Oncor – Peck to Driver 138-kV Line Project
ERCOT Independent Review Status Update

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RPG Meeting
April 11, 2023

Recap

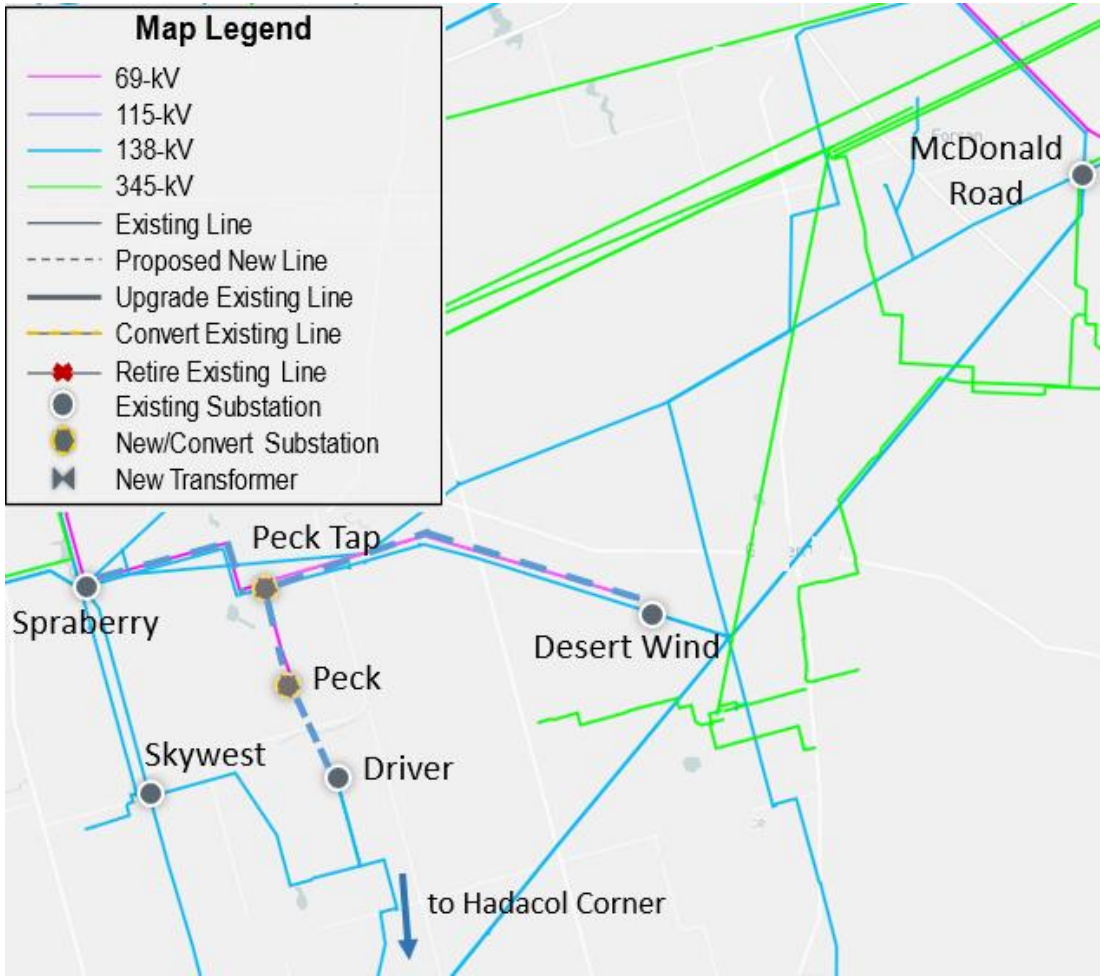
- Oncor submitted the Peck to Driver 138-kV Line Project for Regional Planning Group (RPG) review in December 2022. This is a Tier 2 project that is estimated to cost $36.2 million
  - The project was submitted to address
    - Reliability need driven by new confirmed load additions primarily in the oil and gas industry under maintenance outage conditions
      - ✓ Voltage violations on multiple 138-kV buses
    - Improve system operational flexibility
  - Estimated in-service date
    - Summer 2024
  - The reliability issues may appear before the project in service. If necessary, Oncor will develop and implement Constraint Management Plans (CMPs) such as line sectionalizing or mobile equipment/capacitor installation
- ERCOT provided study scope and status update at the January and March RPG meetings
  - https://www.ercot.com/calendar/01252023-RPG-Meeting
  - https://www.ercot.com/calendar/03222023-RPG-Meeting
- ERCOT completed its Independent Review (EIR) and will present the final recommendation during this presentation

