

August 31, 2016

445' to 450.5' fine
450 - 450.6 a bit

rain / light gray

oxidation at calcite / sand interface (450.4
to 450.6')

452.7' to 453.7'

rain sand (mildly
size
calc

454' 55' perm candidate

Gamma

Background 13 MR

445

5

446 - 447

7

448

7

448 - 449

9

449 - 450

10

450 - 451

7

451 - 452

4

452 - 453

14

52.7 to 453

17

453 - 454

8

17 near carbon

454 - 455

8

456 - 457

14

September 1, 2

2 457' - 470.3'

core taken
esterday afte

12

in core barrel over-night.

457 - 461.5:

mod sorted fine to coarse - tan light
preserved crushed arcuate
coal 3" thick

460.5 -

ST-2 N

461.5 - 463

clay silt, clay rip up clastic thin coal
green / grey

reduced,
light gray
ce 1450.4

ldly
izee
boundary

left

463-465

465

fine to medium
purely calcareous
calcite cement
several intervals of
thin coal bands
dark gray

463-464 Chem candidate

459-460 Chem candidate possible

461.5 to 462.5 XRD

✓ 468.5 469.5 XRD
background 15 μ R/hr.

457'-458'	6 μ R
458'-459'	6.7 μ R
459'-460'	7 μ R
460'-461'	35 μ R at coal through entire interval
461'-462'	15 μ R
462'-463'	45 μ R
463'-464	165 μ R (lower end 463.5-464)
464'-465	45 μ R (calcite starts at 464.6)
465'-466	25 μ R
466'-467	15 μ R
467'-468	25 μ R
468'-469	15 μ R

ST-2 Next core barrel: 470.5' - 477.7'

1 - fine to medium d.
 2 poorly sorted
 3 to 473'
 4 470.5 - 471.5 - med)
 5 coarse - poorly ted - ign 472.5'
 6
 7 calcite
 8 473.3 - .6 - lignite it 475.3
 9
 10 reduced, very fine to coarse, very
 11 poorl 487-
 12 1 487
 13
 14 47 7 = reduced, fine-to-medium grain
 15
 16
 17
 18

470.5-471	15	
47	20-25	
4	48	
473 - 474	40	77.3 - 473.6), 10-12
474 - 475	8 to 10	
- 476	15 to 20	
476 - 477	2 3	
477 - 478	0	

Samples (DCM Labs 463-464 / 472-473
 ACZ labs 463-464 / 472-47
 DBS&A labs 464-464.5 / 454

