



Study Report

McCredie-Overton Transmission Line Right-of-Way Analysis

prepared for the
City of Columbia, Missouri

(S49)

May, 2017

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Purpose

The City of Columbia, Missouri requested an analysis by Ameren Services Company of the Ameren-owned McCredie-Overton 345 kV transmission line with respect to the "characteristics and capabilities" of the right-of-way for adding a parallel 161 kV transmission line owned by the City of Columbia. The parallel line would affect the McCredie-Overton 345 kV transmission line right-of-way through the section located between the City of Columbia's existing Perche Creek 161/69 kV Substation to near the City of Columbia's existing Bolstad 161/69 kV Substation. Ameren performed the analysis and provides the necessary information in this report.

Study Overview

The scope of the study included the following:

- An engineering analysis of the existing McCredie-Overton 345 kV transmission line right-of-way between structure 610, located 1.4 miles east of Bolstad Substation and structure 700 located 2.2 miles north west of Perche Creek Substation including:
 - A review of the existing structures and line layout along the centerline of the 150 foot wide right-of-way to determine the minimum offset that would be required for a new parallel 161kV transmission line.

- A review of all visible existing buildings, structures, and features located within 175 feet of the centerline McCredie-Overton 345kV transmission line (100 feet beyond the edge of the existing 150 foot wide right-of-way). This review was conducted using aerial imagery.
- A review of existing buildings that are suspected to be residences located beyond 175 feet from the centerline of the McCredie-Overton 345kV transmission line that that could potentially be impacted by the addition of a 161 kV transmission line.
- A review of the easement language for the McCredie-Overton 345 kV transmission line right-of-way.

Study Assumptions

- The minimum offset from the centerline of the McCredie-Overton 345kV transmission line to a new 161kV transmission line is dictated by the 2017 National Electric Safety Code.
- The minimum offset from the centerline of the McCredie-Overton 345kV transmission line to a new 161kV transmission line is impacted by the design of the existing 345kV transmission line.
- The design details, including the length and location, of any new parallel transmission line is unknown at this time; therefore, the offset calculations in this report are based on the location along the section of transmission line where the largest blowout can occur.
- Publicly available aerial imagery from Google Earth & Bing Maps was utilized to identify items along the right-of-way. Any changes that may have occurred since those images were taken have not been considered in this study.

Findings Related to Design

Based on the above noted Study Assumptions, the required offset of a parallel 161 kV transmission line is:

- 69 feet from the centerline of the 345kV transmission line to any part of the structure supporting a 161 kV transmission line.
- 71 feet from the centerline of the 345kV transmission line to any wire attachment point for a 161 kV transmission line.

Key findings along the right-of-way include:

- A pinch point (a location where features outside of the right-of-way could impact the ability to obtain additional easements) along the 345 kV transmission line right-of-way is located approximately 2 miles west of Bolstad between North Oakland Gravel Road and Highway 63 where the line passes through a residential neighborhood. This pinch point extends 1.5 miles between structures 632 and 641.
- A double circuit distribution line is located parallel to and along the south edge of the 345kV transmission line right-of-way between structure 623 and 643. This distribution line may impact the location of a new 161 kV transmission line.
- A pinch point on the 345 kV transmission line right-of-way is located 5.5 miles west of Bolstad between North O'Neal Road and North Creasy Springs Road where the line passes through a neighborhood. This pinch point extends 0.7 miles between structures 655 & 660.
- The McCredie-Overton 345kV transmission line right-of-way crosses the middle of a golf course located south of Interstate 70 between structure 688 and 690.

See the Mapbook, attached hereto as Exhibit A, or refer to the Google Earth kmz files, Ameren will provide under separate cover, for additional information related to the right-of-way analysis.

Findings Related to Easements

- Review of Ameren's existing real estate easements for the section of the McCredie-Overton 345 kV transmission line between structures 610 and 700 did not identify any legal restrictions that would prevent the addition of a separate 161 kV transmission line on the same right-of-way.
- However, even though Ameren has easements that do not legally restrict other uses such as the placement of a new 161 kV transmission line, Ameren does not have legal authority to grant any rights for a new 161 kV transmission line or for any other use. It will be necessary for the City of Columbia to obtain any additional land rights, both within the existing Ameren right-of-way or outside of and parallel to the existing Ameren right-of-way.
- The City of Columbia is responsible to obtain any easements or permissions it may need from all land owners and any regulating bodies.

