Oncor Roscoe Area Upgrades Project – ERCOT Independent Review

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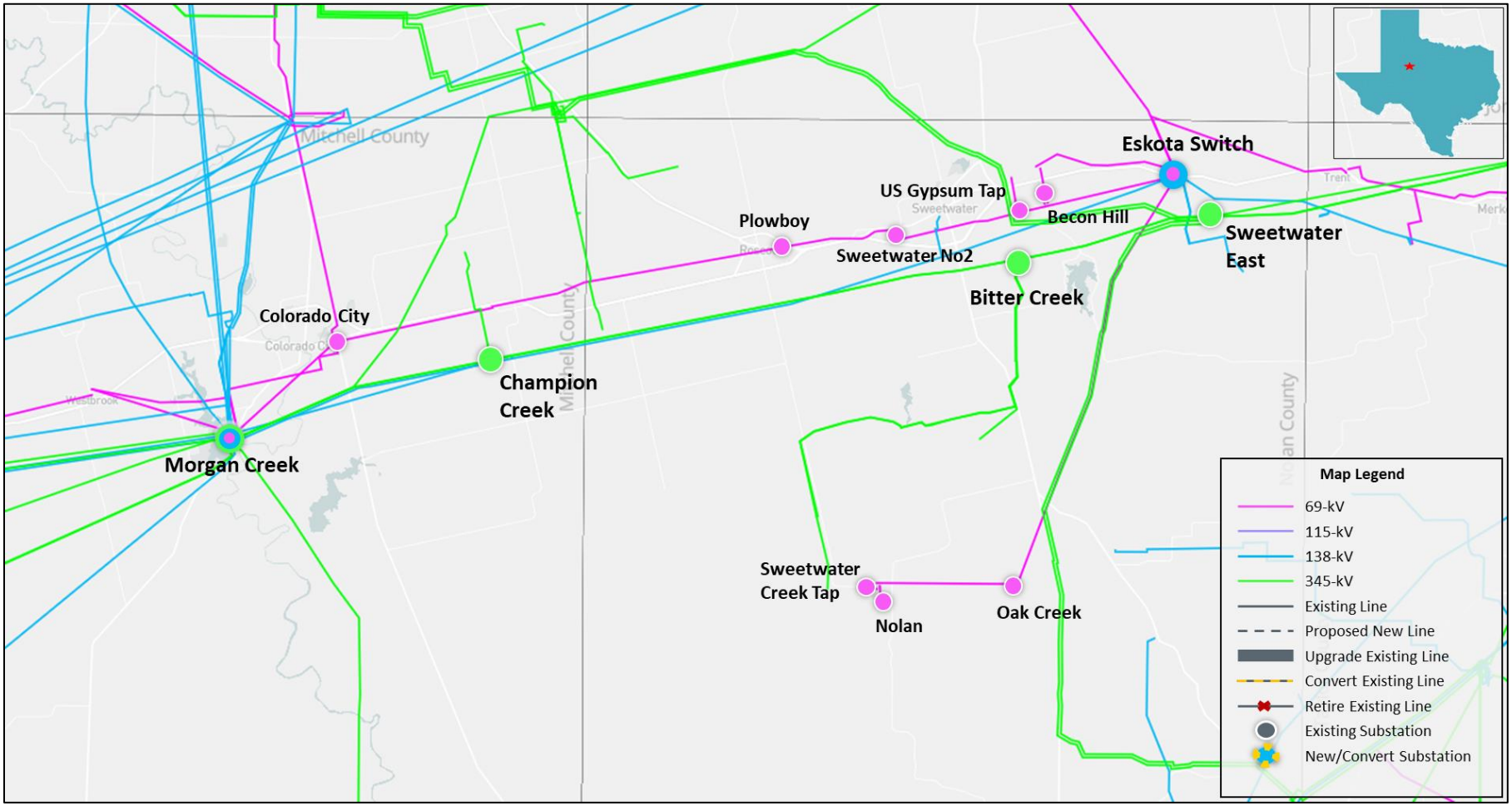
RPG Meeting
May 20, 2025