LOG PARAMETERS

MATRIX DENSITY : 2.65

NEUTRON MATRIX : SANDSTONE

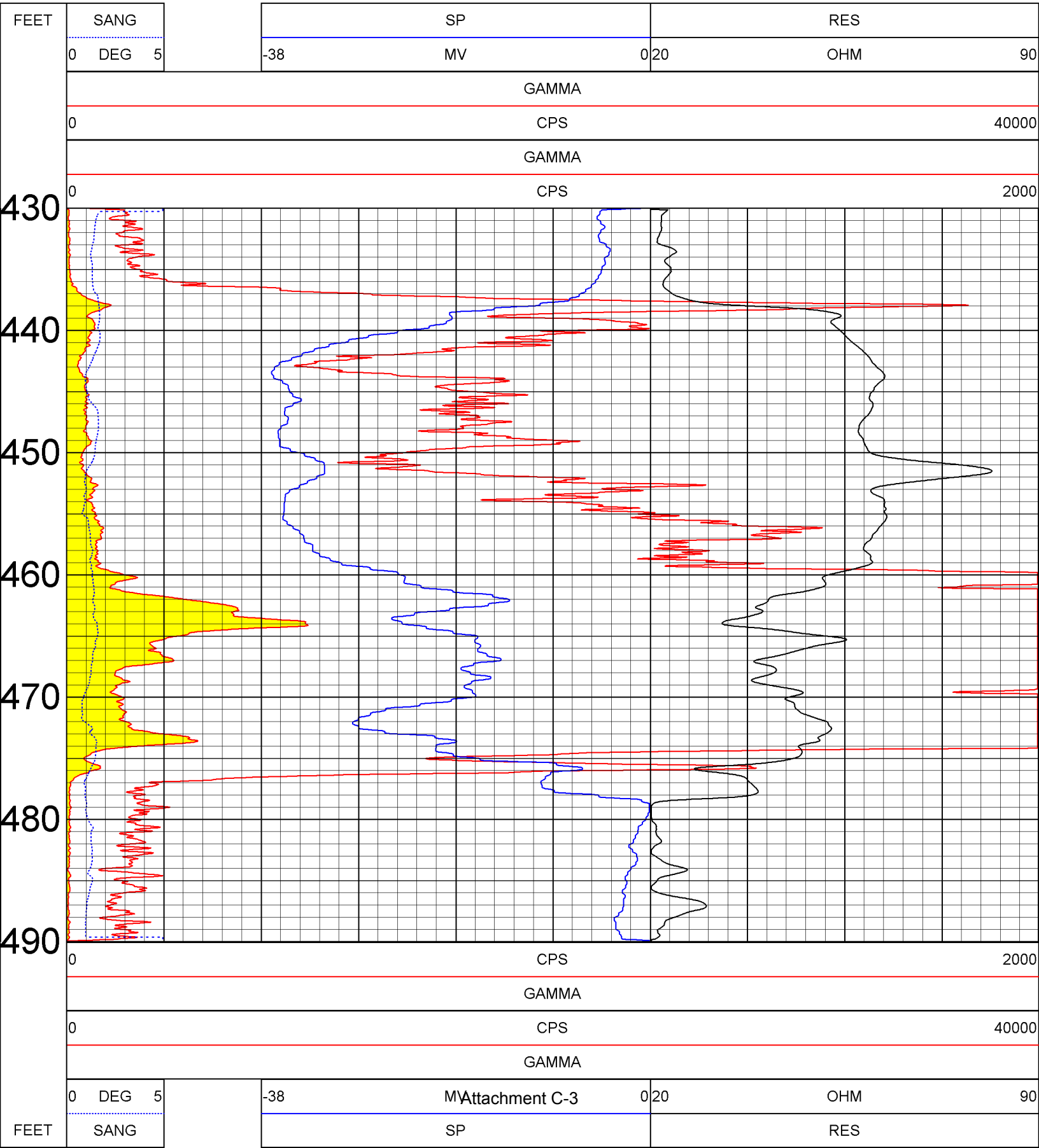
MATRIX DELTA T : 54

MAGNETIC DECL : 14.000

ELECT. CUTOFF : 99999

BIT SIZE : 6.25

PRESENTATION NAME/DATE = 9144C.0 06/18/2009



494-495 => split for

Dr
P-34A
from

d

pr
8'

and

other additives)
later

455-467'

f to very f size
well to moderately well sorted

457-458.1' dark with lignite stringers

455-456.5' olive-color

457.5-458.2' medium-gray with lignite stringers.

460-461' - ^{high flow} coarse-grain - split sample

Some 1 g - split sample - ly-sorted,
for is seg is even better th 460-461'

464'-464.8' - dium to dark gray, lignite stringers,
fine-grained, well-sorted

465'-466' - to f, poorly sorted, lig ingers

466'-467' - calcite th carbon

458'-459' - candidate for perm testing

456.8 5-7

457 10

457-458 10

458-459 5-10

459-4 5

460-461 18-25

461-462 5-7

462-4 10

464-65 5-10

465-46 10-

(Background)

ore barrel 4 6' (nd barrel)

467-46

Background = 15

468-4

2-3

469-

0

470-471

0

471-472

0

47

4-5

473-4

474-475

475-476

0

8/29/16

467-9.7

Lt. Brown to

ol gray, fine grained well sorted sand
w/son trash

Run 1

~~469.7-471.4~~

469.7-471.4

Fine-med, med. sorted

Lt. Brown to Lt. gray

471.4-476

Fine to

Lt. Brown to

poorly sorted sand, minor pebbles
w/gray
with fragments up to 3"

(474-477 indicate for geoch. analysis)

(474-476 candidate for perm analysis
Expected to be v permeable)

(474-477 possible candidate for perm analysis
Expected to be med-range)

3rd b

467' to 474' 476' to 483'