Analysis Performed

- Short-Listed Options
  - Finalized the locations of capacitor banks to resolve all the reliability violations under maintenance outage conditions
  - Cost estimates and feasibility assessment
- Congestion Analysis
  - Congestion analysis will be performed based on the recommended transmission upgrades to ensure that the identified transmission upgrades do not result in new congestion within the study area

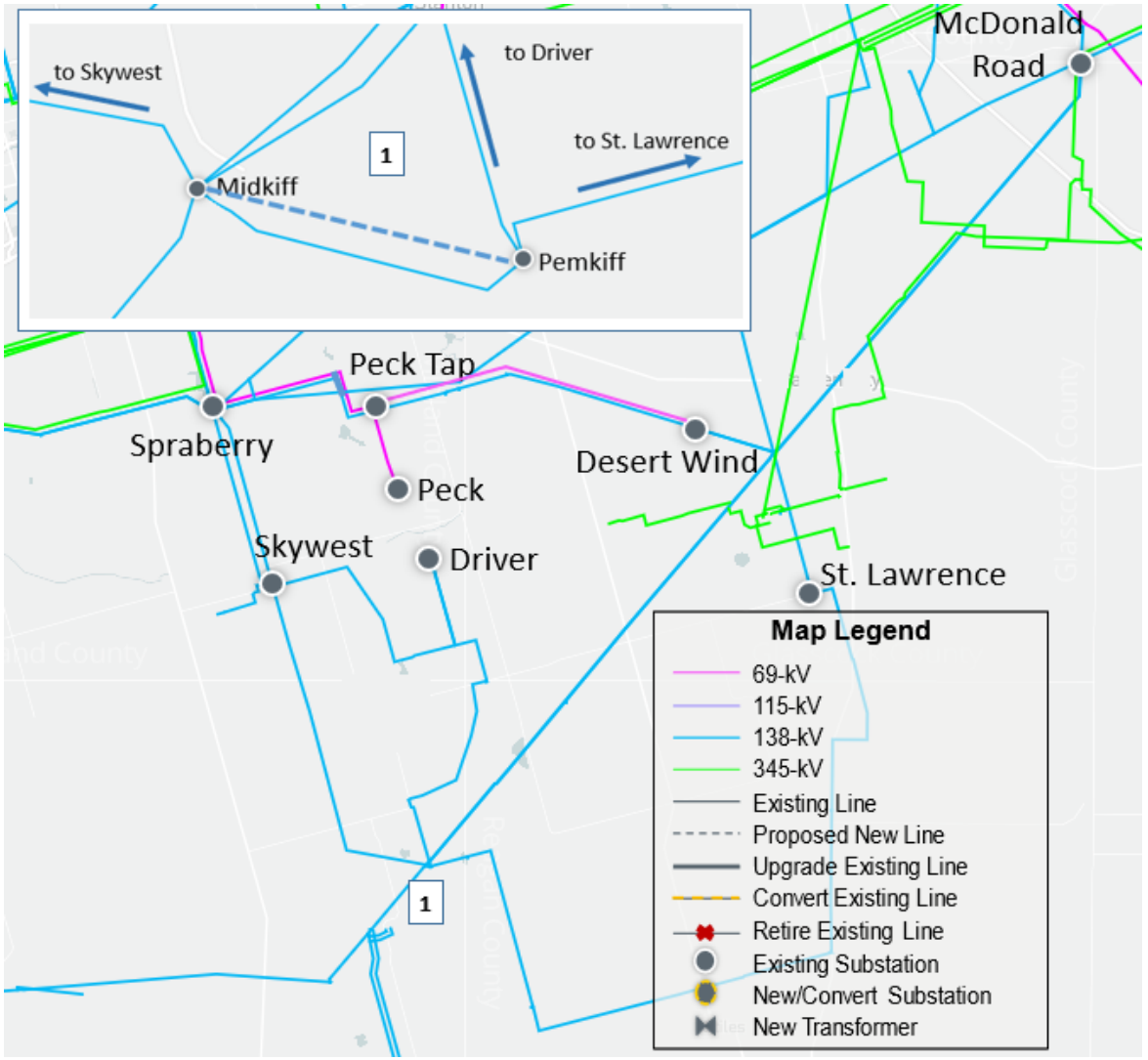
Option 1a: New Peck – Driver 138-kV Line Plus Capacitor Banks

