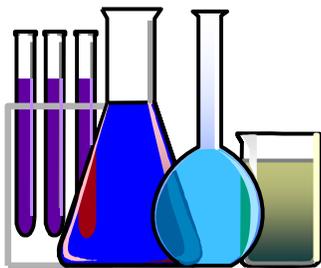




BUREAU OF LAND MANAGEMENT

AMARILLO FIELD OFFICE GAS ANALYSIS LABORATORY



WHO WE ARE



BLM New Mexico, Oklahoma, Kansas, Texas Field Offices

Amarillo Field Office
Bureau of Land Management
801 S. Fillmore Street, Suite 500
Amarillo, TX 79101-3545
(806) 356-1000
(806) 356-1041 FAX

Amarillo Field Office
Cliffside Analysis Laboratory
801 S. Fillmore Street, Suite 500
Amarillo, TX 79101-3545
(806) 383-7815
(806) 383-2952 FAX



CLIFFSIDE GAS ANALYSIS LABORATORY



BLM Cliffside Analysis Team

- Phil Holland
- Kalfred Au
- Sam Burton

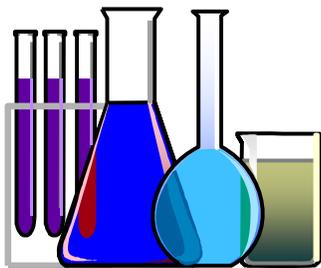
- 80 years combined analysis experience





BUREAU OF LAND MANAGEMENT

AMARILLO FIELD OFFICE GAS ANALYSIS LABORATORY



WHAT WE DO



LABORATORY FUNCTIONS

- NATURAL GAS ANALYSIS
 - FIELD SURVEY
 - CLIFFSIDE GAS WELLS
- CRUDE HELIUM ANALYSIS
 - CRUDE HELIUM PIPELINE
 - PROCESS STREAM ANALYSIS ON HEU
- TECHNICAL ASSISTANCE
 - PURCHASE ANALYTICAL EQUIPMENT TO MEET AMFO ANALYTICAL NEEDS
- MAINTAIN ANALYTICAL CAPABILITY



