



**Oncor Tredway 138-kV Switch and  
Expanse to Tredway 138-kV 2nd Circuit  
Project – ERCOT Independent Review  
Project Update**

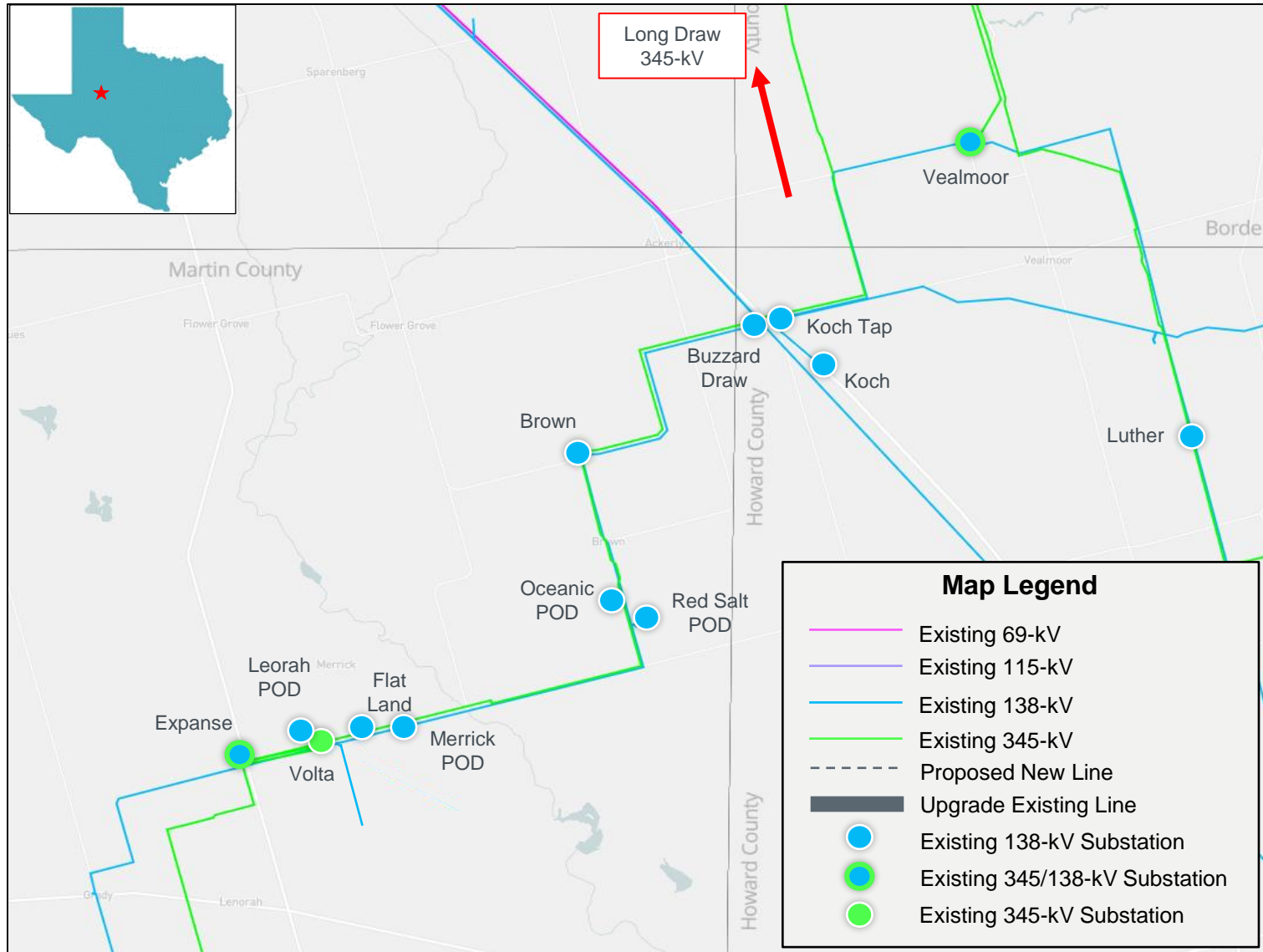
Sarah Gunasekera

RPG Meeting  
January 28, 2025

# Introduction

- Oncor submitted the Tredway 138-kV Switch and Expanse to Tredway 138-kV 2nd Circuit Project for Regional Planning Group (RPG) review in September 2024
  - This Tier 1 project is estimated at \$119.03 million and will require a Convenience and Necessity (CCN)
  - Estimated in-service date (ISD) is December 2025
  - Addresses post-contingency thermal overloads and voltage violations on the Vealmoor to Buzzard Draw to Expanse 138-kV transmission line
- Oncor presented a project overview and ERCOT provided a project scope at the October 2024 RPG Meeting
  - <https://www.ercot.com/calendar/10162024-RPG-Meeting>
- This project is currently under ERCOT Independent Review (EIR)

# Recap: Study Area Map





# Study Assumptions – Base Case

- Study Area
  - West and Far West Weather Zones, focusing on transmission in Martin, Howard, and Borden Counties
  - Monitor surrounding counties that are electrically close to the area
- Steady-State Base Case
  - Final 2023 Regional Transmission Planning (RTP) 2026 summer peak case for West Far West Weather Zones will be updated to construct the West Far West (WFW) study base case posted in Market Information System (MIS)
    - Case: 2023RTP\_2026\_SUM\_WFW\_12222023
    - Link: <https://mis.ercot.com/secure/data-products/grid/regional-planning>

