



Delaware Basin Stage 5 Project ERCOT Independent Review Scope

Tanzila Ahmed

RPG Meeting
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Introduction

- Oncor Electric Delivery (Oncor) submitted the Delaware Basin Stage 5 for Regional Planning Group (RPG) review in May 2024
 - This Tier 1 project is estimated to cost \$744.6 million
 - Filing of Certificate of Convenience and Necessity (CCN) will be required
 - Estimated in-service date (ISD) is December 2029
 - The project is needed to address reliability issues (both thermal overloads and voltage violations) due to significant load growth in the Delaware Basin area, in the Andrews, Borden, Culberson, Dawson, Gaines, Loving, Reeves, and Winkler Counties in the Far West (FW) Weather Zone
 - The project need and solution was identified in the 2019 ERCOT Delaware Basin Load Integration Study
- Wind Energy Transmission Texas, LLC (WETT) submitted an alternative option for RPG review in June 2024
 - WETT's portion of this option is estimated to cost \$305.5 million
 - WETT estimates a total cost saving of up to approximately \$67.0 million
 - Filing of Certificate of Convenience and Necessity (CCN) will be required
 - Estimated in-service date is December 2028
- ERCOT is currently conducting a single ERCOT Independent Review (EIR) by combining these two projects (24RPG015 and 24RPG023)

Background

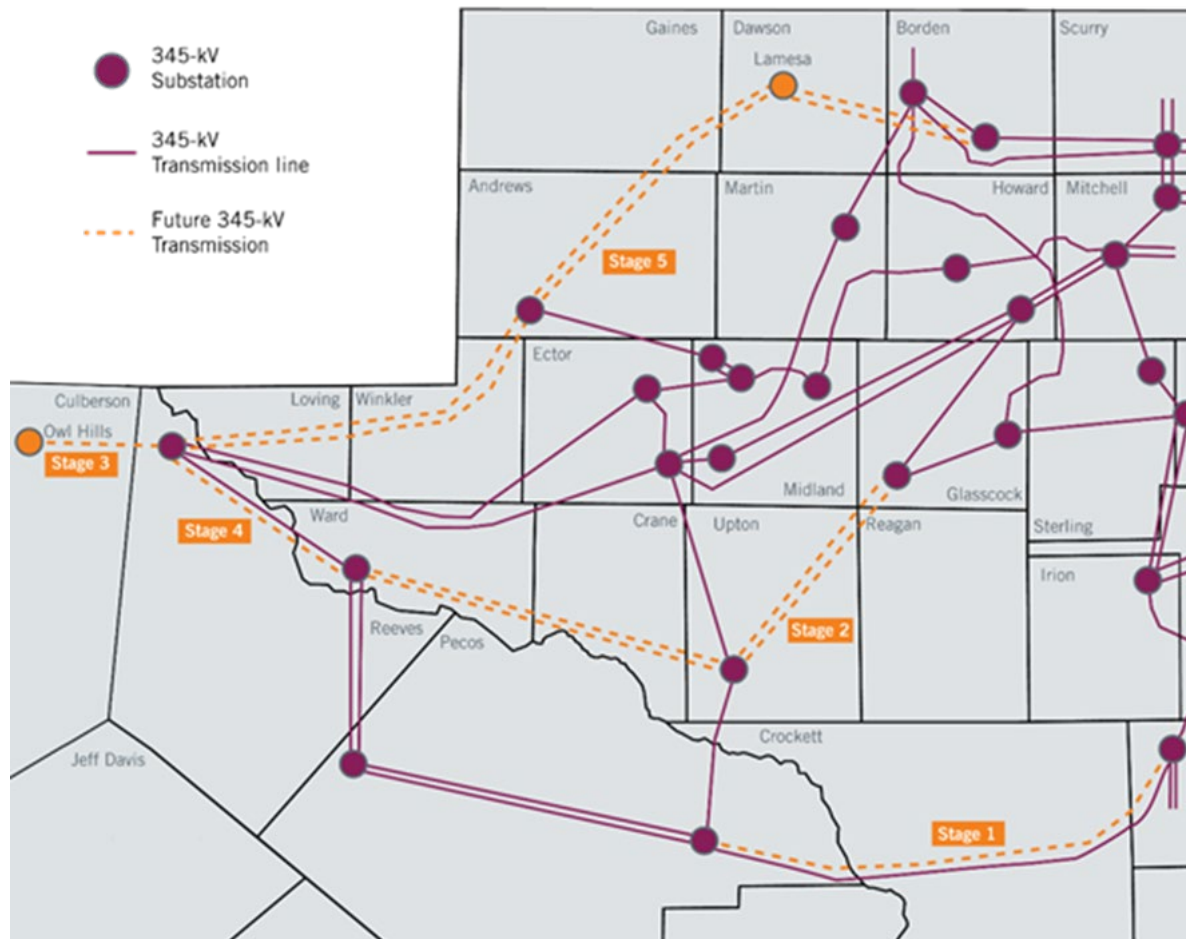
- The Far West Weather Zone, which includes the Study area for this project, has experienced significant growth in oil and natural gas industry demand
- Due to the significant load growth and because of lack of long-term load commitment from the oil and gas customers, ensuring that necessary transmission improvements are in place in time is a significant challenge for both ERCOT and TSPs
- As part of the efforts to address this challenges, ERCOT previously completed two studies which incorporated extensive review and input by Transmission Service Providers (TSPs) and stakeholders:
 - 2019 Delaware Basin Load Integration Study
 - 2024 Permian Basin Reliability Plan Study

