



## Independence Power & Light

Facility Study for Southwest Power Pool Generator Interconnect  
Request

GEN-2023-171

January 2026

## Introduction

Pursuant to the Southwest Power Pool (SPP) Open Access Transmission Tariff (Tariff) and at the request of SPP, Independence Power & Light (IPL) performed the following Facility Study for the following Interconnection and/or Network Upgrade(s) to satisfy the Facility Study Agreement executed by the requesting Interconnection Customer (Customer) for SPP Generation Interconnection Request GEN-2023-171.

The request for interconnection was placed with SPP in accordance with the Tariff, which covers new generation interconnections on SPP member's transmission system. The Customer requests interconnection service for a 150MW battery storage facility. The requirements for interconnection consist of adding a line position and associated equipment to the existing IPL Substation M 161kV ring bus.

The Facility Study does not guarantee the availability of transmission service necessary to deliver the additional generation to any specific point inside or outside the SPP transmission system. The transmission network facilities may not be adequate to deliver additional generation output to the transmission system. If the Customer requests firm transmission service under the SPP Tariff at a future date, Network Upgrades or other new construction may be required to provide the service requested under the SPP Tariff.

## Study Requirements

IPL has performed this Facility Study report in accordance with the Generator Interconnection Procedures (GIP), Attachment V, Section 8.11 for the noted Interconnection and/or Network Upgrade(s).

The Facility Study report includes an evaluation of the following:

- Perform/develop a substation layout, perform a preliminary bus design, determine all electrical equipment requirements, and if required determine a suitable site location to accommodate the Request. Develop/compile cost estimates for all labor, overheads, equipment additions, modifications, etc. to accommodate the generator interconnection.
- Develop an overall construction schedule for completion of the necessary additions and/or modifications.
- Point Of Change of Ownership. For the purposes of this Facility Study report, the Point of Change of Ownership location is defined as the take-off structure(s) at the IPL Substation/Switching Station where the Interconnection Customer's

transmission line(s) connects to the take-off structure(s). Interconnection Customer will furnish and install the conductor jumper and insulator assembly to the take-off structure(s).

- Other Interconnection/Metering Requirements. Basic indication, metering, monitoring, control, and relaying requirements due to a generator interconnection are not included in the cost estimate. IPL's generation metering requirements, as an SPP Transmission Owner, must be met. A list of specific needs will be provided by IPL once design has progressed. Interconnection customer is to install metering equipment at the Collector station.

## Cost & Time Estimates

Cost estimates are accurate to +/- twenty (20) percent, based on current prices, in accordance with Section 8.11 of the Attachment V Generator Interconnection Procedures (GIP). However, cost fluctuations in materials are significant and the accuracy of this estimate at the time of actual procurement and construction cannot be assured.

### GEN-2023-171

#### IPL Substation M

##### **Transmission Owner Interconnection Facilities (TOIF)**

TOIF at the IPL Substation M includes:

- (1) Deadend Structure

TOIF Cost      \$500,000

##### **Non-Shared Network Upgrades**

Non-Shared Network Upgrades at IPL Substation M include:

- (3) 161kV Disconnect Switches
- (3) 161kV CVTs
- (1) 161kV Circuit Breaker
- (3) 161kV Ground Mounted Surge Arresters
- (1) Line Relay Panel
- (1) Breaker Control Panel

Non-Shared Transmission Line Network Upgrades include:

- Relocate 161kV Substation A Line
  - Install (3) single-circuit monopole deadend structures, 85ft above ground height, steel structures on drilled shaft foundations
- Relocate 69kV Substation J Line

- Install (1) single-circuit monopole deadend structure, 60ft above ground height, steel structures on drilled shaft foundations
- Install (1) single-circuit monopole deadend structure, 80ft above ground height, steel structures on drilled shaft foundations
- Install (2) single-circuit monopole tangent structures, 70ft above ground height, steel structures on direct embed foundations

Non-Shared Network Upgrade Cost      \$3,420,000

A preliminary station plan view (Appendix A), a preliminary station one-line (Appendix B), and a preliminary transmission line route (Appendix C) are provided in this report.

