

# **The Joint PUC-RRC Electric/Gas Reliability Workshop For An Energy Assurance Plan for Texas**

## **Midstream – A Quick Overview Kerry Puckett, Vice President Operations**

**Tuesday April 17, 2012**

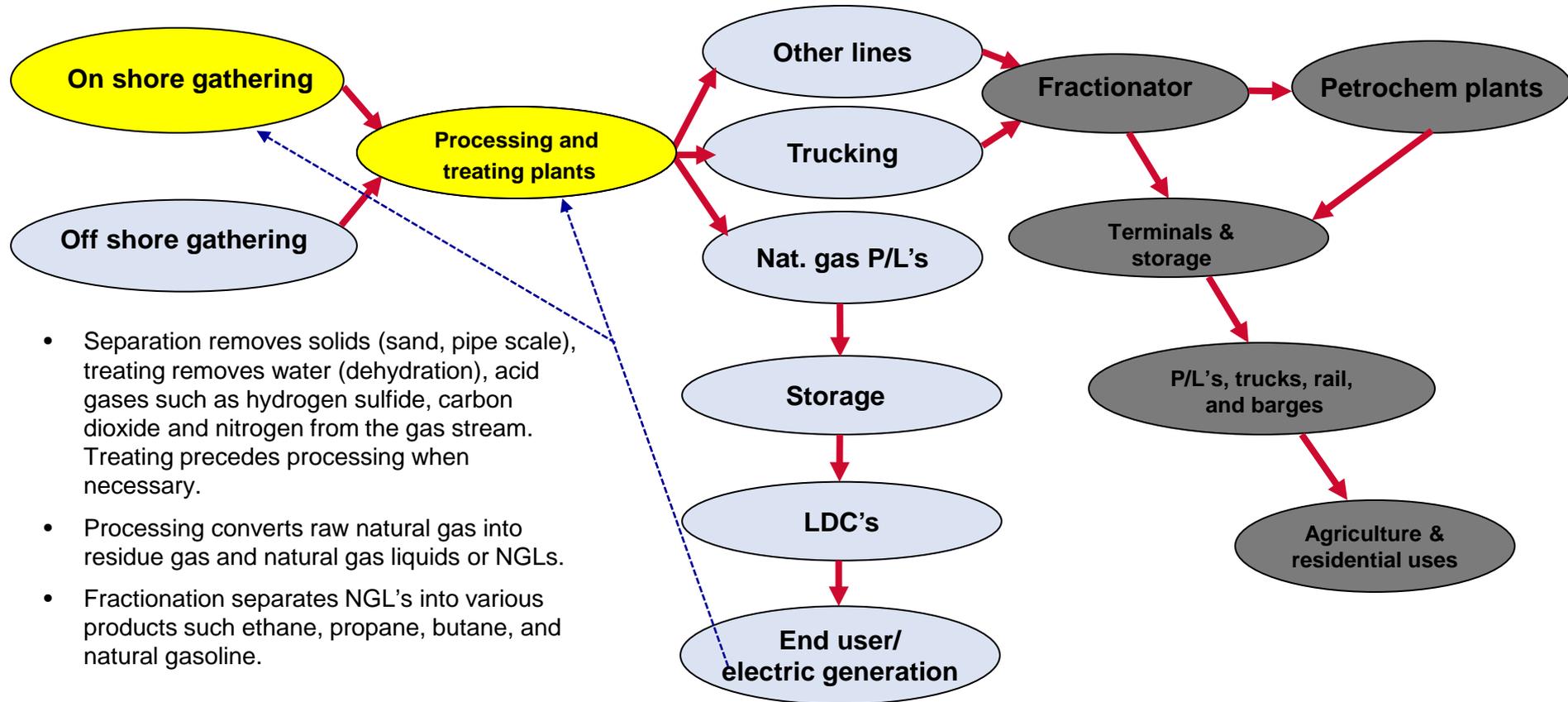
- **The Midstream Value Chain**
- **Gathering & Processing Overview**
- **Some Key Points**
- **Closing Thoughts**