# Study Assumptions – Load, Reserve, Transmission, & Generation

- Load in study area
  - ~515 MW of confirmed load was added to the study basecase
- Reserve
  - Reserve levels are consistent with the 2023 RTP
- Transmission
  - See Appendix A for a list of transmission projects added
  - See Appendix B for a list of RTP placeholder projects that were removed
- Generation
  - See Appendix C for a list of generation projects added

# Preliminary Results of Reliability Assessment – Base Case

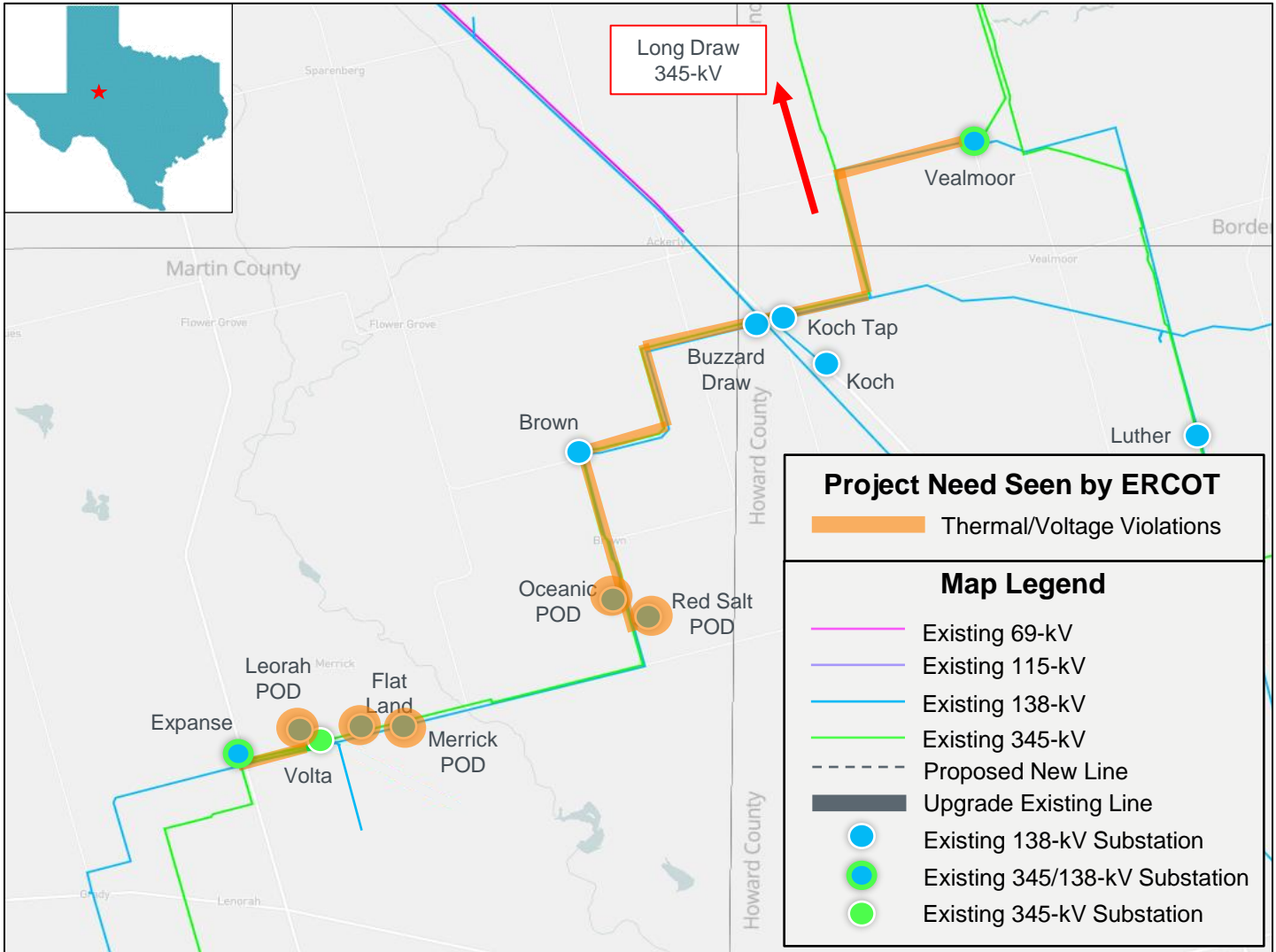
Contingency Category*	Unsolved Power Flow	Voltage Violations	Thermal Overloads
P1	None	5	5
P3 (G-1+N-1)*	None	6***	5***
P6.2 (X-1+N-1)**	None	6***	5***
P7	None	None	None

\*G-1 Generators tested: Odessa, Permian Basin, Juno Solar S1, Long Draw Solar S2, Morgan Creek N1

\*\*X-1 Transformers tested: Expanse X2, Long Draw X1, Morgan Creek X1, Odessa X1

\*\*\*Violations seen in the basecase under P1 events were also seen under G-1 and X-1 events

