



# Waste to Energy

## A Public - Private Partnership

Three Rivers Solid Waste Authority

Kimberly-Clark Corporation

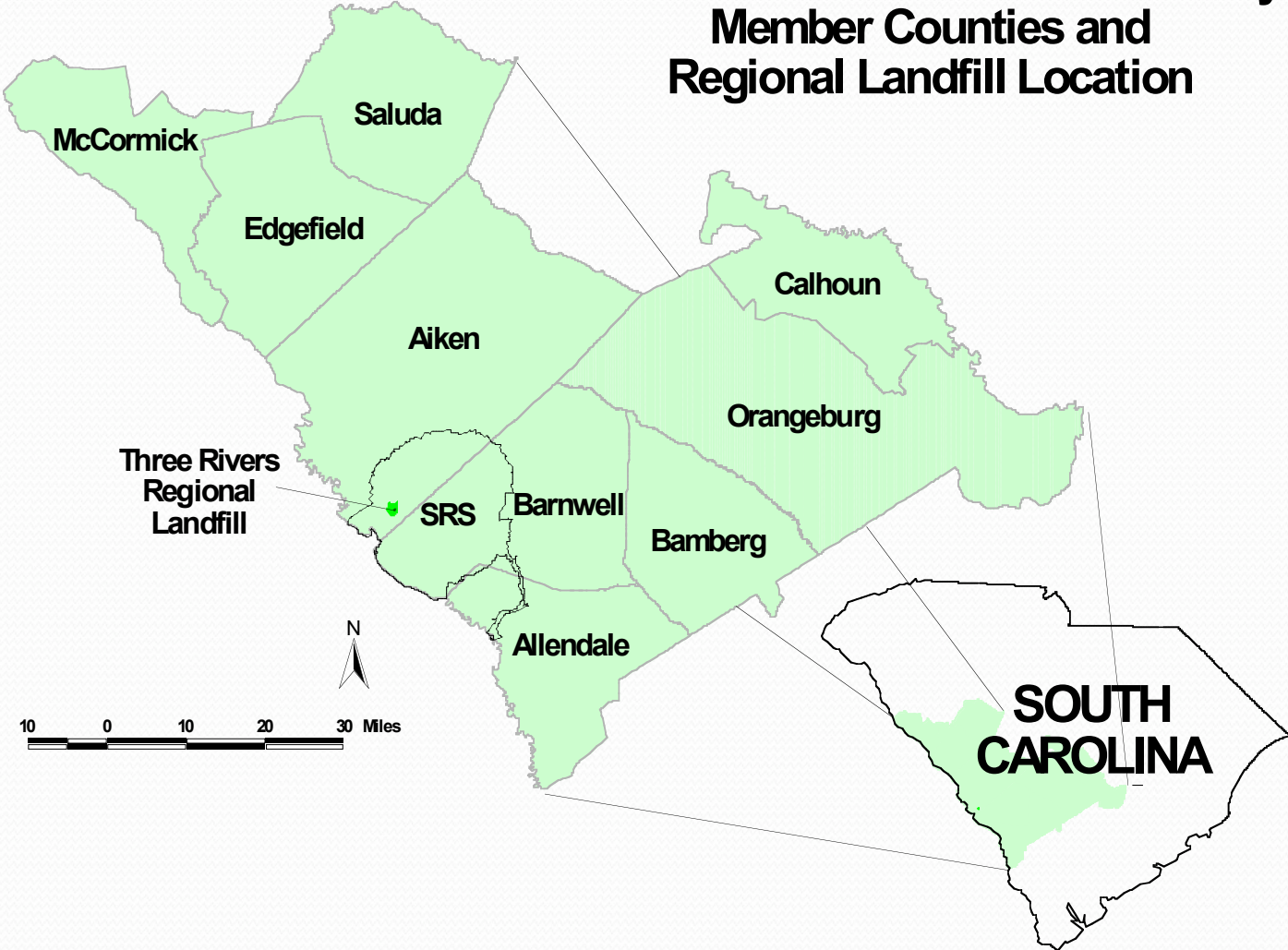
Siemens Building Technologies



# Three Rivers Solid Waste Authority

- Three Rivers Solid Waste Authority is a regional government agency comprised and directed by nine counties.
- The Authority was established in 1992 to promote environmental stewardship through the development and implementation of solid waste plans.
- The Authority operates a Class III lined landfill in south Aiken County for disposal of the member counties' waste.

