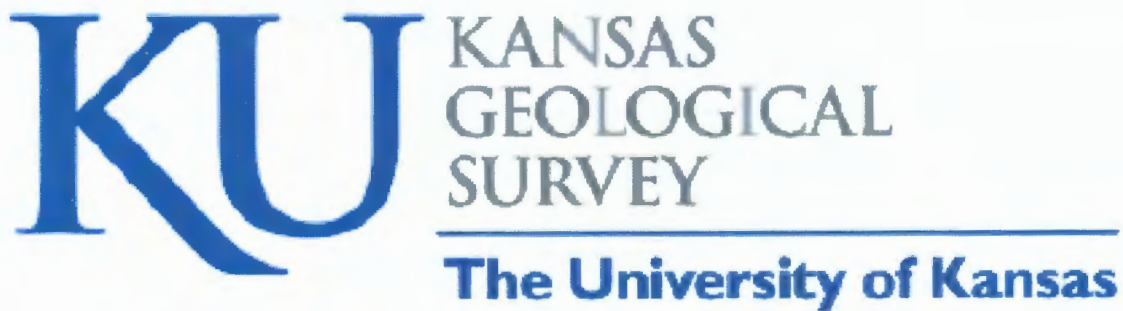


ANALYSIS OF KANSAS CITY, MARMATON, AND CHEROKEE GROUP  
CUTTINGS AND CORE SAMPLES FOR GAS CONTENT  
-- PETROL OIL & GAS #7-1 TRULOVE  
NW NW SE, sec. 7-T.21S.-R.14E., COFFEY COUNTY, KANSAS

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## SUMMARY

Four cuttings and six core samples from the Pennsylvanian Kansas City, Marmaton, and Cherokee Groups were collected from the Petrol Oil & Gas #7-1 Trulove, NW NW SE, sec. 7-T.21S.-R.14E., in Coffey Co., KS. The samples calculate as having the following gas contents:

- CORE -- shale seam in Bethany Falls Ls.; 1051.0'-1051.6' (3.4 scf/ton)
- CORE -- Hushpuckney Shale; 1057.0'-1057.6' (3.1 scf/ton)
- CUTTINGS -- Lake Neosho Shale; 1264' to 1268' (8 scf/ton)
- CUTTINGS -- Anna Shale; 1324' to 1326' (8 scf/ton)
- CORE -- "V shale"; 1482.7' to 1483.6' (25.6 scf/ton)
- CORE -- Croweburg coal; 1483.6' to 1484.5' (101.8 scf/ton)
- CORE -- shale above Tebo coal; 1552.7' to 1553.5' (3.3 scf/ton)
- CORE -- Tebo coal; 1556.1' to 1556.8' (68.0 scf/ton)
- CUTTINGS -- Riverton coal; 1728' to 1731' (large sample)<sup>1</sup> (125 scf/ton)
- CUTTINGS -- Riverton coal; 1728' to 1731' (small sample)<sup>1</sup> (135 scf/ton)

<sup>1</sup>assuming accompanying dark shales in sample desorb 3 scf/ton

The Riverton coal assays to be a high-volatile B bituminous coal. Chemical analysis of the gas indicates that it is a low-BTU gas, with mixed-biogenic-and-thermogenic origin.

## BACKGROUND

The Petrol Oil & Gas Trulove well, NW NW SE, sec. 7-T.21S.-R.14E., in Coffey Co., KS, was selected for cuttings desorption tests in association with an on-going coalbed gas research project at the Kansas Geological Survey. The samples were gathered January 8, 9, and 10, 2004, by K. David Newell and Troy Johnson of the Kansas Geological Survey. Cuttings samples were obtained during normal drilling of the well, with brief cessation of drilling before zones of interest (i.e., coals and dark shales in the Pennsylvanian Kansas City, Marmaton, and Cherokee Groups) were penetrated. The well was drilled using a mud rotary rig ("Rig #9") owned by Coconut Drilling.

Lag times for samples to reach the surface (important for assessing lost gas) were determined by periodic carbide tests.

Four cuttings samples were collected:

- Lake Neosho Shale; 1264' to 1268' (459 grams dry wt.)
- Anna Shale; 1324' to 1326' (422 grams dry wt.)
- Riverton coal; 1728' to 1731' (large sample) (920 grams dry wt.)
- Riverton coal; 1728' to 1731' (small sample) (311 grams dry wt.)

Six core samples were also collected:

- shale seam in Bethany Falls Ls.; 1051.0'-1051.6' (741.2 grams dry wt.)
- Hushpuckney Shale; 1057.0'-1057.6' (2625.6 grams dry wt.)

- "V shale"; 1482.7' to 1483.6' (3241.3 grams dry wt.)
- Croweburg coal; 1483.6' to 1484.5' (1107.5 grams dry wt.)
- shale above Tebo coal; 1552.7' to 1553.5' (3973.2 grams dry wt.)
- Tebo coal; 1556.1' to 1556.8' (1968.6 grams dry wt.)

The cuttings were placed in kitchen strainers after they were shoveled from a settling box in the mud stream situated immediately before the mud emptied into the mud pit. After catching the cuttings samples, the samples were washed in water while in the kitchen strainers to rid them of as much drilling mud as possible. The cuttings were then placed in desorption canisters.

The core samples was also obtained by a conventional coring technique, with time off bottom and at the surface noted.

Two samples (Lake Neosho Shale, Anna Shale) were placed in "Stoeckinger" desorption canisters, which average 38 cubic inches internal volume (620 cm<sup>3</sup>). The other samples were placed in canisters with approximately 153 cubic inches internal volume (2985 cm<sup>3</sup>).

The "Stoeckinger" desorption canisters were obtained from Bill Stoeckinger, consulting geologist to Petrol Oil and Gas. The other canisters were obtained from SSD, Inc., in Grand Junction, CO., or Pel-I-Cans in Dallas, TX.

Temperature baths for the desorption canisters were on site, with temperature kept at approximately 75 °F for the Croweburg and shallower samples. The Tebo and Riverton samples were placed in an 80 °F temperature bath. The canistered samples were transported to the laboratory at the Kansas Geological Survey in Lawrence, KS on January 10, 2004, and desorption measurements were continued at approximately the same temperature. Desorption measurements were periodically made until the canisters produced negligible gas with daily testing for at least two successive days.

## DESORPTION MEASUREMENTS

The equipment and method for measuring desorption gas is that prescribed by McLennan and others (1995). The volumetric displacement apparatus is a set of connected dispensing burettes, one of which measures the gas evolved from the desorption canister. The other burette compensates for the compression that occurs when the desorbed gas displaces the water in the measuring burette. This compensation is performed by adjusting the cylinders so that their water levels are identical, then figuring the amount of gas that evolved by reading the difference in water level using the volumetric scale on the side of the burette.

The desorbed gas that collected in the desorption canisters was periodically released into the volumetric displacement apparatus and measured as a function of time, temperature, and atmospheric pressure.

The time and atmospheric pressure were measured in the field using a portable weather station (model BA928) marketed by Oregon Scientific (Tualatin, OR). The atmospheric pressure was displayed in millibars on this instrument, however, this measurement was not the actual barometric pressure, but rather an altitude-compensated barometric pressure automatically converted to a sea-level-equivalent pressure. To translate this measurement to actual atmospheric pressure, a regression correlation was determined over several weeks by comparing readings from the Oregon Scientific instrument to that from a pressure transducer in the Petrophysics Laboratory in the Kansas Geological Survey in Lawrence, KS (Figure 1). The regression equation shown graphically in Figure 1 was entered into a spreadsheet and was used to automatically convert the millibar measurement to barometric pressure in pounds per square inch (psi).

A spreadsheet program written by K.D. Newell (Kansas Geological Survey) was used to convert all gas volumes at standard temperature and pressure. Conversion of gas volumes to standard temperature and pressure was by application of the perfect-gas equation, obtainable from basic college chemistry texts:

$$n = PV/RT$$

where n is moles of gas, T is degrees Kelvin (i.e., absolute temperature), V is in liters, and R is the universal gas constant, which has a numerical value depending on the units in which it is measured (for example, in the metric system  $R = 0.0820$  liter atmosphere per degree mole). The number of moles of gas (i.e., the value n) is constant in a volumetric conversion, therefore the conversion equation, derived from the ideal gas equation, is:

$$(P_{\text{stp}}V_{\text{stp}})/(RT_{\text{stp}}) = (P_{\text{rig}}V_{\text{rig}})/(RT_{\text{rig}})$$

Customarily, standard temperature and pressure for gas volumetric measurements in the oil industry are 60 °F and 14.7 psi (see Dake, 1978, p. 13), therefore  $P_{\text{stp}}$ ,  $V_{\text{stp}}$ , and  $T_{\text{stp}}$ , respectively, are pressure, volume, and temperature at standard temperature and pressure, where standard temperature is degrees Rankine ( $^{\circ}\text{R} = 460 + ^{\circ}\text{F}$ ).  $P_{\text{rig}}$ ,  $V_{\text{rig}}$ , and  $T_{\text{rig}}$ , respectively, are ambient pressure, volume and temperature measurements taken at the rig site or in the desorption laboratory.

The universal gas constant R drops out as this equation is simplified and the determination of  $V_{\text{stp}}$  becomes:

$$V_{\text{stp}} = (T_{\text{stp}}/T_{\text{rig}}) (P_{\text{rig}}/P_{\text{stp}}) V_{\text{rig}}$$

The conversion calculations in the spreadsheet were carried out in the English metric system, the customary measure system used in American coal and oil industry. V is therefore converted to cubic feet; P is psia; T is °R. The desorbed gas was summed over the time period for which the coal samples evolved all of their gas.

Lost gas (i.e., the gas lost from the sample from the time it was drilled, brought to the surface, to the time it was canistered) was determined using the direct method (Kissel and others, 1975; also see McLennan and others, 1995, p. 6.1-6.14) in which the cumulative gas evolved is plotted against the square root of elapsed time. Time zero is assumed to be the moment that the rock is cut and its cuttings circulated off bottom. Characteristically, the cumulative gas evolved from the sample, when plotted against the square root of time, is linear for a short time period after the sample reaches ambient surface pressure conditions, therefore lost gas is determined by a line projected back to time zero. The period of linearity generally is about an hour for cuttings samples.

## LITHOLOGIC ANALYSIS

Upon removal from the canisters, the cuttings were washed of drilling mud and dried in air for several days. After drying, the cuttings were weighed and then dry sieved into 5 size fractions:  $>0.0930''$ ,  $>0.0661''$ ,  $>0.0460''$ ,  $>0.0331''$ , and  $<0.0331''$ . For large sample sizes, the cuttings were run through a sample splitter and a lesser portion (approximately 75 grams) were sieved and weighed, and the derived size-fraction ratios were applied to the entire sample.

The size fractions were then inspected and sorted by hand under a dissecting microscope. Three major lithologic categories were differentiated: coal, dark shales (generally Munsell rock colors N3 [dark gray], N2 [grayish black], and N1 [black] on dry surface), and lighter-colored lithologies and/or dark and light-colored carbonates. The lighter-colored lithologies are considered to be incapable of generating significant amounts of gas. After sorting, and for every size class, each of these three lithologic categories was weighed and the proportion of coal, dark shale, and light-colored lithologies were determined for the entire cuttings sample based on the weight percentages.

## DATA PRESENTATION

Data and analyses accompanying this report are presented in the following order: 1) data tables for the desorption analyses, 2) lost-gas graphs, 3) "lithologic component sensitivity analyses" showing the interdependence of gas evolved from dark shale versus coal in each cuttings sample, 4) a summary component analysis for all samples showing relative reliability of the data from all the samples, and 5) a desorption graph for all the samples.

### *Data Tables of the Desorption Analyses (Table 1)*

These are the basic data used for lost-gas analysis and determination of total gas desorbed from the cuttings samples. Basic temperature, volume, and barometric measurements are listed at left. Farther to the right, these are converted to standard temperature, pressure and volumes. The volumes are cumulatively summed, and converted to scf/ton based on the total weight of coal *and* dark shale in the sample. At the right of the table, the time of the measurements are listed and converted to hours (and square root of hours) since the sample was drilled.

### *Lost-Gas Graphs (Figures 2-11)*

Gas lost prior to the canistering of the sample was estimated by extrapolation of the first few data points after the sample was canistered. The linear characteristic of the initial desorption measurements is usually lost within the first hour after the cuttings leave the bottom of the hole, thus data for cuttings are presented in the lost-gas graphs for only up to one hour after cuttings were off bottom. Lost-gas for the core samples were posted for a 9-hour period after the core was pulled off bottom. The lost-gas volumes derived from these graphs are incorporated in the data tables described above.

### *"Lithologic Component Sensitivity Analyses" (Figures 12-14)*

Collection of pure lithologies from relatively thin-bedded strata is rather difficult using cuttings. Mixed lithologies are more the norm rather than the exception. Some of this mixing is due to cavings from strata farther up hole. The mixing may also be due to collection of two or more successively drilled lithologies in the kitchen sieve at the exit line, or differential lifting of relatively less-dense coal compared to other lithologies, all of which are more dense than coal.

The total gas evolved from the sample is due to gas being desorbed from both the coal and dark shale. Both lithologies are capable of generating gas, albeit the coal will be richer in gas than the dark-colored shale. Even though dark-colored shale is less rich in sorbed gas than coal, if a sample has a large proportion of dark, organic-rich shale and only a minor amount of coal, the total volume of gas evolved from the dark-shale component may be considerable. The lighter-colored lithologies are considered to be incapable of generating significant amounts of gas.

The total amount of gas evolved from a cuttings sample can be expressed by the following equation:

$$\text{Total gas (cm}^3\text{)} = [\text{weight}_{\text{coal}} \text{ (grams)} \times \text{gas content}_{\text{coal}} \text{ (cm}^3\text{/gram)}] + [\text{weight}_{\text{dark shale}} \text{ (grams)} \times \text{gas content}_{\text{dark shale}} \text{ (cm}^3\text{/gram)}]$$

A unique solution for  $\text{gas content}_{\text{coal}}$  in this equation is not possible because  $\text{gas content}_{\text{dark shale}}$  is not known exactly. An answer can only be expressed as a linear solution to the above equation. The richer in gas the dark shales are, the poorer in gas the admixed coal has to be, and vice versa. If there is little dark shale in a sample, a relatively well constrained answer for  $\text{gas content}_{\text{coal}}$  can be obtained. Conversely, if considerable dark shale is in a sample, the gas content of a coal will be hard to precisely determine.

The lithologic-component-sensitivity-analysis diagram therefore expresses the bivariate nature inherent in the determination of gas content in mixed cuttings. The gas content of dark shales in Kansas can vary greatly. Proprietary desorption analyses of dark shales in cores from southeastern Kansas have registered as much as 50 scf/ton, but can be as low as 2-4 scf/ton.

A value of 3 scf/ton for average dark shale is based on the assay of the gas content of cores of dark shales in wells in southeastern Kansas. However, high-gamma-ray shales (such as the Excello Shale), also colloquially known as "hot shales", typically have more organic matter and associated gas content than dark shales displaying no excessive gamma-ray level. Determination of gas content for a coal associated with a "hot" shale therefore carries more uncertainty than if the coal were associated with a shale without a high gamma-ray value.

In general, the assumed shale gas content does not have to be very much greater than 10 scf/ton before the associated coal starts to have a gas content less than that of the dark shale. In all the lithologic-component-sensitivity-analysis diagrams, a "break-even" point is therefore noted where the gas content of the coal is equal to that of the dark shale. This "break-even" point corresponds to the minimum gas content assignable to the coal and maximum gas content assignable to the dark shale. It can also be thought of the scf/ton gas content of the cuttings sample minus the weight of any of the lighter-colored lithologies, which are assumed to have no inherent gas content. Conversely, to assume that all the gas evolved from a cuttings sample is derived solely from the coal would result in an erroneously high gas content for the coal.

#### *Desorption Graphs (Figures 15, 16)*

These are desorption graphs (gas content per weight vs. square root of time) for all the samples. The rate at which gas is evolved from the samples is thus comparable at a common scale. Core and cuttings data are presented on separate graphs.

#### *Gas Chemistry (Figure 17)*

Gas isotopic chemistry is compared to similar analyses on other nearby conventional and coalbed gases.

### ASHING and DENSITY EXPERIMENTS

Simple ashing of the samples was carried out in a muffle furnace at the Kansas Geological Survey. The samples were first weighed and then subjected to 110 °C until their weight stabilized. This first firing approximates moisture content. A second firing at 750 °C for three to four days essentially ashed the sample. Two crucibles of sample were utilized for both the 110 °C and 750 °C firings. Each crucible was filled with approximately 1.5 grams of pulverized coal (i.e., < 0.0460" sieve size). Results were accepted if the difference in weight loss for each sample was less than 2%.

<i>unit</i>	<i>depth</i>	<i>moisture</i>	<i>ash</i>	<i>moisture-free ash</i>
shale in B. Falls Ls.	1051'	0.73%	83.37%	83.98%
Hushpuckney Shale	1057'	1.04%	91.03%	91.98%
Lake Neosho Shale	1264'	0.88%	79.96%	80.67%
Anna Shale	1324'	0.94%	77.37%	78.10%
"V shale"	1483'	1.1%	77.6%	78.4%
Croweburg coal	1484'	1.02%	7.67%	7.75%

shale over Tebo coal	1553'	1.44%	90.00%	91.31%
Tebo coal	1556'	2.70%	35.75%	36.74%
Riverton large smpl	1728'	2.23%	7.59%	7.76% <sup>1</sup>
Riverton small smpl	1728'	1.91%	6.35%	6.47% <sup>1</sup>

<sup>1</sup>source of data for ashing and moisture are proximate analyses from Luman's Laboratories, Chetopa, KS

Using the equation from McLennan and others (1995):

$$G_c = G_{pc} (1 - a_d)$$

where:

$G_c$  = gas content, scf/ton

$G_{pc}$  = "pure coal", gas content, scf/ton

$a_d$  = dry ash content, weight fraction

the gas content of the samples converts to:

<i>unit</i>	<i>depth</i>	<i>moisture-free ash</i>	$G_c$	$G_{pc}$
shale in B. Falls Ls.	1051'	83.98%	3.4 scf/ton	21.2 scf/ton
Hushpuckney Shale	1057'	91.98%	3.1 scf/ton	38.7 scf/ton
Lake Neosho Shale	1264'	80.67%	8 scf/ton	42 scf/ton
Anna Shale	1324'	78.10%	8 scf/ton	37 scf/ton
"V shale"	1483'	78.4%	25.6 scf/ton	118.5 scf/ton
Croweburg coal	1484'	7.75%	101.8 scf/ton	110.4 scf/ton
shale over Tebo coal	1553'	91.31%	3.3 scf/ton	26.4 scf/ton
Tebo coal	1556'	36.74%	68.0 scf/ton	107.5 scf/ton
Riverton large smpl	1728'	7.59%	125 scf/ton	136 scf/ton
Riverton large smpl	1728'	6.47%	135 scf/ton	145 scf/ton

Coal samples were also tested for their density. Cuttings samples (4 to 5 grams) were weighed and then placed in water in a 10-cc graduated cylinder to determine the volume of the sample. The core samples were weighed and immersed in water in a beaker filled to its brim. With placing the sample in the beaker, the displaced water was spilled from the beaker and subsequently weighed. The volume of the sample is thus easily converted to volume using 1 gram/cc for the density of the water. The following density measurements were calculated:

<i>unit</i>	<i>depth</i>	<i>density and uncertainty</i>
shale in Bethany Falls Ls.	1051'	2.50 g/cc ± 0.06
Hushpuckney Shale	1057'	2.44 g/cc ± 0.01
Lake Neosho Shale	1264'	2.38 g/cc ± 0.07
Anna Shale	1324'	2.39 g/cc ± 0.07
"V shale"	1483'	2.08 g/cc ± 0.05
Croweburg coal	1484'	1.36 g/cc ± 0.03



shale over Tebo coal	1553'	2.49 g/cc ± 0.24
Tebo coal	1556'	1.67 g/cc ± 0.07
Riverton large smpl	1728'	1.26 g/cc ± 0.07
Riverton small smpl	1728'	1.26 g/cc ± 0.07

Compositional and isotopic chemistry were performed on a gas sample from the "large sample" of the Riverton coal. This analysis was performed by Isotech Laboratories in Champaign, IL. The sample was taken after desorption ceased and consisted of headspace gas in the canister.

*Isotopic Analyses*

Analysis	Riverton (1728')
$\delta^{13}\text{CO}_2$	2.27
$\delta^{13}\text{C}_{\text{methane}}$	-55.29
$\delta\text{DC}_{\text{methane}}$	-247.7
$\delta^{13}\text{C}_{\text{ethane}}$	-19.00

*Chemical Analyses (as reported; red = hydrocarbons; blue = non hydrocarbons, green = oxygen)*

Component	(%)
Methane	67.38
Ethane	0.452
Propane	0.0482
n-Butane	0.0055
iso-Butane	0.0134
n-Pentane	0.0000
iso-Pentane	0.0000
Hexane+	0.0039
Nitrogen	29.00
Oxygen	0.488
Argon	0.272
Hydrogen	0.0000
Carbon Dioxide	2.33
Helium	0.0027

*Chemical Analyses (recalculated after removing atmospheric contamination; red = hydrocarbons; blue = non hydrocarbons)*

Component (%) <sup>1</sup>	Riverton
Methane	69.00
Ethane	0.463
Propane	0.0494
n-Butane	0.0060
iso-Butane	0.0140
n-Pentane	0.0000
iso-Pentane	0.0000

Hexane+	0.0040
Nitrogen	27.83
Argon	0.260
Hydrogen	0.0000
Carbon Dioxide	2.38
Helium	0.0028

<sup>1</sup>atmospheric component (based on oxygen content and atmospheric ratio of other gases to oxygen) subtracted from the analysis, with components recalculated to 100%

#### *Other Chemical Data*

	<b>Riverton</b>
Calculated BTU	740
Total % non-HCs	30.48
HC Wetness (%)	0.77

Plotting of the isotopes and gas wetness (Figure 17) indicates that the gas is of mixed biogenic and thermogenic origin. The large quantity of admixed non-hydrocarbon gases indicates that the gas produced will be a low-BTU gas (<950 BTU).

## RESULTS and DISCUSSION

Proximate analyses were made for the Riverton coal samples. The proximate analyses were performed on the following samples by Luman's Laboratory (see Appendix 1):

Luman's Lab proximate analysis:

<i>unit</i>	<i>depth</i>	<i>moisture</i>	<i>ash</i>	<i>moisture-free ash</i>
Riverton large smpl	1728'	2.23%	7.59%	7.76%
Riverton small smpl	1728'	1.91%	6.35%	6.47%

According to the BTU/lb. (dry, ash-free) determinations, all the samples can be classified as high-volatile B bituminous coal.

The Riverton samples, even though they were from cuttings, registered good gas content. Two samples of cuttings, designated the "large" and "small" samples, were taken from this zone. The "small sample" had a markedly greater gas content (scf/ton) than the "large sample" 157.3 scf/ton vs. 125.8 scf/ton, based on the weight of coal calculated in the sample, even though the physical attributes of the samples were virtually identical. Upon examination of the desorption curves (Figure 15) the "small sample" shows an increase in gas generation in its later stages of desorption. This indicates a late-stage biogenic gas being produced in the desorption process. Using a curve based on the larger of the two samples, the gas content of the "small sample" (not counting residual) is likely closer to 136 scf/ton rather than 157 scf/ton.

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## FIGURES and TABLES

FIGURE 1. Correlation of field barometer to Petrophysics Lab pressure transducer.

TABLE 1. Desorption measurements for samples.

FIGURE 2. Lost-gas graph for shale seam in Bethany Falls Ls.; 1051.0'-1051.6'.

FIGURE 3. Lost-gas graph for Hushpuckney Shale; 1057.0'-1057.6'.

FIGURE 4. Lost-gas graph for Lake Neosho Shale; 1264' to 1268'.

FIGURE 5. Lost-gas graph for Anna Shale; 1324' to 1326'.

FIGURE 6. Lost-gas graph for "V shale"; 1482.7' to 1483.6'.

FIGURE 7. Lost-gas graph for Croweburg coal; 1483.6' to 1484.5'.

FIGURE 8. Lost-gas graph for shale above Tebo coal; 1552.7' to 1553.5'.

FIGURE 9. Lost-gas graph for Tebo coal; 1556.1' to 1556.8'.

FIGURE 10. Lost-gas graph for Riverton coal; 1728' to 1731' (large sample).

FIGURE 11. Lost-gas graph for Riverton coal; 1728' to 1731' (small sample).

FIGURE 12. Sensitivity analysis for Lake Neosho Shale; 1264' to 1268'.

FIGURE 13. Sensitivity analysis for Anna Shale; 1324' to 1326'.

FIGURE 14. Sensitivity analysis for Riverton coal; 1728' to 1731'.

FIGURE 15. Desorption graph for cuttings samples.

FIGURE 16. Desorption graph for core samples.

FIGURE 17. Crossplot of isotopes and wetness for the Riverton gas.

APPENDIX 1. Float/sink and proximate analyses for the two Riverton samples.

