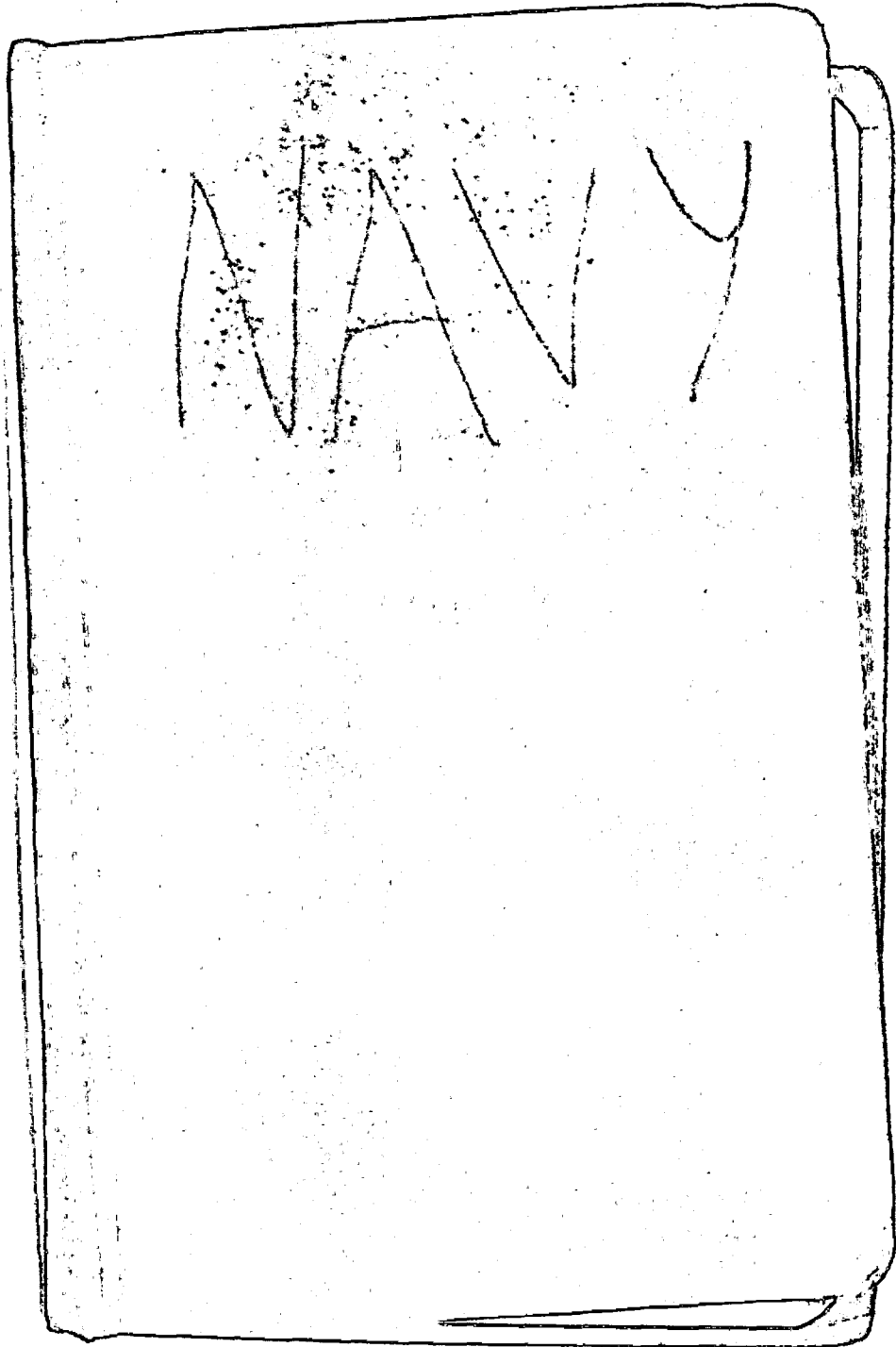


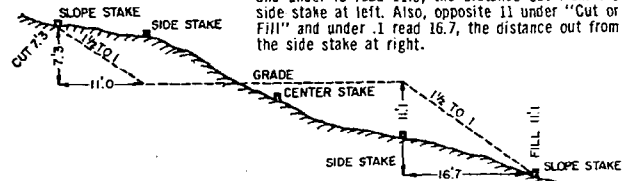
16



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

KEUFFEL & ESSER CO.

For Curve Tables see end of book.

10/22/91

John Barnes arrives onsite at #15.

Delta crew (Mike, Lou, Conrad) disembark from #30.

8¹⁵-8³⁰ Crew w/S. Glash.

8³⁰ - Crew at de-con pad -
J Barnes to GM-3I.

10⁵³ Arrive at de-con pad (Area B) (re-charge basin). Crew just starting steam cleaning operation. The delay is due to their having to go fill their tank truck w/water.

I suggested to D. Yost (NUS) that it might be easier for Delta to use their old decon area (Area A (1)) since they had access to a water source there.

D. Yost asked M. Pellegrino (Delta) for his preference. Mike would prefer to use the old staging area. D. Yost leaves de-con area at 11:05 to discuss this possibility w/Gorman.

11¹⁰ J Barnes off to #13 (off-site)

11³⁰ J Barnes at de-con area.

D. Yost advised me that de-con area will not be moved.
Delta leaving #15 in truck.

10/22/91

1:40 J Barnes to #7.

2:30 J Barnes returns to de-con area - Rig gone - Mike & Lew went to get H₂O.

2:55 Rig returns.

3:05 Rig mobilized at #24I,

4:00-4:30 J Barnes at #7.

4:30 Crew preparing to drill. Start augering w/ 4" ID augers.

4:41 Auger bit down 5' BG.

4:45 Mike removes bit to clean it. Once he did this - the augers were sent back downhole.

4:53 Auger bit down 10' BG.

5:05 Augers down 55' BG. Crew preparing to sample 55'-57' BG.

55'-57'

14/18

Rec = 20"

8/10

H₂O = 8ppm.

Des: fine-coarse tan sand trace silt, clay.

10/24/91

10³ Rig down 60' BG.
Crew preparing to sample
60-63' interval. Crew tests
lights on.

60-62' BG

3/3 Rec. 18"
W/W

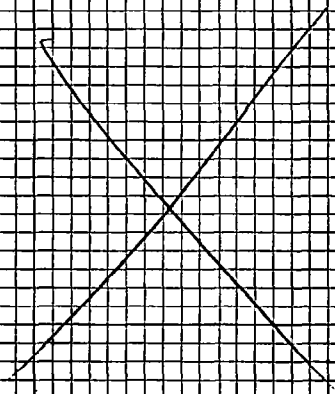
4/10 Desc: Top 8" brown clay
w/brn silt. Trace
fine sand, lignite

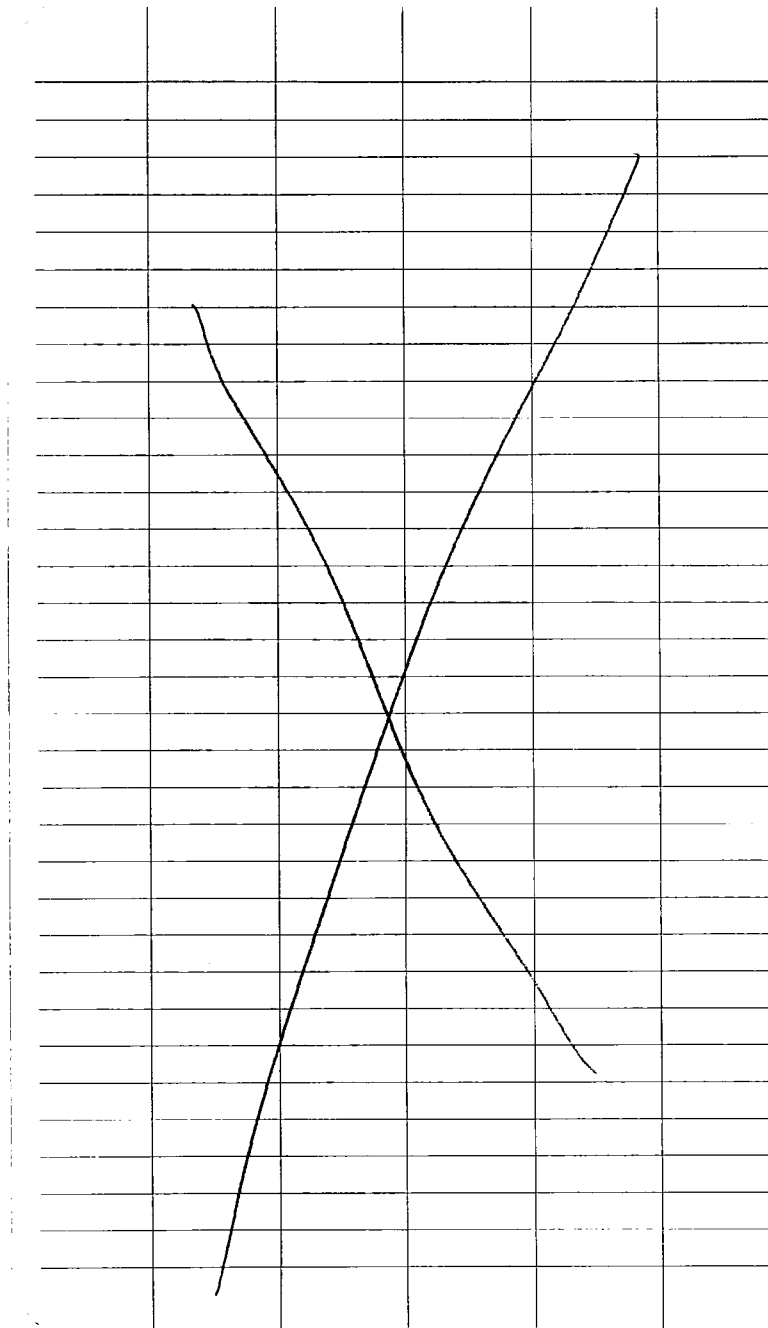
Bottom: med coarse sand
w/trace gravel.