- Construct the new 138-kV Peck Tap Switch
- Convert the existing 25.4-mile Spraberry – Peck Tap – Desert Wind 69-kV line section to operate at 138-kV
- Construct an approximately 0.1-mile loop of the existing Spraberry – McDonald Road 138-kV line into the new Peck Tap Switch
- Convert the existing 4.0-mile Peck Tap – Peck 69-kV line to 138-kV
- Construct a new Peck – Driver 138-kV line (~ 4.1 miles)
- Reconfigure the existing Desert Wind 138-kV substation from a single-tap configuration to a double-tap configuration so the substation is served from the Peck Tap – Midkiff/McDonald Road 138-kV double-circuit line
- Add capacitor banks (Total: 110.4 Mvar) at Desert Wind 138-kV bus



Option 2a: New Midkiff – Pemkiff 138-kV Line Plus Capacitor Banks

- Construct a new Midkiff – Pemkiff 138-kV line (~ 0.3 miles) on separate structures
- Add capacitor banks (Total: 110.4 Mvar) at Desert Wind 138-kV bus
- Add capacitor banks (Total: 55.2 Mvar) at Peck 69-kV bus



Reliability Assessment Results of Short-Listed Options

- No reliability violations were observed in the area for either short-listed option (Options 1a and 2a)
- Long-term load serving capability under N-1 condition

Option	Load Serving Capability (MW)
Option 1a	800
Option 2a	90

Comparison of Short-Listed Options

	Option 1a	Option 2a
Met ERCOT and NERC Reliability Criteria	Yes	Yes
Improved Long-term Load Serving Performance	Yes (Better)	Yes
Improved Operational Flexibility	Yes (Better)	Yes
Required CCN	Yes (~ 4.1 miles)	Yes (~ 0.3 miles)
Capital Cost Estimates *	$39.5 Million	$36.1 Million

* Cost Estimates were provided by TSP

- Although Option 1a is slightly more expensive than Option 2a, Option 1a provides the following benefits over Option 2a:
  - Better long-term load serving capability
  - Better operational flexibility and overall system strength

Preferred Option

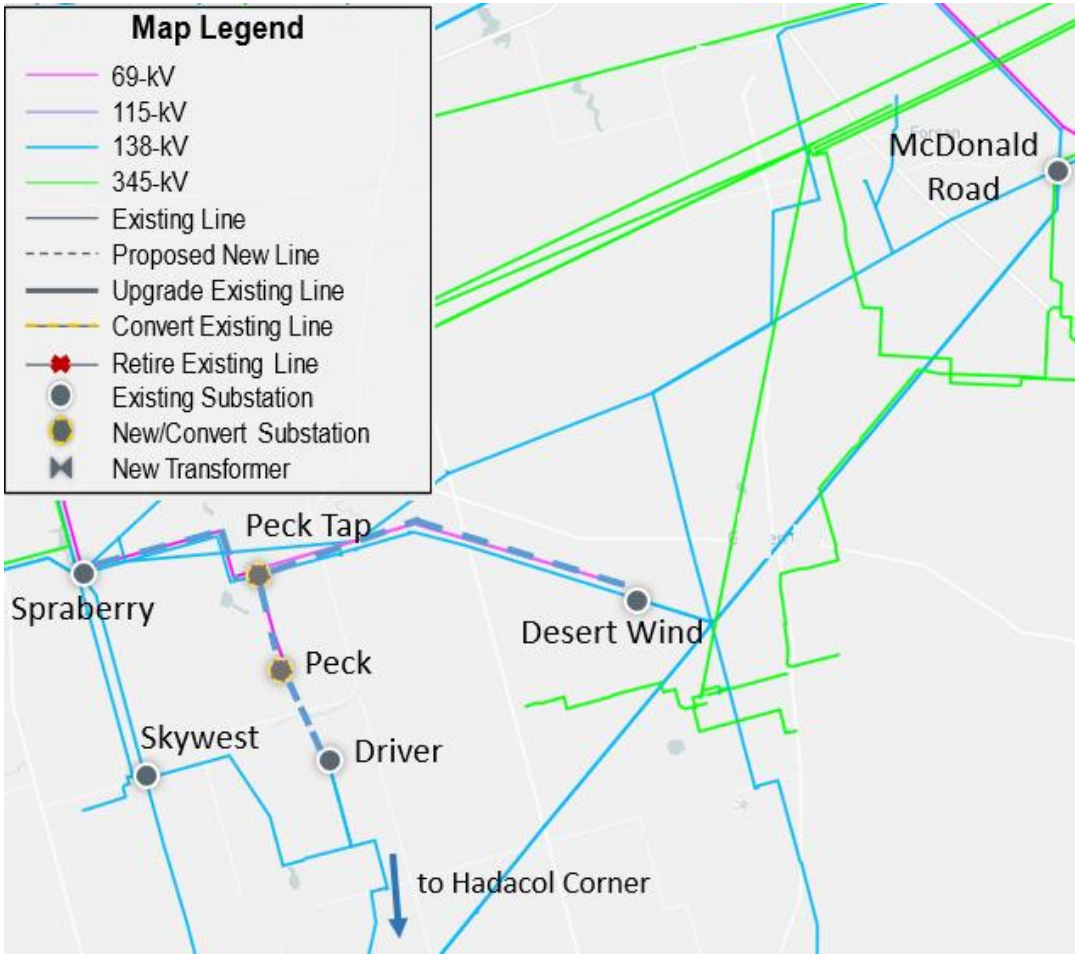
- Option 1a is selected as the preferred option based on the following considerations
  - Addresses the reliability criteria violation
  - Improves system operational flexibility and overall system strength
    - Provides a new 138-kV path with a stronger source allowing bi-directional power flow in the area
    - Converts the existing 69-kV radial lines to 138-kV
    - Loops three radial load buses into the transmission network
  - Provides better long-term load serving capability for future load growth in the area