# Three Rivers Solid Waste Authority Member Counties and Regional Landfill Location



# Three Rivers Regional Landfill, 2003



# Our Partner's Roles

- Three Rivers Solid Waste Authority
  - Owner and Developer
  - Landfill Gas Collection System Operator
- Kimberly-Clark
  - Gas Purchaser
- Siemens Building Technologies
  - Compression/Dehydration Plant Operator
  - Pipeline Operator and Development Contractor



**Three Rivers  
Solid Waste Authority**



**SIEMENS**



# Project History and Timeline

- Three Rivers began investigation, late 2005
- Issued RFQ for partner, Spring 2006
- Selected Siemens, Summer 2006
- Direct use project with KC selected, October 2006
- Detailed engineering and contracts completed, March 2007
- Financial closure, September 2007
- Construction began, October 2007
- Construction completed, March 2008
- Gas flows initiated, April 1, 2008
- Project commercialization, April 7, 2008



# Challenges

- Regulatory requirements for landfill gas control and conveyance
- Limited market acceptance for landfill gas use
- Limited gas production in early years
- Lack of data to support economic viability
- Time commitment for issuance of revenue bonds
- Private activity use of funds

# Response to Challenges

- Voluntarily installed collection/control system 1 year ahead of regulatory requirement, financed by bond Anticipation notes (BANs), and hired consultants to design, construct, and operate system
- Capitalized on a relationship with Kimberly-Clark Corporation cultivated over the past 9 years
- Debt was issued by Authority (developer) and structured to increase the amount of principal payment in later years to match the projected flow increase.