Conclusions, Recommendations and Options

- Ameren does not object to the placement of a new 161 kV transmission line to the extent any new 161 kV transmission line (or any other use) does not interfere with

Ameren's ability to own, operate, and maintain our facilities in a safe and secure manner.

- The analyses performed under this study did not identify any physical constraints on the Ameren electric system that will require mitigation by the City of Columbia if a new 161 kV transmission line is constructed parallel to and upon the existing McCredie-Overton 345 kV transmission line right-of-way provided the design and construction accommodates the offset requirements of 69 feet from the centerline of the 345kV transmission line to any part of a 161 kV transmission line structure and 71 feet from the centerline of the 345kV transmission line to any 161 kV wire attachment point.
- The analysis did not identify any legal restrictions within the existing Ameren easements that would prevent the addition of a separate 161 kV transmission line on the same right-of-way.
- Ameren does not have legal authority to grant any rights to the City of Columbia to use the existing right-of-way.
- The City of Columbia is responsible to obtain any easements or permissions it may need from all land owners and any regulating bodies.
- There may be an option to reduce the required offset from the centerline of the 345kV transmission line to a new 161 kV transmission line. This option will require close design and construction coordination between Ameren and the City of Columbia. Specific methods or design considerations are not presented in this report. However, Ameren is open to meeting with the City of Columbia to discuss further at the City's request.

Next Steps

Ameren recommends meeting with the City of Columbia to review the information provided in this report and to explain the results and conclusions of the analysis. Once the City of Columbia provides more detail related to the design of any new 161 kV transmission line that would parallel the McCredie-Overton 345 kV transmission line right-of-way, Ameren can provide a more detailed analysis and additional design recommendations toward a final project that will accommodate Ameren's requirements, the City's needs and the least cost going forward.