Congestion Analysis

- Congestion analysis was performed for the preferred Option 1a using the 2022 RTP 2027 economic case
- Option 1a did not result in any new congestion within the study area

ERCOT Recommendation

- ERCOT recommends Option 1a as the preferred option
  - Construct the new 138-kV Peck Tap Switch
  - Convert the existing 25.4-mile Spraberry – Peck Tap – Desert Wind 69-kV line section to operate at 138-kV
  - Construct an approximately 0.1-mile loop of the existing Spraberry – McDonald Road 138-kV line into the new Peck Tap Switch
  - Convert the existing 4.0-mile Peck Tap – Peck 69-kV line to 138-kV
  - Construct a new Peck – Driver 138-kV line (~ 4.1 miles)
  - Reconfigure the existing Desert Wind 138-kV substation from a single-tap configuration to a double-tap configuration so the substation is served from the Peck Tap – Midkiff/McDonald Road 138-kV double-circuit line
  - Add capacitor banks (Total: 110.4 Mvar) at Desert Wind 138-kV bus
  - Estimated cost: $39.5 Million
  - CCN is required
  - Expected in-service date: summer 2024



Next Step

- Tentative Timeline
  - ERCOT Independent Review Report to be posted in the MIS in Q2 2023

Thank you!

Stakeholder comments also welcomed through:

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Appendix: Option 1: New Peck – Driver 138-kV Line (Oncor Proposed Solution)