## Correlation of Field Barometer to KGS Petrophysics Lab Barometer

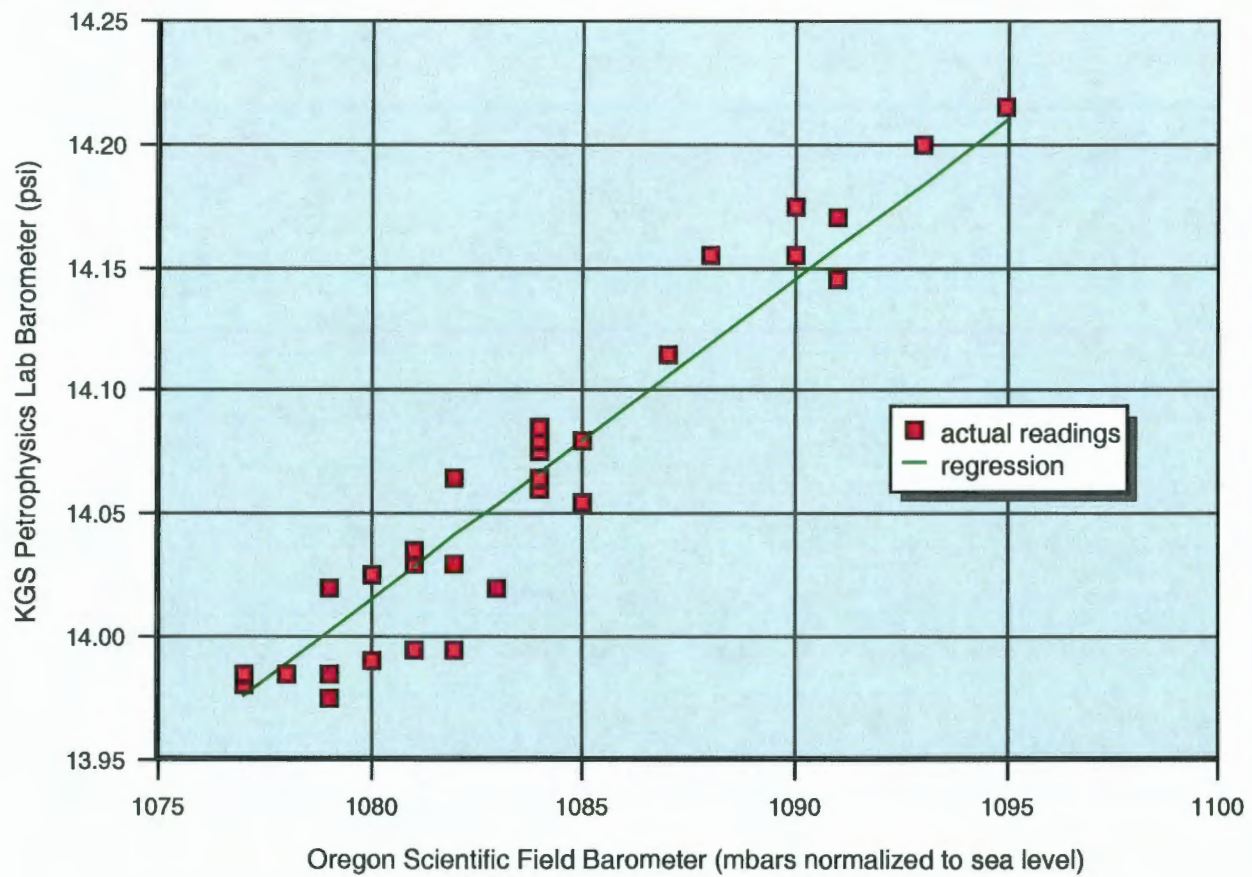


FIGURE 1.

TABLE 1 - Desorption measurements for Petrol Oil & Gas #7-1 Trulove, NW NW SE 7-21S-14E, Coffey Co., KS

**SAMPLE: 1051.0'-1051.6' (whole seam in Bothany Falls La.) core in canister MER 3**

dry sample weight:		lbs.	grams	wet sample weight:		lbs.	grams	moisture %	est. lost gas (cc) =	TIME OF:		elapsed time (off bottom to canistering)						
		1.634	741.20			1.660	762.00	2.73%	48	off bottom	at surface	in canister	133.0 minutes					
										1/8/04	5:53	1/8/04	6:08					
													2.17 hours					
													1.468847429 SCFT (hrs)					
RIGLAB MEASUREMENTS		CONVERSION OF RIGLAB MEASUREMENTS TO STP (@80 deg F, 14.7 psi)						CUMULATIVE VOLUMES (@STP)		SCF/TON	SCF/TON	TIME OF MEASURE		TIME SINCE		in canister		SCFT hrs. (since off bottom)
measured cc	measured T (F)	measured P	cubic ft	absolute T (F)	psi	cubic ft (@STP)	cc (@STP)	cubic ft	cc	without lost gas	with lost gas	off bottom	at surface	in canister	1/8/04	6:08	1.468847429	SCFT (hrs)
0	74	1078	0	534	13.992	0	0.00	0	0.00	0.00	2.07	1/8/04 6:11	2:18:00	0:05:00			1.516575089	
0	72	1079	0	532	14.005	0	0.00	0	0.00	0.00	2.07	1/8/04 6:16	2:23:00	0:10:00			1.543804824	
2	73	1079	7E-05	533	14.005	6.56489E-05	1.66	6.56489E-05	1.66	0.08	2.18	1/8/04 6:31	2:36:00	0:25:00			1.622754859	
5	74	1079	0.0002	534	14.005	0.000163815	4.64	0.000229464	6.50	0.28	2.36	1/8/04 6:58	3:03:00	0:50:00			1.74842492	
8	75	1080	0.0002	535	14.018	0.000198392	5.58	0.000425858	12.08	0.52	2.60	1/8/04 9:39	3:46:00	1:33:00			1.940790217	
4	75	1080	0.0001	535	14.018	0.000130928	3.71	0.000556784	15.77	0.88	2.78	1/8/04 10:01	4:08:00	1:55:00			2.033060091	
4	73	1080	0.0001	533	14.018	0.000131419	3.72	0.000668204	19.49	0.84	2.92	1/8/04 10:31	4:36:00	2:25:00			2.152517905	
7	75	1079	0.0002	535	14.005	0.000228912	6.48	0.000917116	25.97	1.12	3.20	1/8/04 11:16	5:23:00	3:10:00			2.320201141	
8	75	1079	0.0003	535	14.005	0.000281614	7.41	0.00117873	33.36	1.44	3.52	1/8/04 12:01	6:08:00	3:55:00			2.476556749	
19	80	1077	0.0007	540	13.979	0.000614439	17.40	0.001793189	50.76	2.19	4.27	1/8/04 14:47	8:54:00	6:41:00			2.983266778	
-3	79	1078	-0.0001	539	13.992	-0.72869E-05	-2.75	0.001695882	48.02	2.08	4.15	1/8/04 17:41	11:48:00	9:35:00			3.435112807	
-10	76	1082	-0.0004	536	14.044	-0.000327315	-9.27	0.001368567	36.75	1.66	3.75	1/8/04 21:19	15:28:00	13:13:00			3.928526138	
-8	75	1084	-0.0002	535	14.070	-0.00019712	-5.58	0.001171447	33.17	1.43	3.51	1/8/04 0:00	18:07:00	15:54:00			4.256367779	
-5	72	1086	-0.0002	532	14.098	-0.000185497	-4.89	0.00100595	28.49	1.23	3.31	1/8/04 4:49	22:56:00	20:43:00			4.768675999	
-1	73	1089	-4E-05	533	14.135	-3.31287E-05	-0.94	0.000972821	27.55	1.19	3.27	1/8/04 8:01	28:06:00	23:55:00			5.112077203	
4	75	1091	0.0001	535	14.181	0.000132262	3.75	0.001105083	31.29	1.35	3.43	1/8/04 11:26	29:33:00	27:20:00			5.43599117	
0	75	1089	0	535	14.135	0	0.00	0.001105083	31.29	1.35	3.43	1/8/04 14:16	32:25:00	30:12:00			5.693563818	
0	75	1089	0	535	14.135	0	0.00	0.001105083	31.29	1.35	3.43	1/8/04 15:52	33:59:00	31:46:00			5.829522585	
-6	75	1091	-0.0002	535	14.181	-0.000198393	-5.82	0.00090869	25.67	1.11	3.16	1/8/04 19:43	37:50:00	35:37:00			6.150880698	
0	73	1091	0	533	14.181	0	0.00	0.00090869	25.67	1.11	3.16	1/10/04 0:24	42:31:00	40:18:00			6.520480555	
6	74	1087	0.0002	534	14.109	0.000196035	5.61	0.001104726	31.28	1.35	3.43	1/10/04 13:06	55:13:00	53:00:00			7.430791793	
-7	70	1091	-0.0002	530	14.181	-0.000233842	-8.82	0.000871084	24.87	1.07	3.14	1/10/04 17:10	59:24:00	57:11:00			7.707139547	
7	74	1087	0.0002	534	14.109	0.000231041	6.54	0.001102125	31.21	1.35	3.42	1/11/04 21:10	87:17:00	85:04:00			9.342554988	
-8	72	1093	-0.0003	532	14.187	-0.000286503	-7.55	0.000835823	23.66	1.02	3.10	1/12/04 9:22	89:29:00	87:16:00			9.974133212	
-3	78	1096	-0.0001	536	14.226	-9.9485E-05	-2.82	0.000738158	20.85	0.90	2.98	1/13/04 11:46	125:53:00	123:40:00			11.21977421	
6	75	1085	0.0002	535	14.083	0.000197302	5.59	0.000933459	26.43	1.14	3.22	1/14/04 11:48	149:55:00	147:42:00			12.24404817	
-4	75	1089	-0.0001	535	14.135	-0.000132019	-3.74	0.00080144	22.89	0.98	3.06	1/15/04 11:23	173:30:00	171:17:00			13.17193987	
-19	73	1089	-0.0007	533	14.135	-0.000829445	-17.82	0.000171995	4.87	0.21	2.29	1/21/04 10:44	318:51:00	314:36:00			17.8002809	

DECANISTERED 1/27/2004; sample dried 6 days in air

**SAMPLE: 1057.0'-1057.6' (Hushpuckney Shale) core in canister 4**

dry sample weight:		lbs.	grams	wet sample weight:		lbs.	grams	moisture %	est. lost gas (cc) =	TIME OF:		elapsed time (off bottom to canistering)						
		5.769	2625.83			5.955	2700.88	2.79%	135	off bottom	at surface	in canister	124.3 minutes					
										1/8/04	5:53	1/8/04	7:57					
													2.071 hours					
													1.439039031 SCFT (hrs)					
RIGLAB MEASUREMENTS		CONVERSION OF RIGLAB MEASUREMENTS TO STP (@80 deg F, 14.7 psi)						CUMULATIVE VOLUMES (@STP)		SCF/TON	SCF/TON	TIME OF MEASURE		TIME SINCE		in canister		SCFT hrs. (since off bottom)
measured cc	measured T (F)	measured P	cubic ft	absolute T (F)	psi	cubic ft (@STP)	cc (@STP)	cubic ft	cc	without lost gas	with lost gas	off bottom	at surface	in canister	1/8/04	7:57	1.439039031	SCFT (hrs)
16	74	1078	0.0008	534	13.992	0.000523722	14.83	0.000523722	14.83	0.18	1.83	1/8/04 6:03	2:10:00	0:05:45			1.471880144	
7	74	1078	0.0002	534	13.992	0.000229128	8.49	0.00075285	21.32	0.28	1.91	1/8/04 6:08	2:13:00	0:08:45			1.468847429	
7	74	1076	0.0002	534	13.992	0.000229128	8.49	0.000981976	27.81	0.34	1.99	1/8/04 6:10	2:17:00	0:12:45			1.511070261	
13	72	1079	0.0005	532	14.005	0.00042752	12.11	0.001409498	39.91	0.49	2.13	1/8/04 6:20	2:27:00	0:22:45			1.585247584	
7	73	1079	0.0002	533	14.005	0.000229771	8.51	0.00183927	48.42	0.57	2.21	1/8/04 6:30	2:37:00	0:32:45			1.617811408	
15	74	1079	0.0005	534	14.005	0.000491445	13.92	0.002130714	60.33	0.74	2.36	1/8/04 6:55	3:02:00	0:57:45			1.74184673	
10	75	1080	0.0004	535	14.018	0.00032732	9.27	0.002458035	69.80	0.85	2.50	1/8/04 9:36	3:45:00	1:40:45			1.938491673	
5	75	1080	0.0002	535	14.018	0.00016368	4.83	0.002621895	74.24	0.91	2.55	1/8/04 10:00	4:07:00	2:02:45			2.028957039	
4	73	1080	0.0001	533	14.018	0.000131419	3.72	0.002753114	77.96	0.95	2.80	1/8/04 10:30	4:37:00	2:32:45			2.148642983	
8	75	1079	0.0003	535	14.005	0.000281614	7.41	0.003014726	85.37	1.04	2.89	1/8/04 11:15	5:22:00	3:17:45			2.316608714	
11	75	1079	0.0004	535	14.005	0.000359719	10.19	0.003374448	95.55	1.17	2.81	1/8/04 12:00	6:07:00	4:02:45			2.473169574	
21	80	1077	0.0007	540	13.979	0.000679117	19.23	0.004053564	114.78	1.40	3.05	1/8/04 14:50	6:57:00	6:52:45			2.991855508	
0	79	1078	0	539	13.992	0	0.00	0.004053564	114.78	1.40	3.05	1/8/04 17:42	11:49:00	9:44:45			3.437537879	
-8	76	1082	-0.0002	536	14.044	-0.000198389	-5.56	0.003857175	109.22	1.33	2.98	1/8/04 21:25	15:32:00	13:27:45			3.941235001	
-7	75	1084	-0.0002	535	14.070	-0.000229973	-8.51	0.003827202	102.71	1.25	2.90	1/8/04 0:00	18:07:00	18:02:45			4.256367779	
-5	72	1086	-0.0002	532	14.098	-0.000185497	-4.89	0.003481705	98.02	1.20	2.84	1/8/04 4:48	22:55:00	20:50:45			4.787135539	
4	73	1089	0.0001	533	14.135	0.000132515	3.75	0.00359422	101.78	1.24	2.89	1/8/04 6:01	28:06:00	24:03:45			5.112077203	
0	75	1091	0	535	14.181	0	0.00	0.00359422	101.78	1.24	2.89	1/8/04 11:25	29:32:00	27:27:45			5.434457961	
4	75	1089	0.0001	535	14.135	0.000132019	3.74	0.003726239	105.51	1.29	2.93	1/8/04 15:52	33:59:00	31:54:45			5.829522585	
-9	75	1091	-0.0003	535	14.181	-0.000297589	-8.43	0.00342685	97.09	1.18	2.83	1/8/04 19:43	37:50:00	35:45:45			6.150880698	
0	73	1091	0	533	14.181	0	0.00	0.00342685	97.09	1.18	2.83	1/10/0						

-15 73 1089 -0.0005 533 14.135 -0.00048693 -14.07 0.003121975 88.40 1.08 2.73 1/21/04 10:45 318:52:00 314:47:45 17.80074905  
 DECANISTERED 01/27/2004; sample dried 6 days in air

SAMPLE: 1284' to 1288' (Lake Necohe Shale) cuttings in canister Stoelckinger #5

dry sample weight:			lb.	grams	wet sample weight:		lb.	grams	moisture %	est. lost gas (cc) =	TIME OF:			elapsed time (off bottom to canistering)	
dry sample weight:			0.333	151.02	wet sample weight:		7.238	3282.04	1.24%	20	off bottom	at surface	in canister	18.3 minutes	
dry sample weight:			0.333	151.02	wet sample weight:		7.238	3282.04	1.24%	20	1/8/04 17:18	1/8/04 17:29	1/8/04 17:34	0.272 hours	
dry sample weight:			0.333	151.02	wet sample weight:		7.238	3282.04	1.24%	20	1/8/04 17:18	1/8/04 17:29	1/8/04 17:34	0.522015325 SQR (hrs)	
dry sample weight:			0.333	151.02	wet sample weight:		7.238	3282.04	1.24%	20	1/8/04 17:18	1/8/04 17:29	1/8/04 17:34	SQRT hrs. (since off bottom)	
RIGLAB MEASUREMENTS			CONVERSION OF RIGLAB MEASUREMENTS TO STP (@60 deg F; 14.7 psi)				CUMULATIVE VOLUMES (@STP)		SCF/TON	SCF/TON	TIME OF MEASURE			SQRT hrs. (since off bottom)	
measured cc	measured T (F)	measured P	cubic ft	absolute T (F)	psia	cubic ft (@STP)	cc (@STP)	cubic ft	cc	without lost gas	with lost gas	off bottom	at surface	in canister	SQRT hrs. (since off bottom)
8	79	1078	0.0002	539 13.992	0.000194574	5.51	0.000194574	5.51	1.17	5.41	1/8/04 17:44	0:25:51	0:14:45	0:09:30	0.858378956
1	79	1078	4E-05	539 13.992	3.2429E-05	0.92	0.000227003	6.43	1.38	5.81	1/8/04 17:46	0:27:51	0:16:45	0:11:30	0.881297781
1	79	1078	4E-05	539 13.992	3.2429E-05	0.92	0.000259432	7.35	1.58	5.80	1/8/04 17:49	0:31:08	0:20:00	0:14:45	0.719953702
2	79	1078	7E-05	539 13.992	6.48579E-05	1.84	0.00032429	9.18	1.95	6.19	1/8/04 17:54	0:35:38	0:24:30	0:18:15	0.770281334
2	79	1078	7E-05	539 13.992	6.48579E-05	1.84	0.000389148	11.02	2.34	6.56	1/8/04 18:02	0:44:06	0:33:00	0:27:45	0.857321141
1	78	1078	4E-05	538 13.992	3.24893E-05	0.92	0.000421837	11.94	2.53	6.78	1/8/04 18:09	0:50:38	0:39:30	0:34:15	0.918331821
2	78	1078	7E-05	538 13.992	6.49785E-05	1.84	0.000486615	13.78	2.92	7.17	1/8/04 18:21	1:03:06	0:52:00	0:46:45	1.025508004
1	78	1078	4E-05	538 13.992	3.24893E-05	0.92	0.000519105	14.70	3.12	7.36	1/8/04 18:37	1:18:38	1:07:30	1:02:15	1.144552314
1	77	1078	4E-05	537 13.992	3.25498E-05	0.92	0.000551854	15.62	3.31	7.58	1/8/04 18:58	1:37:38	1:26:30	1:21:15	1.275408431
1	78	1080	4E-05	538 14.018	3.2871E-05	0.93	0.000584325	16.55	3.51	7.75	1/8/04 19:00	1:41:38	1:30:30	1:25:15	1.30128142
1	76	1080	4E-05	538 14.018	3.2871E-05	0.93	0.000618998	17.47	3.71	7.95	1/8/04 19:42	2:23:38	2:12:30	2:07:15	1.547040185
0	75	1084	0	535 14.070	0	0.00	0.000618998	17.47	3.71	7.95	1/8/04 0:01	8:42:38	8:31:30	8:26:15	2.590388769
0	72	1086	0	532 14.098	0	0.00	0.000618998	17.47	3.71	7.95	1/8/04 4:50	11:31:38	11:20:30	11:15:15	3.3950945
1	73	1089	4E-05	533 14.135	3.31287E-05	0.94	0.000650125	18.41	3.91	8.15	1/8/04 8:02	14:43:38	14:32:30	14:27:15	3.83753393
0	75	1091	0	535 14.161	0	0.00	0.000650125	18.41	3.91	8.15	1/9/04 11:28	18:09:38	17:58:30	17:53:15	4.281455151
-1	75	1089	-4E-05	535 14.135	-3.30048E-05	-0.93	0.00061712	17.47	3.71	7.95	1/9/04 15:53	22:34:38	22:23:30	22:18:15	4.751488994
-2	75	1091	-7E-05	535 14.161	-8.61309E-05	-1.07	0.000550989	15.80	3.31	7.55	1/9/04 19:44	28:25:38	28:14:30	28:09:15	5.140687373
0	73	1091	0	533 14.161	0	0.00	0.000550989	15.80	3.31	7.55	1/10/04 0:25	31:08:38	30:55:30	30:50:15	5.577833907
-2	74	1087	-7E-05	534 14.109	-8.60118E-05	-1.87	0.000484978	13.73	2.91	7.18	1/10/04 13:07	43:48:38	43:37:30	43:32:15	6.818912297
-4	70	1091	-0.0001	530 14.181	-0.000133509	-3.78	0.000351468	9.95	2.11	8.35	1/10/04 17:15	47:58:38	47:45:30	47:40:15	8.924112458
-4	74	1087	-0.0001	534 14.109	-0.000132024	-3.74	0.000219445	6.21	1.32	5.58	1/11/04 21:11	75:52:38	75:41:30	75:36:15	8.710721383
-6	72	1093	-0.0002	532 14.187	-0.000199877	-5.88	1.95875E-05	0.55	0.12	4.38	1/12/04 9:22	88:03:38	87:52:30	87:47:15	9.364028985
-5	76	1096	-0.0002	538 14.228	-0.000185775	-4.88	-0.00014821	-4.14	-0.88	3.38	1/13/04 11:47	114:28:38	114:17:30	114:12:15	10.69937893

DECANISTERED 01/14/2004; sample dried 12 days in air

SAMPLE: 1324' to 1326' (Anna Shale) cuttings in canister Stoelckinger #1

dry sample weight:			lb.	grams	wet sample weight:		lb.	grams	moisture %	est. lost gas (cc) =	TIME OF:			elapsed time (off bottom to canistering)	
dry sample weight:			0.788	347.39	wet sample weight:		7.238	3282.04	1.24%	22	off bottom	at surface	in canister	20.5 minutes	
dry sample weight:			0.788	347.39	wet sample weight:		7.238	3282.04	1.24%	22	1/8/04 19:21	1/8/04 19:35	1/8/04 19:42	0.341 hours	
dry sample weight:			0.788	347.39	wet sample weight:		7.238	3282.04	1.24%	22	1/8/04 19:21	1/8/04 19:35	1/8/04 19:42	0.584047182 SQR (hrs)	
dry sample weight:			0.788	347.39	wet sample weight:		7.238	3282.04	1.24%	22	1/8/04 19:21	1/8/04 19:35	1/8/04 19:42	SQRT hrs. (since off bottom)	
RIGLAB MEASUREMENTS			CONVERSION OF RIGLAB MEASUREMENTS TO STP (@60 deg F; 14.7 psi)				CUMULATIVE VOLUMES (@STP)		SCF/TON	SCF/TON	TIME OF MEASURE			SQRT hrs. (since off bottom)	
measured cc	measured T (F)	measured P	cubic ft	absolute T (F)	psia	cubic ft (@STP)	cc (@STP)	cubic ft	cc	without lost gas	with lost gas	off bottom	at surface	in canister	SQRT hrs. (since off bottom)
2	78	1080	7E-05	538 14.018	6.5342E-05	1.85027132	6.5342E-05	1.85	0.17	2.20	1/8/04 19:48	0:26:13	0:13:00	0:05:45	0.861017734
5	76	1080	0.0002	538 14.018	0.000163355	4.82587830	0.000228697	6.48	0.80	2.83	1/8/04 19:58	0:38:13	0:23:00	0:15:45	0.778924135 estimate
3	78	1080	0.0001	538 14.018	9.80129E-05	2.77540898	0.00032671	9.25	0.85	2.88	1/8/04 20:03	0:41:13	0:28:00	0:20:45	0.828821117
5	78	1081	0.0002	538 14.031	0.000163508	4.82898134	0.000490218	13.88	1.28	3.31	1/8/04 20:18	0:54:43	0:41:30	0:34:15	0.954957823
2	78	1081	7E-05	538 14.031	6.54025E-05	1.85198453	0.000555818	15.73	1.45	3.48	1/8/04 20:20	0:58:43	0:45:30	0:38:15	0.98924775
3	78	1081	0.0001	538 14.031	9.81037E-05	2.77797880	0.000853722	16.51	1.71	3.74	1/8/04 20:27	1:05:13	0:52:00	0:44:45	1.042588278
4	78	1081	0.0001	538 14.031	0.000130805	3.70398907	0.000784527	22.22	2.05	4.08	1/8/04 20:40	1:18:43	1:05:30	1:08:15	1.205657958
1	76	1081	4E-05	538 14.031	3.27012E-05	0.92599227	0.000817228	23.14	2.13	4.18	1/8/04 20:49	1:27:13	1:14:00	1:11:45	1.145401434
4	75	1081	0.0001	535 14.031	0.000131049	3.71089238	0.000948278	26.85	2.48	4.51	1/8/04 20:59	1:37:13	1:24:00	1:18:45	1.272901323
14	75	1084	0.0005	535 14.070	0.000459948	13.02	0.001408224	39.88	3.88	5.71	1/9/04 0:02	4:40:13	4:27:00	4:19:45	2.181082548
7	72	1088	0.0002	532 14.098	0.000231898	6.58	0.00183992	46.44	4.28	8.31	1/9/04 4:50	9:28:13	9:15:00	9:07:45	3.077381843
5	73	1089	0.0002	533 14.135	0.000185843	4.89	0.001805563	51.13	4.72	6.74	1/9/04 8:03	12:41:13	12:28:00	12:20:45	3.581873727
3	75	1091	0.0001	535 14.161	9.91983E-05	2.81	0.00190476	53.94	4.97	7.00	1/9/04 11:29	16:07:13	15:54:00	15:48:45	4.015008573
1	75	1089	4E-05	535 14.135	3.30048E-05	0.93	0.001937784	54.87	5.08	7.09	1/9/04 15:53	20:31:13	20:18:00	20:10:45	4.529931322
-1	75	1091	-4E-05	535 14.161	-3.30854E-05	-0.94	0.001904899	53.93	4.97	7.00	1/9/04 18:44	24:22:13	24:09:00	24:01:45	4.938828153
0	73	1091	0	533 14.161	0	0.00	0.001904899	53.93	4.97	7.00	1/10/04 0:25	29:03:13	28:50:00	28:42:45	5.390140175
3	74	1087	0.0001	534 14.109	9.90177E-05	2.80	0.002003717	58.74	5.23	7.28	1/10/04 13:07	41:45:13	41:32:00	41:24:45	6.481703422
-2	70	1091	-7E-05	530 14.181	-8.87547E-05	-1.89	0.001938982	54.85	5.08	7.09	1/10/04 17:18	45:58:13	45:43:00	45:35:45	8.778789872
5	74	1087	0.0002	534 14.109	0.000185029	4.87	0.002101991	59.52	5.49	7.52	1/11/04 21:12	73:50:13	73:37:00	73:29:45	8.592842820
-1	72	1093	-4E-05	532 14.187	-3.33128E-05	-0.94	0.002088879	58.58	5.40	7.43	1/12/04 9:23	86:01:13	85:48:00	85:40:45	9.274711736
2	78	1098	7E-05	538 14.228	6.831E-05	1.88	0.002134989	80.48	5.58	7.60	1/13/04 11:47	112:25:13	112:12:00	112:04:45	10.80284291
3	75	1085	0.0001	535 14.083	9.86508E-05	2.79	0.002233839	83.25	5.83	7.88	1/14/04 11:50	138:28:13	138:15:00	138:07:45	11.88204938
0	75	1089	0	535 14.135	0	0.00	0.002233839	83.25	5.83	7.88	1/15/04 11:25	180:03:13	179:50:00	179:42:45	12.85122983
2	75	1079	7E-05	535 14.005	6.54035E-05	1.85	0.002299043	85.10	6.00	8.03	1/18/04 11:08	183:44:13	183:31:00	183:23:45	13.55498014
0															

