Regional Carrizo Program: Overcoming Issues Through Local and Regional Cooperation

Adam Eddy, P.E.

Project Engineer, Water Resources

June 7, 2013

TAWWA / WEAT Summer Seminar

San Antonio Water System

Regional Carrizo Project

- Began in 2002; modified most recently in 2010
- The project brings Carrizo Aquifer groundwater from western Gonzales County to San Antonio
- Regionally available water / Little pumping in the Carrizo Aquifer
- Part of SAWS water diversification effort
- Supports regional partnerships (SSLGC, GCWSC, GCUWCD)
- SAWS *2012 Water Management Plan* project closest to completion
- Delivery of water will be made available to SAWS by late 2013

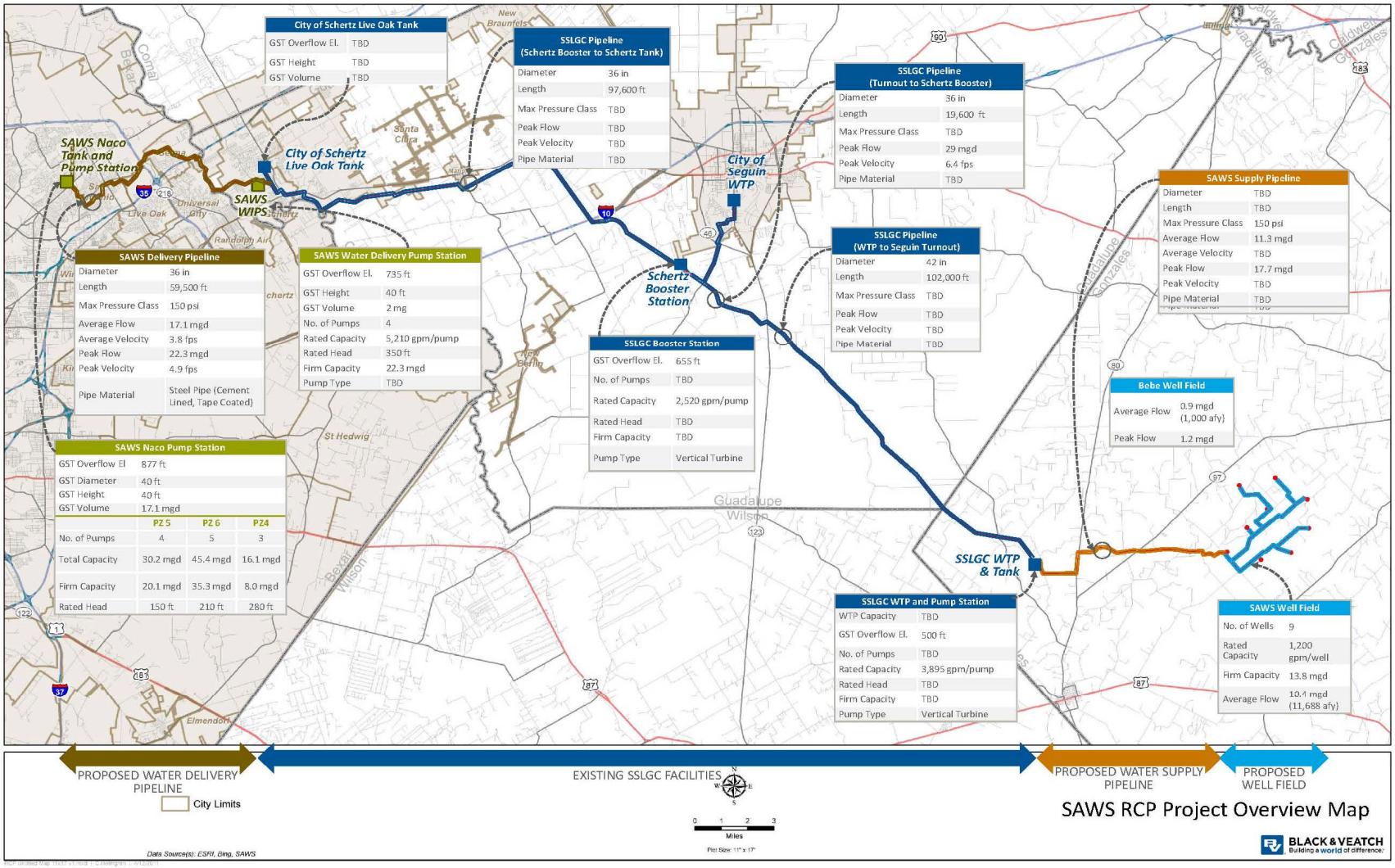
Project History

- Since its inception, the project has undergone numerous transformations:
- Original Concept
  - 2000 – 2005
    - 3 phase program
    - Projected facilities in Gonzales and Wilson Counties
    - Projected yield = 56,700 acre-feet/year
    - Delivery = west side of San Antonio