Background (Cont.)

- [Delaware Basin Load Integration Study](#) completed in December 2019
 - Identified the reliability needs in the region
 - Provided a roadmap of long lead time transmission improvements for the continued oil and gas load growth in the Delaware Basin area
 - Stage 1 upgrade was endorsed in June 2021 and is expected to be complete in 2023
 - Stage 2 upgrade was endorsed in August 2022 and is expected to be complete in 2026
 - Updated Stage 3 upgrade along with Stage 4 upgrade are currently under RPG review and has an expected ISD of Summer 2027

Stage	Estimated Delaware Basin Load Level (MW)	Upgrade Element	Trigger
1	3,052	Add a second circuit on the existing Big Hill - Bakersfield 345-kV line	Import Needs
2	4,022	A new Bearkat - North McCamey - Sand Lake double-circuit 345-kV line	Import Needs
3	4,582	A new Riverton - Owl Hills single-circuit 345-kV line	Culberson Loop Needs
4	5,032	Riverton - Sand Lake 138-kV to 345-kV conversion and a new Riverton - Sand Lake 138-kV line	Culberson Loop Needs
5	5,422	A new Faraday - Lamesa - Clearfork - Riverton double-circuit 345-kV line	Import Needs

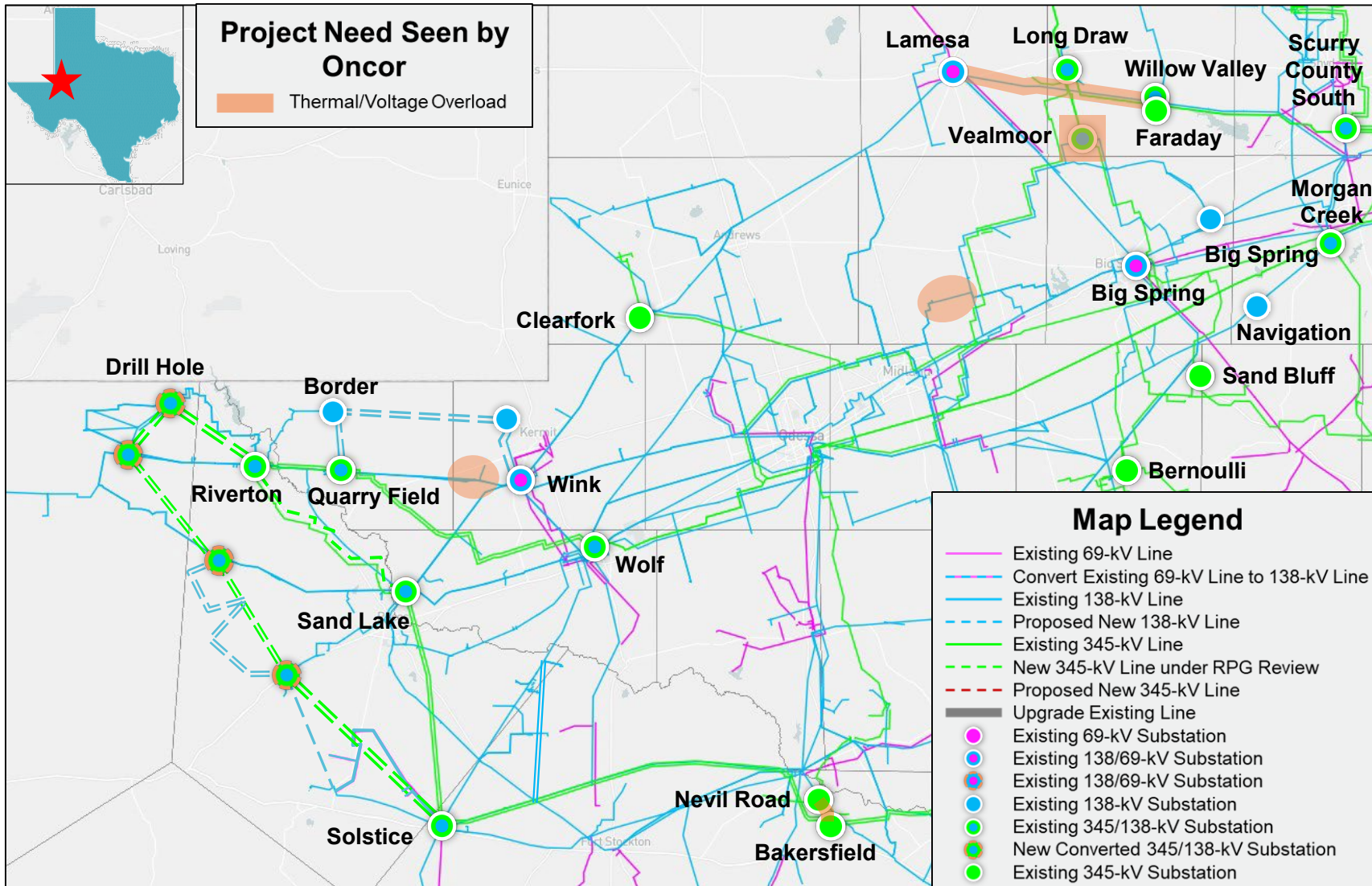
Map – Preferred 2019 Delaware Basin Load Integration Study Upgrades



