

MOBILE DRILL LOG

#13

Forestry Suppliers, Inc.

1-800-647-5368

#49354 Level Book

18111
NO NAME KEY

18112
CUMULATIVE REFERENCE

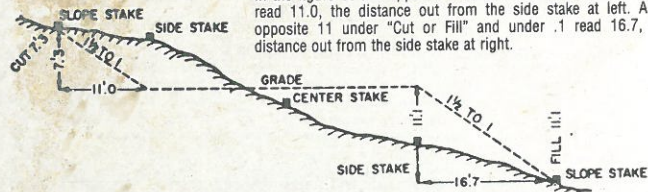
18113
NOYAL STATION

18114
will. 01

DISTANCES FROM SIDE STAKES FOR CROSS-SECTIONING

Roadway of any Width. Side Slopes 1½ to 1.

In the figure below: opposite 7 under "Cut or Fill" and under .3 read 11.0, the distance out from the side stake at left. Also, opposite 11 under "Cut or Fill" and under .1 read 16.7, the distance out from the side stake at right.



Cut or Fill	Distance out from Side or Shoulder Stake										Cut or Fill
	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	
0	0.0	0.2	0.3	0.5	0.6	0.8	0.9	1.1	1.2	1.4	0
1	1.5	1.7	1.8	2.0	2.1	2.3	2.4	2.6	2.7	2.9	1
2	3.0	3.2	3.3	3.5	3.6	3.8	3.9	4.1	4.2	4.4	2
3	4.5	4.7	4.8	5.0	5.1	5.3	5.4	5.6	5.7	5.9	3
4	6.0	6.2	6.3	6.5	6.6	6.8	6.9	7.1	7.2	7.4	4
5	7.5	7.7	7.8	8.0	8.1	8.3	8.4	8.6	8.7	8.9	5
6	9.0	9.2	9.3	9.5	9.6	9.8	9.9	10.1	10.2	10.4	6
7	10.5	10.7	10.8	11.0	11.1	11.3	11.4	11.6	11.7	11.9	7
8	12.0	12.2	12.3	12.5	12.6	12.8	12.9	13.1	13.2	13.4	8
9	13.5	13.7	13.8	14.0	14.1	14.3	14.4	14.6	14.7	14.9	9
10	15.0	15.2	15.3	15.5	15.6	15.8	15.9	16.1	16.2	16.4	10
11	16.5	16.7	16.8	17.0	17.1	17.3	17.4	17.6	17.7	17.9	11
12	18.0	18.2	18.3	18.5	18.6	18.8	18.9	19.1	19.2	19.4	12
13	19.5	19.7	19.8	20.0	20.1	20.3	20.4	20.6	20.7	20.9	13
14	21.0	21.2	21.3	21.5	21.6	21.8	21.9	22.1	22.2	22.4	14
15	22.5	22.7	22.8	23.0	23.1	23.3	23.4	23.6	23.7	23.9	15
16	24.0	24.2	24.3	24.5	24.6	24.8	24.9	25.1	25.2	25.4	16
17	25.5	25.7	25.8	26.0	26.1	26.3	26.4	26.6	26.7	26.9	17
18	27.0	27.2	27.3	27.5	27.6	27.8	27.9	28.1	28.2	28.4	18
19	28.5	28.7	28.8	29.0	29.1	29.3	29.4	29.6	29.7	29.9	19
20	30.0	30.2	30.3	30.5	30.6	30.8	30.9	31.1	31.2	31.4	20
21	31.5	31.7	31.8	32.0	32.1	32.3	32.4	32.6	32.7	32.9	21
22	33.0	33.2	33.3	33.5	33.6	33.8	33.9	34.1	34.2	34.4	22
23	34.5	34.7	34.8	35.0	35.1	35.3	35.4	35.6	35.7	35.9	23
24	36.0	36.2	36.3	36.5	36.6	36.8	36.9	37.1	37.2	37.4	24
25	37.5	37.7	37.8	38.0	38.1	38.3	38.4	38.6	38.7	38.9	25
26	39.0	39.2	39.3	39.5	39.6	39.8	39.9	40.1	40.2	40.4	26
27	40.5	40.7	40.8	41.0	41.1	41.3	41.4	41.6	41.7	41.9	27
28	42.0	42.2	42.3	42.5	42.6	42.8	42.9	43.1	43.2	43.4	28
29	43.5	43.7	43.8	44.0	44.1	44.3	44.4	44.6	44.7	44.9	29
30	45.0	45.2	45.3	45.5	45.6	45.8	45.9	46.1	46.2	46.4	30
31	46.5	46.7	46.8	47.0	47.1	47.3	47.4	47.6	47.7	47.9	31
32	48.0	48.2	48.3	48.5	48.6	48.8	48.9	49.1	49.2	49.4	32
33	49.5	49.7	49.8	50.0	50.1	50.3	50.4	50.6	50.7	50.9	33
34	51.0	51.2	51.3	51.5	51.6	51.8	51.9	52.1	52.2	52.4	34
35	52.5	52.7	52.8	53.0	53.1	53.3	53.4	53.6	53.7	53.9	35
36	54.0	54.2	54.3	54.5	54.6	54.8	54.9	55.1	55.2	55.4	36
37	55.5	55.7	55.8	56.0	56.1	56.3	56.4	56.6	56.7	56.9	37
38	57.0	57.2	57.3	57.5	57.6	57.8	57.9	58.1	58.2	58.4	38
39	58.5	58.7	58.8	59.0	59.1	59.3	59.4	59.6	59.7	59.9	39
40	60.0	60.2	60.3	60.5	60.6	60.8	60.9	61.1	61.2	61.4	40

KC
545-8125

(941) 947-4348

Bob Caughay (941) 947-4348

Paul Atwood (941) 992-8285

Bob or Paul

941-338-2362 -

OxG Ft. Myers

DANIELS Rd Exit 20
(Airport) - Exxon Stan.

SORTROL 4631-56, ENTER, OFF

The paper in this book is
made of 50% high grade rag stock with
a WATER RESISTING surface sizing.

Will - cell 510-8352

18111
NO NAME KEY

18112
CUNNINGHAM REFUSE

18113
HOUSE STATION

18114
HOMERIDGE RD

[illegible]

668
5663

TONEY DRILLING - MIAMI (800) 432-6193
 - ORLANDO (888) 327-2844
 ATLANTIC DRILLING - Riv. BCH (800) 535-7384
 - CAROL (800) 752-9446
 FOREMOST/MOBILE - (800) 706-3745
 ENV. MANUFACTURING - (800) 624-0005
 HOLLEY INC - 576-2131
 CHRISTENSEN BOXES - (800) 453-8418
 FAX-A-LOCATE (800) 638-4097 PHONE
 (800) 826-9063 FAX
 TUN WELDING - 576-9596
 JIM TRINDELL - (305) 815-7708 F&S CELL
 - 926-8735 HOME
 TOM SCOTT - ~~580-4882~~ 422-1310
 LEE BOOTH - (850) 508-9897 MOB.
 TOM SERVISS - BURSIF - (850) 957-~~6153~~ 6153
 CLARENCE MORGAN - BURSIF - (850) 957-6140
 BOB SPRINGER - COLLIER CO. (941) 643-8457
 CAROL MADDOX - SFWMD - (561) 686-8800
 SFWMD (800) 276-1066
 JOEY LEE - SFWMD - (904) 329-4812
 USGS - MIAMI (305) 526-2895
 DAVE ADAMS - DEP - 414-8550
 KEN (850) 545-8125 MOB
 HARVEY (850) 510-9555 MOB
 DAVID Moody, Christine Bate, Bob Sobczak?
 BICY - (941) 695-2000

18111
NO NAME KEY

18112
Cunard Refugé

18113
Nordre Station

18114
Looneyville Rd

John Stewart
2215 Ruins Dr.
Moorehaven FL
(863) - 946-3711
(561)?

4977 GATE

4450

Clyde Dabbs has corub

Home # 's

KEN 668-4437

CRAIG 878-0123

HARLEY 668-2361

RICK 562-3780

JAMES ARNEY 894-8189

DAVE PAUL 573-4340

ERIC 668-5263

DALE 297-0058

Clyde Dabbs SEUMD (941) 338-2929W

18111
NO NAME KEY

18112
Cupola of Refuge

18113
House Station

18114
Loosewill Rd

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0-20.0 MIAMI LS
20.0-TO KEY CARGO LS

NO NAME ^{KM}CORE W- 18111

9-25-00 7:00 AM START CB DP

MEET AT OFFICE B/C TRAVEL HAD
NOT YET BEEN APPROVED BY RAM.
GET APPROVAL. LEAVE TLH @ 10:30 AM
ARRIVE KEY WEST ~ 12:00 AM.
LONG TRIP.

9-26-00 7:00 AM START CB DP

LEAVE KEY WEST TO MEET
ROEL & PHIL OF KEY DEER REFUGE
TO PICK SITE.

CHOOSE SITE / SET UP. GO TO GET
H₂O OUT OF CANAL. STARTED ON
PUMP BROKEN. RIVET POP OUT. FLEW
DOWN RIVER AND BOLT BACK IN PLACE.
START DRILLING 1:00 PM

T	66S	R	30E	S	13	IRR
Lat:	24° 41' 52.3"					
Lon:	81° 19' 38.0"					
Elev. 5'						

NO NAME CORE

0-5' 50% REC. INTERMITTANT LENSES
OF WELL CONSOLIDATED ROCK AND
POORLY CONSOLIDATED RX. TAN FOSSIL IF.
SANDY LS.

5-10' 40% REC. AS ABOVE.

10-12.5 WELL CONSOLIDATED TAN FOLLS.
POREUS LS

12.5-15 AS ABOVE, MORE DOROUS AND VUGS

16-17.5 AS ABOVE. 80% REC. PLUGGED
SIDE. TOO MUCH DOWN FORCE.

175-20 GOOD REP. AS ABOVE W/ LARGER
BIVALS.

20.22.5 50% REC. AS ABOVE

225-15, 50% PFL AS ABOVE

END DAY 5:00 PM

9.27.00 7:30 AM START CS OP.

REFILL H₂O TANKS

25-27.5 50% KFC Al 4150 UE

27.5-30 50% REL. AI ADJUST
SOFT DRINKING

NO NAME CORE

30-32.5 TAN POROUS FOSS. LS

32.5-35 TAN RECRYSTALLIZED FOSS LS
w/ CORALS

35-37.5 AS ABOVE

37.5-40 AS ABOVE

40-45 AS ABOVE w/out CORALS

45-50 AS ABOVE w/ LGE EASTERN

50-55 AS ABOVE

55-57.5 FINE REC. CALCULITE MATRIX
GETTING WASHED OUT

57.5-60 NO REC. SOFT DRILLING

60-62.5 3" REC. LS CLASTS.