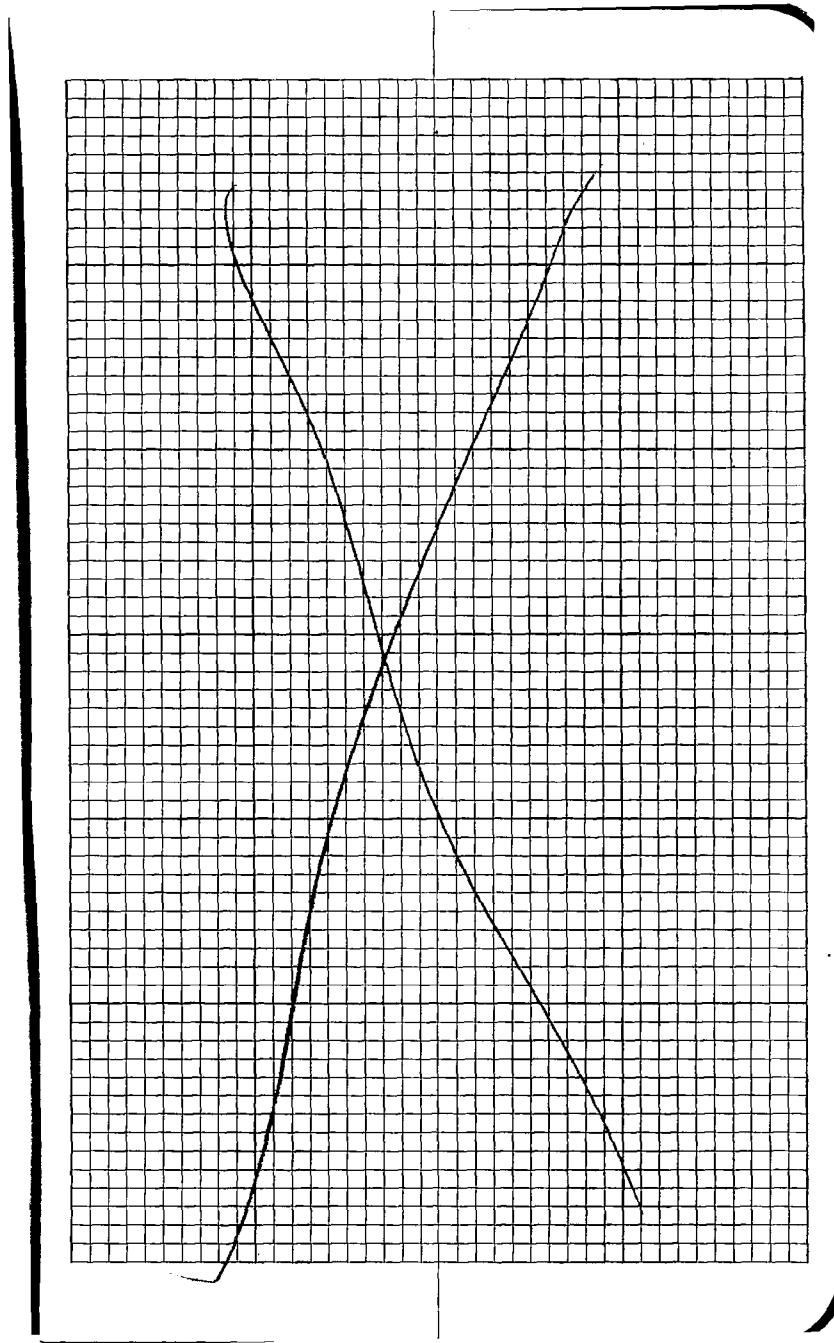
~~7:45 M.H.~~

6:43 Mike shuts off rig.

6:45 JBanner leaves site







10/23/91

J Barnes g-site at 735.
Arrive J 24-I at 745.
Weather clear - T = 55°F.

Onsite: D. Yost } NUS
K. Kilpatrick }
M. Bellarosa } Delta
Conrad }
Lou }

Crew just started drilling (60 → 70' BG)

7:53 Auger down ~69.5' BG, crew
preparing to sand bail.

7:57 Crew done sand bailing. Preparing
to sample 70-72' interval.

70-72' BG

7/8

Rec: 2 1/4"

Wt: 9.4 ppm (10²⁵ ppm)

(10²⁵)

Desc: grey clay with fine sand

Trace iron stain, trace med/coars

sand.

clay has a laminar physical appear

Note: D. Yost advises me that the
high headspace reading (60-62') was
6.2 ppm over background.

10/23/91

8²¹ Augers down ~ 80' BG, Crew preparing to sand bail

8²² Crew preparing to sample 80-82' BG interval.

80-82' BG

8/58

Rec: 24"

HNU: 9.4 ppm (10:25 am)

72/95

Desc: Top $\frac{1}{2}$ = light tan silt
red fine sand

Bottom $\frac{1}{2}$ = brown med-coarse sand

8²⁷ Augers down ~ 90 feet below grade. Crew preparing to sand bail.

90' Crew preparing to sample 90-92' BG interval.

90-92' BG

11/46

Rec: 18"

HNU: 9.4 ppm (10:26)

45/44

Desc: fine & coarse light tan sand, trace silt.

9²² JBanner to #130.

10/23/91

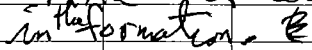
10²² J Barnes returns to #24I
Auger down 110 feet below grade.
Crew preparing to sample 110-112' BG
interval.

110-112' BG

10/40 Rec.: 24"
H.W.: 40"

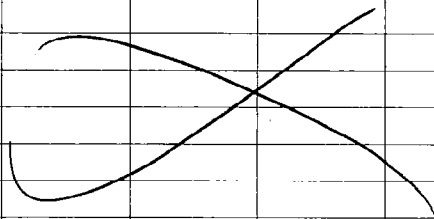
38/40 Desc: top 15" gray brown
fine/med coarse sand, trace
clay
next 4" red fine-med sand ^{trace} silt
next 5" orange fine-med sand
trace silt.

Headrace - 100-102' BG = 16.4 ppm

10⁴⁸ A delay (15+ minutes now) has occurred -
Mike quit retrieval soon. It is stuck
in that formation. 

11⁰⁵ Crew finally get rods "unstuck".

11²⁰ J Barnes leaves for Albany.



NOVEMBER 12

J Barnes arrives en route at 10:45

Check in - make phone calls.

Arrive at #25 at 11:30

Onsite - K. Kilmartin (NUS)
M. Pellegrino } Delta
L. Keipar }
Carril }

Weather T=45 mostly sunny.

Boring (test) being drilled, 73' BG at

11:30 am. Drilling has gone down - flight

formation. Hole readings

60' in 1 ppm

70' in 8 ppm

- according to K. Kilmartin

11:40 Auger down to 80' BG.

11:51 Crew sand bailed to 6" of heave
from the bottom of the borehole. They
are now preparing to sample the 80-82' BG
interval

80-82' BG

10/12

Rec: 7.4"

NW: 11.8 ppm

11/16

Desc: Top 12" brown fine-med
sand.

Bottom 12" tan fine-med
sand.

11/12/91

12¹⁰ Lunch
12³⁵ Lunch over. Crew adding 10'
of auger to drill stem.

12⁵⁶ Auger down 90' BG.

1⁰⁶ Crew finished sand boiling. Preparing
to sample 90-92' BG interval.

90-92' BG

12/30	Rec: 24"
33/40	PTD: 11.0 ppm
	Desc: top 18" tan fine-med sand
	Lower 6" orange-brown (iron-stained) fine-med sand.

1²⁵ Crew leave work area (to make phone calls,
etc).

1⁴⁶ Crew returns.

1⁵⁰ Start drilling 90-100 ft
J Barnes off-site

2²³ J Barnes returns. Auger down
100' sand bader has broken.
It will > 30 min before replacement
arrives

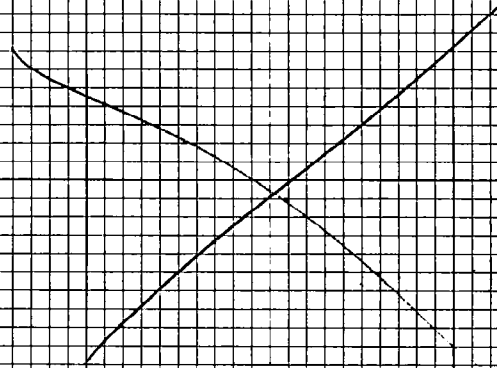
11/12/91

2³⁰ Discussed w/ Kilmatin at what depth sampling would begin at #8. I suggested a depth of 140' BG - the suggestion was acceptable to Kilmatin.

2⁵⁰ Mike is going to use 3' spoon to knock out 5' heave at bottom of auger. (Replacement sails still not here)

3⁰⁰ First attempt w/ 3' spoon complete =
Heave now 3' with auger.

3³⁰ Mike has given up on knocking out heave w/ 3' spoon. He is going to wait for replacement sails to arrive. Thomas leaves for the day.



November 13, 1991

J Barnes arrives at #25 at 8:55
Same crew as yesterday.

Headspace on sample at 130' = 10.2 ppm.
Augers at 140' BG.

9:15 - 9:45 J Barnes at Plant 16.

9:45 The sample from 140-142' BG just
brought to the surface

140-142

6/16

Dec 24"

Rate = 10.8 RPM

31/37

Base Top 22" brown to tan
fine-med sand

Lower 2" grey fine-med
sand w/silt

Note: There was 1' of heave which
the crew sand bailed from the bore hole.

9:51 Start drilling 140-150' BG interval

9:52 Coffee break

10:04 Coffee break over. Delta's delivery
truck arrives.

10:13 Drilling re-commences.

11/13/91

10 ²²	Augers down to 150' BG.
10 ²⁸	Crew send bailing. There is 6' of leaves at bottom of auger stem.
10 ³¹	Crew done sand bailing. Preparing to sample 150-152' BG interval.
150-152' BG	
16/32	Rec: 24"
69/100	How: Desc: Top 12" grey-tan fine-med sand Lower 12" orange-brown fine-med sand, trace grey-tan sand.
11 ¹³	J Barnes leaves site.
11 ¹⁵	J Barnes returns to #25. Augers at 170' BG. Spoon has been stuck at 172' for 1 hr.
Headspace:	
150	→ 10.6 ppm
160	→ 9.2 ppm
from K. Kilmer	

11/13/91

3⁴⁵ Spoon still stuck. Crew has added a 5' auger flyte to the drill stem. Mike hopes that by over drilling 5' he can then pull spoon out.