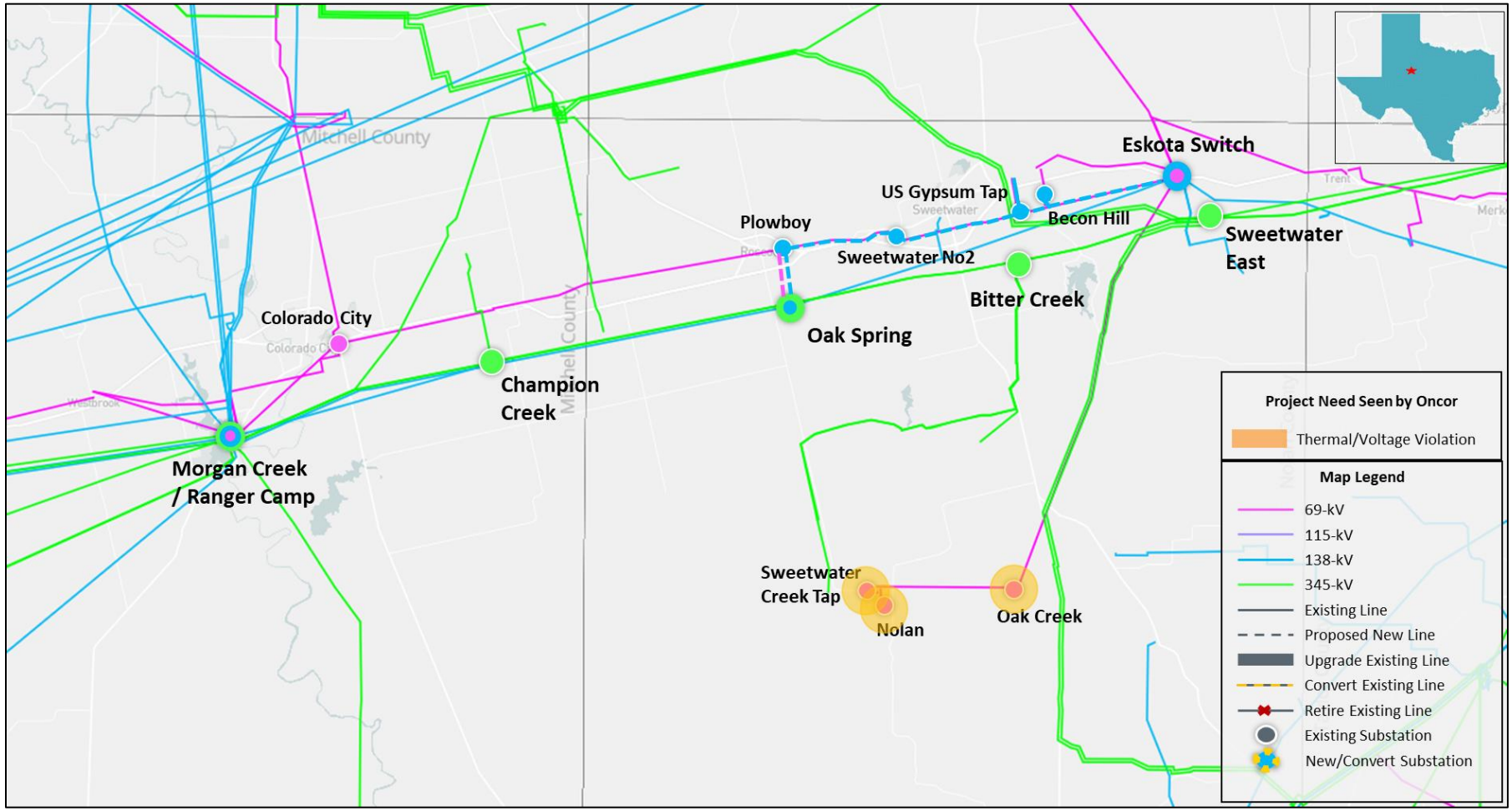
Recap – Introduction

- Oncor submitted the Roscoe Area Upgrades Project for Regional Planning Group (RPG) review in December 2024
  - This Tier 2 project is estimated to cost $83 million and will require a Certificate of Convenience and Necessity (CCN)
  - Estimated in-service date (ISD) is June 2028
  - Addresses voltage violations seen by Oncor
- Oncor presented a project overview and ERCOT provided a project scope at the February RPG Meeting:
  - https://www.ercot.com/calendar/02242025-RPG-Meeting-_-Webex
- ERCOT presented status update at the April 2025 RPG Meetings:
  - https://www.ercot.com/calendar/04292025-RPG-Meeting
- This project is currently under ERCOT Independent Review (EIR)