### Time Estimate

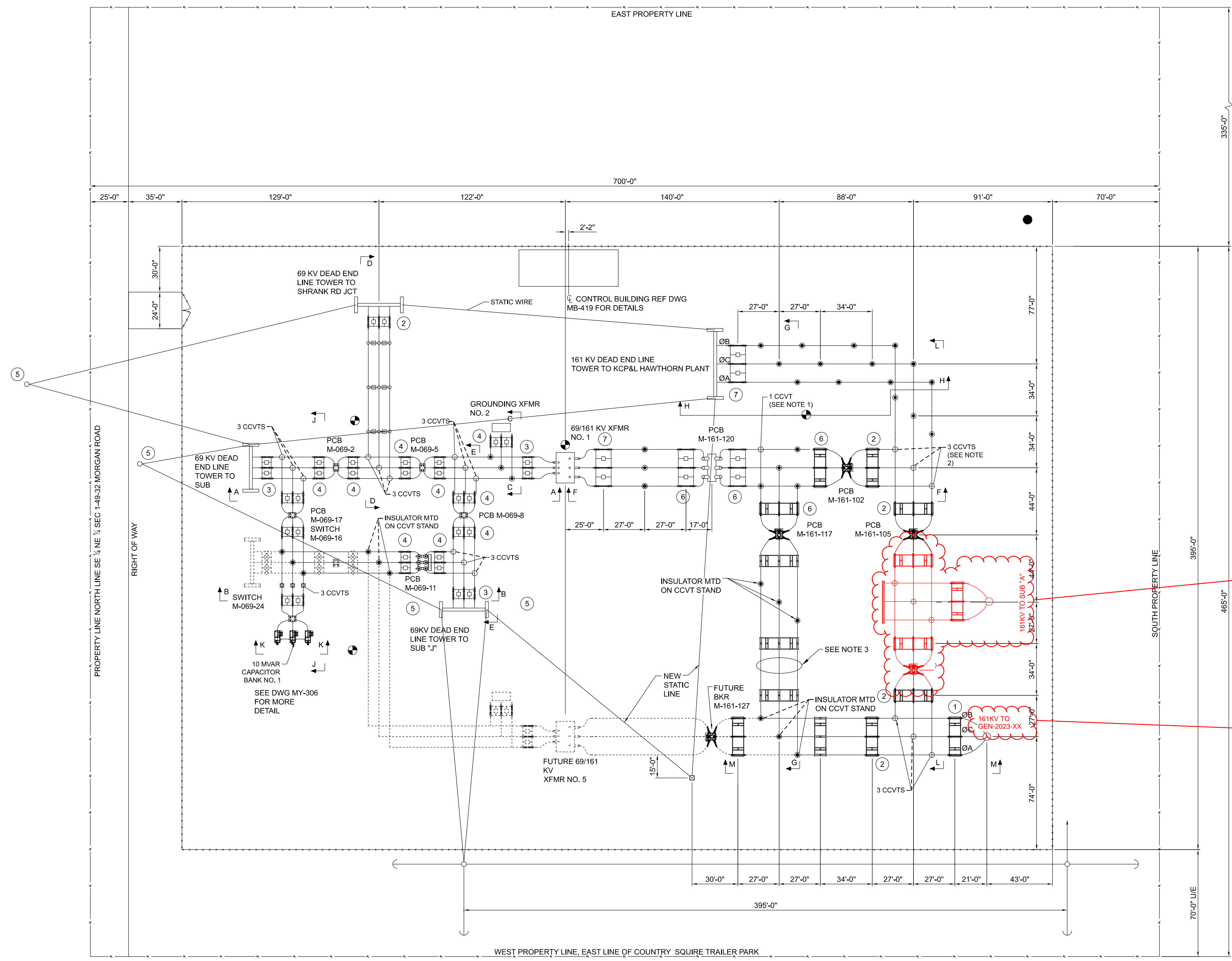
Time Estimates are based on the current version of the project schedule and some processes of each category run concurrently

Activity	Duration
Engineering	12 Months
Procurement	36 Months
Construction	6 Months
<b>Total Project Length</b>	<b>42 Months</b>

## Short Circuit Fault Duty Evaluation

IPL reviewed short circuit analysis for the Substation M 161 kV substation to determine if the addition of GEN-2023-171 would cause the available fault currents to exceed the interrupting capability of any existing circuit breakers. The review found fault currents within circuit breaker interrupting capability with the addition of the GEN-2023-171.