# Study Area Map with Project Need seen by ERCOT





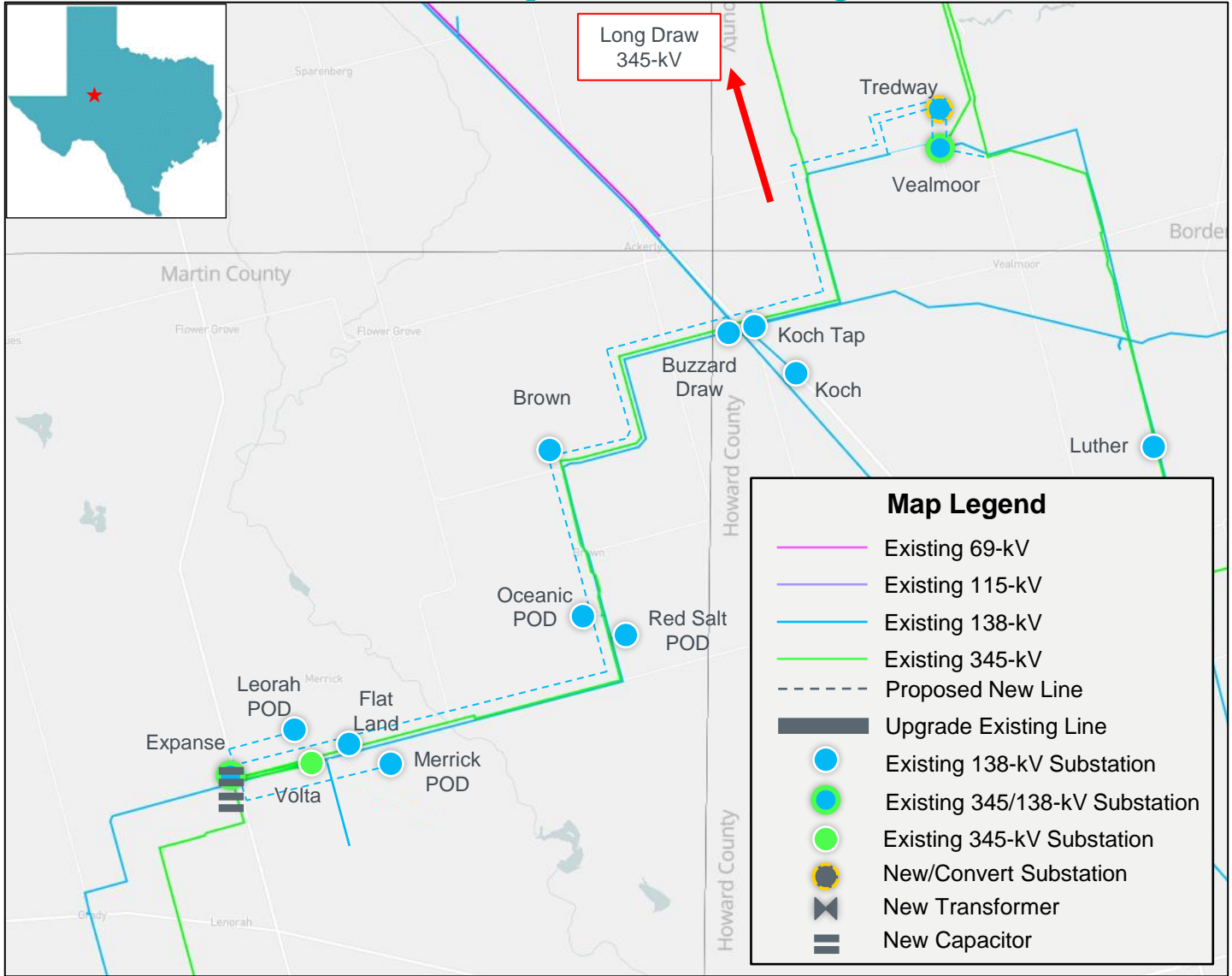
# Option 1 – Oncor Proposed Project

- Establish new Oncor Tredway 138-kV Switch, approximately 0.5-miles north of Oncor's existing Vealmoor 345/138-kV Switch
- Construct a new Tredway to Structure 10/7 138-kV double-circuit transmission line with normal and emergency ratings of 614 MVA or greater, approximately 0.6-mile
  - Disconnect the existing Luther to Vealmoor 138-kV transmission line at Vealmoor 138-kV Switch, and terminate into new Oncor Tredway 138-kV Switch
- Construct two new Tredway to Vealmoor 138kV transmission lines with normal and emergency ratings of 828 MVA, approximately 0.4-mile
- Construct a new Tredway to Structure 1/3 138-kV double-circuit transmission line with normal and emergency ratings of 614 MVA or greater, approximately 0.3-mile
  - Disconnect the existing Buzzard Draw to Koch Tap to Vealmoor transmission line at Vealmoor 138-kV Switch, and terminate into Tredway 138-kV Switch
- Rebuild the existing Expanse to Buzzard Draw to Structure 1/3 138-kV double circuit transmission line with normal and emergency ratings of 614 MVA or greater, approximately 28.8-mile, creating the Expanse to Treadway North and South 138-kV transmission lines

