

WEST TEXAS UPDATE

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Presentation to ERCOT Regional Planning Group (RPG)
Austin, TX

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WE DELIVER.



OUTLINE

- ERCOT West Texas Sensitivity (WTS) Study - 22 projects in the Oncor footprint
- Oncor Projects Completed & Underway
 - 2011-2013
 - 2014
 - 2015+
- New RPG Projects Under Development
 - Culberson – Mason 138 kV Line
 - 69 kV Garden City Area
 - Texaco Mabee – Paul Davis 138 kV Line
- Oncor West Texas Dynamic Assessment Preview

ERCOT/ONCOR WTS PROJECT SET

- ERCOT West Texas Sensitivity (WTS) Study final report was posted on September 16, 2013 and identified 22 projects in the Oncor footprint (total 65 projects all TSPs)
- 9 ERCOT projects extend 345 kV from Midland/Odessa to Andrews County and provide additional 345/138 kV autotransformer capacity for 138 kV system
- The remaining 13 ERCOT projects in Oncor's footprint address issues earlier identified by Oncor and those projects are already completed or under development
- ERCOT and Oncor used different base cases and study assumptions for WTS
 - Studies and differences have been reconciled

2011-2012 Actions & Improvements Completed

Rebuilt the Holt – Goldsmith 69 kV Line as a double-circuit 138 & 69 kV line and converted Goldsmith to 138 kV **Jun 2011**

Inspected Odessa North 138/69 kV Autotransformer and Critical Contingency Lines **Aug 2012**

Installed Online Temperature Monitoring and Auxiliary Oil Cooling on the Odessa North 138/69 kV Autotransformer Rating to 99 MVA (Nameplate 75 MVA) **Sep 2012**

Implemented Changes in System Configuration to Limit Flow through the Odessa North Auto **Sep 2012**

Upgraded Terminal Equipment on Moss – Westover 138 kV Line **Sep 2012**

Upgraded Terminal Equipment Odessa North – Holt 69 kV Line **Sep 2012**

Upgraded Terminal Equipment Odessa North – Cowden North 69 kV Line **Sep 2012**

Increased Emergency Rating of Switches at Judkins on Permian Basin – Odessa EHV 138 kV Line **Sep 2012**

Converted Goldsmith Gulf to 138 kV (Approx 6 MW of load when converted) **Oct 2012**

Replaced Odessa North 138 kV/69 kV Autotransformer with 100 MVA (Rated 125 MVA Emergency) **Nov 2012**

Increased rating (operating temp) of Moss – Odessa EHV 138 kV Line **Dec 2012**

2013 Actions & Improvements Completed

Created New 138 kV circuit from Moss to Goldsmith Junction to Holt by:

Rebuilt Goldsmith – Goldsmith South 69 kV Line as Double-Circuit 138 & 69 kV Line and
Converted Goldsmith South to 138 kV Approx 31 MW **Mar 2013**

Completed Holt – Goldsmith 138 kV Connection **Jun 2013**

Connected Goldsmith Junction to Moss – Ector County North 138 kV Line **Jun 2013**

Rebuilt Goldsmith South – Goldsmith Junction 69 kV Line as a Double-Circuit 138 & 69 kV
Line 138 kV in June 2013 and 69 kV in **Nov 13**

Increased rating (operating temp) of Moss – Holt 138 kV Line to 100 C
(897 A. to 990 A.) **May 2013**