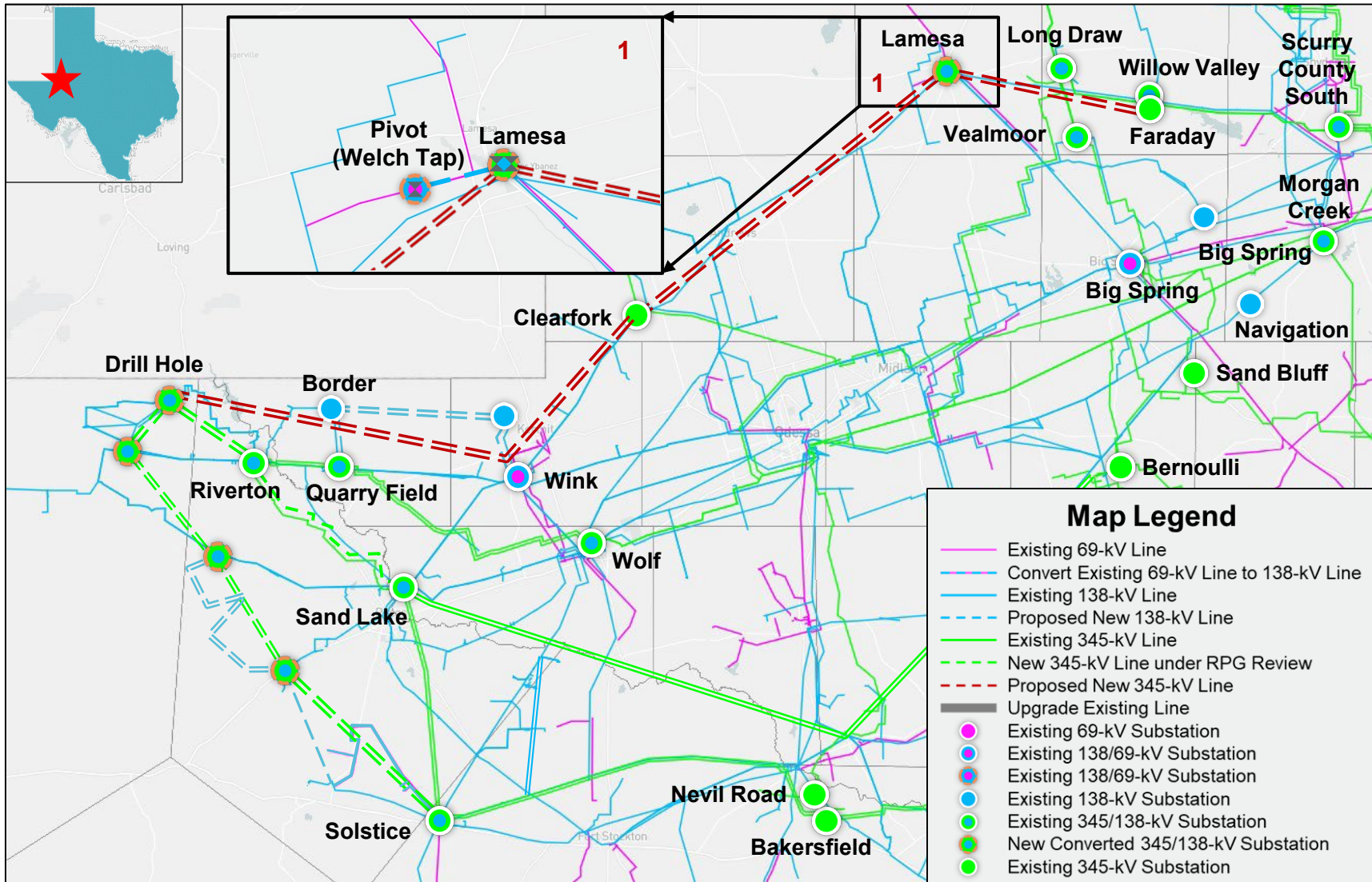
Background (Cont.)