# Option 1 – Oncor Proposed Project (Continued)

- Remove the circuit breakers at the existing Brown 138-kV Substation and connect Brown 138-kV to the north Expanse to Tredway 138-kV transmission line
- Remove the circuit breakers at the existing Oceanic Point of Delivery (POD) 138-kV and connect Oceanic POD 138-kV to the new north Expanse to Tredway 138-kV transmission line
- Reconfigure the existing Flat Land 138-kV substation from a single-tap configuration to a double-tap configuration so the substation is served from both of the Expanse to Tredway 138-kV circuits
- Construct a new Expanse to Lenorah POD 138-kV double-circuit transmission line with normal and emergency ratings of 614 MVA or greater, approximately 0.6-mile
  - Disconnect the existing Lenorah POD from the existing Expanse to Buzzard Draw 138-kV transmission line so it is served radially from Expanse Switch
- Construct a new Expanse to Merrick POD 138-kV double-circuit transmission line with normal and emergency ratings of 614 MVA or greater, approximately 1.0-mile
  - Disconnect the existing Merrick POD from the existing Expanse to Buzzard Draw 138-kV transmission line so it is served radially from Expanse Switch
- Install two 55.2 MVAR capacitor banks at Expanse 345/138-kV Switch

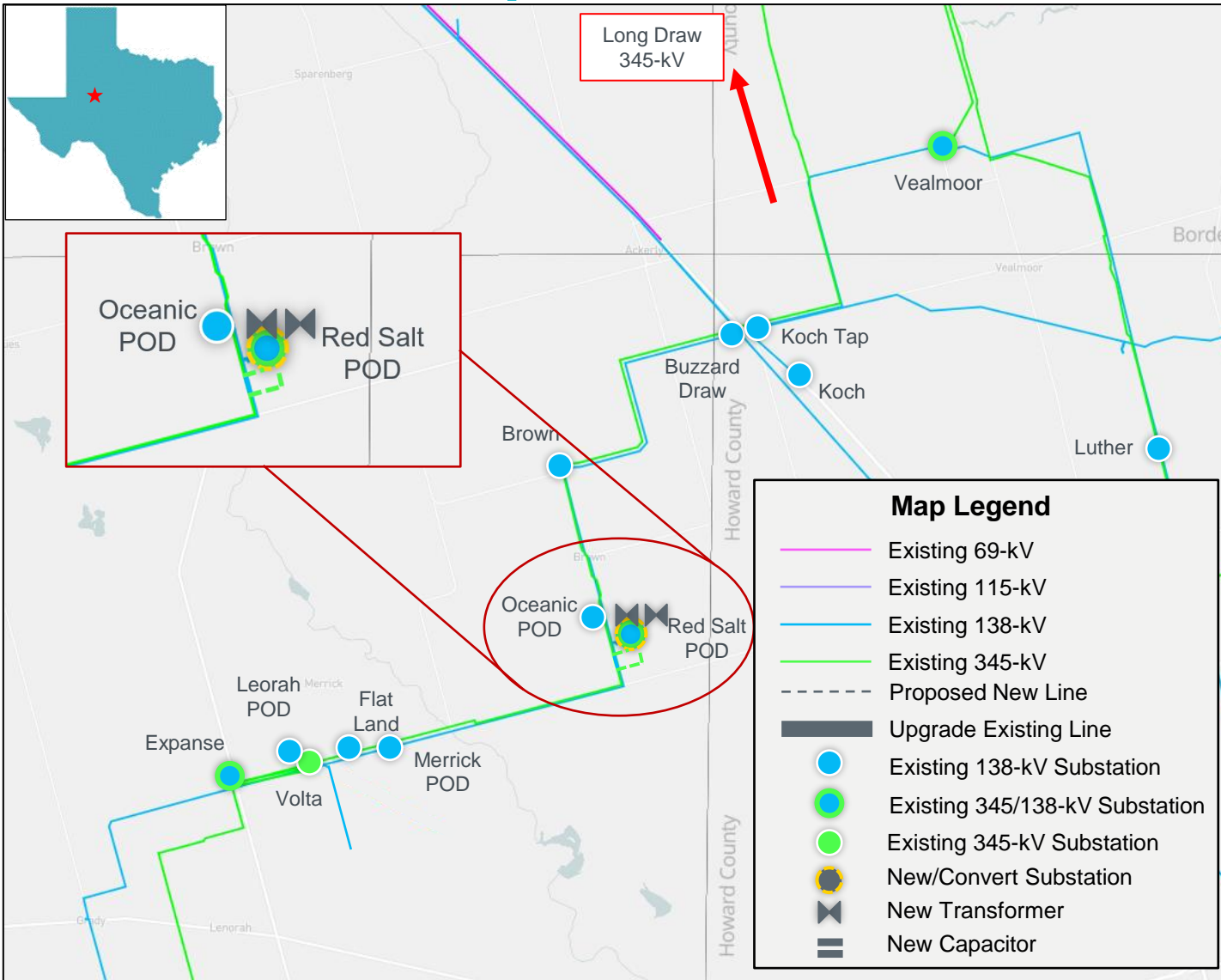
# Option 1 – Oncor Proposed Project



## Option 2 – ERCOT Option

- Create a new Red Salt 345-kV substation near the existing Red Salt 138-kV substation
- Install two 138/345-kV transformers at the existing Red Salt 138-kV substation with normal and emergency ratings of 708 MVA or greater
- Tap the Long Draw to Volta 345-kV transmission line at the new Red Salt 138/345-kV substation creating the Long Draw to Red Salt 345-kV transmission line with normal and emergency ratings of 1723 MVA or greater, approximately 32.0-mile and the Red Salt to Volta 345-kV transmission line with normal and emergency ratings of 1723 MVA or greater, approximately 9.0-mile