measured cc	measured T (F)	measured P	cubic ft	absolute T (F)	pais	cubic ft (@STP)	cc (@STP)	cubic ft	cc	without lost gas	with lost gas	TIME OF MEASURE	off bottom	at surface	in canister	SQRT hrs. (since off bottom)
10	74	1090	0.0004	534 14.148	0.00033097	9.37	0.00033097	9.37	0.09	1.99	1/9/04	12:39	2:32:00	0:59:00	0:10:00	1.581844852
2	74	1090	7E-05	534 14.148	6.8194E-05	1.87	0.000397184	11.25	0.11	2.01	1/9/04	12:43	2:38:00	1:03:00	0:14:00	1.81245155
4	73	1090	0.0001	533 14.148	0.000132638	3.78	0.0005298	15.00	0.15	2.05	1/9/04	12:51	2:44:00	1:11:00	0:22:00	1.853279589
2	73	1090	7E-05	533 14.148	6.83182E-05	1.88	0.000598116	18.88	0.17	2.08	1/9/04	12:55	2:48:00	1:15:00	0:28:00	1.873320053
9	74	1089	0.0003	534 14.135	0.0002978	8.43	0.000693718	25.31	0.25	2.15	1/9/04	13:11	3:04:00	1:31:00	0:42:00	1.751190072
1	74	1089	4E-05	534 14.135	3.30868E-05	0.94	0.000926785	28.24	0.28	2.18	1/9/04	13:15	3:08:00	1:35:00	0:48:00	1.770122408
3	74	1089	0.0001	534 14.135	9.81999E-05	2.81	0.001025984	29.05	0.29	2.18	1/9/04	13:19	3:12:00	1:39:00	0:50:00	1.788854382
8	75	1090	0.0003	535 14.148	0.000284281	7.48	0.001290265	38.54	0.38	2.28	1/9/04	13:38	3:31:00	1:58:00	1:09:00	1.875277757
3	75	1089	0.0001	535 14.135	9.80144E-05	2.80	0.00138928	39.34	0.39	2.29	1/9/04	13:48	3:39:00	2:08:00	1:17:00	1.910497317
2	75	1089	7E-05	535 14.135	6.80088E-05	1.87	0.001455289	41.21	0.41	2.31	1/9/04	13:52	3:45:00	2:12:00	1:23:00	1.936491673
4	75	1089	0.0001	535 14.135	0.000132019	3.74	0.001587309	44.95	0.44	2.34	1/9/04	14:05	3:58:00	2:25:00	1:38:00	1.991849233
12	75	1089	0.0004	535 14.135	0.000398058	11.22	0.001983367	58.18	0.58	2.45	1/9/04	14:44	4:37:00	3:04:00	2:15:00	2.148842983
11	75	1089	0.0004	535 14.135	0.000383053	10.26	0.002348419	68.44	0.68	2.55	1/9/04	15:24	5:17:00	3:44:00	2:55:00	2.289550288
6	75	1089	0.0002	535 14.135	0.000198029	5.81	0.002544448	72.05	0.71	2.81	1/9/04	15:58	5:49:00	4:18:00	3:27:00	2.411778682
12	75	1090	0.0004	535 14.148	0.000398421	11.23	0.00294087	83.28	0.82	2.72	1/9/04	16:55	6:48:00	5:15:00	4:28:00	2.607880982
21	75	1091	0.0007	535 14.181	0.000894374	19.88	0.003635244	102.94	1.02	2.92	1/9/04	18:45	9:38:00	6:05:00	7:16:00	3.103781159
26	73	1091	0.0009	533 14.181	0.000862927	24.44	0.004488171	127.37	1.28	3.18	1/10/04	0:28	14:19:00	12:48:00	11:57:00	3.76373713
28	75	1090	0.001	535 14.148	0.000924983	28.19	0.005423154	153.57	1.52	3.42	1/10/04	5:58	19:51:00	18:18:00	17:29:00	4.455333682
33	74	1087	0.0012	534 14.109	0.001089194	30.84	0.006512349	184.41	1.82	3.72	1/10/04	13:08	27:01:00	25:28:00	24:39:00	5.197755928
10	70	1091	0.0004	530 14.181	0.000333774	9.45	0.006848123	193.88	1.92	3.81	1/10/04	17:18	31:11:00	29:38:00	28:49:00	5.584203912
78	74	1067	0.0028	534 14.109	0.00257448	72.90	0.009420582	288.78	2.84	4.53	1/11/04	21:12	59:05:00	57:32:00	58:43:00	7.686568372
23	72	1083	0.0008	532 14.187	0.000786195	21.70	0.010186778	288.48	2.85	4.75	1/12/04	9:23	71:18:00	69:43:00	68:54:00	8.441958898
37	80	1092	0.0013	540 14.174	0.001213204	34.35	0.011399892	322.81	3.19	5.09	1/12/04	17:20	79:13:00	77:40:00	78:51:00	8.900374524
17	78	1086	0.0008	538 14.228	0.000583635	15.98	0.011983817	338.77	3.35	5.25	1/13/04	11:47	97:40:00	98:07:00	95:18:00	9.88264472
40	75	1085	0.0014	535 14.083	0.001315343	37.25	0.01327898	378.02	3.72	5.81	1/14/04	11:51	121:44:00	120:11:00	119:22:00	11.03328298
25	75	1089	0.0009	535 14.135	0.00062512	23.38	0.01410408	399.38	3.95	5.85	1/15/04	11:25	145:18:00	143:45:00	142:58:00	12.05404488
35	75	1079	0.0012	535 14.005	0.001144581	32.41	0.015246841	431.79	4.27	6.17	1/18/04	11:05	188:59:00	187:28:00	188:37:00	12.99935898
26	75	1077	0.0009	535 13.979	0.000848889	24.03	0.018097311	455.82	4.51	6.40	1/17/04	11:05	192:58:00	191:25:00	190:38:00	13.89124424
24	75	1087	0.0008	536 14.109	0.000790861	22.39	0.018887971	478.21	4.73	6.82	1/18/04	10:04	215:57:00	214:24:00	213:35:00	14.89523732
28	73	1090	0.001	533 14.148	0.000928454	28.29	0.017818428	504.50	4.99	6.88	1/19/04	18:50	248:43:00	247:10:00	248:21:00	15.77075382
20	74	1089	0.0007	534 14.135	0.000661332	18.73	0.018477758	523.23	5.17	7.07	1/20/04	14:23	288:18:00	288:43:00	285:54:00	18.37884815
18	73	1089	0.0006	533 14.135	0.000598318	18.89	0.019074074	540.12	5.34	7.24	1/21/04	10:18	288:09:00	288:38:00	285:47:00	19.87498159
19	76	1095	0.0007	538 14.213	0.00082937	17.82	0.019703444	557.94	5.51	7.41	1/22/04	11:42	313:35:00	312:02:00	311:13:00	17.70828431
38	75	1077	0.0013	535 13.979	0.001240363	35.12	0.020943807	593.08	5.88	7.78	1/22/04	12:42	338:35:00	338:02:00	338:13:00	18.40083405
22	75	1078	0.0008	535 13.992	0.000716772	20.35	0.021862578	613.41	6.08	7.98	1/24/04	17:27	387:20:00	385:47:00	384:58:00	19.65942041
24	78	1089	0.0006	538 13.875	0.000773232	21.90	0.02243581	635.31	6.28	6.18	1/25/04	18:17	390:10:00	388:37:00	387:48:00	19.7523695
7	75	1078	0.0002	535 13.992	0.0002267	6.48	0.022864511	841.79	8.34	8.24	1/28/04	15:21	413:14:00	411:41:00	410:52:00	20.32814141
3	75	1090	0.0001	535 14.148	9.81054E-05	2.81	0.022783818	844.59	8.37	6.27	1/27/04	9:55	431:48:00	430:15:00	429:28:00	20.77878788
85	75	1085	0.003	535 14.083	0.002795105	79.15	0.025556721	723.74	7.15	9.05	2/2/04	15:51	581:44:00	580:11:00	579:22:00	24.11814689
86	75	1091	0.003	535 14.181	0.002843827	80.52	0.028402348	804.28	7.85	9.85	2/9/04	10:51	744:38:00	743:03:00	742:14:00	27.28735971
83	75	1091	0.0029	535 14.181	0.002744431	77.71	0.031148778	881.98	8.72	10.82	2/18/04	14:38	918:29:00	914:58:00	914:07:00	30.27347574
65	74	1086	0.0023	534 14.098	0.002143409	80.89	0.033290188	942.87	9.32	11.21	2/23/04	14:45	1084:38:00	1083:05:00	1082:18:00	32.83377193
58	75	1091	0.002	535 14.181	0.001917795	54.31	0.035207983	998.98	9.85	11.75	3/2/04	10:55	1272:48:00	1271:15:00	1270:28:00	35.87832288
52	75	1088	0.0018	535 14.122	0.001714874	48.55	0.038922857	1045.53	10.33	12.23	3/8/04	10:22	1418:15:00	1414:42:00	1413:53:00	37.83309714
53	74	1081	0.0019	534 14.031	0.001739657	49.28	0.038682314	1094.79	10.82	12.72	3/15/04	11:54	1585:47:00	1584:14:00	1583:25:00	39.82189515
35	75	1097	0.0012	535 14.239	0.001183855	32.95	0.039825988	1127.74	11.15	13.04	3/22/04	10:18	1752:09:00	1750:38:00	1749:47:00	41.85889085
54	75	1088	0.0019	535 14.122	0.001780823	50.42	0.041808592	1178.18	11.84	13.54	3/30/04	20:45	1954:38:00	1953:05:00	1952:18:00	44.21123537
52	75	1090	0.0018	535 14.018	0.001702088	48.20	0.043308858	1228.38	12.12	14.02	4/8/04	14:53	2118:48:00	2115:13:00	2114:24:00	48.00833258
31	75	1088	0.0011	535 14.098	0.001020331	28.89	0.044328989	1255.25	12.41	14.30	4/12/04	15:10	2281:03:00	2259:30:00	2258:41:00	47.55049947
28	68	1088	0.001	526 14.122	0.000935527	28.49	0.045284518	1281.74	12.87	14.57	4/18/04	14:40	2428:33:00	2427:00:00	2428:11:00	49.28032082
44	76	1090	0.0018	536 14.148	0.001450834	41.08	0.048715349	1322.83	13.07	14.97	4/28/04	11:42	2593:35:00	2592:02:00	2591:13:00	50.92723587
47	78	1083	0.0017	536 14.057	0.001539801	43.80	0.048255151	1388.43	13.51	15.40	5/3/04	20:08	2788:59:00	2788:28:00	2787:37:00	52.83083113
41	77	1081	0.0014	537 14.031	0.001338254	37.89	0.049593404	1404.32	13.88	15.78	5/10/04	14:10	2832:03:00	2830:30:00	2829:41:00	54.14840718
32	78	1082	0.0011	538 14.044	0.001043514	29.55	0.050838918	1433.87	14.17	16.07	5/17/04	9:52	3095:45:00	3094:12:00	3093:23:00	55.83948441
30	74	1075	0.0011	534 13.953	0.000979246	27.73	0.051818184	1481.80	14.45	16.34	5/24/04	10:39	3284:32:00	3282:59:00	3282:10:00	57.13809484
38	77	1077	0.0013	537 13.979	0.001235743	34.99	0.052851907	1496.59	14.79	16.89	6/1/04	11:31	3458:54:00	3455:21:00	3454:32:00	58.79540798
34	78	1078	0.0012	538 13.988	0.001102585	31.22	0.053954492	1527.82	15.10	17.00	6/7/04	10:43	3800:38:00	3599:03:00	3598:14:00	60.04499979
23	75	1078	0.0008	535 13.992	0.000751443	21.28	0.054705935	1549.09	15.31	17.21	8/14/04	10:57	3788:50:00	3787:17:00	3786:28:00	81.39808245
39	77	1082	0.0014	537 14.044	0.001274151	38.08	0.055980088	1585.17	15.87	17.57	8/23/04	18:38	3990:28:00	3988:58:00	3988:07:00	83.17027254
31	77	1082	0.0011	537 14.044	0.001012786	28.88	0.058992872	1813.85	15.95	17.85	7/10/04	14:01	4179:54:00	4178:21:00	4177:32:00	84.8

5	73	1090	0.0002	533 14.148	0.000165795	4.89	0.066729828	1889.57	18.86	20.57	11/5/04	11:17	7225:10.00	7223:37.00	7222:48.00	85.00098039
2	75	1095	7E-05	535 14.213	8.83733E-05	1.88	0.066798002	1891.44	18.89	20.59	11/12/04	16:36	7398:29.00	7398:58.00	7396:07.00	86.01443877
46	75	1080	0.0016	535 14.018	0.001505874	42.64	0.088301678	1934.08	19.12	21.01	11/24/04	11:02	7680:55.00	7679:22.00	7678:33.00	87.84083907
23	75	1081	0.0008	535 14.031	0.000753534	21.34	0.08905521	1955.42	19.33	21.22	12/9/04	16:04	7901:57.00	7900:24.00	7899:35.00	88.9929131
26	75	1090	0.0009	535 14.148	0.000858913	24.32	0.089914123	1979.74	19.57	21.47	12/15/04	17:38	8191:31.00	8189:58.00	8189:09.00	90.50899789
-1	72	1100	-4E-05	532 14.278	-3.35282E-05	-0.96	0.089880597	1978.79	19.56	21.46	12/23/04	12:09	8378:02.00	8378:29.00	8375:40.00	91.53159748
35	76	1085	0.0012	538 14.083	0.001148778	32.53	0.071029375	2011.32	19.88	21.78	12/31/04	18:05	8575:58.00	8574:25.00	8573:36.00	92.80651525
19	75	1081	0.0007	535 14.031	0.000822485	17.63	0.07185188	2028.95	20.05	21.95	1/10/05	14:05	8811:58.00	8810:25.00	8809:36.00	93.87207808
26	76	1078	0.0009	538 13.992	0.000847872	24.01	0.072499732	2052.98	20.29	22.19	1/20/05	15:11	9053:04.00	9051:31.00	9050:42.00	95.14780463
-1	75	1094	-4E-05	535 14.200	-3.31584E-05	-0.94	0.072488576	2052.02	20.28	22.18	1/27/05	18:19	9222:12.00	9220:39.00	9219:50.00	96.03228924
13	75	1093	0.0005	535 14.187	0.000430839	12.19	0.072897215	2084.21	20.40	22.30	2/3/05	15:27	9389:20.00	9387:47.00	9388:58.00	96.8985724
15	75	1093	0.0005	535 14.187	0.000498891	14.07	0.073394105	2078.28	20.54	22.44	2/10/05	15:01	9558:54.00	9555:21.00	9554:32.00	97.75939953
11	75	1089	0.0004	535 14.135	0.000383053	10.28	0.073757158	2088.58	20.84	22.54	2/17/05	14:01	9723:54.00	9722:21.00	9721:32.00	98.60983724
16	77	1087	0.0006	537 14.109	0.000525144	14.87	0.074282302	2103.43	20.79	22.89	2/24/05	15:21	9893:14.00	9891:41.00	9890:52.00	99.48473412
17	75	1080	0.0008	535 14.018	0.000558445	15.78	0.074838747	2119.19	20.95	22.84	3/3/05	14:15	10060:08.00	10058:35.00	10057:48.00	100.300216
11	75	1075	0.0004	535 13.953	0.000358388	10.15	0.075197133	2129.34	21.05	22.94	3/10/05	13:59	10227:52.00	10226:19.00	10225:30.00	101.1329158
12	75	1071	0.0004	535 13.901	0.000389511	11.03	0.075588844	2140.37	21.18	23.05	3/16/05	10:38	10418:31.00	10414:58.00	10414:09.00	102.0813378
0	75	1081	0	535 14.031	0	0.00	0.075588844	2140.37	21.18	23.05	3/23/05	12:23	10538:18.00	10535:54.00	10535:00.00	102.6580801
10	75	1084	0.0004	535 14.070	0.000328533	9.30	0.075915177	2149.67	21.25	23.14	4/2/05	15:11	10781:04.00	10779:31.00	10778:42.00	103.8319155
15	75	1080	0.0005	535 14.018	0.000490981	13.90	0.076408158	2183.57	21.38	23.28	4/8/05	14:37	10924:30.00	10922:57.00	10922:08.00	104.520333
-2	75	1091	-7E-05	535 14.161	-8.81309E-05	-1.87	0.078340027	2181.70	21.37	23.28	4/15/05	10:18	11088:11.00	11086:38.00	11085:49.00	105.3004432
78	78	1072	0.0009	538 13.914	0.000810724	22.98	0.077150751	2184.88	21.59	23.49	4/21/05	17:18	11239:11.00	11237:38.00	11238:49.00	108.0150147
-5	75	1080	-0.0002	535 14.018	-0.00018386	-4.63	0.078987091	2180.02	21.55	23.44	4/28/05	14:41	11404:34.00	11403:01.00	11402:12.00	108.7921858
15	76	1087	0.0005	538 14.109	0.000493241	13.97	0.077480332	2193.99	21.89	23.58	5/5/05	21:32	11579:25.00	11577:52.00	11577:03.00	107.807898
19	77	1080	0.0007	537 14.018	0.000619593	17.54	0.078099925	2211.54	21.88	23.78	5/12/05	11:35	11737:28.00	11735:55.00	11735:06.00	108.3395896
2	72	1081	7E-05	532 14.031	8.58942E-05	1.87	0.078185819	2213.40	21.88	23.77	5/20/05	11:49	11929:42.00	11928:09.00	11927:20.00	109.223168
6	73	1085	0.0003	533 14.083	0.000284058	7.48	0.078428675	2220.88	21.95	23.85	5/28/05	15:38	12077:31.00	12075:58.00	12075:09.00	109.8977555
12	74	1077	0.0004	534 13.979	0.000392427	11.11	0.078822302	2231.99	22.06	23.96	8/2/05	14:13	12244:08.00	12242:33.00	12241:44.00	110.6530814
13	76	1076	0.0005	538 13.988	0.00042315	11.98	0.079245451	2243.97	22.18	24.08	8/10/05	21:25	12443:18.00	12441:45.00	12440:56.00	111.5495406
2	73	1081	7E-05	533 14.031	8.57708E-05	1.88	0.079311222	2245.84	22.20	24.10	8/16/05	9:54	12575:47.00	12574:14.00	12573:25.00	112.1418001
7	75	1084	0.0002	535 14.070	0.000229973	6.51	0.079541195	2252.35	22.26	24.16	8/23/05	10:32	12744:25.00	12742:52.00	12742:03.00	112.8911718
12	75	1081	0.0004	535 14.031	0.000393148	11.13	0.079934343	2263.48	22.37	24.27	7/11/05	15:23	12941:16.00	12939:43.00	12938:54.00	113.7598882
4	75	1085	0.0001	535 14.083	0.000131534	3.72	0.080085878	2287.20	22.41	24.31	7/7/05	11:37	13081:30.00	13079:57.00	13079:08.00	114.3743852
16	75	1081	0.0006	535 14.031	0.000524198	14.84	0.080590075	2282.05	22.58	24.45	7/14/05	14:03	13251:58.00	13250:23.00	13249:34.00	115.5170419
9	75	1085	0.0003	535 14.083	0.000295952	8.38	0.080888027	2290.43	22.84	24.54	7/22/05	10:18	13440:09.00	13438:38.00	13437:47.00	115.9318609
2	75	1087	7E-05	535 14.109	8.58884E-05	1.87	0.080951916	2292.29	22.86	24.55	7/28/05	14:27	13588:20.00	13586:47.00	13585:58.00	116.5890027
10	76	1085	0.0004	538 14.083	0.000382221	9.29	0.081280138	2301.59	22.75	24.65	8/4/05	15:44	13757:37.00	13756:04.00	13755:15.00	117.2928871
12	75	1079	0.0004	535 14.005	0.000392421	11.11	0.081872559	2312.70	22.88	24.76	8/11/05	15:25	13923:45.00	13923:45.00	13922:56.00	118.0055083
13	75	1074	0.0005	535 13.940	0.000423153	11.98	0.082095712	2324.88	22.98	24.87	8/16/05	18:17	14094:10.00	14092:37.00	14091:48.00	118.7188556
2	75	1079	7E-05	535 14.005	8.54035E-05	1.85	0.082181115	2328.53	23.00	24.89	8/28/05	14:10	14284:03.00	14282:30.00	14281:41.00	119.5158985
3	75	1086	0.0001	535 14.098	9.87417E-05	2.80	0.082259857	2329.33	23.02	24.92	8/1/05	15:37	14429:30.00	14427:57.00	14427:08.00	120.1228538
9	75	1084	0.0003	535 14.070	0.00029588	6.37	0.082555538	2337.70	23.11	25.00	9/8/05	15:42	14597:35.00	14596:02.00	14595:13.00	120.8204591
7	74	1082	0.0002	534 14.044	0.000229979	6.51	0.082785515	2344.22	23.17	25.07	9/15/05	14:47	14764:40.00	14763:07.00	14762:18.00	121.5099447
11	75	1079	0.0004	535 14.005	0.000359719	10.18	0.083145234	2354.40	23.27	25.17	9/22/05	16:08	14934:01.00	14932:28.00	14931:39.00	122.2048144
-2	75	1090	-7E-05	535 14.148	-8.80702E-05	-1.87	0.083079184	2352.53	23.25	25.15	9/29/05	14:19	15100:12.00	15098:39.00	15097:50.00	122.8828711
-15	85	1089	-0.0005	525 14.135	-0.000504502	-14.29	0.082574862	2338.25	23.11	25.01	10/13/05	14:53	15438:48.00	15435:13.00	15434:24.00	124.2447853
36	78	1077	0.0013	538 13.979	0.001188528	33.08	0.08374319	2371.33	23.44	25.34	10/20/05	14:45	15604:38.00	15603:05.00	15602:18.00	124.9165068
16	77	1084	0.0006	537 14.070	0.000523895	14.83	0.084288864	2386.16	23.58	25.48	11/8/05	23:28	16021:21.00	16019:48.00	16018:59.00	126.5754716
-3	74	1087	-0.0001	534 14.109	-9.90177E-05	-2.80	0.084187867	2383.38	23.56	25.45	11/10/05	17:39	16111:32.00	16109:59.00	16109:10.00	128.931215
10	73	1084	0.0004	533 14.070	0.000329768	9.34	0.084497832	2392.70	23.65	25.55	11/21/05	13:59	16371:52.00	16370:19.00	16369:30.00	127.9525954

DECANISTERED 11/21/2005; sample dried 14 days in air

SAMPLE: 1483.6' to 1484.5' (Crowsburg coal) core in canister MER 1

dry sample weight:	lbs.	grams	wet sample weight:	lbs.	grams	moisture %	est. lost gas (cc) =
	2.442	1107.53		2.477	1123.35	1.41%	480