MATRIX WASHING OUT?

62.5-65 NO REC.

65-67.5 NO REC.

67.5-69.5 REMOVAL DRILL NO H₂O

3" REC. LS CLASTS

SANDOLITES

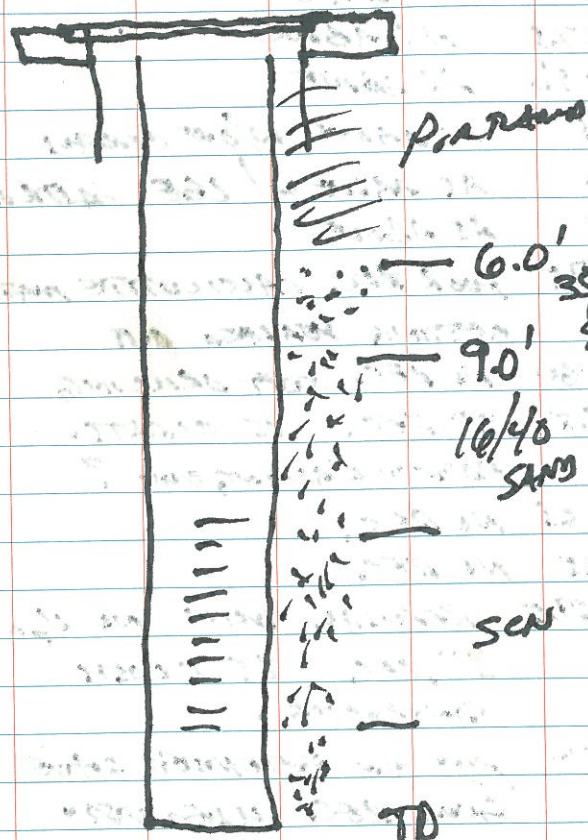
69.5-70 PUT ON EXTENDED SHUT

FROM REC. USE VERY

LITTLE H₂O. LS CLASTS

- w/ CALCAREOUS

END DAY 5100



NO NAME CORE

4

9-28-00

7:30 AM 1904

H₂O LEVEL: 4' 9" BLS

70-72.5 1' REG CALCARENITE w/
LS CLASTS.

72.5-75 AS ABOVE MATRIX WASHING
OUT

TO

PULL NQ

REAM TO 21' BLS

HOLE OPEN TO 54' BLS

ADD 35/65 SAND FOR BACKFILL
BACKFILL TO 21'

SET WELL

FILTERPACK

16/40 TO 9.0' BLS

35/65 TO 6.0' BLS

PORTLAND 6.0-0

DEVELOP AFTER FILTERPACK

35/65

THEN CRUIT

GALAXY/DETROIT

18112
SUNBELT REFUGE

18113
HOUSE STATION

18114
LOOMERY RD

NO NAME CORE

5

FINAL DATA:

WATER LEVEL: 4.4' BTDC

TD: 20.8' BTDC

MANHOLE/TDC: 0.3' BL

WELL YIELD: 4 gpm

MINE EQUIP TO SUBURBAN KEN

END DAY 6:30 pm

GAHAN DETON

18112

SUNBELT REFUE

18113

LOOSE STATION

18114

LOONERVILLE RD

W 18112

6

SUBARLOAF REFUGE

T 66S R 27E S 23

LAT: $24^{\circ}40'35.8''$ LON: $81^{\circ}32'45.7''$

Elev 5'

9-29-00

7:30 AM START CR OF

0-2.5 TAN/BRN MED CONCRETED LS.

2.5-5 TAN OLITIC LS

5-10 AS ABOVE

10-15 50% REC. TAN OLITIC LS w/
INCREASING FISS do.15-20 25% REC. TAN OLITIC LS w/
REXTLIZEN20-22.5 50% REC. FOSS. LS w/
REXTLIZATION. GASTROPODS
PRESENT

22.5-25 PLUGGED BIT. CALCILUTITE

25-27.5 TAN FOSS. LS w/ REXTLIZATION

27.5-30 TAN/BRN FOSS. LS

30-32.5 AS ABOVE

32.5-35 AS ABOVE

0-27.5 MIAMI LS
28.5-70 KEY LAGOON LS

GALAXY DETONAH

18112
Subarload Refuge18113
House Station18114
Lowermill Rd

- 35-37.5 AS ABOVE
 37.5-40 AS ABOVE, used POSITIVE
 RELEASE MECH. FIRST TRY
 40-42.5 TAN/BRO Foss. LS w/ CORAL

END DAY 5:00 PM

ELECTRICAL STORMS

H₂O LEVEL: 2.0' SL

- 42.5-45 TAN Foss LS w/ JUGS &
 REPRODUCTION, BIRCHWRIGHT.

- 45-47.5 AS ABOVE
 47.5-50 AS ABOVE
 50-55 50% REC. TAN Foss JUGS LS
 55-57.5 AS ABOVE
 57.5-60 TAN/GRAY PURPLE LS. Foss.

COQUINA?

- 60-62.5 AS ABOVE → WHITE CHALKY LS
 62.5-65 AS ABOVE
 65-67.5 AS ABOVE
 67.5-70 Foss. REL. AS ABOVE

70-72.5 AS ABOVE
 72.5-75 AS ABOVE - 1st. REC
 75-77.5 AS ABOVE - 5000 REC
 77.5-80 AS ABOVE
 80-82.5 AS ABOVE
 82.5-85 AS ABOVE - 3" REC
 TD.

RE FULL NO
 REAM HOLE TO 22'
 BACKFILL TO 18'

16/8 SAND 10-8
 35/65 8-6
 PORTLAND 6-0

DEVELOPER FILTER
 PACK IN

TD : END DAY ~~5:30~~ 5:30 PM
 HAD 23 AS

4 gal/min

GARY/DEWON
 Borehole #2

18161
 18113
 MURDER STATION

18114
 LOANVILLE RD

10/1/00

START DAY 8:00

9

TD 17.8 BTOC

WATER 1.2 BTOC

MANHOLE/BL.3 bLS

LOAD UP / DRIVE TO COLLIER
SEMINOLE STATE PARK TO

LEAVE EQUIP

DRIVE TO FT MYERS

END DAY 7pm

10-2-00 START DAY 9:00

FT MYERS TO TLK

END DAY

GALAXY DETOUR

Boyer Hole #2 18161

Goph

18113
Mudrace Station

18114
Looneyville Rd

W 18113

MONROE STN. Ambient ¹⁰

10-30-00 KC, CB fr. FLH to
Collier seminoles - pu rig &
trailer thru to ~~Chenal~~ Eglauder
City 7AM - 6PM

10-31-00 7:30 start - to
Bily ofc - intw DAVID ^{must} ~~more~~
thru to MONROE STATION
see 1400 TS3S, R32E
~~the~~ W# 18113

LAT 25° 51' 46"

LONG 81° 06' 00"

45 MIN AVG - EPE 0'
well is 30' ft south of new
6" well

^{put}
0-1.75 FILL → RR ORG CLAYEY SAND
w/ LS & PEBBLES

1.75-3.75 SWITCH TO WIREME. TAN/GA
MOLDIC, FUS LS

3.75-5' AS ABOVE. LAST 1', VERY SAT

GALAXY DETON

Barker Hole #2 18161
Gopher

18113
MONROE STATION

18114
Leavenworth Rd

Garry Maddox 921-9425

USGS well C1130
2" X 50' DEEP

manhole cover crumpled down
? is this the well to be
replaced?

Should we add it while
we are here?

5.7.25 GR. MOLDIC, FINE LS. LAST
1' SOFT.

7.5-10 GR. MOLDIC, FINE LS W/ OYSTERS
LAST 8" SOFT.

10-12.5 SOFT, NO RECOVERY

12.5-14.75 EXTENDED SHOE. NO RECOVERY

14.75-17.25 EXT shoe - v poor recovery
rubbly rock in mud matrix

17.25-19.75 REG SHOE - ~ 50% recovery
hard to crumbly moldic ls.

19.75-22.25 NO REC.

22.25-24.75 NO REC.

24.75-27.25 6" REC. CARBONATE SAND

27.25-29.75 6" REC. CARBONATE SAND.

PLUGGED BIT. AT BEGINNING OF
RUN. CLEAR HOLE BY PUMPING
H₂O.

29.75-30.9 GOOD REC. CARB. SAND.

30.9-32.25 - ls lt gray, moldic hard
to crumbly - some oysters good
recovery

32.25-34.75' ~ 1' ls recovered,
loss at bottom

34.75-37.25' ls, poor recovery
ls + shell frag. soft parts
washed out.

GARY DEDMON
Bayer Hole #2 18161
Gopher Ck
18162
Sound of
18114
Lawrenceville Rd

37.25 - 39.75' NO RECOVERY
 39.75 - 40.75' EXT. SHOE! GOOD REC.
 GR. FINE SAND W/
 CARB. SAND.

