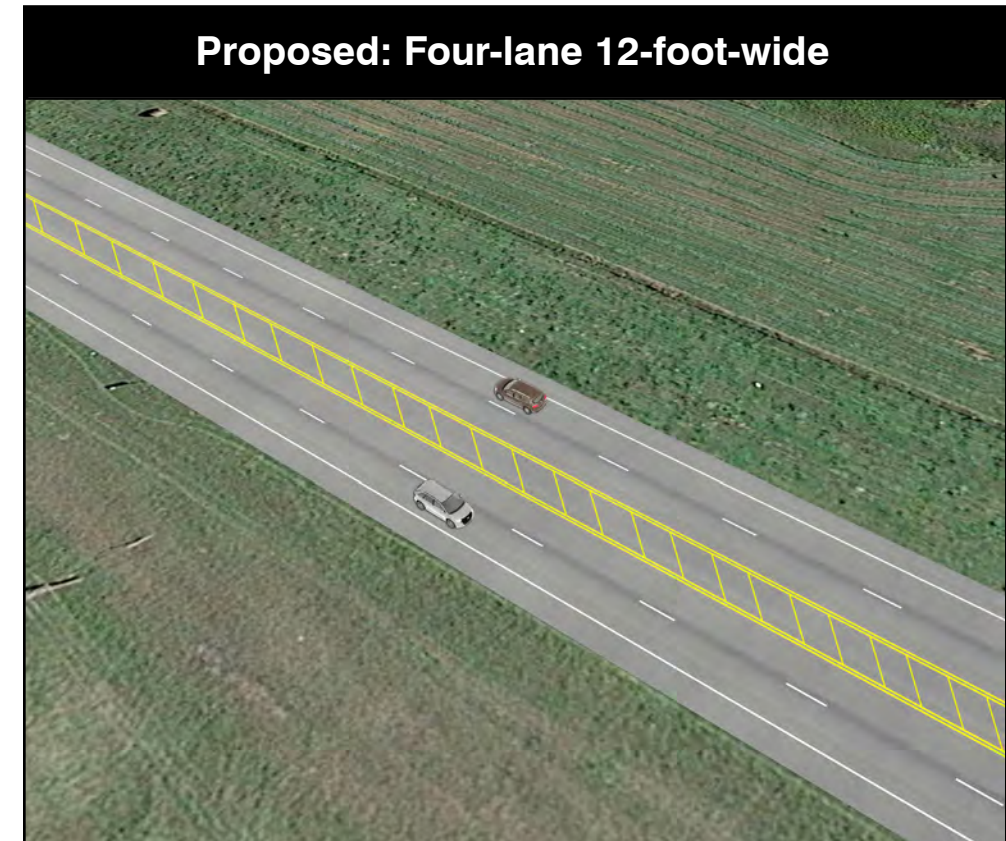
Existing Condition – View east-southeast from Man and Grass Pullout within Theodore Roosevelt National Park - North Unit.



Photograph Location: Viewpoint is approximately 6.7 miles from US 85.



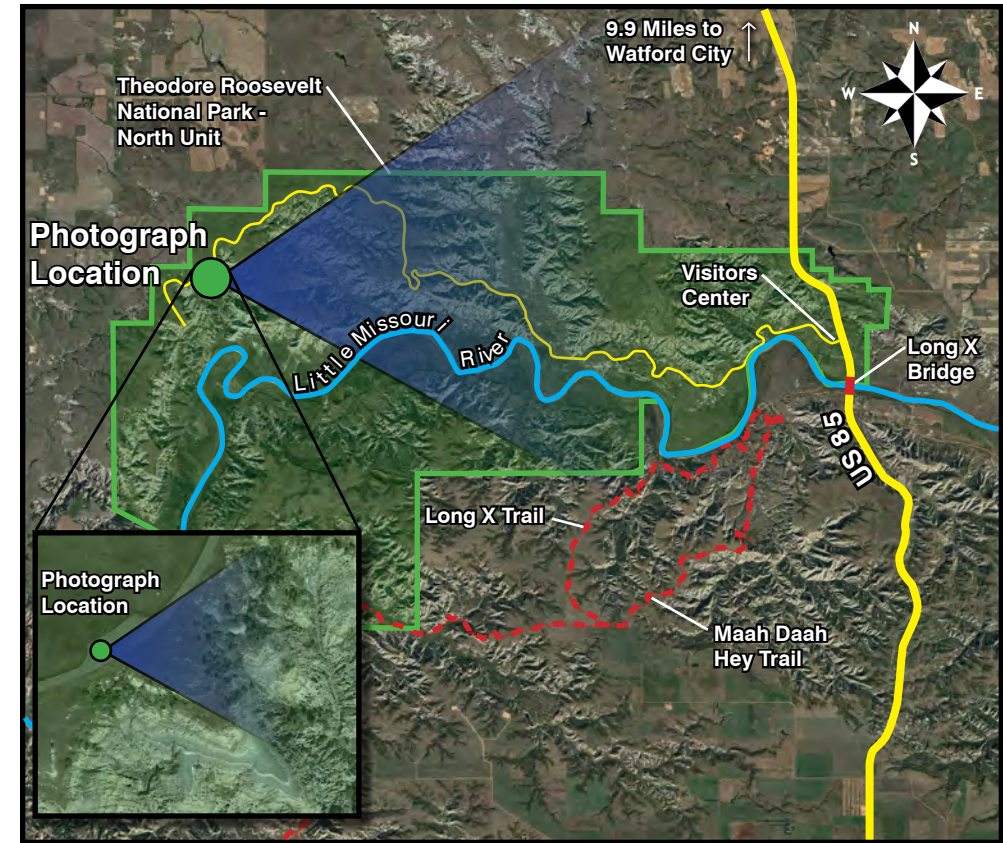
Simulation – Proposed is completely obstructed by terrain.



Site Conditions: Overcast
 Photo Date and Time: 6-14-17, 4:28 p.m. Focal Length: 50mm
 When printed on 11x17 inch paper, this simulation is meant to be viewed at a distance of 15 inches.
 3D models in this simulation were prepared based on preliminary engineering and may change based on final engineering and design.



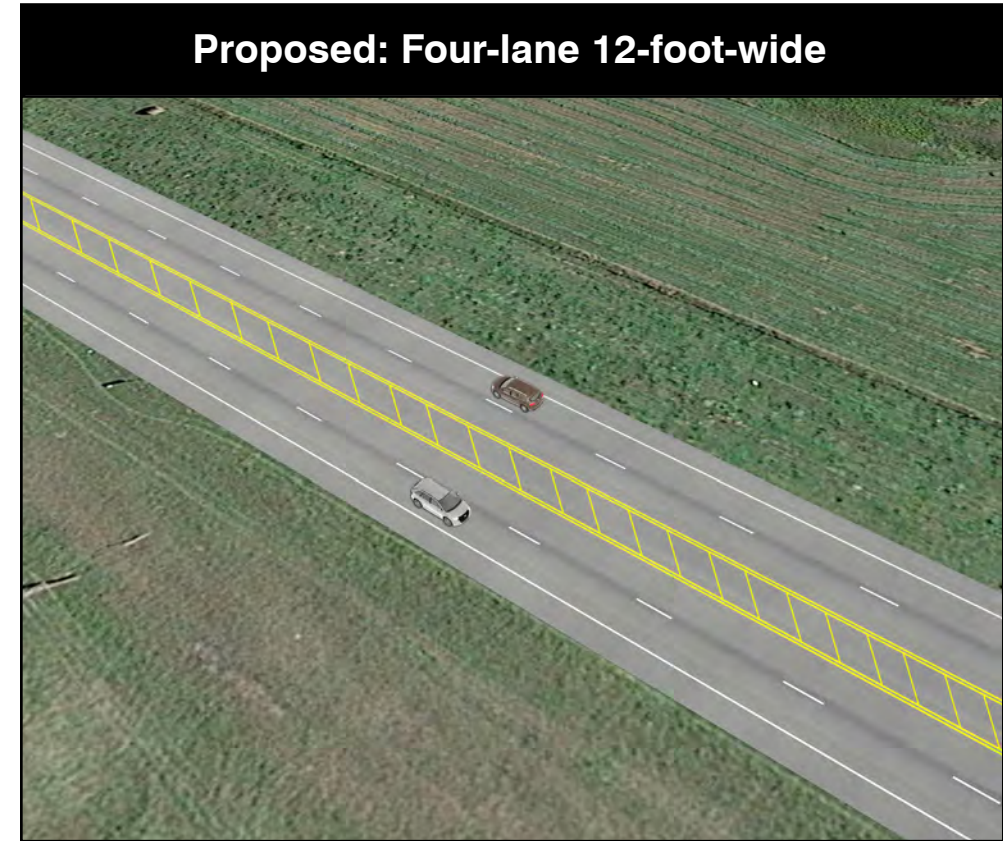
Existing Condition – View east from Edge of Glacier Pullout within Theodore Roosevelt National Park - North Unit.



Photograph Location: Viewpoint is approximately 8.5 miles from US 85.



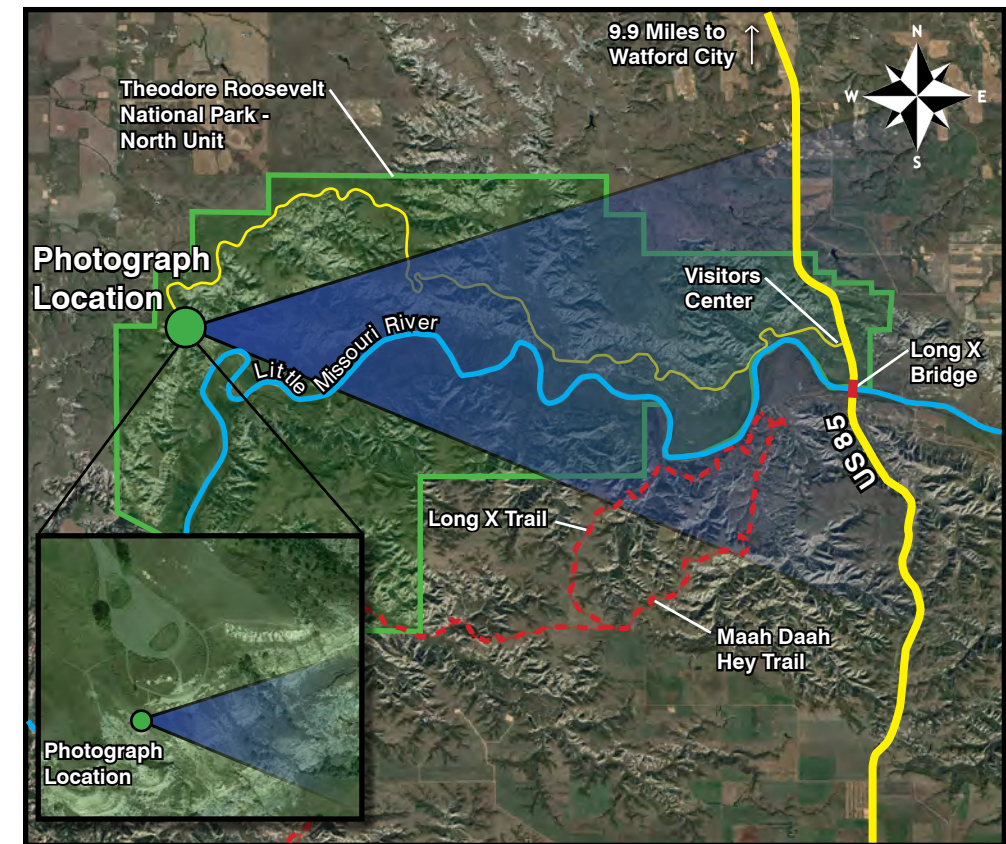
Simulation – Proposed is completely obstructed by terrain.



Site Conditions: Overcast - Moderately Hazy
 Photo Date and Time: 6-14-17, 4:14 p.m. Focal Length: 50mm
 When printed on 11x17 inch paper, this simulation is meant to be viewed at a distance of 8.7 inches.
 3D models in this simulation were prepared based on preliminary engineering and may change based on final engineering and design.