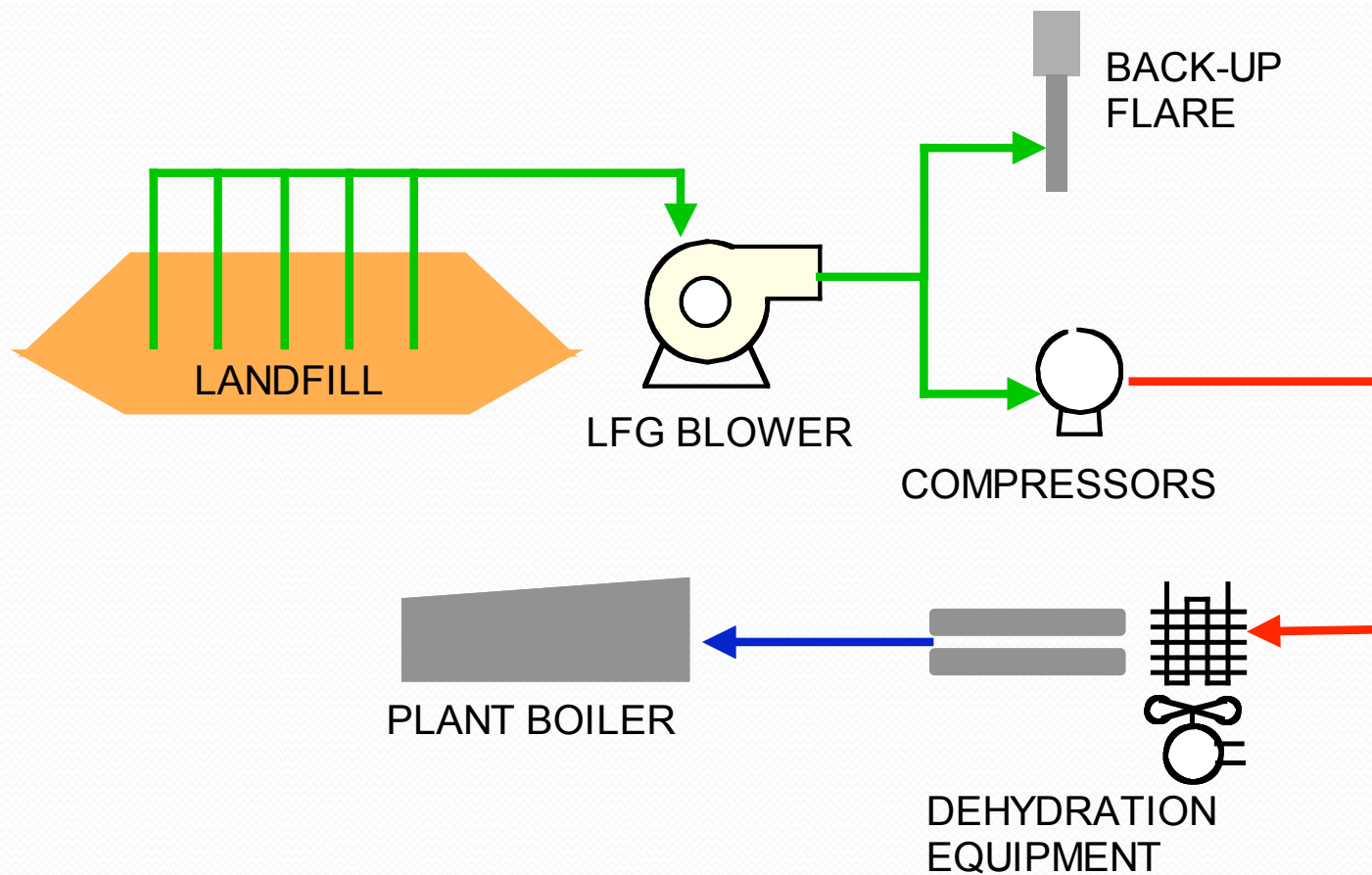
# Response to Challenges Continued

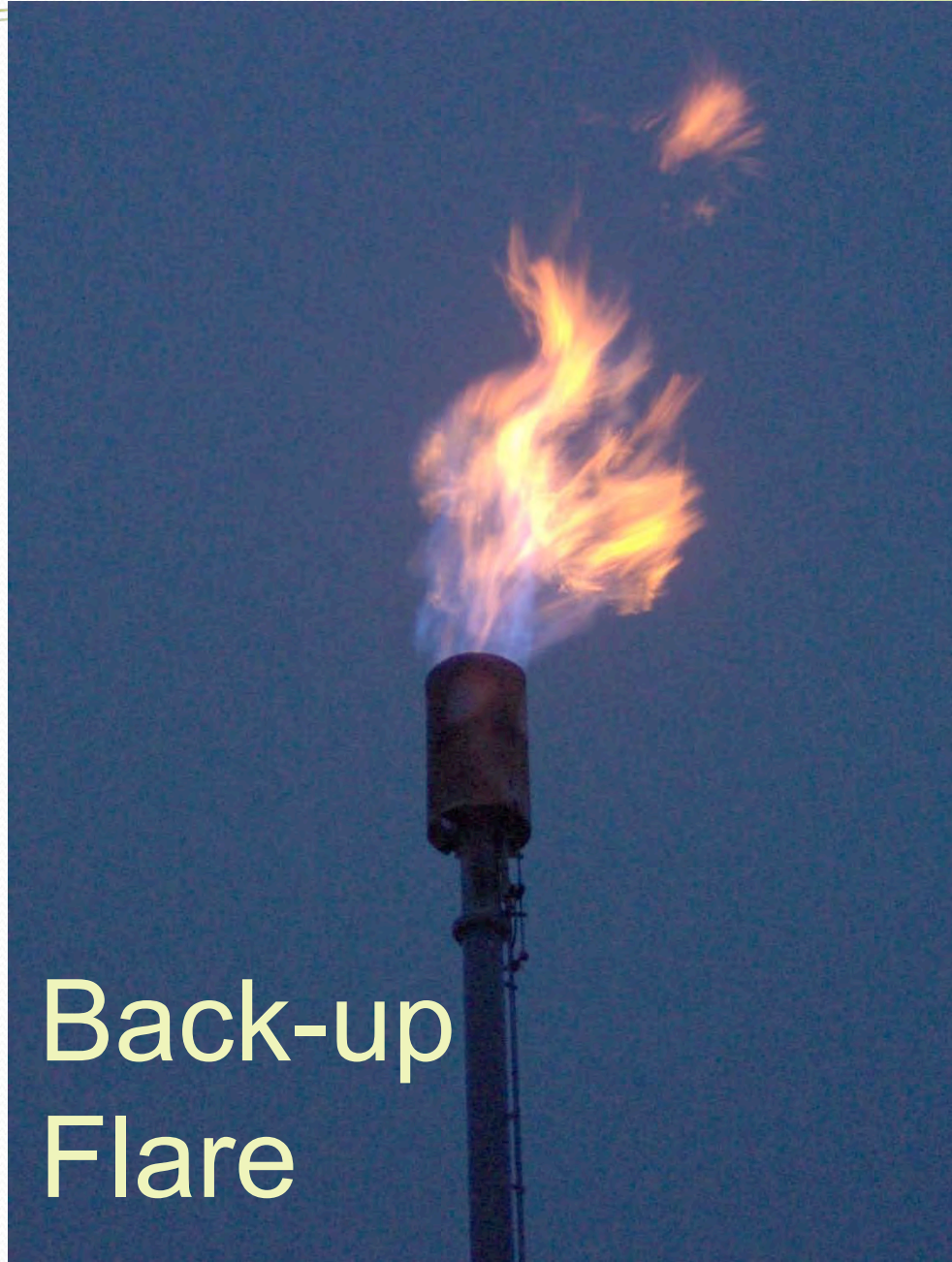
- Engineers were able to collect actual flow data from the flare system because the Authority had begun voluntary operation 1 year before requirement
- Rather than issue revenue bonds, the Authority sold certificates of participation (COPs). The take-or-pay contract with KC is for 15 years to coincide with the term of the COPs
- A small portion of the financing paid for modifications to the Kimberly-Clark system so that their boiler would utilize LFG. The Authority established a sale/lease back agreement with a mirror corporation, TRA, Inc.

