

# VERDE PROJECT

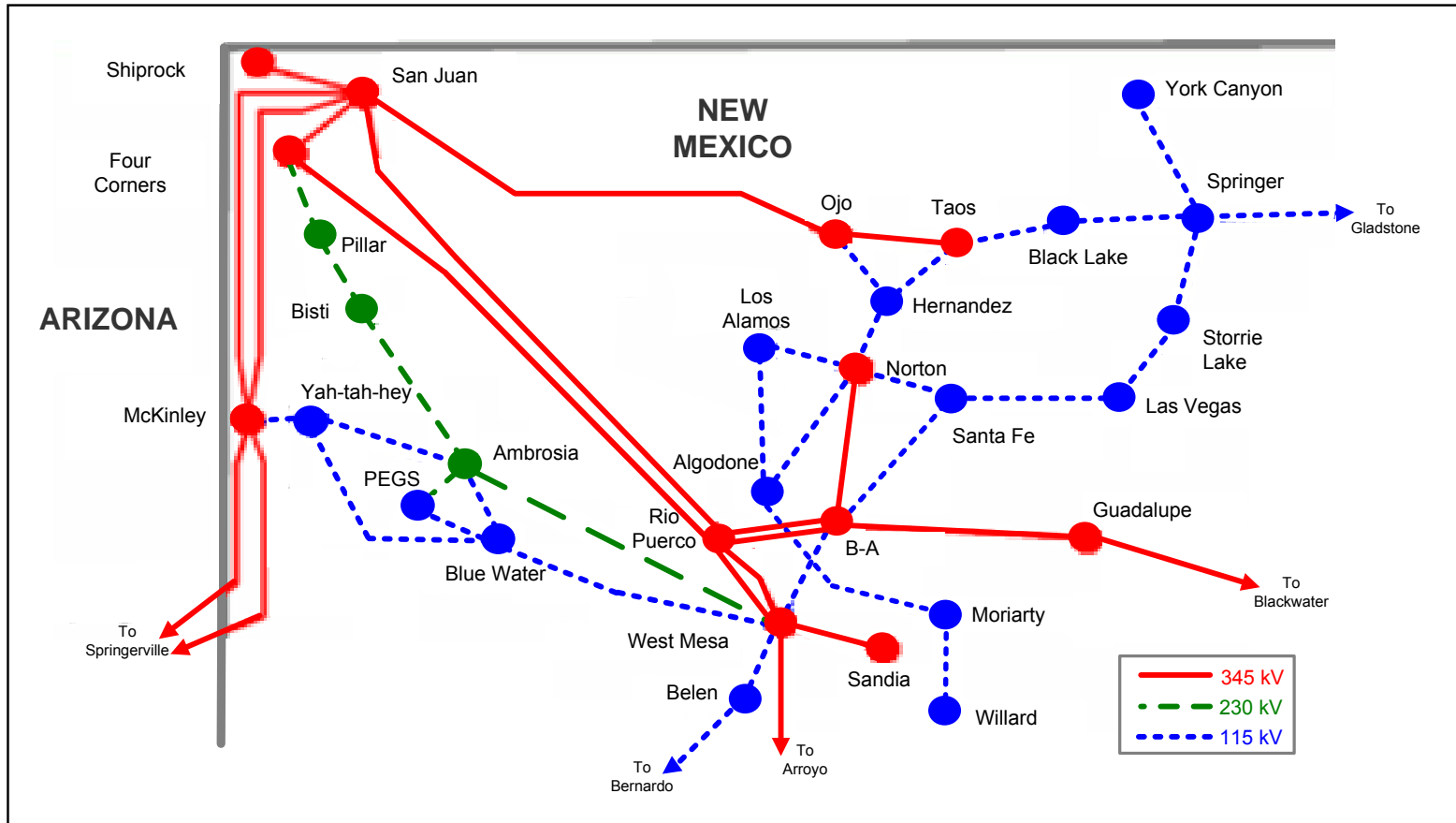
## RESULTS OF PRELIMINARY TECHNICAL ANALYSES

*PNM IRP Meeting  
November 6, 2008*

# PROJECT DRIVERS

- *Northern New Mexico (NNM) System load serving capability exceeded by total NNM System load by 2013*
- *Increasingly smaller window to conduct maintenance on the backbone PNM 345kV system*
  - *1/3 of NNM System transfer capability lost when either the Four Corners or San Juan to Albuquerque lines are out of service*
- *Possibility of controlled load reduction if two or more of the 345kV lines are not in service.*
  - *Exposure to automated load-shedding procedure eliminated or largely mitigated by the addition of NNM transfer capability*