Installed Conductor Monitored Ratings on Five Lines **Jun 2013**

Upgraded terminal equipment of Wink on 138 kV line to Permian Basin **Jun 2013**

Upgraded Fullerton – Exxon Fullerton 69 kV Line **Jul 2013**

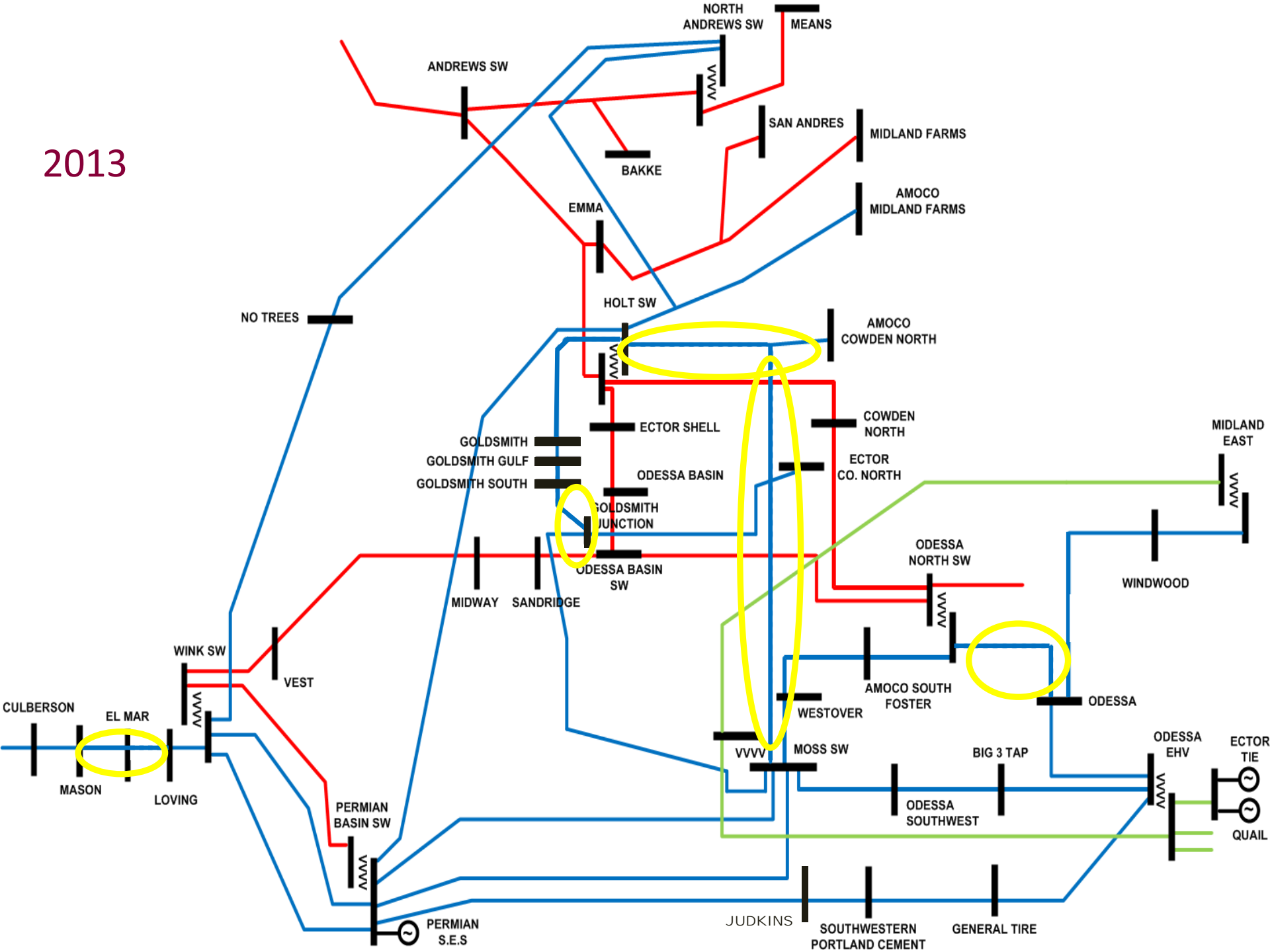
Installed 345/138 kV Autotransformer at Willow Valley **Sep 2013**

Reconducted Odessa – Odessa North 138 kV Line with ACCC Conductor **Oct 2013**

Constructed Barber Lake 138 kV Switching Station **Dec 2013**

Constructed Polecat Creek 138 kV Switching Station **Dec 2013**

2013



2014 Actions & Improvements Underway

Reconducted Moss – Holt 138 kV Line with ACSS/TW Conductor **Jan 2014**

Install Permian Basin SPS **Feb 2014**

Upgrade Terminal Equip on Wink (Oncor) – Wink (TNMP) 69 kV Line **March 2014**

Add 345 kV Breakers at Moss Switching Station **May 2014**

Convert Midland Farms Substation to 138 kV **May 2014**

Establish Odessa North 138 kV Switching Station **May 2014**

Install 138 kV Capacitors at Mason **May 2014**

Upgrade Odessa EHV – Big 3 Tap – Odessa Southwest – Moss 138 kV Line **May 2014**