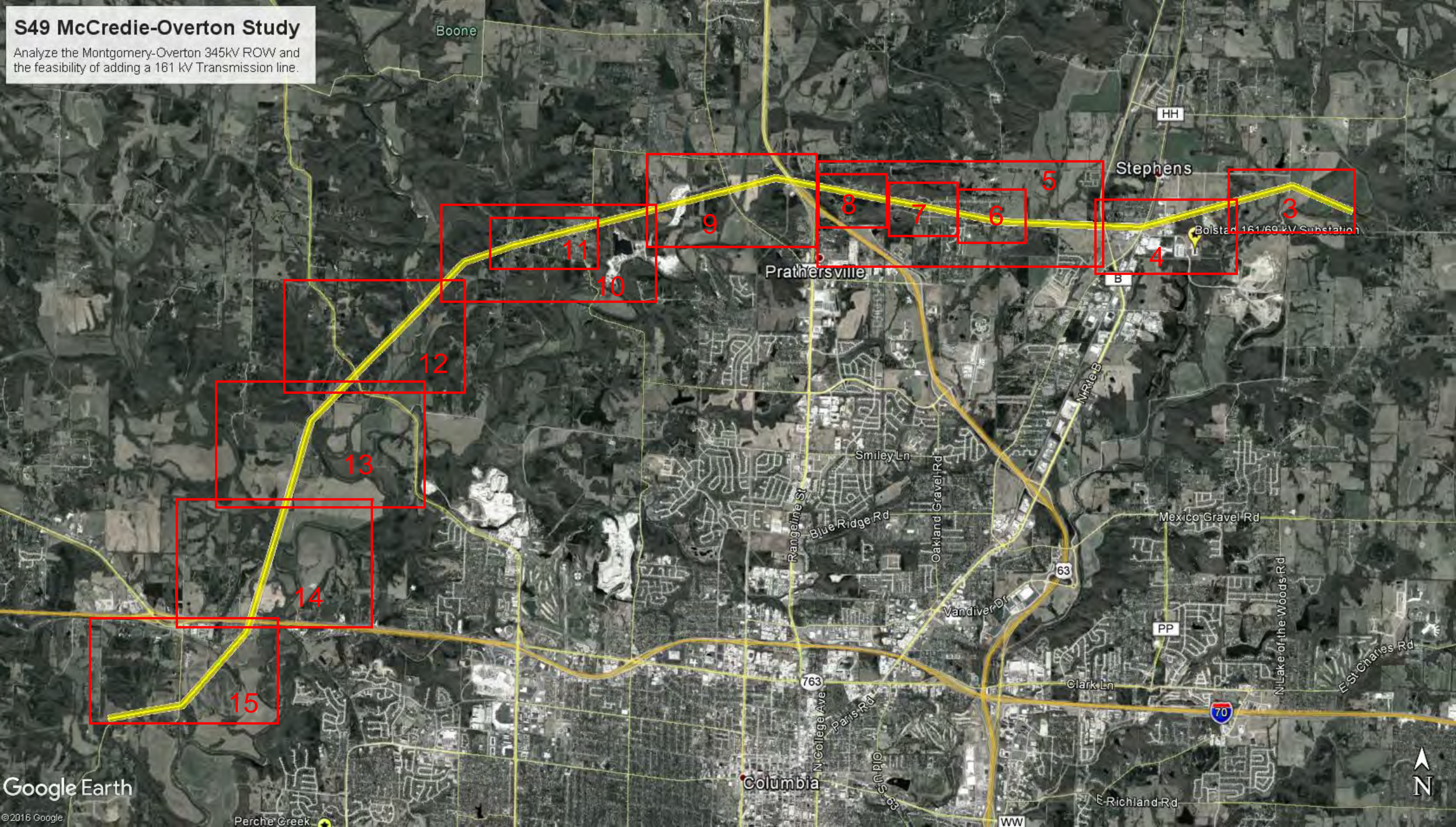
Disclaimer

Any action or decision based on the information contained herein should be undertaken after an independent review of the facts and circumstances of the particular project for which this information was developed and for which it will be used. Although Ameren has made all commercially reasonable efforts to develop the information in an accurate manner consistent with the exercise of Good Utility Practice, NO GUARANTEES OR WARRANTIES OF ANY KIND, INCLUDING EXPRESS OR IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS ARE MADE WITH RESPECT TO THE INFORMATION BY ANY AMEREN COMPANY, ITS AFFILIATES, ITS OFFICERS, DIRECTORS, EMPLOYEES OR AGENTS, WHO ALSO ASSUME NO LEGAL RESPONSIBILITY FOR THE ACCURACY OF THE INFORMATION CONTAINED HEREIN. IN ADDITION, NO LIABILITY IS ASSUMED AND ALL LIABILITY IS EXPRESSLY DISCLAIMED FOR NEGLIGENCE OR DAMAGES OF ANY KIND, ANY DECISIONS, CONTRACTS, COMMITMENTS, OBLIGATIONS OR ANY OTHER ACTIONS UNDERTAKEN OR MADE ON THE BASIS OF THE INFORMATION CONTAINED HEREIN.