- Revised Concept
  - 2005 - 2008
    - Independent review of program conducted
    - Similar to original concept
    - Utilization of ASR pipeline to east-side , with improvements to distribution system

Project History (con't)

- *2009 Water Management Plan* (WMP)
  - 2008 – 2009
    - Project facilities in Western Gonzales County
    - Total of 11,687 acre-feet/yr yield (single phase program)
    - Preferred mid-term project
- Current Concept
  - 2009 - present
    - Builds upon original recommendations in 2009 WMP
    - Preferred short-term project
    - Joint use of existing infrastructure with SSLGC (cost savings)
    - Increased yield through partnerships

Proposed Regional Carrizo Project Facilities



Regional Carrizo Project Permit

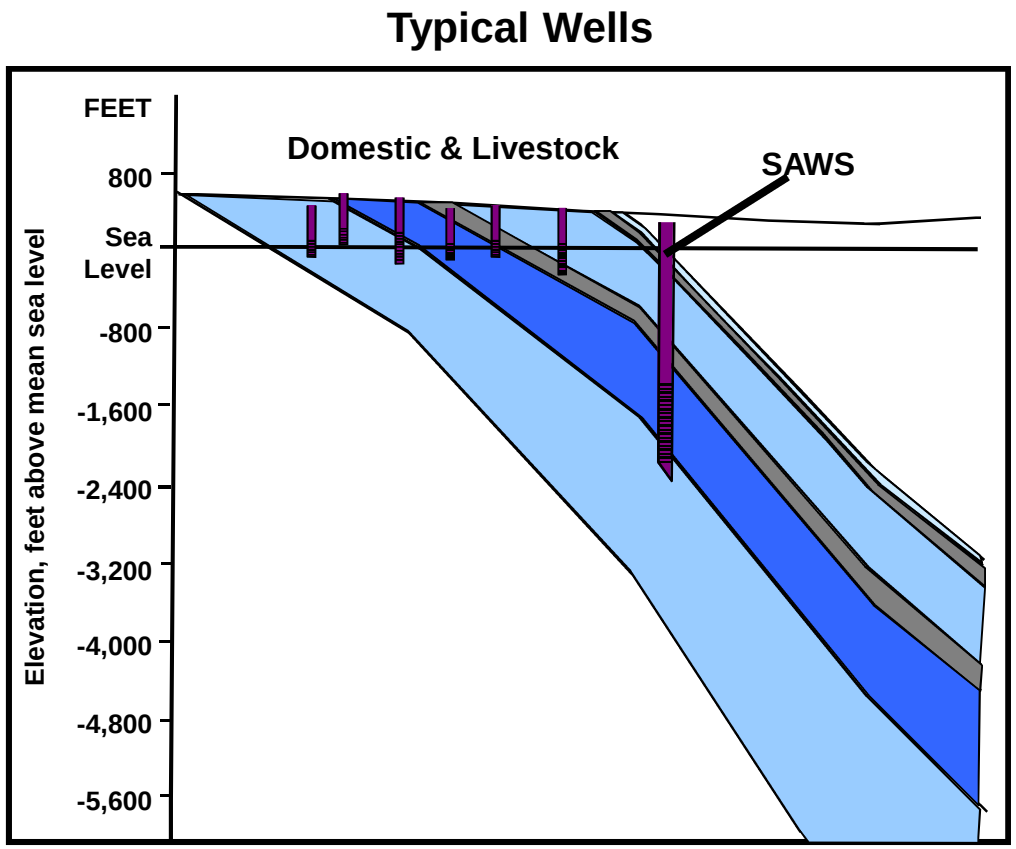
- Gonzales County Underground Water Conservation District approved Production and Transportation Permits on July 13, 2010, for 11,688 acre-feet (originally submitted June 14, 2006)