- [Permian Basin Reliability Plan Study](#) completed in July 2024
 - Identified the reliability needs in the region
 - Identified local upgrades along with import paths needed to serve the Permian Basin region loads
 - Updated Stages 3 and 5 upgrades as well as the Stage 4 upgrade from 2019 Delaware Basin Load Integration Study was included in the base case

Map – Project Need as Seen by Oncor



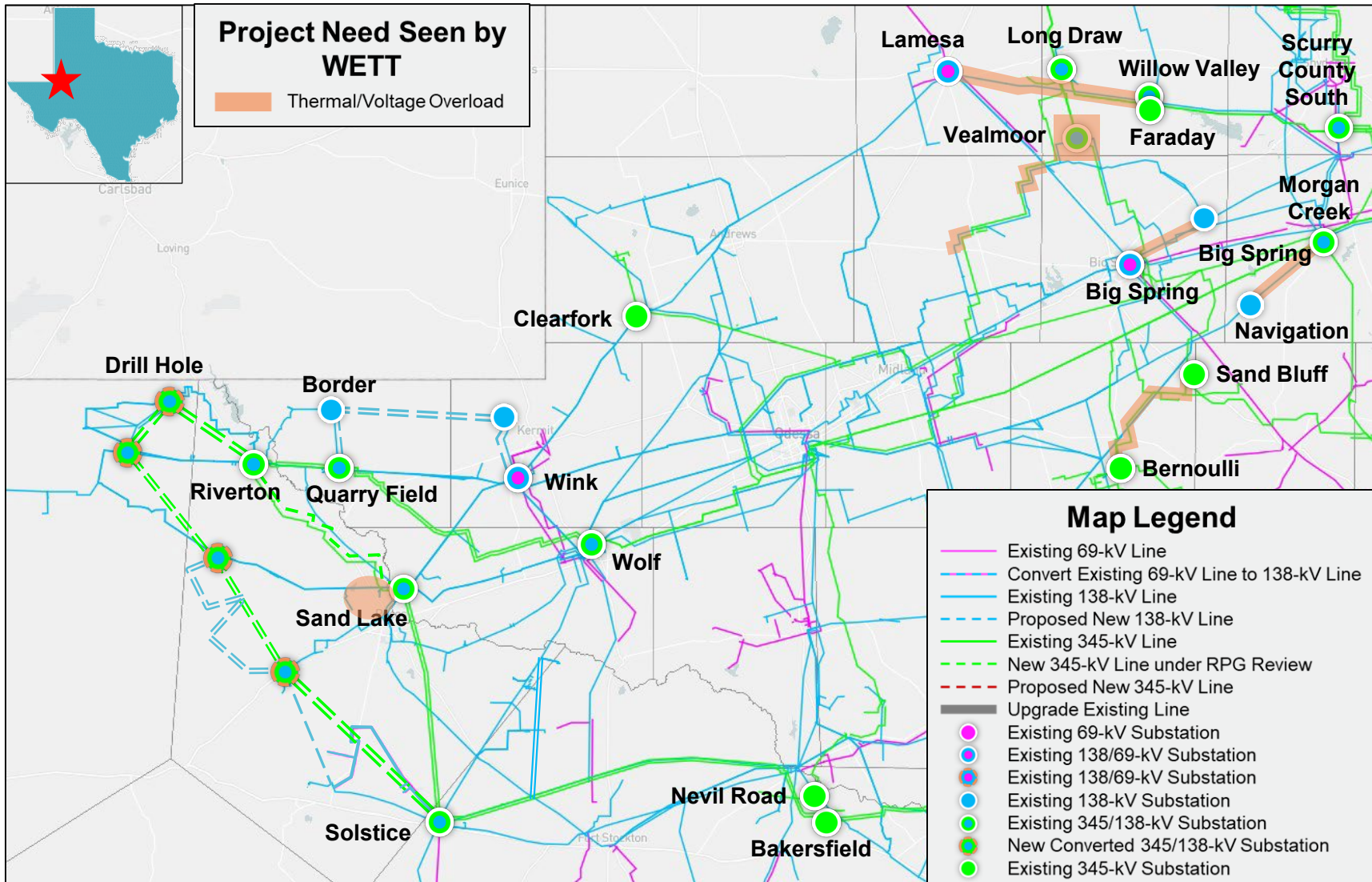
Map – Proposed Project by Oncor



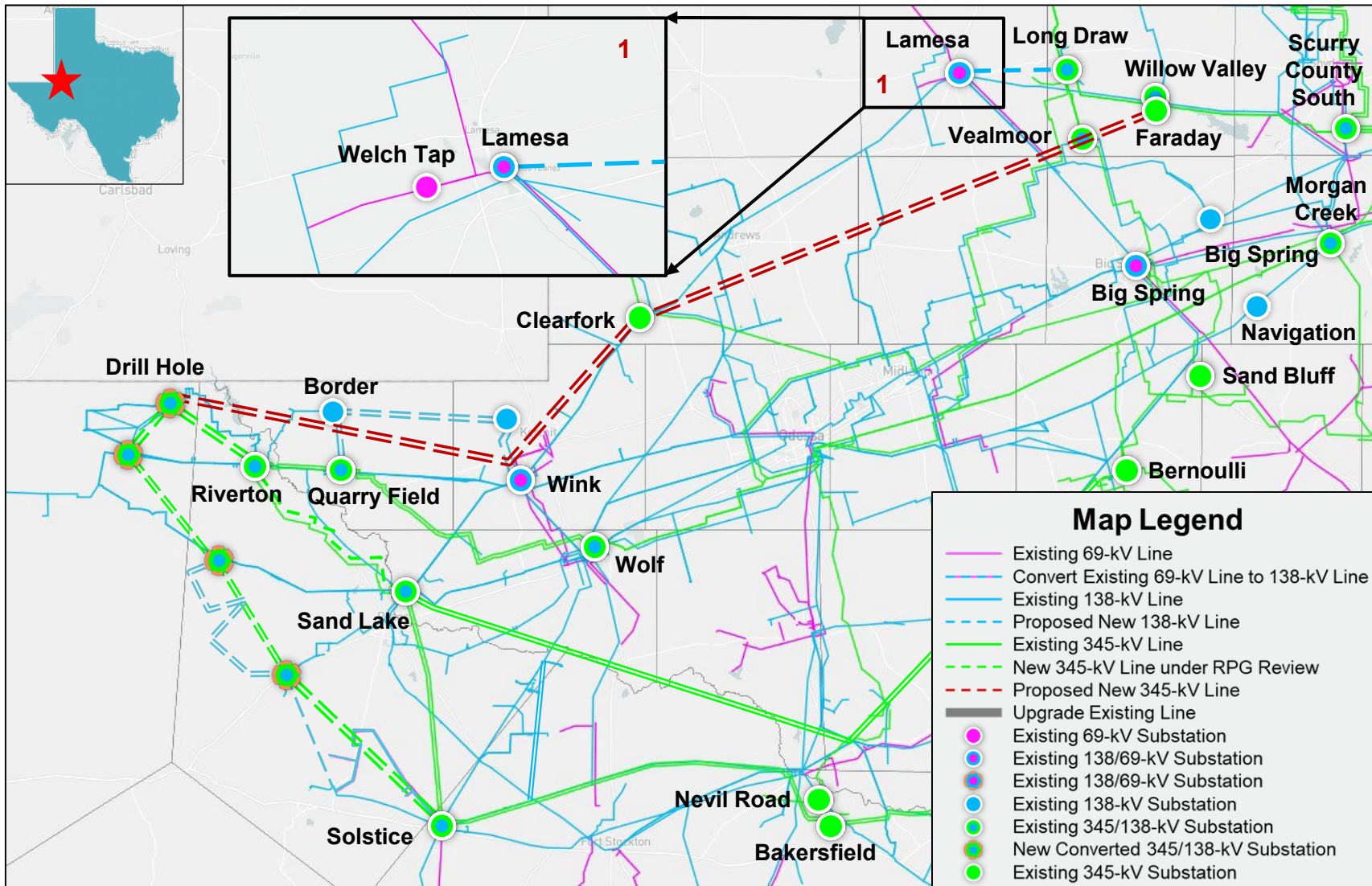
Proposed Project by Oncor

- Expand the existing Lamesa Switch, including a 13-breaker 138-kV breaker-and-a-half bus arrangement and a 9-breaker 345-kV breaker-and-a-half bus arrangement with two 600 MVA, 345/138-kV autotransformers. All terminal and associated equipment will meet or exceed 5000 A for 345-kV and 3200 A for 138-kV
- Construct a new Clearfork Switch – Lamesa Switch 345-kV double-circuit transmission line using a normal and emergency rating of at least 2988 MVA, which will require new right of way (ROW), approximately 77.0-mile
- Construct a new Lamesa Switch – Faraday Switch 345-kV double-circuit transmission line using a normal and emergency rating of at least 2988 MVA, which will require new ROW, approximately 38.0-mile
- Establish a new Pivot 138/69-kV Switch in the current Welch Tap location which will include
 - Relocating one of the existing Lamesa 138/69-kV autotransformers and three of the existing Lamesa 69-kV breakers to the new Pivot 138/69-kV Switch