40.75 - 41.8' GR FOSS Limestone w/ SHELL
 ~ 50% RECOVERED - finer lost
 41.8 - 43.8' SAND thin shell at btm (EXT
 SHOE)

~~43.8~~ 43.8 - 44.75' GR FOSS LS w/
 GR SAND & SHELL & ECHINURAS

44.75 - 47.25' AS ABOVE

47.25 - 49.75' GR FOSS, MOLAR LS w/
 GR F SAND & ECHINURAS

49.75 - 52.25' poor recovery - some
 hard MXL LS, and quartz sand
 52.25 - 53.25' - SAND
 53.25 - 54.75' SAND, NO RECOVERY
 54.75' TD

inner bbl sand locked
 END day 6:00 p

11-1-00 7AM START
 SAX vehicle log to Cindy
 pull NQWL
 REAM. 0-23.5' 4"
 RUN in 23' well away

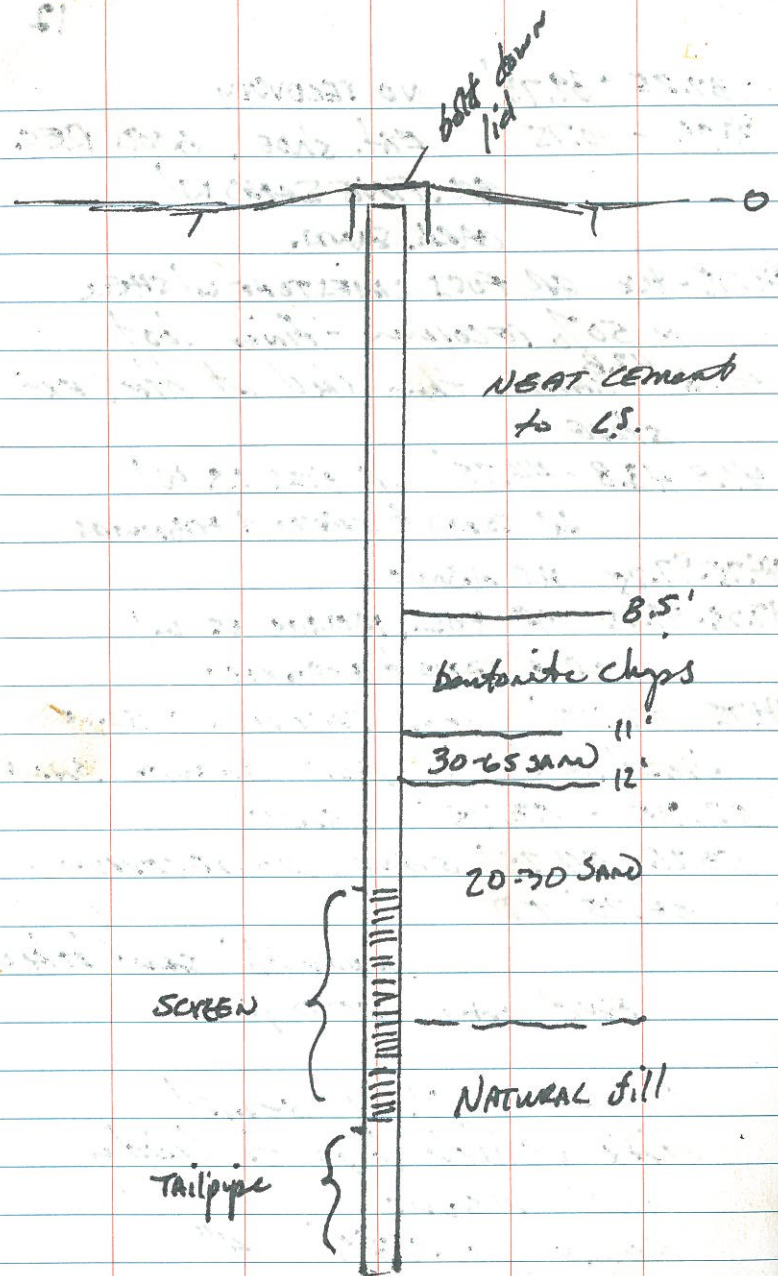
GARY DEERON

Baker Hole #2 18161

Gopher CK

Sound of

18114
 Looneyville Rd



13
 hole blocked/filled at 18'
 washed well away in to
 23' - using washdown valve

- Air lift develop - when
 start to clean up - tape will
 go to 17'

0-15' CS9
 15-20' SCN
 20-23' tp

wash in filter sand
 NAT fill to 17'
 1.5 bags 20-30 sand to 12'
 1/2 bag 30-65 to 11'
 bentonite chips to 8.5'
 NEAT CEMENT to surface
 Well TD 22.3' below top of casing
 TOC 0.25' below top of mantake
 cover (@ ~ land surface)
 yield 8-9 gpm
 SWL 2.5' b/TOC
 end day 6:00 pm

GALAXY DETROIT
 BATER HOLE #2 18161
 Gopher Ck
 18162
 Sound of
 18114
 Looneyville Rd

W 18114

14

11-2-00 7AM START RC, CB

~~David Moody~~ (Bicy) DAVID MOODY

Looneyville Rd

E side of 228 interceptor

Collier Co

S 156d - T 493 R 34E

LAT 26°13'15" 2 min Avg

CON 80°54'51" EPE 3'

Elev 14'

0 - TD is SAND facies of the TAMIAMI Fm

0 - 22" push spec. - refusal

0 - 1' lt y.l. br sd - 1.0 - 1.5 dk to
med br at 1.5 - 1.8 soft roc

1.8 - 4.5' rock -

4.5 - 7' soft rock + sand

7 - 9.5' sand, lt crm ext. shoe

9.5 - 12' same

12 - 14.5' CREAMY sand - bottom
more clayey

14.5 - 17' CREAMY clayey sand
expanded section

17 - 19.5' SAME

19.5 - 22' SAME

22 - 24.5' SAME - one small bed
w shell - pebbles

GALVY/DeLeon
Valencia Co

Barter Hole #2 18161
Copher Ck

18162
Sound of

18114
Looneyville Rd

24.5 - 27 SAME

27 - 29.5 - SAME

29.5 - 32' SAME

32 - 35 - SAME - color change
at 36.3

35 - 37 SAME - color change at
~ 36.25 to ol. gn

37 - 39.5' ol. gn clay

39.5 - 42 SAME

42 - 44.5' SAME

44.5 - 48.5' - ol. gn - shelly
- rotten shell

48.5 - 54.5' softening more crumbly

54.5 - 59.5 SAME

59.5 - 64.5 OL GN - shelly
- rotten shell

64.5 - 67.5 + sl. gn clayey sd some rock
some shell

67.5 - 69.5 SAME

69.5 - 74.5' lt. ol. gy clayey sand -
phosphatic? sl. shelly. poor rec.
sand locked

END day 6:30 p
1 hr lunch

GA-AXY DE-2004
Water Hole #2

18161
Gopher Ck

18162
Sound of

CA/005018

11-3-00 KC, CB 7AM START

pulled ~~the~~ spe retriever loose,
washed out rod. started tripping
rod out ~ 50' before sand
washed out - clean out hole
can

74.5 - 77' sand, sl. clayey, poor
recovering

77-79.5 SAME

79.5 - 82' sand, sl. chy. phosphatic?
shelly.

~~end dry 6:00 pm~~

pull NQWL - run well easy
w/o end cap to wash in -
pump broke connection 20' down
fish out well assy
mix tub of quick gel - ream
hole to 89'

run in well easy - sink w
water - circulate out the
mud
wash in filter sand to 71'

end dry 6:00 pm

11-4 KC-CB. VT - 7:30 START
 - put PVC KC+VT to site
 CB to Involake for cement

setup compressor: air lift ~ 1/2 hr
 then surge in block -
 then CONT air lift ~ 2 hr

filter pack to 71'
 secondary filter pack to 69'
 bentonite chips to 67.5'

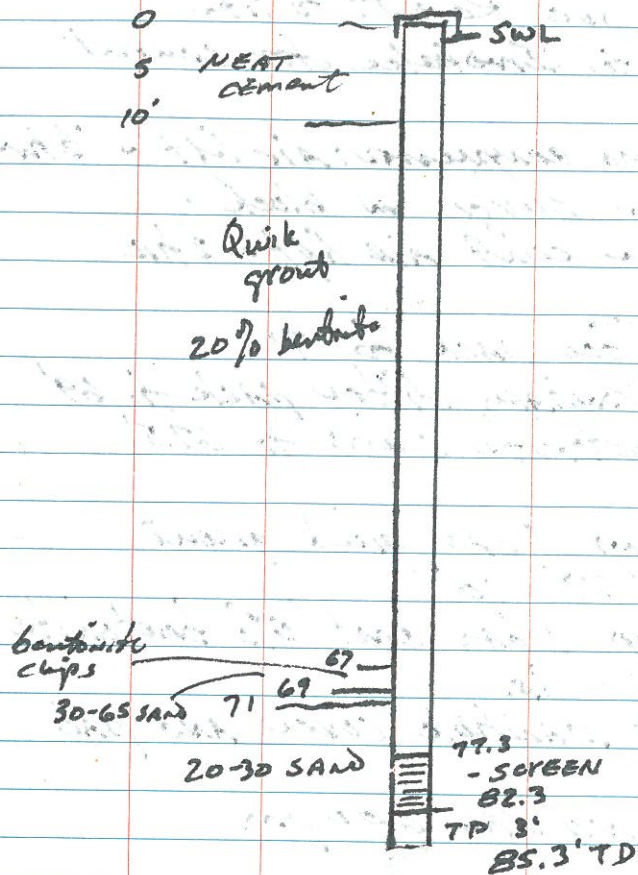
pump 1 bag quick gravel
 67'-10'

pump 1 bag cement/5% bentonite
 10' - 1.5.

SET MANHOLE COVER AND PAD

END day 600 pm

11-5-00 KC-CB to drill site
 JT to Ft Myers - drop off H₂S
 Equip to Paul Atwood
 7:30 START



18
continue deep - cleanup site

SWL 1.2' below TOC
TOC 0.25' below top of manhole
WELL TD 85.3'
yield 8 gpm

HC - return to LH
CB - to Orlando - get rig
repaired - King Truck

n 3' + head

GALAXY/DETROIT
Baker Hole #2 18161
Gopher Ck
18162
Sound of
CA/00548

Goodno Quad

See 256 on S side
of Calcasatatchee canal
T 42S, R 30E

Elev 15'

LAT 26° 04' 30"
81° 16' 33"

19

1-9-01 "Final hole" SP

Calcasatatchee R proj
KC, CB 7 AM start CALCOB
VT 8:15 start

to Volusia Co - EXAMINE sites
for STRUMD proj. then to
Cabelle. END day 7:30 PM

1-10-01 8 AM start

8 AM - 10 AM - get VT freshcut
fuel + vehicle for fillout then
leave + miles to calco
to drill site - get things
set up - core hard rock
then remove before changing
to NQ carbide finger bit
camed to 26.75' - poor recovery
end day 5:00 PM
order survival parts

1-11-01 745A start - bentrite
and rain from survival,
core to ~~REL~~ rods stuck
on last run - remove from,
block for Kelly - direct pull
rods - end day 6:45

Galaxy/Detour
Volusia Co

Better Hole #2 18161
Gopher Ck

18162
Sound of
Rain

Calcasatatchee R

9-12-01 80 start

Lay ~~main~~ Kelly down - break down
swivel, Jim to town - pu swivel
parts + mud

Jim's trip should take 2 hrs
or less - left ~ 900A

still not back at 1:20 pm
SEE sept notes

TO DO ON RIG

- rebuild swivel
- straighten Kelly / replace
- main hnd valve bank leaks
- two front jacks leak
- bean pump - leaks
- repl main hoist cable 200' x 5/8"
- repl wireline (1500' x 3/16")
- get casing advancer + casing
free up / adjust control levers etc
- install safety rigging for work in
mast

~~FAIRING 1500 SN~~

90712 ?

check winch

check gear cases (repl. lubes)

- steam clean rig
- fix leaks in truck tubes

? man lift cage ?