- Construct the new 138-kV Peck Tap Switch
- Convert the existing 25.4-mile Spraberry – Peck Tap – Desert Wind 69-kV line section to operate at 138-kV
- Construct an approximately 0.1-mile loop of the existing Spraberry – McDonald Road 138-kV line into the new Peck Tap Switch
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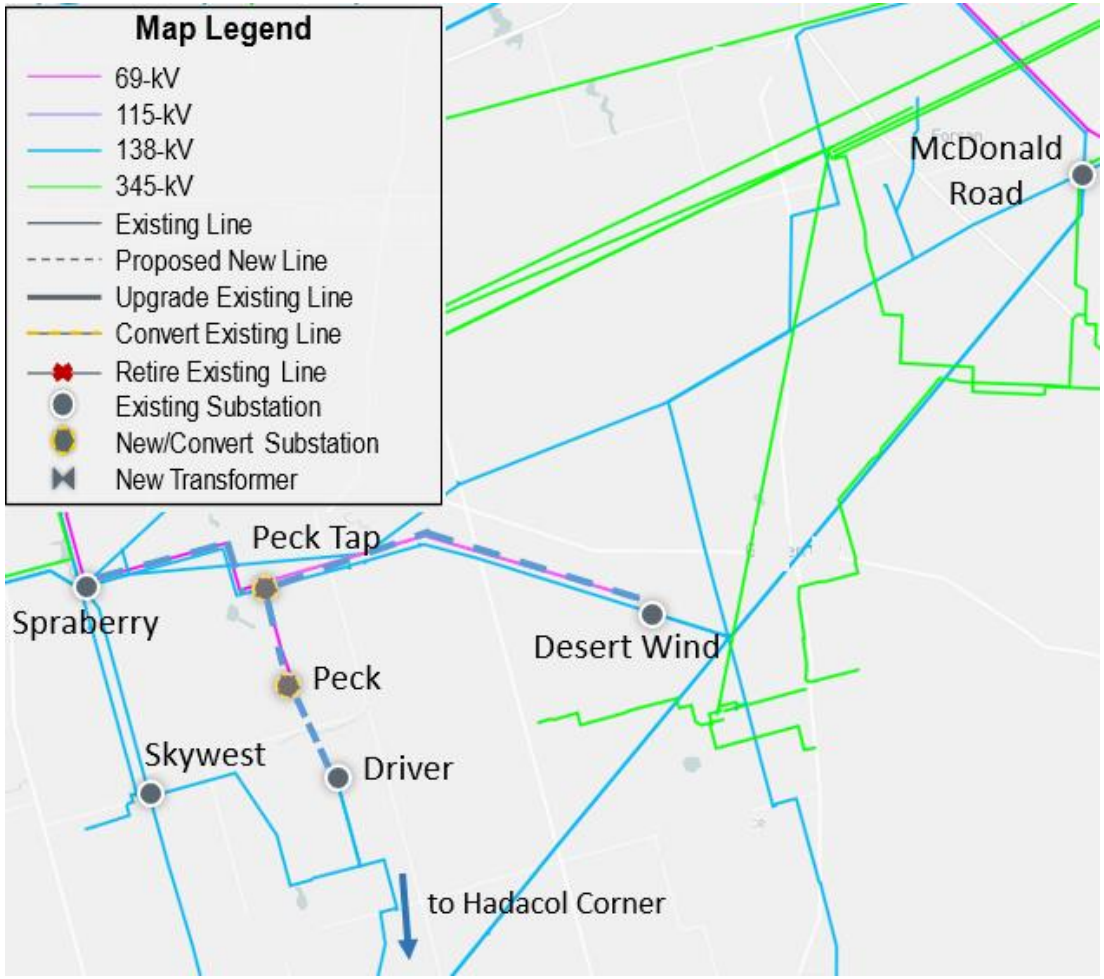
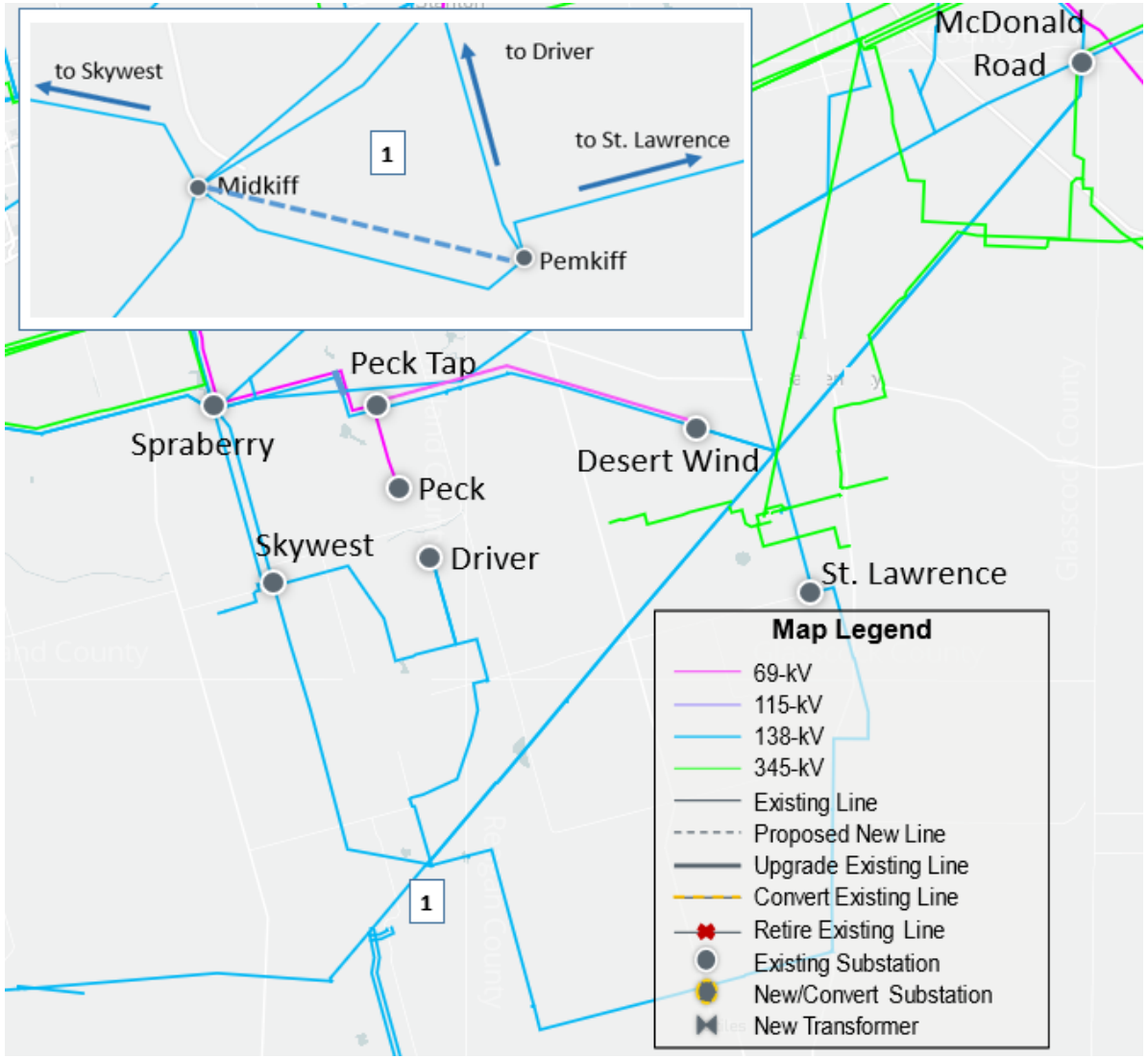