I had suggested using air to lower the density of the heaved sands - however, there is no room in auger or annulus for drill rods and an air line.

4¹⁵ J Barnes at Plant #16.

9¹⁵ Spoon still stuck.

4²⁵ It appears they've got it out. They're breaking rod stem.

170-172' B6

16/30 Rec: 9"

HW: 8.6 ppm

56/100

Desc = Top 3" Brown fine sand

some med grains

Middle 3" orange-brown

fine silty sand.

bottom 3" gray fine silty

sand.

11/13/91

445 Mike reports that 1 inch gravel
came up in the last retrieval of
the sand baker. He thinks that there
is a gravel layer around 170' BG.

446 Now the augers are stuck in place.

448 Augers unstuck. Crew now adding
2-5' auger flights to the drill stem.

502 Start drilling towards 180' BG.

513 Augers down \approx 180' BG.

515 Jim Wright (DPR) arrives. Crew
start sand bailing.

523 Mike still working the sand baker. There
is \approx 12 feet of water.

528 Crew finished sand bailing. They are
now preparing to sample 180-182' BG
interval.

180-182' BG

8/22 Rec 19"
H.W.:

30/32 Desc: Brown silty sand
Some clay and iron
staining, trace lignite.

30 J Barnes leaves site

November 14, 1991

J. Barnes arrives on-site at site (#16) at 7⁰⁵. Delta's crew checking in.

J Barnes at #25 at 7¹⁵ AM.

7³⁰ Delta crew arrives at #25.
Same Delta crew as 11/12.
NVS - Dave Post is here
in addition to K. Kilmartin.

Weather Clear T → 60°F today.

Final headspace reading is 8.4 ppm.
(180-182' BG)

7⁴⁰ Start drilling 180-190' BG.

7⁵⁷ Auger down 190' BG.

8⁰⁰ Crew start sand bailing - there is 4' of heave on hole.

8¹² Crew done sand bailing - They are now preparing to sample the 190-192' BG interval.

190-192' BG

A/2

1/4

Rec: 24"

YNU: 4.0 ppm

Desc: top 8" Brown med sand, some coarse sand

Rest: light brown med sand.

11/14/91

8:35 Start drilling 190-200'

8:44 Augers down ~200' BG. D. West leaves #25 - He is here to supervise well development.

8:47 K. Kilmaning monitors breathing zone and inside augers w/ O₂ =

Breathing ← 5ppm
in Auger ≈ 5ppm

Mike starts sand bailing - 7' of heave.

8:55 Coffee break.

9:05 Break over - sand bailing resumes.

9:15 Crew done sand bailing. Preparing to sample 200-202' BG interval.

200-202' BG

2 1/8 Rec: 24"

PIS: 10.2 ppm

20/20

Notes: Top 14" brown med-

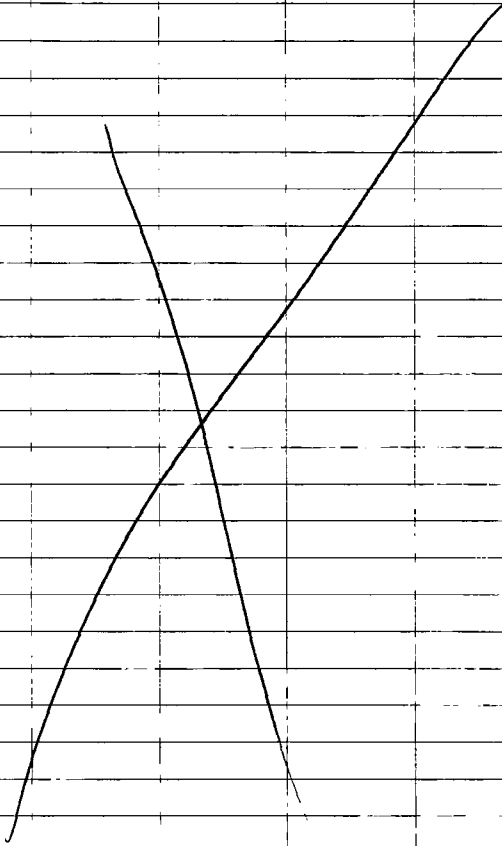
coarse sand

lower 10" Gray fine med sand, some silt, 3 layers of iron staining 2 1/4" wide each.

11/14/91

9³⁸ Start drilling 200-210:36.

450 J Barnes leaves site



J. LISTER

11/5/91

Arrived at site 7:10

overcast 45-50°
rained earlier

Kevin Kilmartin } NUS

~~Dave~~ Gost

Delta Drill Rig Crew

HN25 pulling pilot hole
augers about 80' left
in ground. Hole
went to 230', couldn't
go deeper for fear of
not being able to retrieve

auger
Dont lift to develop a well

8:25 removed last auger

8:35 traveled to down area
drill rig crew unloading
augers.

8:55 Kevin Kilmartin left to make
phone calls; drill rig
crew finishing unloading augers

9:15 crew breaks for coffee

9:45 Break over starting to
steam clean

9:50 left to make phone
calls

10:20 returned from calls
to well 28-F which
they are getting ready
to develop

10:30 air compressor started up

10:33 well starting to be developed
highly turbid water
being discharged

10:40 flow stopped from well
may have gone down
all water in well & got
recovering very fast due to
alot of silt

10:44 flow started again from well
to 1/2 gpm

10:53 started surging well by shutting
air on & off. On for ~ 1 min
off for ~ 20 sec.

10:57: flow seems to have increased
a little ~ 1/5 gpm

11:10 left for NW 25 site
well still flowing very
little

11:12 back to Well 28. I drill
crew still at deson

11:40 about the same flow from
well, talking about
trying to get surge block
and use it if well doesn't
clear up any more
left to find out crew

11:42 Crew getting ready to
break for lunch

11:45 I left site for lunch

12:15 returned from lunch
to well # 287. Well
still not flowing much.

1:10 no progress on 287
left to find drill crew

1:13 at HN25 site they have
started augering only one
man on crew. Down only
5' 868

1:20 rest of crew drove by

1:23 Scott from Keraty & Miller
stopped asked if I could
ask Jim Baizer to call
him I suggested he call
him Jim Baizer

1:25 down 10' BGS

1:26 rest of crew arrived with
water truck

Truck listing to left
tank filled with water
and spring clamp reportedly
snapped
Drilling stopped

1:37 augers pulled & lead auger
removed to weld plug in

1:42 Backhoe brought over to lift
truck tank and move it
to other side of truck

1:50 plug welded in

1:57 tank moved to center of truck

2:15 augers replaced on rig

2:30 another lift attached

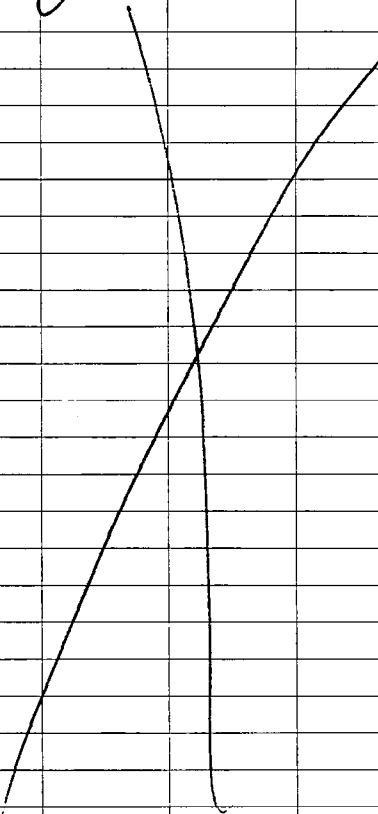
2:29	Down 10' BGS
2:42	15' BGS
	crew on break
2:48 ^{over}	back on job
2:55	20' BGS
3:12	25' BGS
3:27	30' BGS
3:43	35' BGS
3:55	40' BGS
	dark brown - black 1" gravel being retrieved from hole spoke to Kevin Kilmartin about installing double filter system on air compressor lines used in well development. He agreed it was a good idea.
4:10	augers started dancing and going in at an angle due to gravel
4:20	augers broken off & mast dropped

4:45 rig moved auger reattached
4:50 pushed another 5' however
only re-drilling old hole
5:06 Still reaming out old hole,
pulled up what seems to
be piece of old concrete
about 4" x 6" x 1" may be old
fill
5:21 Broke auger off again getting
ready to move rig again
5:35 Rig moved ready to reattach
auger
5:50 Started reaming hole again
6:10 added another auger
and went down another
5' auger seem to have
straightened out somewhat but
not totally

6:15 rig shut down

6:25 left site for day

James B. Foster



11/10/91

J. LISTER

8:00 arrived at site mainly overcast
~50°F

Dave Ford - NUS

Marty Simonson - DOD

Delta Drill Crew

8:20 started drilling @ 40' BGS
black gravel (11') spuds

8:30 Joe from Delta & another
rig pull in - other rig is
to be used to surge 28I
Dave left to go to 28I

8:45 Pulled Hanger flites off

8:55 Pulling ^{one} more flites

9:00 Pulling another flite

9:05 Pulling another flite - very light
rain starting

9:10 Pulled another flite

9:15 Lead surge pulled

9:20 Dave returned & we all
agreed to start a new hole
several feet away. Old hole
cored to 15' BGS & will need
to be grouted.

9:35 - Coffee Break - raining still

9:50 Break over moving rig
ca. 2' to east

10:12 Mast raised

10:18 left to go to 28I
stopped raining -
charging well with
single block

10:45 Returned to HN25

have augered down 10' BGS
with open lead auger
replacing with lead auger
with plug for it

10:54 Down 10' BGS

11:07 Down 15' BGS

11:21 Down 20' BGS

11:40 Down 25' BGS

12:00 Down 30' BGS
12:02 Break for lunch
12:35 Lunch over
1:00 Down 35' BGS
1:45 Down about 40' and augers
are not going in straight
Driller trying to straighten hole
by reaming.
2:00 Breaking off an auger flite
2:05 Dave returned reporting
that development of 282
going real good. Turbidity
down to 20 NTU but wants
to continue developing until
he gets real good recovery.
2:08 Bill crew breaking off another
auger.
2:14 Dave asked if any problem
moving to new location about
10'-15' to the west of this
hole. I agreed.