## Appendix A – Preliminary Station Plan View

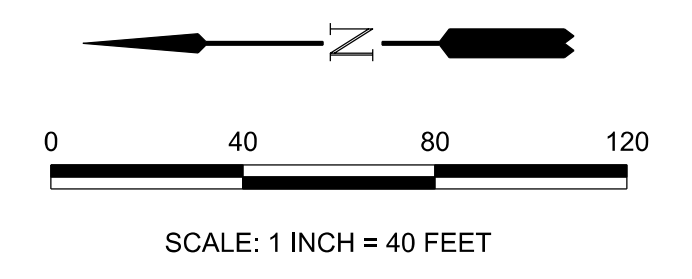


**NOTES:**

1. EXISTING CCVT RELOCATED FROM POSITION IN FRONT OF XFMR 1.
2. EXISTING CCVTs RELOCATED TO THIS POSITION FROM POSITION BETWEEN SW M-161-119 AND SW M-161-101.
3. CONTRACTOR TO BEND ALUMINUM BUS TO MATCH ELEVATION CHANGE SHOWN ON DRAWING MP410.

**LEGEND:**

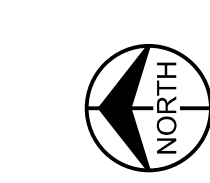
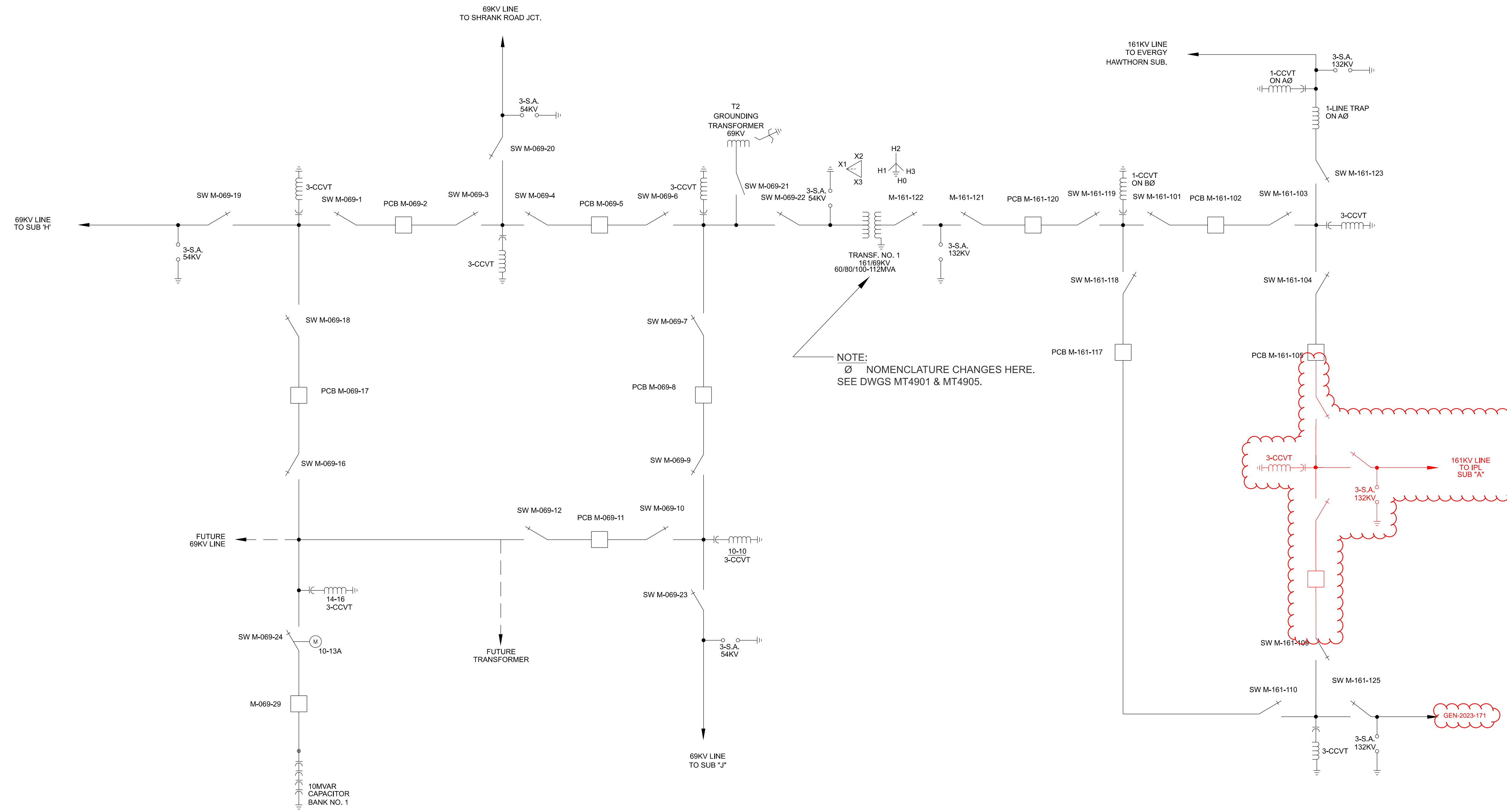
- ① NEW 161 KV VERTICAL BREAK DISCONNECT SWITCH, 1200A CONTINUOUS, 61,000A MOMENTARY, STAND MOUNTED.
  - ② NEW 161 KV VERTICAL BREAK DISCONNECT SWITCH, 2000A CONTINUOUS, 100,000A MOMENTARY, STAND MOUNTED.
  - ③ 69 KV VERTICAL BREAK DISCONNECT SWITCH, 1200A CONTINUOUS, 61,000A MOMENTARY, STAND MOUNTED.
  - ④ 69 KV VERTICAL BREAK DISCONNECT SWITCH, 2000A CONTINUOUS, 100,000A MOMENTARY, STAND MOUNTED.
  - ⑤ SHIELD WIRE TO BE 3/8 INCH EHS 1,000#
  - ⑥ EXISTING 161 KV VERTICAL BREAK DISCONNECT SWITCH, 2000A CONTINUOUS, 100,000A MOMENTARY, STAND MOUNTED.
  - ⑦ EXISTING 161 KV VERTICAL BREAK DISCONNECT SWITCH, 1200A CONTINUOUS, 61,000A MOMENTARY, STAND MOUNTED.
- CCVTS
  - BUS SUPPORTS
  - SOIL BORING LOCATIONS
  - 2009 SOIL BORING APPROXIMATE LOCATION
  - 70' SHIELD MAST
- INDICATES NEW  
 - - - INDICATES EXISTING  
 - - - INDICATES FUTURE  
 R RIGID CONNECTION  
 S SLIP CONNECTION  
 X EXPANSION CONNECTION