* Install Morgan Creek SPS #51 **May 2014**

*** Denotes New Project**

* Install Shunt Reactors 75 Mvar at Willow Valley **May 2014**

Convert Bakke Substation to 138 kV Operation **June 2014**

Install 69 kV Capacitors at Spraberry and Tex Harvey **Jun 2014**

Rebuild Odessa North – Goldsmith Junction 69 kV Line as a Double-Circuit 138 & 69 kV Line (Disconnect from Moss – Ector County North 138 kV Line) **Jun 2014**

2014 Actions & Improvements Underway

Rebuild Wink – Mason 138 kV Line (25-miles up to El Mar complete) Dec 2014

Add Lamesa – Buzzard Draw Second 138 kV Circuit Dec 2014

Rebuild Stanton East – Buffalo (SU) – Midland East 138 kV Line Dec 2014 and Retire Stanton East SPS Dec 2014

Rebuild Wink – Permian Basin 138 kV Line Dec 2014

Reconductor Odessa – Odessa EHV 138 kV Line Dec 2014

Upgrade Moss – Westover 138 kV Line Dec 2014

Install 69 kV Capacitors at Midway Dec 2014

* Install 138 kV Capacitors at Mockingbird, North Andrews and Odessa Dec 2014

* Convert Aruba POI and Associated 69 kV Line to 138 kV Operation Dec 2014

* Construct Buzzard Draw Switching Station Dec 2014

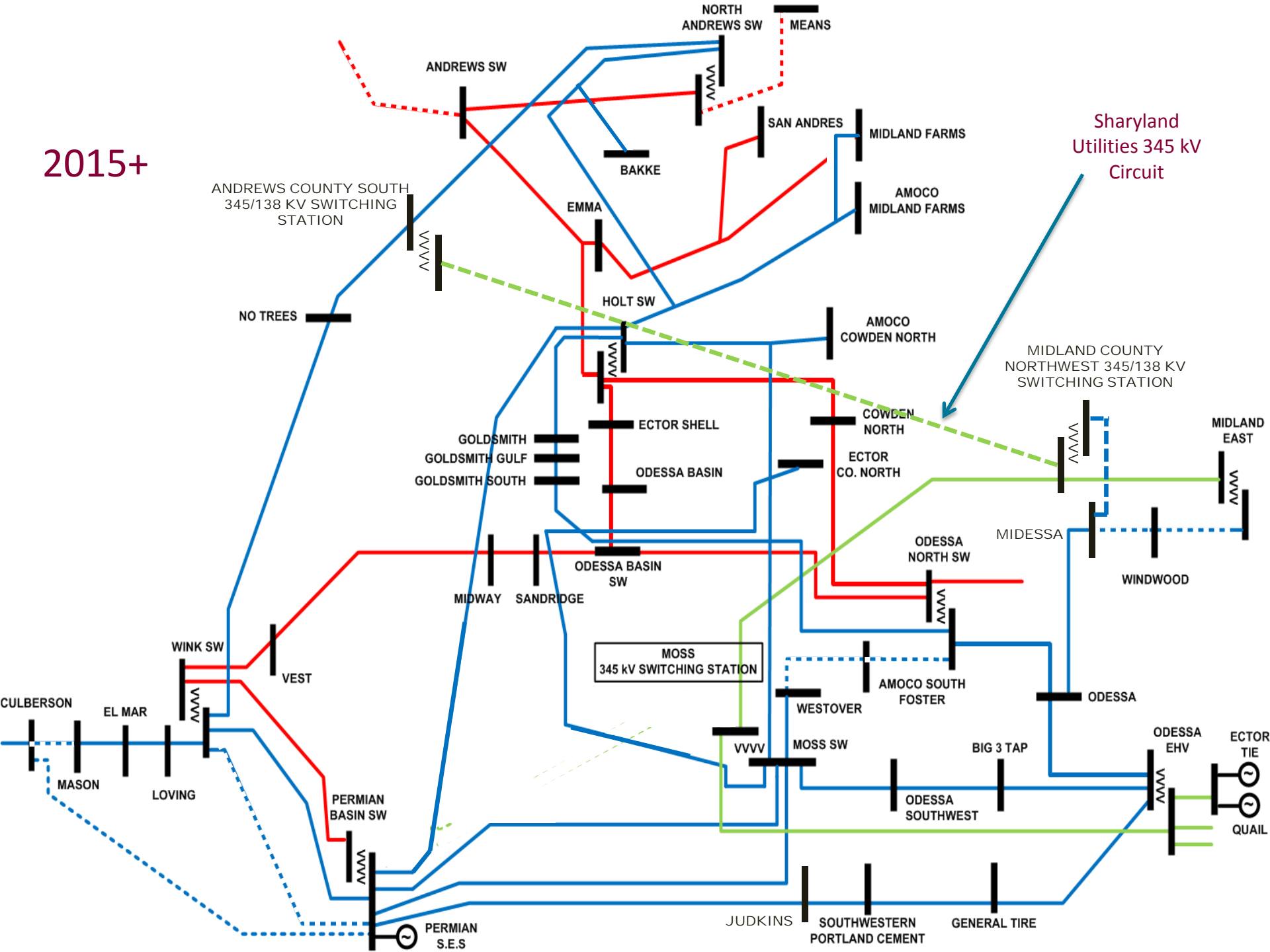
*** Denotes New Project**

2015 Improvements

*** Denotes New Project**

- * Construct Dermott – Ennis Creek 138 kV Line Jan 2015 to May 2015 (under review)
- Construct New Midland County Northwest 345/138 kV Switching Station Jan 2015
