#20817

CASS COUNTY, MISSOURI
P R OPERATING COMPANY NO. 1 ZIMMERMAN
NW NW NW Sec. 30, T. 45 N., R. 32 W.
FNL FWL
API NO: 29-037-20817
SPUD NOVEMBER 20, 2007

UNIQUE ID: 453230005
GL ELEVATION 977 FT FROM WEST LINE TOPO MAP
GPS LAT 38.69609225 N, LONG -94.51607170 W
GPS 540 FNL 370 FWL
748.42 FT TOTAL DEPTH
TD DECEMBER 5, 2007

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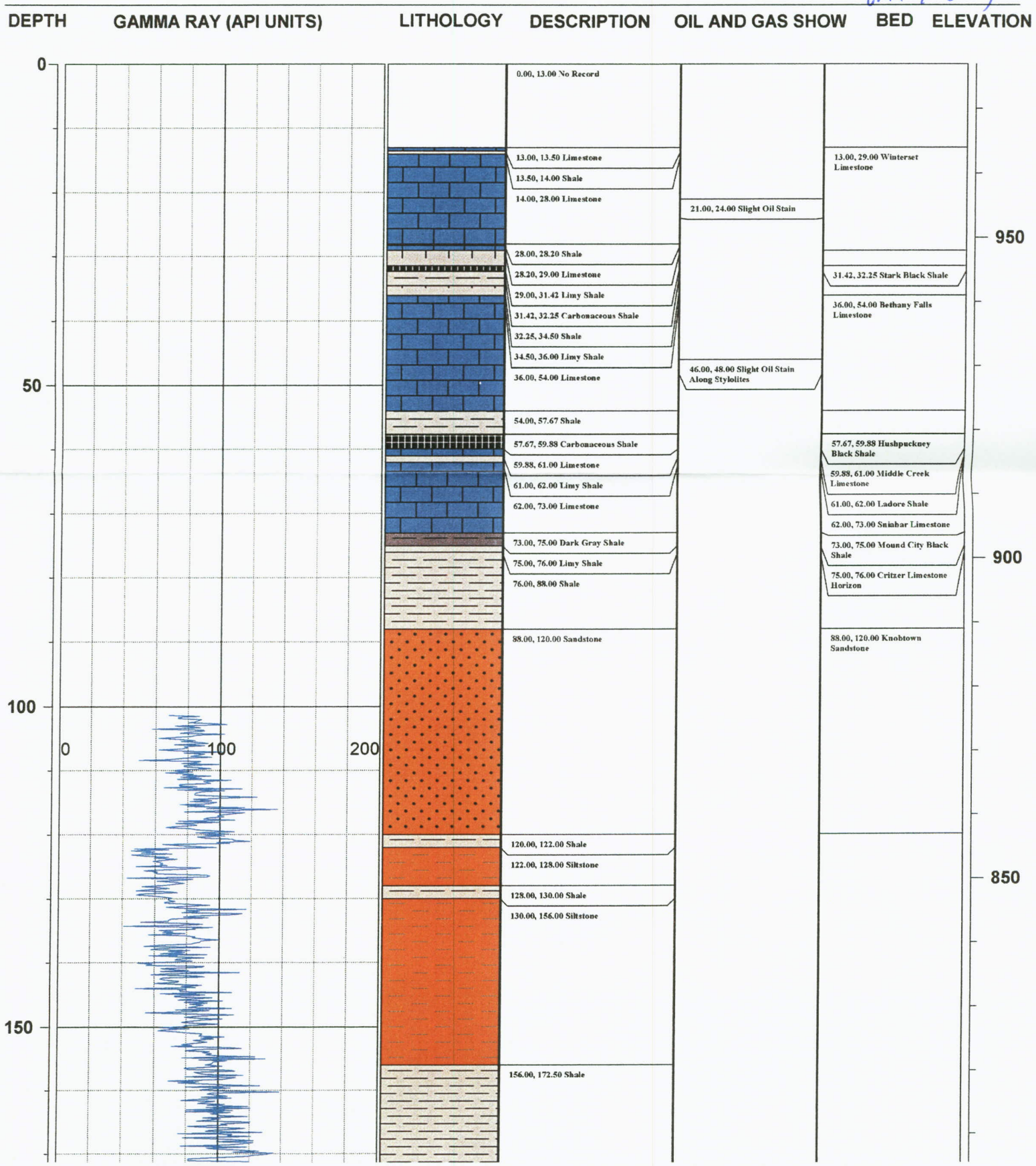
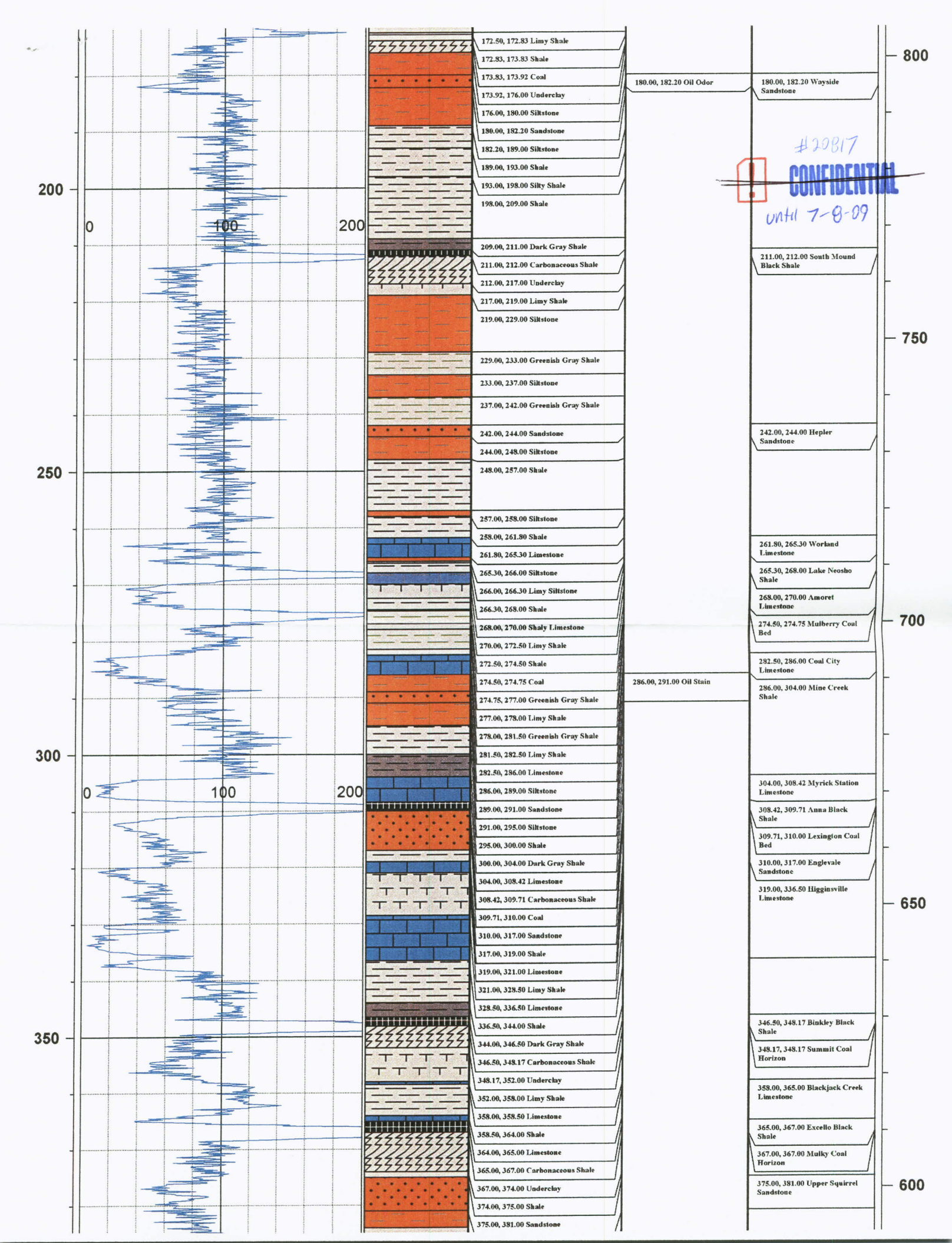
until 7-8-09




0
100
200
0
100
200
200
250
300
350
800
750
700
650
600
172.50, 172.83 Limy Shale
172.83, 173.83 Shale
173.83, 173.92 Coal
173.92, 176.00 Underclay
176.00, 180.00 Siltstone
180.00, 182.20 Sandstone
182.20, 189.00 Siltstone
189.00, 193.00 Shale
193.00, 198.00 Silty Shale
198.00, 209.00 Shale
209.00, 211.00 Dark Gray Shale
211.00, 212.00 Carbonaceous Shale
212.00, 217.00 Underclay
217.00, 219.00 Limy Shale
219.00, 229.00 Siltstone
229.00, 233.00 Greenish Gray Shale