- safety straps for hoses
- 1 1/2" Fairing (high pressure)
- 1 1/2" main Kelly valve, main mud pump
valve

- 1 adder {
- skid proof girders on
mast horizontals
 - extra bracing - horizontals
no slat on step
 - safety harness + ascender(?)
+ cable for climbing

no any good survival & start
cleaning out hole - got to 70'
mix + prep good mud - pull
rod & end day 645

730 started
1-13-01 washed back to bottom
of hole - conditioned hole
caved to 161 - each run getting
harder to keep hole open
151-161 mixed hard mud, conditioned
hole ~ 1.5 hr tot. - hole collapsed
35' while we pulled wire 561
- pulled all rods - hole filled to
~ 70' 1/2 hr later
hole TD 161'
End day 600 pm

1-14-01

KC-CD start BAC
in AM 900 w USGS loggers
in town

GARY/DEW4
Harris Co

Baker Hole #2 18161
Gopher Cr

18162
Sound of
Thunder

8163
843 Pit

Calloos #8 Tiffy log

- 0-2' grey + bn sand mostly
fine-med gr #w some gtz
granular, variably shelly.
probable fill. some mottling.
- 2-4.5' sand or above but much
less shell. prob fill
- 4.5-5.25' blk + grey organic rich
sand. prob. orig sediment
surface (pneconal)
- 5.25-6' grey clayey sand. calc.?
- ~~6.75~~ 6.75 - cream, ltgy sand
clean.
- 7.75-9.0 - NOSM - prob clean sand
- 9-11.5 med grey v shelly clayey sd.
- ~11.5-14.3 NOSM - prob same
- ~~14.3~~ 14-14.5 same as above
- 14.5-16.75 med d gn clayey sand,
variably shelly but nowhere as
shelly as 9-11.5.
- 16.75-21.75 grey fossil moldic (mollusc)
well indurated ls. phys. hir. sl. phos
- 21.75-26.75 v poor recovery what little
recovered same as above
- 26.75-32 NOSM

32-33.75 ft bn grey f gr sd.

v poor recovery, sl. shaly.

33.75-51' ft bn gy to ol. gy v sl. clayey
sand, some clay blebs, sl. phos

51-56 sl. gy to gray sl clay sd.

some crs shell stuff at top. some
washed gravel

56-59.25 ol. gn clay, silty

59.75-71' sd, v sl. clay, v sl. phos
coarser at base

71-~~71.81~~ 81' sl. gn clay to ~72.5 then
med crs sand, sl. phos

NOTE: All runs from here on are
10' runs - mostly with core bbl
plugging at 2.5-4' into run -

~~81-71.81~~ 2.5' recovery

81-91 same as above ~3' recovery

~~this stringer of Argill. clay~~

91-101 same plus thin stringer of
ol. gn clay.

101-111 same 3' recovery

111-121 same med-fine, ol. gn
clay blebs ~1.5' recovery

121-131 3.25' rec same - more clay
blebs

131-141 same 4.5' rec

141-151' SAME SL darker
151-161' FD SAME

Note: From 71' to TD much of
formation was probably lithology
of the clay blobs

hole open to ~70' - logs
logged - gamma + induction
in open part of hole

grout hole, pull casing load up
taken till 5 pm end day

1-15-01 KC-CB 7:30 start
get flatbed trailer turned
around, get sample trailer
hooked up

Jim still NOT here at 9:15

JT ARR 9:20

finish load up / hook up
to volusia co - drop off
ring etc

then retn tch 9:15 pm
9:30 JT

1-30-01 CB, EH, KC 8 AM START

MEET AT W-HOUSE. WAIT FOR
TRAVEL APPROVAL. KEN STAY TO MEET
N/ DIVISION. CB, EH LEAVE AT
9:00. CALL RANDY SLEETER W/ VOLVIA
CO. TO SET UP MEETING TIME AT SITE.
ARRIVE AT SITE 2:00 PM MEET W/ ERNIE.
MOVE TRAILER & WATER TRUCK TO SITE.
RIG GETS STUCK. WORK ON GETTING RIG
UNSTUCK. WINCH ON RIG BREAKS.

END DAY 6:30 PM

SET UP CAMP.

1-31-01 CB, EH 7 AM START.

RAINED ALL NIGHT LONG. WILL
HELP WITH GETTING RIG UNSTUCK.
ERNIE CALLS AT 7 AM. WILL HAVE
BULLDOZER TO SITE BY 9 AM.
SET UP IN SITE BY 11:30. GET WATER
LINES RUN & BEGIN DRILLING.
BY 2:30 PM.

GALAXY DETOUR
Volusia Co

Barker Hole #2 18161

Gopher Ck

18162
Sound of
Rain

8163
843 Pit

1-31-01 CONT. 26

GALAXY/DELTONA #1 CB, EH

RAINING

0-1.5 HAND SHOVELED. GR/TY FINE SAND

1.5-6.5 PUSH W/ 5' CORE BARREL
TAN/ORANGE FINE SAND

6.5-11.5 PUSH. AS ABOVE

11.5-15.5 PUSH. TAN/ORANGE FINE
SAND. W/ ORANGE SAND
STRINGERS.

15.5-19.5 AS ABOVE TO 19.0' PUSH.
9" ORGANIC LENS TO 19.75

19.75-22.5 BRN/TAN MOTTLED FINE SAND.

22.5-23 TAN FINE SAND. REFUSAL
USING PUSH METHOD.

CLEAN UP/LOCK UP.

END DAY 6PM

2-1-01

7:30 AM START CB, EH

RAINED ALL NIGHT (HARD)

& ALL DAY

GALAXY/DELTONA
Volusia Co

Borer Hole #2 18161
Gopher Ck

18162
Sound of
Rain

8163
943 Pit

LOWES

OFFICE SHARPIES

LONG ZIP TIES (RIG)

FINE

BREAK FREE (LOWES)

ULTRA FINE

TAPE MEASURE (LOWES)

FIELD BOOK

CAUTION TAPE (RIG)

BUNGIES (RIG)

SMALL WIRE BRUSHES (LOWES)

RAGS (LOWES)

BUCKETS (LOWES)

HOLLEY

SCRUB BRUSHES (LOWES)

AIR TOOL OIL (RIG)
(LOWES)

1" FEMALE QUICK
CONNECT

4" HOSE w/
2 FEMALES
12'?

WINCH CABLE
200'?

(See pg. 20)

SET UP RECIRCULATION SYSTEM, DIG
OUT AREA FOR MUD TIR, MIX
MUD. REAM TO 23', INSERT
CORE BAR & INNER BAR
BEGIN DRILLING

23-30 TAN/ORANGE FINE SAND.
35' RECOVERY

30-35 GREY FINE GRAYEY SAND

35-40 GREY/WHITE FINE SAND

40-43.5 AS ABOVE.

43.5-48.5 AS ABOVE

48.5-53.5 AS ABOVE

53.5-63.5 AS ABOVE w/ 15' INTERVAL
w/ CLAY CONTENT

LOST CIRCULATION. PULL UP TO
REAM. WHITE SILT, CLAYEY SAND
ON BIT. WANT TO SET CASING
BUT NOTHING HARD TO SET STEEL
IN. NOT ENOUGH PVC.
CLEAN UP. END DAY 6:30 PM

2-2-01

CB, EH 7:30AM

FILLING 1500

4528 HRS

H₂O TRUCK

12812 AS AT 1/20/01

2-2-01

BOTTOM OF HOLE IS 63.5 W/
 25' OF MUD IN BOTTOM OF HOLE.
 MIX 2 BAGS OF BENTONITE AROUT
 AND PUMP DOWN HOLE W/ TRENIE
 PIPE. BROUGHT MUD TO 15'
 BLS CLEAN UP / TAKE OFF
 SITE. LEAVE FOR TLA @
 11:30 AM.

RTN TO TALL 6:15 pm

HAZELWOOD TALL

Barker Hole #2 18161

Copper Creek

18162
Sound of
Drumming8163
Pit

~~EGLIN~~ EGLIN AFB
ROLL
882-5800

EOD

882-3225 882-3274

Jackson Guard Forestry
8824164

Mr. Chandler 882-2991
3-5 days lead time

STEWART

N1793

18164
HAZELWOOD ROW

Porter Hole #2 18161
Copher CK

18162
Sound of

8163
343 Pit

★ NOTE: P.H. #2
drilled only to determine
FAS water level at this
date

DEP 4894 breaks down -
call wrecker, and then
to FGS - pm 2943 says
V.C. came out & brought a
truck to tow trailer
and day 6:30 p.

30

2-28-01 Check out casing
advancer - pull damaged casing
load adv. + 55' CSG for PRR
to take to Volusia Co.

KC + DP to Lake Jackson -
2nd hole at Porter hole

Porter Hole Jink #2 ~10' to south
of Porter hole core

0-2.5' NOSM

2.5-4' SSP - 14.6w very sand

4-5' NOSM

5-8.5' NOSM

8.5-11' SSP - grey clay

11-13.5' NOSM

13.5-16' NOSM

16-18.5' SSP bn or mottled clay

18.5-21' NOSM

21-23.5' NOSM - ls at btm

chg over to NQWC

drill in wo sampling. to 59.5' (?)

WL 53.1' bLS

at 4:10 pm

18164
Hazelwood Rd

Porter Hole #2 18161
Copher Cr

18162
Sound of
Copher Cr

18163
843 Pit

3-1-01 - FC, DP BA Start. - Gary
2943, run water into tank look up etc. 31

SWZ 9:30 3-1-01

56.6' BLS

tile open to 59.15'

pull NQWL rod

Dodge thunderstorm

pour 2 bags quick grout

pour 1 bag chips

then another quick grout
to 31' BLS

pour 1 bag bentonite chips

then pour 2 add bags quick grout

to -6' top off w Tamped cuttings

6 bags bentonite grout

2 bags bentonite chips

NOTE grc Elev 78.56' NGVD

Floridan waterlevel 56.6 bLS

21.96' NGVD

END DAY 4:30 PM

18164

HAZELWOOD ROAD

18165

CHICKY CK

18161

GOPHER CK

18162

SOUND OF

FLORIDIAN

18163

343 PIT

CRESTVIEW
quad S

Gopher Ck

32

4-4-01 RC, HM 7:15 start.

a/c then to where - semi
tractor jackknifed in where driveway
get on road 9:30 to Eglw Abb
Gopher Ck site

Jackie L., Wanda, Paulette & the
French kids to observe -
raining.