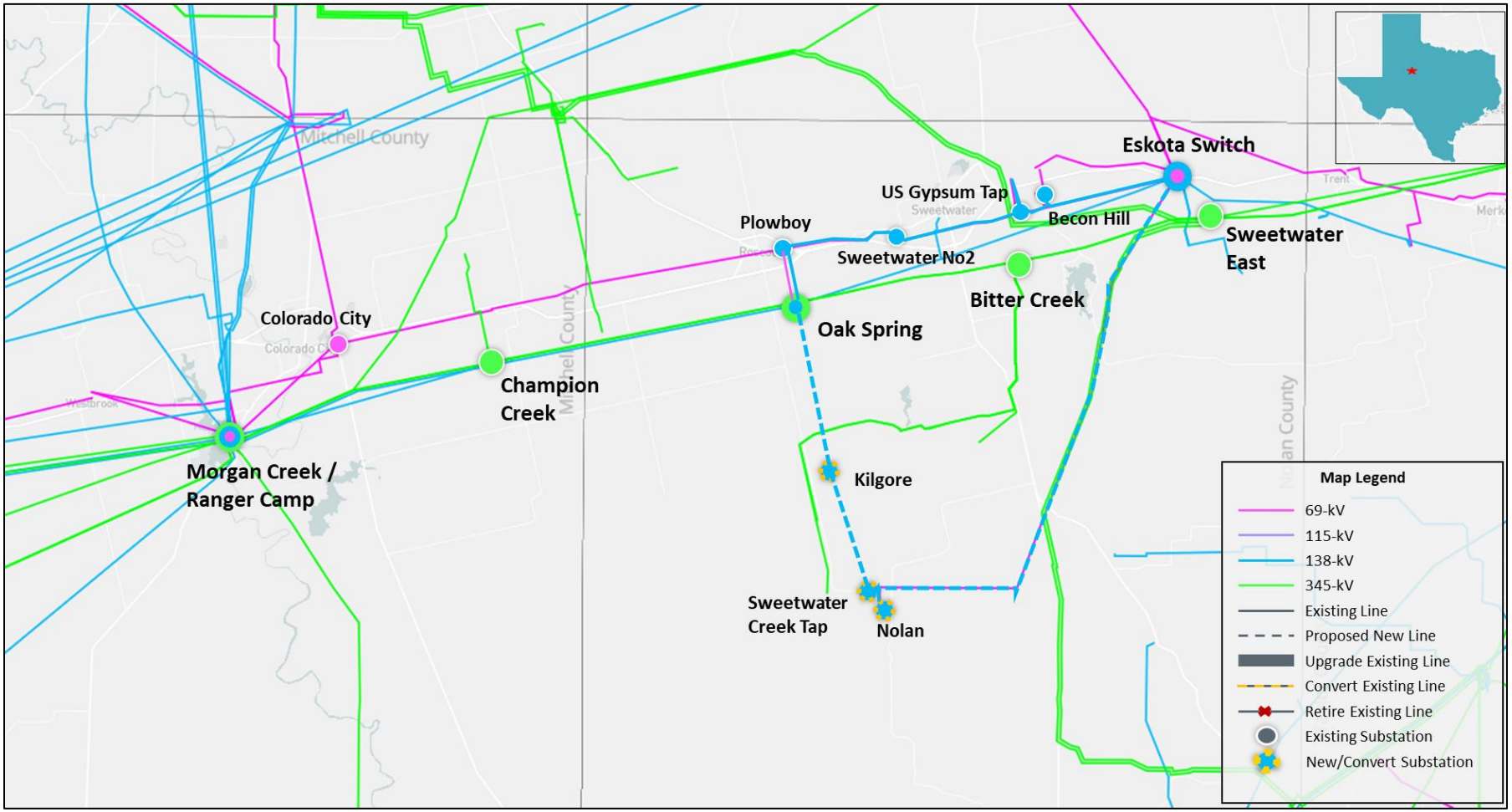
Recap – Study Area Map



Recap – Study Area Map with Permian Basin L25 Project and Need Seen by Oncor



Recap – Project Proposed by Oncor



Recap – Project Proposed by Oncor

- Establish the new load serving Kilgore 138-kV Substation, approximately 3 miles northeast of the existing Sweetwater Creek POI;
- Construct a new 138-kV transmission line from Sweetwater Creek POI to Oak Spring looping into the newly build Kilgore 138-kV substation, using a conductor with normal and emergency rating of 614 MVA. The new line will require a CCN and a new right-of-way (ROW), approximately 15.25-mile;
- All sectionalizing switches and associated equipment will meet or exceed 3200 A for 138-kV;
- Decommission the existing Oak Creek 69-kV substation and transfer existing load to Kilgore 138-kV substation;
- Rebuild the existing Sweetwater Creek POI to Eskota 69-kV line on new 138-kV double-circuit structures with one 138-kV circuit in place using a conductor with normal and emergency rating of 614 MVA and convert the line to 138-kV operation, approximately 24.6-mile; and
- Install one 3200 A, 138-kV circuit breaker at Eskota 138-kV Switch.

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

- 2024 Regional Transmission Planning (RTP) 2029 summer peak case was used as the start case
- Load in study area
  - Loads in study area were updated to create the study base case
- Reserve
  - Reserve levels are consistent with the 2024 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

Recap – Preliminary Results of Reliability Assessment – Need Analysis

- ERCOT conducted steady-state load flow analysis for the study base case according to the NERC TPL-001-5.1 and ERCOT Planning Criteria to identify project need

Contingency Category	Voltage Violations	Thermal Violations	Unsolved Power Flow
N-0 (P0)	None	None	None
N-1 (P1, P2-1, P7)	8	None	None
G-1 + N-1 (P3)*	8	1	None
X-1 + N-1 (P6-2)*	8	5	8

* See Appendix D for list of G-1 generators and X-1 transformers tested

Recap – Preliminary Results of Reliability Assessment – Options

Option	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	1	None	1	None	1	None
3	None	None	None	None	None	None
4	None	None	None	None	None	None

* See Appendix D for list of G-1 generators and X-1 transformers tested

- Option 3 was deemed infeasible by Oncor.
- Option 1 and Option 4 are used for further evaluation

Recap – Preliminary Results of Planned Maintenance Outage Evaluation

- ERCOT conducted planned maintenance outage evaluation on the short-listed options
  - Load level in the West Weather Zone were scaled down to 82.5% of their summer peak loads in the study base case, respectively based on ERCOT load forecast and historical load, in order to mimic the off- peak load condition
  - N-2 contingencies were tested as a proxy for N-1-1. Any applicable violating contingencies were further tested with system adjustments
  - The transmission elements in the Roscoe area were monitored in the maintenance outage evaluation
- Planned maintenance outage analysis results

Option	Voltage Violations	Thermal Overloads	Unsolved Power Flow
1	None	None	None
4	None	None	None

Recap – 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 study area
  - Based on N-1 contingency
- Findings
  - All Options show significant additional transfer capability

Option	Incremental Load-Serving Capability(~MW)
1	147
4	187

Status Update

- Options Evaluation
  - Cost Estimate and Feasibility Assessment from Transmission Service Providers (TSPs)
- ERCOT Preferred Option Selected
  - Congestion Analysis

Cost Estimate and Feasibility Assessment – Short-Listed Options

- TSPs performed feasibility assessments and provided final cost estimates for the two short-listed options

Option	Cost Estimates* (~$M)	CCN Required (~Miles)	Feasibility
1	84.3	Yes (15.25)	Yes
4	133.4	Yes (16.25)	Yes

Comparison of Short-Listed Options

	Option 1	Option 4
Address the project needs	Yes	Yes
Met ERCOT and NERC Reliability Criteria	Yes	Yes
Feasibility	Yes	Yes
Improved Operational Flexibility (Planned Maintenance Outages)	Yes	Yes
Improved Long-Term Load-Serving Capability	Yes	Yes
CCN Needed (~Miles)	Yes (~15.25)	Yes (~16.25)
Capital Cost Estimates (~$M)	84.3	133.4

ERCOT Preferred Option

- Option 1 was selected as the ERCOT preferred option because it:
  - Addresses project need in the Roscoe area;
  - Meets ERCOT and NERC Reliability Criteria;
  - Least cost option that resolves the low voltage issues; and
  - Improves long-term load-serving capability for future load growth in the area.

