



## Targa Midstream Services Limited Partnership's Experience with EPA's Natural Gas STAR Program



Producers and Processors Technology  
Transfer Workshop ( New Mexico )  
February 21, 2006  
Farmington, NM

### Outline

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- ★ Background
- ★ Gas Processing Plant's Phase I study
- ★ Optical Imaging
- ★ Phase II Study
- ★ Pipeline Leak Study
- ★ Future Plans



## Background

- ★ EPA STAR Program is a voluntary, cooperative partnership between EPA and oil & gas industry
- ★ Program is designed to help & encourage companies to reduce methane emissions



## Background .....

- ★ Gas processing plant accounts for 12 % which is 36 Bcf
- ★ Fugitives: 24 Bcf  
Combustion stack exhaust: 7 Bcf  
Other sources: 5 Bcf
- ★ Methane 21 times more potent than CO<sub>2</sub>



## Gas Plant's Phase I Study



- ★ Two DMS facilities in study
- ★ Cost was \$ 30 K
- ★ Amount methane saved = 100 MMSCF/yr  
(\$700K @ \$7/MSCF)
- ★ Savings Realized within 18 Months – Largest  
Cost-Effective Leaks Repaired



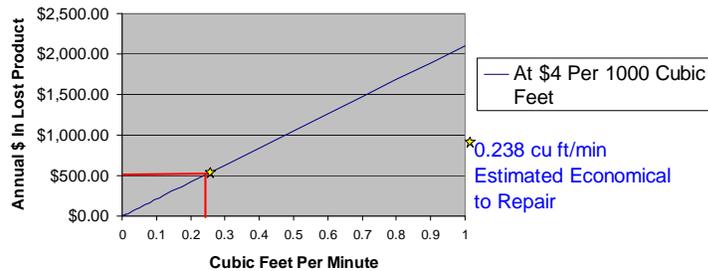
## Chico Gas Plant



## Economics of LAUF



### Lost and Unaccounted For Product Potential \$ Savings Equating Pure Methane Leak Rate to Dollars



## Optical Remote Leak Detection



### Infrared Differential Absorption

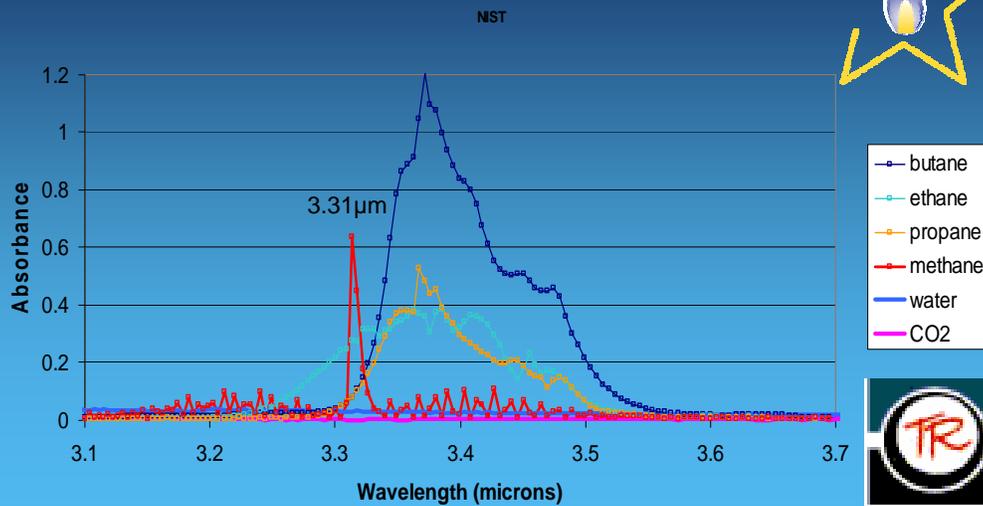
- ★ Mid wave Infrared - 3 to 5  $\mu\text{m}$
- ★ Long wave Infrared - 8 to 11  $\mu\text{m}$
- ★ Visible - 0.4 to 1.0 Microns
- ★ Near IR - 0.9 to 1.6 Microns

Remote sensing is the science and art of obtaining information about an object, area, or phenomenon through the analysis of data acquired by a device that is not in contact with the object, area, or phenomenon under investigation.