W 18161 / 71.5' CVS-2A

Gopher Ck

OKALOOSA Co

S 116° T 2N R 24W

LAT 30° 41' 17" 4 min NG

LONG 80° 36' 43" EPE 3'

Elev 60' TSP

0-2.5 push - med bn soft sand
poor recovery

2.5-4. SAME

4.0-6.5' H bn to white sd w
SAMPLE

6.5-9 white to yl. bn sd - sl
clayey in btm.

9.0-11.5' sd + clay sd - w c
at 9.25' b/s - poor rec.

11.5-14' vlt yl. sand

18164
Hazelwood Blvd
berry Ck

18161
Gopher Ck

18162
Sound of
843 Pit

shopping list

RAGS

4" pvc coupling

6" cold chisel ^{4 1/2}

~~3.25~~

3" spur core catcher

3.25" tapered plugs

garbage bags

spack plug for grout

new? pump

pull cord for grout

~~top 3/4" drive head~~

~~for plugs~~

~~to draw out of plate~~

Gopher Ck

33

14-16.5' bailed sample - v 1/4 lb

st. clay sed

16.5-19.25' - bailed sample - SAME

19.25-21.5' SAME - clay - no

sed in HSA - staying open

21.5-24' - bailed sample

24-26.5' bailed sample

26.5-29' ult. gl. sd as above

~~29' - out of sync with depth~~

Auger drilled down

~5' of sand in HSA -

need to pump - bailing is

simply pulling in more sed.

- last 3" of run was soft

winch duddy + trailer up

hill thru sand

END day 730

4-5-01 KC, NM, DALE F. 8:30 start

- winch trailer + water tanks

thru sand (700 gal)

SWL 8'10" BLS

29'-34' NO sampler - exp. sand

had clay? wood? plugging HSA

had to pull HSA's - plug fell out

ran back in - have 7' sed in HSA

3.25" ASA inventory

	5'	18	90'
2	2.5' $\approx$	5	5'
1	latch Assy	1.5'	1.5'
			96.5'

Gopher Ok

34

break for lunch

34- NOW 1:45 PM - still same
problem - sand floods ASA;
if pick up
34' ASA in hole

change over to NQWL

~~34-34.5' - 10' - may be from~~

~~34-34.5' - 10' - may be from~~

No recovery
sucked in 10' of sed fr somewhere

pull NQ

Drill 34-35.75' - pump spl

36.75-38.5' pumped spl

38.5-40.75' - same (42' ASA in)

40.75-43.5' pumped - 1 sm spl

orange clay matrix

43.5-46' - 3-4' in ASA - bailed snap

+ pumped spl - bailed to ~44.5'

clay w id

~~44.5-47.5'~~ - 44.25-47.5' WL spl
gray silty clay

top of AB?

47.5-49.5' SAME WL spl

49.5-51' SAME

end day - pickup/lockup

netn model 1:00 PM

Gopher Ck

35

4-6-01 KC, HM, DF 7:30 start

hole open to bottom

SWC 9.5' b/s

51-53' SAME - maybe softer at
the bottom

53-55' grey clay

55-56.5' " "

56.5-59' " "

59-60.5' " "

60.5-61.5' " "

61.5-63.5 SAME

63.5-65.5 - SAME + some lighter
& darker bands

65.5-67.5 -

67.5-69.5'

69.5-71.5' TD

==
pump 2 bags quick grout in ambf
section

pull remaining auger - hole
fills in to - 18' - cuttings to
- 10, pump 1 Add! quick grout
to 4.5' - pile remaining
cuttings over hole

18164
Hazelwood Road

18165
Berkley Ck

18166
Netts Bluffs

18162
Sound of

18163
343 Pit

Valpariso Quad

Sound of Freedom

36

4-16-01 KC, RG 7:30
start to Jackson Guard
pu rig & trailer, fill water
tanks then to Eglin AFB
W 18162

"Eglin VP-4 Toms Ck
"Sound of Freedom"

SEC 12CCC T 15 R 23W
LAT 30°30'22" 6min Avg
LON 86°30'36"
Elev ~25'
County Okaloosa

0-2.5' dug with post hole
digger
2.5-4.5 push spcs ck full hole
diameter as we go
4.5-6.5' wht spe - y.l. sand
6.5-9' - med y.l. sd - 1/4" at b/n
9-11.5' lt y.l. sd
11.5-14' wht + y.l. sd
14-16.5' top 6" or above unaltered
y.l. clayey sand
water table at 16'
16.5-19'

18164
Hazelwood Road
berry Ck

18166
Motts Bluff

18162
Sound of
Freedom

8163
943 Pit

19-21.5' vlt. gy. sd - bailed
 21.5-24 bailed - same
 24-26.5' orange clay sd w
 26.5-29' orange clayey sd -
 6" at btm soft clayey sd? w ls
 frg

29-31.5' SAME

31.5-32.75' of clayey sand

32.75-34' SAME

34-36.5' - ~1.5' rec - or clay sd
 sand locked - got sampler out
 - ~2' sed in hsa - pumped out

36.5-39' yl. brn sl. clay sd.

39-41.5' WLSPL - sand locked.

cable broke - end day 700pm

4-17-01

7:30 start - pull 2 hsa's

- water held in hsa's - drained

re rig hook etc on WL

- put hook in line with remainder
 on top of splr + removed splr
 ~1.25' recovered - yellow & sl. clayey
 sand

- run hsa's back in

18164
 HAZELWOOD ROAD

18165
 berry ck

18166
 MERTS BLUFF

18167
 live oak ck

18163
 B43 pit

Decible meter readings

background rig off - 47

rig at idle - no systems engaged 63db

rig turning auger - 1200 ENG rpm
80 db

rig at 1500 rpm - NO sys 73

EASY rot. 78

impact wrench 92

Air compressor - idle 80-82

" " light Air running 92

Generator - 95

F16 overhead 114 (~300')

Drilled auger in to 43.5'

pump spl
41.5' ~~44.5'~~ 43.5' sand, v sl. clayey, sl. shelly~~44.5' - 46.5'~~ 43.5 - 45.5' purged spl~~46.5' - 48.5'~~ out of hsa's - some clay~~48.5' - 51'~~ no sample stuck in hsa -- bailed to try + get clay - mostly
made thick slurry - some frg. of
ol. gr silty clay - Ambt?45.5 - ~~48.5'~~ 48.4' ^{48.4'} appears 3/8 has been
washed grey micaceous clay
at btmtop
in
43.5' Ambt? int.
45.5' →

48.4 - ~~50.25~~ 50.25 sl. gn micaceous
sandy clay

50.25 - 52.25 dk olive gn sandy
micaceous clay

52.25 - 54.25 SAME

54.25 - 56.25 SAME

56.25 - 58.75 sl. gn sdy mic. clay

58.75 - 61.25 - ol. gn clayey sd

61.25 - 63.25 ol. gn clayey sd

soft -

63.5 - 65.25 sl. gn sd at top -

clayer toward bottom

65.5 - 67.25 75

67.75 - 69.75 TD sl. ch. sd - sandlock
broke w.l. TD

pulled bsa's to retrieve
sampler Assy -

hole filled to 10' bls

pump 1 bag quick gravel to 15.

settled to -1' - poured bentonite
chips for firm top.

END DAY 700PM

18164
HAZELWOOD ROAD

DECK CK

18166
NETS BLUFF

18167
LIVE OAK CK

18163
PIT 843

VALPARAISO QUAD

B-43

40

4-18-01 KC, RG, HM 7:30 start
move rig + trailer from "Sound of Freedom"
to B-43 pit

W #

S11 add T IN R 23W

LAT: $30^{\circ} 35' 45''$ 10 min

LONG: $86^{\circ} 30' 47''$ AV9

Elev: ~~118~~ 118'

CO: Oklahoma

sampled outcrop walls

coring started at "0" on
pit floor - bagged samples
were collected from the
pit wall.

0-2.5' push spl - red-or
clayey sand

2.5-4.25' push spl - SAME

4.25-6.75' WL spl - SAME

6.75-8.75' Clayey coarse sample

~50% recovery - pushed nose out 1"

8.75-11.25 - Hard, clayey sand

zone - 50% recovery.

11.25-13.75' - Hard, white clayey, coarse
sand.

18164
Hazelwood Road

18165
Belly Ck

18166
METS Bluff

18167
live oak ck

18163
B43 pit

- 16.25' good rec.
- 13.75-~~10.25~~ - ~~50% recovery~~ - reddish/
white clayey coarse sands.
- ~~10.25~~ Hit water.
- 16.25-18.75 - ~50% recovery clayey
coarse sand.
- 18.75-21.25' - As above - slightly better
recovery.
- 21.25-23.75 - Wet, unconsolidated
clayey, coarse sand &
gravel - very poor rec.
- 23.75-26.25' - Wet, loosely consolidated
white clay. ~50% rec.
- 26.25-28.75' - Fine, white sand -
coarsens downward &
gets more clayey.
- 28.75-31.25 - Very poor rec. Attempt
to bail sample - got
some sample.
- 31.25-33.75 - Coarse, clayey sand -
poor rec.
- 33.75-36.25 - Yellowish, clayey coarse
sand - good recovery.
- 36.25-38.75 - As above
- 38.75-41.25 - As above
- 41.25-43.75 - As above - 50% rec.

18164
Hazelwood Road18165
berry ck18166
Mets Bluff18167
live oak ck18168
Rolling Springs

- 43.75-46.25 - 25% rec coarse-fine sand, yellow clay matrix
- 46.25-48.75 - ~50% rec - clayey sand as above.
- 48.75-51.25 - Bright orange clayey sand better rec.
- 51.25-53.75 - As above
- 53.75-56.25 - As above - finer grained sand
- 56.25-58.75 - As above - clayey content increases down hole.
- 58.75-61.25 - Orange clayey sand. AB Group contact @ 61.25'
- 61.25-63.75 - AB Group - blueish clayey, tight, med-fine sand - micaceous. Rotation pressure hi in this interval.
- 63.75-66.25 - Blueish, clayey, micaceous tightly compacted fine-med. sand. Tough to turn augers through.
- 66.25-68.75 - As above highly compacted.

68.75-71.25 - As above

71.25-73.75 - As above

Stop here for the day. Back
at camp @ 7:00 pm.

HM, RG, DF.

4-19-01 Leave camp @ 7:30 am.