233.00, 237.00 Siltstone
237.00, 242.00 Greenish Gray Shale
242.00, 244.00 Sandstone
244.00, 248.00 Siltstone
248.00, 257.00 Shale
257.00, 258.00 Siltstone
258.00, 261.80 Shale
261.80, 265.30 Limestone
265.30, 266.00 Siltstone
266.00, 266.30 Limy Siltstone
266.30, 268.00 Shale
268.00, 270.00 Shaly Limestone
270.00, 272.50 Limy Shale
272.50, 274.50 Shale
274.50, 274.75 Coal
274.75, 277.00 Greenish Gray Shale
277.00, 278.00 Limy Shale
278.00, 281.50 Greenish Gray Shale
281.50, 282.50 Limy Shale
282.50, 286.00 Limestone
286.00, 289.00 Siltstone
289.00, 291.00 Sandstone
291.00, 295.00 Siltstone
295.00, 300.00 Shale
300.00, 304.00 Dark Gray Shale
304.00, 308.42 Limestone
308.42, 309.71 Carbonaceous Shale
309.71, 310.00 Coal
310.00, 317.00 Sandstone
317.00, 319.00 Shale
319.00, 321.00 Limestone
321.00, 328.50 Limy Shale
328.50, 336.50 Limestone
336.50, 344.00 Shale
344.00, 346.50 Dark Gray Shale
346.50, 348.17 Carbonaceous Shale
348.17, 352.00 Underclay