- Gonzales County Water Supply Corporation agreed to sell SAWS 1,000 to 1,200 acre-feet of water per year

Consideration of Groundwater District Rules

- Pumpage that will not cause water level drawdowns to exceed the 100-foot rule limitation
- Pumpage not exceeding one acre-foot per surface acre of land leased for the Carrizo Aquifer
- SAWS is committed to mitigate impacts on neighboring Carrizo Aquifer wells through participation in the GCUWCD administered fund
- Changes or additions to existing rules may impact project
- Drilling complete within 1 year; Construction to commence within 3 years

What is the impact on nearby wells?



- Most domestic wells are in the shallow aquifers
- Fewer domestic wells are found in the Carrizo aquifer
- There are some commercial wells in the Carrizo Aquifer

Regional Cooperation

Mitigation

- Fund set up as condition of permits
  - Small cities excluded
  - GCWSC excluded
- GCUWCD will administer the fund
- All major export permittees in Western Gonzales County contribute to fund
- Considerations for replenishment of fund over time
- Separate mitigation agreement with Nixon

SSLGC-SAWS Partnership

- SSLGC will:
  - Expand their water treatment plant
  - Modify and / or add additional booster pump capacity and storage volume
- Partnership would provide:
  - SSLGC and the Cities with a reduced rate structure
  - A mechanism to transport SAWS water
  - Less infrastructure for SAWS to construct
  - SAWS water at a substantially reduced cost
  - Treat and transport SAWS Gonzales County water

SSLGC-SAWS Partnership (con't)

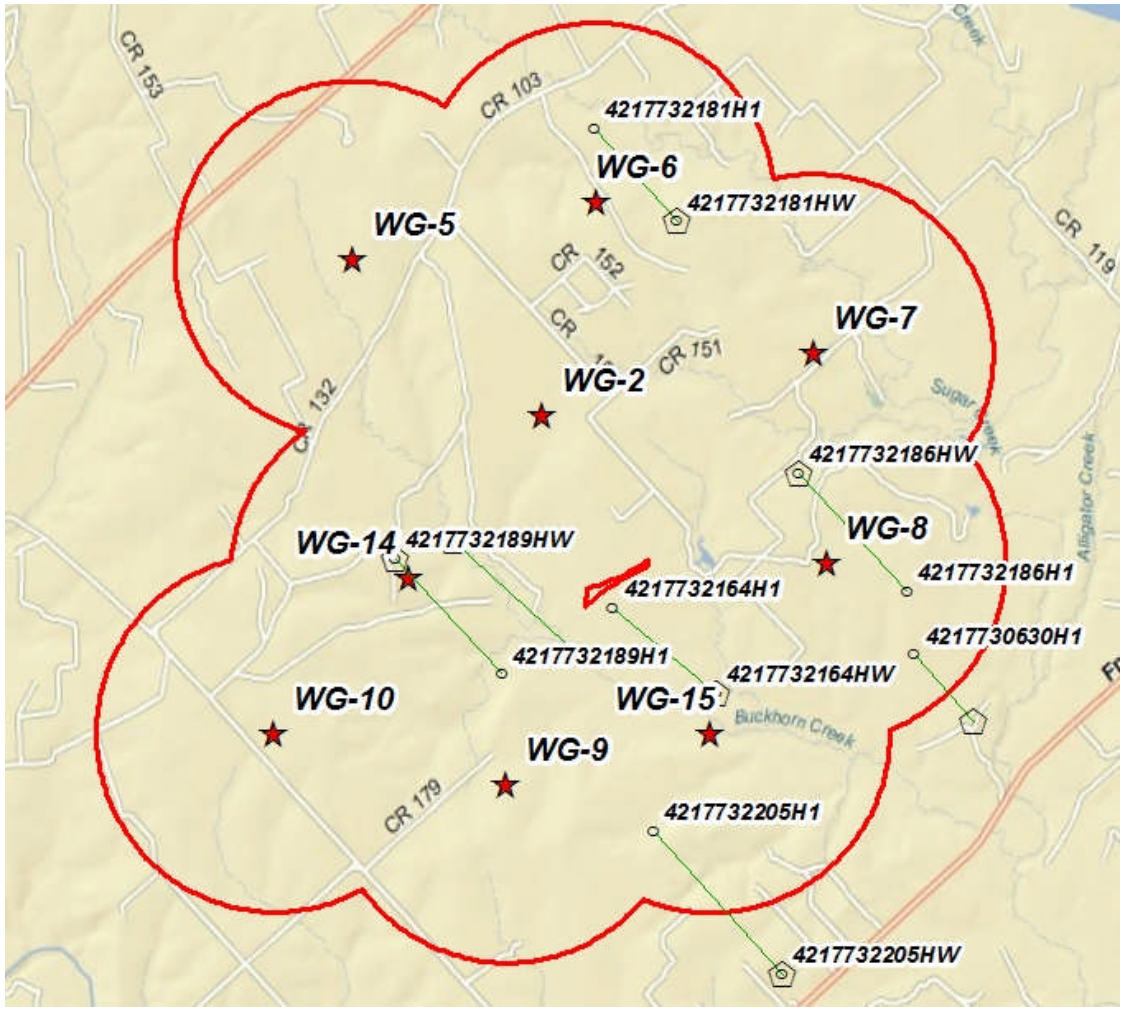
- Partnership would provide:
  - SAWS has opportunity to purchase Surplus Water from SSLGC
    - Estimated to be available in late 2013
    - Estimated at 5,000 acre-feet per year in near future
    - Estimated to average 3,400 acre-feet per year over the contract term
    - SAWS can purchase up to 75% of surplus water
  - Provide SSLGC with emergency water from SAWS for up to six months for any one emergency
- Effective date of agreement is January 1, 2011