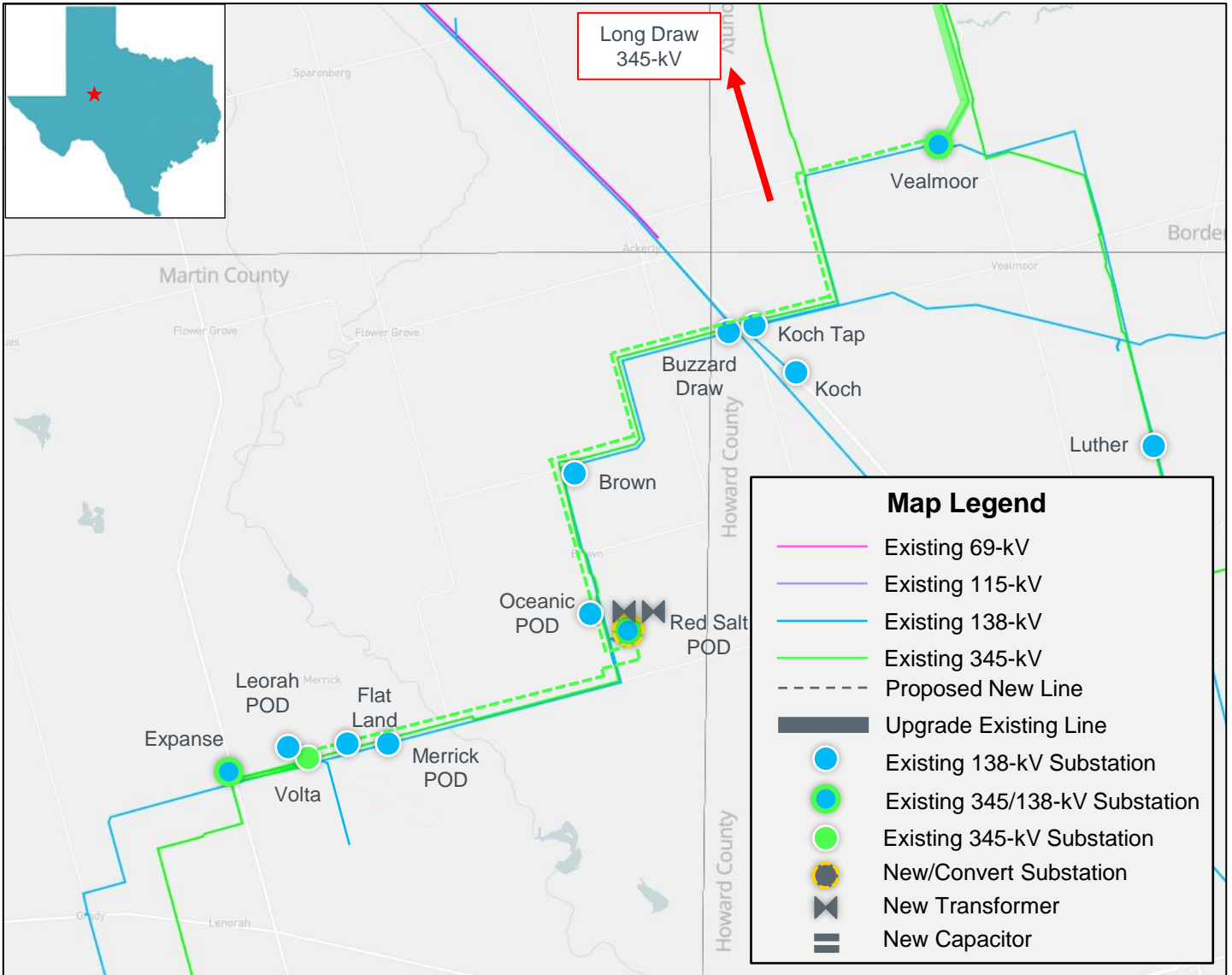
# Option 2 – ERCOT Option



## Option 3 – ERCOT Option

- Create a new Red Salt 345-kV substation near the existing Red Salt 138-kV substation
- Install two 138/345-kV transformers at the existing Red Salt 138-kV Substation with normal and emergency ratings of 708 MVA or greater
- Construct a new Vealmoor to Red Salt 345-kV transmission line with normal and emergency ratings of 1723 MVA or greater, approximately 19.0-mile
- Construct a new Red Salt to Volta 345-kV transmission line with normal and emergency ratings of 1723 MVA or greater, approximately 9.0-mile
- Rebuild the existing Vealmoor to Long Draw 345-kV transmission line with normal and emergency ratings of 1723 MVA or greater, approximately 11.4-mile