VG PRIMA 600 MASS SPECTROMETER



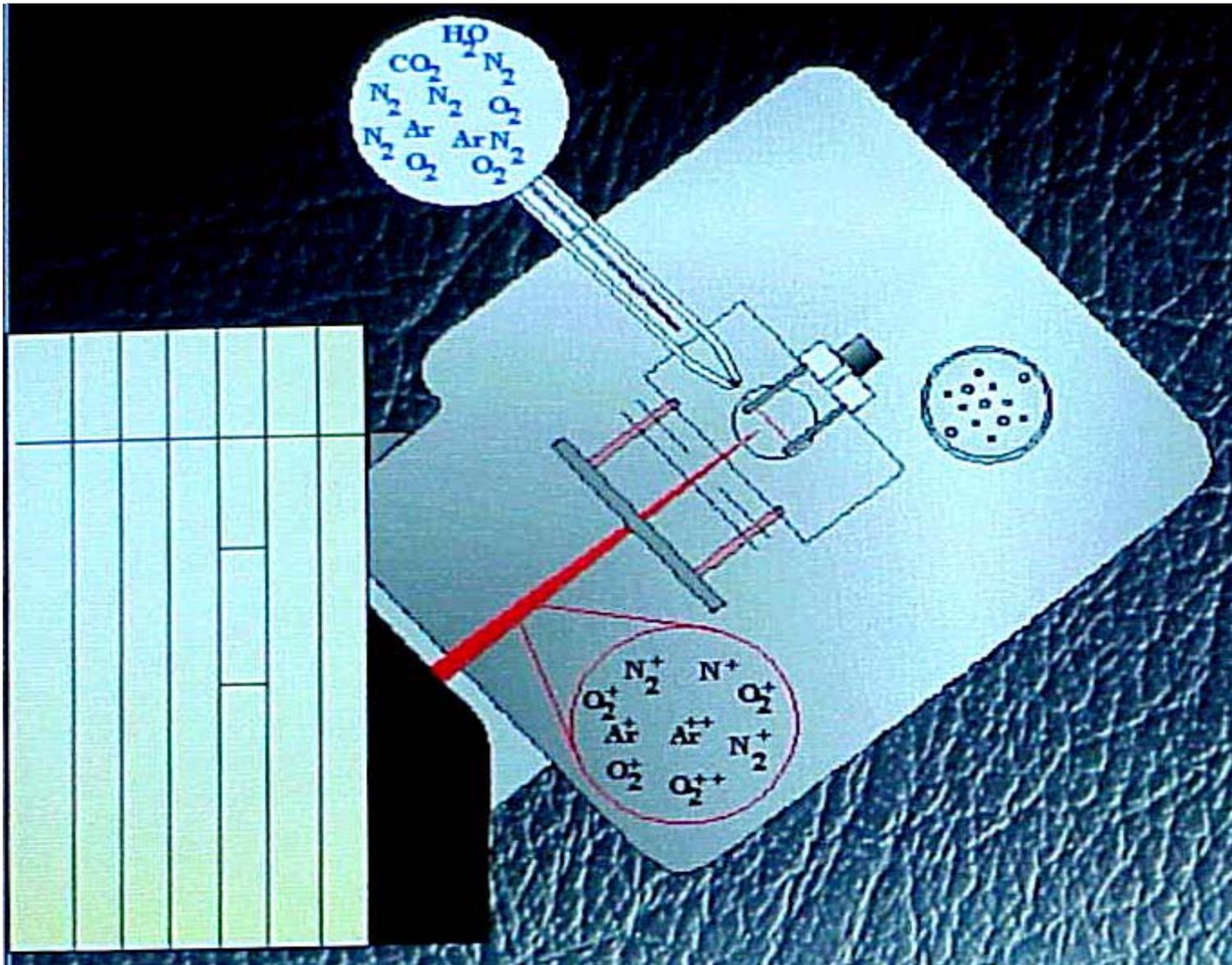
INSTRUMENTS - METHODS

● MASS SPECTROMETRY

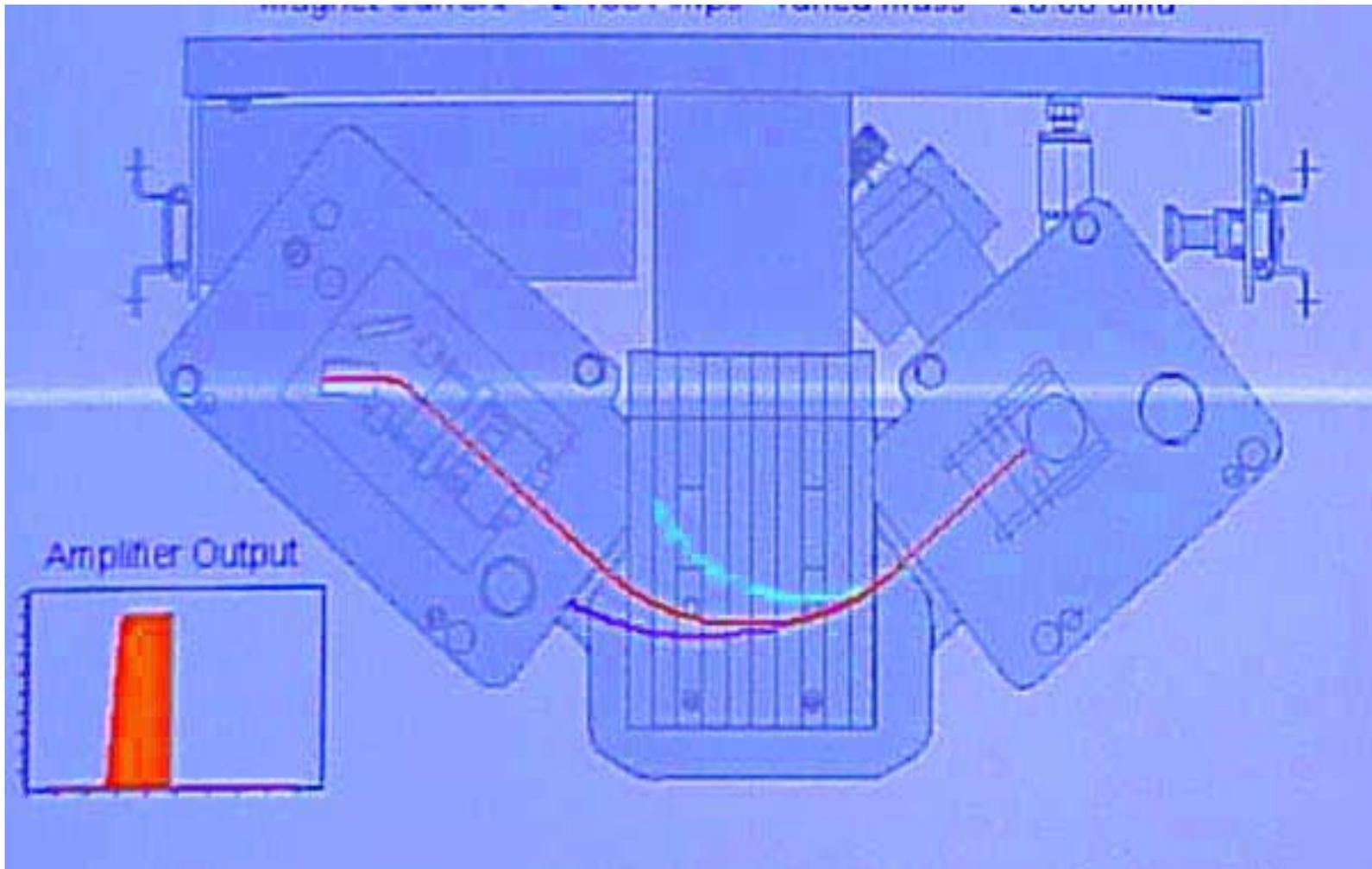
- POSITIVE PRESSURE SAMPLES
- 14 COMPONENT ANALYSIS
- EXCELLENT ACCURACY AND PRECISION
- ANALYSIS TIME - 5 MINUTES
- CALIBRATED WITH GRAVIMETRIC CALIBRATION STANDARDS