Additional Analysis

- Congestion analysis
  - Congestion analysis was performed for the preferred option using the 2024 RTP 2029 economic case
  - The preferred option did not result in any new congestion within the study area

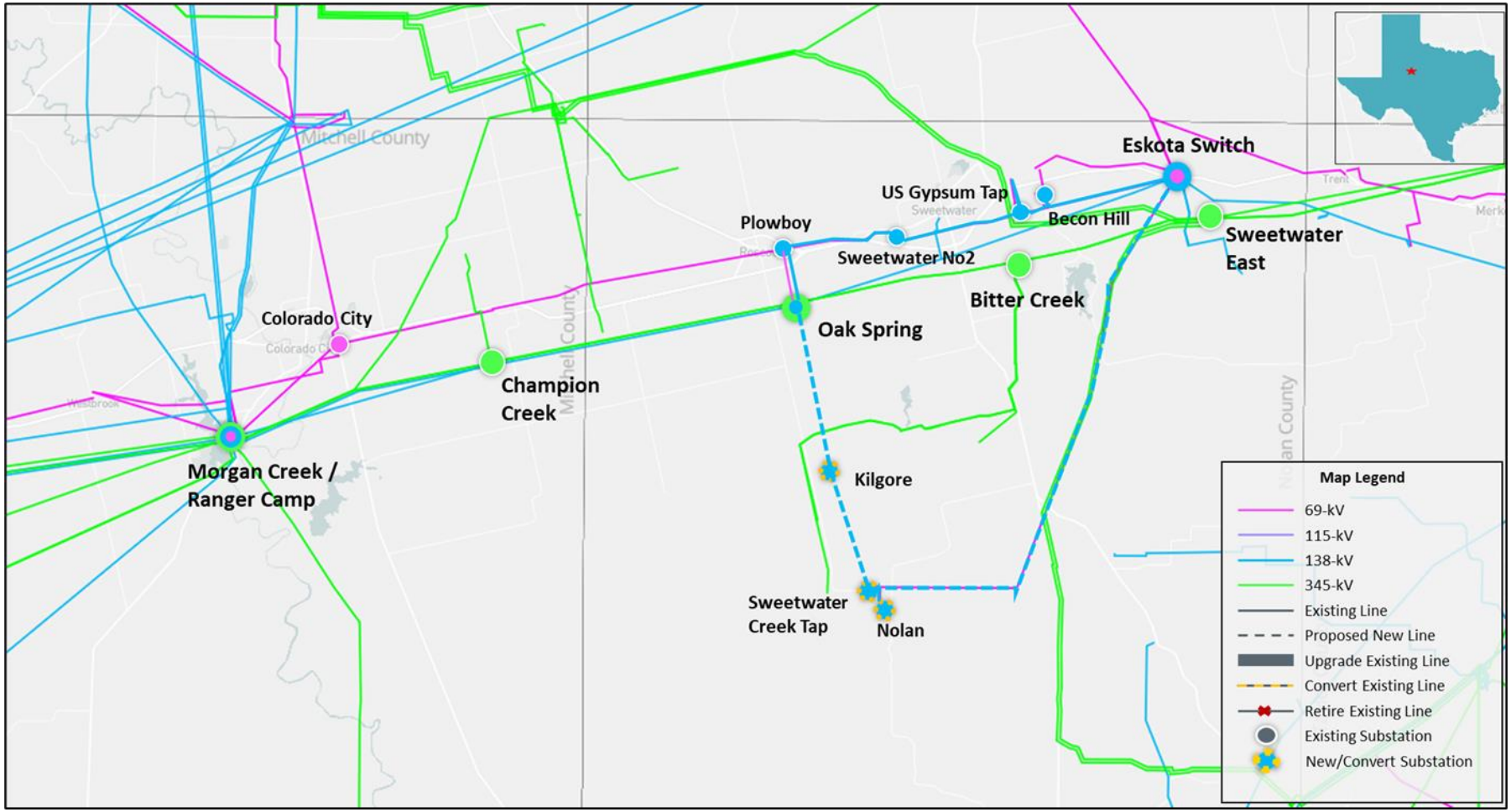
ERCOT Recommendation

- ERCOT recommends Option 1
  - Estimated Cost: approximately $84.3 million
  - Expected ISD: June 2028
    - The expected ISD may change based on requirements for environmental assessment, licensing requests, regulatory approval, rights-of-way acquisition and construction progress
  - CCN filling will be acquired to
    - To construct a new 138-kV transmission line from the existing Sweetwater Creek POI 138-kV substation to the planned Oak Spring 138-kV substation, looping into the new Kilgore 138-kV substation, approximately 15.25-mile

ERCOT Recommended Option

- Establish the new load serving Kilgore 138-kV substation, approximately 3 miles northeast of the existing Sweetwater Creek POI;
- Construct a new 138-kV transmission line from the existing Sweetwater Creek POI 138-kV substation to the planned Oak Spring 138-kV substation, looping into the new Kilgore 138-kV substation, using a conductor with normal and emergency ratings of at least 614 MVA. The new line will require a CCN and a new right of way (ROW), approximately 15.25-mile;
- Decommission the existing Oak Creek 69-kV substation and transfer the existing load to the new Kilgore 138-kV substation;
- Ensure all line terminal and associated equipment are rated to meet or exceed 5000 A for 345-kV and 3200 A for 138-kV.
- Rebuild the existing Sweetwater Creek POI to Eskota 69-kV transmission line on new 138-kV double-circuit structures with one circuit in place using a conductor with normal and emergency ratings of at least 614 MVA and convert the line to 138-kV operation, approximately 24.6-mile;
- Install one 3200 A, 138-kV circuit breaker at the existing Eskota 138-kV Switch; and
- All sectionalizing switches and associated equipment will meet or exceed 3200 A for 138-kV;

Map of ERCOT Recommended Option



Next Steps and Tentative Timeline

- Tentative Timelines
  - EIR report to be posted in the MIS in May 2025

Thank you!