Contract Benefits

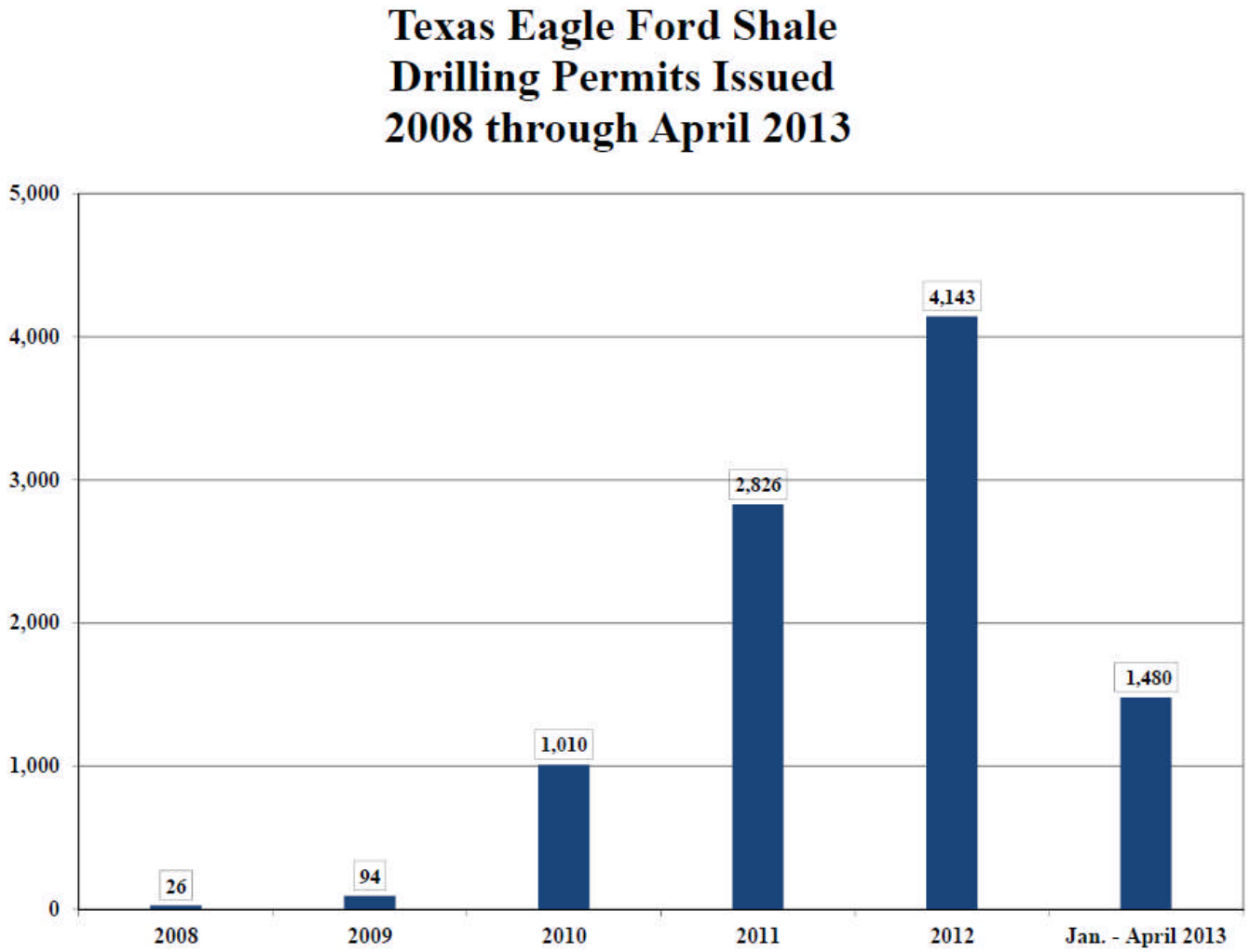
- Regional partnership established
- Utilizes existing capacity within an existing water system
- Cost reduction for SSLGC, Schertz, Seguin, and wholesale customers
- Lower operating and capital cost for SAWS customers and reduction in projected rate increases
- Delivers water sooner to the SAWS distribution system
- Increases water amount through purchase of Surplus Water
- Diversifies SAWS water supply
- Allows other projects (BGD, WRIP, etc.) more time to develop

Eagle Ford Drilling Impacts?

- Lots of activity in the area
- Multiple well sites within SAWS Wellfield
- Coordination with Oil Companies
- Risk Assessment Study Performed