Static water @ 17' 5".

73.75-76.25 - Tight, clayey, Micaceous
fine-med. sand. ^{ovs}
~50% rec. Very tight.

76.25-78.75 - As above - better
rec. ~90%

78.75-81.25 - As above

81.25-83.75 - As above good rec.

83.75-96.25 - As above - good
T.D. rec. Grey-blue clayey
sand & sandy clay.

Hole caved to 16.5 feet. 1.5
bags of grout mixed & pumped
in.

Leave site 300 pm.

Setup on new site Hazelwood
Pond. End day - 6:30.

Hazelwood Pond
18164
18165
bcky ck

18166
Nerts Bluff
18167
live oak ck

18168
Boiling Springs

Niceville Quad

Hazelwood Pond

44

4-20-01 HM, RG, DF 8:00am

Setup Eglin AFB

"Hazelwood Pond" core.

W#

18164

S 20aba T ~~IN~~ R 22W

LAT 30° 34' 27"

LON 86° 28' 33"

Elev 100'

CO Okaloosa

0-2 Push smpl

2-4 Push smpl - tan/orange med.-fine sand

4-6 Core - poor recovery - unconsol. seeds.

6-8.5' ~50% rec - orangish, clayey med.-coarse sand.

8.5-9.6 Orangish clayey sand

9.0-11.5 Poorly consolidated, orangish clayey sand - med.-coarse ~50% rec.

11.5-14 - As above - almost no recovery.

14-16.5' - As above 50% rec

16.5-19.0 - As above 50% rec.

18164

Hazelwood Pond

Netts Cr

18166

Netts Bluff

18167

live oak ck

18168

Rolling Springs

19-21.5 - Orangish/white med.
coarse sand slightly clayey.
60% rec.

21.5-24.0 - As above, 50% rec.

24-26.5 - Clayey sand / med-
coarse - hit H₂O table.

26.5-29.6 - Sample washed out
bottom of hole. Hole
depth ~ 29.9 - may
be clean to bottom.

Lv. site ~ 1:00 pm.

4-30-01 KC, EM, WE. 7:30

START - load up - pump rig +
trailer at Jackson guard.
reoccupy drill site

N 1.5' sed in HSA - puped sample
to 30.25'

30.25-31 - bailed sample - sd w
whit clay matrix - some small
clay blebs

31-33.5' washed spc

33.5-36 - w2 spc - NO recovery

36-38.5' y.l. gy sl. chy sd

38.5-41 poor recovery - sand + chy sd

41-43.5' 1/4 y. + 1/4 gy sl. ch sd

43.5-46' crs/mid sl. ch sd

46-48.5' - NO sm - WL - bailed
scl

48.5-51 - NO recovery - sand

pumped sample F-C sd. v 1/1
clay matrix51-53.5' - ~~sample~~ bailed sample~~53.5~~ - sd, sl. micaceous, minor
kaolin blebs53.5-56 - f. sand bailed spe
sl micaceous

56-58.5 - NO sed in TSA -

bailed sample at base of int.

(58.5-58.75') F-C sd

58.75-61 bailed sample - VF-P

sand, micaceous, white kaolin matrix

61-63.5 - v f sd as above w/n 5%

~~crs~~ crs component

63.5-66' v f sd + crs fr. - granular

w 1/4 gy ch matrix

END day 700pm

5-1-01 KC, EM, WE

7:45 start

$$\begin{array}{r} 46.5 \\ 42 \\ \hline 54.5 \end{array}$$

2103

shopping list

2" pvc + couplings
SUNSCREEN

SWC 24.75' 615

3' sludge in btm - pump out

66-68.5' bailed spl. - f. sd w gravel
white clay matrix

68.5-71' bailed sample - f. sd,
~ 5% cors fraction

71-73.5' bailed spl - f. sd w
Abd granule/gravel

73.5-76' SAME - bailed spl

76-78.5' f. sd w v Abd granules
- more clay than above (bailed)

78.5-81.5' - drilled like more clay
content, sticky retraction - NO
sed in TSA - bailed spl fr btm
of interval (81-81.5')

SAME as above but clayier.

81.5' - had to free up Auger:

5' sludge in TSA

81.5-83.5' bailed spl

83.5-86' bailed sample at base of
interval

86-88.5' bailed sample - v f. sd
As above w/o cors fr.

88.5-91' - EASY penetration -

bailed spl - or bn clay sd - Also
blebs ol. gn clay

Hazelwood pond

48

91-93.5' WE spl - predominantly
or clay sd w gray blebs/
laminar in lower part

93.5-96' bulged sampler
upper $\frac{1}{2}$ orange micaceous sd
clay, lower part ol. gn micaceous
sd clay - Ambf. - color change
appears to oxidation only.

96' TD

End day 6:00 pm

NOTE to KC - Bring
hex extender

Rock Hill

Rocky Ck

18166
Motts Bluff

18167
Live Oak Ck

18168
Boiling Springs

W 18165

Niceville Quad

Little Rocky Cr

49

5-2-01

8AM START

KE, EM
WE

Little
Rocky Creek
Yellow
photo
59 red

Rocky Creek

SEC ^{18 Dec}

T IN

R 21W

LAT ~~30° 35'~~ ^{30° 35'} LON ~~86° 23'~~ ^{86° 23'} 20.3"

Elev ^{30° 35'} ~~30° 35'~~ 45' (topo)

CO. WALTON

W# 18165

0-2.5' push spl lt gl. bn sd

2.5-4.25' push spl same

4.25-6' push spl - bn/bl ky. sd

6-6.5' ^{in org.} we spl same

6.5-9 gl. bn sd WATER table
at 7.25'

9-11.25 lt gl. sd

11.25-13.75 bn sd

13.75-17' fine sd - bailed

17-18.75' bailed - f. sd - ~~dk~~ dk bn
sl. clayey

18.75-21.25 bailed spl - f. gray sd

then ~~22.25~~ bailed spl or bn sd +
finely coarse gray sd.

21.25-23.75' lt gy fine sd

23.75-24.5 - no spm - washed out

24.5-26.5' bailed spl - pulled

~6' sd in hole

18164
Rock Hill

18165
Rocky Cr

18166
Motts Bluff

18167
Live Oak Cr

18168
Boring Springs

- 26.5 - 28.75 bailed spl
 28.75 - 31.5' bailed purp
 31.5 - 33.5 COARSE SAND & wood
 frg in upper $\frac{1}{2}$ - ~1' plug in
 bot of HSA - ~~frg~~ wood +
 Ambs of ol. gn micaceous clay
 - per auger + knocked plug loose
 - will pump clean + in w/ splr.
 33.5 - 35.5' w/ splr - ol. gn silty
 silty clay
 35.5 - 37.5' SAME
 37.5 - 39.25' - SAME
 39.25 - 41.25' - ol. gn silty clay
 upper $\frac{1}{2}$ orange + con sl.
 clay sd. in lower part
 41.25 - 42.5' sand - 5' in HSA
 42.5 - ~~43.5~~ 43.5' - drilled down - NO
 sample
 43.5 - 46' bailed sample - sand
 46 - purp splr has cemented
 clayey sand clumps like root
 casts or burrows
 46 - 48.5' ol. gn clay sd
 48.5' TD

End day 700pm

18169
Rock Hill18166
METS Bluff18167
live oak cr18168
Boring Springs

Little Rocky ck.

51

- 5-3-01 - 7:30 start - 10nd water
back to drill site, pull auger
- hole filled in as auger pulled
- tipped off hole in cuttings
(no containers breached)

have appt. - MEET EOD AT 1pm
for next site - we finally get
there ~ 3pm. trying to find a
way in that didn't cross stone
bridges

18169
Rock Hill

18166
Motts Bluff

18167
Live Oak ck

18168
Boiling Springs

5-3-01

W[#] METTS 18166 CORE/635'
METTS Bluff

SEC 2366a T 2N R 25W

LAT 30° 40' 05"

CON 86° 43' 12"

Elev 30'

Co. OKALOOSA

19 MIN AVG
EYES

0-2.5' push spe ylt sd

2.5-4.25' push spe org. sd + glgy sd

4.25-6.75' we spe mostly grey clay

6.75-9' f. sand

9-11.5' white v.f. sd

11.5-14 white sand, uncon. ~ 50% sec

14-16.5' white sand, uncon.

poor recovery - purple sample

16.5-19 - purple sample - clean sand

19-21.5' purple spe sand

21.5-24'

END day 7:15 p

S-4-01 KL, WE, EM

8 AM START

SWL 9.9' bLS

24-26.5' purple spl - sand & grain
w/ dk bn clay matrix, also
organic material - wood frag.

26.5-29' WL spl dk bn clay sd
+ sand w ~ 1/4 of spl wood

29-31.5' WL spl - clean sand ~
1' recovered

31.5-34' - sand locked. hook came
lowe - purple spl

34-36.5' NORM

36.5-39' NORM in WL or hsa
tailed spl at btm of run

gy sd, wood frag + some clay matrix

39-41.5' - Almost no recovery
gray clay sd

41.5-44' WL spl H gy. gn cns clayey sd
upper 8" - grad dn to fine gray sd

44-46.5' gy gn clayey sand

46.5-49' - H gy gn clayey sand

49-51.5' bluish gy clay sd. w

coarse zones

51.5-54' H gy clayey sand

18169
Rock Hill

18167
Live Oak Ck

18168
Rolling Springs

W 18167
Holt SW Quad

Metts Bluff / Live Oak ck 54

54-56.5 SAME

56.5-59

59-61.5'

61.5-63.5'

63.5' TD

hole filled on August were pulled
return 7:30 pm

5-14-01 HM, DE Lv. whs @ 7:45

Met EOD @ Jackson Guard

W# 18167

Live Oak Creek Core

S. 11ddT. 15 R. 25W

Lat 30° 30' 43"N

Lon. 86° 42' 55"W

Elev. ~~50~~' 50' top

Co. OKALOOSA

0-2.5 - Push core - med - coarse
sand, light orange.

2.5-5.0 - As above.

5.0-7.5 - As above, lighter color.

7.5-9.0 - As above, some clay -
hit water table.

18169
Rock Hill

18167
Live Oak ck

18168
Boring Spring

Flights in hole
bit, latch assembly,

|||||

drill 2 1/2

LIVE oak ck

55

9.0-11.5 - Tan, med-coarse sand
trace of clay.

11.5-14.0 - ~25% recovery - as
above.

14.0-15.0 - Unconsol. med-coarse
sand - trace of clay.

15-19.5 - Fine-med white sand -
pumped sample.