- Replace North Andrews 138/69 kV Autotransformers May 2015
- Replace Morgan Creek 138/69 kV Autotransformer May 2015
- Upgrade North Andrews – Means 69 kV Line May 2015
- Upgrade Odessa North – Amoco South Foster – Westover 138 kV Line May 2015
- Upgrade Big Spring Switch – Big Spring West 138 kV Lines May 2015
- Construct New Andrews County South 138 kV Switching Station and 345/138 kV Auto May 2015
- * Upgrade McDonald Road 138 KV Switching Station May 2015
- * Install McDonald Road Sw. Sta. – Garden City East 138 kV Line on new double-circuit structures and operate both 69 kV and 138 kV May 2015
- * Rebuild Lamesa 69 kV Switching Station as Ring Bus May 2015
- * Upgrade Spraberry 138 KV Switching Station Dec 2015
- * Install Spraberry Sw. Sta. – Garden City East 138 kV Line on new double-circuit structures and operate both 69 kV and 138 kV completing new McDonald Road – Spraberry 138 kV Line Dec 2015
- Upgrade Andrews Switch – Frankel City 69 kV Line Dec 2015
- Upgrade Permian Basin – Ward Gulf Tap – Wink 138 kV Lines Dec 2015
- Upgrade Midland East – Windwood – Midessa 138 kV Line Dec 2015

2015+



New RPG Projects Under Development

- Culberson – Mason 138 kV Line
Completion of the Wink – Culberson 138 kV Rebuild
- Upgrading 69 kV facilities in Garden City East Area
- Connect radial lines at Texaco Mabee and Paul Davis