RIGLAB MEASUREMENTS		CONVERSION OF RIGLAB MEASUREMENTS TO STP (@80 deg F; 14.7 psi)				CUMULATIVE VOLUMES (@STP)		SCF/TON	SCF/TON	TIME OF MEASURE				TIME SINCE	elapsed time (off bottom to canistering)	
measured cc	measured T (F)	measured P	cubic ft	absolute T (F)	psia	cubic ft (@STP)	cc (@STP)	without lost gas	with lost gas	off bottom	at surface	in canister	in canister	SCF/TON	SCRT (hrs)	
19	75	1091	0.0007	535 14.181	0.000828243	17.79	0.000828243	17.79	0.51	14.40	1/9/04	12:31	2:24:00	0:51:00	0:08:00	1.549193338
8	75	1091	0.0002	535 14.181	0.000198393	5.82	0.000828638	23.41	0.88	14.58	1/9/04	12:34	2:27:00	0:54:00	0:09:00	1.585247584
4	74	1090	0.0001	534 14.148	0.000132388	3.75	0.000959024	27.16	0.79	14.87	1/9/04	12:38	2:29:00	0:58:00	0:11:00	1.575859554
15	74	1090	0.0005	534 14.148	0.000498455	14.08	0.001455478	41.21	1.19	15.08	1/9/04	12:44	2:37:00	1:04:00	0:19:00	1.817811408
5	73	1090	0.0002	533 14.148	0.000165795	4.69	0.001821274	45.91	1.33	15.21	1/9/04	12:48	2:41:00	1:08:00	0:23:00	1.838088317
18	73	1090	0.0006	533 14.148	0.000598863	16.90	0.002218137	62.81								



50	75	1091	0.0018	535	14.181	0.001853272	48.82	0.009221408	261.12	7.55	21.44	1/9/04	19:48	9:39:00	8:08:00	7:21:00	3.108444913
57	73	1091	0.002	533	14.181	0.001891802	53.57	0.011113208	314.89	9.10	22.99	1/10/04	0:27	14:20:00	12:47:00	12:02:00	3.785938997
72	75	1090	0.0025	535	14.148	0.002378529	87.35	0.013491737	382.04	11.05	24.94	1/10/04	5:59	19:52:00	18:19:00	17:34:00	4.457203907
78	74	1087	0.0028	534	14.109	0.002574448	72.90	0.018088197	454.94	13.18	27.04	1/10/04	13:08	27:01:00	25:28:00	24:43:00	5.197755928
11	70	1091	0.0004	530	14.181	0.000387151	10.40	0.018433348	485.34	13.48	27.35	1/10/04	17:19	31:12:00	29:39:00	28:54:00	5.585898018
169	74	1087	0.008	534	14.109	0.005577998	157.95	0.022011344	823.29	18.03	31.91	1/11/04	21:13	59:08:00	57:33:00	58:48:00	7.887852438
33	72	1093	0.0012	532	14.187	0.001099324	31.13	0.023110886	854.42	18.93	32.81	1/12/04	9:24	71:17:00	89:44:00	88:59:00	8.442945773
77	80	1092	0.0027	540	14.174	0.002524778	71.49	0.025835443	725.91	21.00	34.88	1/12/04	17:21	79:14:00	77:41:00	78:58:00	8.901310785
36	78	1096	0.0013	538	14.228	0.001193958	33.80	0.028829023	759.71	21.98	35.88	1/13/04	11:48	97:41:00	98:08:00	95:23:00	9.883487913
82	75	1085	0.0029	535	14.083	0.002898454	53.5	0.029525477	838.07	24.18	38.07	1/14/04	11:52	121:45:00	120:12:00	119:27:00	11.03403825
48	75	1089	0.0017	535	14.135	0.001584231	44.88	0.031109708	880.93	25.48	39.37	1/15/04	11:28	145:19:00	143:48:00	143:01:00	12.05473828
61	75	1079	0.0022	535	14.005	0.001994808	58.49	0.033104514	937.41	27.12	41.00	1/18/04	11:07	189:00:00	187:27:00	188:42:00	13
55	75	1077	0.0019	535	13.979	0.001795282	50.84	0.034899778	988.25	28.59	42.47	1/17/04	11:08	192:59:00	191:28:00	190:41:00	13.89184413
23	75	1087	0.0008	535	14.109	0.000757717	21.48	0.035857493	1009.70	29.21	43.09	1/18/04	10:05	215:58:00	214:25:00	213:40:00	14.89580439
41	73	1090	0.0014	533	14.148	0.001359522	38.50	0.037017015	1048.20	30.32	44.21	1/19/04	18:51	248:44:00	247:11:00	248:28:00	15.77128192
32	74	1089	0.0011	534	14.135	0.001058132	29.98	0.038075147	1078.18	31.19	45.07	1/20/04	14:25	288:18:00	288:45:00	288:00:00	18.37988569
24	73	1089	0.0008	533	14.135	0.000795088	22.51	0.038670235	1100.88	31.84	45.72	1/21/04	10:17	288:10:00	288:37:00	285:52:00	18.9754725
27	78	1095	0.001	538	14.213	0.000894388	25.33	0.039764803	1128.00	32.57	46.48	1/22/04	11:43	313:38:00	312:03:00	311:18:00	17.7087549
61	75	1077	0.0022	535	13.979	0.001991109	58.38	0.041755712	1182.39	34.20	48.09	1/23/04	12:42	338:35:00	337:02:00	338:17:00	18.40083405
36	75	1078	0.0013	535	13.992	0.001178172	33.31	0.042931883	1215.89	35.17	49.05	1/24/04	17:28	367:21:00	385:48:00	385:03:00	19.18837881
39	78	1089	0.0014	538	13.875	0.001258502	35.58	0.044188388	1251.27	36.10	50.08	1/25/04	18:18	390:11:00	388:38:00	387:53:00	19.75056883
7	75	1078	0.0002	535	13.992	0.0002287	8.48	0.044417088	1257.75	36.38	50.27	1/28/04	15:22	413:15:00	411:42:00	410:57:00	20.32855135
-1	75	1091	-4E-05	535	14.181	-3.30854E-05	-0.94	0.04438402	1258.81	36.38	50.24	1/27/04	9:58	431:49:00	430:18:00	429:31:00	20.78018891
118	73	1085	0.0041	533	14.083	0.003628809	108.42	0.048212829	1385.23	39.49	53.38	2/2/04	15:52	581:45:00	580:12:00	579:27:00	24.11849419
131	74	1091	0.0046	534	14.181	0.004339883	122.89	0.052552512	1488.12	43.05	58.93	2/9/04	10:44	744:37:00	743:04:00	742:19:00	27.2878851
122	75	1091	0.0043	535	14.181	0.004033982	114.23	0.058588495	1802.35	48.35	80.24	2/18/04	14:37	918:30:00	914:57:00	914:12:00	30.27375101
114	75	1086	0.004	535	14.098	0.003752184	108.25	0.080338879	1708.59	49.42	83.31	2/23/04	14:48	1084:39:00	1083:08:00	1082:21:00	32.83402498
95	75	1091	0.0034	535	14.181	0.003141218	88.95	0.083478894	1797.54	52.00	85.88	3/2/04	10:55	1272:48:00	1271:15:00	1270:30:00	35.87832288
96	75	1088	0.0034	535	14.122	0.003185553	89.84	0.088645447	1887.18	54.59	88.47	3/8/04	10:24	1418:17:00	1414:44:00	1413:59:00	37.83354001
88	74	1081	0.0031	534	14.031	0.002888488	81.79	0.089533933	1988.97	58.98	70.84	3/15/04	11:55	1585:48:00	1584:15:00	1583:30:00	39.82210441
51	77	1097	0.0018	537	14.239	0.001889298	47.84	0.071223292	2018.81	58.34	72.22	3/22/04	10:17	1752:10:00	1750:37:00	1749:52:00	41.85868994
80	74	1088	0.0028	534	14.122	0.002842901	74.84	0.07388813	2091.85	60.50	74.39	3/30/04	20:48	1954:39:00	1953:08:00	1952:21:00	44.21142386
87	75	1080	0.0031	535	14.018	0.002847888	80.84	0.078713818	2172.29	62.84	78.72	4/8/04	14:53	2118:48:00	2115:13:00	2114:28:00	48.00833258
33	74	1088	0.0012	534	14.098	0.00188192	30.81	0.077802011	2203.10	63.73	77.81	4/12/04	15:10	2281:03:00	2259:30:00	2258:45:00	47.55049947
84	77	1088	0.0023	537	14.122	0.002102509	59.54	0.079904519	2282.84	85.45	79.34	4/19/04	14:41	2428:34:00	2427:01:00	2428:18:00	49.28048972
40	78	1090	0.0014	538	14.148	0.00131894	37.35	0.081223459	2298.98	88.53	80.42	4/28/04	11:42	2593:35:00	2592:02:00	2591:17:00	50.92723587
54	74	1083	0.0019	534	14.057	0.00177578	50.28	0.082999218	2350.27	87.99	81.87	5/3/04	20:08	2770:01:00	2768:28:00	2767:43:00	52.8309478
55	78	1081	0.0019	538	14.031	0.001798598	50.93	0.084779788	2401.20	88.48	83.34	5/10/04	14:11	2932:04:00	2930:31:00	2929:48:00	54.14858108
24	75	1082	0.0008	535	14.044	0.000787024	22.29	0.08558481	2423.48	70.10	83.99	5/17/04	9:52	3095:45:00	3094:12:00	3093:27:00	55.83948441
88	78	1075	0.0024	538	13.953	0.002203121	62.39	0.087787931	2485.87	71.91	85.79	5/24/04	10:39	3284:32:00	3282:59:00	3282:14:00	57.13809484
30	75	1077	0.0011	535	13.979	0.000978234	27.73	0.088787185	2513.80	72.71	88.59	6/1/04	11:03	3458:58:00	3455:23:00	3454:38:00	58.78589145
37	76	1078	0.0013	538	13.988	0.001204349	34.10	0.089971514	2547.70	73.70	87.58	6/7/04	10:44	3600:37:00	3599:04:00	3598:19:00	60.00513867
45	79	1078	0.0018	539	13.992	0.001459304	41.32	0.091430818	2589.02	74.89	88.78	6/14/04	10:58	3788:51:00	3787:18:00	3786:33:00	61.39098025
12	78	1082	0.0004	538	14.044	0.000392778	11.12	0.091823595	2800.14	75.21	89.10	8/23/04	18:38	3990:29:00	3988:58:00	3988:11:00	63.17027254
25	77	1082	0.0009	537	14.044	0.000818783	23.13	0.092840359	2823.27	75.88	89.77	7/1/04	14:04	4179:57:00	4178:24:00	4177:39:00	64.85253282
28	78	1082	0.0009	538	14.044	0.000847855	24.01	0.093488214	2847.28	76.58	90.48	7/7/04	10:43	4320:38:00	4319:03:00	4318:18:00	65.7312711
25	79	1082	0.0009	539	14.044	0.000813733	23.04	0.094301948	2870.32	77.24	91.13	7/13/04	14:29	4488:22:00	4488:49:00	4488:04:00	68.84584255
18	75	1080	0.0008	535	14.018	0.000589177	18.88	0.094891123	2887.01	77.73	91.81	7/19/04	11:29	4809:22:00	4807:49:00	4807:04:00	67.8923187
-1	78	1091	-4E-05	538	14.181	-3.30037E-05	-0.93	0.094888119	2888.07	77.74	91.58	7/28/04	10:29	4778:22:00	4774:49:00	4774:04:00	69.11128295
39	77	1079	0.0014	537	14.005	0.001270818	35.98	0.098128737	2722.05	78.74	92.82	8/2/04	14:50	4948:43:00	4947:10:00	4948:25:00	70.34711555
8	78	1088	0.0003	538	14.098	0.000261843	7.41	0.098380556	2729.47	78.95	92.84	8/9/04	11:12	5118:05:00	5114:32:00	5113:47:00	71.5288015
5	76	1088	0.0002	538	14.122	0.000164585	4.88	0.098555145	2734.13	79.09	92.97	8/18/04	11:13	5281:08:00	5279:33:00	5278:48:00	72.87117723
30	75	1078	0.0011	535	13.988	0.000978325	27.70	0.097533347	2761.83	79.89	93.78	8/23/04	14:40	5452:33:00	5451:00:00	5450:15:00	73.84138408
12	78	1087	0.0004	538	14.109	0.000394593	11.17	0.097928082	2773.00	80.21	94.10	8/30/04	18:58	5822:51:00	5821:18:00	5820:33:00	74.9858853
4	75	1087	0.0001	535	14.109	0.000131777	3.73	0.098059839	2778.73	80.32	94.21	9/7/04	18:18	5814:09:00	5812:38:00	5811:51:00	78.25057377
39	78	1073	0.0014	538	13.927	0.00128591	35.85	0.099325749	2812.58	81.38	95.24	9/14/04	18:51	5984:44:00	5983:11:00	5982:28:00	77.38105825
8	76	1084	-0.0002	538	14.070	-0.000198752	-8.57	0.099128997	2807.01	81.20	95.08	9/21/04	18:55	6150:48:00	6149:15:00	6148:30:00	78.42703815
-7	75	1089	-0.0002	535	14.135	-0.000231034	-8.54	0.098897983	2800.47	81.01	94.89	9/28/04	21:18	6323:11:00	6321:38:00	6320:53:00	79.51844485
19	75	1085	0.0007	535	14.083												

9	75	1093	0.0003	535 14.167	0.000298134	6.44	0.10497473	2972.54	65.99	99.67	2/10/05 15:03	9558:56:00	9555:23:00	9554:36:00	97.75958901
10	75	1089	0.0004	535 14.135	0.000330048	9.35	0.105304779	2981.89	88.26	100.14	2/17/05 14:03	9723:56:00	9722:23:00	9721:36:00	98.61000825
18	77	1087	0.0006	537 14.109	0.000590787	16.73	0.105895566	2996.62	86.74	100.62	2/24/05 15:22	9893:15:00	9891:42:00	9890:57:00	99.4646179
17	75	1080	0.0006	535 14.018	0.000556445	15.78	0.108452011	3014.37	67.20	101.08	3/3/05 14:15	10080:08:00	10058:35:00	10057:50:00	100.3002116
11	75	1075	0.0004	535 13.953	0.000356366	10.15	0.106810398	3024.52	67.49	101.37	3/10/05 13:59	10227:52:00	10226:19:00	10225:34:00	101.1329156
17	75	1071	0.0006	535 13.901	0.000551608	15.83	0.107382204	3040.15	87.94	101.83	3/18/05 10:39	10416:32:00	10414:59:00	10414:14:00	102.0814194
-7	75	1061	-0.0002	535 14.031	-0.000229338	-6.49	0.107132887	3033.65	87.75	101.84	3/23/05 12:24	10538:17:00	10536:44:00	10535:59:00	102.6561412
1	75	1064	4E-05	535 14.070	3.28533E-05	0.93	0.107165721	3034.56	87.76	101.66	4/2/05 15:12	10761:05:00	10779:32:00	10778:47:00	103.6319957

DECANISTERED 4/02/2005, sample dried 21 days in air

SAMPLE: 1552.7' to 1553.5' (Tubo shale) core in canister 8

dry sample weight:		lbs.	grams	wet sample weight:		lbs.	grams	moisture %	est. lost gas (cc) =		TIME OF:		elapsed time (off bottom to canistering)			
		6.759	3973.18			9.424	4274.88	7.06%	253		off bottom	at surface	in canister	175.0 minutes		
											1/10/04 0:08		1/10/04 3:01	2.917 hours		
RIGLAB MEASUREMENTS		CONVERSION OF RIGLAB MEASUREMENTS TO STP (@60 deg F; 14.7 psi)						CUMULATIVE VOLUMES (@STP)		SCF/TON	SCF/TON	TIME SINCE		1.707825128 SQRT (hrs)		
measured cc	measured T (F)	measured P	cubic ft	absolute T (F)	psia	cubic ft (@STP)	cc (@STP)	cubic ft	cc	without lost gas	with lost gas	TIME OF MEASURE	off bottom	at surface	in canister	SQRT hrs. (since off bottom)
3	81	1091	0.0001	541 14.161	9.80961E-05	2.78	0.60961E-05	2.78	0.02	2.06	1/10/04 3:06	2:59:45			0:04:45	1.730847577
1	81	1091	4E-05	541 14.161	3.26987E-05	0.93	0.000130795	3.70	0.03	2.07	1/10/04 3:06	3:00:15			0:05:15	1.733253203
1	81	1091	4E-05	541 14.161	3.26987E-05	0.93	0.000183494	4.63	0.04	2.08	1/10/04 3:07	3:00:45			0:05:45	1.735655466
0	81	1091	0	541 14.161	0	0.00	0.000183494	4.63	0.04	2.08	1/10/04 3:07	3:01:15			0:08:15	1.736054466
0	81	1091	0	541 14.161	0	0.00	0.000183494	4.63	0.04	2.08	1/10/04 3:08	3:01:45			0:08:45	1.740450133
0	81	1091	0	541 14.161	0	0.00	0.000183494	4.63	0.04	2.08	1/10/04 3:09	3:02:45			0:07:45	1.745231599
3	81	1091	0.0001	541 14.161	9.80961E-05	2.78	0.00026159	7.41	0.06	2.10	1/10/04 3:12	3:05:45			0:10:45	1.759498034
4	82	1091	0.0001	542 14.161	0.000130554	3.70	0.000392143	11.10	0.09	2.13	1/10/04 3:15	3:09:15			0:14:15	1.775997372
3	82	1091	0.0001	542 14.161	9.79152E-05	2.77	0.000490058	13.66	0.11	2.15	1/10/04 3:20	3:14:15			0:19:15	1.799305422
5	81	1091	0.0002	541 14.161	0.000163494	4.63	0.000653552	18.51	0.15	2.19	1/10/04 3:28	3:19:45			0:24:45	1.824600413
5	82	1091	0.0002	542 14.161	0.000163192	4.62	0.000816744	23.13	0.19	2.23	1/10/04 3:31	3:24:45			0:29:45	1.84729532
8	82	1091	0.0002	542 14.161	0.00019583	5.55	0.001012574	26.67	0.23	2.27	1/10/04 3:46	3:39:45			0:44:45	1.913785921
6	81	1091	0.0002	541 14.161	0.000196192	5.58	0.001208767	34.23	0.26	2.32	1/10/04 4:01	3:54:45			0:59:45	1.978004044
20	80	1091	0.0007	540 14.161	0.000655165	18.55	0.001663952	52.78	0.43	2.47	1/10/04 5:01	4:54:45			1:59:45	2.218416026
15	81	1090	0.0005	541 14.148	0.000490031	13.68	0.002353963	66.66	0.54	2.58	1/10/04 6:01	5:54:45			2:59:45	2.431583263
18	80	1091	0.0008	540 14.161	0.000524148	14.84	0.002876131	81.50	0.66	2.70	1/10/04 7:29	7:22:45			4:27:45	2.71648216
11	81	1091	0.0004	541 14.161	0.000359666	10.19	0.003237617	91.68	0.74	2.78	1/10/04 9:07	9:00:45			6:05:45	3.00208261
11	80	1090	0.0004	540 14.148	0.000360022	10.19	0.003597639	101.88	0.82	2.86	1/10/04 11:17	11:10:45			8:15:45	3.343528083
1	80	1067	4E-05	540 14.109	3.26982E-05	0.92	0.003630476	102.80	0.83	2.87	1/10/04 13:11	13:04:45			10:09:45	3.618513054
-2	80	1091	-7E-05	540 14.161	-6.55185E-05	-1.86	0.00356498	100.96	0.81	2.85	1/10/04 17:22	17:15:45			14:20:45	4.154616462
28	80	1067	0.001	540 14.109	0.000913897	25.86	0.004478656	126.83	1.02	3.08	1/11/04 21:15	45:08:45			42:13:45	6.7119064915
2	79	1093	7E-05	539 14.167	6.57804E-05	1.88	0.004544618	126.69	1.04	3.08	1/12/04 9:26	57:19:45			54:24:45	7.571602646
4	80	1095	0.0001	540 14.226	0.000131838	3.73	0.004676254	132.42	1.07	3.11	1/13/04 11:46	83:41:45			80:46:45	9.148542689
12	80	1065	0.0004	540 14.083	0.000390949	11.07	0.005087203	143.49	1.16	3.20	1/14/04 11:53	107:46:45			104:51:45	10.38187456
-3	80	1089	-0.0001	540 14.135	-9.8078E-05	-2.78	0.004986106	140.71	1.13	3.17	1/15/04 11:46	131:21:45			128:28:45	11.46134809
10	81	1079	0.0004	541 14.005	0.000323391	9.16	0.005292466	149.67	1.21	3.25	1/18/04 11:08	155:01:45			152:06:45	12.4510709
-12	80	1089	-0.0004	540 14.135	-0.000392391	-11.11	0.004900106	136.76	1.12	3.16	1/21/04 10:45	274:38:45			271:43:45	16.57244196

DECANISTERED 01/27/2004; sample dried 5 days in air

SAMPLE: 1556.1' to 1556.8' (Tubo coal) core in canister 8

dry sample weight:		lbs.	grams	wet sample weight:		lbs.	grams	moisture %	est. lost gas (cc) =		TIME OF:		elapsed time (off bottom to canistering)			
		4.340	1966.83			4.365	1979.76	0.56%	715		off bottom	at surface	in canister	149.7 minutes		
											1/10/04 0:08		1/10/04 2:36	2.496 hours		
RIGLAB MEASUREMENTS		CONVERSION OF RIGLAB MEASUREMENTS TO STP (@60 deg F; 14.7 psi)						CUMULATIVE VOLUMES (@STP)		SCF/TON	SCF/TON	TIME SINCE		1.579620865 SQRT (hrs)		
measured cc	measured T (F)	measured P	cubic ft	absolute T (F)	psia	cubic ft (@STP)	cc (@STP)	cubic ft	cc	without lost gas	with lost gas	TIME OF MEASURE	off bottom	at surface	in canister	SQRT hrs. (since off bottom)
39	81	1091	0.0014	541 14.161	0.00127525	36.11	0.00127525	36.11	0.59	12.22	1/10/04 2:52	2:45:45			0:16:00	1.662077014
3	81	1091	0.0001	541 14.161	9.80961E-05	2.78	0.001373346	36.69	0.63	12.27	1/10/04 2:52	2:46:15			0:18:30	1.66458203
2	81	1091	7E-05	541 14.161	6.53974E-05	1.65	0.001436743	40.74	0.66	12.30	1/10/04 2:53	2:47:15			0:17:30	1.669560766
3	81	1091	0.0001	541 14.161	9.80961E-05	2.78	0.00153684	43.52	0.71	12.34	1/10/04 2:55	2:48:45			0:19:00	1.677050963
13	81	1091	0.0005	541 14.161	0.000425063	12.04	0.001961923	55.58	0.90	12.54	1/10/04 3:00	2:54:15			0:24:30	1.704161573
10	81	1091	0.0004	541 14.161	0.000328967	9.26	0.00226891	64.81	1.05	12.69	1/10/04 3:05	2:58:45			0:29:00	1.728028265
10	81	1091	0.0004	541 14.161	0.000328967	9.26	0.002615897	74.07	1.21	12.84	1/10/04 3:10	3:03:45			0:34:00	1.75
11	82	1091	0.0004	542 14.161	0.000359022	10.17	0.002974919	84.24	1.37	13.01	1/10/04 3:15	3:08:45			0:39:00	1.773649721
11	82	1091	0.0004	542 14.161	0.000359022	10.17	0.00333942	94.41	1.54	13.17	1/10/04 3:20	3:13:45			0:44:00	1.798866221
12	81	1091	0.0004	541 14.161	0.000392385	11.11	0.003726326	105.52	1.72	13.35	1/10/04 3:25	3:16:45			0:49:00	1.820027472
11	82	1091	0.0004	542 14.161	0.000359022	10.17	0.004065349	115.66	1.88	13.52	1/10/04 3:30	3:23:45			0:54:00	1.842776699
30	82	1091	0.0011	542 14.161	0.000979152	27.73	0.0050645	143.41	2.33	13.97	1/10/04 3:45	3:36:45			1:09:00	1.90840654
30	81	1091	0.0011	541 14.161	0.000980661	27.78	0.00645462	171.19	2.79	14.42	1/10/04 4:00	3:53:45			1:24:00	1.973766547
60	79	1091	0.0021	539 14.161	0.001989203	55.78	0.008014864	226.95	3.89	15.33	1/10/04 4:30	4:23:45			1:54:00	2.098624271
61	80	1091	0.0022	540 14.161	0.001988316	56.59	0.01001296	263.53	4.81	16.25	1/10/04 5:00	4:53:45			2:24:00	2.212653006
45	80	1090	0.0016	540 14.148	0.001472816	41.71	0.011485796	325.24	5.29	16.93	1/10/04 5:30	5:23:45			2:54:00	2.322893311
51	81	1090	0.0018	541 14.148	0.001688106	47.16	0.013151902	372.42	6.06	17.70	1/10/04 6:00	5:53:45			3:24:00	2.428133714
122	80	1091	0.0043	540 14.161	0.003996631	113.17	0.017148532	465.59	7.90	19.54	1/10/04 7:30	7:23:45			4:54:00	2.719526145
119	81	1091	0.0042	541 14.161	0.003861147	110.18	0.02103986	595.78	9.70	21.33	1/10/04 9:08	8:59:45			6:30:00	2.999305475
130	80	1090	0.0046	540 14.148	0.004254601	120.48	0.026294481	718.26	11.66	23.29	1/10/04 11:16	11:09:45			8:40:00	3.341032774
84	80	1087	0.003	540 14.109	0.00274169	77.64	0.028036171	793.89	12.92	24.56	1/10/04 13:10	13:03:45			10:34:00	3.814206074