Stakeholder comments also welcomed through:

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Appendix A – Transmission Projects

- List of transmission projects added to study base case

RPG/TPIT No	Project Name	Tier	Project ISD	TSP
90004	Juncus: Construct New 69 kV Temporary Tap	Tier 4	Mar-25	AEP TCC
81354	GSEC_9452_Add_Snodgrass_Sub	Tier 4	Apr-25	GSEC
81544	GSEC_9466_Add_CampSprings_Sub	Tier 4	May-25	GSEC
77122	Mulberry Creek: Construct New 345 kV Terminal	Tier 4	Sep-25	AEP TNC
87861	Range Rider - Ranger Camp 138 kV Double-Circuit Line	Tier 1	Nov-25	Oncor
81223	Range Rider 138 kV Switch	Tier 1	Dec-25	Oncor
81274	Ranger Camp – Cattleman 345 kV Double-Circuit Line	Tier 1	Dec-25	Oncor
81415	Tonkawa Switch Syncrhonous Condenser	Tier 1	May-26	Oncor
87146	GSEC_Tier4_9468_Add_Bull_Sub	Tier 4	Jun-26	GSEC
81227	Cattleman – Gascondades 345 kV Reroute	Tier 1	Dec-26	Oncor
87653	Bluff Creek to Scurry Chevron Line Rebuild	Tier 3	Dec-26	Oncor
81299	Ranger Camp – Prong Moss 345 kV Line Rebuild	Tier 1	May-27	Oncor
81232	Cattleman – Bitter Creek/Champion Creek 345 kV Reroute	Tier 1	May-27	Oncor
90065	Abilene Northwest to Mulberry Creek: Rebuild 138 kV Line	Tier 4	May-27	AEP TNC
90063	Elm Creek to Mulberry Creek: Rebuild 138 kV Line	Tier 4	May-27	AEP TNC
81152	China Grove to Tributary Line Rebuild	Tier 3	Dec-27	Oncor
81225	Cattleman - Range Rider 138 kV Double-Circuit Line	Tier 1	May-28	Oncor

Appendix B – Transmission Projects

- List of transmission projects removed from the study base case

TPIT No	Project Name	County
2021-W5	Sacroc - Deep Creek Sub 138-kV Line Upgrade	Scurry
2023-W6	Cedar Hills to Silver Tap 69-kV Line Upgrade	Coke
2023-W10	Dermott - Scurry Chevron - Kndrsacrc - Oncor900041 Tap - Knapp - Bluff Creek 138-kV Line Upgrade	Scurry
2023-W19	Bluff Creek Switch (1309) - Exxon Sharon Ridge (1300) 138-kV Line Upgrade	Scurry
2024-W1	Winters (6333) - Steamboat (60332) 69-kV Line Upgrade	Runnels
2024-W2	Barber Lake Station (1189) 138-kV Cap Bank Addition	Mitchell
2024-W3	Ranger (10050) to Frontier (11393) 138-kV Second Circuit Line Addition	Mitchell
2024-W7	Ranger (10050) - Loraine South POI (11342) - Roscoe (10104) 138-kV Line Upgrade and Sweetwater Tap (1341) 138-kV Cap Bank Addition	Mitchell, Nolan
2023-WFW1	Exxon Sharon Ridge (1300) - Willow Valley Switch (1301) 138-kV Line Upgrades	Scurry, Borden

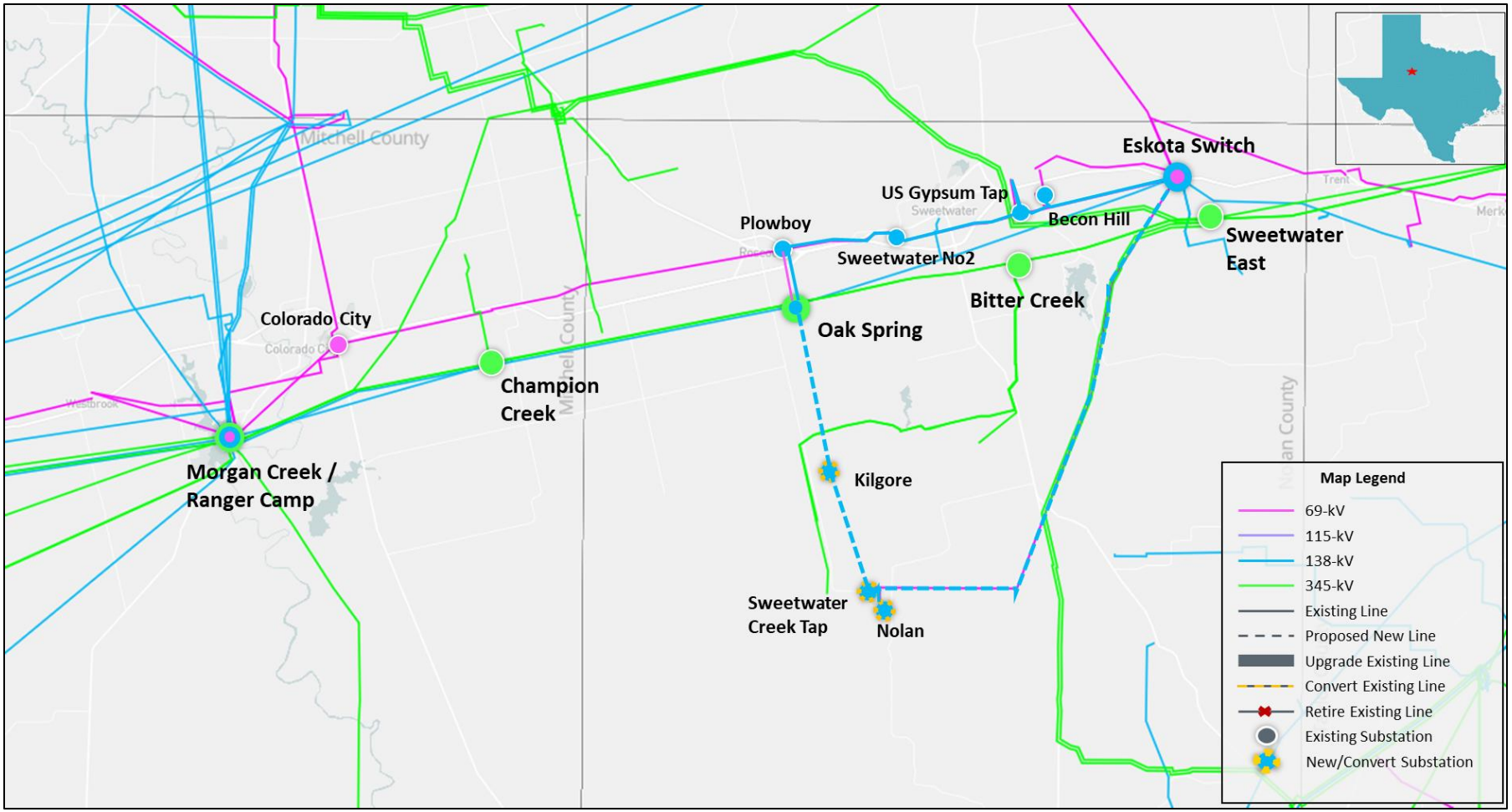
Appendix C – New Generation Projects to Add