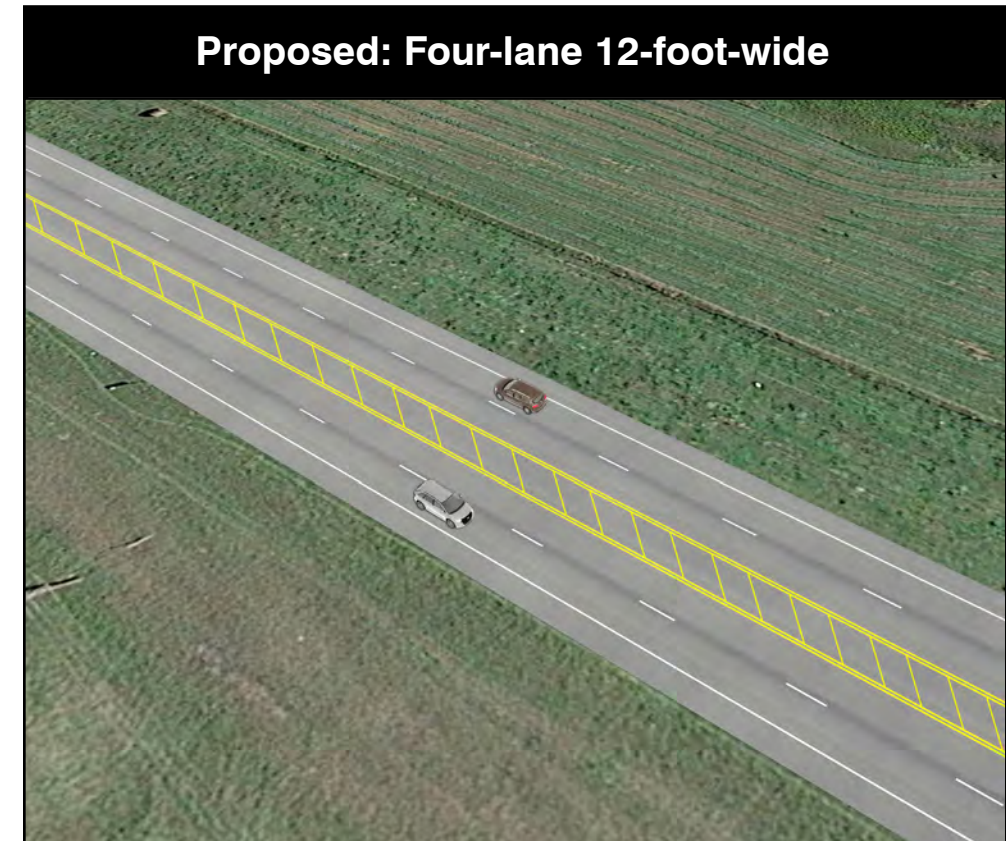
Existing Condition – View east from Oxbow Overlook within Theodore Roosevelt National Park - North Unit.



Photograph Location: Viewpoint is approximately 8.9 miles from US 85.



Simulation – Proposed is completely obstructed by terrain.

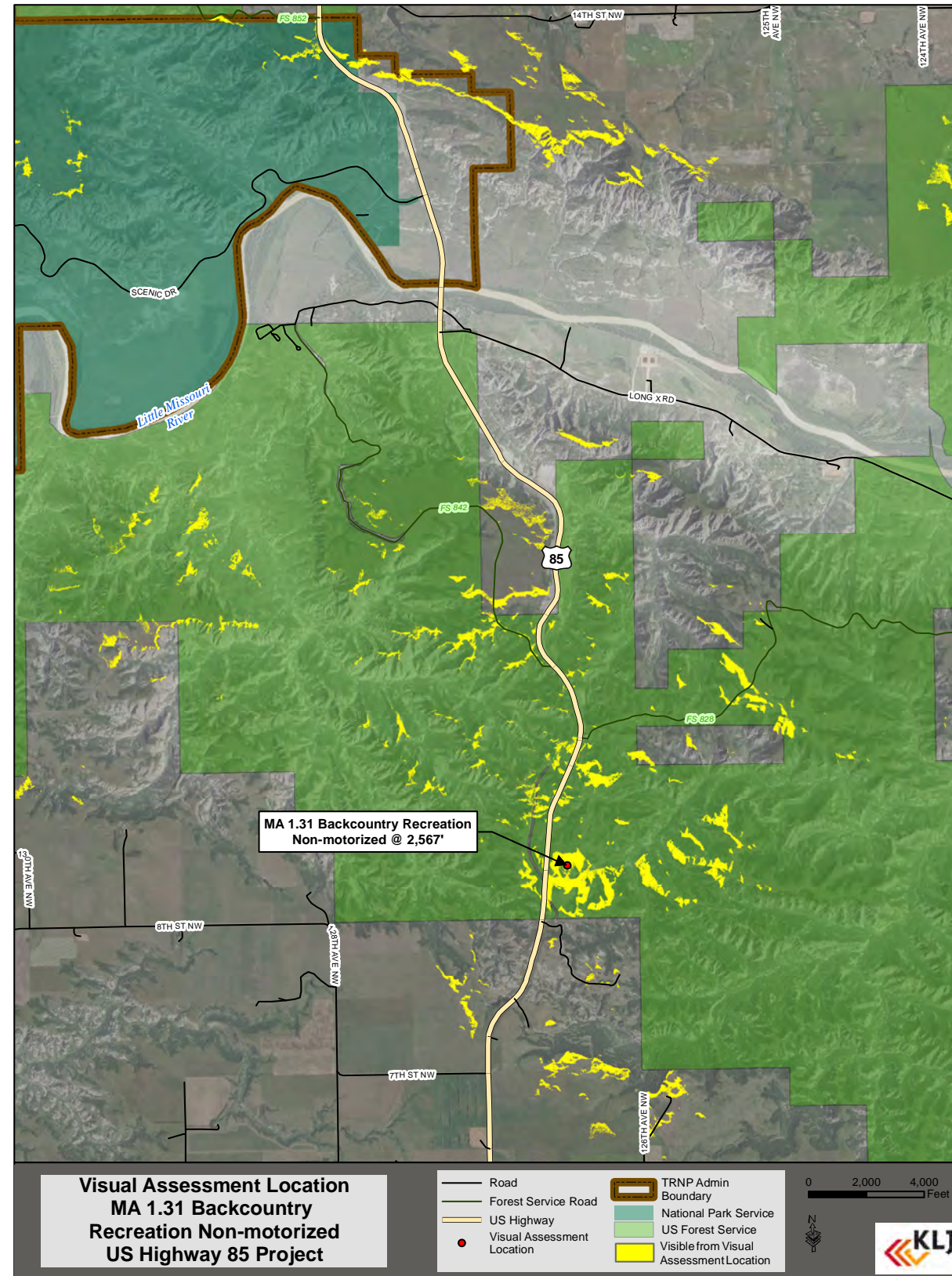


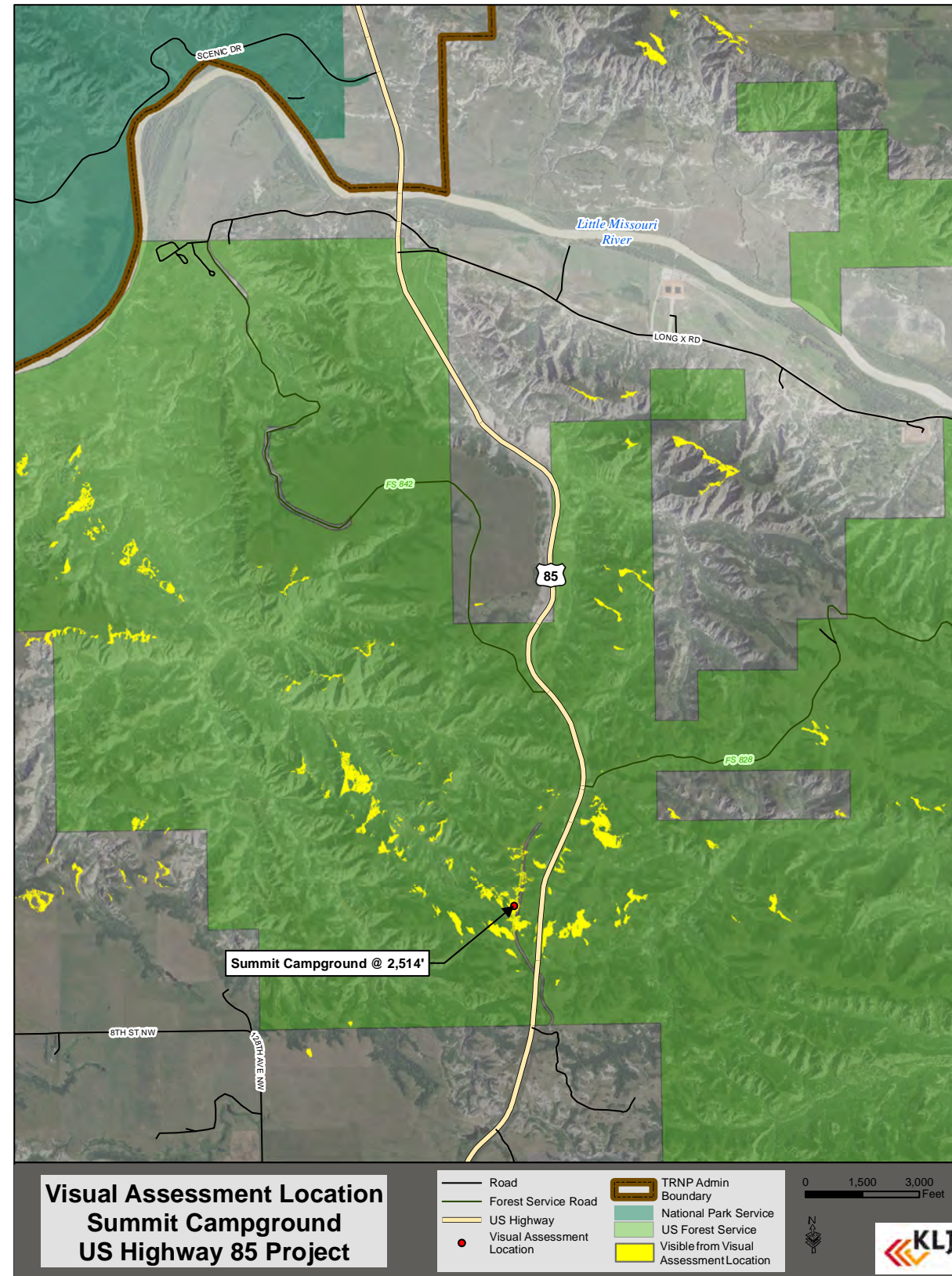
Site Conditions: Overcast - Moderately Hazy
 Photo Date and Time: 6-14-17, 3:43 p.m. Focal Length: 50mm
 When printed on 11x17 inch paper, this simulation is meant to be viewed at a distance of 15 inches.
 3D models in this simulation were prepared based on preliminary engineering and may change based on final engineering and design.

E.2. Line-of-Sight Models

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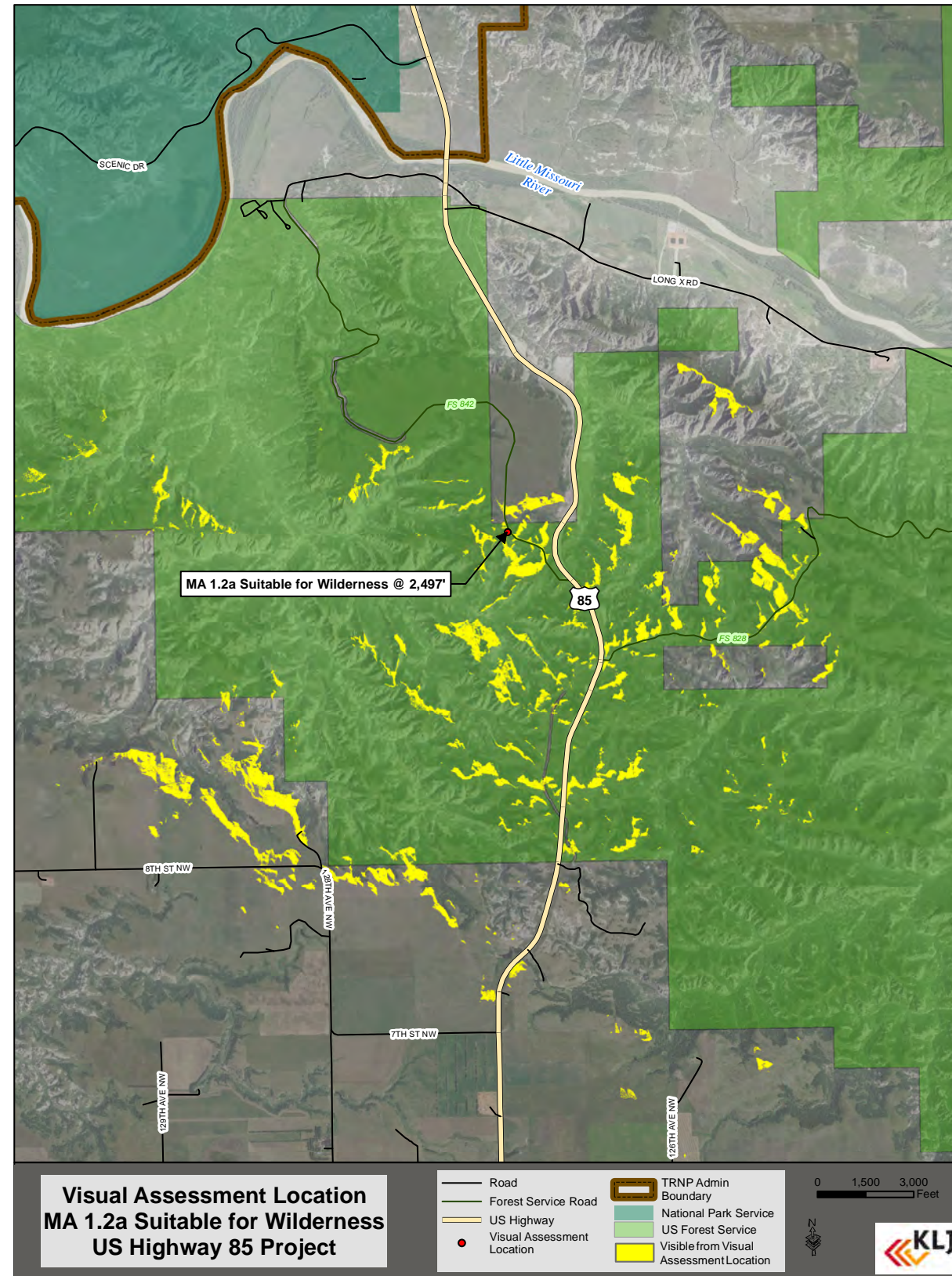
I-94 Interchange to Watford City Bypass (McKenzie County Road 30)
 Project 9-085(085)075 PCN 20046 ❖ Stark, Billings and McKenzie Counties, North Dakota