# PRE-PROJECT SYSTEM

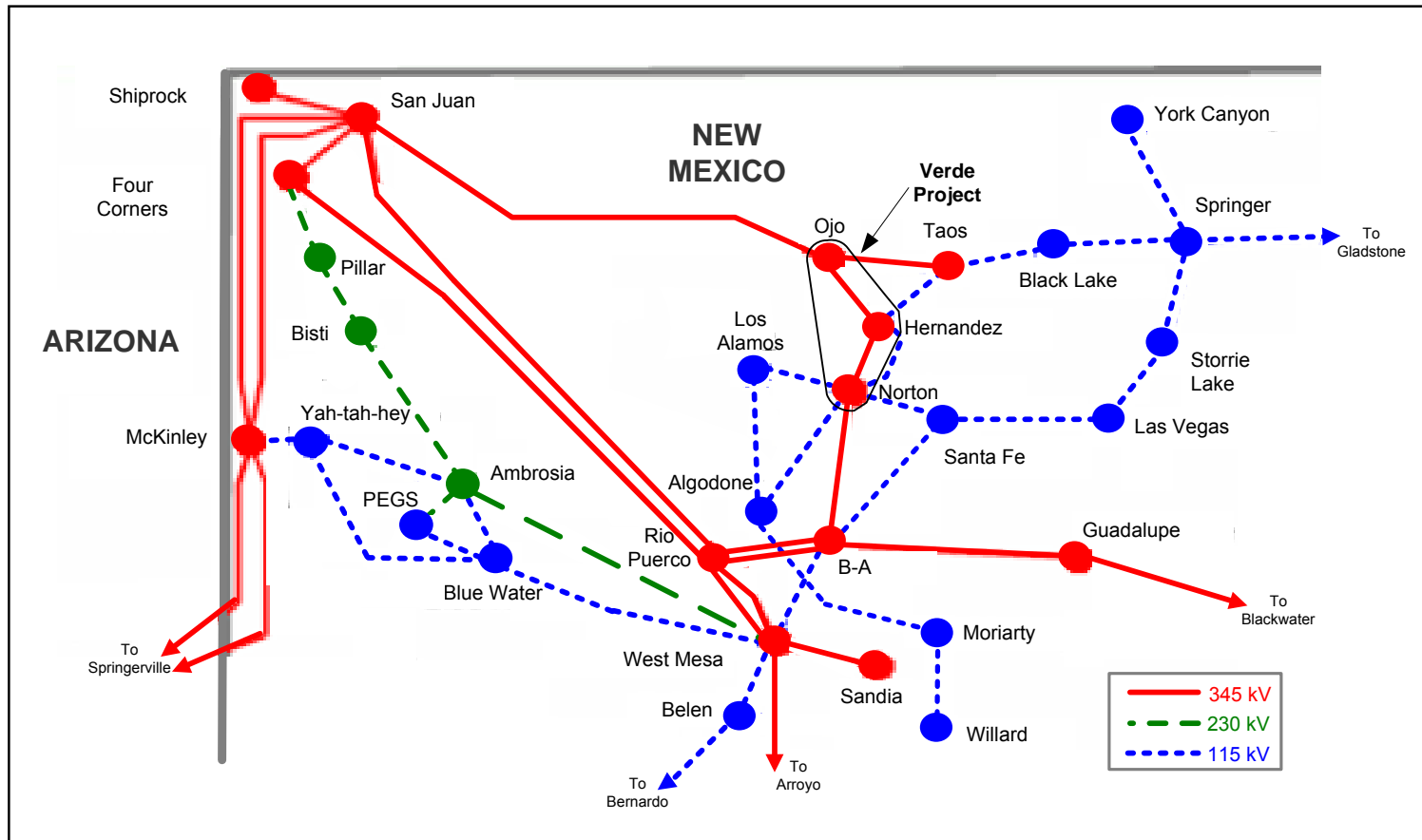


*The import limit into NNM for the pre-Project 2012 system is approximately 1,900 MW*

# PROJECT DESCRIPTION

- *The Verde Project would include the following components:*
  - *A 5-mile long 345-kV line from the existing Ojo 345/115-kV Substation to the existing Hernandez 115-kV Substation*
  - *A 345-kV switchyard and a 345/115-kV, 230 MVA transformer at the Hernandez Substation*
  - *A 20-mile long 345-kV line from the Hernandez Substation to the existing Norton 345/115-kV Substation*
  - *40% series compensation in the San Juan-Ojo 345-kV line and 50 MVAR of reactive support at Ojo*
- *In addition, the Ojo-Hernandez 115-kV line would be removed to accommodate the new 345-kV line*

# POST-PROJECT SYSTEM



*The import limit into NNM for the post-Project system would be approximately 2,500 MW*

# TECHNICAL ANALYSES

- *Technical analyses (powerflow, transient stability, and reactive margin) were performed on a pre-Project case and on post-Project cases to assess the benefits and impacts of adding the Project and increasing NNM imports*
- *These analyses indicated that certain “project specific” additions and/or upgrades would be required due to the addition of the Project*
- *They also indicated that other “non project specific” additions and/or upgrades would be required to mitigate the impacts of the increased imports over the facilities extending into NNM from San Juan/Four Corners independent of the project selected to increase imports*

# RESULTS OF TECHNICAL ANALYSES

- *Preliminary technical analyses indicate that the NNM import limit could be increased by approximately 600 MW if both “project-specific” and “non project-specific” additions and upgrades were made to the system.*
- *Project-specific additions/upgrades include:*
  - *The Verde Project facilities discussed previously*
  - *Increasing the emergency rating of the San Juan-Ojo line to at least 1,500 amps*
  - *Increasing the emergency ratings of three 115-kV lines as follows:*
    - *Taos-Hernandez line - to about 700 amps*
    - *Hernandez-Norton line - to about 950 amps*
    - *Bluewater-Grants line – to about 465 amps*
- *Non-project specific upgrades involve the use of additional shunt capacitors, an SVC, upgrades to lower voltage lines and autotransformers in and around Albuquerque*