DRAWING TAKEN FROM ORIGINAL MYLAR DRAWING NO. MY311 WORTHINGTON & ASSOCIATES

			DRAWN BY: LJC				CITY OF INDEPENDENCE POWER & LIGHT DEPARTMENT SUBSTATION "M" APPARATUS LAYOUT YARD & STRUCTURE LAYOUT			
			APPD: RAW							
			DATE: 08-05-85							
			CAD NAME: MY311-2.DWG							
2	12/23/11	CONFORMING TO CONSTRUCTION RECORDS	LJH	SMS	SCALE: 1" = 40'	DRAWING NO. MY311		SHEET NO. 1 OF 1		REV 2
1	03-02-09	REDRAWN IN CAD	JGB	RDB						
REV.	DATE	DESCRIPTION	BY	APPD						

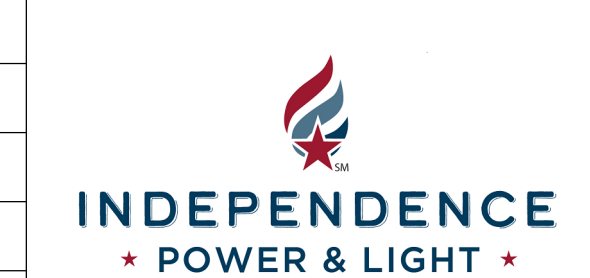
## Appendix B – Preliminary One Line



NOTE: DRAWING TAKEN FROM

REV.	DATE	DESCRIPTION	BY	APPD.
10	10/18/24	RECORD DRAWINGS - BKRS M-069-02, 05, 08 REPLACEMENT	NH	DB
9	07-25-23	ADDED NEW IPL LOGO AND NORTH ARROW	JAK	-
8	07-29-13	UPDATED TO CONSTRUCTION RECORDS	DR	BF
7	03-02-11	DOUBLING OF CAP BANK NO. 1 FROM 10MVAR TO 20MVAR	DR	JRG
6	02-27-09	CORRECTIONS TO DRAWING	JAK	MSD
5	12-15-08	RELOCATED CAP BANK/BREAKER AND ADDED PCB	JGB	LLG