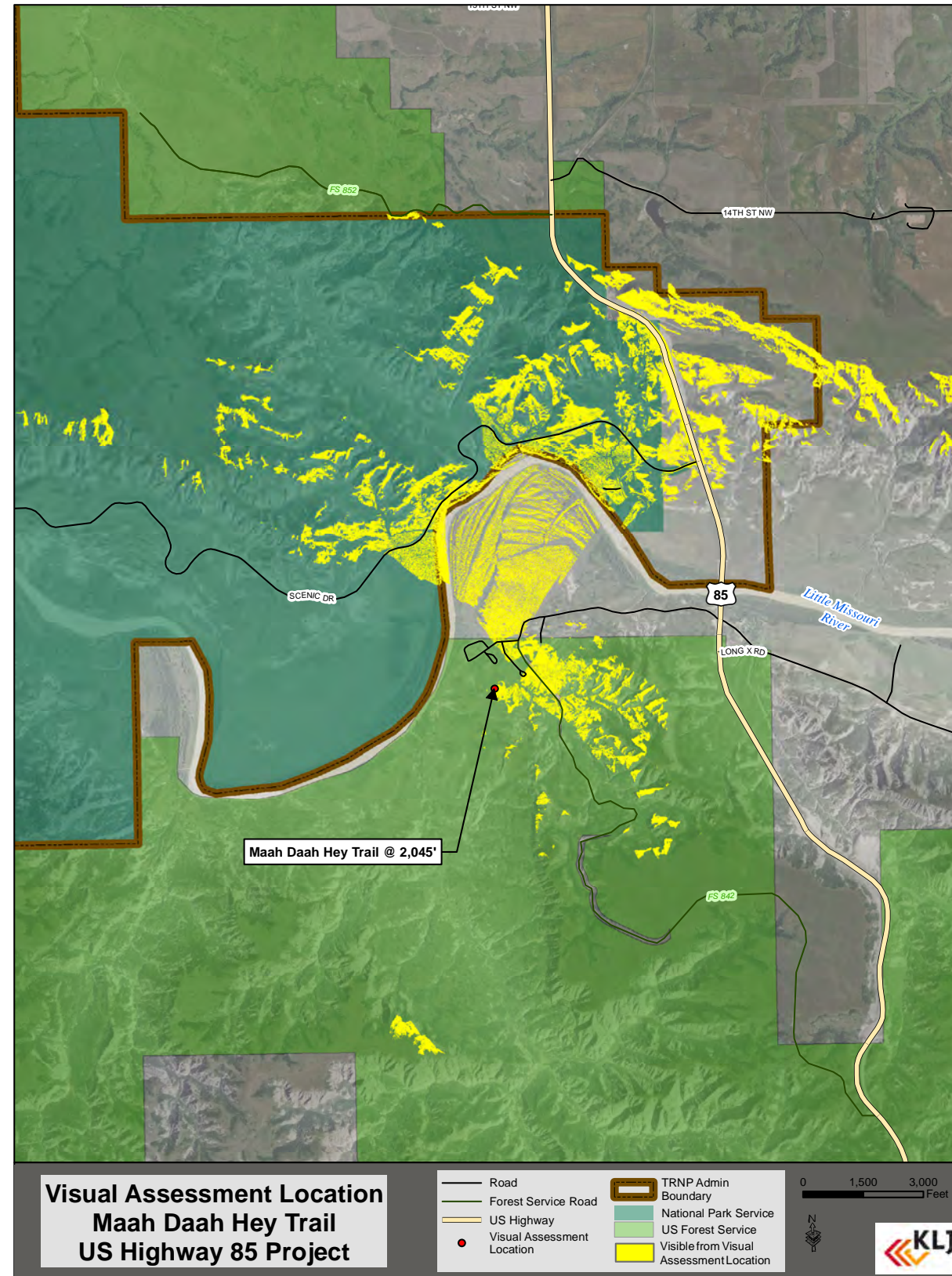




U.S. HIGHWAY 85

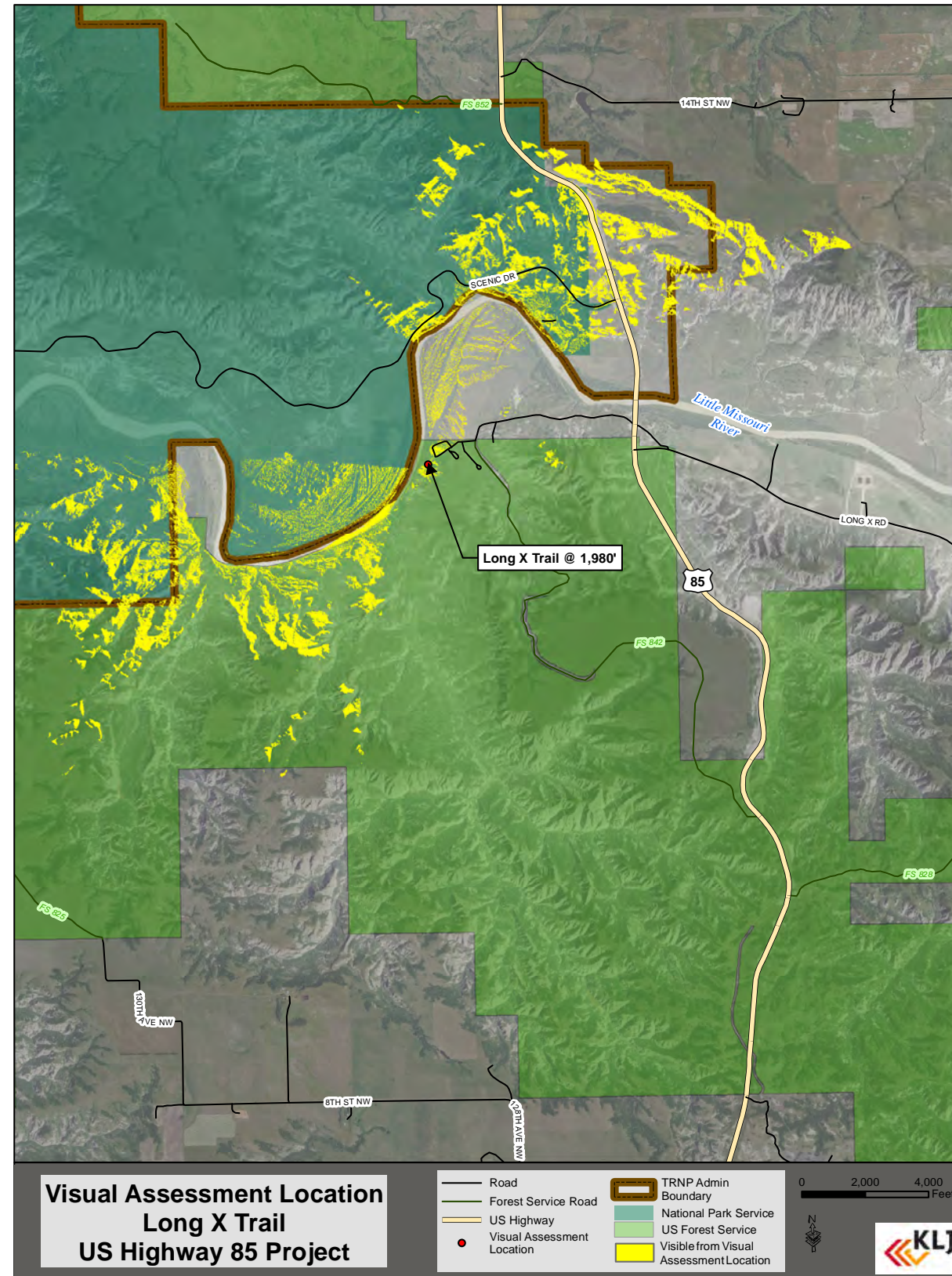
I-94 Interchange to Watford City Bypass (McKenzie County Road 30)
 Project 9-085(085)075 PCN 20046 ❖ Stark, Billings and McKenzie Counties, North Dakota

