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Pipelines

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Arizona Corporation Commission Natural Gas Storage

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D E P E N D A B L E N A T U R A L G A S

El Paso Storage Background

- El Paso Corporation is the largest natural gas pipeline company in the United States with 43,000 miles of pipeline from coast to coast
- El Paso Corporation operates 10 reservoir storage facilities with a combined 3.7 Bcf/d of deliverability and 199 Bcf of working capacity
- El Paso has a history and culture dedicated to the safe and efficient operation and development of natural gas storage facilities
- The design, construction and operation of El Paso's storage facilities are regulated by the FERC, DOT, and numerous state regulatory agencies

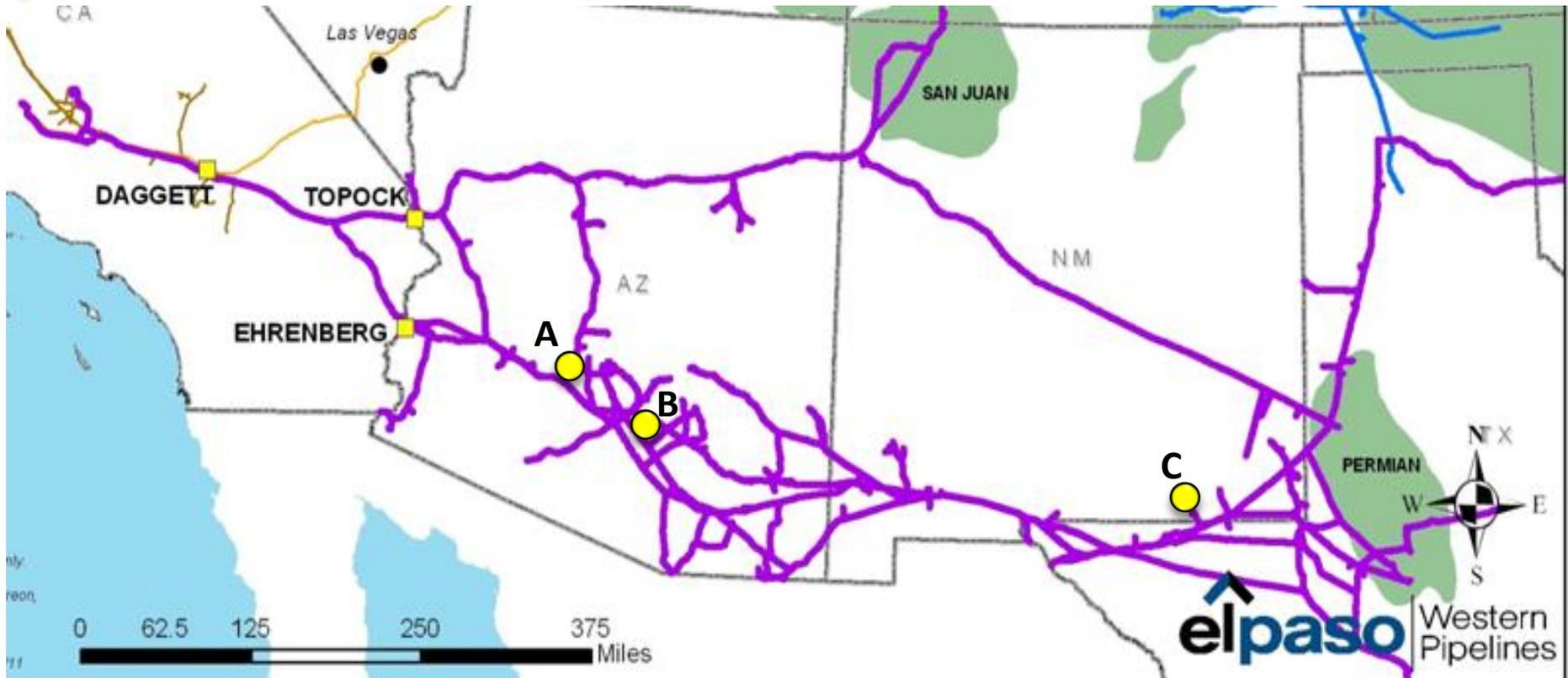
EPNG has the Assets in Arizona to Optimize Storage Service and Value

- EPNG is the largest transporter of natural gas in the state Arizona
- EPNG operates 4,887 miles of pipeline with 350 meters in Arizona
- Gas storage integrated with EPNG's pipeline system will allow rapid dispatch of injections and withdrawals for storage customers