# Option 3 – ERCOT Option



## Option 4 – ERCOT Option

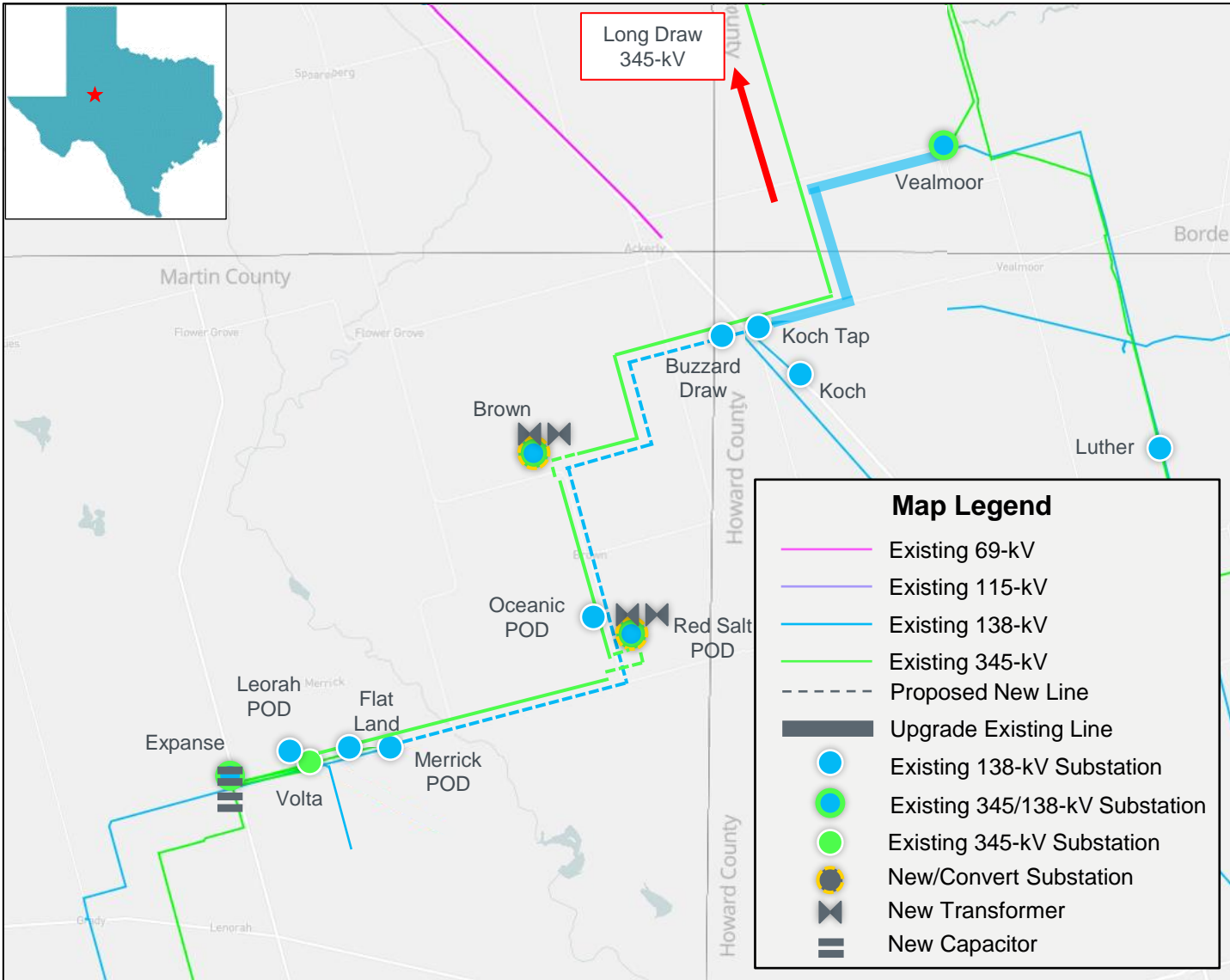
- Rebuild the existing Vealmoor to Koch Tap 138-kV transmission line with normal and emergency ratings of 614 MVA or greater, approximately 8.6-mile
- Rebuild the existing Koch Tap to Buzzard Draw 138-kV transmission line with normal and emergency ratings of 614 MVA or greater, approximately 0.3-mile
- Create a new Brown 345-kV substation near the existing Brown 138-kV substation
- Install two 138/345-kV transformers at the existing Brown 138-kV Substation with normal and emergency ratings of 708 MVA or greater
- Create a new Red Salt 345-kV substation near the existing Red Salt 138-kV substation
- Install two 138/345-kV transformers at the existing Red Salt 138-kV Substation with normal and emergency ratings of 708 MVA or greater
- Tap the Long Draw to Volta 345-kV transmission line at the new Brown 138/345-kV substation and at the new Red Salt 138/345-kV substation creating the Long Draw to Brown 345-kV transmission line with normal and emergency ratings of 1723 MVA or greater, approximately 28.0-mile, the Brown to Red Salt 345-kV transmission line with normal and emergency ratings of 1723 MVA or greater, approximately 4.0-mile, and the Red Salt to Volta 345-kV transmission line with normal and emergency ratings of 1723 MVA or greater, approximately 9.0-mile



## Option 4 – ERCOT Option (Continued)

- Construct a new Buzzard Draw to Oceanic 138-kV transmission line with normal and emergency ratings of 614 MVA or greater, approximately 19.3-mile
- Construct a new Oceanic to Merrick 138-kV transmission line with normal and emergency ratings of 614 MVA or greater, approximately 9.0-mile
- Install two 55.2 MVar capacitor banks at Expanse 345/138-kV Switch