19.5-24.0 - As above - pumped

24.0-28.5 - As above - litho
change in interval to
sand w/ white clay
matrix.

28.5-33.0 - VF sand in white
clay matrix -
pumped.

33.0-35.5 - VF sand in white clay
matrix. Some mica
~50% rec.

35.5-38.0 - As above.

38.0-40.0 - As above
stop for today.

18169
Rock Hill

18168
Boring Spring

5-15-0

LIVE oak ck

56

5-15-01/

On site @ 8:00am.

HM, DF

Static water level at
21 feet. 8' of stuff in
the hole this am

40-45 - Flowing sands - pumped &
bailed repeatedly & material
remains in hole. Some bailed
& pumped sample in box.

45-47.5 - Pumped clean & ran a
sampler in. Sand lock
at 47.5. Broke cable.

Must pack up & be off site
until 5:00 or so.

5-16-01 - On site 8:00am. Pulled
all but 15' of augers & got
sampler out. Got augers drilled
back down.

47.5-49.0 - Sample pumped - lost
some sample. Clean med
sand.

49.0-51.5 - Coarse sand w/ bright
orange matrix - clay.

18169
Rock Hill

18168
Rolling Spring

- 51.5-54.0 - Coarse sand - orangish matrix - clayey. Pumped
54.0-56.5 - As above - Pumped.
56.5-59.0 - Pushed sample out of way - hole open to bottom.
59.0-61.5 - No sample - hole clean to bottom.
61.5-64.0 - Fine-med. gray sand Pumped.
64.0-66.5 - As above.
-

5-17-01 On site @ 10:00
Static H₂O level @ 21'
hole clean to the bottom.

- 66.5-69.0 - Fine gray sand, clayey white matrix - pumped.
69.0-71.5 - As above - pumped.
71.5-74.0 - Pumped sample - as above lithology.
74.0-76.5 - Clean to bottom - no sample.

76.5-79 - Gray fine-med. sand
Pumped sample.

79-81.5 - No smpl. Hole clean
to bottom.

81.5-85.0 - No smple - Hole clean
to the bottom.

85.0-87.5 - Fine, gray sand, white
clay matrix, micaceous.

87.5-90.0 - As above - pumped
sample.

90-92.5 - As above - pumped
TP sample.

New auger flight doesn't fit -
belt bushing set too deep.

5-30-01

On site 8:00am

59

Boiling Creek & RR. 211

W# - 18168

Sec. 2966 T. 1N R. 26W

Lat. $30^{\circ} 33' 54''$ N

Lon. $86^{\circ} 52' 06''$ W

elv. 0'

Co. Santa Rosa

0-2.5 - Push core - upper soil
horizon - organic rich sand
grading to sand.

2.5-3.5 Push core - Hit water -
coarse sand.

3.5-5.0 - No smpl. in pipe

5.0-7.5 - Pumped sample - mod. -
coarse sand.

7.5-11.0 - Pumped sample. Multiple
13.75 lithologies. first clean sand,
then orange, platy clay, then
highly organic rich sand w/
wood chunks.

18168
Rock Hill

18168
Boiling Springs

13.75-14.5 - Core - some trash
~~14.0~~ - Clayey sand, wood & greenish
 gray clay.

14.5-17.0 - Organic rich clayey
 sand.

17.0-18.0 - Organic rich sand w/
 wood chunk. Sand is
 fine-medium.

18.0-21.0 Pumped sample
 Med. sand, micaceous
 w/organics.

21.0-24.5 - Pumped sample - as
 above.

24.5-28 - Pumped sample - sand
 as above.

28-30.5 - Core - poor recovery.
 Greenish clayey sand.

30.5-33.0 - Poor recovery - slightly
 clayey, greenish ~~can~~
 micaceous sand.

33.0 - 33.5 - $\frac{1}{2}$ ' run - hard packed
clayey, micaceous, green
sand.

33.5 - 36.0 - Fat green clay w/
sand & shell.

36.0 - 38.0 - As above

38.0 - 40.5 - Greenish clayey sand
& shell.

40.5 - 43.0 - As above.

43.0 - 45.5' - Sampler stuck in
hole. Plastic clay w/
shell.

5-31-01 - Sampler came right out
this am. Sampler was bowed.

45.5 - 47.0 - As above - some sandy
laminations w/shell.

47.0 - 48.5 - As above - some chatter
in the drill string when
drilling this interval.

48.5-50.5 - No recovery -
drilling very slow
over this interval.

50.5-51.5 - Clayey sand w/ chunks
of well lithified material.
Some shell. Poor recovery

51.5-53.0 Slightly clayey sand &
shell - recovered some
sample from previous
interval possibly. Zone
has some head pressure
& water. We pumped out
down to the bottom - fine
- med sand w/ heavies &
shell.

53-54.5 - Coarse sand, gravel &
shell material.

54.5-56.5 - Sand & shell - minor
clayey - silty matrix.

56.5-58.5 - Fine - med. sand - some
shell - minor matrix "clay".

58.5-60.5 - As above - less shell.

60.5-63.0 - Slightly clayey,
micaceous fine-med.
sand - trace of shell.

63.0-65.5 - ~75% recovery. As above.

65.5-68.0 - Poor recovery - drill string
chattered on this run -
hit shell/something hard.

68.0-70.5 - Better recovery - lithology
as above. Removed core
catcher for this run.

70.5-73.0 - As above.

73.0-75.5 - As above.

75.5-78.0 - As above.

78-80.5 - Sand grading downward
into clay - very
micaceous.

80.5-83.0 - fine, clayey sand w/
some clay intervals.
Micaceous.

T.D.

From Rockhill Rd
to pit gotk .6 mi
to site .7 mi

collect 4 sps from
pit outcrop to on SW
corner of entrance area
5' 10' 15'
in citrinell (to ~18')
~18' - 22' leached coral sd.

Rock Hill

65

6-5-01 KC, DP. 7:30 A Start
Wheeler to Jackson guard - per
rig + trailer then to
WALTON Co Rock Hill sand pit
W# 18169

Rock Hill Pit Core

WALTON CO

S 5 CC T IN. R 18W ^{11 min}

LAT 30°36'13" ^{AVG}

LONG 86°04'18" NAD83

Elev ~ ^{140'} ~~150'~~ TOPO

original grd Elev ~ 160' TOPO - pit is ~20' deep

0-1' push to refusal - dk or ch sd

1-2 Auger spl - med or ch sd

2-4.25' SAME -

4.25-6.25' WL spl red ch sd thin lt yl.

6.25-8.75' or ch sd

8.75-11.25' SAME - some purple blks

11.25-13.75' WL spl - wt at btm

13.75-16.25' red + pink + yellow

ch sd w gravel

16.25-18.75' white yl. + gy ch sd w

gran & gravel + thin clay

springers

18.75-21.25' lt yl. gy ch sd w

gravel/granular

18169
Rock Hill

gate valve
ICE
WATER

~~1/4" drill bit
duct tape
cable tape
best drilling~~

BOB2/130

Holley

~~1 1/4" suction hose 50'
fire hose 30' - 1 1/2"
small hydrant fitting
warp hydrant wrench
Mbl drill - feed cpl. bush~~

ROCK HILL

66

21.25 - 22.5' NOSM - washed

CRS sd/granule

22.5 - 23.75' pink + gy coarse sl. clay
sd - sucked 1.5' into HSA - pump
clear

23.75' - 25.5' shoe plugged off.

CRS clay sd - NOSM push rep.
24 - 25.5'

25.5 - 27.5' poor recovery - washed
sample in top. yellow or
clay sd in shoe - plugged

27.5 - 28.5' - WL spl - full run
yl. CRS clay sd

28.5 - 31' (1 yd/bn CRS clayey sd
WL spl

END DAY

END DAY 6:30 pm

6:6 8 AM START - fuel/etc
SWL 10.85' bLS

3.25' sludge in botm of hole -
pump out

31 - 33.5' very soft - almost no
recovery - plugged spur

STAPLES

trowels ?
grinding wheel

pass top Ambf ?

Rock Hill

67

- 33.5-36' v soft - 1 tgl. - or +
cream clayey sd - mottled
36-38.5' - SAME
38.5-41' SAME
41-43.5' 1 tgl. chg sd
43.5-46' 1 tgl. chg sd
46-48.5' SAME - sly orange
48.5-51' or brn chg sd
51-53.5' SAME
53.5-56.25' bailed - f. sd, gl. or chg
56.25-58.25' matrix, small
to qtz granules
56.25-58.35' w. spl. - qtz gravel
(ly at top (drilling caused it))
orange clayey sand, mottled
some qtz granules. bottom +
58.35-61' is grey clay
58.5-61' dk gy silty clay
61-62.75' SAME
62.75-64.5' ol. gn clay
64.5-66' ol. gy clay
66-67.5' SAME
67.5-68.5' ol. gn silty
clay
68.5-70' ol. gn silty clay
70-71.5' SAME

EXP
section

expanded
section

note: Acts like bit is balled
up. Needs feed pressure to
penetrate upper than
Auger bit + screw in.
Sediment toothpaste squeezing
into spur

71.5-72.75' ol. gn silty clay
72.75-73.5' ol. gn clayey silt
-dry

Am getting better than 2:1
core recovery - will chg
over to NQ

8002/136hr

Go to BLK type loc. collect sp.

End day 700pm (1/2hr lunch)

6-7-01 KC, DP 8:15 start
put ice & water, set up
tarp & change over to
NQWL

Set up RECIRC 3yr +
run rods + core barrel
77.5' total

82.75
- 4.75
77.75

82.50

- 4.75

77.75

8082/741 hr

Rock Hill

69

73.5 - 75 olgn clayey silt?

75 - 77.75 - SAME

77.75 - 80' SAME

80 - 85' olgn silty clay - 1 or
two thin mollusc shells + 1
ls clast.

85 - 90' olgn silty clay at top
becoming lighter gray w depth
- shell frag / carbonate % inc
with depth

90 - 95' ~ 50% recovery - rock layers
interbedded w sdy clay

95 - 97.5' med ol. silty clay sd,
~~not~~ some rock

97.5 - 100' med ol. gn calcareous(?)

ss - 5 ft below, minor shell

100 - 102.5' ol. gn, poor ind calc.
clayey sd

102.5 - 105 SAME

105 - 110 SAME

110 - 113 SAME

113 - 115' harder, shelly

END coring for day

END day 6:45 PM

~~ink~~
~~to~~
 core btm 7
 core top 12
 core liner 10
 plenty of lg dividers
 need small dividers

6-8-01 8:20 start

to W. Co dist dot ofc -
 pu key to gate, thunder
 storm -

115-120' light ol. gn clay/silt

120-125' SAME

~~125~~ - pull 45' of 5's
 run in 10' rods

125-130 SAME - slightly lighter
 color - new depth record
 for rig

130-135 same upper 1/2 - appear
 sandier in btm 1/2

135-140 SAND? - clayey, silty,
 minor fine shell frag. with
 heavy minerals in sol fr.