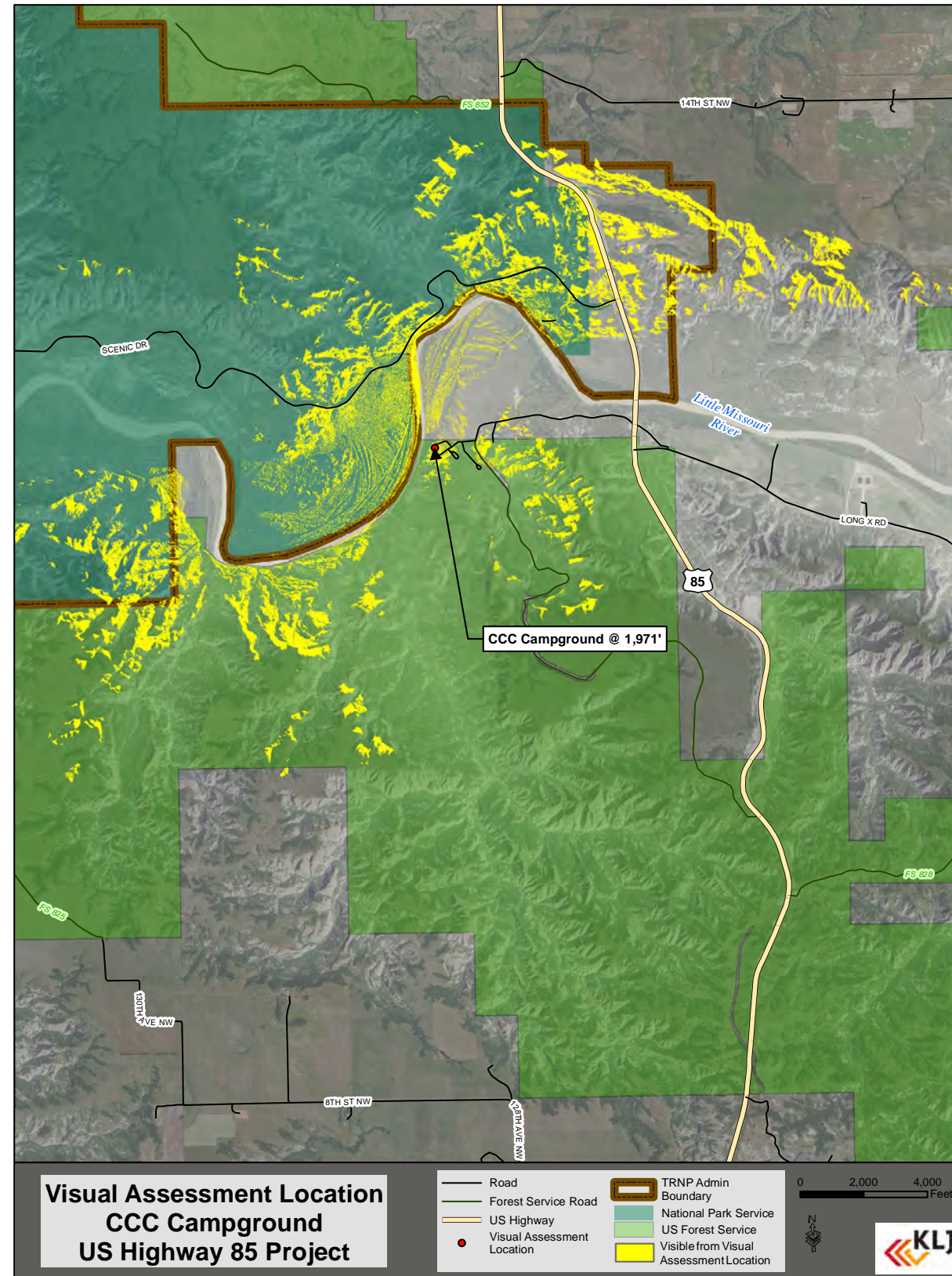




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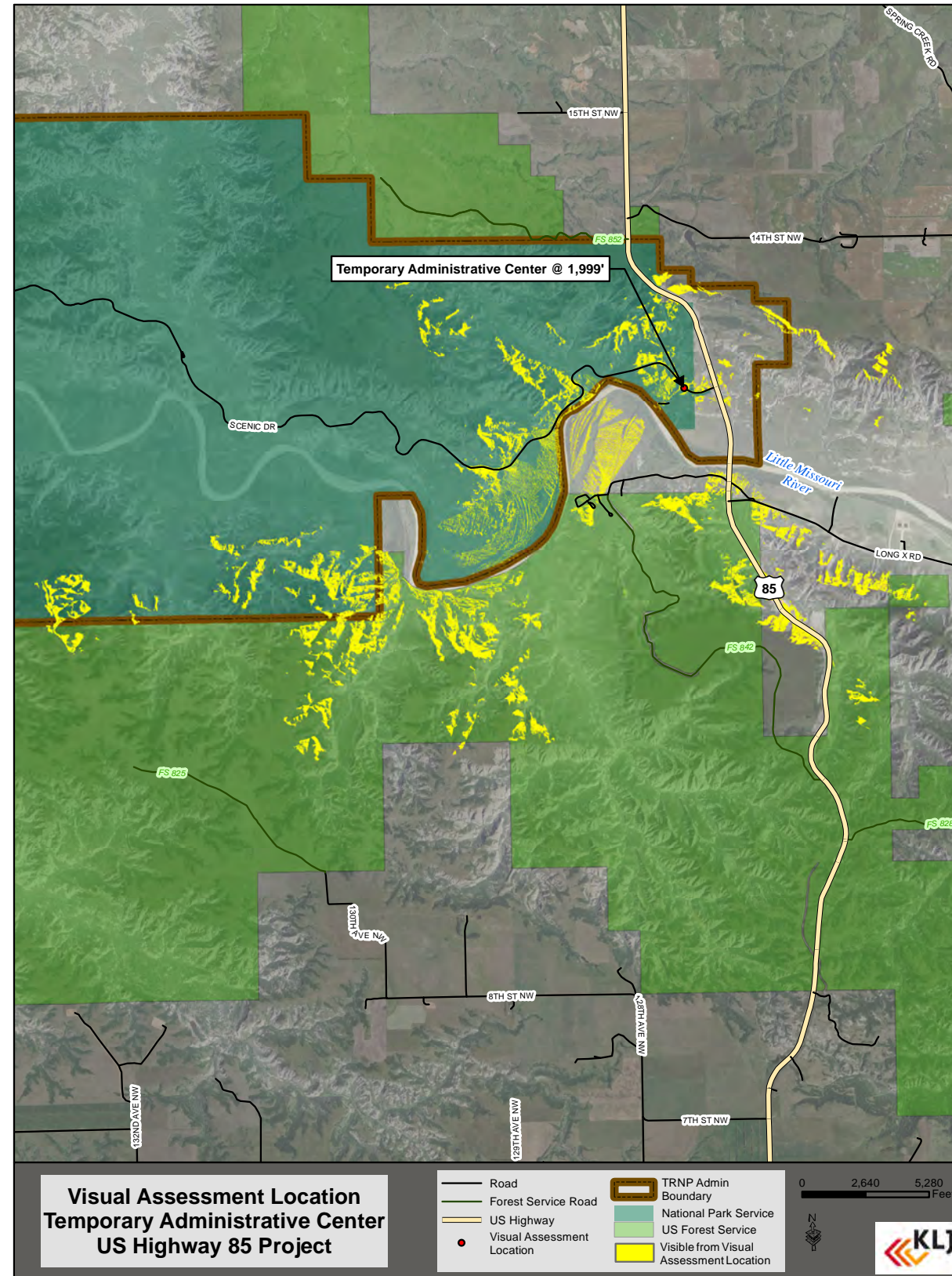
I-94 Interchange to Watford City Bypass (McKenzie County Road 30)
 Project 9-085(085)075 PCN 20046 ❖ Stark, Billings and McKenzie Counties, North Dakota

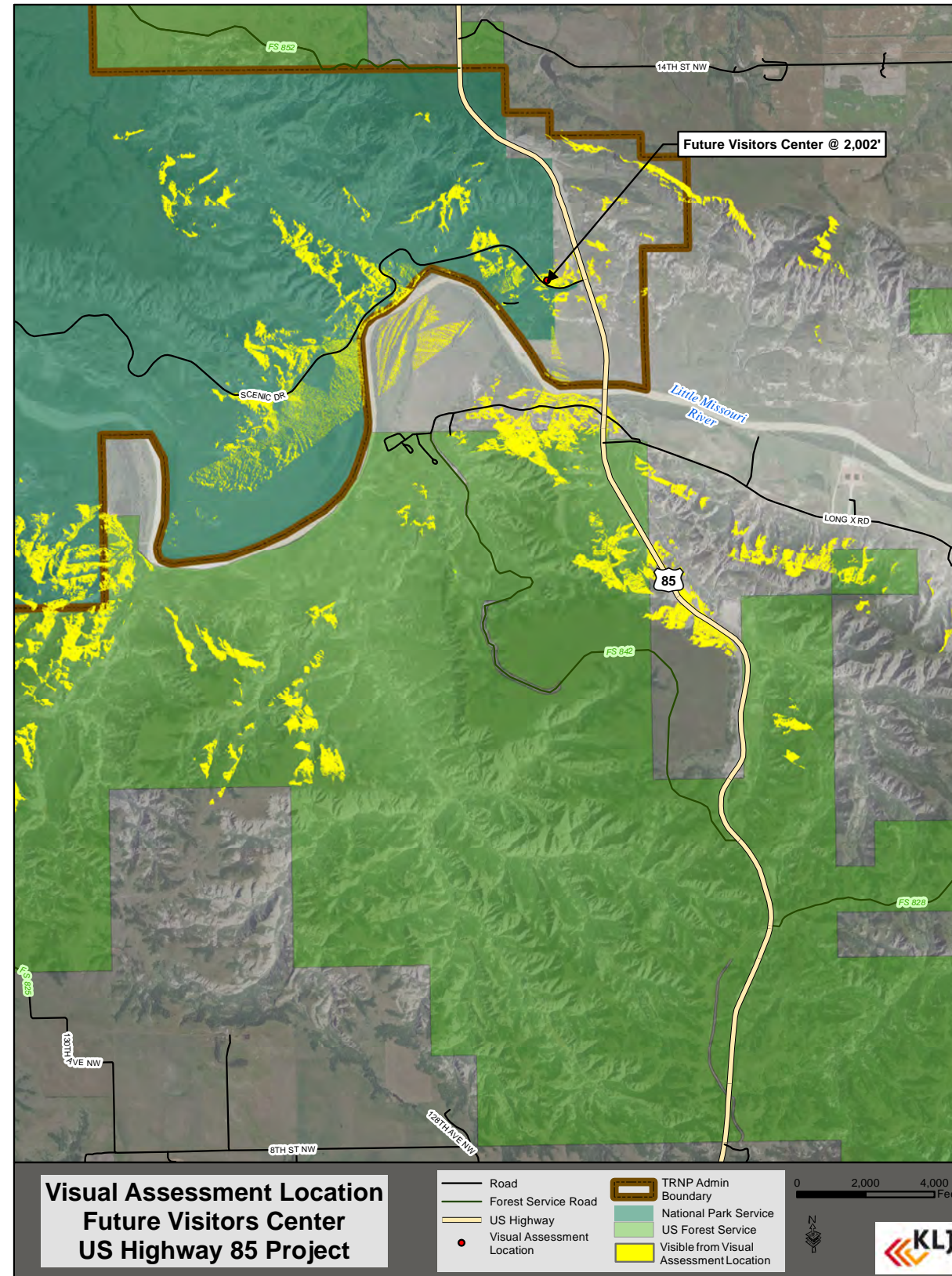




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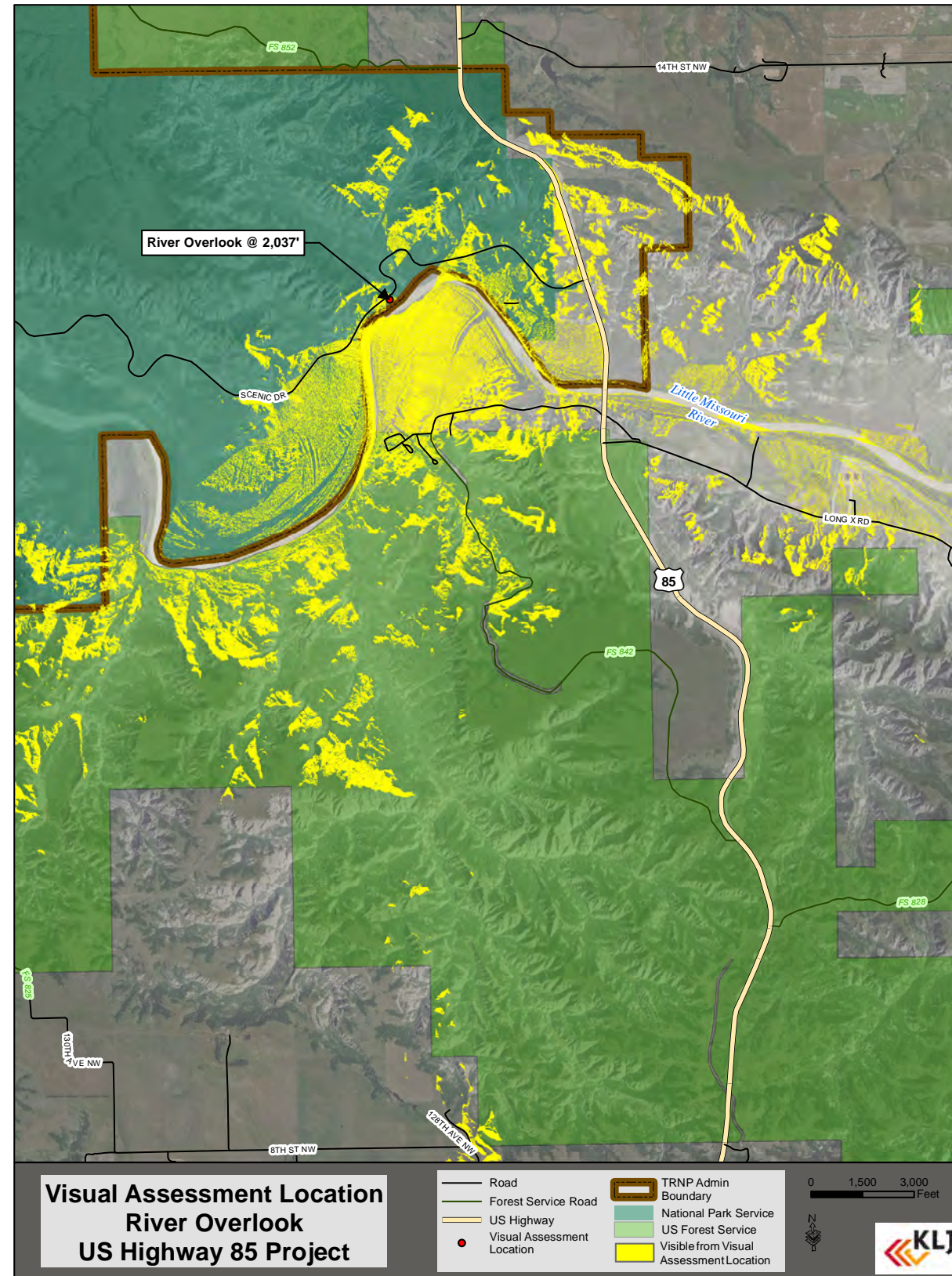
I-94 Interchange to Watford City Bypass (McKenzie County Road 30)
 Project 9-085(085)075 PCN 20046 ❖ Stark, Billings and McKenzie Counties, North Dakota