Culberson – Mason 138 kV Line

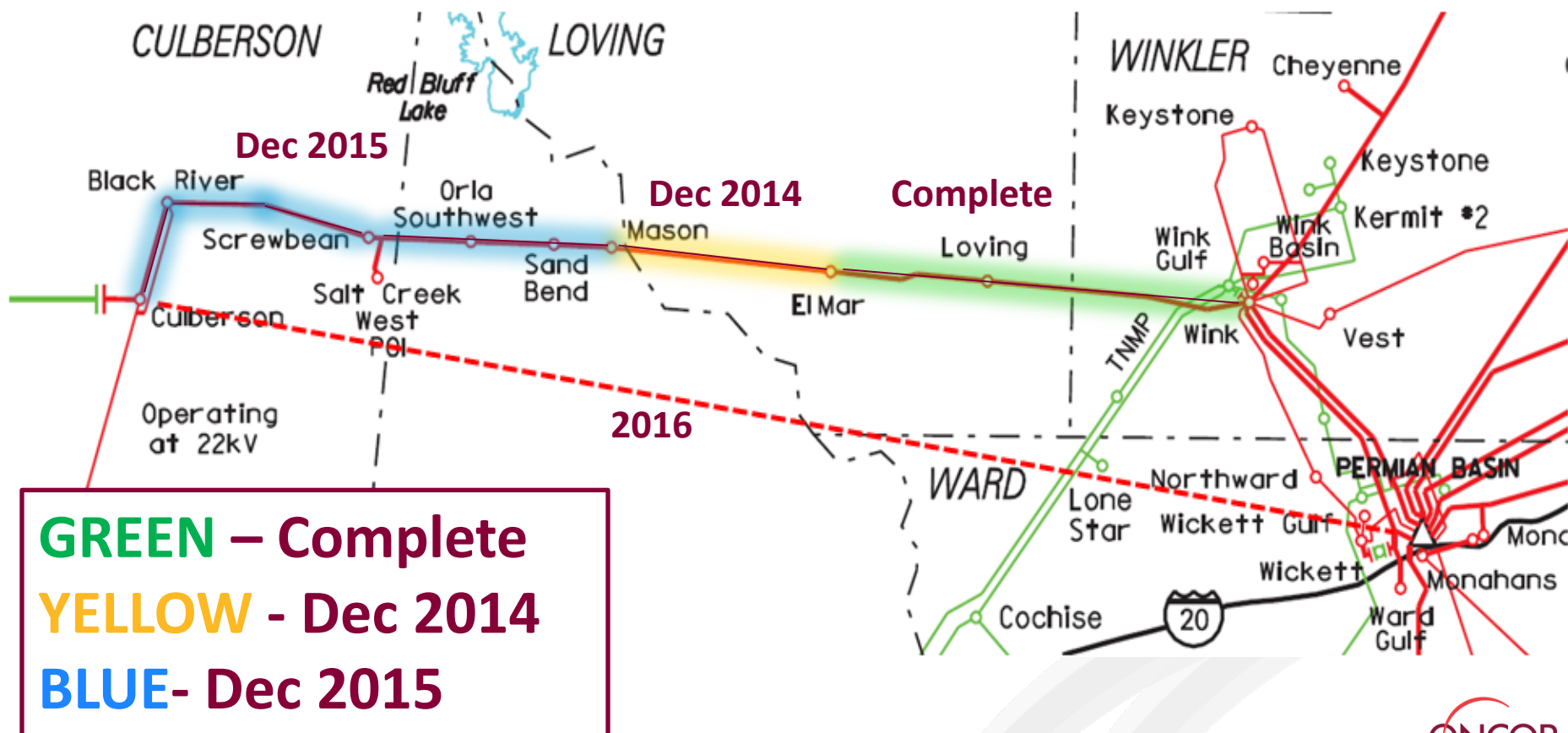
Upgrades;