109	80	1091	0.0038	540 14.181	0.00357078	101.11	0.031608931	895.01	14.57	28.20	1/10/04	17:20	17:13:45	14:44:00	4.150803135
152	80	1089	0.0054	540 14.135	0.004970281	140.74	0.038577211	1035.75	18.88	28.49	1/10/04	21:19	21:12:45	18:43:00	4.805702987
243	82	1085	0.0088	542 14.083	0.00788751	223.35	0.044484722	1259.10	20.49	32.13	1/11/04	9:25	33:18:45	30:49:00	5.77189819
153	80	1087	0.0054	540 14.109	0.004993792	141.41	0.048458513	1400.50	22.79	34.43	1/11/04	21:04	44:57:45	42:28:00	8.705408285
111	79	1093	0.0039	539 14.187	0.003849703	103.35	0.053108217	1503.85	24.47	38.11	1/12/04	9:25	57:18:45	54:49:00	7.570501985
90	80	1092	0.0032	540 14.174	0.002951037	83.58	0.050659253	1587.42	25.83	37.47	1/12/04	17:22	85:15:45	82:48:00	8.078520904
125	80	1096	0.0044	540 14.228	0.004113875	118.49	0.080172929	1703.90	27.73	39.38	1/13/04	11:50	83:43:45	81:14:00	9.150364291
154	80	1085	0.0054	540 14.083	0.005017183	142.07	0.085190111	1845.97	30.04	41.88	1/14/04	11:54	107:47:45	105:18:00	10.38247723
103	80	1089	0.0036	540 14.135	0.003388019	95.37	0.08655813	1941.34	31.59	43.23	1/15/04	11:30	131:23:45	128:54:00	11.48280216
105	81	1079	0.0037	541 14.005	0.003395801	98.15	0.071953732	2037.50	33.18	44.79	1/18/04	11:08	155:01:45	152:32:00	12.4510709
117	81	1077	0.0041	541 13.979	0.003778857	108.94	0.075730388	2144.44	34.90	46.53	1/17/04	11:08	170:01:45	178:32:00	13.38017813
33	80	1087	0.0012	540 14.109	0.001077092	30.50	0.078807481	2174.94	35.39	47.03	1/18/04	10:07	202:00:45	199:31:00	14.21311015
57	80	1090	0.002	540 14.148	0.001865587	52.83	0.078873048	2227.78	36.25	47.89	1/19/04	18:57	234:50:45	232:21:00	15.32488053
82	84	1089	0.0029	544 14.135	0.00288182	75.37	0.081334887	2303.13	37.48	49.12	1/20/04	14:28	254:19:45	251:50:00	15.94770098
36	80	1089	0.0013	540 14.135	0.001177172	33.33	0.082511839	2338.47	38.02	49.88	1/21/04	10:18	274:11:45	271:42:00	16.55885988
33	80	1095	0.0012	540 14.213	0.001085019	30.72	0.083598659	2387.19	38.52	50.18	1/22/04	11:44	299:37:45	297:08:00	17.30979973
71	80	1077	0.0025	540 13.979	0.002298081	65.02	0.08589292	2432.21	39.58	51.22	1/23/04	12:41	324:34:45	322:05:00	18.01608078
43	80	1078	0.0015	540 13.992	0.001391884	39.41	0.087284784	2471.82	40.22	51.88	1/24/04	17:29	353:22:45	350:53:00	18.79838202
45	81	1069	0.0016	541 13.875	0.001441771	40.83	0.088728554	2512.45	40.89	52.52	1/25/04	18:20	378:13:45	373:44:00	19.39882771
12	80	1078	0.0004	540 13.992	0.000388427	11.00	0.089114981	2523.45	41.07	52.70	1/26/04	15:23	399:18:45	398:47:00	19.98197104
5	79	1091	0.0002	539 14.181	0.0001841	4.85	0.089279081	2528.09	41.14	52.78	1/27/04	9:57	417:50:45	415:21:00	20.44127788
150	80	1085	0.0053	540 14.083	0.004888886	138.38	0.084185948	2888.47	43.39	55.03	2/2/04	15:53	587:48:45	585:17:00	23.82811714
122	81	1091	0.0043	541 14.181	0.003989243	112.98	0.089155191	2779.43	45.23	58.87	2/8/04	10:48	730:39:45	728:10:00	27.0307695
99	81	1091	0.0035	541 14.181	0.003237173	91.87	0.101392384	2871.10	46.72	58.36	2/18/04	14:39	902:32:45	900:03:00	30.04240059
75	80	1086	0.0026	540 14.098	0.002445885	89.25	0.103838049	2940.35	47.85	59.49	2/23/04	14:47	1070:40:45	1068:11:00	32.72123419
83	80	1091	0.0029	540 14.181	0.002719019	78.99	0.106557088	3017.35	49.10	60.74	3/2/04	10:55	1258:48:45	1256:19:00	35.47974774
75	80	1088	0.0026	540 14.122	0.002450189	89.38	0.109007257	3088.73	50.23	61.87	3/6/04	10:24	1402:17:45	1399:48:00	37.44724086
85	81	1081	0.003	541 14.031	0.002753915	77.98	0.111781172	3184.71	51.50	63.14	3/15/04	11:58	1571:49:45	1569:20:00	39.84630079
48	80	1097	0.0017	540 14.239	0.001581093	44.77	0.113342265	3209.48	52.23	63.87	3/22/04	10:18	1738:11:45	1735:42:00	41.69187583
37	75	1088	0.0013	535 14.122	0.001220057	34.55	0.114582322	3244.03	52.79	64.43	3/30/04	20:48	1840:39:45	1838:10:00	44.05295109
11	78	1081	0.0004	538 14.031	0.000358378	10.15	0.114920898	3254.18	52.88	64.59	4/9/04	17:29	2177:22:45	2174:53:00	48.88239584
-4	76	1088	-0.0001	538 14.098	-0.00013141	-3.72	0.114789288	3250.48	52.90	64.53	4/12/04	15:11	2247:04:45	2244:35:00	47.40338682
54	80	1088	0.0019	540 14.122	0.001784138	49.95	0.118553424	3300.41	53.71	65.35	4/19/04	14:41	2414:34:45	2412:05:00	49.13838756
6	78	1090	0.0002	538 14.148	0.000197105	5.58	0.118750553	3305.99	53.80	65.44	4/28/04	11:43	2579:38:45	2577:07:00	50.7898858
24	80	1083	0.0008	540 14.057	0.000780457	22.10	0.117530987	3328.09	54.18	65.80	5/3/04	20:09	2756:02:45	2753:33:00	52.49805552
21	80	1081	0.0007	540 14.031	0.000881839	19.30	0.118212828	3347.40	54.47	66.11	5/10/04	14:11	2918:04:45	2915:35:00	54.01924411
17	80	1082	0.0006	540 14.044	0.000552313	15.84	0.11878494	3383.04	54.73	66.37	5/17/04	9:52	3081:45:45	3079:18:00	55.51382445
28	80	1075	0.001	540 13.953	0.000903808	25.59	0.119888747	3388.83	55.15	66.78	5/24/04	10:40	3250:33:45	3248:04:00	57.01370449
28	80	1077	0.001	540 13.979	0.000905489	25.84	0.120574236	3414.27	55.58	67.20	6/1/04	11:03	3442:58:45	3440:27:00	58.87882084
30	82	1076	0.0011	542 13.986	0.000985889	27.35	0.121539925	3441.81	58.01	67.84	6/7/04	10:44	3588:37:45	3584:08:00	59.88847274
22	83	1078	0.0008	543 13.992	0.000708182	20.05	0.122248107	3481.87	58.33	67.97	6/14/04	10:58	3754:51:45	3752:22:00	61.27893285
-3	81	1082	-0.0001	541 14.044	-9.72889E-05	-2.75	0.12215082	3458.81	58.29	67.93	6/23/04	18:37	3978:30:45	3974:01:00	63.05959483
0	81	1082	0	541 14.044	0	0.00	0.12215082	3458.81	58.29	67.93	7/1/04	14:03	4185:58:45	4183:27:00	64.54413884

DECANISTERED 7/1/2004; sample dried 21 days in air

SAMPLE: 1728' to 1731' (Riverton coal) cuttings in canister 10

dry sample weight: 1.935 lb. 877.78 grams

est. lost gas (cc) = 382

TIME OF:

off bottom 1/10/04 10:24 at surface

elapsed time (off bottom to canistering)

24.0 minutes 0.400 hours

RIGLAB MEASUREMENTS

measured cc measured T (F) measured P

53 80 1090 0.0019

4 80 1090 0.0001

4 80 1090 0.0001

3 80 1090 0.0001

4 80 1090 0.0001

4 80 1090 0.0001

5 80 1090 0.0002

26 80 1090 0.0009

7 80 1090 0.0002

6 80 1090 0.0002

20 80 1090 0.0007

44 80 1090 0.0016

45 80 1090 0.0016

32 80 1090 0.0011

35 79 1089 0.0012

37 80 1089 0.0013

37 80 1089 0.0013

33 80 1088 0.0012

70 80 1087 0.0025

105 77 1087 0.0037

174 80 1091 0.0081

540 14.148 0.00173485

540 14.148 0.000130917

540 14.148 0.000130917

540 14.148 9.81677E-05

540 14.148 0.000130917

540 14.148 0.000130917

540 14.148 0.000183848

540 14.148 0.00085098

540 14.148 0.000229105

540 14.148 0.000198375

540 14.148 0.000854585

540 14.148 0.001440087

540 14.148 0.001472816

540 14.148 0.001047338

539 14.135 0.001148598

540 14.135 0.001209871

540 14.135 0.001209871

540 14.122 0.001078083

540 14.109 0.002284741

537 14.109 0.003448258

540 14.181 0.005700113

CONVERSION OF RIGLAB MEASUREMENTS TO STP (@0 deg F; 14.7 psi)

540 14.148 0.00173485

540 14.148 0.000130917

540 14.148 0.000130917

540 14.148 9.81677E-05

540 14.148 0.000130917

540 14.148 0.000130917

540 14.148 0.000183848

540 14.148 0.00085098

540 14.148 0.000229105

540 14.148 0.000198375

540 14.148 0.000854585

540 14.148 0.001440087

540 14.148 0.001472816

540 14.148 0.001047338

539 14.135 0.001148598

540 14.135 0.001209871

540 14.135 0.001209871

540 14.122 0.001078083

251	80	1089	0.0089	540 14.135	0.008207503	232.41	0.032894451	925.80	33.79	47.00	1/10/04	22:21	11:57:00	11:33:00	3.458877203
297	82	1085	0.0105	542 14.083	0.00984029	272.98	0.042334741	1198.78	43.75	56.97	1/11/04	9:27	23:03:00	22:39:00	4.801041554
150	80	1087	0.0053	540 14.109	0.004895874	138.84	0.047230815	1337.42	48.81	82.03	1/11/04	21:08	34:42:00	34:18:00	5.89087059
107	79	1093	0.0038	539 14.187	0.003518183	99.82	0.050748798	1437.04	52.45	85.88	1/12/04	9:27	47:03:00	48:39:00	6.859300258
97	80	1092	0.0034	540 14.174	0.003180582	90.08	0.05392938	1527.10	55.74	88.95	1/12/04	17:24	55:00:00	54:38:00	7.416198487
117	80	1096	0.0041	540 14.228	0.0038504	109.03	0.05777978	1838.13	59.72	72.93	1/12/04	11:51	73:27:00	73:03:00	8.570297544
154	80	1084	0.0054	540 14.070	0.005012558	141.94	0.082792318	1778.07	64.90	78.11	1/14/04	11:58	97:32:00	97:08:00	9.875898584
98	80	1089	0.0035	540 14.135	0.003204523	90.74	0.085998841	1888.82	68.21	81.42	1/15/04	11:31	121:07:00	120:43:00	11.00530175
105	81	1079	0.0037	541 14.005	0.003395601	98.15	0.088992443	1984.97	71.72	84.93	1/18/04	11:09	144:45:00	144:21:00	12.03120942
113	81	1077	0.004	541 13.979	0.00384754	103.29	0.073039983	2088.25	75.49	88.70	1/17/04	11:09	188:45:00	188:21:00	12.99038108
15	80	1087	0.0005	540 14.109	0.000489587	13.86	0.07352957	2082.12	75.99	89.21	1/18/04	10:08	191:44:00	191:20:00	13.84878081
42	80	1090	0.0015	540 14.148	0.001374828	38.92	0.074904198	2121.04	77.41	90.83	1/19/04	18:53	224:29:00	224:05:00	14.98278788
84	84	1089	0.003	544 14.135	0.002728537	77.21	0.077830738	2198.25	80.23	93.44	1/20/04	14:27	244:03:00	243:39:00	15.62209973
20	80	1089	0.0007	540 14.135	0.000853984	18.52	0.07828472	2218.77	80.91	94.12	1/21/04	10:18	283:54:00	283:30:00	16.24499923
14	80	1095	0.0005	540 14.213	0.000480311	13.03	0.078745031	2229.80	81.38	94.80	1/22/04	11:45	289:21:00	288:57:00	17.010291
68	80	1077	0.0023	540 13.979	0.002134387	80.44	0.080879398	2290.24	83.59	96.80	1/23/04	12:40	314:18:00	313:52:00	17.72758799
34	80	1078	0.0012	540 13.992	0.001100543	31.18	0.081979942	2321.40	84.73	97.94	1/24/04	17:30	343:08:00	342:42:00	18.52295873
41	81	1069	0.0014	541 13.875	0.001313813	37.20	0.083293555	2358.80	88.08	99.30	1/25/04	18:21	385:57:00	385:33:00	19.12981985
-3	80	1078	-0.0001	540 13.992	-9.71088E-05	-2.75	0.083198448	2355.85	85.98	99.20	1/26/04	15:24	389:00:00	388:38:00	19.72308292
11	79	1091	-0.0004	539 14.181	-0.000381021	-10.22	0.082835428	2345.83	85.81	98.82	1/27/04	9:57	407:33:00	407:09:00	20.18788784
11	79	1091	0.0004	539 14.181	0.000381021	10.22	0.083198448	2355.85	85.98	99.20	1/28/04	10:27	432:03:00	431:39:00	20.78581247
24	80	1085	0.0008	540 14.083	0.000781899	22.14	0.083978347	2377.99	86.79	100.00	1/29/04	9:33	455:09:00	454:45:00	21.33424477
10	79	1089	0.0004	539 14.135	0.000327589	9.26	0.084305945	2387.27	87.13	100.34	1/30/04	10:38	480:12:00	479:48:00	21.91348818
43	81	1081	0.0015	541 14.031	0.001393157	39.45	0.085899103	2428.72	88.57	101.78	1/31/04	12:32	508:08:00	505:44:00	22.49740728
14	80	1080	0.0005	540 14.018	0.000454008	12.88	0.088153108	2439.58	89.04	102.25	2/1/04	14:47	532:23:00	531:59:00	23.0734335
0	80	1085	0	540 14.083	0	0.00	0.088153108	2439.58	89.04	102.25	2/2/04	15:31	557:07:00	556:43:00	23.80331898
8	81	1094	0.0002	541 14.200	0.000198732	5.57	0.08834984	2445.15	89.24	102.45	2/3/04	12:17	577:53:00	577:29:00	24.03920409
6	80	1087	0.0002	540 14.109	0.000195835	5.55	0.088545875	2450.89	89.45	102.68	2/4/04	18:21	605:57:00	605:33:00	24.81805187
20	80	1080	0.0007	540 14.018	0.000848579	18.37	0.087194254	2489.08	90.12	103.33	2/5/04	14:34	828:10:00	827:46:00	25.08325331
0	80	1086	0	540 14.098	0	0.00	0.087194254	2489.08	90.12	103.33	2/6/04	9:28	847:04:00	846:40:00	25.43750512
-7	80	1095	-0.0002	540 14.213	-0.000230158	-8.52	0.088984099	2482.54	89.88	103.09	2/7/04	13:32	875:08:00	874:44:00	25.98332799
18	80	1083	0.0008	540 14.067	0.000855343	18.58	0.087549442	2479.11	90.48	103.89	2/8/04	12:13	897:48:00	897:25:00	26.41821978
12	81	1091	0.0004	541 14.181	0.000392385	11.11	0.087941826	2490.23	90.89	104.10	2/9/04	10:21	719:57:00	719:33:00	26.83188402
0	80	1092	0	540 14.174	0	0.00	0.087941826	2490.23	90.89	104.10	2/10/04	10:11	743:47:00	743:23:00	27.27239141
15	80	1086	0.0005	540 14.098	0.000489137	13.85	0.088430983	2504.08	91.39	104.81	2/11/04	9:24	787:00:00	786:36:00	27.89478485
14	80	1099	-0.0005	540 14.285	-0.000481993	-13.08	0.087988971	2490.99	90.92	104.13	2/12/04	9:41	791:17:00	790:53:00	28.12975888
14	80	1091	0.0005	540 14.181	0.000458983	12.99	0.0884278	2503.98	91.39	104.80	2/13/04	12:18	817:54:00	817:30:00	28.59895103
20	80	1085	0.0007	540 14.083	0.000851582	18.45	0.089079182	2522.43	92.08	105.28	2/14/04	11:35	841:11:00	840:47:00	29.00318075
-3	80	1092	-0.0001	540 14.174	-8.83879E-05	-2.79	0.088980815	2519.85	91.98	105.17	2/15/04	14:32	888:08:00	887:44:00	29.48410245
17	81	1091	0.0008	541 14.181	0.000555878	15.74	0.089538893	2536.39	92.54	105.75	2/16/04	14:02	891:38:00	891:14:00	29.86022998
-12	80	1098	-0.0004	540 14.252	-0.000395633	-11.20	0.089141059	2524.18	92.13	105.34	2/17/04	9:53	911:29:00	911:05:00	30.19078228
13	80	1091	0.0005	540 14.181	0.00042587	12.08	0.08958893	2538.24	92.57	105.78	2/18/04	9:11	934:47:00	934:23:00	30.57422882
56	82	1071	0.0019	542 13.901	0.001782204	49.90	0.091329133	2588.14	94.39	107.80	2/19/04	8:58	958:34:00	958:10:00	30.98072781
-4	81	1076	-0.0001	541 13.988	-0.000128997	-3.85	0.091200137	2582.49	94.28	107.47	2/20/04	18:21	989:57:00	989:33:00	31.48347088
-6	80	1085	-0.0002	540 14.083	-0.000195475	-5.54	0.091004882	2578.98	94.05	107.27	2/21/04	19:40	1017:18:00	1016:52:00	31.89481815
15	81	1079	0.0005	541 14.005	0.000485088	13.74	0.091489748	2590.89	94.55	107.77	2/22/04	16:27	1037:03:00	1036:39:00	32.20329007
-18	80	1085	-0.0008	540 14.083	-0.000586424	-18.81	0.090903324	2574.09	93.95	107.18	2/23/04	14:13	1059:49:00	1059:25:00	32.55482555

DECANISTERED 2/23/2004; sample dried for 5 days in air

SAMPLE 1728' to 1731' (Riverton coal) cuttings in canister MER Fe  
lb. grams

dry sample weight: 0.883 300.81

est. lost gas (cc) =  
188

TIME OF:  
off bottom at surface  
1/10/04 10:24

elapsed time (off bottom to canistering)  
in canister 25.0 minutes  
1/10/04 10:49 0.417 hours

RIGLAB MEASUREMENTS

CONVERSION OF RIGLAB MEASUREMENTS TO STP (@80 deg F; 14.7 psi)

CUMULATIVE VOLUMES (@STP)

measured cc	measured T (F)	measured P	CONVERSION OF RIGLAB MEASUREMENTS TO STP (@80 deg F; 14.7 psi)		CUMULATIVE VOLUMES (@STP)		SCF/TON without lost gas	SCF/TON with lost gas	TIME OF MEASURE	TIME SINCE		in canister	SORT hrs. (since off bottom)		
			cubic ft	absolute T (F)	cc (@STP)	cc				off bottom	at surface				
42	80	1090	0.0015	540 14.148	0.001374828	38.92	0.001374828	38.92	4.15	24.18	1/10/04	10:59	0:35:30	0:10:30	0.789198717
2	80	1090	7E-05	540 14.148	8.54585E-05	1.85	0.001440087	40.78	4.35	24.38	1/10/04	11:00	0:38:00	0:11:00	0.774598889
1	80	1090	4E-05	540 14.148	3.27292E-05	0.93	0.001472818	41.71	4.44	24.48	1/10/04	11:00	0:38:30	0:11:30	0.779957284
1	80	1090	4E-05	540 14.148	3.27292E-05	0.93	0.001505545	42.83	4.54	24.58	1/10/04	11:01	0:37:00	0:12:00	0.785281288
3	80	1090	0.0001	540 14.148	9.81877E-05	2.78	0.001803733	45.41	4.84	24.88	1/10/04	11:02	0:38:00	0:13:00	0.795822428
1	80	1090	4E-05	540 14.148	3.27292E-05	0.93	0.001838482	48.34	4.94	24.97	1/10/04	11:03	0:39:00	0:14:00	0.808225775
10	80	1090	0.0004	540 14.148	0.000327292	9.27	0.001983755	55.81	5.93	25.98	1/10/04	11:07	0:43:00	0:18:00	0.848581873
7	80	1090	0.0002	540 14.148	0.000229105	8.49	0.002192859	82.09	8.82	26.85	1/10/04	11:11	0:47:00	0:22:00	0.885081203
20	80	1090	0.0007	540 14.148	0.000854585	18.54	0.002847444	80.83	8.59	26.83	1/10/04	11:21	0:57:00	0:32:00	0.974879434
16	80	1090	0.0008	540 14.148	0.000523888	14.83	0.003371112	95.48	10.17	30.21	1/10/04	11:32	1:08:00	0:43:00	1.084581295
12	80	1090	0.0004	540 14.148	0.000392751	11.12	0.003783883	108.58	11.38	31.39	1/10/04	11:41	1:17:00	0:52:00	1.132843031
14	79	1089	0.0005	539 14.135	0.000458838	12.99	0.004222501	119.57	12.74	32.78	1/10/04	11:51	1:27:00	1:02:00	1.204159458
9	80	1089	0.0003	540 14.135	0.000294293	8.33	0.004518794	127.90	13.83	33.87	1/10/04	12:00	1:38:00	1:11:00	1.284911084
16	80	1089	0.0008	540 14.135	0.000										