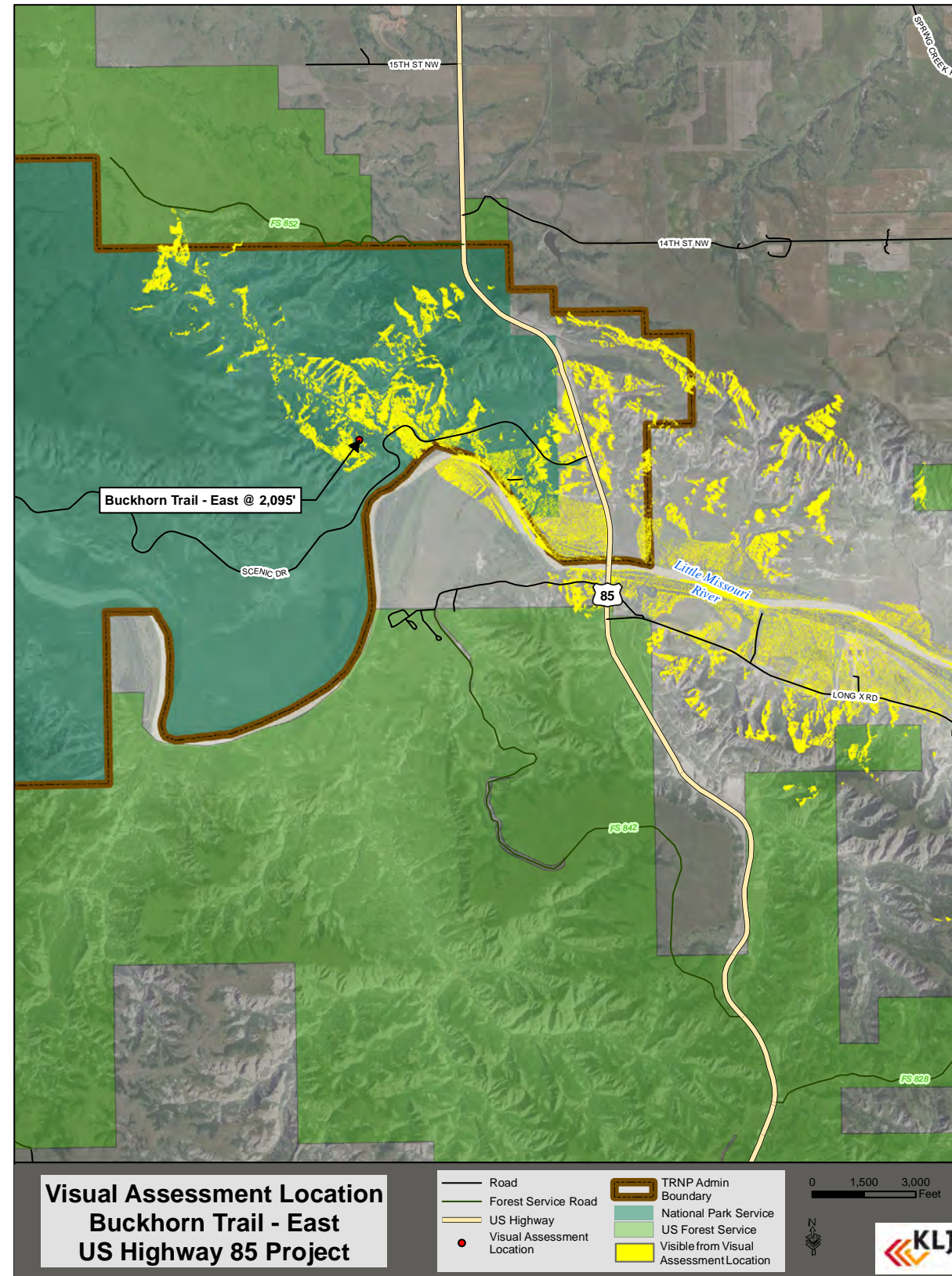




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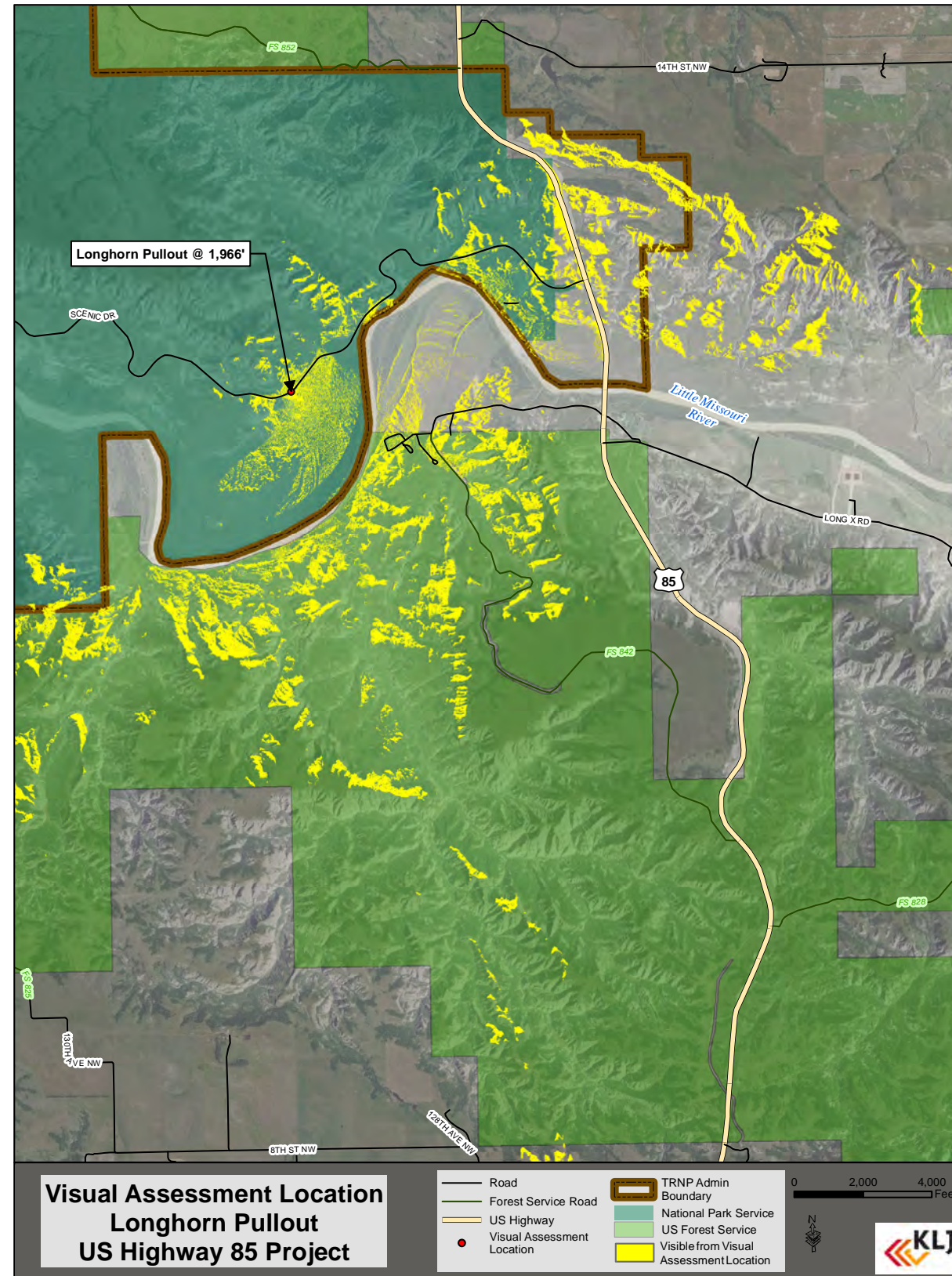
I-94 Interchange to Watford City Bypass (McKenzie County Road 30)
 Project 9-085(085)075 PCN 20046 ❖ Stark, Billings and McKenzie Counties, North Dakota