Wink – Mason 138 kV Line **Dec 2014**

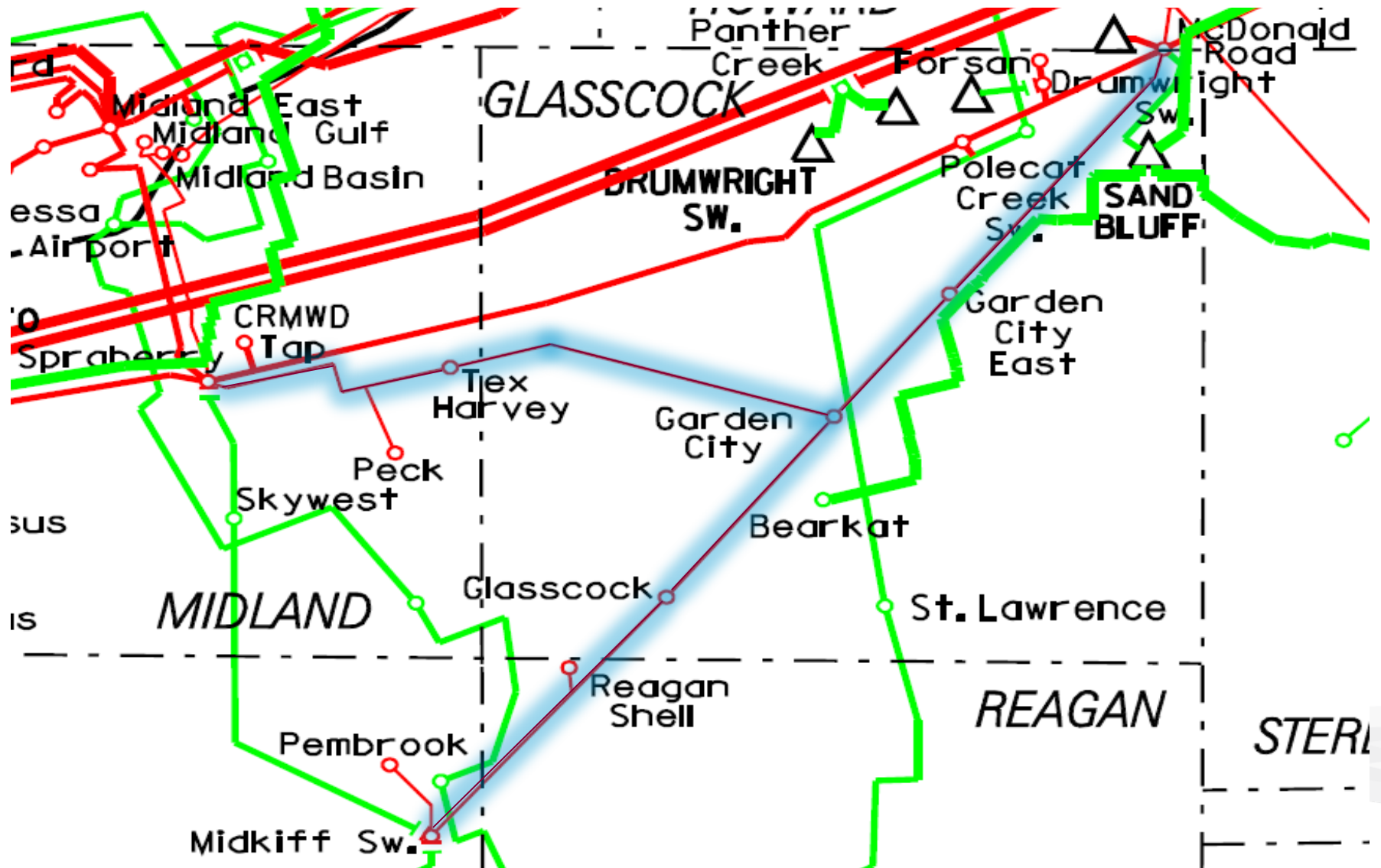
Mason – Screwbean 138 kV Line **May 2015**