 - Rebuilding and converting the existing Lamesa Switch – Welch Tap 69-kV transmission line to 138-kV operation using a normal and emergency rating of at least 614 MVA, 2.0-mile
- Rebuild the existing Clearfork 345-kV Switch by installing thirteen 5000 A, 345-kV circuit breakers in a breaker-and-a-half bus arrangement
- Install two 5000 A, 345-kV circuit breakers in a breaker-and-a-half bus arrangement at the planned Drill Hole 345-kV Switch
- Construct a new Clearfork Switch – Drill Hole Switch 345-kV double-circuit transmission line using a normal and emergency rating of at least 2988 MVA, which will require new ROW, approximately 105.0-mile
 - This line will be routed near the location of planned Border Switch for a future 345-kV interconnection to provide an injection point to support this high load growth area

Map – Project Need as Seen by WETT



Map – Proposed Project by WETT



Proposed Project by WETT

- Construct a new Faraday Switch – Clearfork Switch 345-kV double-circuit line using a normal and emergency rating of at least 2988 MVA, which will require new ROW, approximately 105.0-mile
- Expand the existing Faraday 345-kV substation to accommodate the new Faraday Switch - Clearfork Switch 345-kV double-circuit transmission line and loop in the existing Long Draw – Scurry 345-kV transmission line
- Construct a new Long Draw Switch – Lamesa Switch 138-kV transmission line using a normal and emergency rating of at least 614 MVA, which will require new ROW, approximately 22.0-mile