476-477 0

477-478 0

478-479 0

479-480 0

480-481 5-7

482-483 25

482.5 (shale) 70

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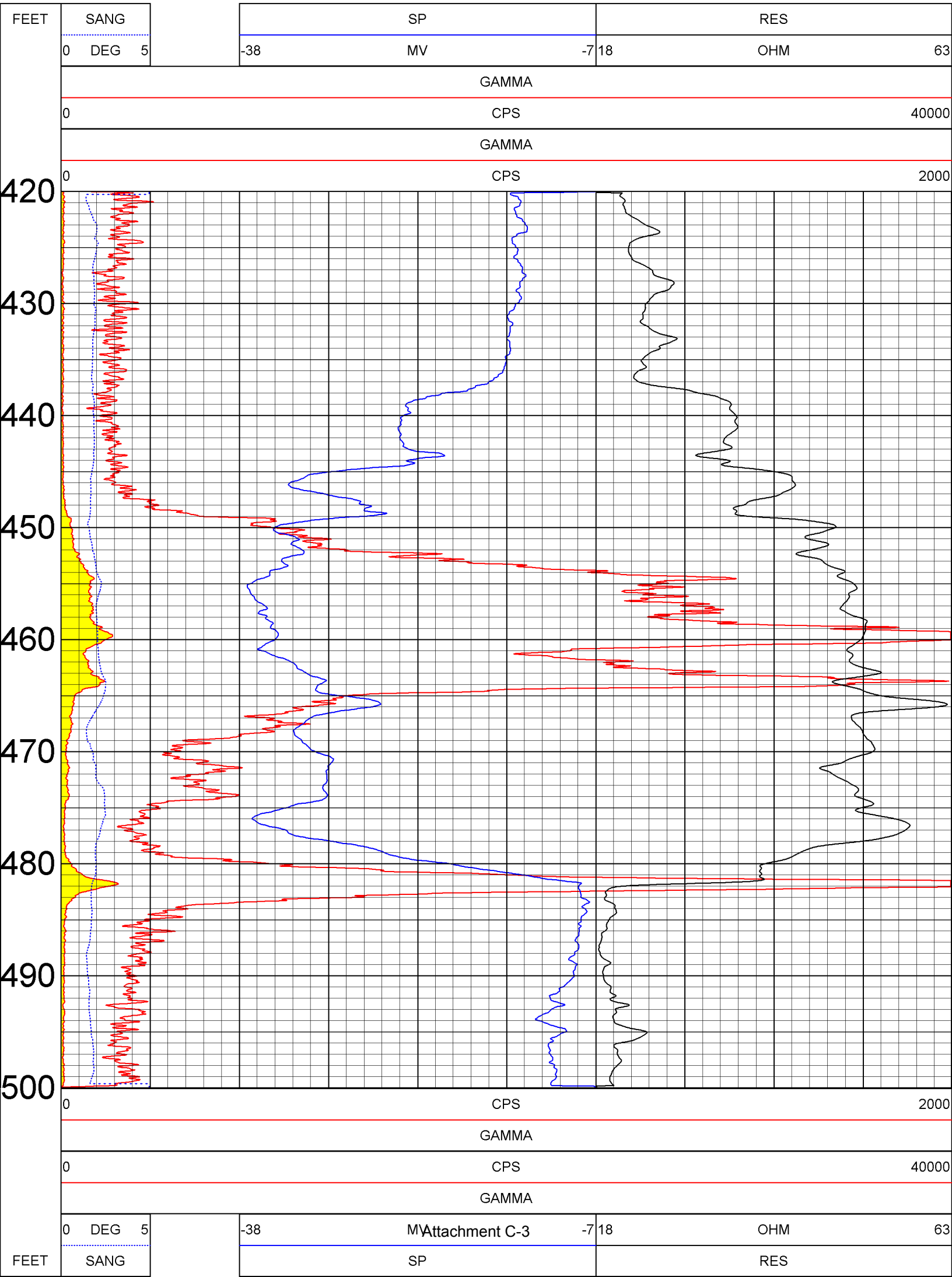
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Coarse ox
Fine ox
Carbon stringer
Carbon st
shale

1 ft

475-479.5 med coarse sand, Quartz, carbon 476.5, 477.5

479.5- Clay possible sample for chem

480-481.5 Very Coarse, poorly sorted, slightly oxidized

481.5-483 same as top interval

483-487 poorly sorted med coarse sand, 5% clay content, carbon throughout, reddish gray

Gemma

475-476	0
476-477	0
477-478	10 near carbon
478-479	15
479-480	25
480-481	15
481-482	15
482-483	50
483-484	85
484-485	60
485-486	60
486-487	60

30 August 2016

487' - 500' section, ST-4

Lith

487 - 489 mod sorted coarse, tan to light brown, arcose
 489 - 489.5 very fine, well sorted, grey, salt and pepper
 489.5 - 492.25 poorly sorted, fine to very coarse, heavy calcite cementation, feldspar frags
 492.25 - 491.75 solid carbon
 491.75 - 492 solid carbon
 492 - 493.5 poorly sorted fine to coarse gravel, 493 to 493.5 ex. coal
 493.5 - 496 very fine to fine, mod sorted, salt and pepper, slightly oxidized thin carbon layers
 496 - 497 Reduced fine to med, mod sorted, arcose sand
 497 - 498 well sorted fine sand, 5% clay content, reduced
 498 - 499 poorly sorted fine to very coarse, very arcose, minor clay
 499 - 500 poorly sorted fine to very coarse, moderate clay, some coal banding, olive green