2:22 Went to 28I & water is
usually so clear, surging stopped
being developed by air lift

2:30 Returned to HW 25
Drill crew still breaking
off augers.

2:50 Lead auger pulled out

2:56 Returned to 28I
well still being developed
by air lift flow up
better than day before.

3:01 Turbidity reading of 15.1
air compressor shutdown

3:15 Left site

11/21/91 DAVE BEANT Arrive @ Site 7:00

Weather - overcast, 60°, low wind.

7:15 HN-25 DAVE YOST - NUS

CONRAD, Lou, Mike - Delta

Well set @ 130' - must grout today

7:20 Kevin Kilpatrick arrives HN-26

to be brushed on status.

7:30 Dave & Kevin return to office to

unload van - they are renting another

van because of exhaust problems with

this one. Dave also needs to

calibrate equipment for development

7:55 Dave & Kevin now arrive at office -

they first went to HN 24: to see

if German construction in the area

has affected well. The well seems

low (~6" below grade) as if it was

pushed down by a large truck

running over it - but Kevin says

that it had sunk that low
on its own.

Also - yesterday Dave V. developed
HN-28-i down to single digit
NTU.

Today, in addition to grouting
HN-25-i, must develop HN-29-s
(last shallow well)

24
25
20
Remaining to be done in this stage
is drill HN-29-i, and develop
24-i, 25-i, 29-i. Kevin hopes
to be complete with this before
Thanksgiving.

8:09 In office - Dave V. calibrating
turbidimeter, Ph, conductivity.

Change of scope - HN-29-i well may
not be drilled before Thanksgiving
because they are planning a pilot
hole to 250' to sample and find
optimal screening zones for both intermediate
and deep wells. Then, they
can just blow down to the
zones desired to be screened for
29-i and 29-d. The pilot hole
will be allowed to collapse.

8:35	HN-29s - Gate not open, Joe from Delta is wanting to develop. Dave Y. is trying to get a key to open the gate.
8:48	Dave Y. and I went to Bldg. 16 and security told us they'd open the gate to HN-29. Dave Y. is now bringing Joe back to HN-25 to get the air compressor.
	Conrad, Lou & Mike are still mixing grout @ HN-25.
8:53	Security just unlocked gate & Dave Y. and Joe just showed up with the compressor.
9:17	I returned from Drillers staging area with Joe after fetching a pump. Dave returns with key for HN-29.
9:21	Joe is setting up to develop HN-29. Dave Y. went to check out of

his motel (he is leaving tonight)
and then he will return with
OZ water. Kevin is looking
for someone from Grumann and
then he will sit on HN-25.

9:30 Starting to rain

HN-29
9:35 Air on.

9:43 HN-29 - 1 spurt of water = looking
back at well data (screened 39'-49',
water table @ 41') may not be
able to use air. I am having
Joe measure to be sure his hose
is down far enough. Air off.

9:46 HN-29 - Joe was at bottom \Rightarrow can't
be able to use air. Will have
to use a submersible pump.

rain has stopped.

Now waiting for Dave Y. to return to
tell him status.

10:00 Dave returns and OKs submersible pump.

10:15 HN-25 - Kevin is watching the
drillers grant - still have ~40'
of augers in hole.

10:50 HW-29 Submersible Pump in well
and ready to go.

Pumping at 15 gpm. Water is very
turbid - obviously after the air.

Dave and Joe are returning pick-up
truck to other crew & will be back.

10:57 Dave & Joe return to HW-29.

11:02 HW-25: Drill rig is ~~being~~ taken
down \Rightarrow all augers are out of hole.

Grout is within 6' of surface, & other
holes are grouted (other holes are first
couple attempts at this well). After

this is complete then they will decide

if get water & set up at HW-29
for the pilot hole. Dave Y. is

currently developing HW-29, so

timing will be critical. Kevin has

gone to get the new van.

11:15	HN-29s	- Dave K. thinks they will complete the development before the pilot hole is drilled. If not, I think there is enough room if the tanker truck is brought outside the gate. We will have to wait & see.		
		Water is still too turbid to measure.		
11:35	HN-29s	- Flow is now 11 gpm.		
		Turbidity is still too high.		
		Temp has gone up .1°C to 17.4 since 11:02		
		Ph " " from 9.63 to 9.35 " "		
		Conductivity " " " 980 to 910 " "		
11:44	Temp 17.4	[see summary next page]		
	Cond 895			
	Ph 9.40			
	Turb. - X			
11:52	HN-25i	- drillers are 5 minutes from going to decar area. Kevin not back yet.		
		Raining again, very light.		
12:10	HN-29s			
12:25	HN-29s	Temp 17.5	Cond. 905	NTU —
		ph 9.58		

12:48	HN-29s	Temp 17.4	cond. 895
		PH 9.62	TURB. 0
12:53	HN-25	Drill crew still packing up.	
		Kevin is still not back yet.	
12:57	Kevin	returns with a new van.	
1:02	HN-29s	Dave Y. went to make phone call	
1:15	Kevin	shows up to HN-25 to check status. Plans on Dave taking one more reading & shutting down.	
1:33	Dave Yost	shows up @ HN-29. He had called Dave Breyck (P), Project Manager for NUS. It has been decided that this well (HN-29s) be pumped until the rig shows up & then will exit development & start to drill the pilot hole. I was concerned about using mud rotary for the deep well through the screened area of the intermediate well.	

Dave B. says that all intermediate wells and shallow wells (prior to installation of the deep wells) will be sampled, then, after deep wells are installed, the shallow & intermediate wells will be redeveloped if nec.

2:03 HN-29r
 Temp- 17.5 Cond- 880
 Ph- 9.62 Turb- —

Summary

	Temp	Ph	Cond	Turb.
11:02	17.3	9.63	980	-
	17.4	9.35	910	-
	17.4	9.40	895	-
	17.5	9.58	905	-
	17.4	9.62	895	-
2:03	17.5	9.62	880	-

This 3-hour, fairly stable pumping episode is in addition to ~~two~~ other development attempts on this well, which is just not clearing.

Due to logistics of getting the drill rig in to start the pilot hole, I OK'd the cessation of developments. Other rig is decoming and is expected within an hour.

2:34 Joe is breaking down development equipment. Dave Y has gone to make phone calls.

2:40 I called John Barnes.

3:00 Dave Y and I went to talk to Foreman @ HW-24 (they are pouring a concrete pad next to the well) they said (barring rain) they will be out Fri., I will have Kevin open the well for me Saturday.

3:08 Decon area - I talked with Mike from Delta & he said they should be @ HW-29 in ~1 hour. Main rig is decon'd & left to fetch water, Conrad is decon'ing auger's.

3:50 Loading drill rig to HW-29.

4:05 Rig @ HW-29, now checking on locations.

4:43	Lou & Mike went to decon pad to fetch water trucks
5:18	Jim Wright from Grumman is here to escort since its after 5:00
5:30	Mike crawls & says the water truck is waiting at the gate out to get water but the gate is locked. Jim Wright is going to see if he can get security to open it.
5:55	Enter Delta crew (Lou, Mike, Conrad) back and have water truck full.
6:05	Starting drilling.
6:13	Under asphalt is concrete - having difficulty drilling through.
6:30	Still trying to get through - rebar in the concrete messing things up.
6:49	Stake hammered through concrete, preparing to shut down for night.
7:00	Leave site

David [Signature]

11/22/91 David Peart

Weather - heavy rain, 60°

7:00 Arrive site & check in

7:20 Kevin arrives to HM-29 & leaves
again to find key for gate.

7:35 Gate opened, but Kevin not
returned yet. We will be able to
drill the 1st 50 ft without
samples because HM-29s already
was characterized, however,
operations may cease for the
day after that because it
is too dangerous to use the
cathhead in this heavy rain.

7:55 Kevin arrives back @ HM-29 with
Conrad & Mike.

8:06 Kevin leaves to make phone calls

8:11 Drilling commences - Very heavy rain

8:24	Drilling has stopped and the drillers are again hammering (with sledgehammer, chisels, etc.) at the concrete.
8:34	Drilling has restarted & a second auger flight attacked.
8:42	Kevin returns to HW-29. Drillers are making fast progress.
8:51	Rain has stopped. Drillers have pulled the augers & are changing a tooth.
9:20	Coffee break
9:38	break over. Rain starting again, heavy Hole is drilled to 20', and 30' of augers are on.
9:50	Hole @ 30', 40' of augers on.
10:10	Auger is @ 50' - will now attempt to spear. Rain has reduced to a sprinkle.
10:25	6" Blow Counts 25, 20, 23, 30 50'-52'

50-52' - surface slag

50.8-52' coarse, white sand - moist (below)

10:41 - Regering to 60'. Mike said he didn't like the feel of the hammer (slipping) when he did 50-52'. It is still raining, heavier now. We told Mike to stop when he feels he should. We will see how it goes with 60-62'.

10:47 H₂N readings are questionable - Background level is 5.1 gpm and rising because of the rain. No elevated levels detected anywhere.

10:52 Headspace for 50-52' 26 gpm - 1.8 background = 24.2 gpm. Kevin left jar in van (and H₂N) and took readings here.

11:05 Ed Ambrose from Navy stopped by to ask if we needed him for an escort tonight.

The drillers are clearing the suspect of running sands prior to spooring.

Kevin is still trying to use the HNu to get background and work zone readings - but he can not get consistent readings because of the humidity.

11:11 Kevin is ordering level C in the work zone. His background HNu readings vary from ~5-6 ppm and work zone readings are 2ppm higher than this. Mike has his mask available but Conrad must go fetch his. Kevin is checking again while we write.

11:14 Joe from Delta arrives as replacement for Lon, who didn't come in today because he's sick.

11:20 Conrad is back with respirator. However, since shutdown 12 minutes ago the difference between background and work zone is .2 ppm (action level is 1ppm above background) We are not sure if we were possibly reading diesel fumes or the difference went down because we ceased intrusive activities. We are starting

Aug 29, 1991

42-44' BG #215

17/16

Rec: 14"
MU: 0.5 ppm

11/13

Desc: Brown fine med sand
fine gravel, iron.