- Expansion of the existing Long Draw 138-kV substation and the existing Lamesa 138-kV substation to accommodate the new Long Draw – Lamesa 138-kV transmission line
- Rebuild the existing Clearfork 345-kV Switch by installing thirteen 5000 A, 345-kV circuit breakers in a breaker-and-a-half bus arrangement
- Install two 5000 A, 345-kV circuit breakers in a breaker-and-a-half bus arrangement at the planned Drill Hole 345-kV Switch
- Construct a new Clearfork Switch – Drill Hole Switch 345-kV double-circuit transmission line using a normal and emergency rating of at least 2988 MVA, which will require new ROW, approximately 105.0-mile
 - This line will be routed near the location of planned Border Switch for a future 345-kV interconnection to provide an injection point to support this high load growth area

Study Assumptions – Base Case

- Study Region
 - Far West Weather Zone, focusing on the transmission elements in the Andrews, Borden, Culberson, Dawson, Gaines, Loving, Reeves, and Winkler Counties in the Delaware Basin Area
- Steady-State Base Case
 - Final 2023 Regional Transmission Planning (RTP) 2029 summer peak case for West and Far West (WFW) Weather Zones, posted in Market Information System (MIS), will be updated to construct the summer peak load study base case
 - Case: 2023RTP_2029_SUM_WFW_12222023
 - Link: <https://mis.ercot.com/secure/data-products/grid/regional-planning>