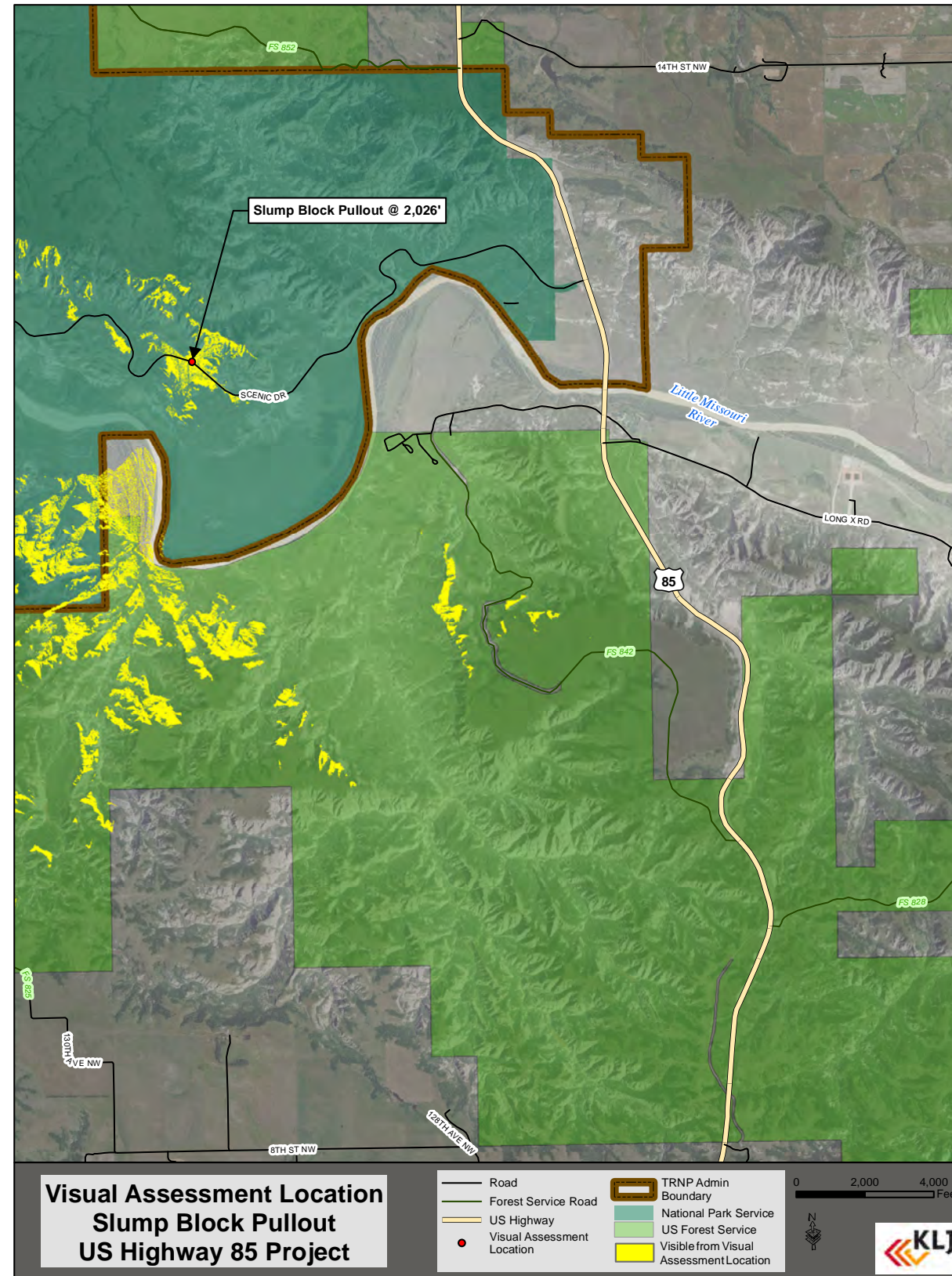




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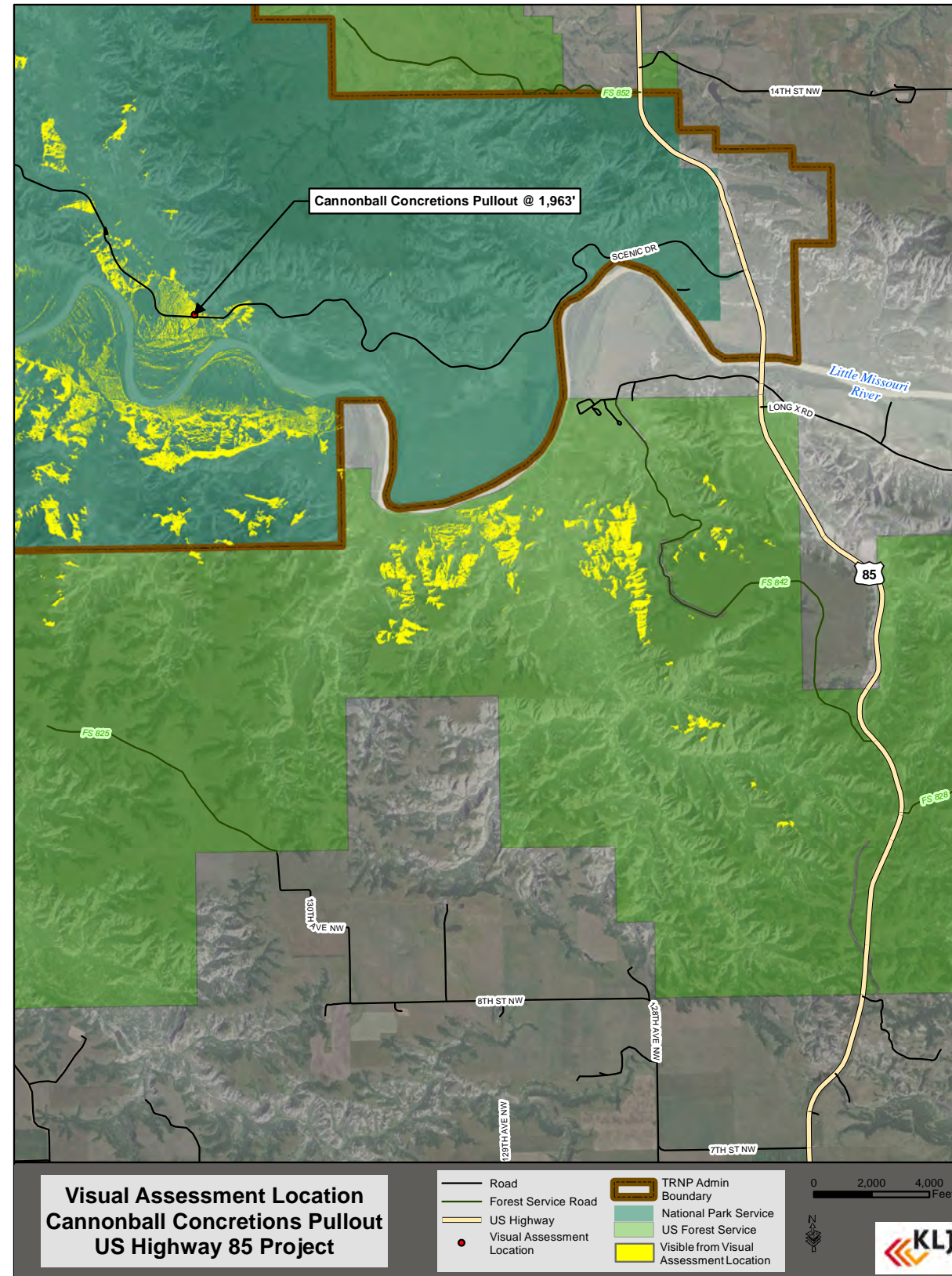
I-94 Interchange to Watford City Bypass (McKenzie County Road 30)
 Project 9-085(085)075 PCN 20046 ❖ Stark, Billings and McKenzie Counties, North Dakota

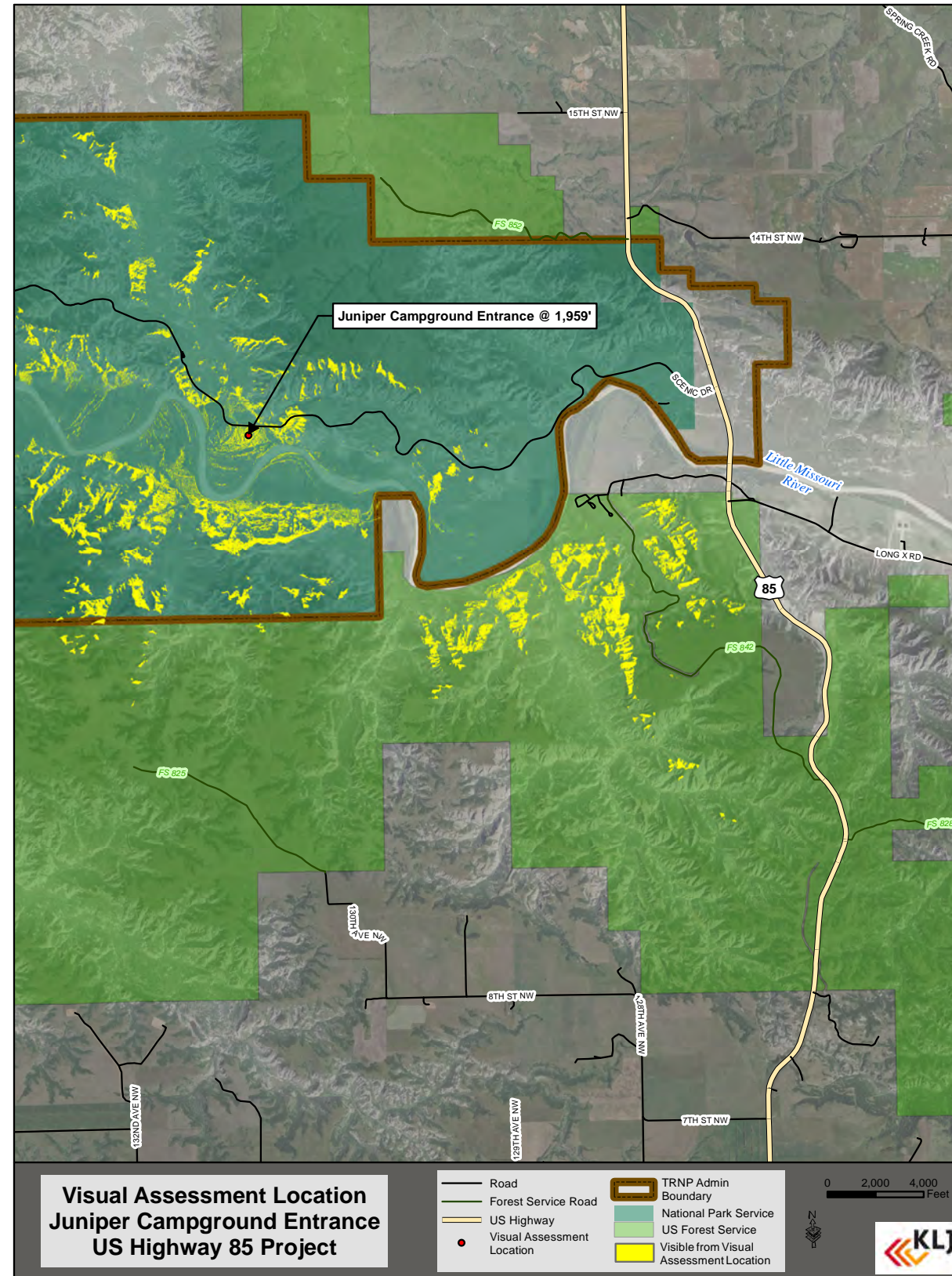




U.S. HIGHWAY 85

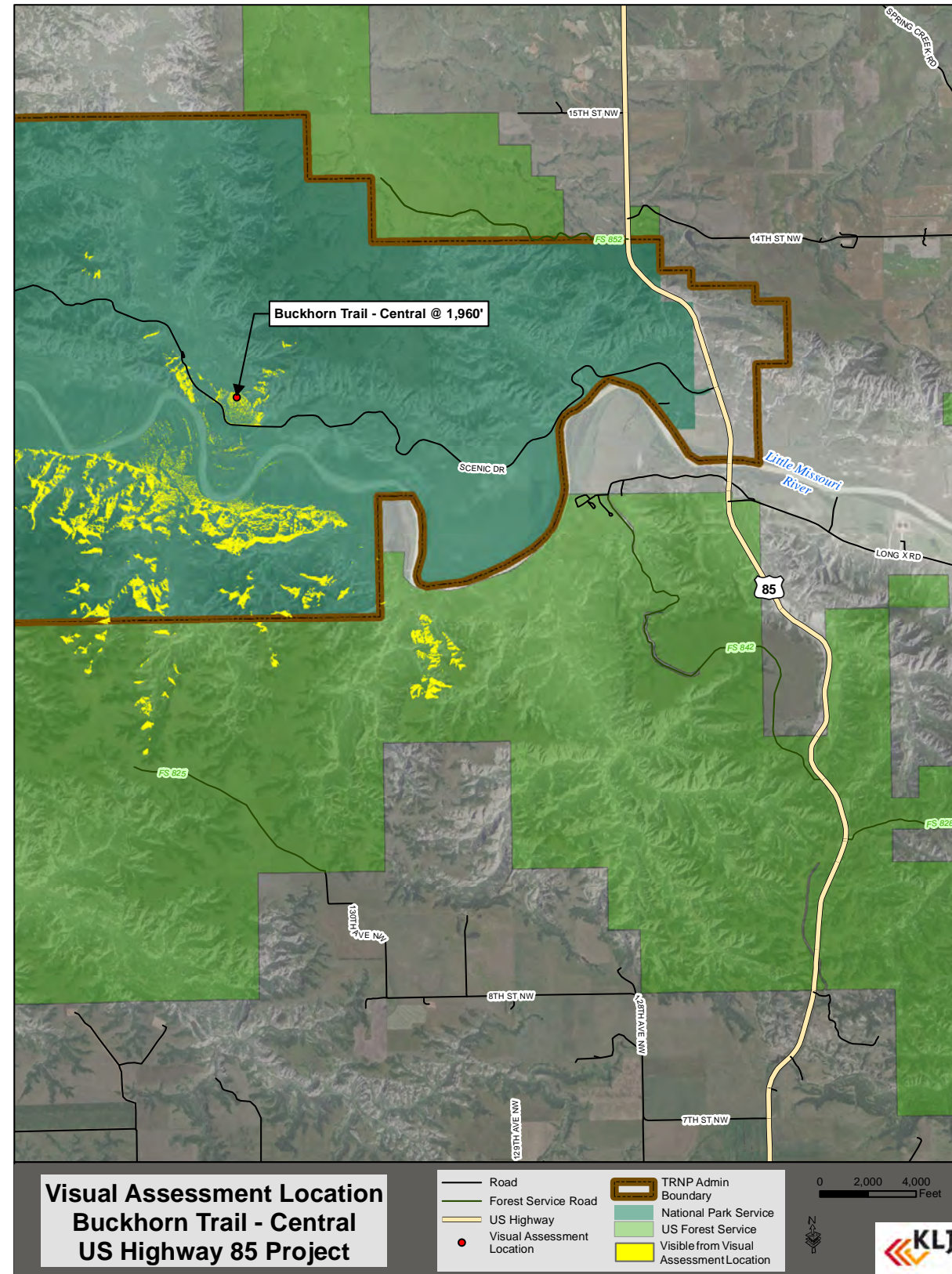
I-94 Interchange to Watford City Bypass (McKenzie County Road 30)
 Project 9-085(085)075 PCN 20046 ❖ Stark, Billings and McKenzie Counties, North Dakota