Exhibit A – Mapbook

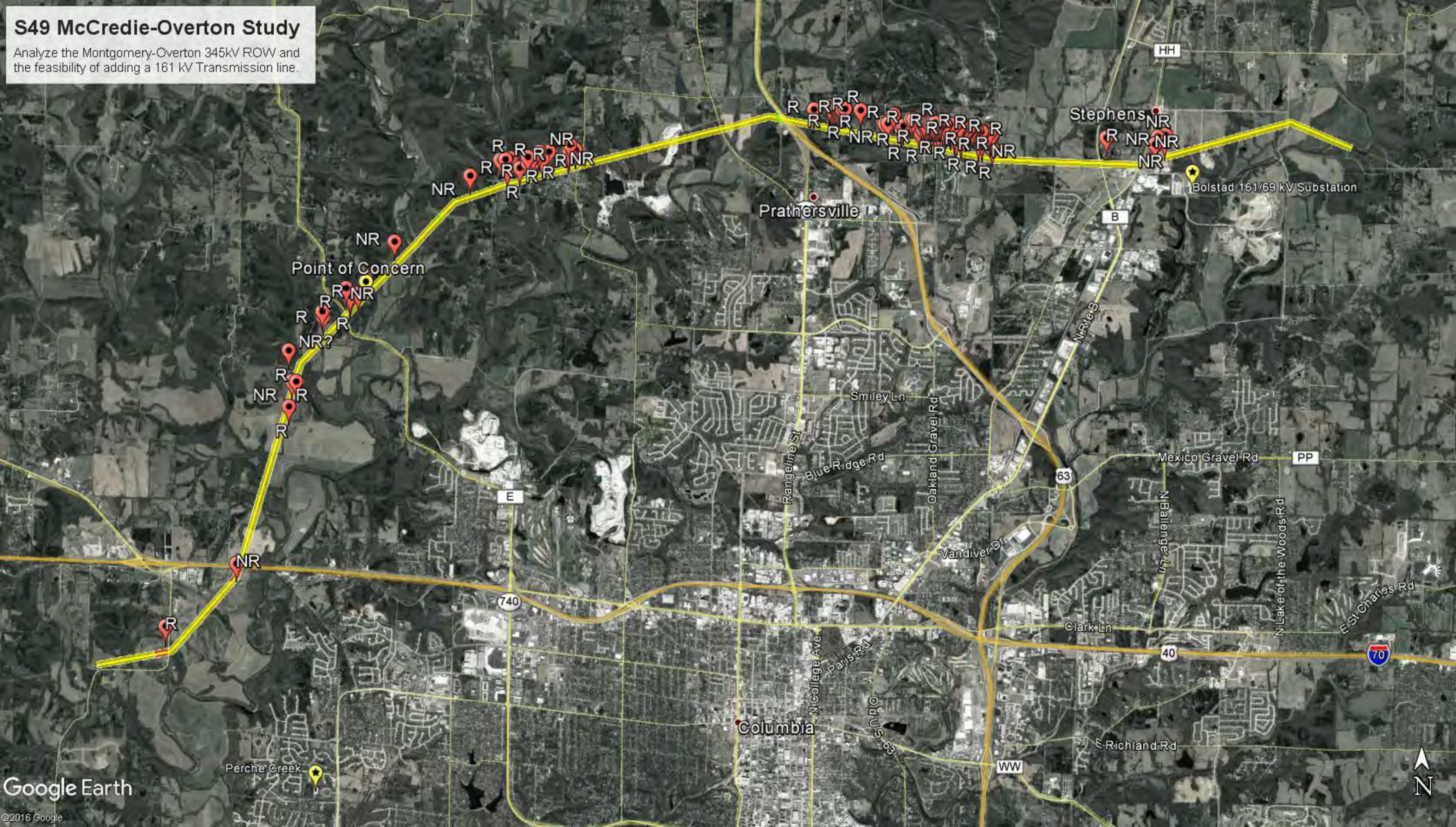
S49 McCredie-Overton Study

Analyze the Montgomery-Overton 345kV ROW and the feasibility of adding a 161 kV Transmission line.