From Remote Sensing and Image Interpretation, Lilles and Kiefer, 1987



## Similar to Gas Chromatography



## Active vs. Passive Imaging



- ★ Active techniques employ an artificial radiation source (e.g. a microwave transmitter, a laser, a thermal heater, etc.) for illumination of the target area
  - ★ Passive techniques utilize the naturally occurring ambient radiation
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## Passive Remote Optical Infrared Leak Detection, Quantification, and Speciation



PAT



## LSI Camera Visualizes Gasoline Vapor



- ★ Field Portable
- ★ Rugged
- ★ Reliable
- ★ Repeatable
- ★ Sensitivity
- ★ Ease of Use - Doesn't Require Frequent Adjustment
- ★ Capable of Identifying "Inaccessible" Leaks



# LSI Leak Surveys Video Imagery



**Flange Leak**



**Buried Pipeline Leak**

# Infrared LSI Camera



## High Volume Sampler



## Phase II Study

- ★ Eunice Gas Plant – Eunice , NM
- ★ Eunice North & South Comp. Stns.
- ★ Chico Gas Plant – Chico , TX
- ★ East Chico & Sitz Comp. Stns.



## Eunice Gas Plant



- ★ Constructed in 1948
- ★ Sour Gas Processing Plant
- ★ Part of the Facility under LDAR Program
- ★ Number of components monitored
- ★ Number of leaks found



## Eunice Plant



## Eunice Plant – Engine Room



## Eunice Plant



## Eunice Compressor Stations



- ★ Eunice North Comp. Stn.
- ★ Number of components monitored vs. leaks found
- ★ Eunice South Comp. Stn
- ★ Number of components monitored vs. leaks found



## Chico Gas Plant



- ★ Constructed in 1966
- ★ Sweet Gas Processing Plant
- ★ Part of the Facility under LDAR Program
- ★ Number of components monitored
- ★ Number of leaks found



## Chico Plant



## Chico Plant



## Chico area Compressor Stations



- ★ East Chico Compressor Station
- ★ Number of components monitored vs. leaks found
- ★ Sitz Compressor Station
- ★ Number of components monitored vs. leaks found



## East Chico Compressor Station



## Sitz Compressor Station



## DI & M program- Identification of leaks

- ★ Conventional methods such as sniffing, soaping and ultrasonic etc.
- ★ Optical Infrared Remote Leak Detection method



## Conventional vs Remote Sensing



- ★ Speed: 2,400 comp./day    2,300 comp./hr
- ★ Mobility: most areas    difficult in congest.  
elevated : difficult    easy
- ★ Cost : \$1200/ day    \$ 4000/ day
- ★ Safety: less    more  
proximity    distance



## Pipeline Leak Study



- ★ Driving – visible signs (e.g. vegetation stress)
- ★ Driving with sniffer trucks twice a year
- ★ 25 – 40 miles per day



## Pipeline Leak Study

- ★ Mass Balance Discrepancy Identified Need for Survey
- ★ Infrared Remote Sensing from helicopter
- ★ 200-400 miles per day
- ★ Amount of methane estimated at ~146 MM SCF /yr or (0.5 MMSCFD)



## Monument Gas Plant



## Monument Gas Plant



- ★ Infrared survey conducted to identify sources of leakage
- ★ Leaking sources identified
- ★ Largest opportunities - blow down vents and valve packing
- ★ Amount of methane saved is ~146 MMSCF/yr \$1022K @ \$7/MSCF



## Future Plans



- ★ Planning a D I & M study at our Sand hills gas Plant in West Texas
- ★ Conduct more pipeline Leak Studies in SE New Mexico on a periodic basis
- ★ Conduct D I & M studies in LA



## Contact Information

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