ION SOURCE



MAGNETIC SECTOR



INSTRUMENTS - METHODS

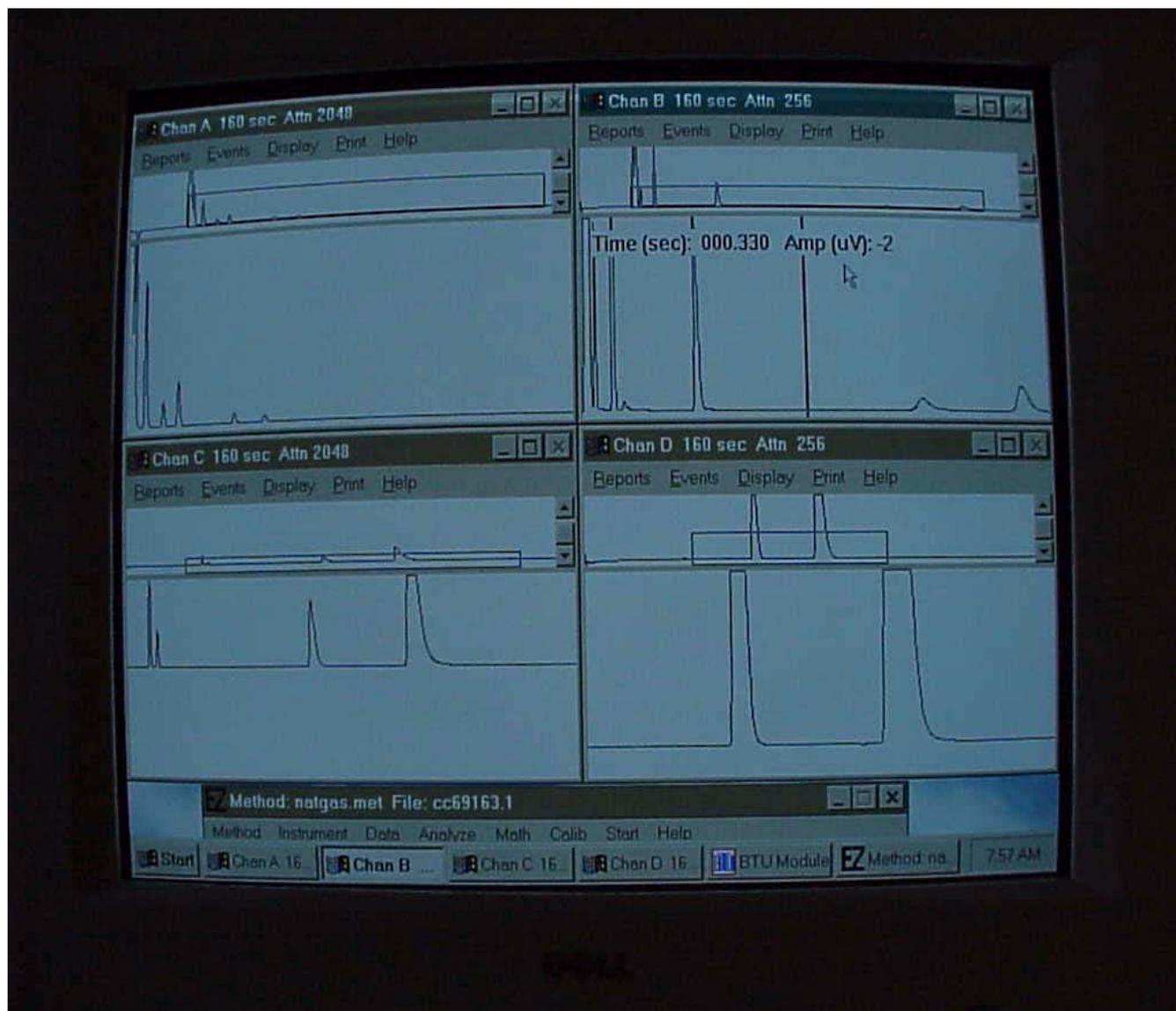
- GAS CHROMATOGRAPHY
 - ATMOSPHERIC PRESSURE
 - AVERAGE OF MULTIPLE RUNS
 - 14 COMPONENT ANALYSIS
 - EXCELLENT ACCURACY AND PRECISION
 - ANALYSIS TIME - 2 MINUTES
 - PORTABLE