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Residential Building

Non-residential Building

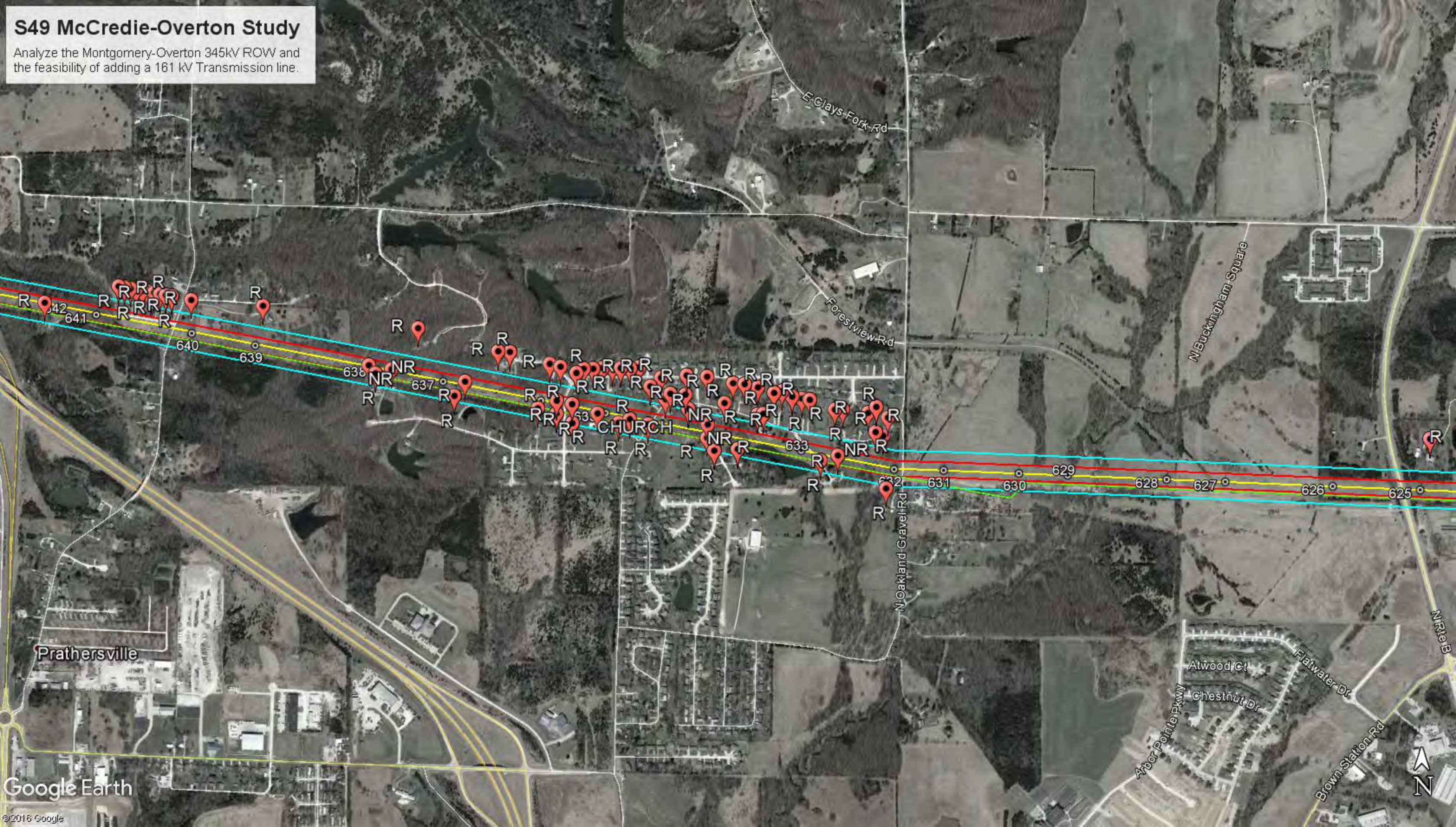
Distribution Line

Bolstad 161/69 kV Substation

