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

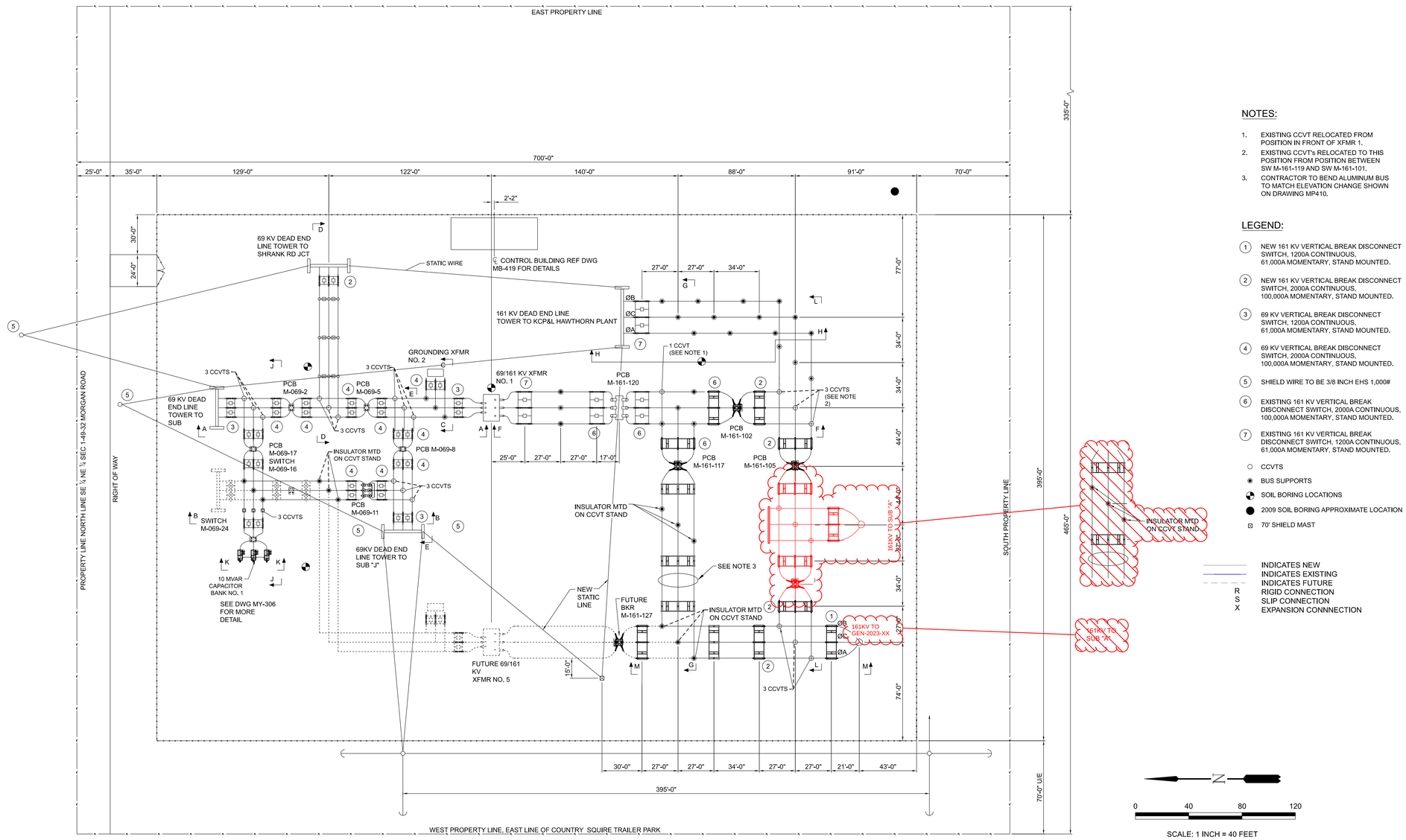
Time Estimates are based on the current version of the project schedule and some processes of each category run concurrently

Activity	Duration
Engineering	12 Months
Procurement	36 Months
Construction	6 Months
Total Project Length	**42 Months**

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 CCVT's 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 CONNNECTION

N

0 40 80 120

SCALE: 1 INCH = 40 FEET

DRAWING TAKEN FORM ORIGNAL MYLAR DRAWING NO. MY311 WORTHINGTON & ASSOCIATES

REV.	DATE	DESCRIPTION	BY	APPD
2	12/23/11	CONFORMING TO CONSTRUCTION RECORDS	LJH	SMS
1	03-02-09	REDRAWN IN CAD	JGB	RDB

DRAWN BY: LJC
APPD.: RAW
DATE: 08-05-85
CAD NAME: MY311-2.DWG
SCALE: 1" = 40'