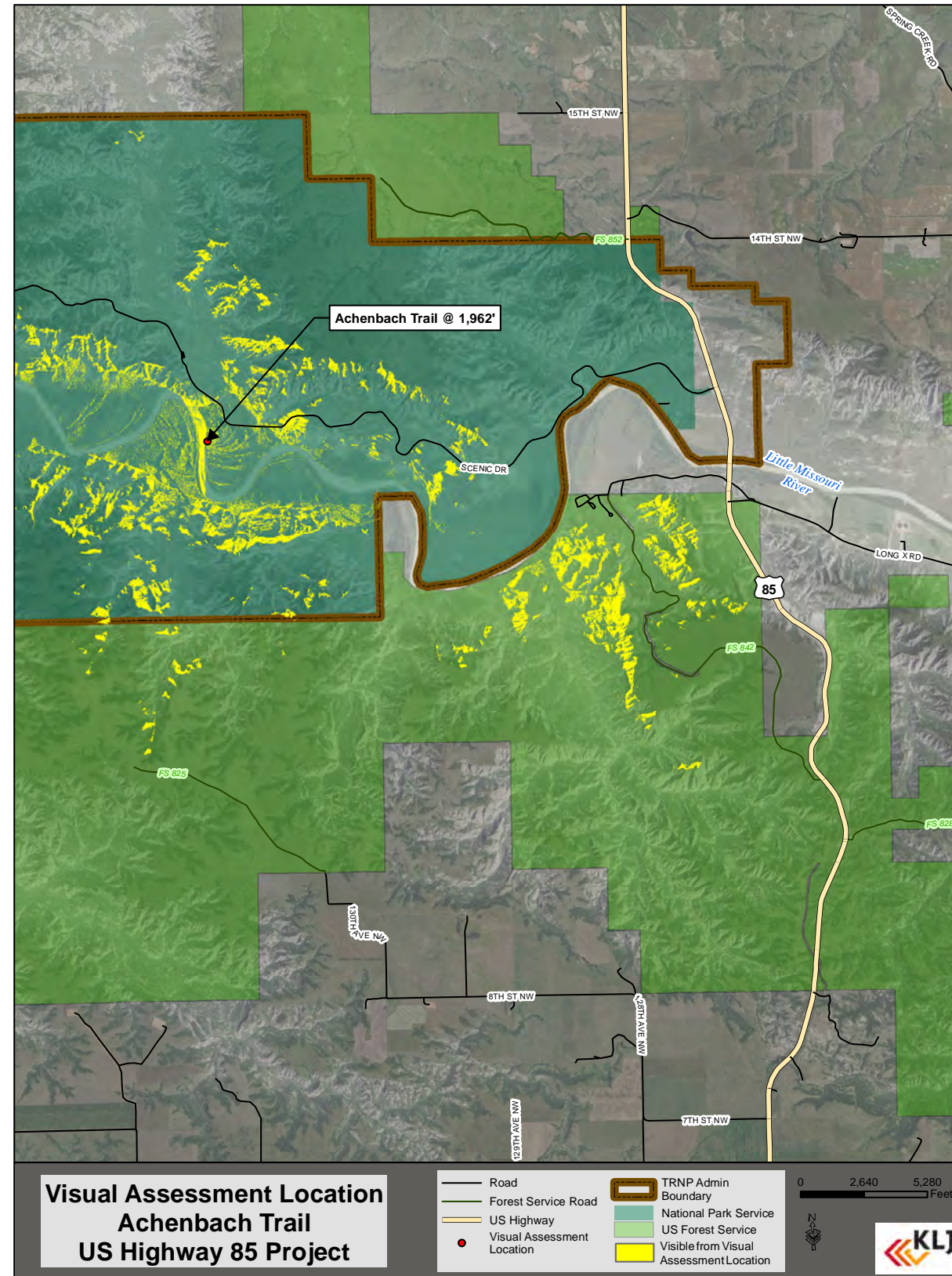




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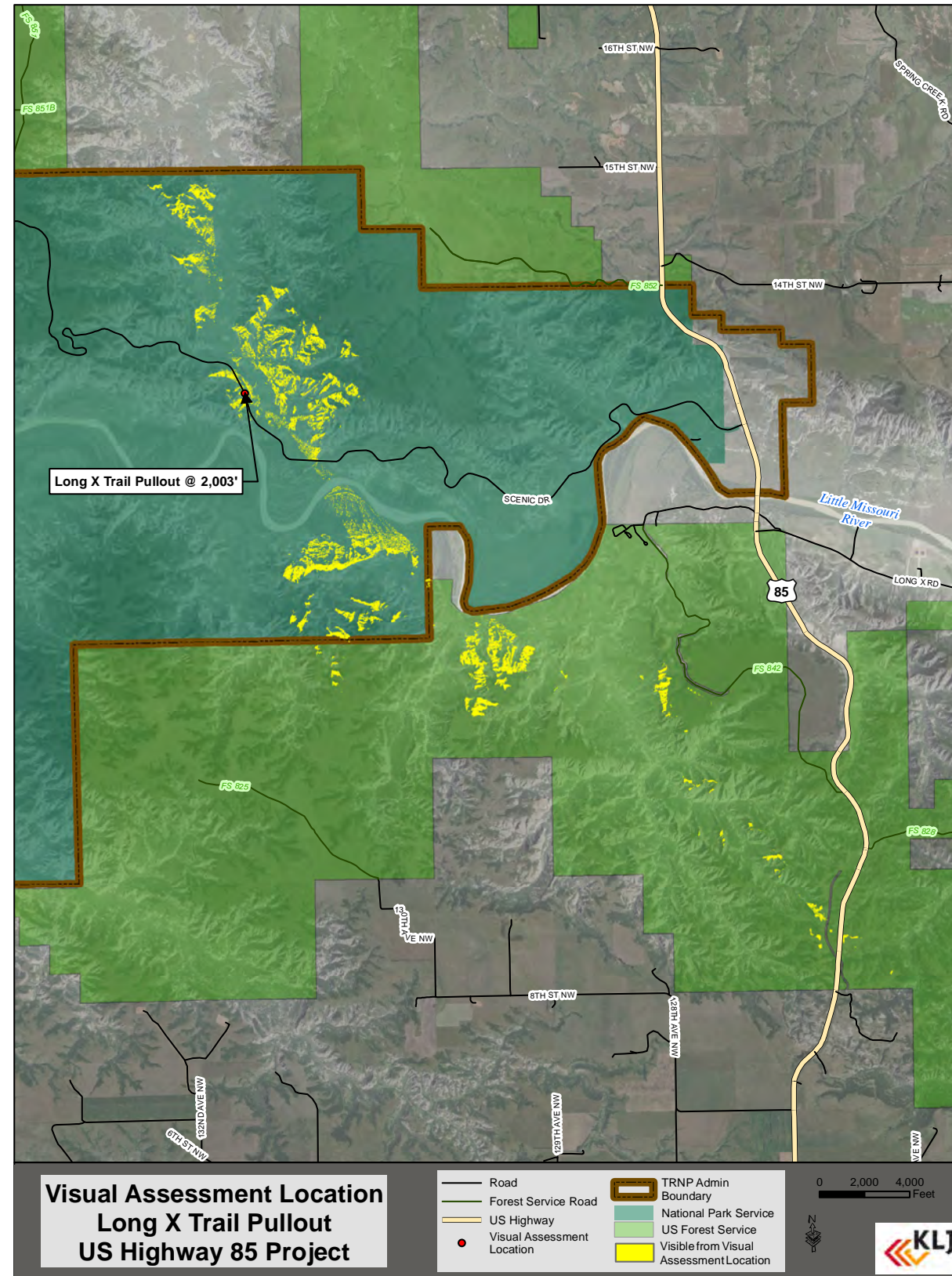
I-94 Interchange to Watford City Bypass (McKenzie County Road 30)
 Project 9-085(085)075 PCN 20046 ❖ Stark, Billings and McKenzie Counties, North Dakota