DRAWN BY: RGP  
 APPD: NN  
 DATE: 06/01/1990  
 CAD NAME: MO0001.dwg  
 SCALE: NTS



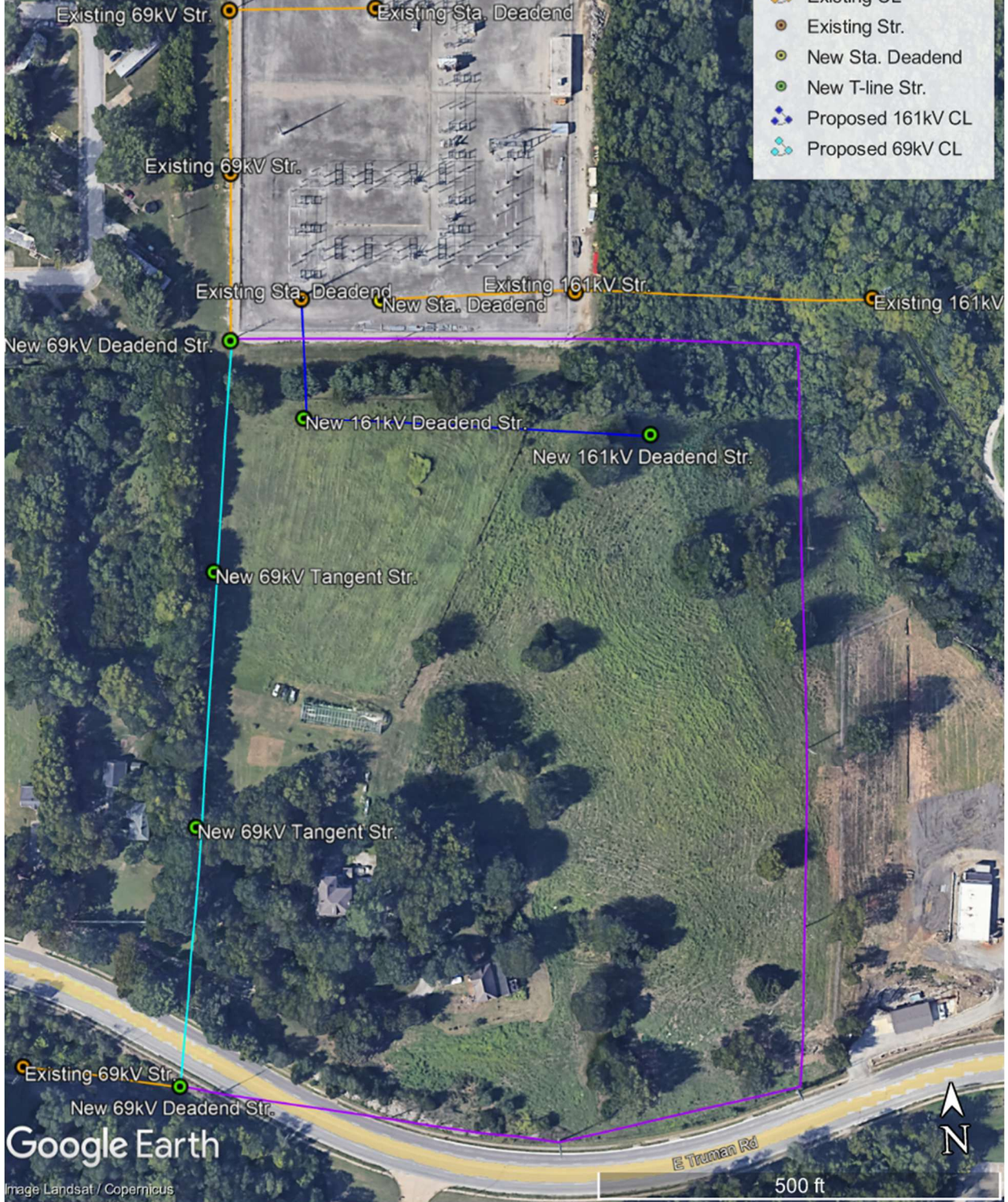
CITY OF INDEPENDENCE POWER & LIGHT DEPARTMENT		
SUBSTATION "M" ONE-LINE DIAGRAM ONE-LINE DIAGRAM		
DRAWING NO. MO0001	SHEET NO. 1 OF 1	REV. NO. 10