78	80	1091	0.0028	540 14.181	0.002555223	72.38	0.010017792	283.87	30.23	50.27	1/10/04	17-25	7:01:00	8:38:00	2.848899142
98	80	1089	0.0035	540 14.135	0.003204523	90.74	0.013222315	374.41	39.90	59.94	1/10/04	22-24	12:00:00	11:38:00	3.484101815
112	82	1085	0.004	542 14.083	0.003835398	102.94	0.01885771	477.36	50.87	70.91	1/11/04	9-31	23:07:00	22:42:00	4.807979479
53	80	1087	0.0019	540 14.109	0.001729878	48.98	0.018587588	528.34	58.09	78.13	1/11/04	21:08	34:44:00	34:19:00	5.893499244
28	79	1093	0.001	539 14.187	0.000920848	28.07	0.019508232	552.41	58.87	78.91	1/12/04	9-28	47:04:00	46:39:00	6.860515044
28	80	1092	0.0009	540 14.174	0.000852522	24.14	0.020380754	578.55	61.44	81.48	1/12/04	17-25	55:01:00	54:38:00	7.417322088
24	80	1096	0.0008	540 14.228	0.000789828	22.37	0.021150579	598.92	63.83	83.86	1/13/04	11-53	73:29:00	73:04:00	8.572242025
45	80	1084	0.0018	540 14.070	0.001484709	41.48	0.022815288	640.39	68.25	88.28	1/14/04	11:58	87:34:00	87:09:00	9.87758405
22	80	1089	0.0008	540 14.135	0.000719383	20.37	0.023334871	860.78	70.42	90.45	1/15/04	11:32	121:08:00	120:43:00	11.00805894
41	81	1079	0.0014	541 14.005	0.001325901	37.55	0.024880572	898.31	74.42	94.48	1/16/04	11:11	144:47:00	144:22:00	12.03259482
42	81	1077	0.0015	541 13.979	0.001355723	38.39	0.026018295	738.70	78.51	98.55	1/17/04	11:11	188:47:00	188:22:00	12.99188399
-2	80	1087	-7E-05	540 14.109	-8.52783E-05	-1.85	0.025951017	734.85	78.31	98.35	1/18/04	10:11	191:47:00	191:22:00	13.84858597
15	80	1090	0.0005	540 14.148	0.000490939	13.90	0.028441955	748.75	79.80	99.83	1/19/04	18:54	224:30:00	224:05:00	14.98332408
40	84	1089	0.0014	544 14.135	0.001298351	38.77	0.027740308	785.52	83.71	103.75	1/20/04	14:29	244:05:00	243:40:00	15.82318858
10	80	1089	0.0004	540 14.135	0.000328992	9.28	0.028087299	794.77	84.70	104.74	1/21/04	10:19	283:55:00	283:30:00	16.2455122
7	80	1095	0.0002	540 14.213	0.000230158	8.52	0.028297454	801.29	85.40	105.43	1/22/04	11:45	289:21:00	288:58:00	17.010291
41	80	1077	0.0014	540 13.979	0.001325895	37.55	0.029623349	838.84	89.40	109.43	1/23/04	12:39	314:15:00	313:50:00	17.7270979
20	80	1078	0.0007	540 13.992	0.000847378	16.33	0.030270727	857.17	91.35	111.39	1/24/04	17:31	343:07:00	342:42:00	18.52340861
25	81	1069	0.0009	541 13.875	0.000800984	22.88	0.031071711	879.85	93.77	113.80	1/25/04	18:22	385:58:00	385:33:00	19.13025527
-3	80	1078	-0.0001	540 13.992	-9.71088E-05	-2.75	0.030974804	877.10	93.47	113.51	1/28/04	15:25	389:01:00	388:38:00	19.72350544
-7	79	1091	-0.0002	539 14.181	-0.00022974	-8.61	0.030744884	870.59	92.78	112.82	1/27/04	9:58	407:34:00	407:09:00	20.18828043
9	79	1091	0.0003	539 14.181	0.00029538	8.38	0.031040244	878.98	93.87	113.71	1/28/04	10:28	432:04:00	431:39:00	20.78621338
20	80	1085	0.0007	540 14.083	0.000851582	18.45	0.031891826	897.41	95.84	115.88	1/29/04	9:33	455:09:00	454:44:00	21.33424477
10	79	1089	0.0004	539 14.135	0.000327599	9.28	0.032019425	908.89	96.83	118.88	1/30/04	10:35	480:11:00	479:46:00	21.91308589
33	81	1081	0.0012	541 14.031	0.001089187	30.28	0.033088592	938.98	99.85	119.89	1/31/04	12:33	508:09:00	505:44:00	22.49777767
15	80	1080	0.0005	540 14.018	0.000488435	13.77	0.033575027	950.74	101.32	121.38	2/1/04	14:48	532:24:00	531:59:00	23.07379466
5	80	1085	0.0002	540 14.083	0.000182898	4.81	0.033737922	955.35	101.81	121.85	2/2/04	15:32	557:08:00	558:43:00	23.60387203
10	81	1094	0.0004	541 14.200	0.000327888	9.28	0.034085909	984.83	102.80	122.84	2/3/04	12:18	577:54:00	577:29:00	24.03955074
12	80	1087	0.0004	540 14.109	0.00039187	11.09	0.034457479	975.72	103.99	124.02	2/4/04	18:21	805:57:00	805:32:00	24.81805167
19	80	1080	0.0007	540 14.018	0.00081815	17.45	0.035073829	993.17	105.84	125.88	2/5/04	14:35	828:11:00	827:48:00	25.0635858
6	80	1088	0.0002	540 14.098	0.000195855	5.54	0.035289284	998.71	108.44	128.47	2/8/04	9:28	847:04:00	848:39:00	25.43750512
0	80	1095	0	540 14.213	0	0.00	0.035289284	998.71	108.44	128.47	2/7/04	13:32	875:08:00	874:43:00	25.98332799
19	80	1083	0.0007	540 14.057	0.000817882	17.50	0.035867148	1018.21	108.30	128.34	2/8/04	12:15	897:51:00	897:28:00	28.41885088
11	81	1091	0.0004	541 14.181	0.000359886	10.19	0.036246832	1028.39	109.39	129.42	2/9/04	10:21	719:57:00	719:32:00	28.83188402
6	80	1092	0.0002	540 14.174	0.000198738	5.57	0.038443588	1031.98	109.98	130.01	2/10/04	10:12	743:48:00	743:23:00	27.27289997
18	80	1085	0.0006	540 14.083	0.000521288	14.78	0.038984833	1048.72	111.55	131.59	2/11/04	9:25	787:01:00	788:38:00	27.89808575
-6	80	1099	-0.0002	540 14.285	-0.000197997	-5.81	0.038788838	1041.12	110.95	130.99	2/12/04	9:42	791:18:00	790:53:00	28.1300551
15	80	1091	0.0005	540 14.181	0.000491389	13.91	0.037258225	1055.03	112.44	132.47	2/13/04	12:19	817:55:00	817:30:00	28.59924241
16	80	1085	0.0008	540 14.083	0.000521288	14.78	0.037779491	1089.79	114.01	134.05	2/14/04	11:35	841:11:00	840:46:00	29.00318075
1	80	1092	4E-05	540 14.174	3.27893E-05	0.93	0.03781228	1070.72	114.11	134.15	2/15/04	14:33	868:09:00	867:44:00	29.48438528
16	81	1091	0.0008	541 14.181	0.000523179	14.81	0.03833548	1085.54	115.89	135.72	2/16/04	14:03	891:39:00	891:14:00	29.86050904
-8	80	1098	-0.0002	540 14.252	-0.000197817	-8.80	0.038137843	1079.93	115.09	135.13	2/17/04	8:55	911:31:00	911:08:00	30.1913343
10	80	1091	0.0004	540 14.181	0.000327593	9.28	0.038485236	1089.21	118.08	138.12	2/18/04	8:11	934:47:00	934:22:00	30.57422862
38	82	1071	0.0013	542 13.901	0.001217522	34.48	0.039862758	1123.89	119.75	139.79	2/19/04	9:00	958:38:00	958:11:00	30.98128812
-3	81	1076	-0.0001	541 13.988	-9.87474E-05	-2.74	0.039588011	1120.95	119.48	139.50	2/20/04	16:22	989:58:00	989:33:00	31.48373574
-1	80	1085	-4E-05	540 14.083	-3.25791E-05	-0.92	0.039553432	1120.02	119.38	139.40	2/21/04	19:39	1017:15:00	1018:50:00	31.89435887
13	81	1079	0.0005	541 14.005	0.000420408	11.90	0.03997384	1131.93	120.83	140.87	2/22/04	15:25	1037:01:00	1038:38:00	32.20274315
-9	80	1085	-0.0003	540 14.083	-0.000293212	-8.30	0.039868028	1123.83	119.75	139.78	2/23/04	14:14	1059:50:00	1059:25:00	32.55508153

DECANISTERED 2/23/2004; sample oven dried for 5 days in air

1051.0'-1051.6' (shale seam in Bethany Falls Ls.) core in canister MER 3  
Petrol Oil & Gas #7-1 Trulove; NW NW SE 7-T.21S.-R.14E., Coffey County, KS

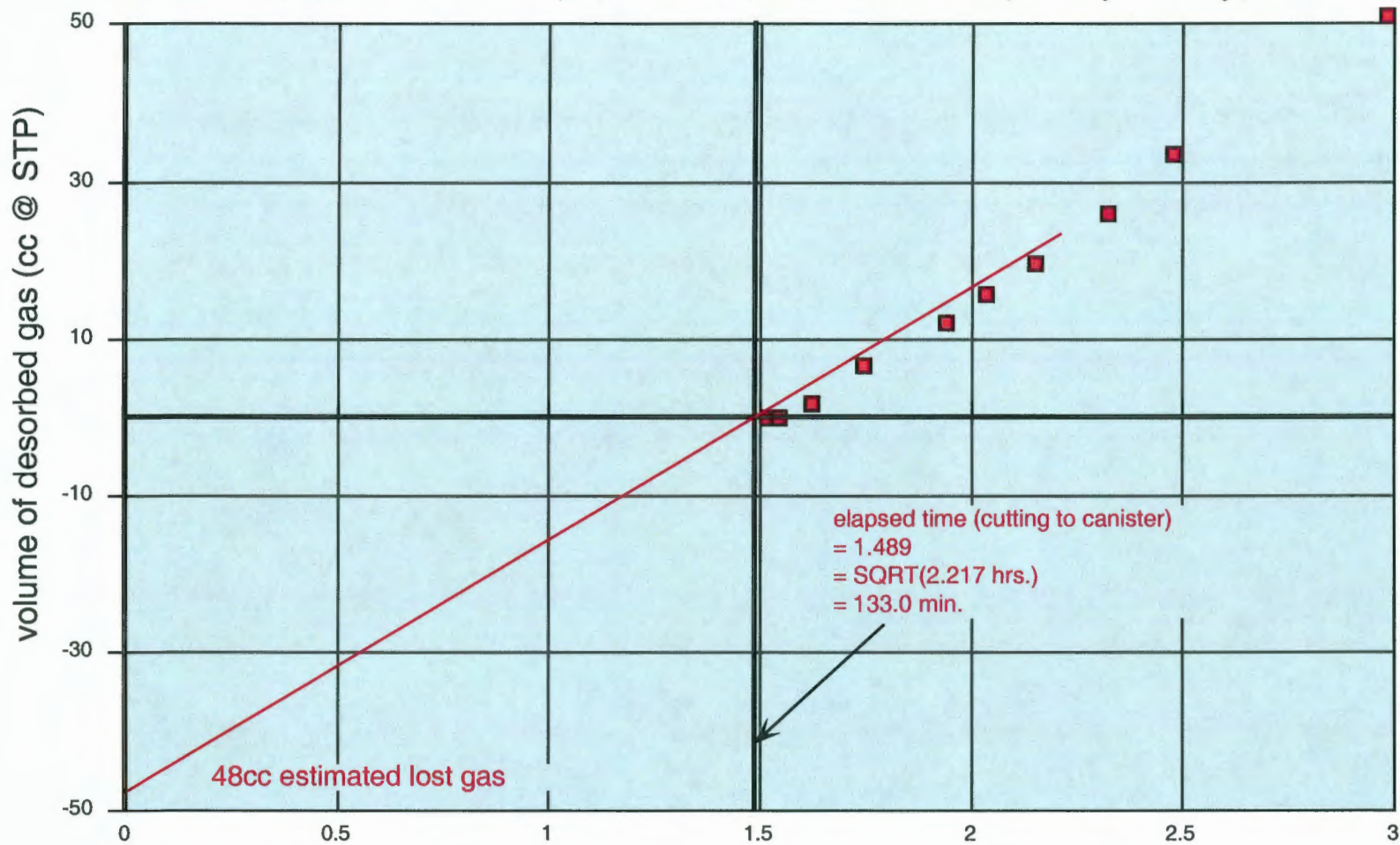


Figure 2.

1057.0'-1057.6' (Hushpuckney Shale) core in canister 4  
Petrol Oil & Gas #7-1 Trulove; NW NW SE 7-T.21S.-R.14E., Coffey County, KS

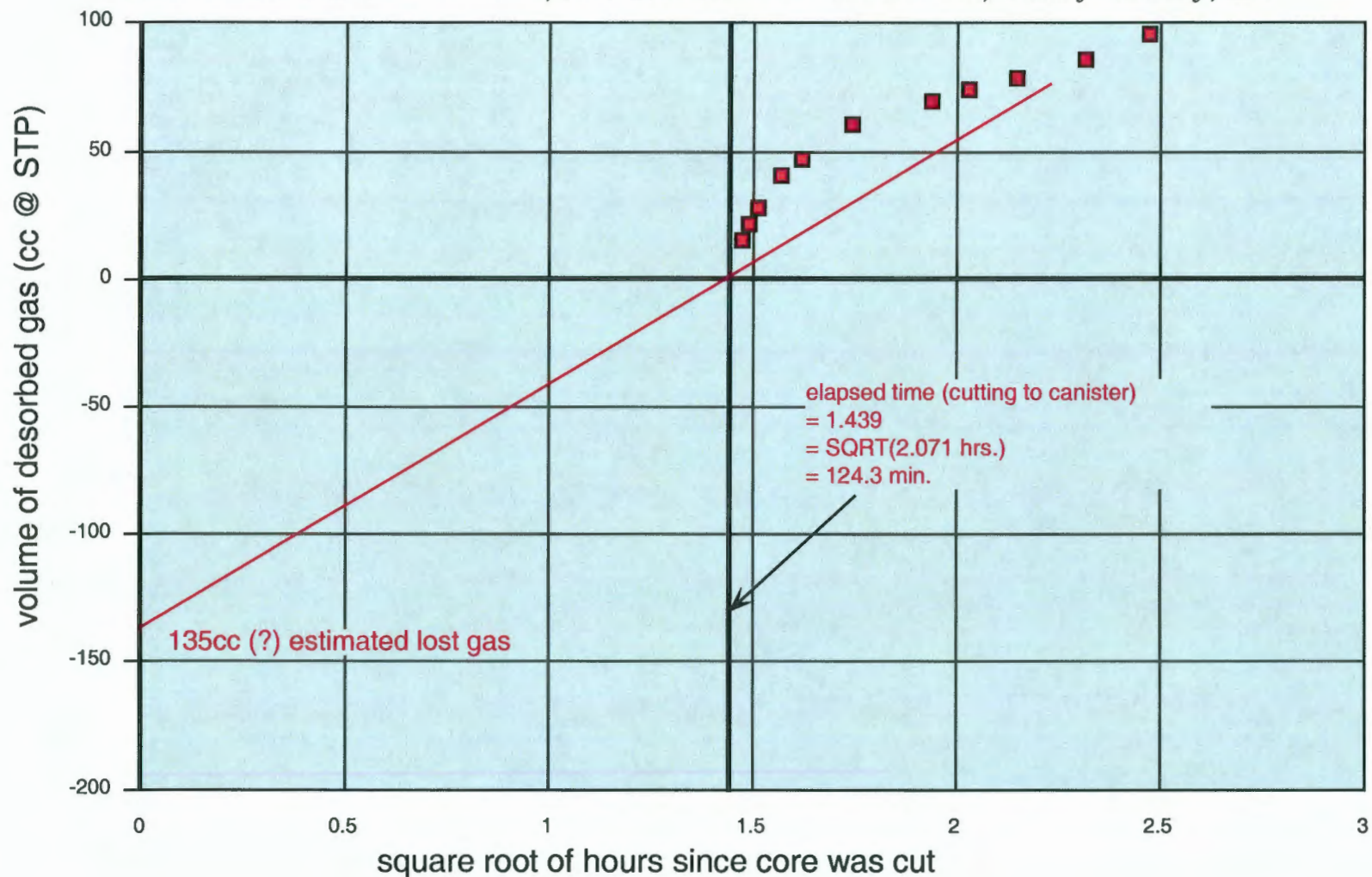


Figure 3.

1264' to 1268' (Lake Neosho Shale) cuttings in canister Stoeckinger #5  
Petrol Oil & Gas #7-1 Trulove; NW NW SE 7-T.21S.-R.14E., Coffey County, KS

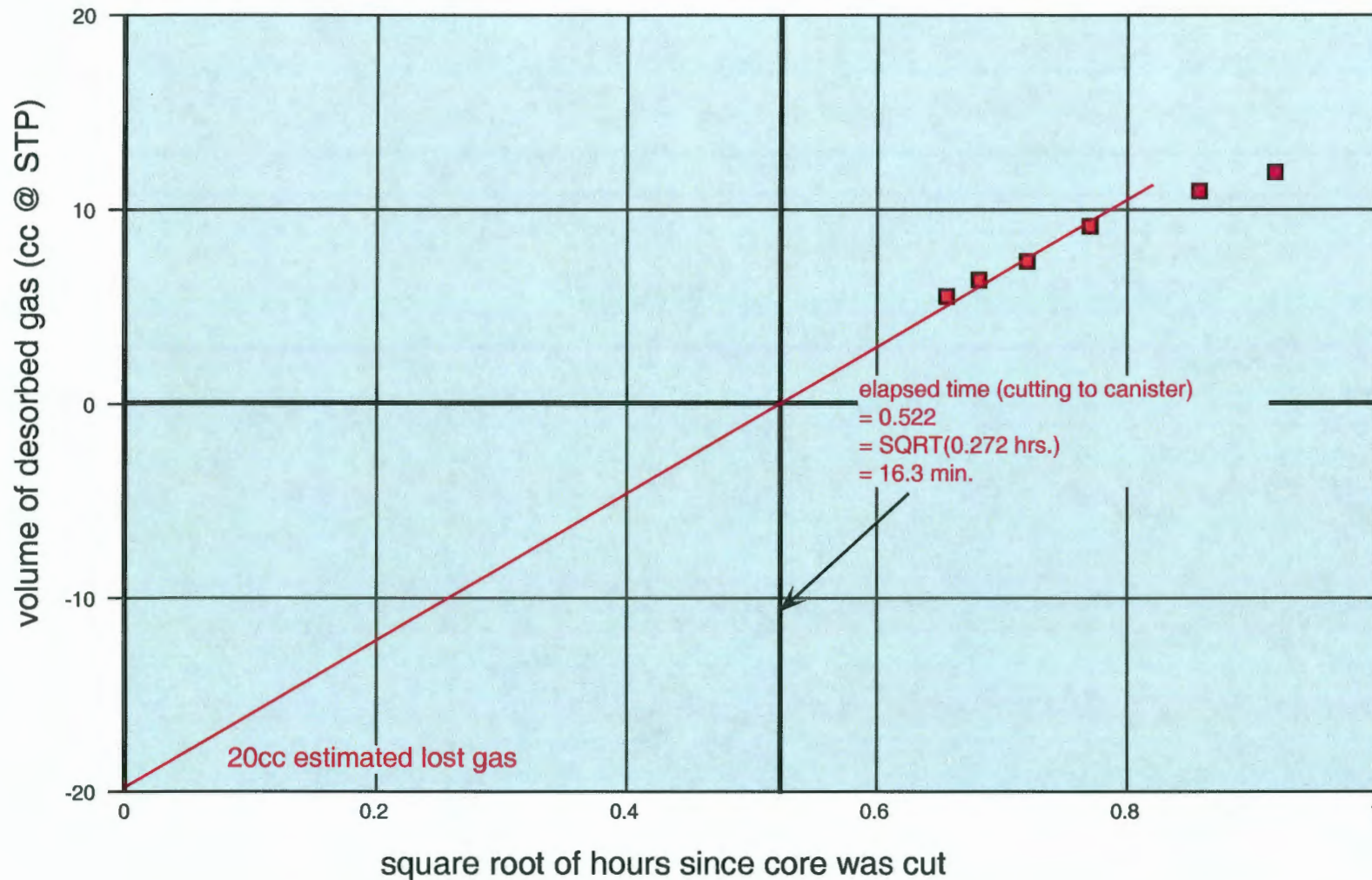


Figure 4.



1324' to 1326' (Lexington/Anna Shale) cuttings in canister Stoeckinger #1  
Petrol Oil & Gas #7-1 Trulove; NW NW SE 7-T.21S.-R.14E., Coffey County, KS

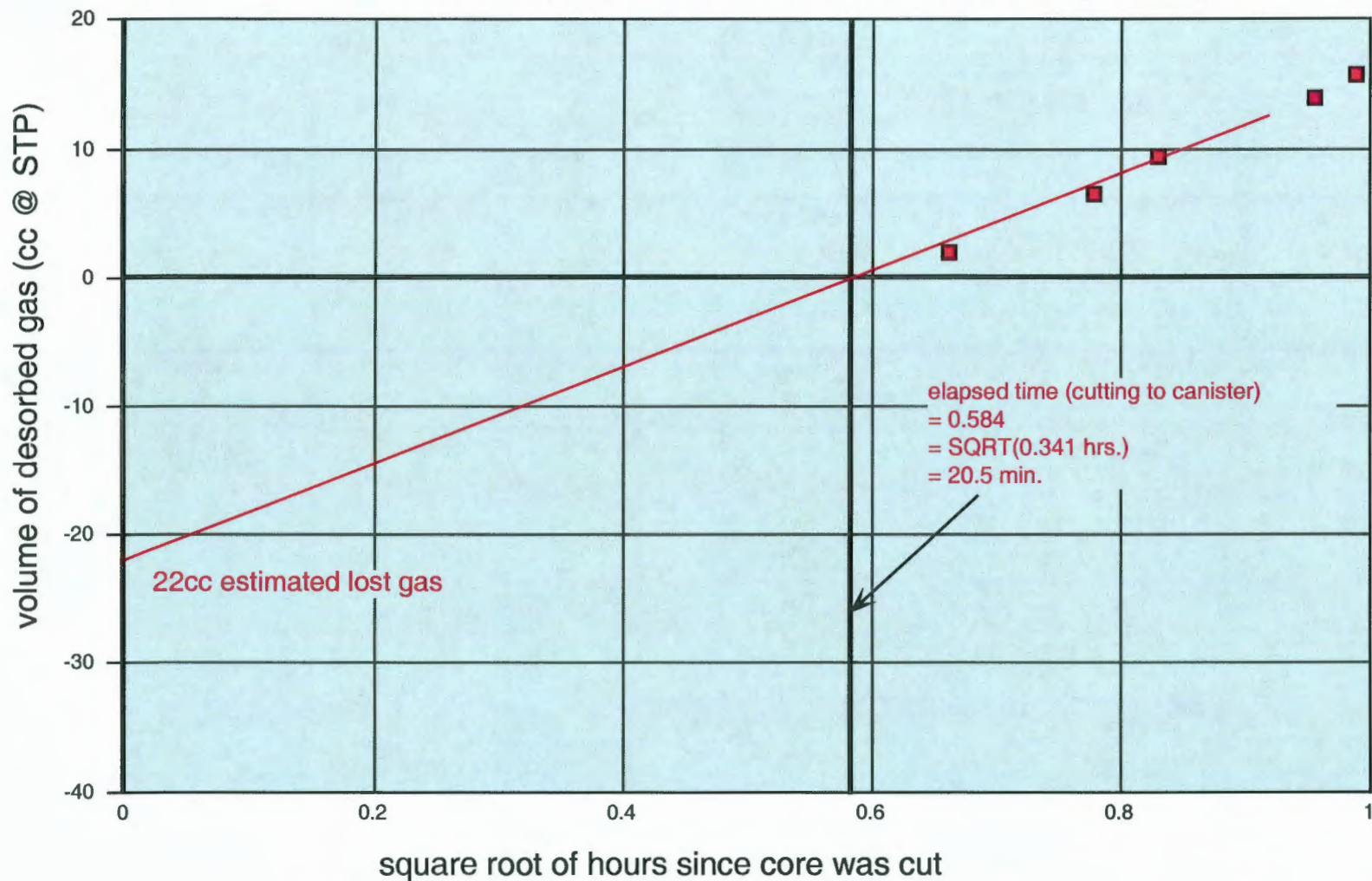


Figure 5.

1482.7' to 1483.6' (V Shale) core in canister MER 2  
Petrol Oil & Gas #7-1 Trulove; NW NW SE 7-T.21S.-R.14E., Coffey County, KS

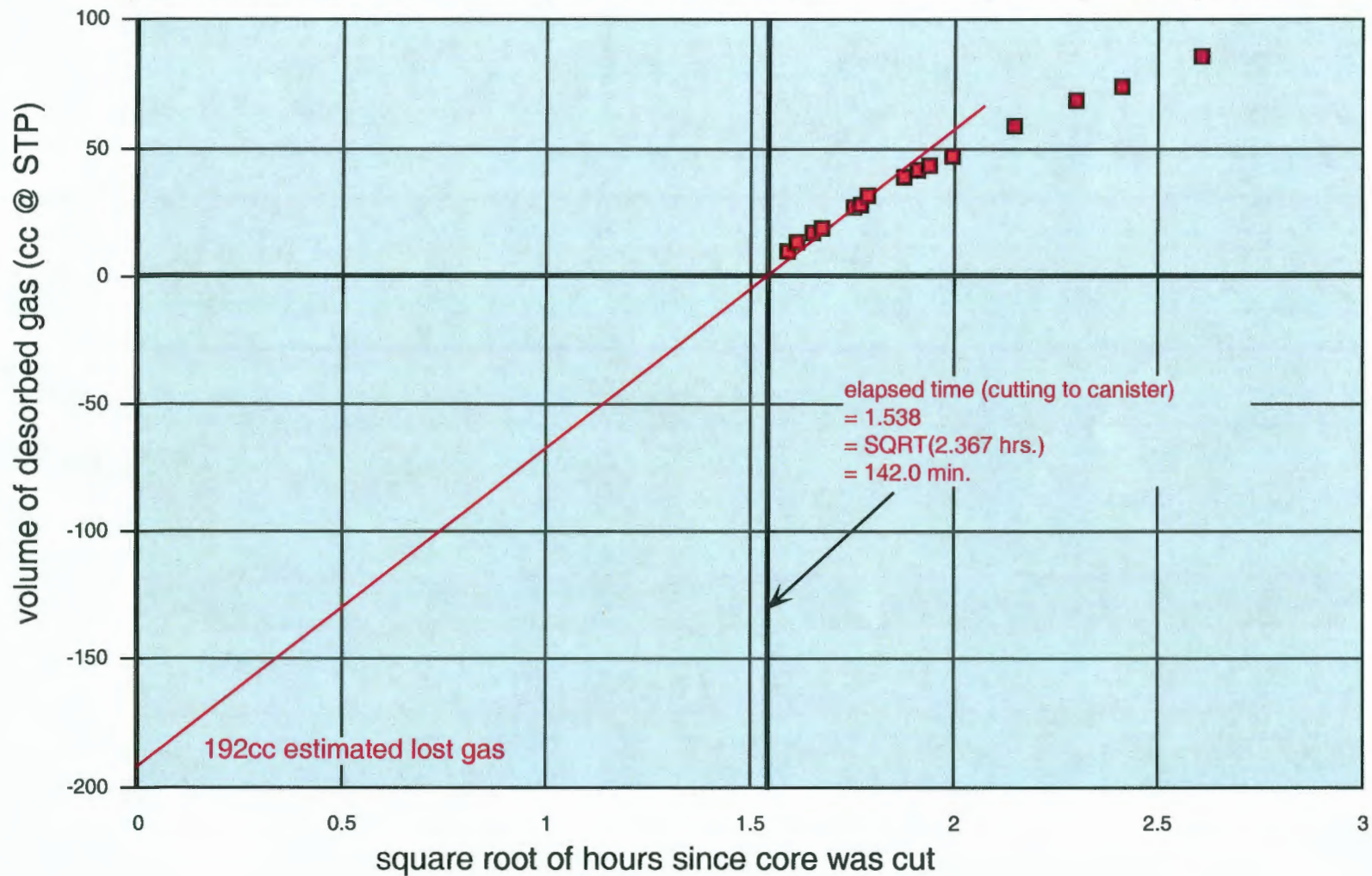


Figure 6.