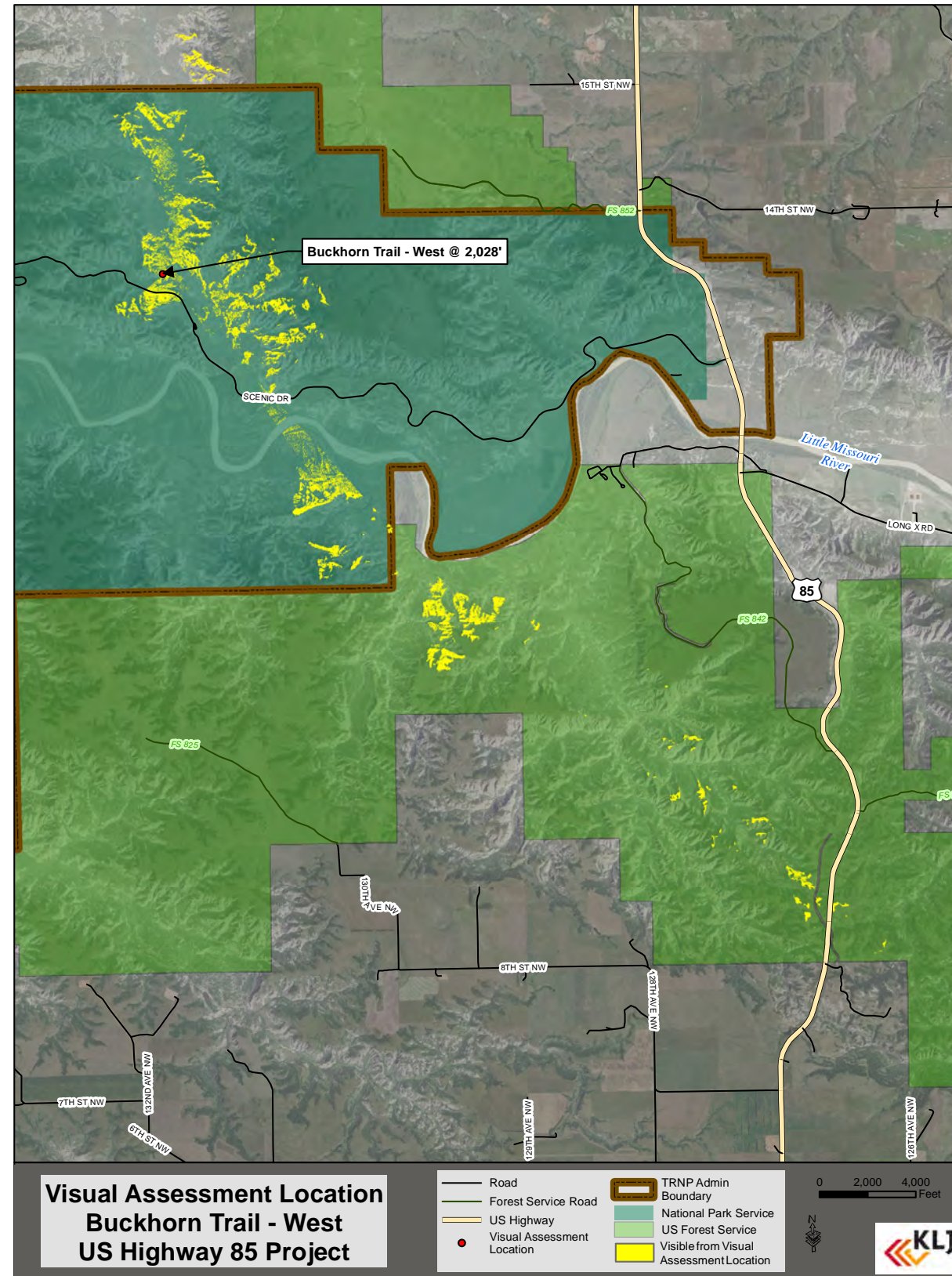




U.S. HIGHWAY 85

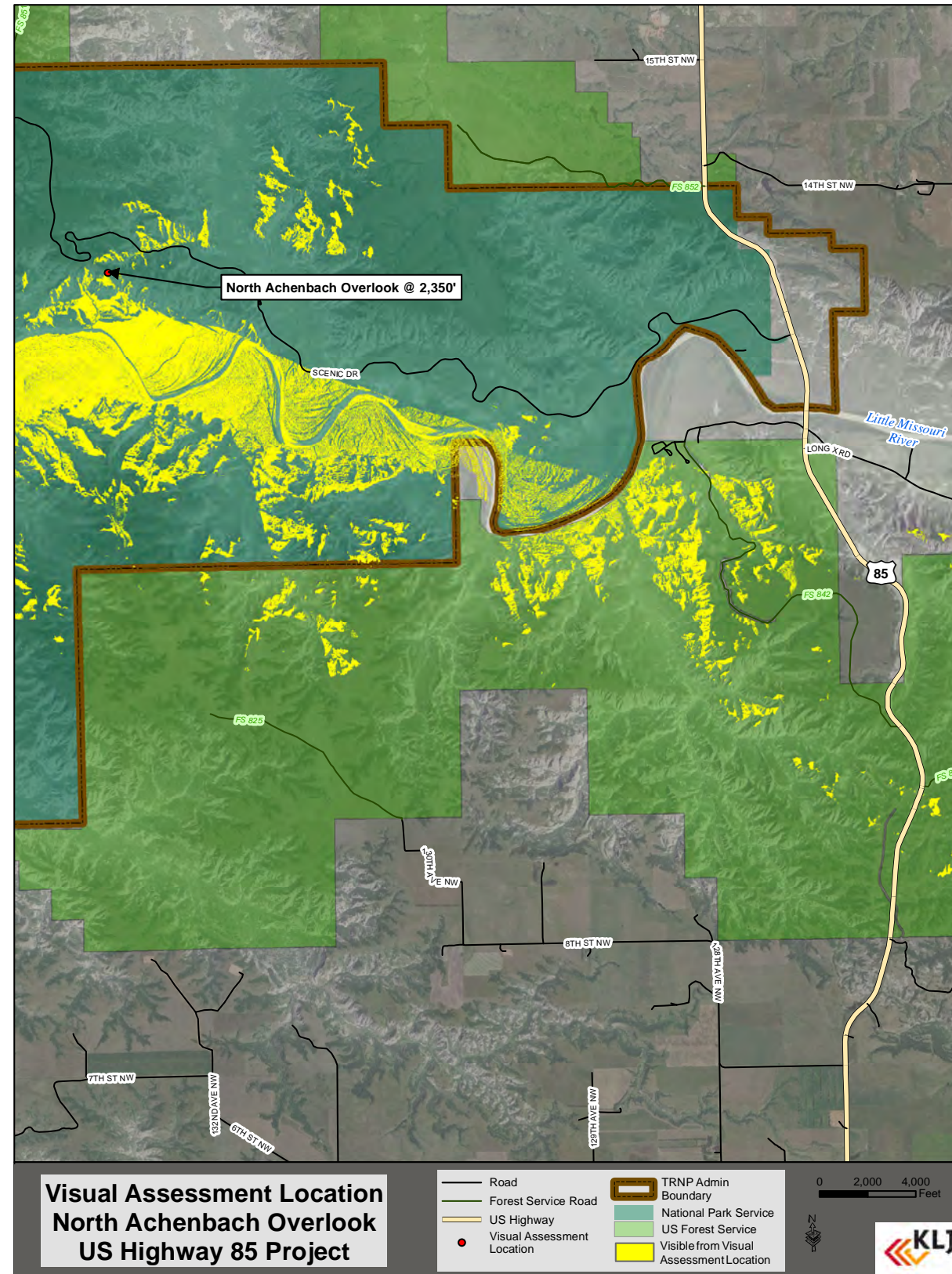
I-94 Interchange to Watford City Bypass (McKenzie County Road 30)
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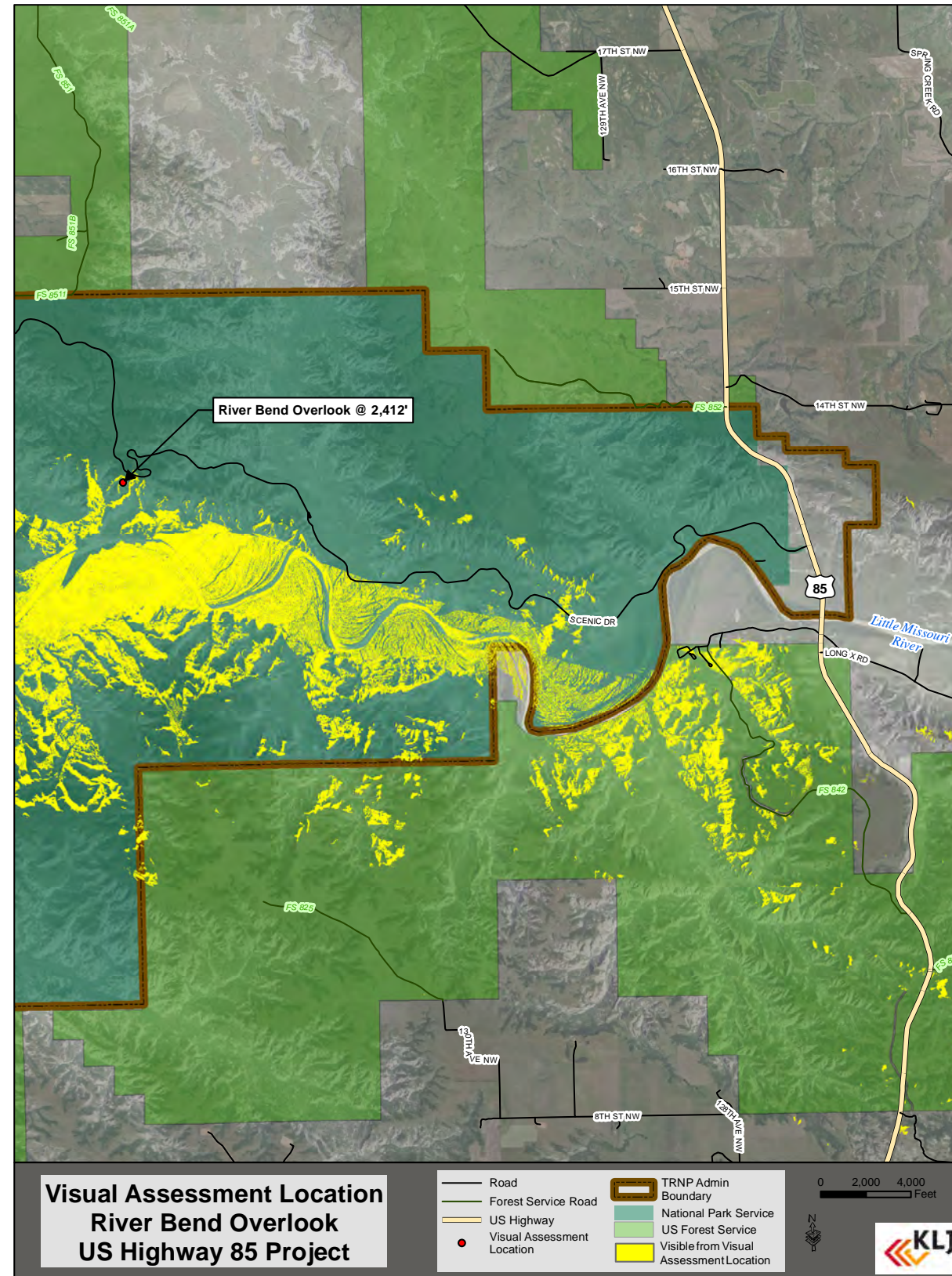




U.S. HIGHWAY 85

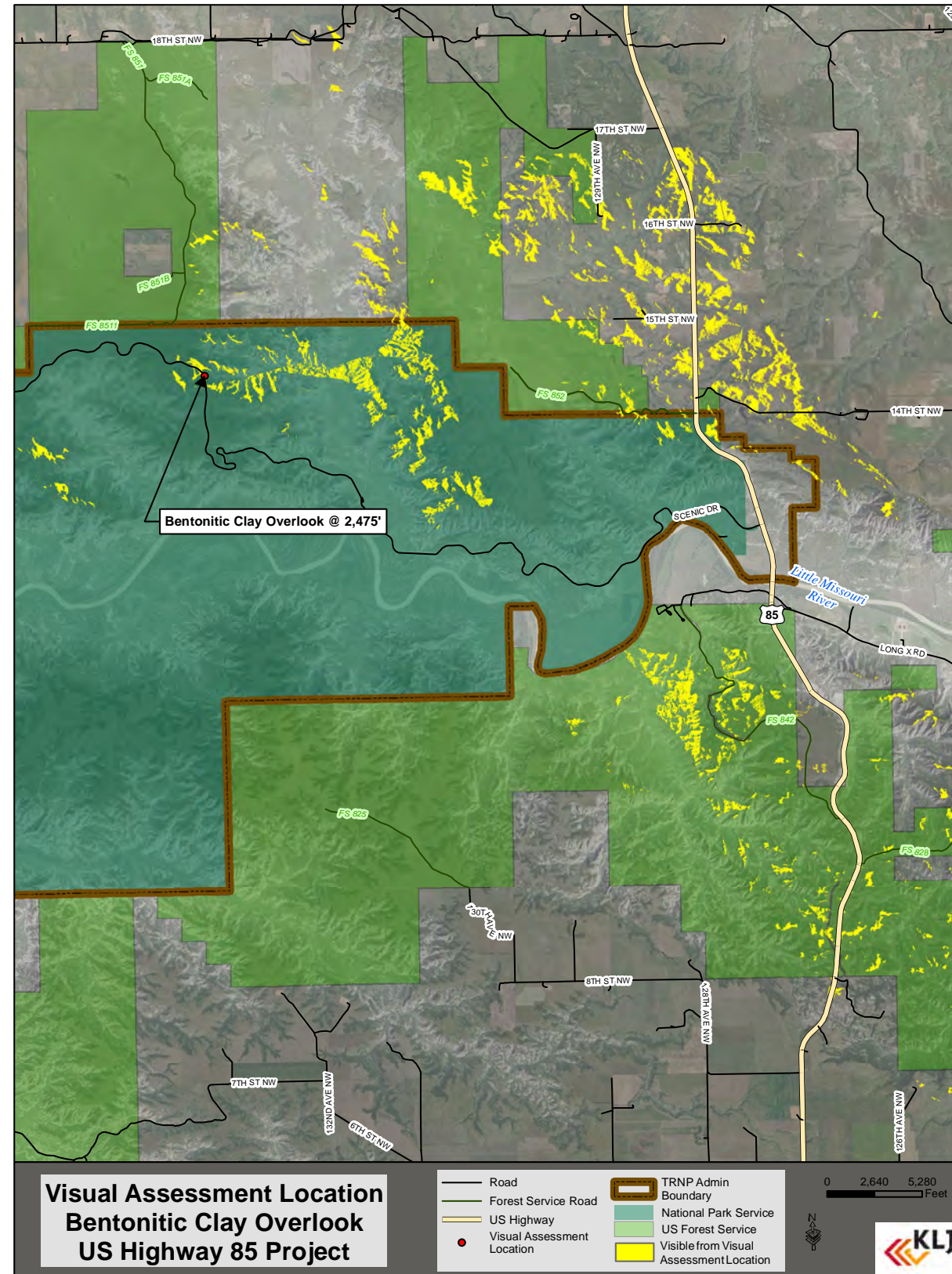
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 Project 9-085(085)075 PCN 20046 ❖ Stark, Billings and McKenzie Counties, North Dakota

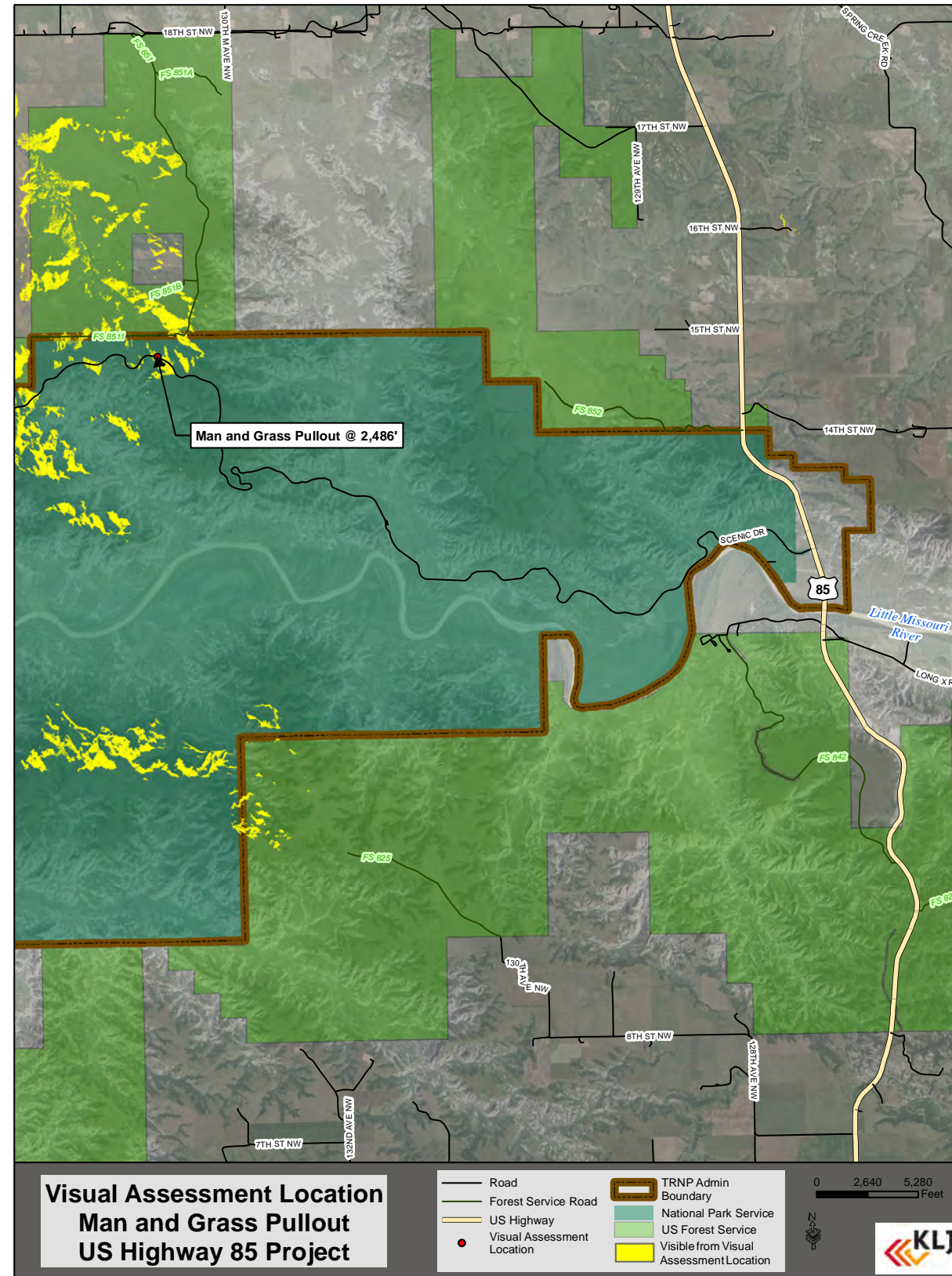




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