## Appendix C – Preliminary Transmission Line Route

# Preliminary T-line Route

## Legend

- 69kV Removal
- Existing CL
- Existing Str.
- New Sta. Deadend
- New T-line Str.
- Proposed 161kV CL
- Proposed 69kV CL



Google Earth

Image Landsat / Copernicus





## **Facilities Study For Southwest Power Pool (SPP)**

Group 5  
DISIS-2023-Network Upgrades

Xcel Energy Services, Inc.  
Southwestern Public Service Co.  
Transmission Planning South  
Updated 3/12/2026

# Executive Summary

The Southwest Power Pool (SPP or Transmission Provider [TP]) requested a Facility Study for certain Network Upgrades that were identified in the DISIS-2023-001 Phase 2 Restudy. The results were posted in December 2025.

This report is for the identified Network Upgrade – “Switch Out Carpenter Line Reactor.”

SPP assigned UID 171463 to this project.

It is anticipated that the entire process of this project will require approximately 36 - 42 months to complete after an agreement is signed and an authorization to proceed is received. The estimated costs for the work needed for this project are shown below in Table 1.

**Table 1: Cost Summary<sup>1</sup>**

Switch Out Carpenter Line Reactor to Finney UID 171463	<b>\$ 2,739,899</b>
Switch Out Carpenter Line Reactor to Hitchland UID 171463	<b>\$ 2,002,275</b>
Total:	<b>\$ 4,742,174</b>

---

<sup>1</sup> The cost estimates are 2026 dollars with an accuracy level of ±20%.

# General Description of SPS<sup>2</sup> Facilities

1. **SPS Carpenter Substation:** See Appendix A, Figure A-1 for general vicinity location map of the SPS facility.
2. **Estimated Construction Costs and Schedule**
  - a. **Schedule:** An engineering and construction schedule for this project is estimated at approximately 36 - 42 months. Other factors associated with clearances, equipment delays, and work schedules could cause additional delays. This is applicable after all required agreements are signed and internal approvals are granted.
  - b. All additional costs for work not identified in this study are the sole responsibility of the IC unless other arrangements are made.

---

<sup>2</sup> All modifications to SPS facilities will be owned, maintained, and operated by SPS.

## Appendix A

Figure A-1: General vicinity location map of the Carpenter Substation



SPS 345 kV transmission lines are shown in red.

– END OF REPORT –



## **Facilities Study For Southwest Power Pool (SPP)**

Group 5  
DISIS-2023-Network Upgrades

Xcel Energy Services, Inc.  
Southwestern Public Service Co.  
Transmission Planning South  
Updated 3/12/2026

# Executive Summary

The Southwest Power Pool (SPP or Transmission Provider [TP]) requested a Facility Study for certain Network Upgrades that were identified in the DISIS-2023-001 Phase 2 Restudy. The results were posted in December 2025.

This report is for the identified Network Upgrade – “Switch Out Finney Line Reactors.”

SPP assigned UID 171464 to this project.

It is anticipated that the entire process of this project will require approximately 36 - 42 months to complete after an agreement is signed and an authorization to proceed is received. The estimated costs for the work needed for this project are shown below in Table 1.

**Table 1: Cost Summary<sup>1</sup>**

Switch Out Finney Line Reactor to Carpenter UID 171464	<b>\$ 1,788,278</b>
Total:	<b>\$ 1,788,278</b>

<sup>1</sup> The cost estimates are 2026 dollars with an accuracy level of ±20%.