44-46' BG #215

7/19

Rec: 16"
MU: 1.0 ppm

11/19

Desc: Top 3" moist
Bottom 9" appears
saturated

Brown = red med sand
and gravel.

46-48' BG #215

10/11

Rec: 16"
MU: 0.0 ppm

9/29

Desc: Brown med sand, few
gravel, trace fine, wet.

48-50' BG #215

6/19

Rec: 15"
MU: 1.0 ppm

14/7

Desc: top 3" brown coarse
sand and gravel (brown stain)
lower 12" green fine
sand, some coarse, med
sand, few gravel.

Aug 29, 1991

1⁵⁸ Augers drilled to ~55' BG then pulled up two feet. Crew installing temporary well.

WT 47' BG
Bottom of well ~52' BG.

2:04 Nelson starting to purge well.

2²⁴ Paternity collecting groundwater sample (2 - 40ml vials) at 215.
J. Barnes goes off site

3:07 J. Barnes returns. Jack Nelson at #227 - augers down 5' BG.

Rich & Ke Jim (ASD) at #225 w/ Ransom & Gost.
Well set at 43-53' BG. Drillers removing an auger flyte.
Water level ~48' BG
Bottom ~52' BG.

3¹³ Rich driving casing down ~1 ft with 140# hammer.
Water level at ~48' BG
Bottom of well ~53' BG

Aug 29, 1991

316 Full crew starting to purge well at #225.

324 F. Pinner collecting sample at 225 (2 - 40 ml Nipals) center

327 Back at 227 =
Augers down 30' BG.

339 Augers down 15' BG. Crew preparing to sample 45-47 vertical.

45-47' BG #227

5/11

Rec: 14"
HW: 4.0 ppm

7/12

Des: Light brown -
brown med
Sand w/ iron filings.

A piece of quartz
was ground up with
sample & iron filings
of spms

47-49' BG #227

11/9

Rec: 12"
HW: 4.6

13/7

Des: Brown med-fine
Sand, some gravel

Aug 29, 1991

49-51' #227

4/5 Rec: 13"
6/5 MW: 2.0 ppm
Desc: Top 10" brown med
sand, some iron, stone, trace
fines.
Bottom 3" brown fine
sand and silt, trace
gravel embedded in
silt

51-53' BG #227

7/6 Rec: 20"
9/7 MW: 1.8 ppm
Desc: brown fine-med
sand, some gravel.
≈ 1" clay lenses 4" from
bottom of 5' pipe. Clay
off-white in color.
Sands - saturated.

4¹⁵ Augers down 54' (drilled to 55')
Crew setting well.
4²² Water at 52 1/4'
Bottom of well 53' BG

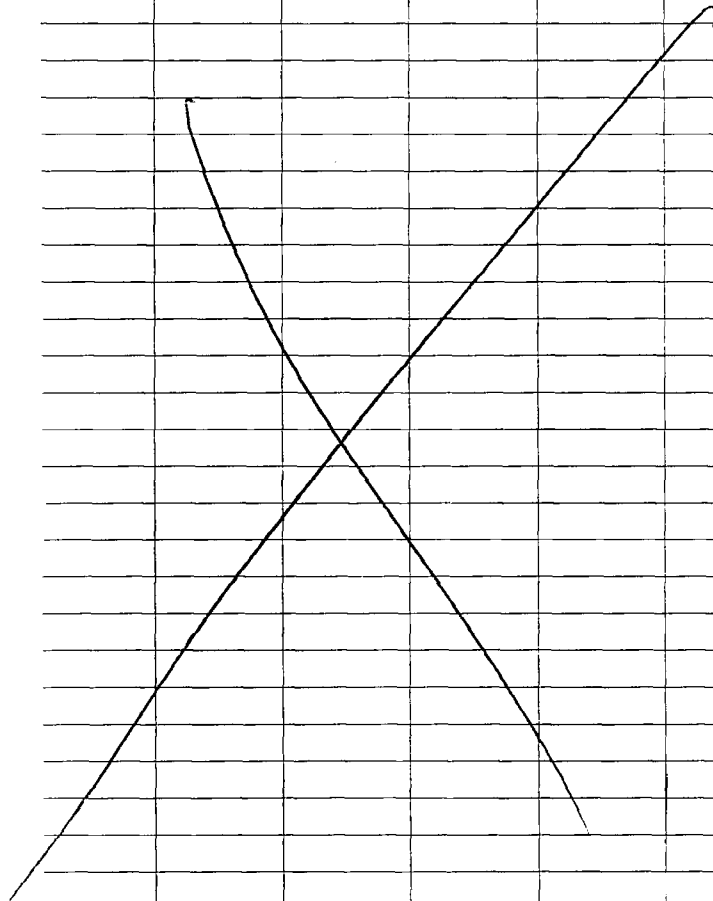
August 29, 1991

429	2 auger flights required. Well drilled to 113'
	Water at 48'
	Bottom of hole 55'
	Nelson starting to pump live oil
430	J. D. Boring # 31309 Puck & J. M. AOT E. P. Boring, bottling sample from 3-5 feet below ground. 3-4 inch VOA, 2 carbon pens
	no result on VOA.
433	Auger down 19' 36". Crew preparing to sample 19-21 interval
19-21	# 329
8/15	Disc 1 2 16"
	Wdu: oil ppm
18/18	Disc: fine coarse sand and gravel, light brown in color
504	Disc part = 237 - crew is pulling auger

Aug 29, 1991

5²² Joe & Nelson mixing grout.
Marty Simonsen - DPR is here

5³⁰ J Ben loan site



Sept 4, 1991

DAVID PRATT - NYSDEC

8:00 Kevin Kilmartin - update

- HN-28 installed 9/3/91

- Now one crew on HN-27

one crew on HN-24

Weather Sunny - 75°

8:05 HN-27 Fred Ramsey

Bottom of well @ 54 ft.

Water level @ 46 ft.

Now ready to install PVC.

9/3/91 had well to ~45 ft.

8:15 HN-27 - placing sand in hole

around screen.

8:45 HN-27 - a total of 5 - 100 lb bags

of No. 1 grade sand in hole. Now

are putting pellets down hole

8:55 Dave Yost came to HN-27

~~He~~ He says HN-24 will be

grouted and another attempt will

be made at drilling it ~20 ft

				OP	9/4/91
					from original location. At about 19 feet B.G. they hit concrete debris which caused the hole to be bent.
9:05	HN-24	Randy	Latarcity		setting up to auger new hole.
9:15	HN-24				can not proceed until Kevin gets an OK from Plant manager that no subsurface structures is known to be in the area.
9:25	HN-27				Breaking down rig
9:35	Terry	Rajahn			taking ^{surface soil} A samples in Site 1. This is his 3rd sample today.
9:40	HN-28				- No steel protective riser yet. Grout sank down to about 6' B.G.
9:45		Barry	Dave	Yost	informs the drillers will re-grout HN-28.
					I am at Decon Area. Drilled crew from HN-27 now steam cleaning back of rig.

9/4/91

The drillers for the Grumman Investigation have their decor area near HN-28 and HN-29. John Barnes expressed concern that there may be a problem because of space. No problems have come up + HN-28 was installed yesterday and HN-29 is on the other side of a fence from the decor area.

10:00 Leaving Decor area

10:10 At site for HN-29 - drill rig may not fit in area planned. Dave Vest is checking with Kevin to see about moving hole 10 ft.

10:15 HN-28~~4~~ - augers are 45' into ground. This went fast because there were split spurs taken in the 1st attempt of this hole. pulling typical brown medium sand & gravel.

DP 9/4/91

10:20 HN-24 Augered to 55', moist sand brought up by augers. Preparing to split spoon.

55-57 12,16,27,26

Light brown to white medium coarse sand. moist. Slight HNu reading \approx (0.1 ppm)

From rods can tell GW at \sim 50 ft.

10:40 HN-24 augering to 58' to set well.

10:50 HN-29 moved again. There is a fence behind Plant #3 and an 8' foot drop in grade. The location of HN-29 is on the other side of the fence and down the grade from the location on Work Plan Figure 4-5. In all, the well will be \sim 40 ft. south of mapped location.

HN-29 crew is wearing Tyvek suits because pilot hole showed some contamination. (12,000 ppl)

10:55 HN-29
Spoon 25-27 medium, light brown/yellow sand.
HNu detection \approx 0.4 ppm

11:05 HN-29
Spoon 20-32 HNu \approx 2.5 ppm
same sand - more red - iron staining

DP 9/4/91

11:15 HW-24 - PVC 4" in hole, bottom of screen at 59' BG. Are now adding sand.

11:32 ~~HW-24~~ HW-24 water at 47' setting up for spoon 45-47 then will adjust to 49 and set cells.
No readings higher than 2.5 ppm H₂Nu

11:35 HW-24
split spoon 45'-47' 5, 7, 10, 14
H₂Nu - 2.5 light brown/reddish coarse sand with lens 3" thick of light grey clay.
Dave York says they have been hitting lenses of that clay up to 1 ft thick

11:50 HW-24 I have been watching the H₂Nu for 10 minutes now and ambient air readings have been 2.5 ppm. Not much confidence in split spoon readings.

11:55 HW-24 Bottom of hole 48.5 ft BG.
Are now placing 4" PVC in well.

			DP	9/4/91
12:00	HN-29	Placing sand in hole		
12:20	HN-24	Finished sand in hole - 3 1/2 - 100 lb bags #1 sand. now pellets -		
12:23	HN-24	↳ wrong - sand fell some, adding more.		
12:45	HN-24	4 1/2 bags sand used. 1/2 bucket bentonite pellets down hole		
		Drillers leaving with HN-29 crew for lunch.		
1:00		I am going to lunch		
1:30		return lunch		
1:45		Drillers return from lunch		
		Meeting with Kevin, Randy, Dave and Fred: - This afternoon: Finish HN-24, HN-29 one crew work on HN-30 (install one crew work on developing HN-28		
		- Tomorrow - test two wells (HN-25, 26) - continue developing		

DP 9/4/91

HN-24 drillers need water (several hundred gallons) to mix grout. Will have to wait for Kevin to say where they can get water on site (if possible). Terry Rajahn will sample any supply they use.

2:00 HN-29 adding pellets now.