Screwbean – Culberson 138 kV Line **Dec 2015**

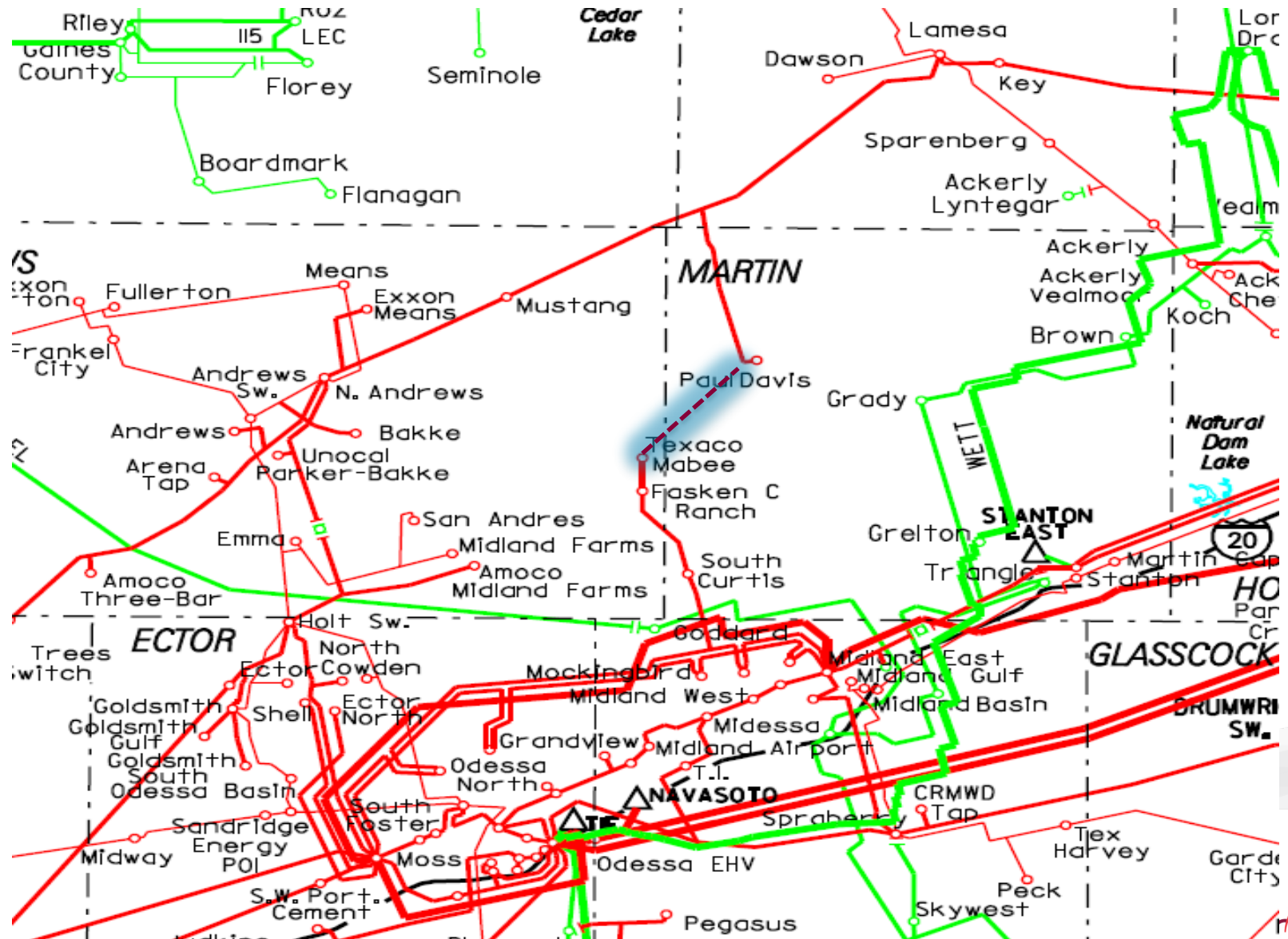
Construct New Permian Basin – Culberson 138 kV Line **Dec 2016**



69 kV Garden City Area



Texaco Mabee – Paul Davis 138 kV Line



West Texas Dynamic Assessment Preview

- Complex dynamic analysis focused on 2016 and 2017 peak and minimum load, and high wind-light load scenarios
- Sensitivity studies considers availability of Permian Basin generation, static VAR compensators (SVCs), and continuing load growth
- Preliminary results indicate that ERCOT WTS (West Texas Sensitivity) projects provide significant system stability benefits:
 - North 345 kV lines that will run between Oncor's Midland County NW Station and the Andrews County South Station improves voltage stability of the Andrews 138 kV system by extending 345 kV sources closer to the Andrews/Martin/Borden County load & generation
 - Preliminary results suggest that 345 kV line from Odessa EHV thru Moss to Permian Basin will provides voltage stability improvements if Permian Basin generation is not running
- Oncor has met with representatives from several companies to assist in the modeling of load responses to system events/faults
- Final study will be complete by June 2014