352.00, 358.00 Limy Shale
358.00, 358.50 Limestone
358.50, 364.00 Shale
364.00, 365.00 Limestone
365.00, 367.00 Carbonaceous Shale
367.00, 374.00 Underclay
374.00, 375.00 Shale
375.00, 381.00 Sandstone
180.00, 182.20 Oil Odor
286.00, 291.00 Oil Stain
180.00, 182.20 Wayside Sandstone
211.00, 212.00 South Mound Black Shale
242.00, 244.00 Hepler Sandstone
261.80, 265.30 Worland Limestone
265.30, 268.00 Lake Neosho Shale
268.00, 270.00 Amoret Limestone
274.50, 274.75 Mulberry Coal Bed
282.50, 286.00 Coal City Limestone
286.00, 304.00 Mine Creek Shale
304.00, 308.42 Myrick Station Limestone
308.42, 309.71 Anna Black Shale
309.71, 310.00 Lexington Coal Bed
310.00, 317.00 Englevale Sandstone
319.00, 336.50 Higginsville Limestone
346.50, 348.17 Binkley Black Shale
348.17, 348.17 Summit Coal Horizon
358.00, 365.00 Blackjack Creek Limestone
365.00, 367.00 Excello Black Shale
367.00, 367.00 Mulky Coal Horizon
375.00, 381.00 Upper Squirrel Sandstone