GINR	Project Name	Fuel	Projected COD	Capacity (~MW)	County
23INR0372	Cross Trails Storage	OTH	05/25/2025	58.3	Scurry
24INR0627	Champion Wind Repower	WIN	05/09/2025	0.3	Nolan
24INR0629	Jade Storage SLF	OTH	01/10/2025	160.8	Scurry
24INR0630	Andromeda Storage SLF	OTH	02/21/2025	160.4	Scurry
25INR0400	Maldives Solar (Alternate POI)	SOL	07/01/2027	184.0	Scurry

Appendix D – G-1 Generators and X-1 Transformers

G-1 Generators	X-1 Transformers
Holstein S2	Roscoe – Ckt 1 345/138-kV
	Eskota – Ckt 1 138/69-kV
	Abilene – Ckt 1 138/69-kV
	Elm Creek –Ckt 1 138/69-kV

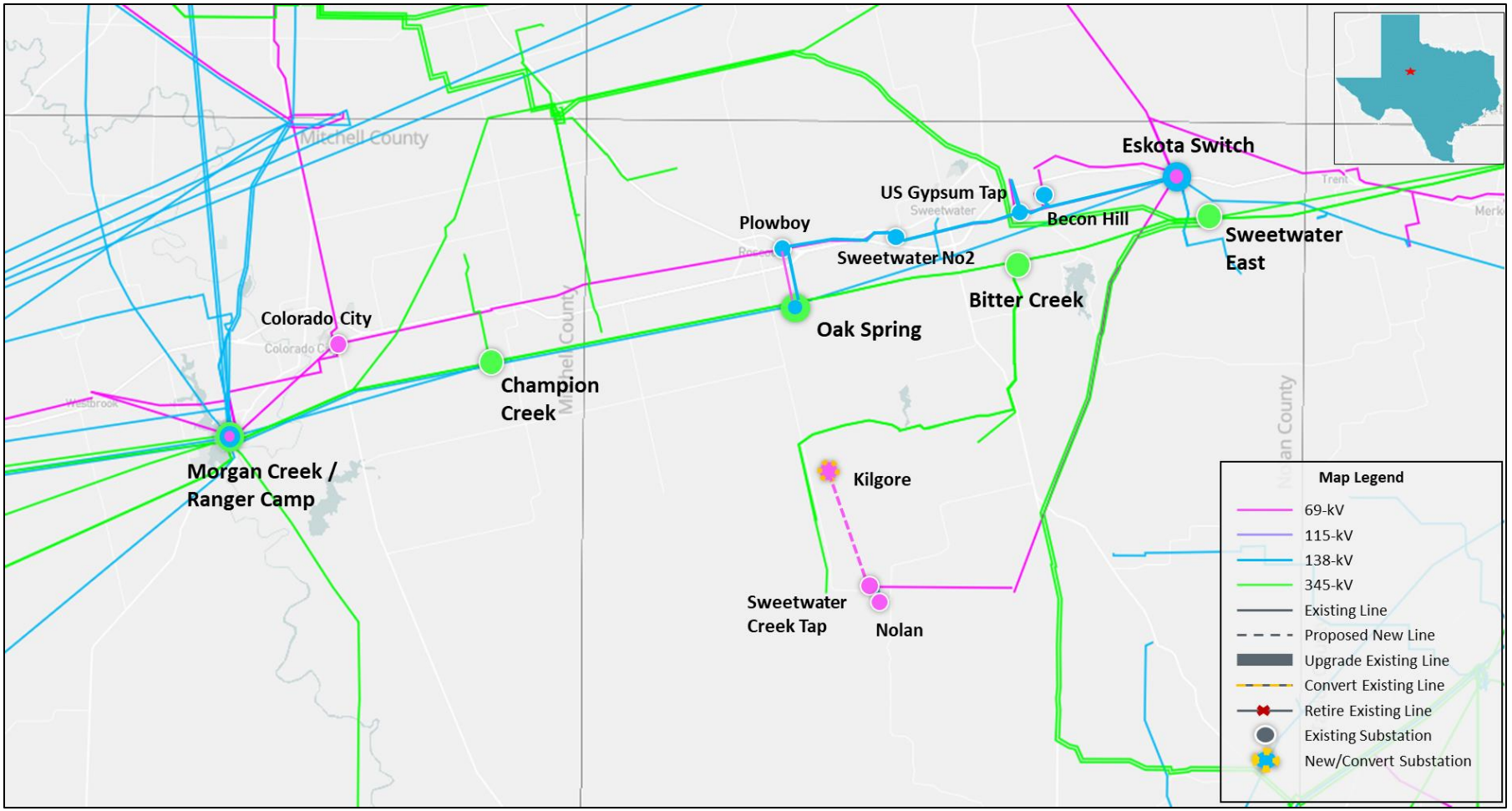
Option 1 – Oncor Proposed Project



Option 1 – Oncor Proposed Project

- Establish the new load serving Kilgore 138-kV Substation, approximately 3 miles northeast of the existing Sweetwater Creek POI;
- Construct a new 138-kV transmission line from Sweetwater Creek POI to Oak Spring looping into the newly build Kilgore 138-kV substation, using a conductor with normal and emergency rating of 614 MVA. The new line will require a CCN and a new ROW, approximately 15.25-mile;
- All sectionalizing switches and associated equipment will meet or exceed 3200 A for 138-kV;
- Decommission the existing Oak Creek 69-kV substation and transfer existing load to Kilgore 138-kV substation;
- Rebuild the existing Sweetwater Creek POI to Eskota 69-kV line on new 138-kV double-circuit structures with one 138-kV circuit in place using a conductor with normal and emergency rating of 614 MVA and convert the line to 138-kV operation, approximately 24.6-mile; and
- Install one 3200 A, 138-kV circuit breaker at Eskota 138-kV Switch.