# Project Summary

- Collection System
  - Must extract 95% of gas being generated.
  - Surface of landfill monitored for need for system expansion.
- Back-up Control Flare
  - Flare must burn 100% of the gas being produced.
  - Flare will activate automatically with lowered demand.
- Compression/Dehydration Plant
  - The hot and wet landfill gas must be compressed, cooled and dried for use at Kimberly-Clark.
- Landfill Gas Transmission Pipeline
  - 15.8 miles of 10 inch high density polyethylene.
- Boiler Modifications
  - Boiler burns natural gas and landfill gas.
  - Natural gas consumption will decrease with increases in landfill gas.

# System Schematic



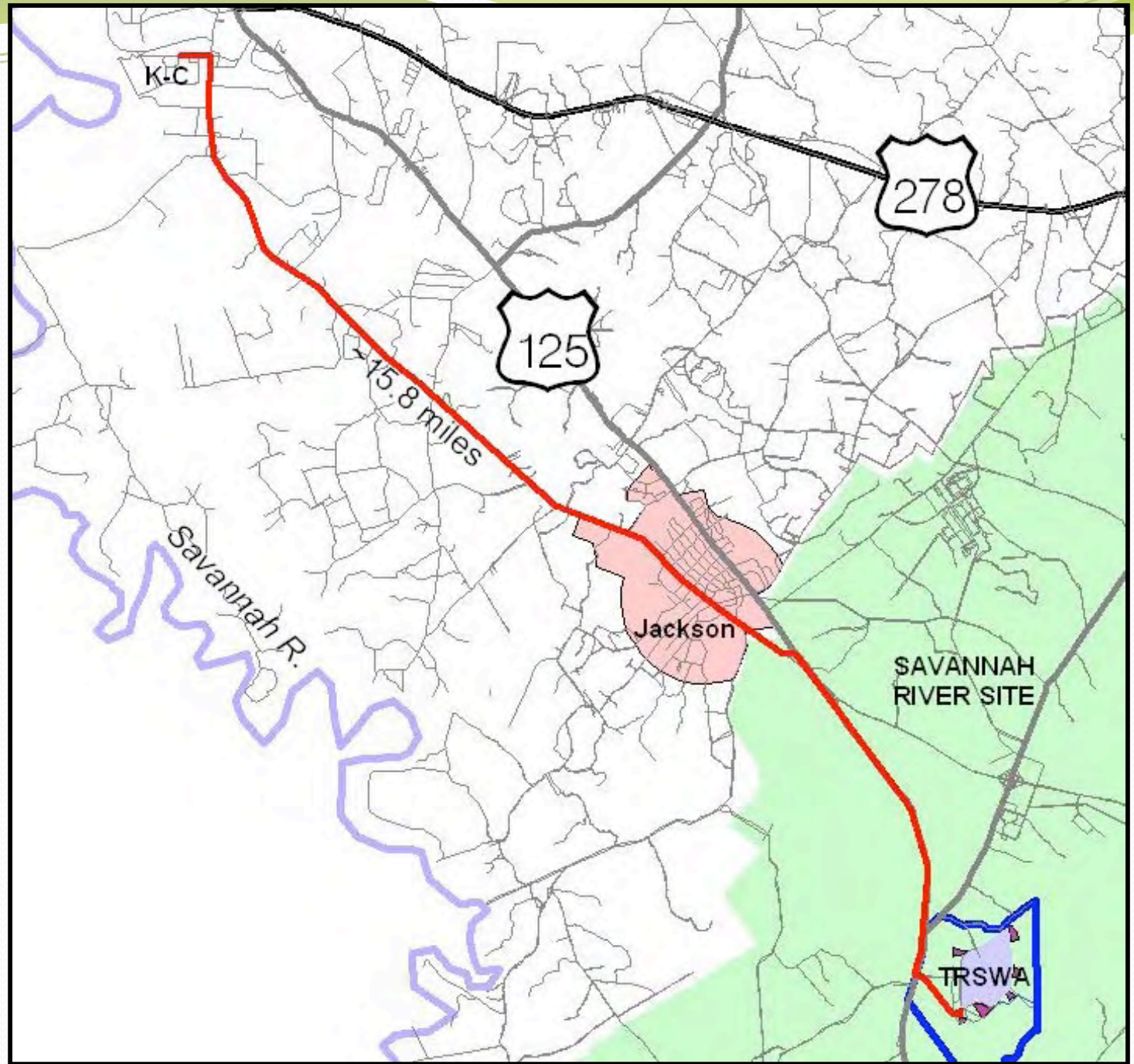


Back-up  
Flare



Compression/Dehydration Plant

# Pipeline Route





# Pipeline Fusion



# Pipeline Installation



# Why Direct Use?

- Kimberly-Clark can use all the gas the landfill is projected to produce with minimal down time.
- No other option allowed for the theoretical sale of 98% of LFG generated.
- LFG is more commonly used in the U.S. to make electricity, but energy conversion is far less energy efficient, and maintenance of electrical generation systems is more costly and complicated.
- Helped a local employer reduce costs.
- Kimberly-Clark's Beech Island facility is their largest plant in North America, just completing a \$400 million expansion.
- Created the most economic value for Three Rivers.

# Three Rivers Elected to Own the Project

- Allowed Three Rivers to retain control of the project decisions.
- Tax exempt financing structures available to Three Rivers allowed for financial viability in early years.
- Comprehensive performance contract with Siemens shifted project risks and responsibility to Siemens.
- Three Rivers owns the project and all long term revenue from the project.
- Three Rivers retains carbon offset credits.
- Contractually created the most economic value for Three Rivers with limited risk.
- Current (June 2008) revenues are \$150,000 per month, with breakeven point at \$76,000 per month.

# Tax Exempt Bond Structure

- Effective Rate of 4.5% APR using private activity COPs and credit enhancement letter from U.S. Bank.
- 15 year term.
- Payments are graduated year over year for 15 years to match the projected gas curve.

# Major Benefits

- Creates environmental benefits.
- Creates financial savings for local employer.
- Creates new cash flow for Three Rivers.
- TRSWA partners with and receives technical support from a large steam user (K-C) whose professional energy managers and operators are motivated to maximize use of LFG.
- TRSWA partners with and receives technical support from a major international energy management and equipment company (Siemens) whose subsidiary, Siemens Building Technologies, is committed to the development of LFG-to-energy projects.



# Environmental Benefits Created

- Reduces greenhouse gases by 170,000 tons per year.
- Environmental equivalent
  - Planting 45,000 acres of trees
  - Displacing 18,000,000 gallons of gasoline per year
  - Removing 40,000 vehicles from the road annually
- Energy equivalent of heating 10,500 homes

# Carbon Offset Sales

- Collection system was voluntary until May 2008.
- Creates 61,000 tons CO<sub>2</sub> credits the first year.
- Early installation of wells will generate another 15,000 tons of offsets per year.

# Direct Use Application

- Boiler had to be modified to accept LFG, which contains about half the btu value of natural gas per volume of measurement. Authority paid \$895,000 for modifications.
- Additional maintenance is required for K-C because LFG contains siloxanes, which are residues from cosmetic products.
- LFG from Three Rivers will replace about 40% of K-C's energy needs the first year and up to 90% annually over the life of the project.
- K-C can seamlessly switch to natural gas in the event of LFG supply interruptions.

# Contract Structures – K-C and Siemens

- 15 year contract with K-C, renewable
- 5 year contract with Siemens, renewable
- K-C must take or pay for all gas produced up to 520,000 mm BTUs per year (double current 2008 volume), and has options to purchase more if produced.
- A price cap reduces K-C exposure to very high gas costs, and a price floor ensures TRSWA the ability to pay bond debt.
- Siemens is contractually obligated to deliver LFG to K-C at least 80% of the time and will pay a penalty of \$4500 per day for any time LFG is delivered below the 80% annual requirement.
- Siemens is responsible for total maintenance, repair and replacement of the entire system.





Questions?