2:05 HN-29 $\frac{1}{2}$ bucket bentonite pellets in hole

Bottom of screen - 24.9' b.g.

Top of sandpack - 37.5'

Top of pellets - 35.5'

2:10 HN-29 pulling augers

2:30 HN-29 20' of augers still in hole. Getting set to tremie pipe grout into hole. I had them measure to see how much formation fell onto the bentonite seal and only $\sim \frac{1}{2}$ foot fell.

2:35 HN-29: Cement-Bentonite mix for grout - 70 lbs Cement / 70 lbs Bentonite / 50 gal H₂O.

DP 9/4/21

For HN-28 and HN-27 were
constructed using 100 lbs bent / 40 gal H₂O
~~(no cement)~~ (no cement)
Drillers did not know specs.

2:45 HN-24 grout 75 lbs bent / 40 gal H₂O
still mixing at this point

2:50 Attempted to call Sue McCormick - she
was on her phone.

Note: Dirt from cuttings at each hole
is being placed on plastic sheeting and
is supposed to be covered tonight before
everyone leaves.

3:15 HW-24 grout within 10 feet of
surface now. Before leaving this
hole crew must - Grout hole from 1st attempt.
- cover cuttings pile

3:25 HW-29 well completed - riser in.
crew is drilling holes for 3 protective
posts so trucks in the area don't
hit well.

3:30 Attempted to call Sue McCormick - busy

W 9/4/91

3:35 HN-24 well grouted to surface.

Bill (head driller this crew) sent his assistant to get more water and some cement to plug hole from 1st attempt.

Crew from HN-29 arrived at HN-24.

HN-29 is complete except for

3 protective parts (holes are drilled).

3:40 Randy Paterson is leaving for the week.

Crew from HN-29 is going to Decar area.

4:15 HN-30 crew from HN-29 is setting up to drill.

4:30 HN-30 auger in 10 ft

Split spoon 10-12'

31, 18, 19, 21 No recovery

HNu - 2.5 gm seems to be ambient readings still.

				DR	9/4/91
4:40	HN-30				
	15'-17'				
		4, 5, 7, 9			
	HNu is <u>not</u> operating properly.				
4:46	HN-24				
	Crew is ~1/2 done filling hole with grout. I took their HNu to bring to HN-30				
4:50	HN-30				
	25'-27'				
					HNu reading of 3.5 ppm
	Kevin stopped by - plans on crews being out to Tam This monitoring well should be in, HN-28 developed.				
4:55	30-32	5, 8, 8, 7			
					HNu - 3.5 ppm
					Light brown to white, med to coarse sand
6:10	35'-37'	7, 8, 11, 12			
					18" recovery HNu - 4 ppm
					same, with 4 thin bands of dark brown fine to med sand
					HNu - Background level 2 ppm
					All levels I record are total (background +)

DR 9/4/91

5:12	HN-30		
40-42'	7, 9, 10, 16	HNu - 11	recovery = 18"
	Same as 30-32		
	Dave West is not sure about the accuracy of the HNu (I tend to agree) the data here will have to be compared to groundwater results from his well.		
5:22	HN-30		
45-47'	5, 15, 17, 19	HNu - 15 rpm	recovery = 20"
	Same as above		
	Barrett HNu - 6 rpm		
5:25	Crew from HN-24 arrived at decom pad		
5:35	HN-30		
50-52'	12, 22, 30, 32	HNu - X	recovery 0'
	Under table at 49 feet - 2" of STPP		
	white/pink clay.		
	Kevin stopped by - other drill crew setting up to develop HN-28.		
	We must leave the site by 7:00.		
5:45	Marty Stinson of New at HN-30		

DP 9/4/91

5:47 HN-30
SS-57 4, 9, 12, 16
HN_{in} - 20 ppm (?)
reuser - 20"
1st 3" same clay
remainder a light brown, medium sand

5:57 augering to 57'
HN_{in} background increased to 7 ppm
as the evening continues - increase
in humidity may have an effect.

6:05 4" PVC is in well - now adding
sand. Bottom of screen at
57 ft.

6:50 Sand to 45'
Bentonite pellets to 43'
grout will be done tomorrow.

7:00 HN-28 Set up to develop
first thing in morning.

7:15 leave site

David [signature]

Sept. 5, 1991

DAVID PRATT NYSDEC

7:05 In office with Kevin, Dave Yarr, Fred

7:20 HN-29 checked to see if grout

settled - no, looks good.

Weather - rain, 70°

7:35 HN's are not working properly.

Terry will work on them while we

head out to drill rigs.

8:20 Crew has just arrived to HN-28

to begin development.

HN-30 crew is grouting hole with

premix pipe and the same cement

portland mix as HN-29

8:30 HN-20 grout to surface.

Crew breaking down.

9:10 HN-26 other crew augering down

now - HN-28 development will wait.

HN-25 crew from HN-30 setting up

9:35 Both crews are augering.

9:50 Called Sue McCormick - will call D.

				DP	4/5/91
					Burnes this afternoon
10:00	HN-25	spec 15'-17'			Dave Yost
		recovery - 10"			light brown med sand with gravel.
					No HN- readings today - broken (raining anyway)
10:05	HN-26	spec 30'-32'			Fred Ramser
		recovery - 18"			light brown fine sand with 6" of light brown silty/clay layer
					moist \uparrow - augering 5 more feet and checking.
10:15	HN-26				
	35-37	12, 34, 36			
					Pulling rocks \rightarrow water table \sim 30'
10:20	Wrong	perched water -			
		recovery - 2'			
		top 1' moist clay (above)			
		bottom 1' red fine to med sand with cobbles.			
					Continuing to auger to 40'

01

9/5/91

10:32 HW-26

40-42' 9, 11, 14, 18

recovery 2'

Top 6" - same type of clay

remainder - very light brown med sand

10:45 HW-26

45-47' 9, 15, 17, 20

20" recovery

top 4" very silty - almost clay - light brown

remainder white med to fine sand with

silt. streaks of red (iron).

not saturated, but moist

11:00 HW-26

51-52' 3, 5, 9, 20

recovery - 2'

top 6" - silty clay (loose)

remainder same as sand above.

Saturated - from rods → water

table appears to go at 49'

11:10 HW-25 45-47'

white med sand with silt - reddish
brown sand patches intermixed

				01	1/5/91
11:17	HN-25				
	50'-52'	9, 9, 11, 13			
		recovery 24"			
		top 6" same as above			
		bottom 18" same but majority is the red sand.			
		water table may be at 51'			
11:27	HN-25				
	55'-57'	4, 4, 11, 15			
		recovery - 24"			
		top 2" medium white sand			
		2"-7" med. red sand			
		7"-17" red yellow sand			
		17"-24" med yellow orange sand			
11:40	HN-26				
		Water level in hole is now at 47'5" and rising. Crew will wait another 10 minutes and measure again before setting well.			
12:08	HN-26				
		water at 46'8" - trying to put PVC into hole but sand came two feet up inside of auger.			
12:12	HN-25				
		PVC in - screened at 49'-59' BG. adding sand now			

DP 9/15/91

The rain has prevented Terry from
sampling Surface Soils today, maybe
he will do it afternoon

12:30 HN-26 POC at 54' BG.
HN-26

12:48 GW level at 46' - ready to
sand pack.

12:53 HN-25 mixing grout
80 lb bent / 45 lb cement / 50 gal H₂O.

1:00 HN-26 adding sand pack now.

1:32 HN-25 grouted to surface
and breaking down r.g. to
head of Recon. after setting
flush mortar.

1:45 HN-26 top of sand pack 40' 5"
51-100 lb bags used.

2:05 HN-26 bentonite pellets 26' 6"

Hydrating - mixing grout
50/50 cement/bentonite

Other Crew is deconing and preparing to leave.

DB 9/15/91

2:45 Called Sue McCormick + informed
all was done except development.
She said I don't need to stay.

3:05 HN-26 still grouting.

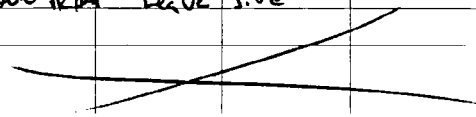
Summary of wells:

Well #	Screen B.G.	Water table B.G.
HN-24	RAVY 49-59	51
25	DAVE 49-59	51
26	FRED 44-54	46
27	FRED/DAVE 44-54	46
28	FRED/DAVE 44-54	46
29	DAVE 39-49	47
30	DAVE 47-57	49

Development is set up but not started
at HN-28 - this is the only well
that would conflict with Delta
Drilling's staging area. I talked
to the Delta people and they informed
me they would be out by 3:30.
After they leave NUS and UTD
can develop HN-28 without
conflict.

4:00 HN-26 grouted to surface.

4:15 Dave Pratt leave site



October 21, 1991

J. Benmes arrives on-site at 10³⁰.

10³⁰: Arrive at #30. Delta crew (Mike Pellegrino, Lou Kasper) installing internet to well. Screen 110-120.

Dave Yost - NUS on site rep.

Well "flooding" at 90' BG. Bottom of hole ~120' crew adding water down hole.

10⁴⁵ Crew added another 10' segment of 4" ID PVC casing to casing string. They are having trouble getting it to go down hole. After a few minutes - they take this casing off - and add more water to well (in casing).

10⁵³ Mike using drive head to push casing down hole.

11⁰⁵ Well screen down to ~120' BG

10/21/91

11¹⁵ Mike starts installing sand pack -
(Marie #1)

11³⁸ Sand at 110' - may have bridged.

11⁵² - Bridge at 103' BG. Mike is
going to pull out permeable tube in an
attempt to break the bridge.

11⁵⁴ - Mike changed his mind apparently -
he just raised and lowered auger
flutes string a couple of times.

11⁵⁶ Sand pack at 106' BG. No bridging.

12⁰⁰ Mike and Lou go to staging area
to get a couple buckets of masonry
sand (fine sand pack).

12¹⁰ Mike & Lou return. While they
were gone David Yast, asked if he
needed to grout through clay layers
at deep layers: For example:
drill to 250 and clay from
210-220. I said it would be OK to
but grouting collapses as augers
are retracted. This will in turn
well after reaming had.
I told him grout would affect chemistry
- i.e. inorganic in gw at deep wells would
be immobilized due to pH ↑ from grout.