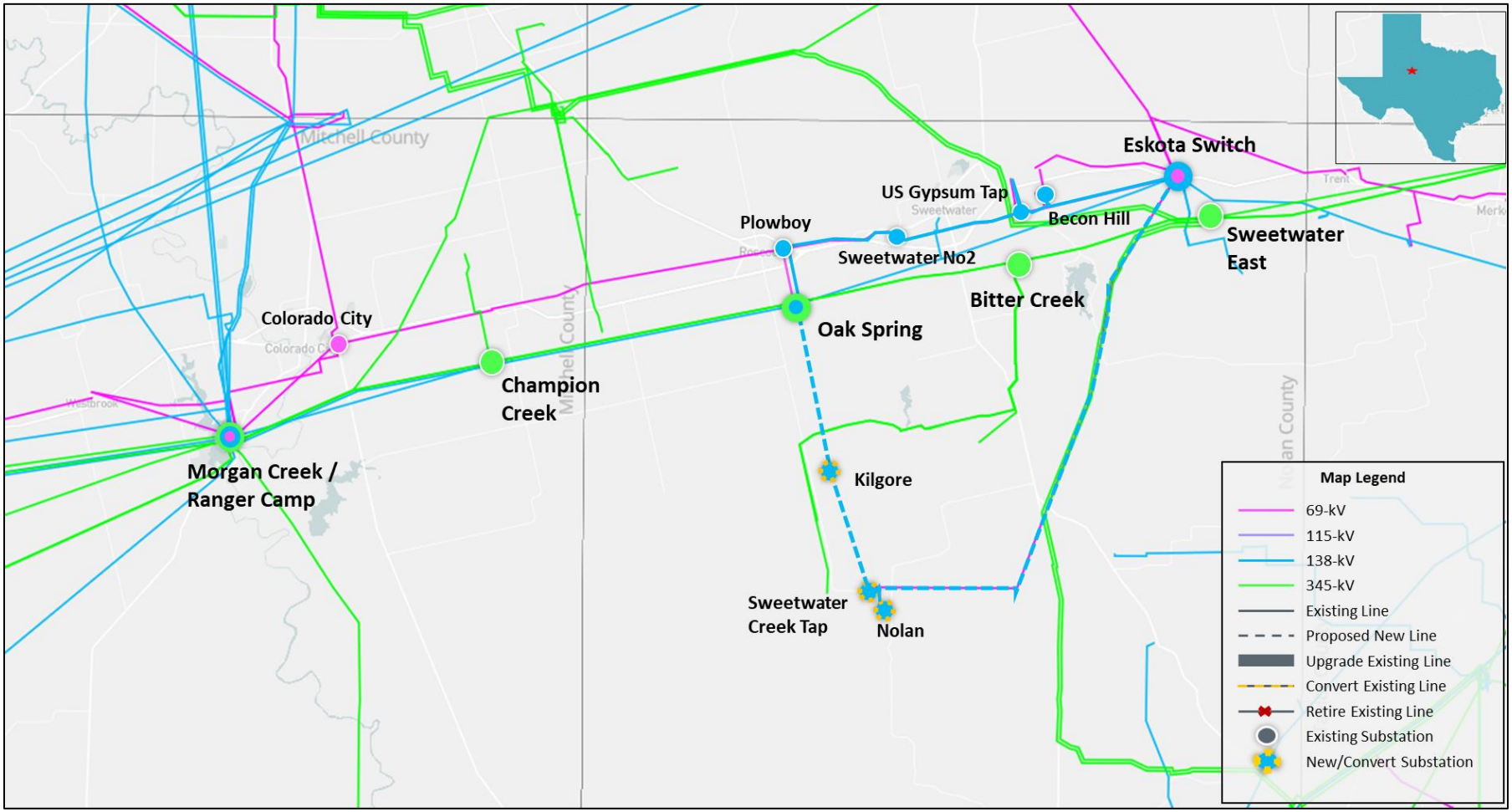
Option 2 – ERCOT Option



Option 2 – ERCOT Option

- Establish the new load serving Kilgore 69-kV Substation, approximately 3 miles northeast of the existing Sweetwater Creek POI;
- Construct a new 69-kV transmission line from Sweetwater Creek POI to Kilgore substation, using a conductor with normal and emergency rating of 40 MVA. The new line will require a CCN and a new ROW, approximately 3-miles;
- Construct a new 138/69-kV auto transformer at Eskota substation with a normal and emergency ratings of 122 MVA and 125 MVA respectively;
- Decommission the existing Oak Creek 69-kV substation and transfer existing load to Kilgore 69-kV substation; and
- Install three blocks of 9.2 MVAr Switch Shunts at Kilgore 69-kV substation.