QUAD 400 MTI AND AGILENT MICRO GC



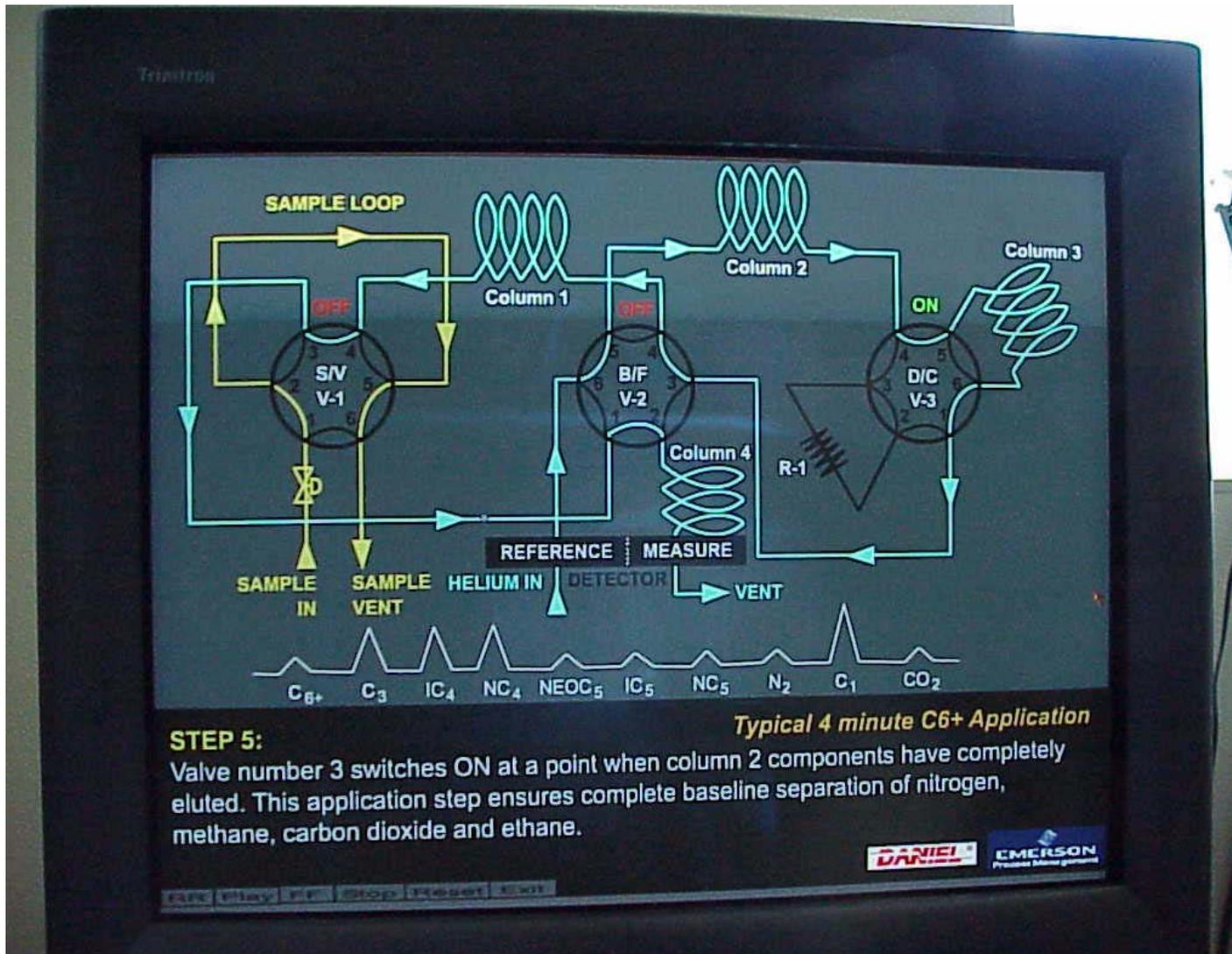
MTI 400 FUEL GAS GC SCAN



VARIAN CP-3800 HELIUM CHROMATOGRAPH



GAS CHROMATOGRAPH DETAIL



INSTRUMENTS - METHODS

- HELIUM ANALYSIS
 - BASED ON MASS SPECTRAL SEPARATION OF HELIUM- ION
 - BASED ON GAS CHROMATOGRAPHIC SEPARATION OF HELIUM
 - ACCURACY WITHIN 0.1% FROM 30 TO 100 % HELIUM



GAS BLENDING APPARATUS - MANIFOLD AND PRESSURE MEASUREMENT



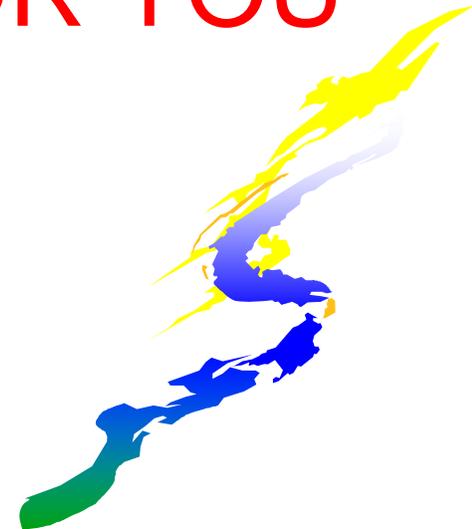
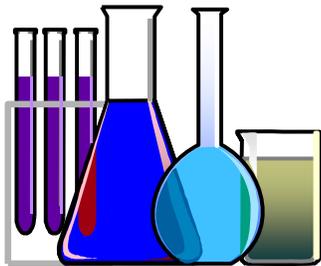