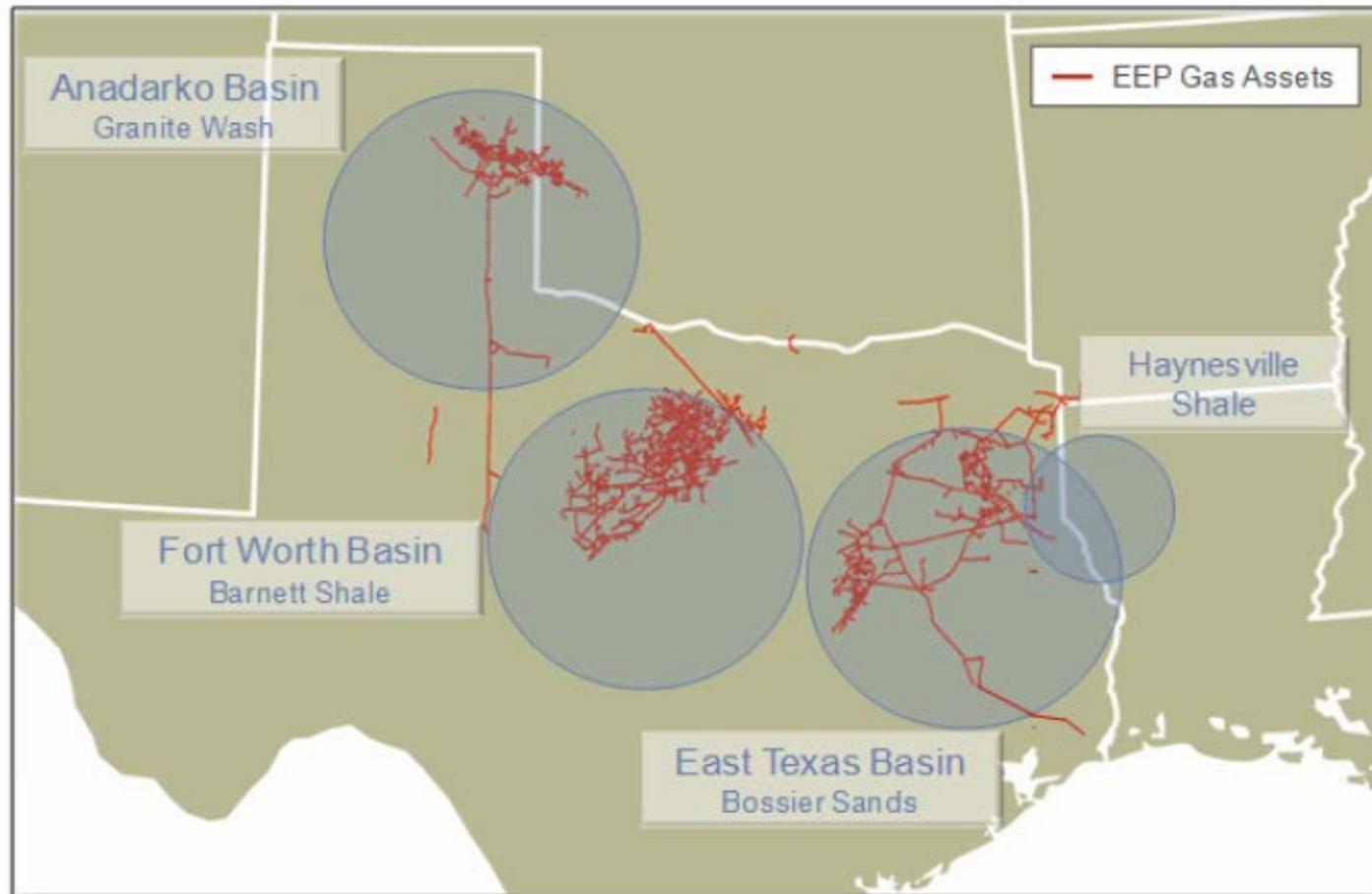
# Midstream – Where we are in the value chain

← Upstream (production)

← Midstream →      ← Downstream →



- Separation removes solids (sand, pipe scale), treating removes water (dehydration), acid gases such as hydrogen sulfide, carbon dioxide and nitrogen from the gas stream. Treating precedes processing when necessary.
- Processing converts raw natural gas into residue gas and natural gas liquids or NGLs.
- Fractionation separates NGL's into various products such as ethane, propane, butane, and natural gasoline.