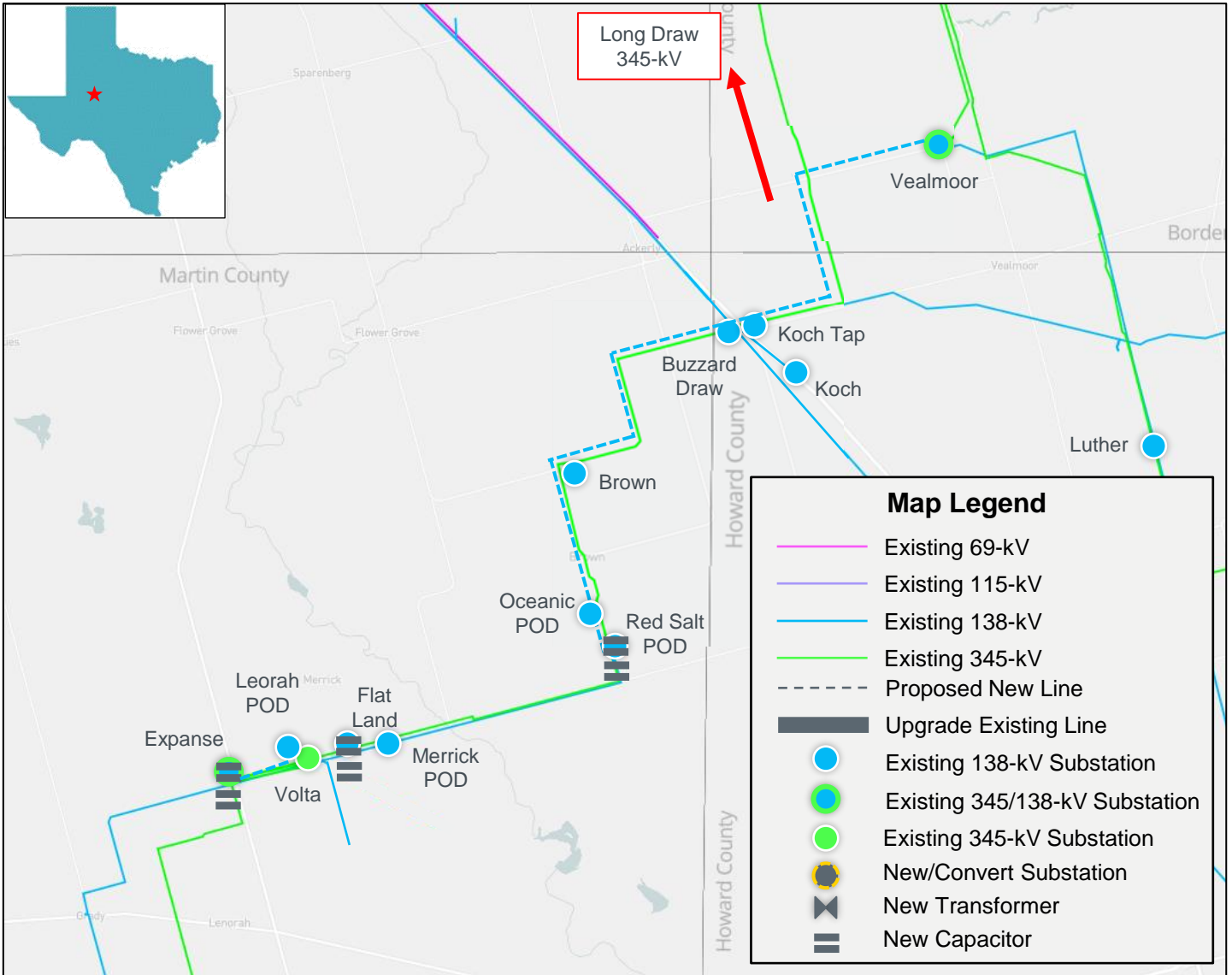
# Option 4 – ERCOT Option



## Option 5 – ERCOT Option

- Rebuild the existing Vealmoor to Koch Tap 138-kV transmission line with normal and emergency ratings of 614 MVA or greater, approximately 8.6-mile
- Rebuild the existing Koch Tap to Buzzard Draw 138-kV transmission line with normal and emergency ratings of 614 MVA or greater, approximately 0.3-mile
- Rebuild the existing Buzzard Draw to Brown 138-kV transmission line with normal and emergency ratings of 614 MVA or greater, approximately 15.3-mile
- Rebuild the existing Brown to Oceanic POD 138-kV transmission line with normal and emergency ratings of 614 MVA or greater, approximately 3.6-mile
- Rebuild the existing Oceanic POD to Red Salt 138-kV transmission line with normal and emergency ratings of 614 MVA or greater, approximately 0.8-mile
- Rebuild the existing Lenorah to Expanse 138-kV transmission line with normal and emergency ratings of 614 MVA or greater, approximately 1.4-mile
- Install two 55.2 MVAR capacitor banks at Expanse 345/138-kV Switch
- Install two 55.2 MVAR capacitor banks at Flatland 138-kV substation
- Install two 55.2 MVAR capacitor banks at Red Salt 138-kV substation

# Option 5 – ERCOT Option



# Preliminary Results of Reliability Assessment – Options

Options	N-1		G-1+N-1*		X-1+N-1**	
	Thermal Violations	Voltage Violations	Thermal Violations	Voltage Violations	Thermal Violations	Voltage Violations
1	None	None	None	None	None	None
2	2	None	3	1	2	None
3	None	None	None	None	None	None
4	None	5	None	5	None	5
5	None	None	None	None	None	None

\*G-1 Generators tested: Odessa U1, Morgan Creek SES U1, Long Draw Solar S2

\*\*X-1 Transformers tested: Long Draw X1, Expanse X2, Odessa X1, Morgan Creek X1

- Option 1, Option 3, and Option 5 will be short-listed for further evaluation.