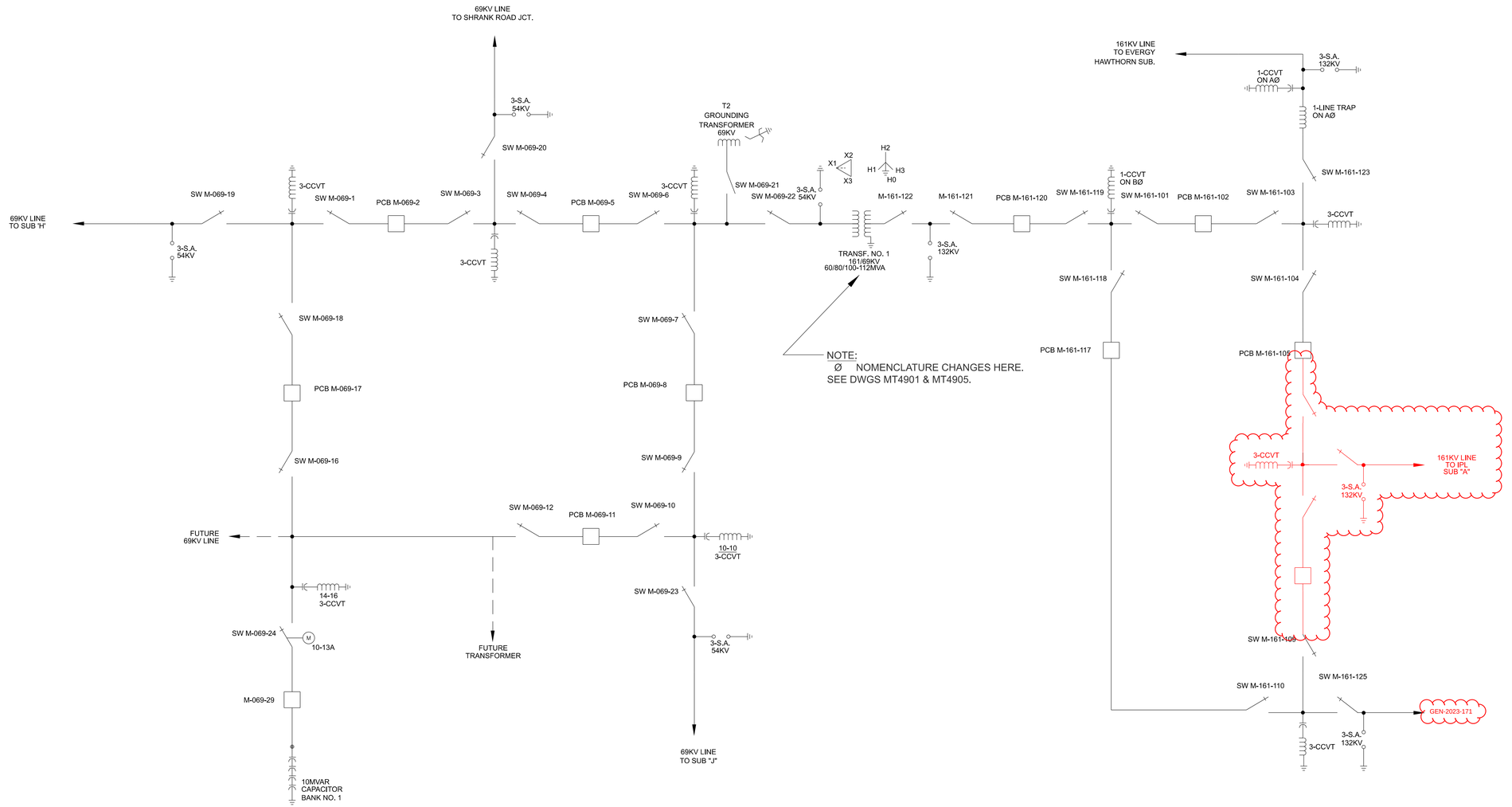
Independence Power & Light

CITY OF INDEPENDENCE
POWER & LIGHT DEPARTMENT

SUBSTATION "M"
APPARATUS LAYOUT
YARD & STRUCTURE LAYOUT

DRAWING NO. MY311
SHEET NO. 1 OF 1
REV 2

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. 1FROM 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