BKG

Interval	Notes
487 - 489	20 to 30
489 - 490	10
490 - 491	10
491 - 492	15 in coal
492 - 493	6 to 15
493 - 494	10
494 - 495	0
495 - 496	0
496 - 497	1
497 - 498	1
498 - 499	0
499 - 500	0

498 - 499 chem. land ✓
 493.5 to 493 phys. land ✓
 493 to 497 phys. low flow cent ✓
 497 to 498 clay xRP work ✓

Run 3

500.D -

479-4

First

ST-4

479-4

DC Lab

ST

ACZ 1

ST

Run 3

500.0 - 500.5 GAMMA-O Carbon very fine well sorted

479-480 Split and bagged for emu

to Daniel Stevens & Associates (Albuquerque)

ST-5
~~495~~ 495

ST-4 492.5 - 493.0
496.0 - 497.0

DCM Labs 2/2

474-475 | 4

479-480 | ST-5

499-500
494-495
497-498 (for XRD)

ACZ labs 1/

ST-5 499-500
494-495

ST-3 463-464
474-475

ST-4 488-489
479 480

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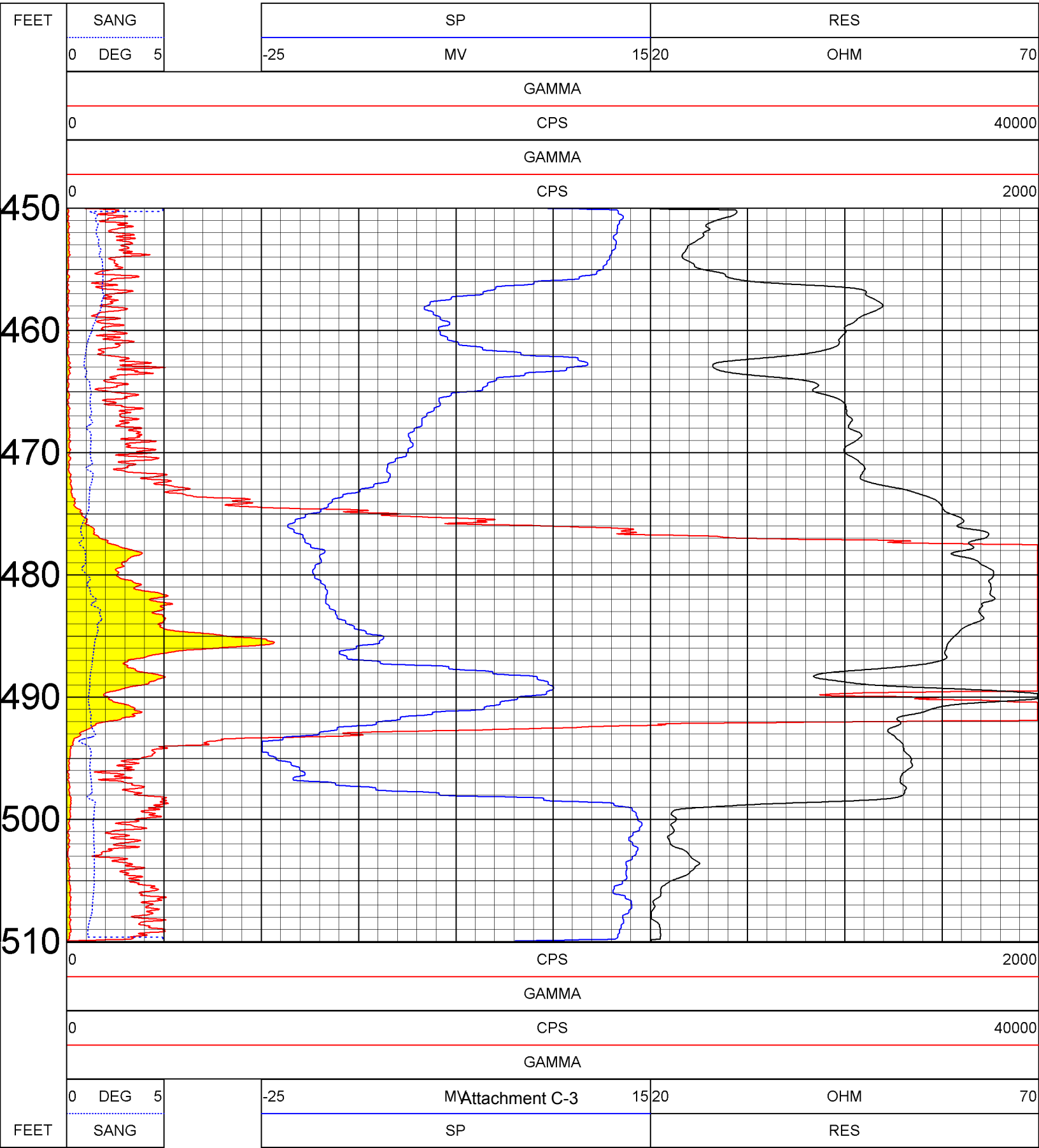
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key