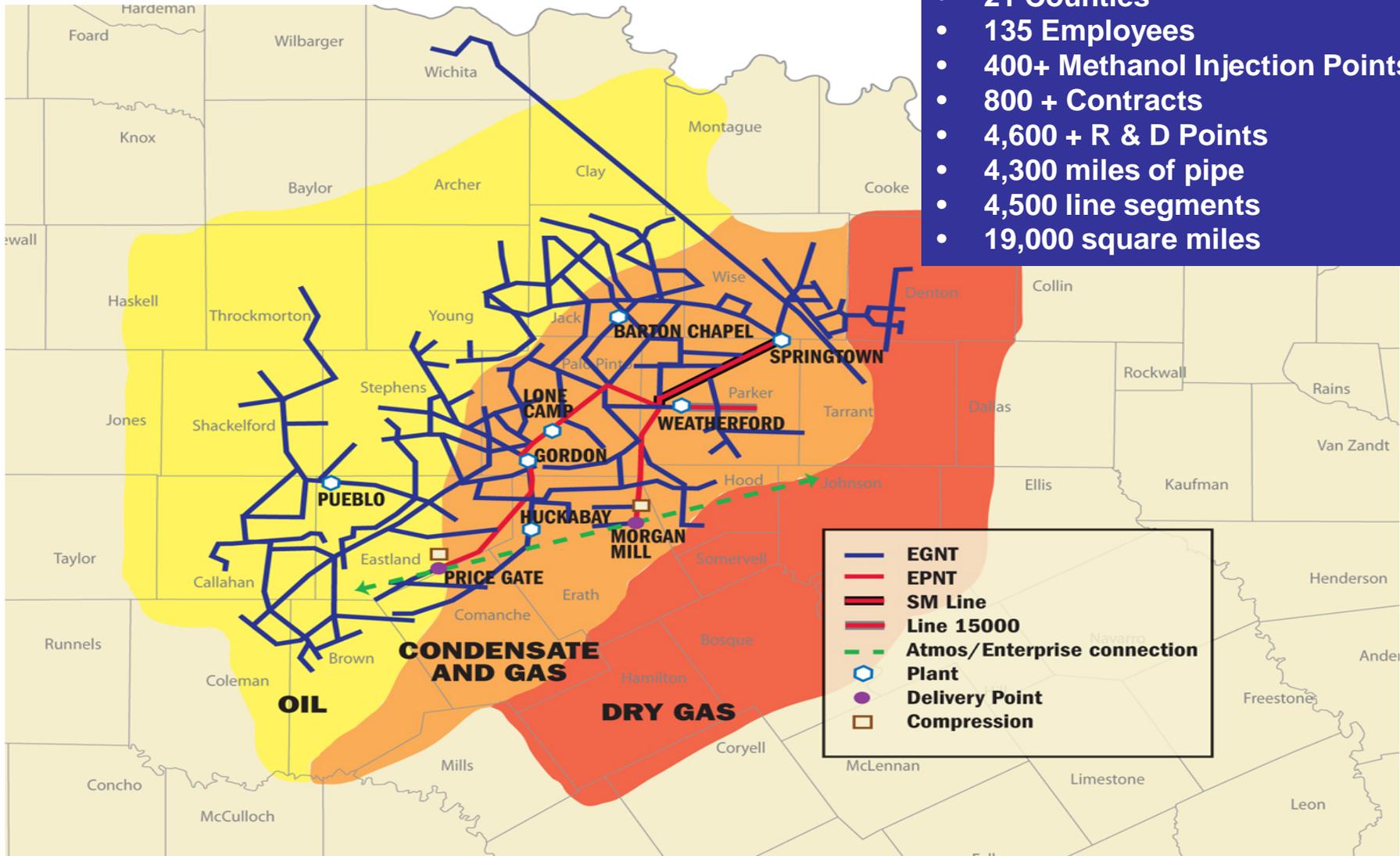
- **12,500 miles of transmission & gathering pipe**
- **2.7 Bcf/d of throughput**
- **750,000 HP of Compression**
- **85,000 bbls/d of NGLs**
- **Nine active treating plants**
- **24 active processing plants**