1483.6' to 1484.5' (Croweburg coal ) core in canister MER 1  
Petrol Oil & Gas #7-1 Trulove; NW NW SE 7-T.21S.-R.14E., Coffey County, KS

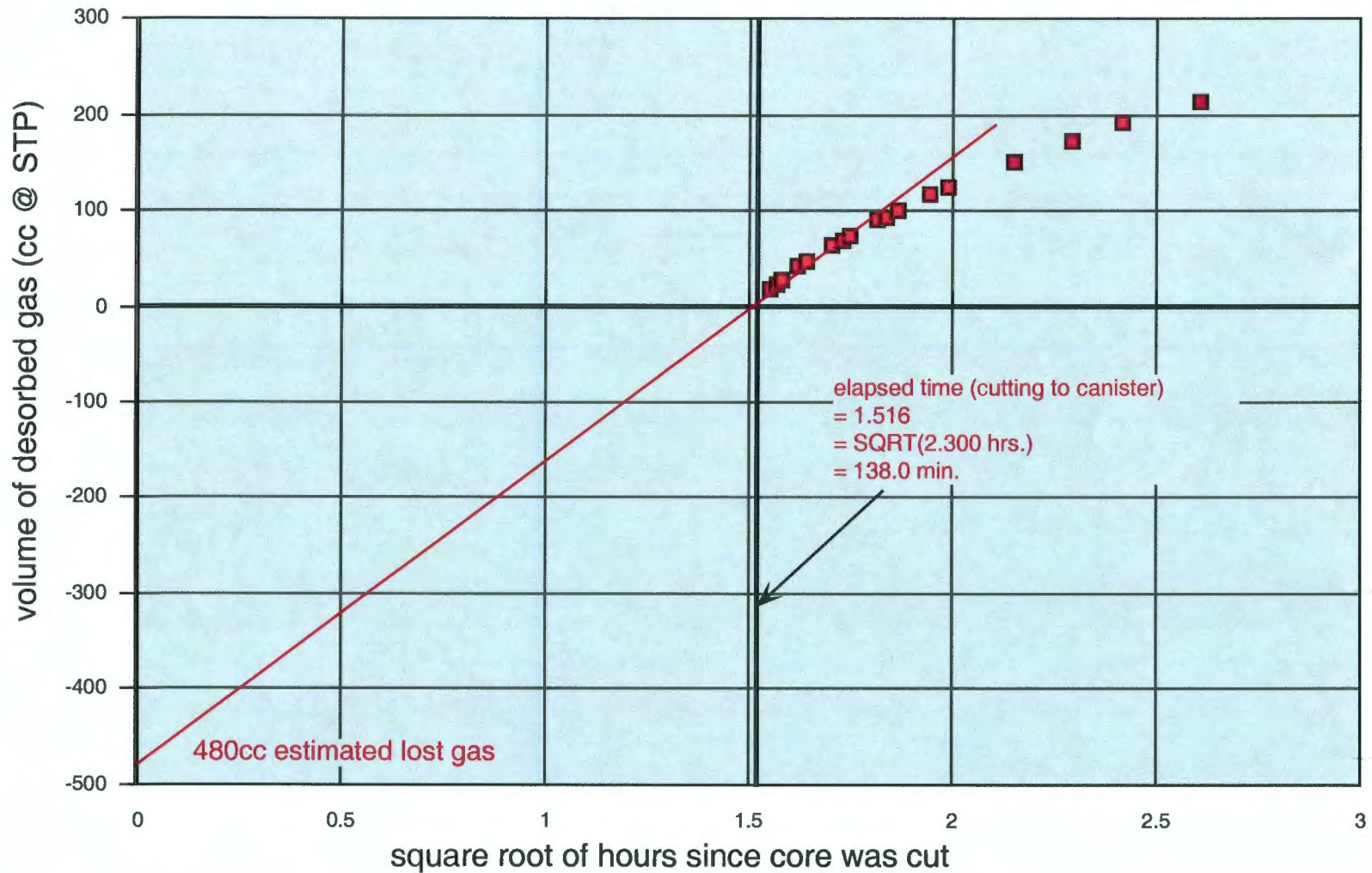


Figure 7.

1552.7' to 1553.5' ("Tebo shale") core in canister 8  
Petrol Oil & Gas #7-1 Trulove; NW NW SE 7-T.21S.-R.14E., Coffey County, KS

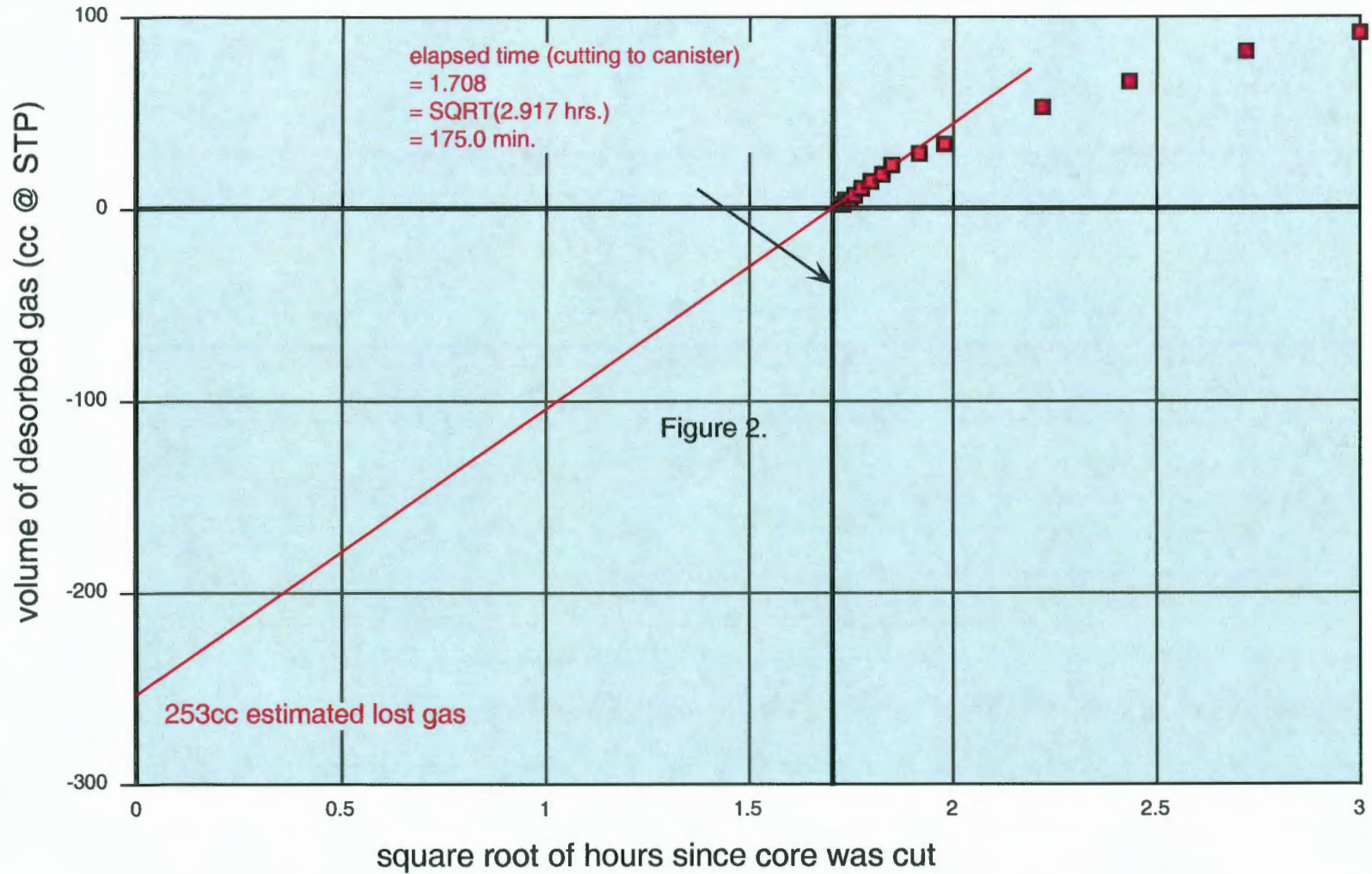


Figure 8.

1556.1' to 1556.8' (Tebo(?) coal) core in canister 6  
Petrol Oil & Gas #7-1 Trulove; NW NW SE 7-T.21S.-R.14E., Coffey County, KS

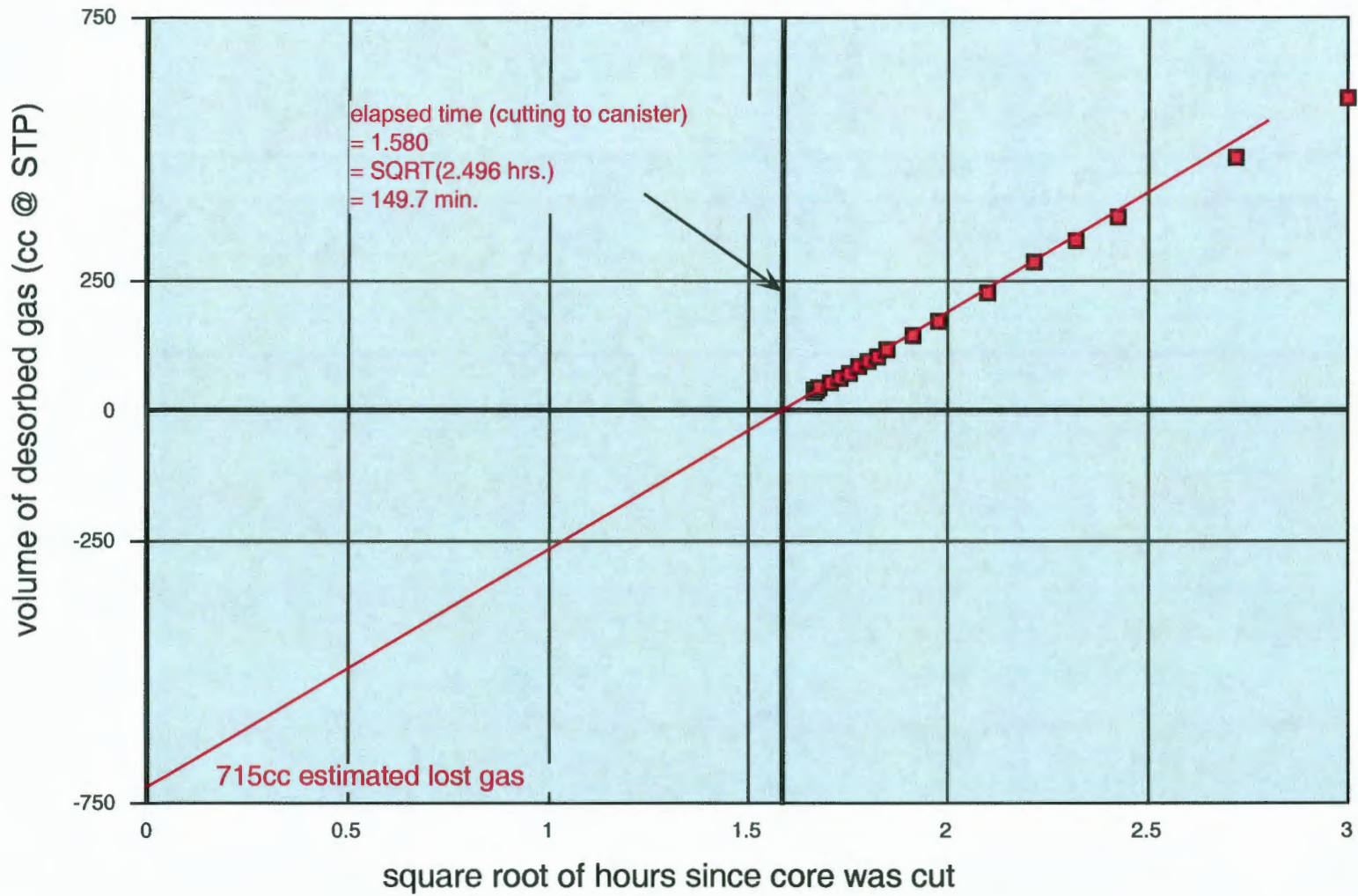


Figure 9.

1728' to 1731' (Riverton coal) cuttings in canister 10  
Petrol Oil & Gas #7-1 Trulove; NW NW SE 7-T.21S.-R.14E., Coffey County, KS

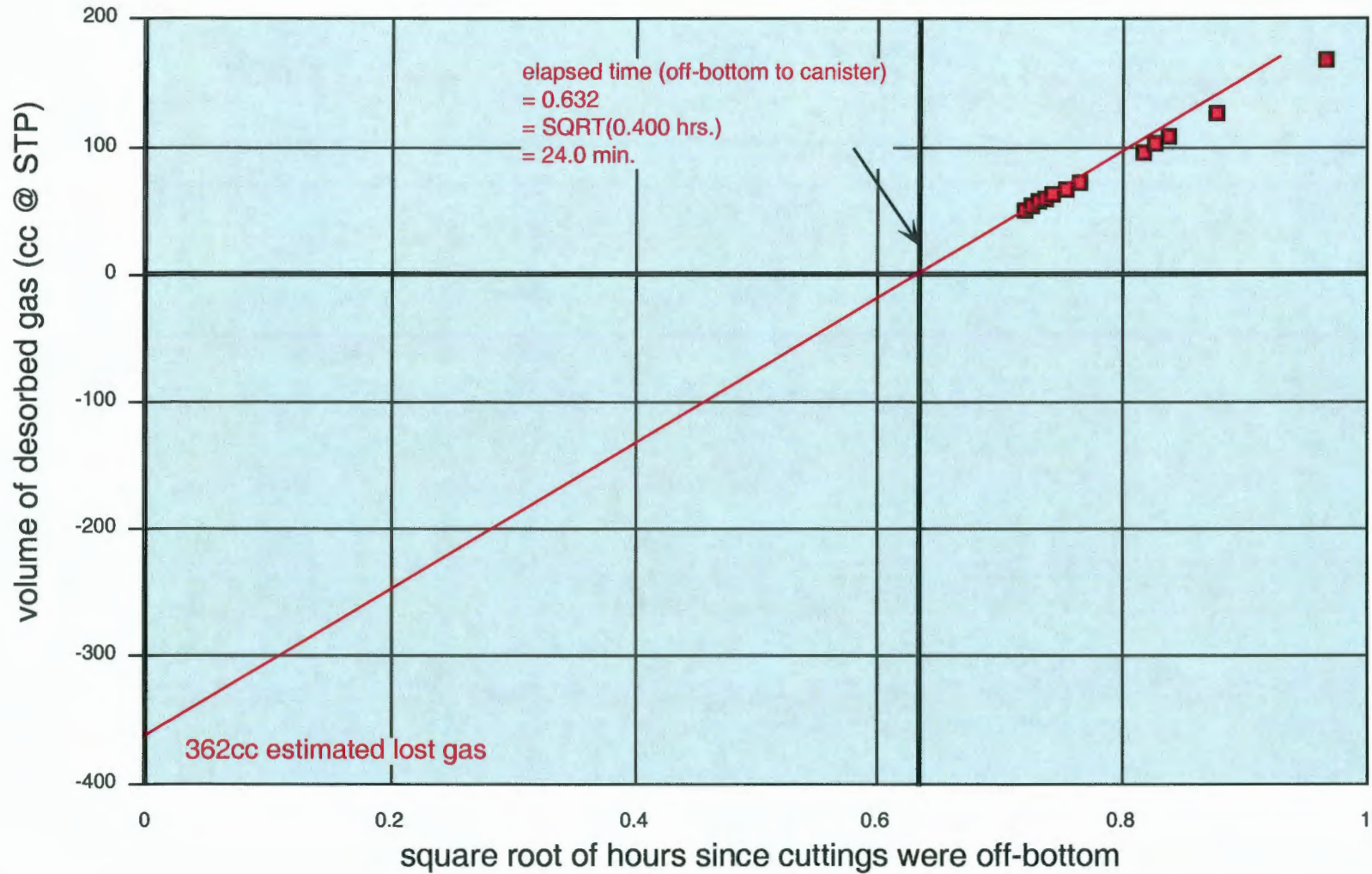


Figure 10.

1728' to 1731' (Riverton coal) cuttings in canister MER Fe  
Petrol Oil & Gas #7-1 Trulove; NW NW SE 7-T.21S.-R.14E., Coffey County, KS

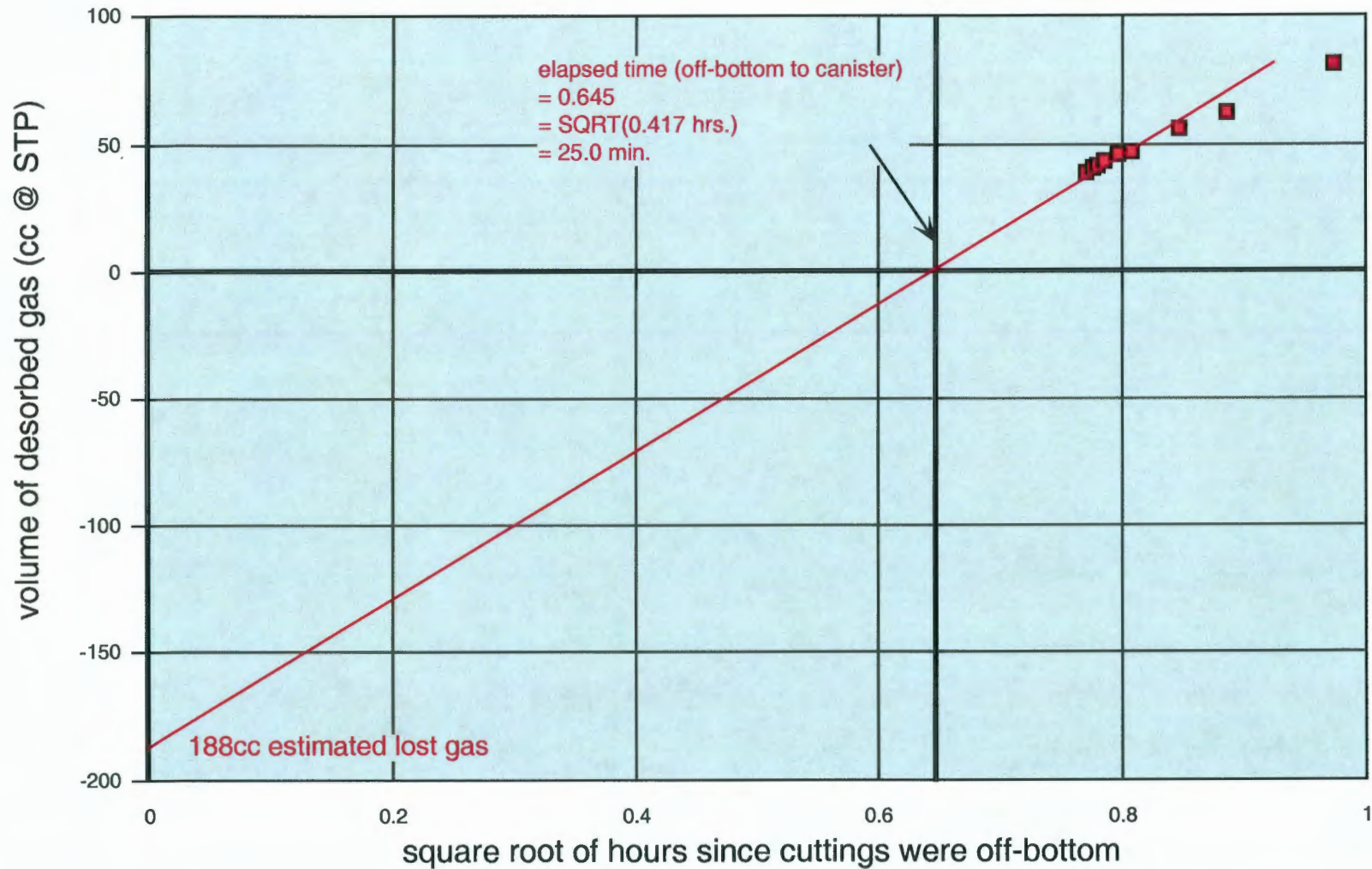


Figure 11.

# Desorption Characteristics of Cuttings Samples

## Petrol Oil & Gas #7-1 Trulove, NW NW SE 7-21S-14E, Coffey Co., KS

LITHOLOGIC COMPONENT SENSITIVITY ANALYSIS for calculation of gas content of Lake Neosho Shale from 1264-1268'

$$\text{GAS CONTENT}_{\text{coal}} = \frac{\text{total gas desorbed} - ((\text{gas content}_{\text{dark shale}}) * (\text{weight}_{\text{dark shale}}))}{\text{weight}_{\text{coal}}}$$

total gas desorbed = 38.4 ccs

TOTAL DRY WEIGHT OF SAMPLE = 458.69 grams

weight<sub>light-colored lithologies</sub> = 307.67 grams (67.1%)

weight<sub>dark shale</sub> = 151.02 grams (32.9%)

weight<sub>coal</sub> = 0.00 grams (0.0%)

sieve size	grams	% coal / % dark shale / % light-colored liths
>0.0930"	84.74	0.00% / 62.05% / 37.95%
>0.0661"	94.81	0.00% / 40.72% / 59.28%
>0.0460"	117.81	0.00% / 31.28% / 68.72%
>0.0331"	75.05	0.00% / 19.13% / 80.87%
<0.0331"	86.29	0.00% / 10.00% / 90.00%

**458.69 TOTAL**

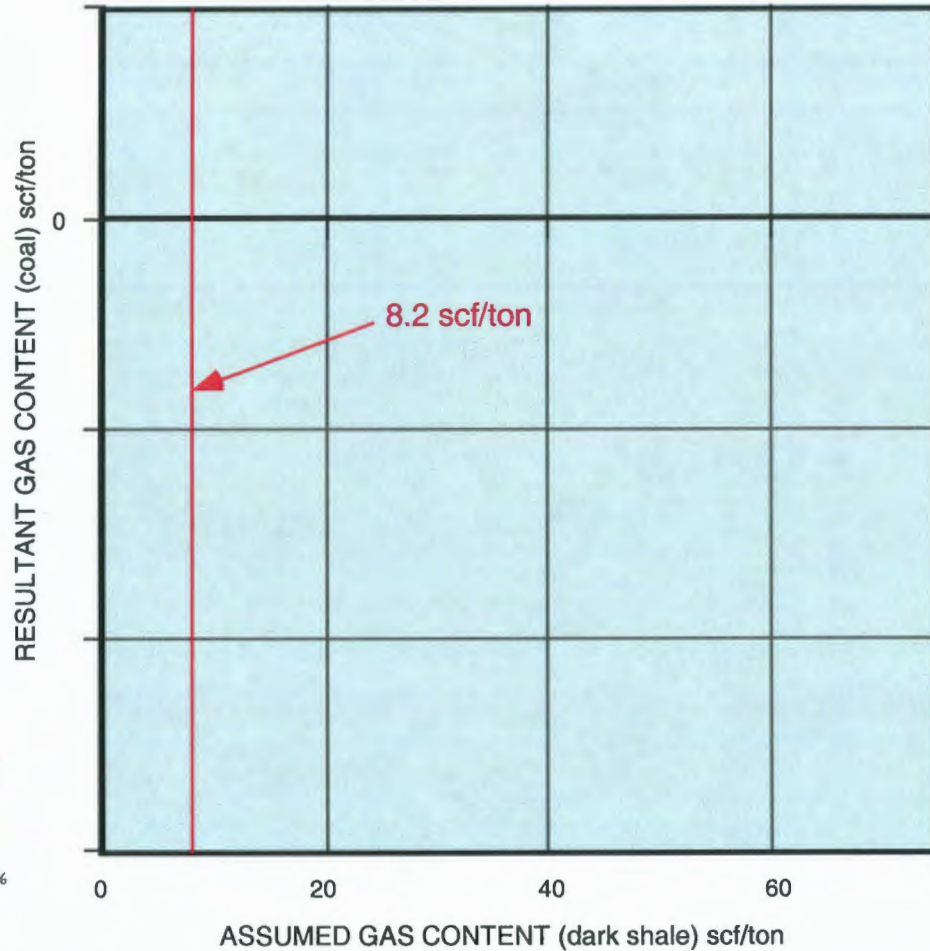
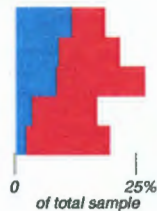


Figure 12.