10/21/91

12¹⁵ - Crew installed fine sand pack
- 104' BG.

12²⁵ - Crew breaks for lunch. JBarnes
leaves for GM 1 for gas sampling.

1⁵⁵ JBarnes returns to #30 - I
Mike & Lou grinding hole. It
appears that ~~total~~ of ~~any~~ 50' of angles
10 flutes - have been removed from
the borehole.

3^{00-3²⁰} Crew w/ D. West

Development will start on Monday.
NUS plans to sample shallow and
intermediate wells together and the deep
wells at a later date after installation.

Sampling - Start after development of
intermediate wells is completed.

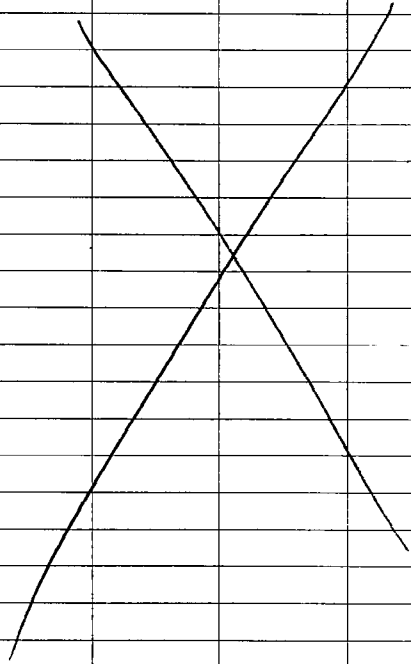
Next well - #24 - Starting
tomorrow. Delta to detect
tonight.

3²⁷ JBarnes leaves - off to
Geology & M. Har. Inc's sampling
unit.

10/21/91

3:30 -

Note: Delta has a gamma logger
which is being used after
pilot hole is drilled - according
to D. Jost.



8/26/91

4:00 44-46' BG # 103

Rec 24

HW 3.0 ppm

Desc Top 10" whitish brown
fine sand w/silt
Bottom 14" white
fine-med sand
entire spoon wet

~~4:05-4:10 J. Barnes off-site.~~

4:02 Driller at 103 notices foam on
rods. Claims it is floating production
WT. Sample from 47-49' BG
just brought to surface?

47-49' BG # 103

/ Rec
/ HW
/ Desc:

4:27 Heaving sands → Sample
not collected after all,
Hole drilled to 49' BG.
Water table 42.5' BG.

4:30 Crew beginning to set well

Aug 26, 1991

4³² At #111 Augers down 25' BG.
2nd soil sample has already been collected.

4⁴¹ Driller starting to purge well at #103.

[Temporary wells: 2' PVC stuck down hole. No sand packs, etc.]

Water - muddy w/ silt.

4⁴⁶ Augers down to 38' BG at #111.
Driller preparing to collect sample from 38-40' BG interval.

#111 38-40 BG

16/17

Rec: 12"

17/19

HW: 3' off top

Desc: Lower half of spoon (outside west).

Min Red brown and white coarse sand

Some iron stone

4⁵⁷ Crew at 103 pulling augers out of the ground.

Aug 26, 1991

5:02 Crew at #111 sampling 40-42' below grade

40-42 #111

6/9 Res: 17"

11/16 UPU: 3.0 ppm
Diss: Same as above -
and saturated.

5:09 Advised by D. West that
this will be back filled
w/ Bentonite.

5:14 Augers down 48' BG at #111.
Crew beginning to put screen & casing
down hole. Well materials reportedly
steam cleaned - but appear dirty to me.
The other rig has manufactured #112

5:25 WT at 111 47' BG - ditches
to add in 5 more feet of casing.

5:30 J. Barnes over at S.D. - Uni Tech
set-up - won't work today.

Aug 26, 1991

5:45 - 5:55

Spoke w/ K. Kilmartin

Drillers are planning to drill pilot holes w/ mud. Split-spore sampling would start at 150' BG.

Spores given to drillers were auger pilot hole - they apparently have their own ideas.

Kilmartin, Me, and drillers to meet first thing in AM.

2 possibilities

1 - Mud to 150' BG, then use water as fluid → sample from there.

2 - Else - drillers will have to change plans.

Kilmartin said that if I don't like what drillers want to do - they'll go to augers.

Kilmartin showed me soil gas results for Site 1. He will get a copy of entire soil gas survey to me.

Aug 26, 1991

6⁵⁹ Crew at #111 pulling auger.

6⁰ Crew which was at #113 to
grout (bertrite) holes.

6¹⁵ J. Barnes arrives at #12
sample from 19-21' BG just brought
to surface.

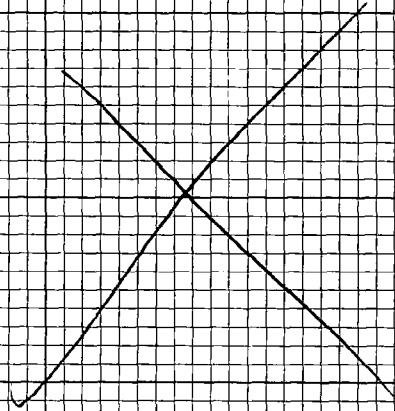
2.4' Rec

light brown fine-medium
sand w/ gravel, trace pebbles.

6⁴⁰ Augers down 30' BG.

6⁴⁵ Crew which worked at #111
mixing bentonite.

6⁵⁰ J. Barnes leaves site.



August 27, 1991

J Barnes arrives on-site at 7¹² am.
Aquifer Testing just beginning mobilization.
One rig will start at #104. The others
will mobilize at 115.

7²⁰-7³⁵ J. Barnes off-site.

7⁴⁵ Work has commenced at #104.
Work delayed at 115. Delta's
Water truck blocking access.

7⁵⁵ Location 104 - Sample collected
from 19-21' BG

19-21' #104

11/8 Rec: 20"
H₂O in 0.6 ppm

11/15 Desc: Brown med-coarse
sand and gravel - A quantity
pebble center of span.

Note - no sample collected from
3-5'

Note VOA duplicate collected
from this sample (17-21)

8:05 M. Pellegrino & Lou Kasper
(Delta) arrive at Site 1 (their
staging area)

Aug 27, 1991

8¹⁵ Augers down 35' BG at #104.

8¹⁷ Augers down 40' BG at #104. Crew preparing to collect sample from 40-42' BG.

40-42' BG #104

10/12 Rec: 12"

25/29 H₂O:

Desc: Tan med-coarse sand.
Moist.

8²² The other ADT rig is mobilizing at #115.

8²⁵ J. Burns to Plant 16.

8²⁵ J. Burns returns to Site 1.

8²⁵ Augers down 53' BG. WT at 48 in pipe. Buried well dry, letting well recover.

9¹¹ R. Patterson collecting water sample at #104.

August 27, 1991

9¹³ At location 115. Augers down
39' BG. Crew preparing to
sample 39-41' BG.

Loc 115 39-41' BG

24/30 Rec: 17"

49/48 H₂O = 3.0 ppm

Desc: layers of red, orange
and tan fine-med sand, trace
gravel.

9¹⁵ Augers being pulled at #104.
Crew at 115 collecting S-S sample
at 41-43' BG.

Loc 115 41-43' BG

30/32 Rec:

48/49 H₂O:

Desc:

Did not observe sample - spoke w/ K. Kitman.

He had just called his office regarding
auger vs mud but I had seen no mud
when I spoke w/ him at ~9:05.

August 27, 1991

945 Sample collected from 44-46
at #115

10/26
23/17

Loc: 18'
H2O: 1.4 ppm
Desc: Red-brown coarse
sand, some fine, trace
silty, wet

at rig which was at #104
off to beam area.

952 Crew at #115 preparing to
sample 47-49' interval

Loc #115 47-49' B6

4/10
7/19

Loc: 20'
H2O: 1.1 ppm (spoon-scan)
Desc: Top 6" Silty sand
brown - (some clay)
Rest of spoon light
brown - fine sand
and silt.

10:10 D. Post measures WT at 49' B6

10:15 Drill crew eating a snack
nearby hole. Advised D. Post
of this. He stopped them.

August 27, 1991

10¹⁷ Fuller augered down to 52' BG
then pulled up auger to 51' BG.

10²⁰ WT (measured by York) at 51'
Fuller to drop well at 42-52, then
lift auger to expose screen.

10²⁵ Well set on 42-52' Water
level on casing (F. Ransen) is
at 46' BG

10^{30-10⁴⁵} J. Barnes at Plant 16.

10⁴⁵: F. Ransen sampling water at #115.

10⁵⁷ J. Barnes arrives at Boring 338
Auger down 35' BG.

11⁰⁴ Auger down to 40' BG at 338. Crew
preparing to sample 40-42' BG interval.

Boring 338 40-42' BG

9/10

Rec: 12"

HNu: 0.0ppm

12/11

Desc: Brown med-coarse
sand and gravel.

Note: When sample is collected for lab
analysis - 3" ID spoons are used. Else 2" ID
spoons are used.

August 27, 1991

11:15 Target's Un. dig by - apparently they are still on-site.
Crew sampling 42-44' interval at 338.

42-44' Loc 338

12/16

Rec: 16"

16/19

HWS: 0.1ppm

Desc: brown - light brown
med-coarse sand and
gravel.

25
11 Crew sampling 44-46' interval
at Loc 338.

Boring 338 44-46'

19/23

Rec: 16"

45/54

HWS:

Desc: white - light brown
med-coarse sand and gravel.
{Damp. (Capillary zone.)}

On previous holes this crew has
purged well to depths - this time,
they will test well (44-59') then
lift 8-10' of overburden.

Aug 27 1991

Note Randy Patascio NUS at
338 (I spelled his name wrong
in log yesterday).

11³⁰ Augers down $\approx 54\frac{1}{2}$ ' BG. Drill
Crew setting well.

11⁵⁰ Well set $\approx 44-54'$ BG. 5' auger
removed. WT at $52\frac{1}{2}'$ BG.

1⁰⁰ Been speaking w/ K. K. Martin:
NUS exploring options
regarding augering deep hole.
He may have an answer by 3pm
today.

12²⁵ - 1¹⁵ J Barnes off-site.