Brundage Rd

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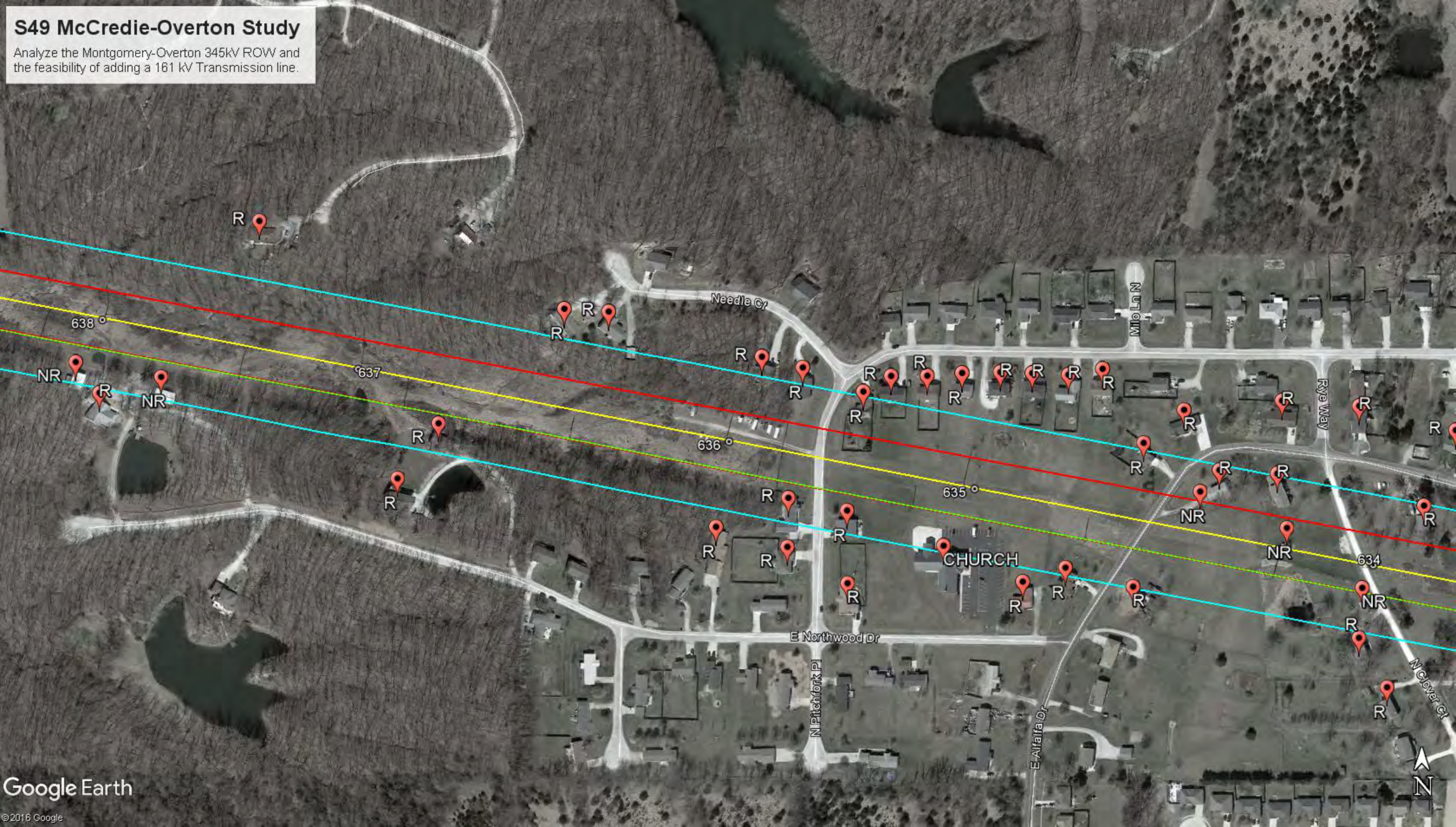
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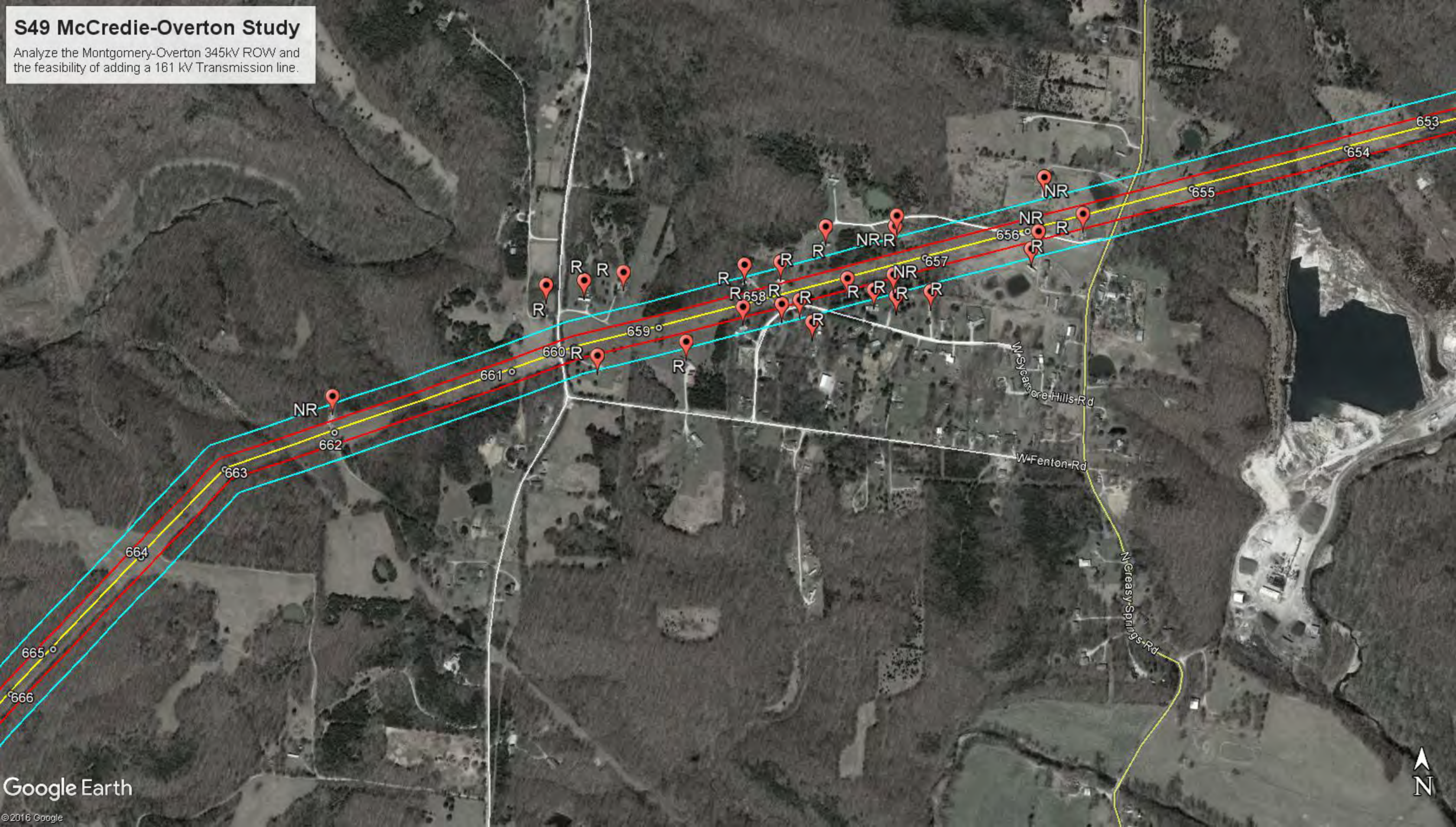