Study Assumption - Transmission

- Based on the June 2024 Transmission Project and Information Tracking (TPIT) posted in July 2024 on ERCOT website, projects with in-service dates before December 2029 within the study area will be added to the study base case if not already modeled in the study base case
 - TPIT Link: <https://www.ercot.com/gridinfo/planning>
- All recently approved RPG projects in the study area will also be added to the study base case
- The Delaware Basin Stages 3 and 4 project (24RPG010) will be added as placeholder in the base case
- Local upgrades (L1, L3, and L5) identified in the 2024 Permian Basin Reliability Plan Study for the Delaware Basin area will be added as placeholder to the base case
- See Appendix A for the list of transmission projects to be added

Study Assumptions – Generation

- Based on the July 2024 Generator Interconnection Status (GIS) report posted on MIS in August 2024, new generation that met Planning Guide Section 6.9(1) condition with Commercial Operation Date (COD) before December 2029 in the study area at the time of the study, but not already modeled in the RTP cases, will be added to the study base case GIS
 - GIS Link: <https://www.ercot.com/gridinfo/resource>
 - See Appendix B for the list of generation projects to be added
- All generation will be dispatched consistent with the 2024 RTP methodology
- All recent retired/indefinitely mothballed units will be reviewed and opened (turned off), if not already reflected in the 2023 RTP final case

Study Assumptions – Load & Reserve

- Load in study area
 - Oil & Gas loads in the FW Weather Zone will be updated based loads forecasted in the 2023 S&P Global Permian Basin study
 - Large Loads with Signed Interconnection Agreement (IA) will also be added in the FW Weather Zone
- Reserve
 - Load outside of WFW Weather Zones may be adjusted to maintain the reserve consistent with the 2023 RTP

Contingencies and Criteria

- Contingencies
 - NERC TPL-001-5.1 and ERCOT Planning Criteria
 - Link: <https://www.ercot.com/mktrules/guides/planning/current>
 - P0 (System Intact)
 - P1, P2-1, P7 (N-1 condition)
 - P2-2, P2-3, P4, and P5 (345-kV only)
 - P3 (G-1+N-1: G-1 of Permian Basin all five units, Odessa Combined Cycle (CC) train 1)
 - P6-2 (X-1+N-1: X-1 of Riverton, Sand Lake, and Long Draw 345/138-kV transformers)
- Criteria
 - Monitor all 60-kV and above buses, transmission lines, and transformers in the study area (excluding generator step-up (GSU) transformers)
 - Thermal
 - Use Rate A for pre-contingency conditions
 - Use Rate B for post-contingency conditions
 - Voltage
 - Voltages exceeding their pre-contingency and post-contingency limits
 - Voltage deviations exceeding 8% on non-radial load busses

Study Procedure

- Need Analysis
 - Reliability analysis will be performed to identify the need to serve the projected area load using the study base case
- Project Evaluation
 - Project alternatives will be tested to satisfy the NERC and ERCOT reliability requirements
 - ERCOT may also perform the following studies
 - Planned Maintenance Outage Evaluation
 - Long-Term Load-Serving Capability Assessment
 - Congestion Analysis to ensure that the identified transmission upgrades do not result in new congestion within the study area
 - Cost Estimate and Feasibility Assessment will be requested from Transmission Service Providers (TSPs)
- Additional Analyses may be performed on the preferred option
 - 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)

Deliverables

- Tentative Timelines
 - Status updates at future RPG meetings
 - Final recommendation – Q4 2024

Thank you!



Stakeholder comments also welcomed through:

Tanzila.Ahmed@ercot.com

Robert.Golen@ercot.com

Appendix A1 – Transmission Projects Added

TPIT No	Project Name	Tier	Project ISD	County
6719	Twelvemile Substation Addition	4	5/30/2025	Pecos
72863	Delaware River 138-kV Switch	4	5/15/2024	Culberson
72935	Saragosa: Install 2nd Bay	4	9/30/2024	Reeves
73381	TNMP_JACKRABBIT_CUTIN_AC_4-5-2023	4	8/2/2023	Pecos
73452	TNMP_WINK_FISHHOOK_RECONDUCTOR_AC_4-5-2023	4	1/31/2024	Pecos
73476	TNMP_KERMIT_RECONDUCTOR	4	12/31/2024	Pecos
76151	Gas Pad Tap: Replace CTVT	4	4/30/2024	Reeves
76174	Origin 138-kV Interconnection	4	6/30/2025	Reeves
76212	Model Coachwhip Sub	4	5/31/2024	Ward
76232	Reconductor Mivida-Coachwhip-Fishhook 2045 ACCC	4	5/31/2026	Ward
76291	Upgraded Cedarvale–BoneSpringsTap–Fishhook	4	5/31/2026	Ward
76293	Upgraded Cedvale-MiDiva138KV	4	5/31/2026	Ward
76348	Reconductor Foxtail-PIGCreek-1926ACSS-138KV	4	5/31/2026	Pecos
76696	Construct a new Border – Shifting Sands 138-kV Line	2	12/15/2026	Loving
76719	Establish Bull Moose 138-kV Switch	4	12/15/2024	Loving
77146	Reconductor WNK-AAT-MDT-FSH	4	1/31/2024	Winkler
77320	Add CapBANK in COYANOSA	4	6/1/2026	Ward
78044	ROCK DRAW 345-kV Switch	3	12/30/2026	Ward
78046	TOYAH CREEK 345-kV Switch	3	12/30/2026	Ward