# Desorption Characteristics of Cuttings Samples

## Petrol Oil & Gas #7-1 Trulove, NW NW SE 7-21S-14E, Coffey Co., KS

LITHOLOGIC COMPONENT SENSITIVITY ANALYSIS for calculation of gas content of Anna Shale from 1324-1326'

$$\text{GAS CONTENT}_{\text{coal}} = \frac{\text{total gas desorbed} - ((\text{gas content}_{\text{dark shale}}) * (\text{weight}_{\text{dark shale}}))}{\text{weight}_{\text{coal}}}$$

total gas desorbed = 65.1 ccs

TOTAL DRY WEIGHT OF SAMPLE = 422.45 grams

weight<sub>light-colored lithologies</sub> = 75.06 grams (17.8%)

weight<sub>dark shale</sub> = 347.39 grams (82.2%)

weight<sub>coal</sub> = 0.00 grams (0.0%)

sieve size	grams	% coal / % dark shale / % light-colored liths
>0.0930"	90.98	0.00% / 76.27% / 23.73%
>0.0661"	103.89	0.00% / 82.34% / 17.66%
>0.0460"	112.43	0.00% / 84.75% / 15.25%
>0.0331"	63.20	0.00% / 83.89% / 16.11%
<0.0331"	51.95	0.00% / 85.00% / 15.00%
<b>422.45 TOTAL</b>		

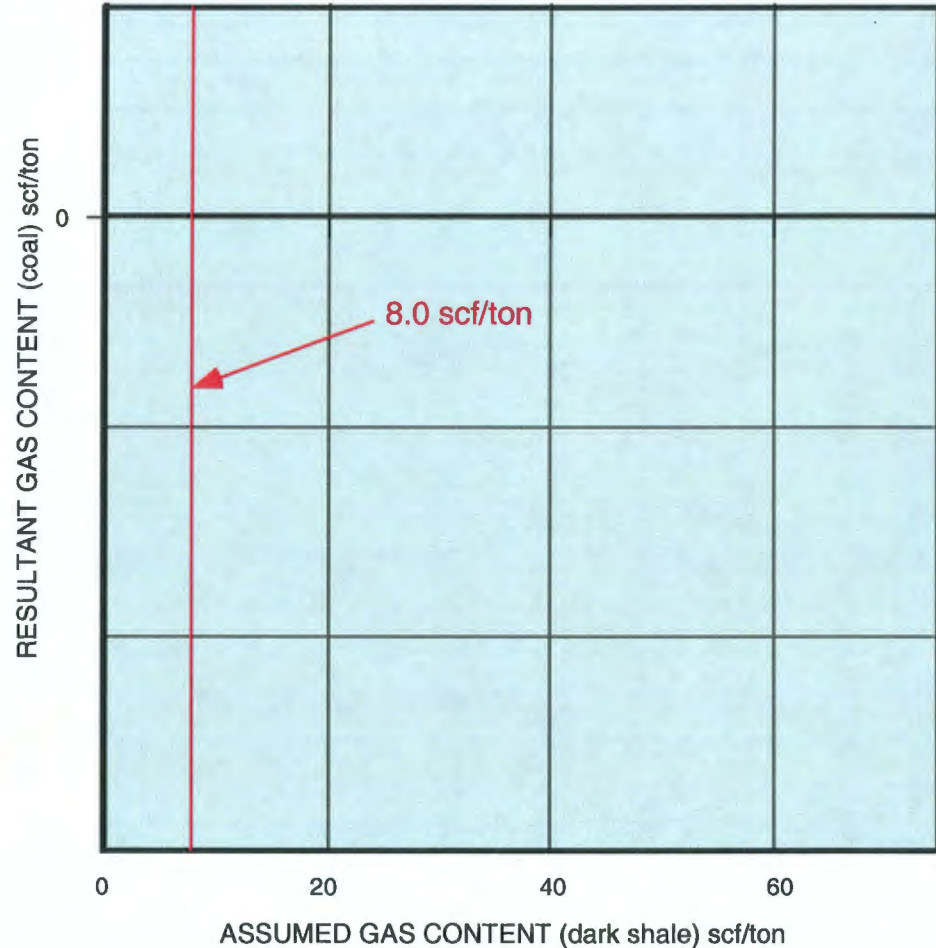
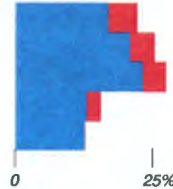


Figure 13.

# Desorption Characteristics of Cuttings Samples

## Petrol Oil & Gas #7-1 Trulove, NW NW SE 7-21S-14E, Coffey Co., KS

LITHOLOGIC COMPONENT SENSITIVITY ANALYSIS for calculation of gas content of Riverton coal from 1728-1731'

$$\text{GAS CONTENT}_{\text{coal}} = \frac{\text{total gas desorbed} - ((\text{gas content}_{\text{dark shale}}) * (\text{weight}_{\text{dark shale}}))}{\text{weight}_{\text{coal}}}$$

### sample in canister 10

total gas desorbed = 2952.7 ccs

TOTAL DRY WEIGHT OF SAMPLE = 919.74 grams

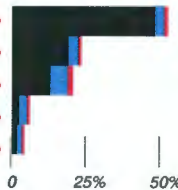
weight<sub>light-colored lithologies</sub> = 41.96 grams (4.6%)

weight<sub>dark shale</sub> = 125.52 grams (13.7%)

weight<sub>coal</sub> = 752.26 grams (81.8%)

sieve size	grams	% coal	% dark shale	% light-colored liths
>0.0930"	506.71	92.03%	5.75%	2.22%
>0.0661"	211.64	81.61%	14.83%	3.56%
>0.0460"	136.46	62.12%	28.98%	8.90%
>0.0331"	39.27	46.25%	38.74%	15.02%
<0.0331"	26.67	40.00%	40.00%	20.00%

**919.74 TOTAL**



### sample in canister Mer Fe

total gas desorbed = 1319.9 ccs

TOTAL DRY WEIGHT OF SAMPLE = 311.40 grams

weight<sub>light-colored lithologies</sub> = 10.79 grams (3.5%)

weight<sub>dark shale</sub> = 31.74 grams (10.2%)

weight<sub>coal</sub> = 268.88 grams (86.3%)

sieve size	grams	% coal	% dark shale	% light-colored liths
>0.0930"	159.79	96.46%	2.96%	0.58%
>0.0661"	70.22	87.29%	9.94%	2.76%
>0.0460"	52.57	73.45%	20.65%	5.90%
>0.0331"	17.19	52.49%	33.03%	14.48%
<0.0331"	11.64	50.00%	30.00%	20.00%

**311.40 TOTAL**

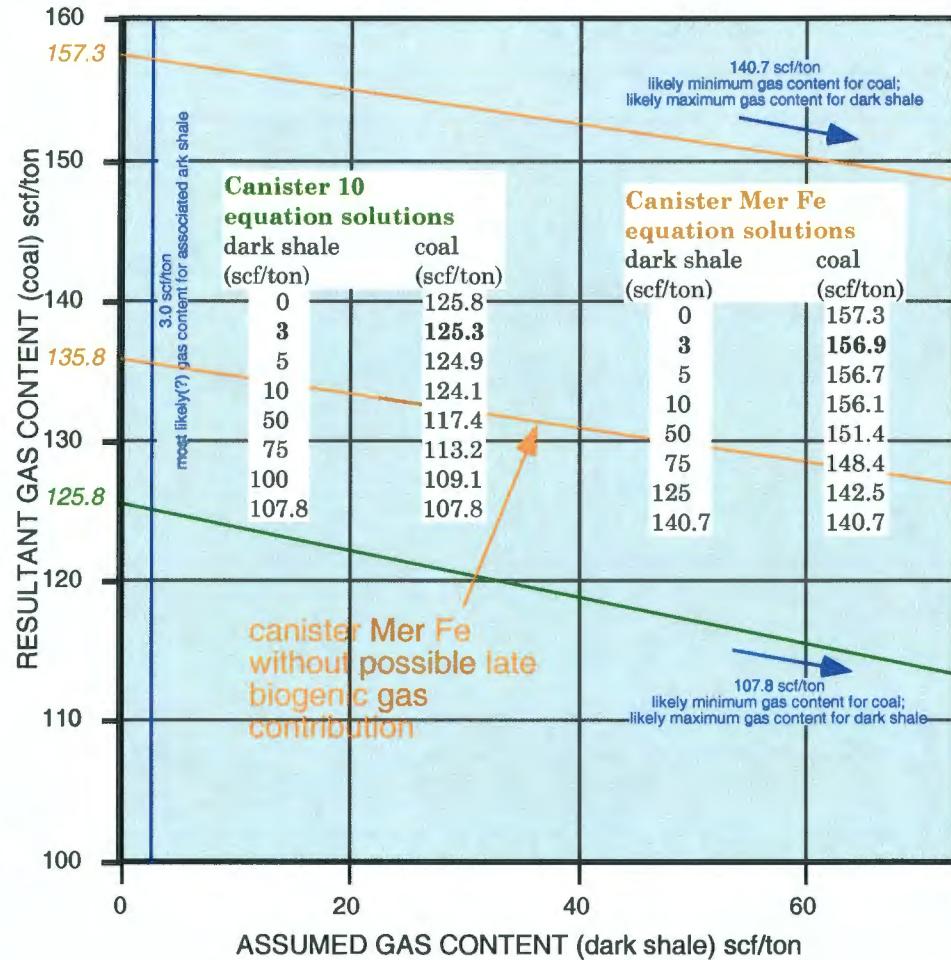
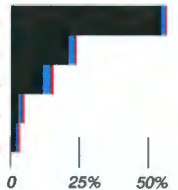


Figure 14.

# PETROL OIL & GAS #7-1 TRULOVE

## NW NW SE 7-21S-14E, Coffey Co., KS

### cuttings desorption curves

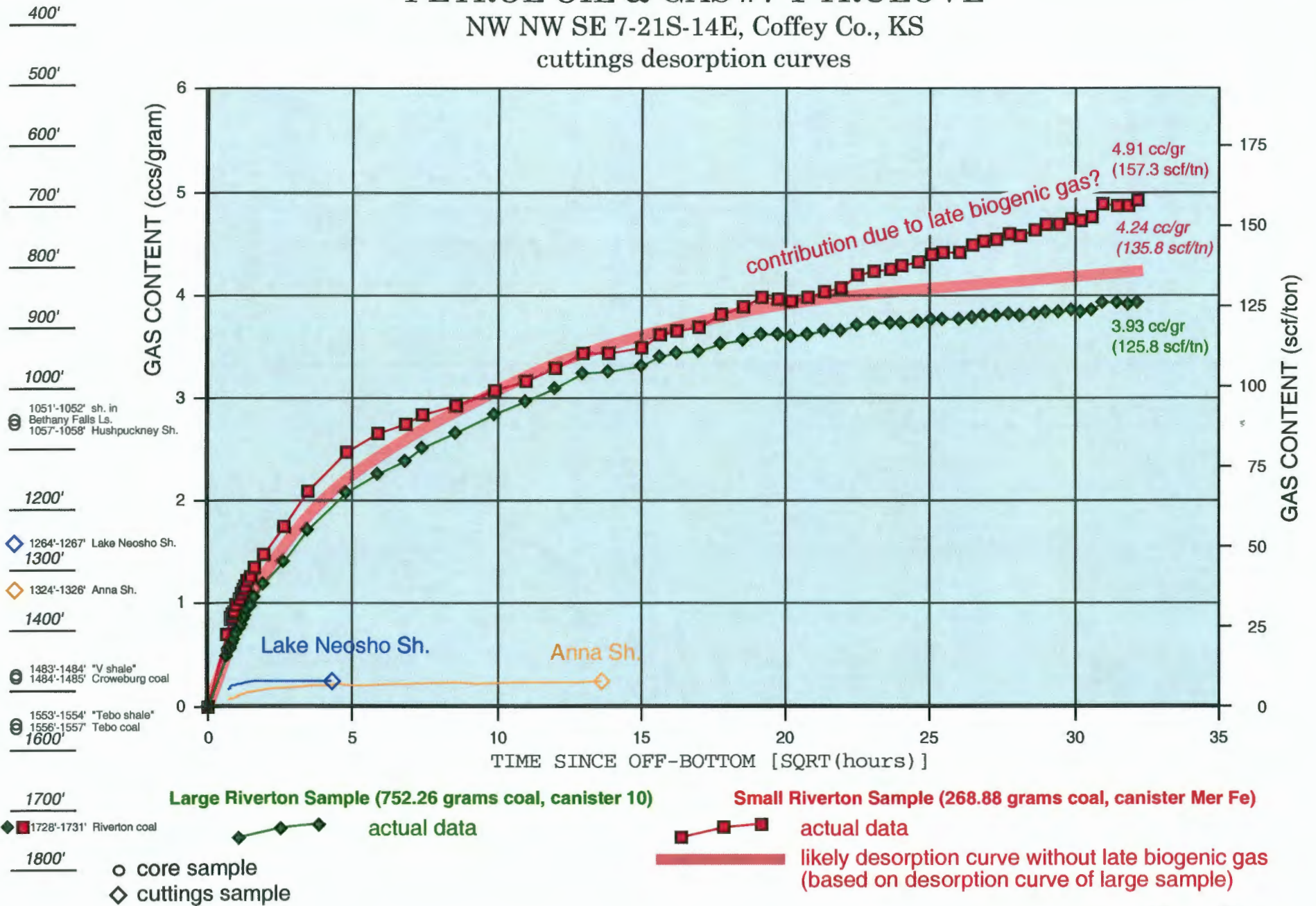
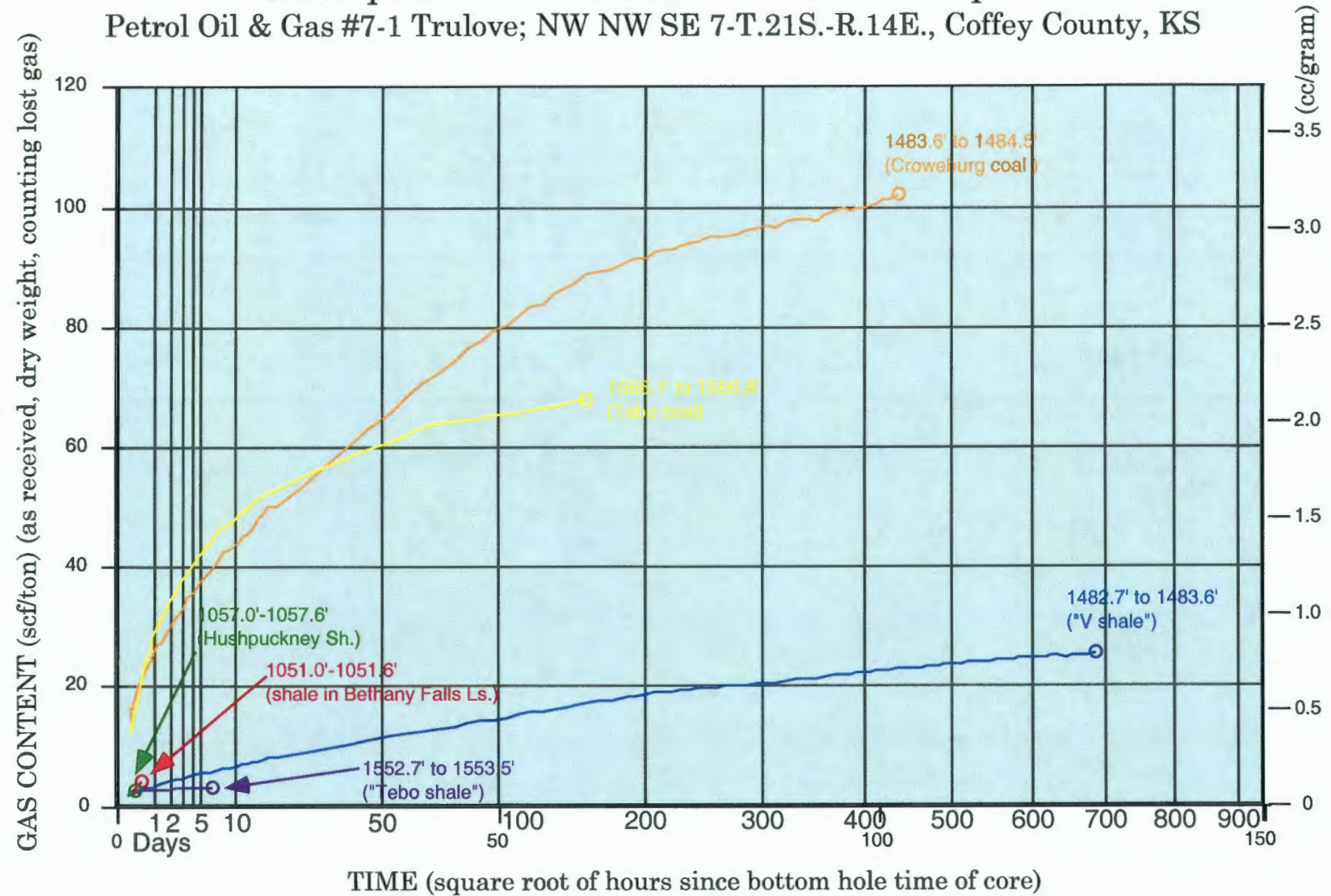


Figure 15.

400'  
500'  
600'  
700'  
800'  
900'  
1000'  
1200'  
1300'  
1400'  
1600'  
1700'  
1800'

## Desorption Characteristics of Core Samples

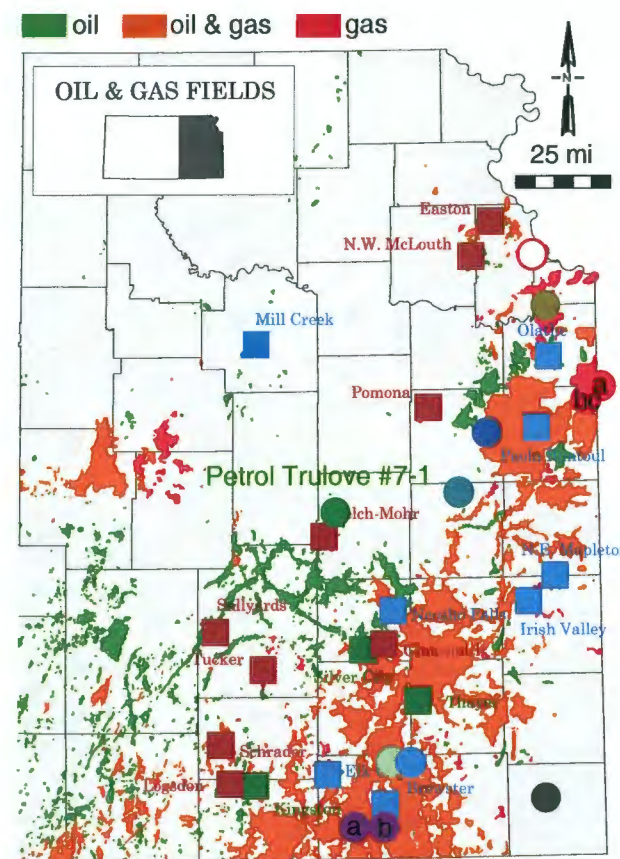
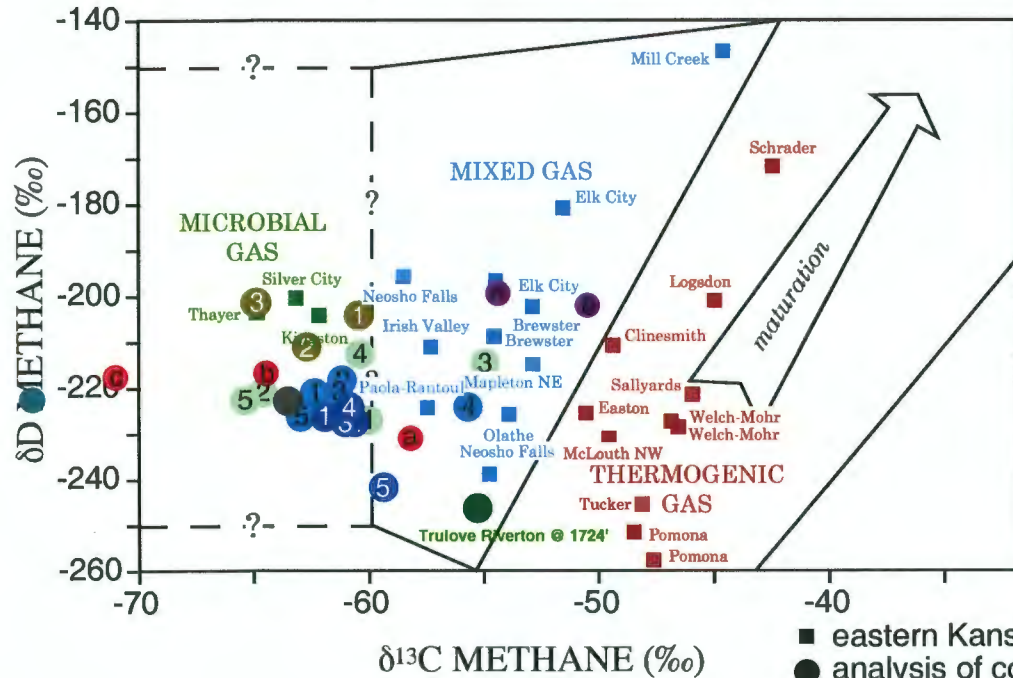
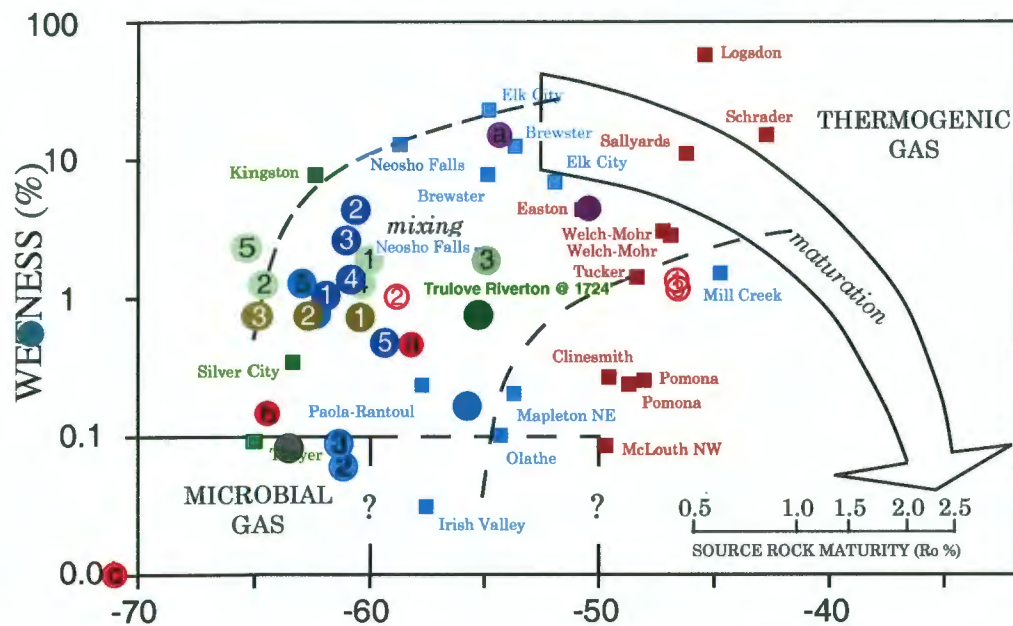
Petrol Oil & Gas #7-1 Trulove; NW NW SE 7-T.21S.-R.14E., Coffey County, KS



- 1051'-1052' sh. in Bethany Falls Ls.  
○ 1057'-1058' Hushpuckney Sh.
- ◇ 1264'-1267' Lake Neosho Sh.
- ◇ 1324'-1326' Anna Sh.
- 1483'-1484' "V shale"  
○ 1484'-1485' Croweburg coal
- 1553'-1554' "Tebo shale"  
○ 1556'-1557' Tebo coal
- ◇ 1728'-1731' Riverton coal

○ core sample  
◇ cuttings sample

Figure 16.



- U. PENN Mill Creek, Schrader
- M. PENN Silver City, Thayer, Brewster, Elk City, Mapleton NE, Neosho Falls, Olathe, Clinesmith, Easton, McLouth NW, Pomona, Sallyards, Welch-Mohr
- MSSP Kingston, Brewster, Irish Valley, Neosho Falls, Paola-Rantoul, Tucker
- L. ORD Logsdon
- eastern Kansas conventional gas (from Jenden et al., 1988)
- analysis of coalbed desorption gas

Figure 17.

# LUMAN'S LABORATORIES

P.O. Box 326 • Chetopa, KS 67336  
(620) 236-7874



March 19, 2004

William T. Stoeckinger  
5742 Hazel Rd.  
Bartlesville, OK 74006

*Petrol O&G  
Trilove*

Attn: William T. Stoeckinger

Please find listed below analysis on the following sample.

Lab ID. SM10-1 Sample ID. Riverton Large 859.11.

	As Received	Moisture Free	MAF
Moisture	2.23%		
Ash	7.59%	7.76%	
Volatile Matter	36.65%	37.49%	
Fixed Carbon	53.53%	54.75%	
BTU/lb	13,714	14,027	15,207
Sulfur	2.21%	2.26%	

84.81% Coal Floated at 1.65 Specific Gravity 1.31  
Air Dried weight of sample 857.1 gm

Respectfully,

*Carrol Luman*  
Carrol Luman

CGL:pdl

*Appendix 1 (1st pg)*

# LUMAN'S LABORATORIES

P.O. Box 326 • Chetopa, KS 67336  
(620) 236-7874



ANALYTICAL  
AND  
PHYSICAL  
TESTING

March 19, 2004

William T. Stoeckinger  
5742 Hazel Rd.  
Bartlesville, OK 74006

*Petrol Oil  
Trilobe*

Attn: William T. Stoeckinger

Please find listed below analysis on the following sample.

Lab ID. SM10-2 Sample ID. Riverton <sup>*Small*</sup> ~~Large~~ 270-88.

	As Received	Moisture Free	MAF
Moisture	1.91%		
Ash	6.35%	6.47%	
Volatile Matter	38.71%	39.46%	
Fixed Carbon	53.03%	54.07%	
BTU/lb	13,981	14,253	15,239
Sulfur	2.12%	2.16%	

86.98% Coal Floated at 1.65 Specific Gravity 1.31  
Air Dried weight of sample 271.1 gm

Respectfully,  
  
Carrol Luman

CGL:pdl

*APPENDIX 1 (2nd pg)*