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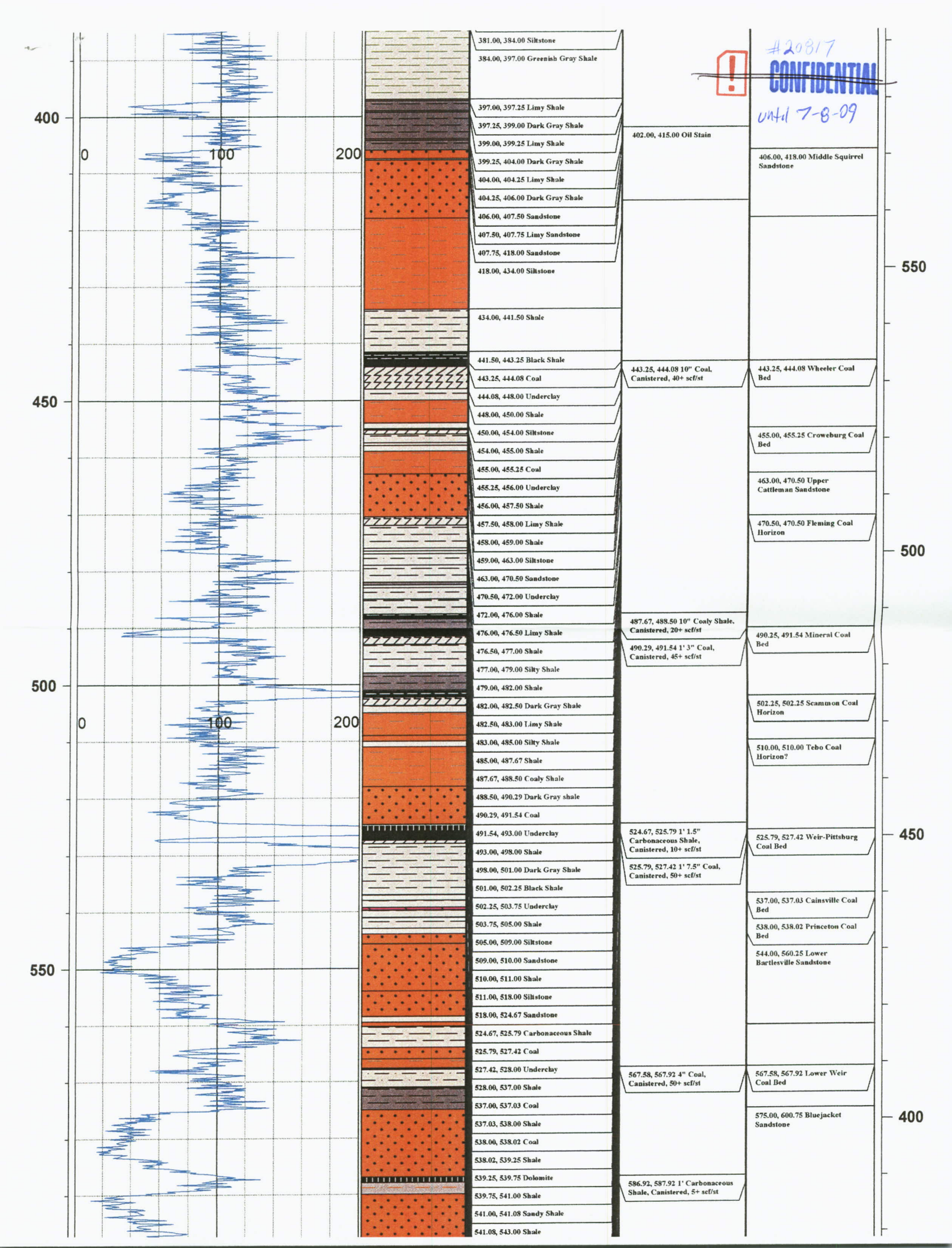
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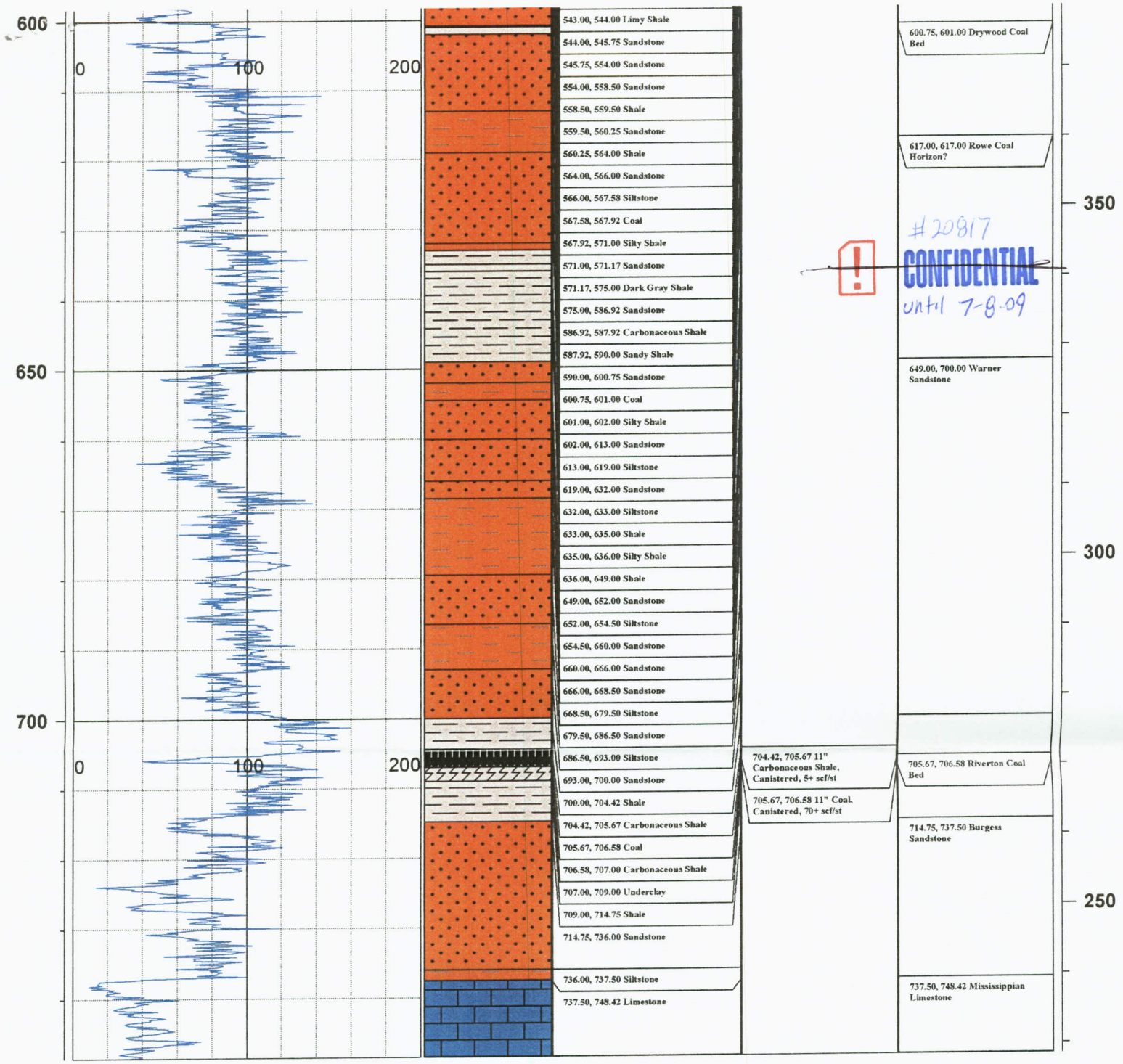
400
450
500
550
0
100
200
381.00, 384.00 Siltstone
384.00, 397.00 Greenish Gray Shale
397.00, 397.25 Limy Shale
397.25, 399.00 Dark Gray Shale
399.00, 399.25 Limy Shale
399.25, 404.00 Dark Gray Shale
404.00, 404.25 Limy Shale
404.25, 406.00 Dark Gray Shale
406.00, 407.50 Sandstone
407.50, 407.75 Limy Sandstone
407.75, 418.00 Sandstone
418.00, 434.00 Siltstone
434.00, 441.50 Shale
441.50, 443.25 Black Shale
443.25, 444.08 Coal
444.08, 448.00 Underclay
448.00, 450.00 Shale
450.00, 454.00 Siltstone
454.00, 455.00 Shale
455.00, 455.25 Coal
455.25, 456.00 Underclay
456.00, 457.50 Shale
457.50, 458.00 Limy Shale
458.00, 459.00 Shale
459.00, 463.00 Siltstone
463.00, 470.50 Sandstone
470.50, 472.00 Underclay
472.00, 476.00 Shale
476.00, 476.50 Limy Shale
476.50, 477.00 Shale
477.00, 479.00 Silty Shale