- **Step 1 – Gather the gas at the wellhead or CDP (wet or full well stream)**
- **Step 2 – Possible Field Compression requirements**
- **Step 3 - Inlet Separation at the Plant to separate free liquids from the gas stream**
- **Step 4 – Gas Treating to remove impurities (if required)**
- **Step 5 – Gas Processing to extract the NGL's**
- **Step 6 – Recompression of the processed natural gas to Market Pressure and electric driven pumps to pump the NGL's to Markets.**

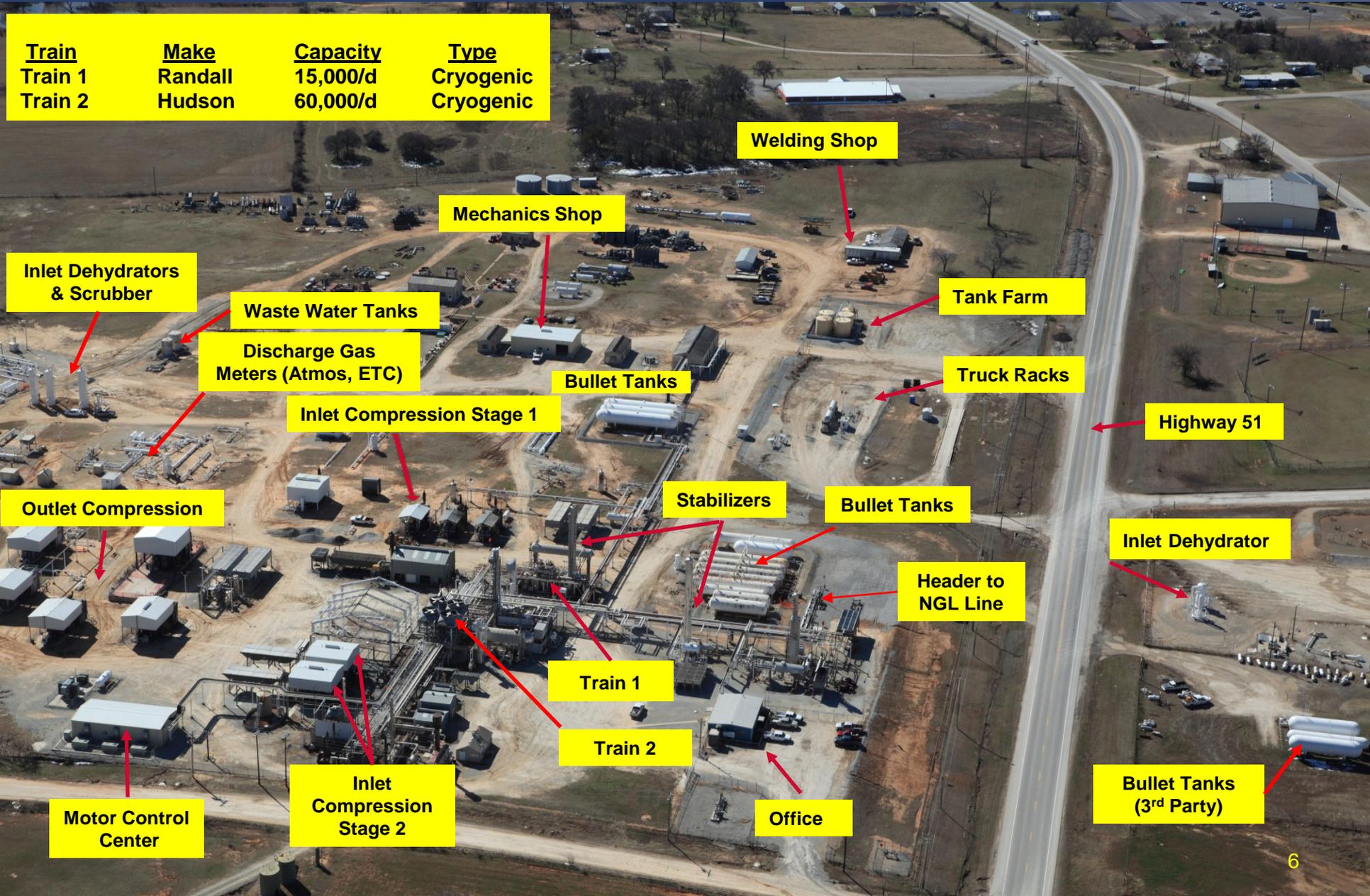
# North Texas Gathering

- 21 Counties
- 135 Employees
- 400+ Methanol Injection Points
- 800 + Contracts
- 4,600 + R & D Points
- 4,300 miles of pipe
- 4,500 line segments
- 19,000 square miles