140-145 SAME

145-150 ol. gn clays + sds - use shelly

150-155 SAME

End coring for day
 End day 6:15 pm

6-13-01 KC, DP TAM START

load core box materials

then to Rock Hill Pit

- raining, thunderstorms around
set up tarp + do misc
work - then wait out TS

Spool on 250' $\frac{1}{4}$ " wireline

run rods back in

155-160 ~2' recovered - some soft
sandy green. minor shell, track
clast

160-165' ol gn cly sd as above
~5" gy ls at 162.5-163.
cly sd below

165-170 ~3" ls at top remainder
dk olive cly + cly sd exc $\frac{1}{2}$ " ls at bot

170-175' ~50% recovered

gray fossiliferous ls. some
clayey zones

175-177.5' gray clayey ls. var to
fossiliferous

177.5-180. ls. VAR clayey + fossil
iferous

END CORING for day

END day 6:30 PM

8082/749

6-14-01 KC, DP, EM

7 AM ~~START~~ LOAD PVC
for seismic pu. Add PVC +
conspige - to site

180-185' gray ls + gray calc. clay

185-190' gray clayey ls.

190-195' same, but ls becoming more
more porous (fossil moldic)

195-200' gray sdy clay

200-205' gray sdy clay + ls.
ls fossiliferous sdy205-210' variably clayey ls
shelly moldic210-215' poor recovery in
sand215-220' - soft + sandy - NO
recovery220-²²⁵~~222.5~~ NO recovery - same
collected ~~222.5'~~ ^{225'} cutting spec
225' TO

pull NQWL string

End day 700 PM

8082/754

PVC primer
PVC glue
2x2x4 horse trough

to do list

Reflectors on rig
trailer
pressure rel. valve on
myno pumps
redo dr. side lifeline
core travels
get brake recall handled
ck on sch maint for rig
Air cleaner + muffler
for generator motor
get pressure cells for pump

Rock Hill

73

6-18-01 KC, DP - TAM START

RUN 210' 1 1/4" TIEMMIE - pump
3.5 bags quick grout -
got rtn to 15 thru auger
- pull Auger
hole tilted to 10' as auger
were pulled. top 5/6 hole w
cuttings

retn to H 700 PM

10/31/00

INNER CORE BRL SHOE

CORE LIFTER

NWT BOX X NQWL PIN SUB

6" SHOULDER TO SHOULDER

NWT BOX TO AL BOX SUB

WDYD

SILICONE SEALER

SMALL WIRE BRUSHES

PARTS BRUSH (2)

9/30/00 INVENTORY

20/30 11.5
 16/40 5
 25/65 6
 ASPHALT 6 + 4 10
 CONCRETE 4
 BENTONITE 3
 HOLE AUG
 5' SCW 0
 5' RISER
 2.5' RISER 0
 10' RISER
 CAPS
 L. CAPS
 LOCKS 2
 MANHOLES 0
 S-UP 0
 BOXES 19

CURVE TABLES

HOW TO USE CURVE TABLES

Table I. contains Tangents and External to a 1° curve. Tan. and Ext. to any other radius may be found nearly enough, by dividing the Tan. or Ext. opposite the given Central Angle by the given degree of curve.

To find Deg. of Curve, having the Central Angle and Tangent: Divide Tan. opposite the given Central Angle by the given Tangent.

To find Deg. of Curve, having the Central Angle and External: Divide Ext. opposite the given Central Angle by the given External.

To find Nat. Tan. and Nat. Ex. Sec. for any angle by Table I.: Tan. or Ext. of twice the given angle divided by the radius of a 1° curve will be the Nat. Tan. or Nat. Ex. Sec.

EXAMPLE

Wanted a Curve with an Ext. of about 12 ft. Angle of Intersection or I. P. = $23^\circ 20'$ to the R. at Station 542 + 72.

Ext. in Tab. I opposite $23^\circ 20' = 120.87$
 $120.87 \div 12 = 10.07$. Say a 10° Curve.

Tan. in Tab. I opp. $23^\circ 20' = 1183.1$
 $1183.1 \div 10 = 118.31$.

Correction for A. $23^\circ 20'$ for a 10° Cur. = 0.16
 $118.31 + 0.16 = 118.47 = \text{corrected Tangent}$.

(If corrected Ext. is required find in same way)
 Ang. $23^\circ 20' = 23.33^\circ \div 10 = 2.3333 = \text{L. C.}$

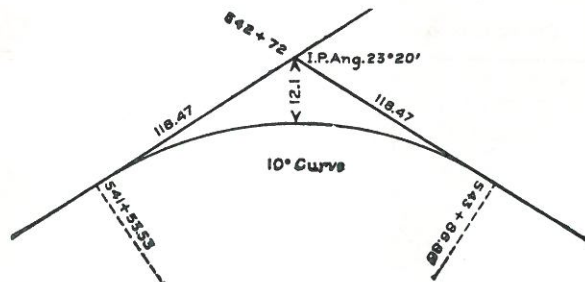
$2^\circ 19\frac{1}{2}' = \text{def. for sta.}$	542	I. P. = sta.	542 + 72
$4^\circ 49\frac{1}{2}' = \text{" " "}$	+ 50	Tan. =	1 18.47
$7^\circ 19\frac{1}{2}' = \text{" " "}$	543	B. C. = sta.	541 + 53.53
$9^\circ 49\frac{1}{2}' = \text{" " "}$	+ 50	L. C. =	2 33.33
$11^\circ 40' = \text{" " "}$	543 +	E. C. = Sta.	543 + 86.86
	86.86		

$100 - 53.53 = 46.47 \times 3' (\text{def. for 1 ft. of } 10^\circ \text{ Cur.}) = 139.41' =$

$2^\circ 19\frac{1}{2}' = \text{def. for sta. 542.}$

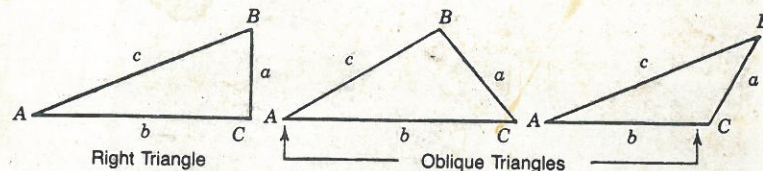
Def. for 50 ft. = $2^\circ 30'$ for a 10° Curve.

Def. for 36.86 ft. = $1^\circ 50\frac{1}{2}'$ for a 10° Curve.



WAETDNCO
 Animal Clinic
 1640 W 90th
 892-5894
 -7873
 Shepher Rd
 Hwy 90
 toward Arroyo

TRIGONOMETRIC FORMULÆ



Solution of Right Triangles

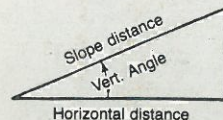
For Angle A. $\sin = \frac{a}{c}$, $\cos = \frac{b}{c}$, $\tan = \frac{a}{b}$, $\cot = \frac{b}{a}$, $\sec = \frac{c}{a}$, $\csc = \frac{c}{b}$

Given a, b	Required A, B, c	$\tan A = \frac{a}{b} = \cot B$, $c = \sqrt{a^2 + b^2} = a \sqrt{1 + \frac{b^2}{a^2}}$
a, c	A, B, b	$\sin A = \frac{a}{c} = \cos B$, $b = \sqrt{(c+a)(c-a)} = c \sqrt{1 - \frac{a^2}{c^2}}$
A, a	B, b, c	$B = 90^\circ - A$, $b = a \cot A$, $c = \frac{a}{\sin A}$
A, b	B, a, c	$B = 90^\circ - A$, $a = b \tan A$, $c = \frac{b}{\cos A}$
A, c	B, a, b	$B = 90^\circ - A$, $a = c \sin A$, $b = c \cos A$

Solution of Oblique Triangles

Given A, B, a	Required b, c, C	$b = \frac{a \sin B}{\sin A}$, $C = 180^\circ - (A + B)$, $c = \frac{a \sin C}{\sin A}$
A, a, b	B, c, C	$\sin B = \frac{b \sin A}{a}$, $C = 180^\circ - (A + B)$, $c = \frac{a \sin C}{\sin A}$
a, b, C	A, B, c	$A + B = 180^\circ - C$, $\tan \frac{1}{2}(A - B) = \frac{(a - b) \tan \frac{1}{2}(A + B)}{a + b}$, $c = \frac{a \sin C}{\sin A}$
a, b, c	A, B, C	$s = \frac{a + b + c}{2}$, $\sin \frac{1}{2} A = \sqrt{\frac{(s - b)(s - c)}{bc}}$, $\sin \frac{1}{2} B = \sqrt{\frac{(s - a)(s - c)}{ac}}$, $C = 180^\circ - (A + B)$
a, b, c	Area	$s = \frac{a + b + c}{2}$, $\text{area} = \sqrt{s(s - a)(s - b)(s - c)}$
A, b, c	Area	$\text{area} = \frac{bc \sin A}{2}$
A, B, C, a	Area	$\text{area} = \frac{a^2 \sin B \sin C}{2 \sin A}$

REDUCTION TO HORIZONTAL



Horizontal distance = Slope distance multiplied by the cosine of the vertical angle. Thus: slope distance = 319.4 ft. Vert. angle = $5^\circ 10'$. From Table, Page IX, $\cos 5^\circ 10' = .9959$. Horizontal distance = $319.4 \times .9959 = 318.09$ ft.
 Horizontal distance also = Slope distance minus slope distance times (1 - cosine of vertical angle). With the same figures as in the preceding example, the following result is obtained. Cosine $5^\circ 10' = .9959$. $1 - .9959 = .0041$. $319.4 \times .0041 = 1.31$. $319.4 - 1.31 = 318.09$ ft.

When the rise is known, the horizontal distance is approximately: - the slope distance less the square of the rise divided by twice the slope distance. Thus: rise = 14 ft., slope distance = 302.6 ft. Horizontal distance = $302.6 - \frac{14 \times 14}{2 \times 302.6} = 302.6 - 0.32 = 302.28$ ft.