479.00, 482.00 Shale
482.00, 482.50 Dark Gray Shale
482.50, 483.00 Limy Shale
483.00, 485.00 Silty Shale
485.00, 487.67 Shale
487.67, 488.50 Coaly Shale
488.50, 490.29 Dark Gray shale
490.29, 491.54 Coal
491.54, 493.00 Underclay
493.00, 498.00 Shale
498.00, 501.00 Dark Gray Shale
501.00, 502.25 Black Shale
502.25, 503.75 Underclay
503.75, 505.00 Shale
505.00, 509.00 Siltstone
509.00, 510.00 Sandstone
510.00, 511.00 Shale
511.00, 518.00 Siltstone
518.00, 524.67 Sandstone
524.67, 525.79 Carbonaceous Shale
525.79, 527.42 Coal
527.42, 528.00 Underclay
528.00, 537.00 Shale
537.00, 537.03 Coal
537.03, 538.00 Shale
538.00, 538.02 Coal
538.02, 539.25 Shale
539.25, 539.75 Dolomite
539.75, 541.00 Shale
541.00, 541.08 Sandy Shale
541.08, 543.00 Shale
402.00, 415.00 Oil Stain
443.25, 444.08 10" Coal, Canistered, 40+ scf/st
487.67, 488.50 10" Coaly Shale, Canistered, 20+ scf/st
490.29, 491.54 1' 3" Coal, Canistered, 45+ scf/st