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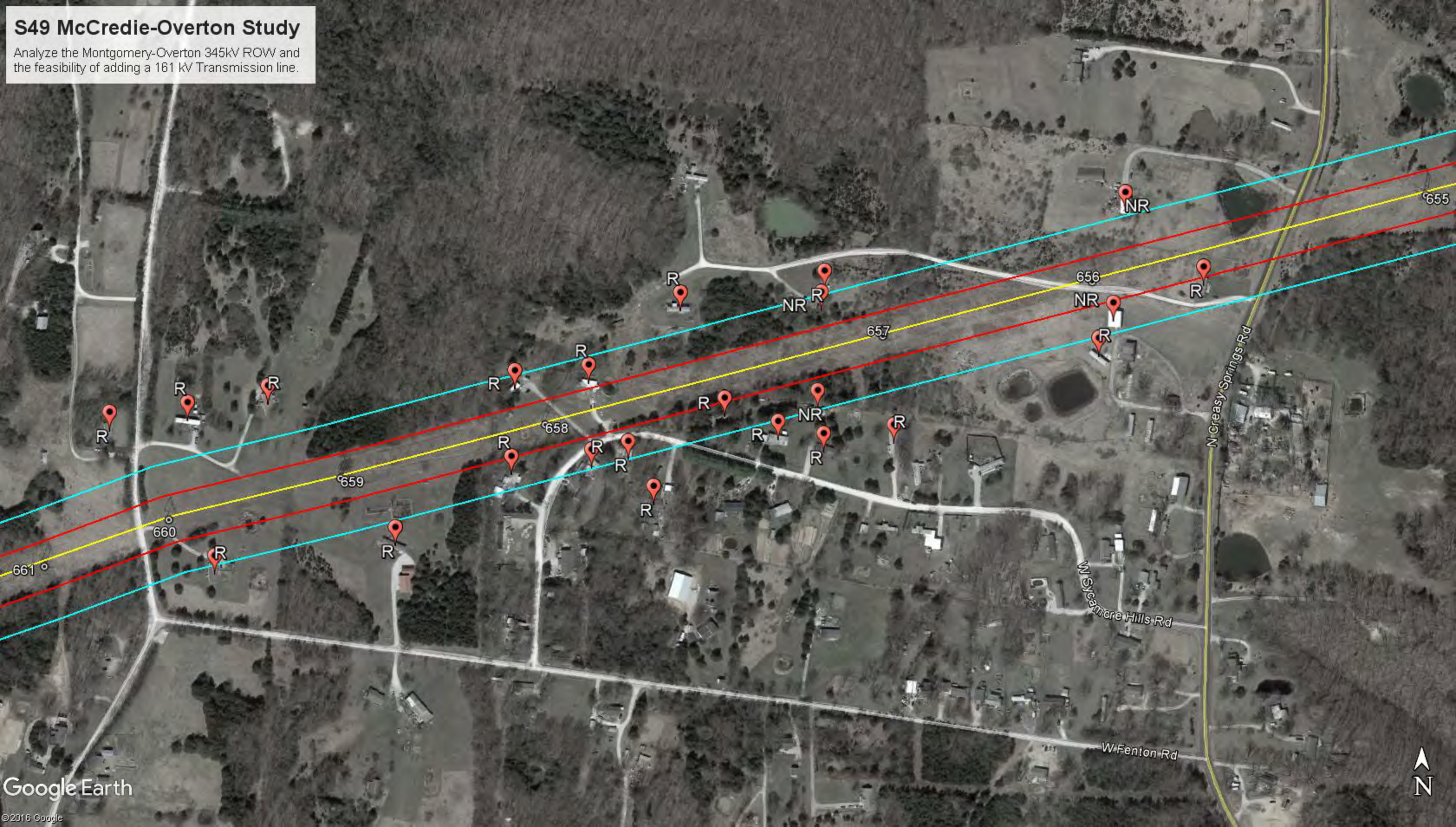
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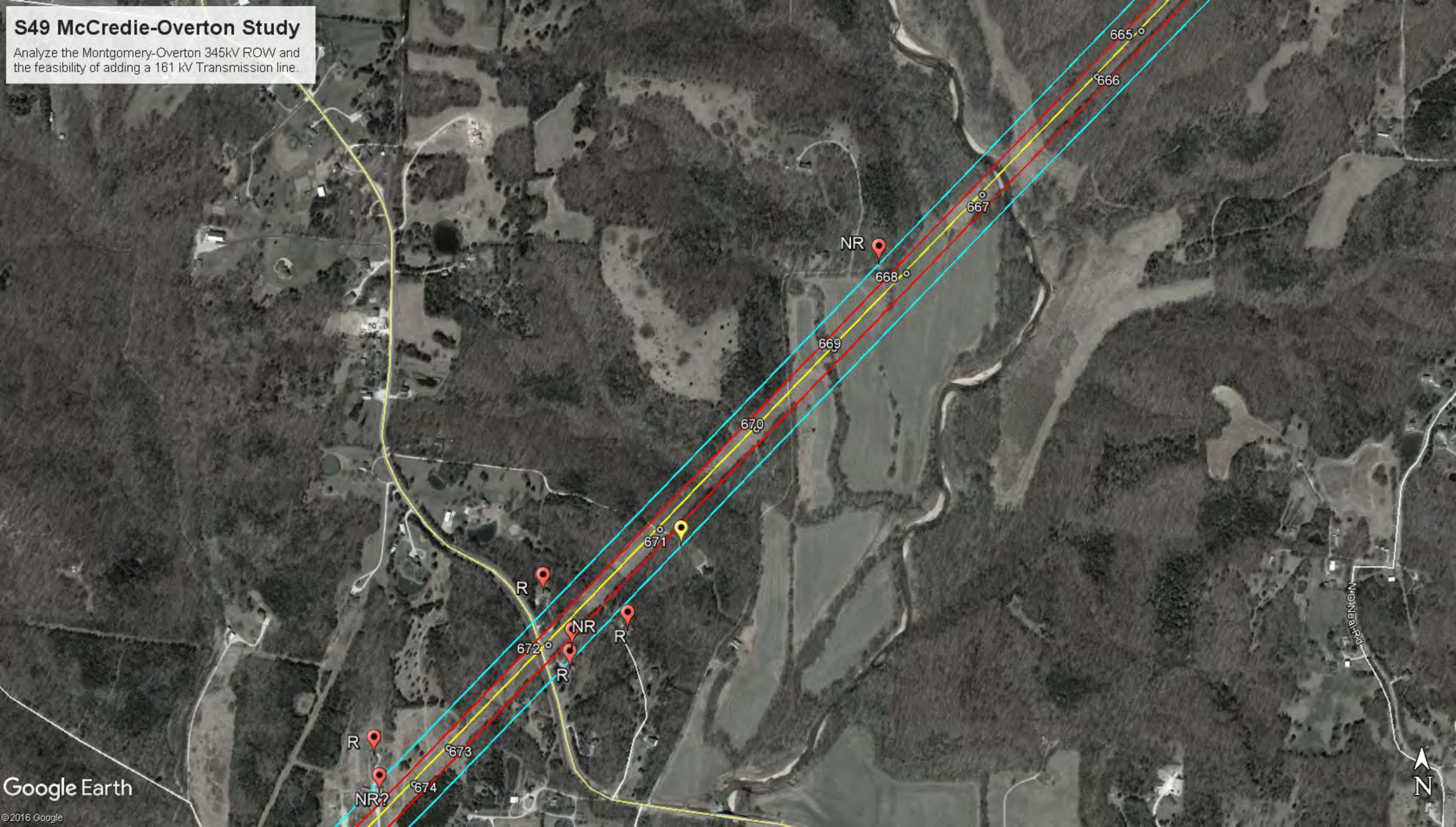
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N Abilene Acres

W Gibbs Rd

N Chapman Ln

N Dawn Dr

Interstate 70 Dr NW

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