# General Description of SPS<sup>2</sup> Facilities

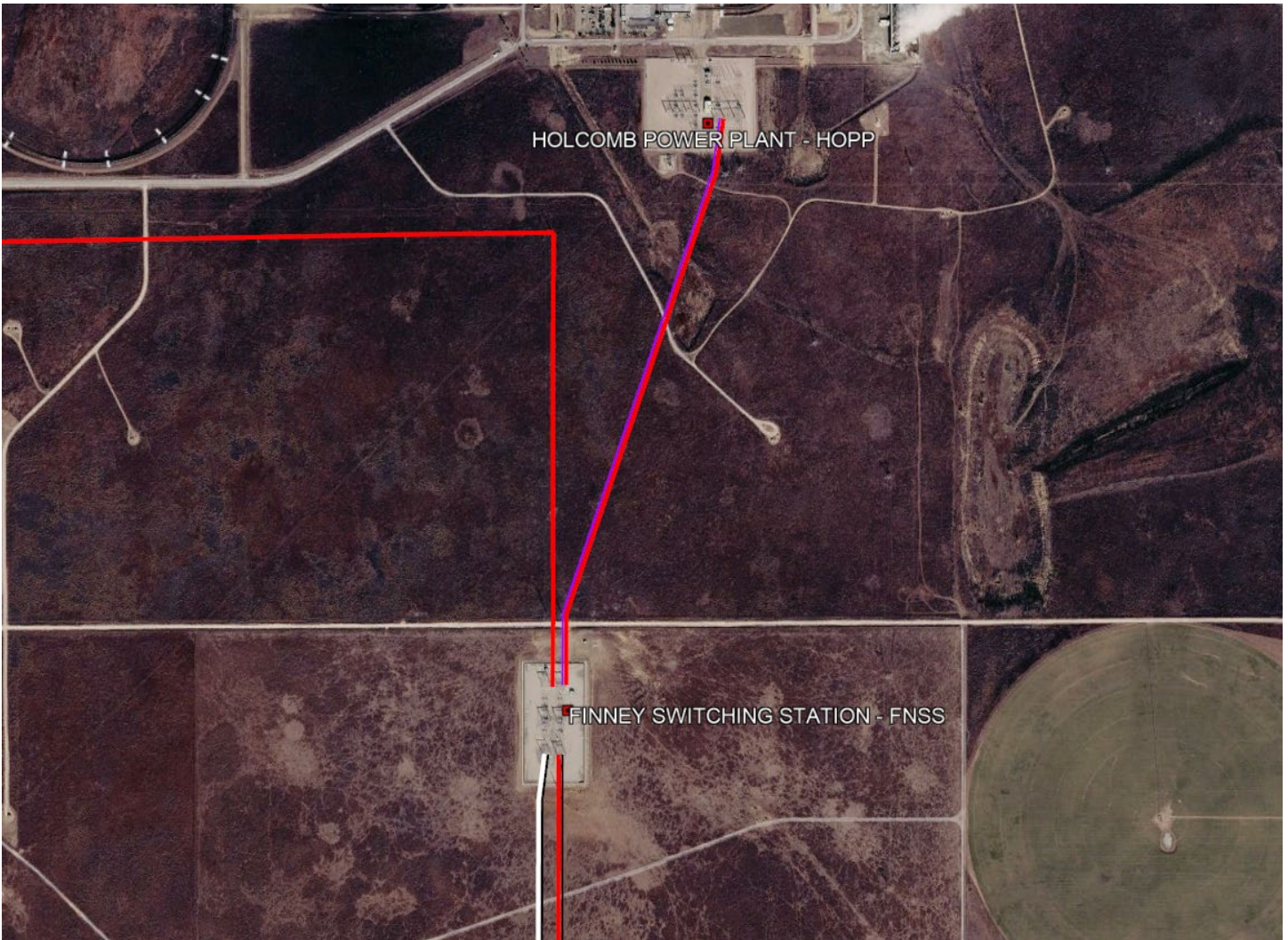
1. **SPS Finney Substation:** See Appendix A, Figure A-1 for general vicinity location map of the SPS facility.
2. **Estimated Construction Costs and Schedule**
  - a. **Schedule:** An engineering and construction schedule for this project is estimated at approximately 36 - 42 months. Other factors associated with clearances, equipment delays, and work schedules could cause additional delays. This is applicable after all required agreements are signed and internal approvals are granted.
  - b. All additional costs for work not identified in this study are the sole responsibility of the IC unless other arrangements are made.

---

<sup>2</sup> All modifications to SPS facilities will be owned, maintained, and operated by SPS.

## Appendix A

Figure A-1: General vicinity location map of the Finney Substation



SPS 345 kV transmission lines shown in red, earlier customer's gen-tie line shown in white.

– END OF REPORT –