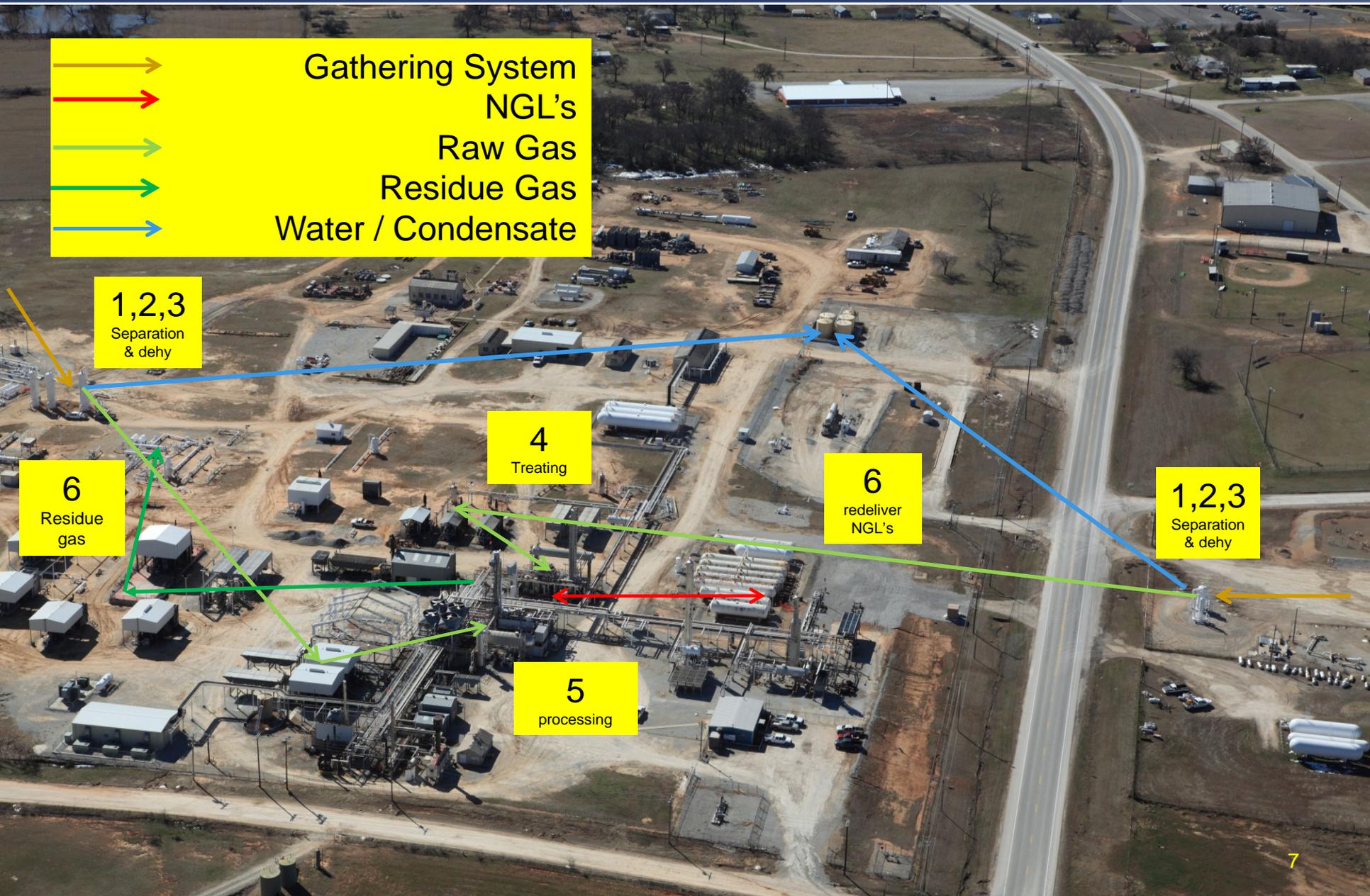


# The Springtown Plant

<u>Train</u>	<u>Make</u>	<u>Capacity</u>	<u>Type</u>
Train 1	Randall	15,000/d	Cryogenic
Train 2	Hudson	60,000/d	Cryogenic



# Processing at Springtown



- **Gathering systems can be large and diverse**
  - Not all gathering systems are regulated as gas utilities
  - Production characteristics and gas quality often vary within systems
  - Producer needs can vary across connected systems. High pressure, mid pressure and low pressure gathering
  - It's not uncommon to have sour gas, rich gas and lean gas all within the same geographical operation
- **Gathering system gas is often not “marketable”**
  - Rich gas – the btu content is too high
  - Nitrogen – can make the btu content too low
  - Sour Gas (H<sub>2</sub>S) – the gas is toxic
  - Water – allow hydrates or freeze offs to occur in the pipeline
  - Impurities (CO<sub>2</sub>) – can cause internal corrosion to the pipeline
  - The gathering company functions to take un-marketable gas and make it marketable
- **One size does not fit all – flexibility is a must**
  - System characteristics will change over time as production matures
  - G&P contractual commitments vary – they are not uniform, they are based on producer needs
  - Shale production has been a game changer in system design and operations

- **Plants remove the impurities to make the gas “marketable”**
- **Plants are:**
  - **Highly automated but mostly still manned 24/7/365**
  - **Extremely complex operations with various axillary systems**
  - **Operate most efficiently from about 40° F to 90° F**
  - **Heavily Dependent on electricity**