BUREAU OF LAND MANAGEMENT

AMARILLO FIELD OFFICE

GAS ANALYSIS LABORATORY

WHAT WE CAN DO FOR YOU



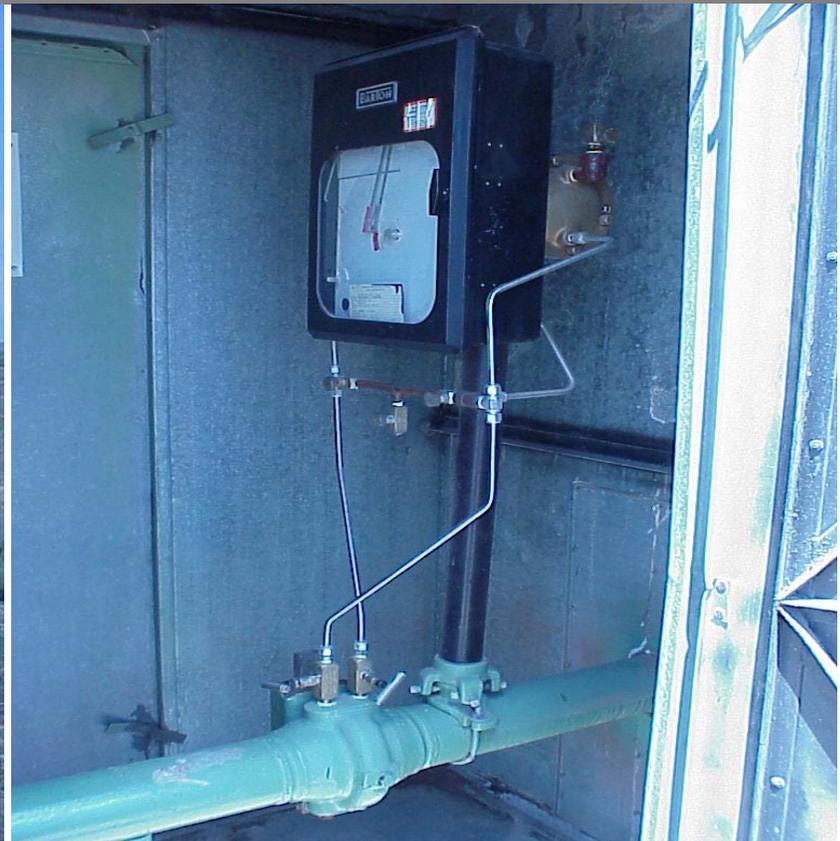
AVAILABLE LAB SERVICES

- **NATURAL GAS ANALYSIS**
 - ONSITE ANALYSIS/SAMPLING
 - ONSITE FEASIBILITY STUDIES
 - NATURAL GAS STANDARDS and BLENDS
 - MERCURY IN NATURAL GAS

- **HELIUM ANALYSIS**
- **PROVIDE CERTIFICATION FOR HELIUM ANALYSIS BY PRIVATE LABS**
- **TECHNICAL ASSISTANCE**
 - WATER TREATMENT
 - REVERSE OSMOSIS SYSTEMS
 - SPECIFICATIONS FOR ANALYTICAL EQUIPMENT



ONSITE SAMPLING



ONSITE SAMPLING



HOW PRIVATE LABS CAN BECOME CERTIFIED TO DO HELIUM ANALYSIS

- SAMPLING AND HANDLING OF SAMPLES MUST MEET API STANDARD 14.1, 2001 EDITION.
- **TWO WAYS TO BE CERTIFIED**
 - BLM SENDS 2 KNOWN SAMPLES TO PRIVATE LAB FOR ANALYSIS. RESULTS MEET ACCURACY REQUIREMENT
 - PRIVATE LAB SENDS ANALYZED SAMPLES TO BLM FOR COMPARISON. RESULTS MEET ACCURACY REQUIREMENT



ACCURACY REQUIREMENT FOR LABORATORY CERTIFICATION

Helium Mole %	Maximum Allowable Deviation (\pm Mole%)
0 to 1	0.04
>1 to 5	0.13
>5 to 10	0.26
> 10	0.3



Questions?

- Contact me at 806-383-7815
- Sam_Burton@blm.gov