524.67, 525.79 1' 1.5" Carbonaceous Shale, Canistered, 10+ scf/st
525.79, 527.42 1' 7.5" Coal, Canistered, 50+ scf/st
567.58, 567.92 4" Coal, Canistered, 50+ scf/st
586.92, 587.92 1' Carbonaceous Shale, Canistered, 5+ scf/st
406.00, 418.00 Middle Squirrel Sandstone
443.25, 444.08 Wheeler Coal Bed
455.00, 455.25 Croweburg Coal Bed
463.00, 470.50 Upper Cattleman Sandstone
470.50, 470.50 Fleming Coal Horizon
490.25, 491.54 Mineral Coal Bed
502.25, 502.25 Scammon Coal Horizon
510.00, 510.00 Tebo Coal Horizon?
525.79, 527.42 Weir-Pittsburg Coal Bed
537.00, 537.03 Cainsville Coal Bed
538.00, 538.02 Princeton Coal Bed
544.00, 560.25 Lower Bartlesville Sandstone
567.58, 567.92 Lower Weir Coal Bed
575.00, 600.75 Bluejacket Sandstone
550
500
450
400



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Lithologic Log and Correlations by David C. Smith, Geologist, February 5, 2008

From Gamma Ray Log and Graphic Core Log by K. David Newell, Geologist

Schlumberger BlueView :