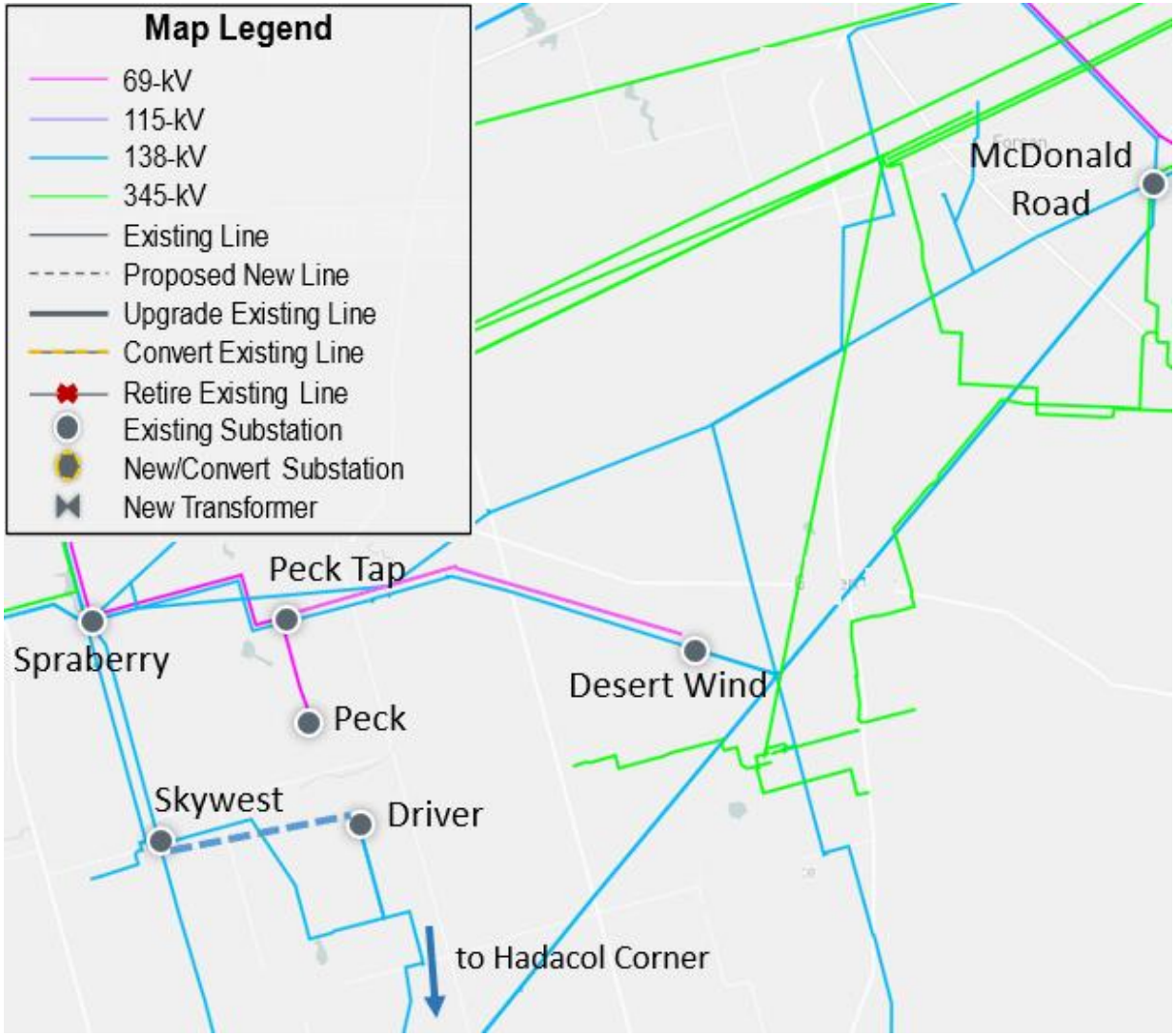
Appendix: Option 2: New Midkiff – Pemkiff 138-kV Line