# Preliminary Results of Planned Maintenance Outage Evaluation

- ERCOT conducted planned maintenance outage analysis on all short-listed options to compare relative performance of the options
  - Load levels the Far West Weather zone were scaled down based on the historical non-summer peak data to 96.0%, in order to mimic the non-summer peak load condition
  - Based on the review of system topology of the area, ERCOT tested N-2 contingency combinations, and then tested all applicable contingency violations with system adjustments (N-1-1)
- The following thermal or voltage constraints were observed in the N-1-1 analysis

Option	Thermal Violation	Voltage Violation
1	None	None
3	None	None
5	None	None

# Long-Term Load-Serving Capability Assessment

- Assumptions
  - Adjusted load up in the study area, excluding Flexible Loads in the area
  - Adjusted conforming load down outside of the Far West weather zone to balance power
  - Based on N-1 contingency
- Findings
  - Option 3 provides the highest additional transfer capability, followed closely by Option 1, and then Option 5.

Option	Incremental Load-Serving Capability (~MW)
1	820
3	915
5	762

# Next Steps and Tentative Timeline

- Project Evaluation
  - The TSP will provide the Cost Estimate and Feasibility Assessment
- Generation Addition and Load Scaling Sensitivity Analyses
  - Planning Guide Section 3.1.3(4)
- Subsynchronous Resonance (SSR) Assessment
  - Nodal Protocol Section 3.22.1.3(2)
- Congestion Analysis
  - Congestion analysis may 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



# Deliverables

- Tentative Timelines
  - Status updates at the future RPG meetings
  - Final Recommendation – Q1 2025

*Thank you!*



Stakeholder comments also welcomed through:

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# Appendix A – Transmission Projects Added

TPIT/RPG No	Project Name	Tier	Project ISD	County(s)
70964	WETT 345 kV Volta witch	Tier 3	Mar-24	Howard
73043	Peck - Driver 138 kV Line	Tier 2	Dec-24	Glasscock
73368	Grey Well Draw - Buffalo 138 kV Second Circuit	Tier 3	Dec-24	Midland
76686	Add Hog Mountain 138 kV POD	Tier 4	Dec-24	Glasscock
76705	Prairieland 345/138 kV Switch and 138 kV Line	Tier 2	May-25	Glasscock
78374	Rockhound 345/138 kV Switch	Tier 3	Dec-24	Midland
80858	Sterling City: Upgrade 69 kV Relays	Tier 4	Apr-25	Sterling
80913	Sloan 138 kV Switch	Tier 4	May-25	Midland
66532	Grey Well Draw - Pronghorn 138 kV Line Rebuild	Tier 4	Jan-24	Midland
73434	Shaw 138 kV POD	Tier 4	May-24	Reagan

# Appendix B – Transmission Backed Out

RTP Project ID	Project Name	County(s)
2021-FW19	Morgan Creek SES - Longshore Switch 345-kV Line Upgrade	Mitchell, Howard
2021-FW20	Lamesa - Key Sub - Gail Sub - Willow Valley Switch 138-kV Line Upgrade	Dawson, Borden
2022-FW24	Faraday - Lamesa - Clearfork - Riverton 345-kV Double Circuit Line Addition	Borden, Dawson, Andrews, Winkler, Loving and Reeves
2023-FW4	Buzzard Draw Switch - Koch Tap - Vealmoor 138-kV Line Upgrade	Howard
2023-FW13	Bulldog - Elbow - Eiland - Einstein - Carterville 138-kV Line Upgrade	Howard, Midland
2022-WFW2	Midessa South SW - Consavvy - Longshore Switch - Morgan Creek SES 345-kV Line Upgrades	Midland, Howard, Mitchell
2023-WFW1	Exxon Sharon Ridge to Willow Valley Switch 138-kV Line Upgrade	Scurry, Borden
2023-WFW2	Morgan Creek SES - Falcon Seaboard - Midland East 345-kV Line Upgrade	Midland, Howard, Mitchell

# Appendix C – Generation Added

GINR	Project Name	Fuel	Project COD	Capacity (~MW)	County
19INR0203	Angelo Solar	SOL	08/01/2024	195.4	Tom Green
22INR0502	Shamrock Wind SLF	WIN	09/15/2024	223.9	Crockett
23INR0372	Cross Trails Storage	OTH	04/25/2025	58.3	Scurry
23INR0387	Pioneer DJ Wind	WIN	09/15/2024	140.3	Midland
23INR0418	Angelo Storage	OTH	08/10/2024	103.0	Tom Green
24INR0273	AI Pastor BESS	OTH	09/10/2024	103.1	Dawson
24INR0421	Swift Air Solar	SOL	03/31/2025	146.5	Ector
24INR0568	Shamrock Energy Storage (SLF)	OTH	07/01/2025	99.3	Crockett
24INR0578	Panther Creek 1 Repower	WIN	12/31/2024	11.0	Glasscock
24INR0582	Panther Creek 2 Repower	WIN	12/31/2024	8.0	Glasscock
24INR0629	Jade Storage SLF	OTH	09/30/2024	160.0	Scurry
24INR0630	Andromeda Storage SLF	OTH	12/31/2024	160.0	Scurry