ned.

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SAW 1

and a
ann, es

5th, 1995

~~488-489~~ 495.5' - 496' => sent for permeability / porosity
P-34A is closest producer - 494' to 508'
production interval.

Drill
P-34A
fr

Aw +

503 - 503.5 (calcite) for permeability

last run 505 - 505.5 is coal, no γ activity,
very hard, solid (not fractured).

Very little clay was found in core ST-5, so no XRD will be
requested for these samples.

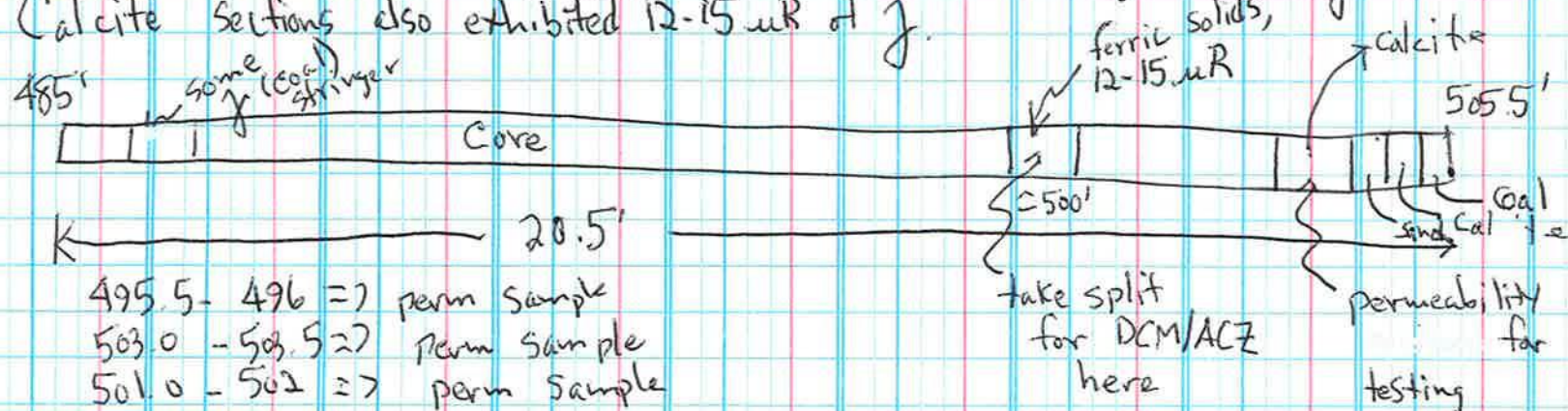
Condensed Notes for Core ST-5:

22 August 2016 - first barrel contained 485' to 491.5'
Second barrel contained 491.5' to 505' of core, left
sealed and taped in core barrel at rig until
morning (barrel ends were taped shut to
minimize O₂ contact).
23 - Second barrel was unloaded and
Aug d.

3rd stage of coring produced only 6" of coal (505 to 505.5')

in general, little clay was observed in this core. Sand,
coal, and calcite were observed.

The core was hand-scanned with a γ meter (50 μ R
full-scale setting). Background γ was 18-20 μ R (pointing
instrument away from core). Most of core length showed
little γ , however 489' - 490.5' showed $\approx 5-7 \mu$ R above background
in vicinity of coal stringer. 491.3' to 492' also exhibited this
level of γ . 499 - 500.5, which appears to contain significant
amounts of ferric solids gave 12-15 μ R above background for γ .
Calcite sections also exhibited 12-15 μ R of γ .



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(Background)

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