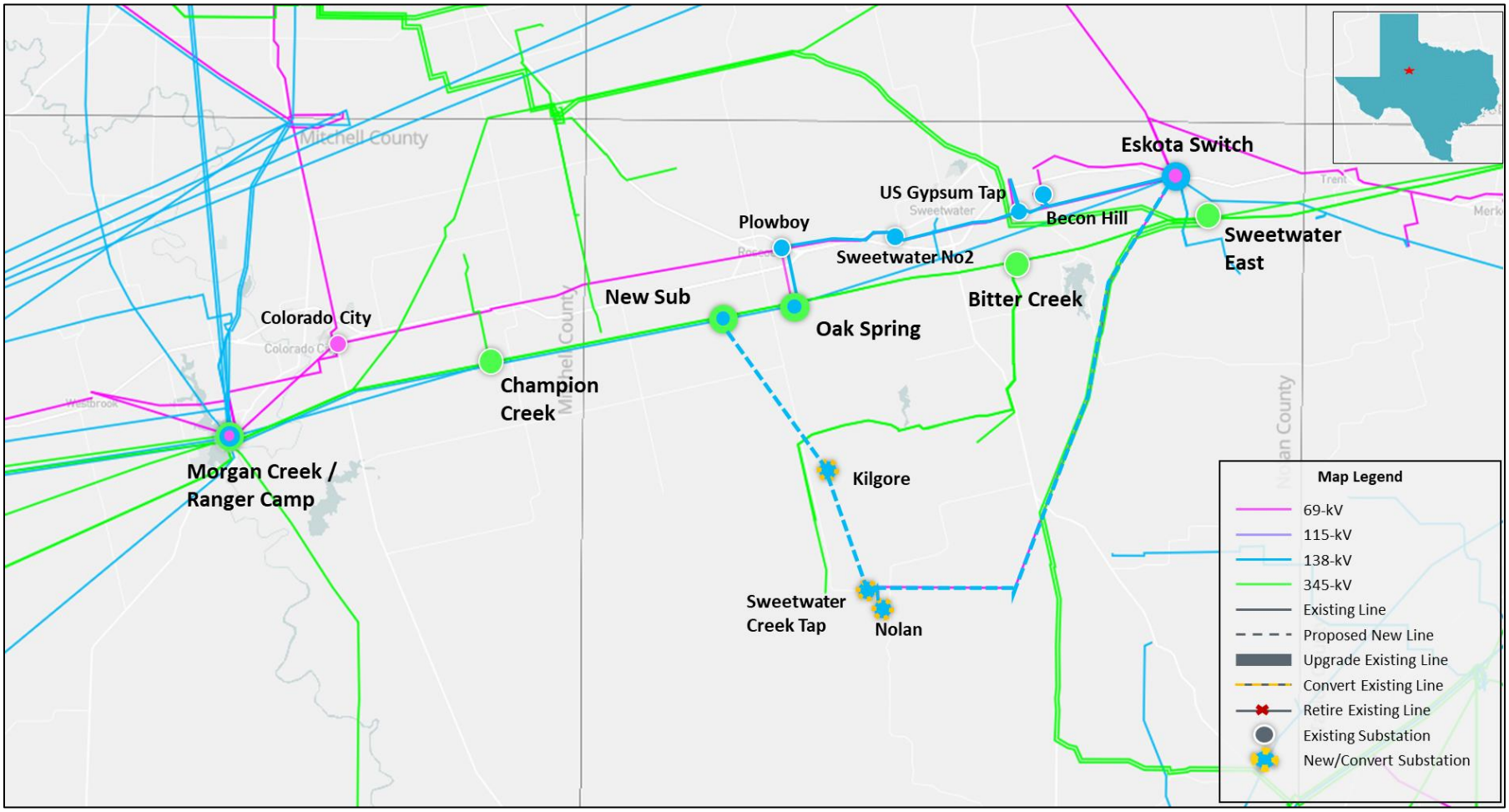
Option 3 – ERCOT Option



Option 3 – ERCOT Option

- Establish the new load serving Kilgore 138-kV Substation, approximately 3 miles northeast of the existing Sweetwater Creek POI;
- Construct a new 345/138-kV auto transformer at Oak Spring substation with a normal and emergency ratings of 668 MVA and 750 MVA respectively;
- Construct a new 138-kV transmission line from Sweetwater Creek POI to Oak Spring 138-kV terminal of new auto transformer and looping into the newly build Kilgore 138-kV substation, using a conductor with normal and emergency rating of 614 MVA. The new line will require a CCN and a new Right-of-Way (ROW), approximately 15.25-miles;
- All sectionalizing switches and associated equipment will meet or exceed 3200 A for 138-kV;
- Decommission the existing Oak Creek 69-kV substation and transfer existing load to Kilgore 138-kV substation;
- Rebuild the existing Sweetwater Creek POI to Eskota 69-kV line on new 138-kV double-circuit structures with one 138-kV circuit in place using a conductor with normal and emergency rating of 614 MVA and convert the line to 138-kV operation, approximately 24.6-mile; and
- Install one 3200 A, 138-kV circuit breaker at Eskota 138-kV Switch.

Option 4 – ERCOT Option



Option 4 – ERCOT Option

- Establish the new load serving Kilgore 138-kV Substation, approximately 3 miles northeast of the existing Sweetwater Creek POI;
- Establish a New Sub 345-kV substation which taps the Champions Creek to Oak Spring 345-kV transmission line; approximately 1-mile from Oak Spring 345-kV Substation;
- Construct a new 345/138-kV auto transformer at New Sub substation with a normal and emergency ratings of 668 MVA and 750 MVA respectively;
- Construct a new 138-kV transmission line from Sweetwater Creek POI to New Sub looping into the newly build Kilgore 138-kV substation, using a conductor with normal and emergency rating of 614 MVA. The new line will require a CCN and a new ROW, approximately 15.25-mile;
- All sectionalizing switches and associated equipment will meet or exceed 3200 A for 138-kV;
- Decommission the existing Oak Creek 69-kV substation and transfer existing load to Kilgore 138-kV substation;
- Rebuild the existing Sweetwater Creek POI to Eskota 69-kV line on new 138-kV double-circuit structures with one 138-kV circuit in place using a conductor with normal and emergency rating of 614 MVA and convert the line to 138-kV operation, approximately 24.6-mile; and
- Install one 3200 A, 138-kV circuit breaker at Eskota 138-kV Switch.