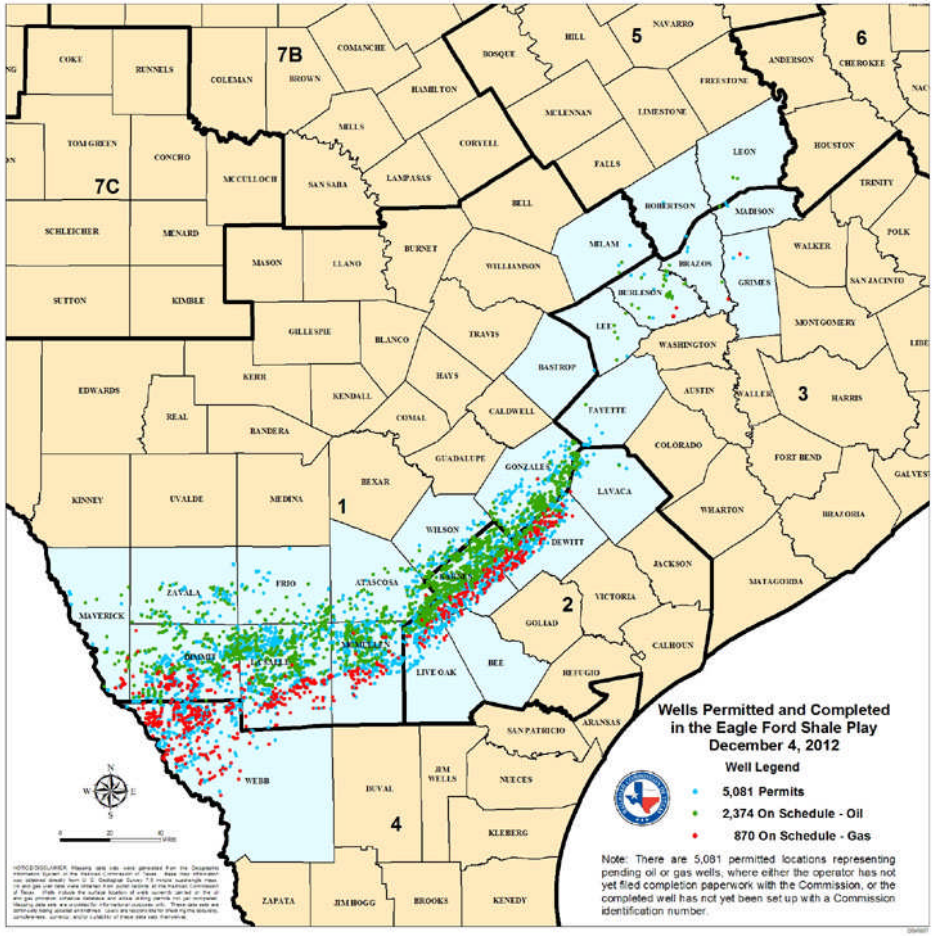
Rapidly increasing activity



http://www.rrc.state.tx.us/eagleford/EagleFordDrillingPermitsIssued.pdf

Why did we do the study?

- National media attention to the topic of hydraulic fracturing/horizontal drilling
- Project specific concerns
  - Public water supply
  - Deep water wells
  - Coordination with oil/gas well drillers
- Increased oil/gas activity in the area



Scope of the study

- Qualitative evaluation
- Evaluation of potential migration pathways
- Typical fracturing fluid chemicals
- Geology
- Regulatory framework
- RRC Data

Study Results

- Through overlying strata
  - Unlikely due to proven confinement and formation thickness between the Eagle Ford and the Carrizo including the Wilcox and Navarro.
- Infiltration from Surface Spills and Improper Disposal of Wastewater
  - Unlikely due to the depth of the Carrizo aquifer. (>1,000 ft). The most likely pathway would be through the annulus of a substandard well. Hydraulic analyses suggest that conservative estimate of hydraulic conductivity and formation pressures would make this nearly impossible
- Through structural deficiencies in existing wells
  - Unlikely based on documented construction of existing wells. In some cases, surface casings did not penetrate the Carrizo Aquifer, however, in those cases, multi-stage cementing of production strings, isolated the Carrizo from formation water and hydraulic fracturing chemicals.

Regional Carrizo Cooperation

- Gonzales County: Road maintenance
- GVEC: Electrical Infrastructure