  - **EEP G&P electric cost is approximately \$15MM annually**
- **Reliable Electricity is very important for Gathering and Processing:**
  - **SCADA –Supervisory Control and Data Acquisition**
  - **Compression, plant control (DCS) and motor control**
  - **Telecommunications & other control facilities**
  - **Upstream and downstream operations**
  - **Safety**

- **It's a cycle.....freezing temperatures in the South cause:**
  - **Some wellhead supply to freeze off**
  - **Some gathering lines to hydrate**
  - **Some mechanical freeze offs to occur to equipment**
  - **Some electric lines fail**
  - **Driving hazards due to ice/snow and infrastructure support**
- **Normally anything short of a complete outage can be managed. A complete outage stops flow and when flow stops the problems compound for all parties, including the power generators**
- **Upstream, Midstream, and Downstream companies have a long standing relationship in maximizing production during difficult times through effective communication and understanding**
- **Employee and Public safety always trumps production....always**

- **The gas industry and the electric industry are dependent on each other**
- **Technology has increased the gas industries dependence on electricity**
- **We need:**
  - **Efficient communications and planning during possible electrical outages. The safety risk during unplanned shutdowns dwarfs planned shutdowns**
  - **Better understanding of critical facilities when outages are planned and the impact to all so the risk can be mitigated**
  - **An alternative to wellhead supply during critical times, like storage**