Advantages of Market Area Storage

- Market area storage is typically used by gas LDCs, power plants, marketers and pipelines for peak day and hour coverage and price management
- Using supplies stored near the market is more cost effective than adding pipelines and compression to move gas from remote areas
- Proximity to market is important for reliability
 - Gas travels at 15 to 30 miles per hour in a pipeline
 - Allows for rapid dispatch time to the market

El Paso Natural Gas – Storage Initiatives



- A: Copper Eagle
- B: Arizona Gas Storage
- C: Washington Ranch

Proposed Copper Eagle Storage

A domal salt cavern storage project

● Scope

- 3 caverns providing 9,600,000 Dth of working capacity, and 400,000 Dth per day of deliverability
- 2004 estimated cost of ~ \$ 270 million
- Requires 35 miles of 36 " pipe to connect to EPNG

● Benefits

- Location is within core Arizona market area
- Excellent salt dome allows for expansion

● Very Substantial Challenges

- Location has legal restrictions (Arizona HB 2134) and strong NIMBY opponents
- No confirmed disposal methodology for 90 MM barrels of saturated brine
- Solution mining water permits have expired
- 35 mile pipeline is contentious with developers
- Opposition from Luke Air Force Base

Proposed Washington Ranch Enhancement

Expansion of an existing facility utilizing a depleted reservoir

● Scope

- Provides an additional 50,000 to 100,000 Dth per day of withdrawal, above current 250,000 Dth per day level; incremental 60,000 Dth per day of injection.
- Add 4 to 8 new wells to expand injection and withdrawal capabilities. Upgrade processing, gathering and automation, add 4,000 hp of compression, and 3,000,000 Dth of additional base gas
- 2010 estimated cost of ~ \$ 75 to \$105 million

● Benefits

- An established and known geologic storage facility
- 18 month in-service

● Challenges

- Expensive on a per unit of deliverability basis
- Location is remote to Phoenix and Tucson market area

Proposed Arizona Gas Storage Project

A bedded salt cavern storage project

● Scope

- 4 caverns providing 2,000,000 to 4,000,000 Dth of working capacity and 400,000 Dth per day of deliverability
- Estimated development cost 2008 ~ \$320 million

● Benefits

- Provides market area storage to major metropolitan areas of Arizona
- Salt cavern storage provides quick market deliverability
- Proven geologic project with adequate salt bed allowing for expansion
- Upper Picacho salt bed suitable for compressed air energy storage development
- Easily interconnected to EPNG and TW

● Challenges

- Brine disposal method needs to be clarified and approved by agencies
- Cost of brine disposal
- Securing a long term source of water

Arizona Gas Storage – What has EPNG Done?

- Purchased 238 Acres in Section 21, T7S, R8E, Pinal County AZ
- Drilled AGS #1-21 deep stratigraphic test well to collect geological data and evaluate deep brine disposal
- Drilled EPNG State #1-11 & #1-20 shallow stratigraphic tests to collect salt core and geological data
- Conducted Rock mechanics testing data on salt cores from wells (AGS #1-21 and State #1-20)
- Shot 25 miles of 2D Seismic and conducted geophysical interpretation
- Conducted detailed geological & environmental investigations
- Worked with leading salt cavern design and construction firms to prepare storage cavern designs, solution mining plans, and cost estimates
- Developed solar evaporation pond design and cost estimates
- Developed compression & dehydration plant design and cost estimates
- Designed gas transmission line design and cost estimate

What is required to Restart Arizona Gas Storage?

- Receive market support
- Update geo-technical and engineering designs
 - Determine optimal brine disposal methodology and associated costs
 - Finalize storage cavern and solution mining design and cost estimate
 - Finalize gas compression & dehydration facility design and cost estimate
 - Finalize gas transmission line route and cost estimate
 - Update environmental work in preparation for FERC filings
- Secure a supplemental source of water for solution mining
- Hold open season and sign storage agreements with prospective customers
- Prepare and file a FERC certificate application
- Receive FERC certificate approval

Timeline to Restart Arizona Gas Storage

- 1Q 2012 – Restart commercial discussions
- 2Q 2012 – Open season for storage contract commitments
- 3Q 2012 – NEPA process start
- 1Q 2013 – FERC filing
- 1Q 2014 – Construction Start
- 2015-2020 - Solution mine storage caverns
 - Cavern 1 - 2Q 2016 (100 Mdth/d deliverability & 500 Mdth capacity)
 - Cavern 2 - 3Q 2017 (200 Mdth/d deliverability & 1,000 Mdth capacity)
 - Cavern 3 - 1Q 2019 (300 Mdth/d deliverability & 1,500 Mdth capacity)
 - Cavern 4 – 2Q 2020 (400 Mdth/d deliverability & 2,000 Mdth capacity)