- Oil & Gas Companies: Partnering on road maintenance, electrical infrastructure, well placement, pipeline alignment
- Local Landowners: Provide guidance and input during design and construction

Regional Carrizo Project Status

- District Permits Acquired
- Acquisition of Water Rights complete
- Negotiation with possible partners complete
- All projects under construction (40 - 85% complete)
- Well Drilling is complete
- Easement Acquisition complete
- Commence pumping water by late 2013

Conclusion: A Win Win for All

- Reduces water rates for the regional partners
- Surplus Water sale provides additional income
- Largest single “non Edwards” for both parties
- Expands SAWS Water Portfolio
- Capital savings to SAWS estimated at $83M
- Brings SAWS closer to completing its long range *2012 Water Management Plan*
- Supports regional partnerships (SAWS, SSLGC, GCWSC and GCUWCD)
- Provides SSLGC with an emergency water supply

Regional Carrizo Program: Overcoming Issues Through Local and Regional Cooperation

Adam Eddy, P.E.

Project Engineer, Water Resources

June 7, 2013

TAWWA / WEAT Summer Seminar

San Antonio Water System

Projected Water Delivery

- SAWS Permitted Water 11,688 AF
- GCWSC Purchased Water 1,000 AF

Total 12,688 AF

- Projected Water Loss @ 7.4% * 939 AF
- **Projected SAWS Water Delivered 11,749 AF**
- Projected SSLGC Surplus Water 3,407 AF
- **Total Projected Water Delivered 15,156 AF**

* SSLGC treatment and system losses from 2010 Rate Study and Long-Term Financial Plan updated December 2010