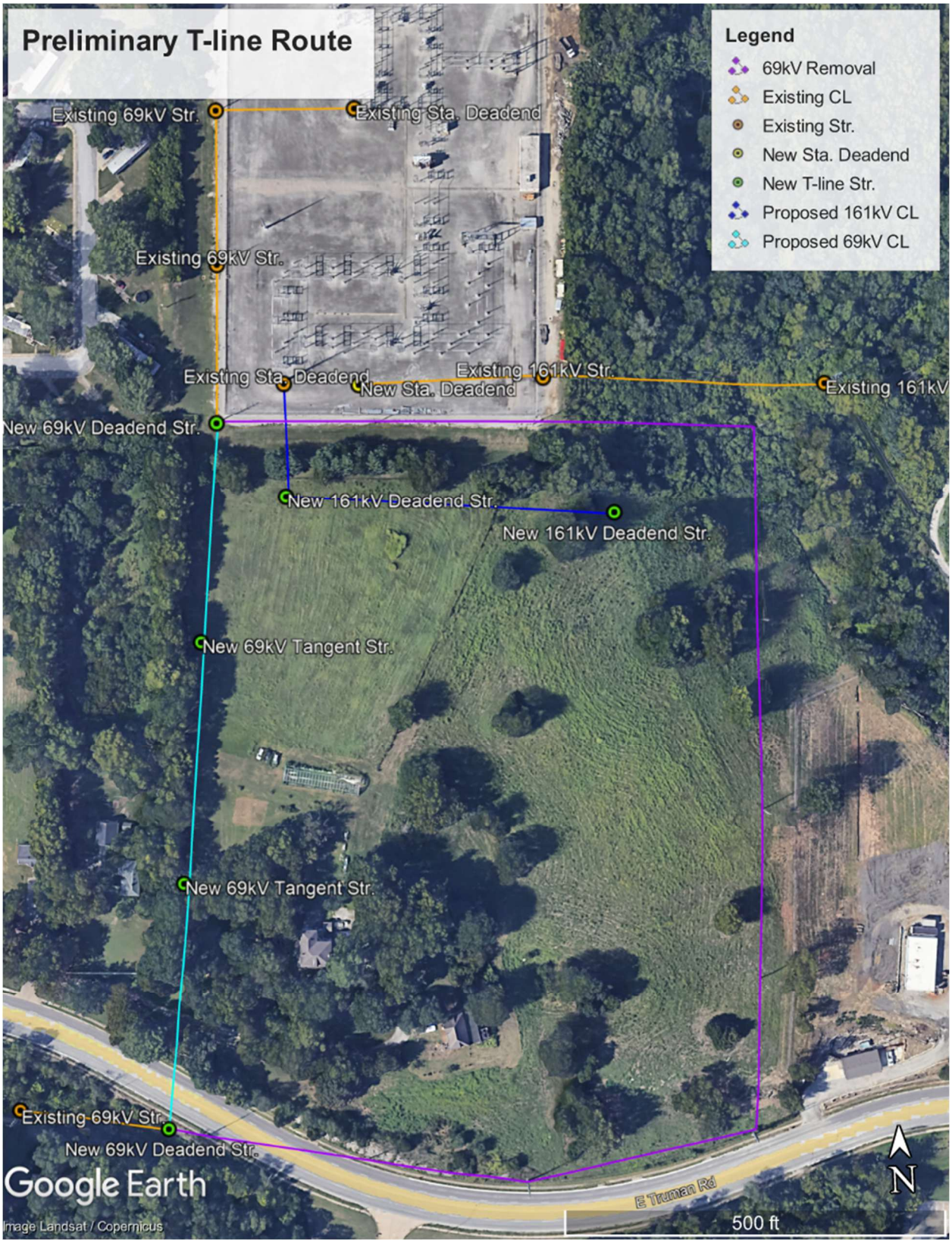
INDEPENDENCE POWER & LIGHT

CITY OF INDEPENDENCE
POWER & LIGHT DEPARTMENT

SUBSTATION "M"
ONE-LINE DIAGRAM
ONE-LINE DIAGRAM

DRAWING NO.	SHEET NO.	REV NO.
MO0001	1 OF 1	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
Existing 69kV Str.
Existing Sta. Deadend
Existing 69kV Str.
Existing Sta. Deadend
New Sta. Deadend
Existing 161kV Str.
Existing 161kV
New 69kV Deadend Str.
New 161kV Deadend Str.
New 161kV Deadend Str.
New 69kV Tangent Str.
New 69kV Tangent Str.
Existing 69kV Str.
New 69kV Deadend Str.
Google Earth
Image Landsat / Copernicus
E Truman Rd
500 ft
N