- Construct a new Midkiff – Pemkiff 138-kV line (~ 0.3 miles) on separate structures



Appendix: Option 3: New Skywest – Driver 138-kV Line

- Construct a new Skywest – Driver 138-kV line (~ 9.4 miles) on separate structures



Appendix: Preliminary Results of Reliability Assessment – Study Options

- No reliability violations were observed under P0, P1, P2-1, P3, P6-2, and P7 contingency categories for all three options
- Preliminary results under P6-1, P6-3

Option	Thermal Overloads (mi)	# of Voltage Issues	# of Unsolved Contingencies
Study Base Case	0	10	1
Option 1	0	4	0
Option 2	0	10	0
Option 3	0	10	0

- The bus low voltage issues in Options 1, 2, and 3 could be addressed by adding shunt reactive devices

Appendix: Preliminary Results of Long-Term Load Serving Capability Assessment

- Based on the review of study area, loads in Glasscock, Midland, Upton, and Reagan counties were increased for the load serving capability assessment
- Long-term load serving capability under N-1 condition

Option	Load Serving Capability (MW)	Violation
Option 1	210	Bus Low Voltage
Option 1 plus capacitor bank	800	Bus Low Voltage
Option 2	90	Thermal
Option 3	90	Thermal

- In Option 1, adding capacitor bank at a 138-kV bus could significantly increase the load serving capability (~ 800 MW)
- In Options 2 & 3, thermal overload of 69-kV system was observed with additional 90 MW load in the four counties. Adding shunt reactive support would not be able to relieve the thermal overload

Appendix: Options Evaluation and Short-Listed Options

- No reliability violations were observed under P0, P1, P2-1, P3, P6-2, and P7 contingency categories for all three options
- Option 1 could address all reliability violations under maintenance outage condition in the study area by adding shunt reactive support at one location
- Options 2 and 3 could address all reliability violations under maintenance outage condition in the study area by adding shunt reactive support at two different locations
- The results of the long-term load serving capability assessment indicated Option 1 performed better than Options 2 and 3
- Option 2 performs the same as Option 3 but requires less new Right of Way (ROW) (about 0.3 miles vs. 9.4 miles)
- Based on the study results, Options 1 and 2 were selected as the short-listed options for further evaluation