Appendix A1 (cont.)

TPIT No	Project Name	Tier	Project ISD	County
22RPG045	Yucca to Moss 138-kV Line Project	4	5/1/2024	Ward
23RPG013	Silverleaf and Cowpen 345/138-kV Stations Project	1	5/31/2025	Ward, Reeves
23RPG023	Pecos County Transmission Improvement Project	1	6/1/2027	Pecos
23RPG027	Bakersfield Dynamic Reactive Substation Upgrade	1	8/31/2026	Pecos
24RPG002	Rockhound 345/138-kV Switch and Grey Well Draw to Buffalo 2nd 138-kV Circuit Project	3	12/24/2024	Martin
23RPG034	West Texas 345-kV Infrastructure Rebuild Project	1	6/15/2028	Scurry, Mitchell, Howard, Glasscock, Martin, Midland, Ector
24RPG010	Delaware Basin Stages 3 and 4 Project	1	Summer 2027	Culberson, Loving, Reeves, Ward

Appendix A2 – Local Upgrades from 2024 Permian Basin Reliability Plan Study Added

Project No	Project Name
L1	Add Quarry Field – Border 138-kV second circuit
L1	Add Wink – Shifting Sands 138-kV second circuit
L1	Connect new load bus 900004 to Border and new load bus 900066 to Shifting Sands to form a 138-kV double-circuit loop
L1	Add Riverton – Border 138-kV second circuit
L3	Connect new load buses to 11610 and Faulkner and form a 138-kV double-circuit loop: 11610 – 900005 – 900111 – 900023 – 900012 – 900021 – 900038 – 38124
L5	Establish a new Culberson 345/138-kV substation at the existing Culberson Switch and install two new 345/138-kV transformers
L5	Establish a new ONC900005_TAP 345/138-kV substation and install two new 345/138-kV transformers
L5	Establish a new Faulkner 345/138-kV substation at Faulkner station and install two new 345/138-kV transformers
L5	Add a new Drill Hole – Culberson 345-kV double-circuit line
L5	Add a new Culberson – 900005Tap 345-kV double-circuit line
L5	Add a new 900005Tap – Faulkner 345-kV double-circuit line
L5	Add a new Solstice – Faulkner 345-kV double-circuit line

Appendix B1 – New Generation Added

GINR	Project Name	Fuel	Projected COD	Capacity (~MW)	County
19INR0203	Angelo Solar	SOL	8/1/2024	195.4	Tom Green
21INR0424	Tierra Bonita Solar	SOL	9/26/2024	306.9	Pecos
22INR0502	Shamrock Wind SLF	WIN	4/19/2024	223.9	Crockett
23INR0219	Dogfish BESS	OTH	4/16/2025	77.4	Pecos
23INR0372	Cross Trails Storage	OTH	4/25/2025	58.3	Scurry
23INR0387	Pioneer DJ Wind	WIN	9/15/2024	140.3	Midland
23INR0401	Headcamp BESS	OTH	6/16/2025	152.9	Pecos
23INR0418	Angelo Storage	OTH	8/10/2024	103.0	Tom Green
23INR0470	BoCo BESS	OTH	7/17/2024	155.5	Borden
24INR0273	Al Pastor BESS	OTH	8/30/2024	103.1	Dawson
24INR0421	Swift Air Solar	SOL	2/12/2025	148.8	Ector
24INR0578	Panther Creek 1 Repower	WIN	10/30/2024	11.0	Glasscock
24INR0582	Panther Creek 2 Repower	WIN	10/30/2024	8.0	Glasscock
24INR0627	Champion Wind Repower	WIN	5/9/2025	0.3	Nolan
25INR0400	Maldives Solar (Alternate POI)	SOL	7/1/2027	210.0	Scurry