1¹⁵ Finished sampling at 338.
They purged well dry again.

Begin SA-334 Augers down
45' BG at 1¹⁵.

1²¹ Augers down 48' BG at 334-
Crew preparing to collect sample
from 48-50' BG

#334 48-50 BG

9/12 Rec 19"
 UNO: 0.3 ppm
 Desc: Orange fine-grained
 sand w/ iron stone, trace
 silt
 Bottom 6" wet

13/16

13/33 The auger rig is moving back
 to site 1. Camp at 534 to
 sample 50-52 intervals

334 50-52'

8/7 Rec 22"
 UNO: 0.3 ppm
 Desc: Orange + red brown
 fine and sand
 lower 6" gray sandy clay

13/26

220 Moving sands in auger. Pull
 to auger down to 54' BG

228 Lost measure with
 SI auger down 54' BG

229 Auger down 57' BG
 J. Barnes goes off-site

225 J. Barnes returns to #334

Aug 27, 1991

225 Drillers purging well
WT at 50.5' BG

231 14 barrels of water purged.
F. Lauser collecting gwater sample.

238 J. Biquas at #121, D Potability
and drill crew in Tyvek. Down
hole NH₃ reading 200ppm. Nothing
detected in breathing zone.

243 Crew collected SS sample from 40-42'
BG at #121:

6/4 Rec: 10"
7/9 NH₃: 94ppm
Desc: orange-tan
med-fine sand

WT appears to be at 41'6"

250 Sample from 42-44' collected.

9/11 Rec: 12"

13/19 NH₃: 70ppm

Desc: orange brown
med-coarse sand, layer
of tan sand, trace fines.
West

Aug 27, 1891

3-23 Duller's sampling 44-46'
interval at #121.

#121 44-46' BG

11/12 Rec: 12"
13/10 No: 10 ppm

Desc: Same as above, with
more fines present

3-12 Advised R. Patercity that duller
show blowdown from 6" to 5"
with recovery. Duller's sampling
46-48' interval.

#121 46-48' BG

12/21 Rec: 19"

31/32 No: 1

Desc: Lower 13" orange-brown
med-coarse sand, some
fines.

Upper 7" dark brown
fine-med sand iron
stain visible.

3-26 S. Barnes to Plot 16.

Aug 27 1991

3⁴⁵ J. Barnes returns to #12.
Augers drilled to 55' BG then
pulled up to 53.5' BG.

3⁵⁰ Casing set at ~43-53' BG.
D. Palancity measures 160ppm w/4Kw
inside well casing.

3⁵⁵ Dredger removed 1.5-foot casing.
Well casing rose ~3 feet. Dredger
trying to punch casing down w/140lb
hammer.

3⁵⁹ Decision made to pull casing out
of the hole and try to knock out
heaving sands.

4⁰² Dredger spun augers back down to
55' BG. Measured bottom of hole: 55' BG.
He then lifted augers up ~3 ft. Bottom
of hole now: 52' BG.

4⁰⁵ Re-installing temporary well.
Screen now approximately at 42-52' BG.

4⁰⁸ There is a plug at the bottom
of the augers. Crew pulling casing
out of hole?

Note: No water in casing

Aug 27, 1991

4²⁵ Drill crew using 3" to knock
out sand plug.

4²⁸ Miller reports that he broke
through plug.

4³² Drill crew re-installing temporary
well at #121.

Screen = 43-53' BG.

WT - 49'36"

Depth - 54' BG

4³⁸ 2 auger flyers removed.
WT at 46'10"

4³⁷ R. Patascity collected 2-40ml
vials of gwater.

4³⁸ Inspected 334 & 338 holes.
Apparently, 338 grouted and dirt
was ~~not~~ placed on top. I stepped
where hole was. There was some give.
334 - couldn't budge drum over hole,

Aug 27, 1991

John Barnes arrives at #329
at 5:07. Sample from 3-5 ft
Black clay and sand and gravel.
HNU = 1.0 ppm.

5:17 Duff crew just re-fueled
rig. Augers down 4 feet below
grade.

5:45 Augers down 44' BG. Crew
preparing to sample 44-46' interval.

#329 44-46' BG

19/26 Rec = 15" (sand)

39/23 HNU = 0

Desc: fine-med brown
sand and gravel, and
trace pebbles.

55 Sample #50' BG #329

18/24

Rec = 12"

HNU = 0.0

23/32

Desc: med-fine brown
sand, and some silt

6:15 J. Barnes leaves site.

~~X~~

Aug 28, 1991

J. Banna arrive on-site at 7³⁰
Looking for E. Blackburn who will do
oversight at SAC off site west.

8⁰⁰ At location #313 Augers
down 3 ft. Dull crew Joe & Helen.
Work shut down temporarily.
The other crew (Rich & Tina) are
at #304.

8¹⁵ Crew collecting sample from 3-5'
BC. R. Paternity - NUS map
at site.

#318 3-5' BC

7/6 Rec: 18" Sample collected
S/O H₂O: 3 ppm by outside

Desc: Top 6" Deep top soil - black.
Layer 12" Tan fine-grained
sand and gravel (granite)

outside of spoon wet (Perched
water table?)

H₂O - 7 ppm down hole

8³⁰ Augers down 19' BC. Crew preparing
to sample 17-21' interval.

Aug 28, 1991

#318 19-21' BG

7/8 Rec: 16"

9/8 HNu: 4 ppm
Rec: light brown fine
to med sand and gravel, some
coarse sands

Sample collected in 3-40 ml
vials.

⁵⁶ Augers down ~40' BG. Crew preparing
to sample 40-42' interval.

40-42' #318

4/3 Rec: 16"

4/4 HNu: Not done
Desc: brown - light brown
fine sand and silt, trace
mica.
Dry

42-44' BG #318

6/3 Rec: 20"

5/7 HNu: Not done
Desc: bands of white, brown,
and orange fine med sands
with silt, trace mica,

Aug 28, 1991

44-46' BG #318

6/9

Dec: 15"

W/L: Not done

7/11

Dec: Orange brown fine med
sand, little silt.

9²⁵ Drill crew preparing to sample
46-48' interval.

#318 46-48' BG

8/7

Dec: 17"

11/12

W/L: Not done

Dec: Same as above.

9²⁵

Out of clean spurs; spurs off.
↓ de-ice. Work shut down temporarily.

9⁴⁰

A clean spur has been found. Check
samples 48-50 interval.

8/28/91

48-50' BG - #318

7/15

Rac: 12"

MU: Not done

6/16

Desc: lower couple inches damp

Orange - to tan fine
to med sand, some silt.

9⁵⁷ Work stopped - no spore.

10⁰³ Clean spore arrive. Work recommenced.

10¹³ Crew preparing to sample 50-52'
interval.

#318 50-52' BG.

17/21

Dec: 23"

32/43

MU: Not done

Desc: white to brown
fine to med sand, saturated.

10³⁰ Auger pulled to 55' BG, then
pulled up one foot. Casing set
at 44-54'

WT 49 1/2 ft Bottom of well 52 1/2' BG

5 feet of auger removed

8/28/91

10³⁷ Nelson purging well.

10⁴⁶ 7 barrels purged → sampled
collected by R. Patacitis.

11⁰⁰ Augers have been removed from
boring.

11⁰⁰ Nelson (keeper) shoveling
cuttings into drums.

11¹³ Drill crew making grout.

11¹⁸ Crews mixing 2nd batch of
grout.

11²³ Grout at surface.

11²⁵ J. Barnes leaves for GM-200.

12⁰⁵ J. Barnes returns, Joe & Nelson
drilling # 316.

12⁴⁵ J. Barnes returns home —

he was stung by a bee earlier —
and was not able to keep water.

12⁵⁰ J. Barnes returns to # 316.

Aug 28, 1991

Out to meeting 1³⁰ - 2⁰⁵

Frank Klanchas	}	US Navy
Jack DeLaney		
Marty Simonson		DPR
David Poyark	}	NUS
Kevin Kilmartin		
John Barnes		DEC

I was asked:

1- Can mud rotary/ reverse be used on shallow and intermediate wells?

Answer - absolutely not on shallow.

Re: intermediate - only if auguring not feasible.

Resolution: Unitech will not be asked w/ deep and intermediate wells. Bids for these wells to go out ASAP.

2 - Asked for DEC written policy. Said that it didn't exist to his knowledge.

What followed was a discussion regarding schedule. Simonson concerned about a proposed public Mtg in Lawrence - I said that if Navy is only a few (3-4) weeks

8/28/91

behind GAC, that I would wait
for them to catch up.

Next wk's schedule:

J & U: Tom wants to do
3 hallway wells, they will
probably have 2 dig on site.

Hours 7-6 no work Saturday

A discussion on daily work hours
took place (concern of DPKO and
NUS, I just listened).

AD7 should finish their work
Friday 8/30.

²⁰ Joe & Nelson finishing hole # 316.

²⁵ J. Burns arrives at 229.

Joe and R. Patricity at location -
helps still at previous location.

#229 3-5 feet

6/29	Rec	0
7/31/20	HNo	X
	Disc	X

Aug 28, 1991

3:03 Nelson returns.

3:13 Augers down 40' BG
Crew preparing to sample
40-42' interval.

#229 40-42' BG

6/5 Rec: 12"

MN: 0.6ppm

7/9 Desc: brown med-coarse sand,
trace gravel

3:28 Crew preparing to sample
42-44' interval

#229 42-44' BG

17/19 Rec: 12"

MN: 0.9ppm

15/18 Desc: light brown fine-
med sand. Trace silt

3:05 Crew collecting SS sample
from 44-46' BG.

8/28/91

#229 44-46' BG
 39/36 Rec: 24"
 45/40 UNo: 0.4ppm
 Desc: light brown
 fine to med sand, some
 silt.

#229 46-48' BG
 17/28 Rec: 17"
 29/32 UNo: 0.4ppm
 Desc: light brown fine-
 med sand, trace silt, trace
 gravel, trace iron stone.

4¹⁷ Nelson and Mike (ADT) refer
 to sample 48-50' interval.

#229 48-50' BG
 13/32 Rec: 17"
 52/50 UNo
 Desc: Top 12" med-fine
 sand and gravel. Bottom 8"
 brown fine - med sand and gravel &
 and iron stone (~1" dia) (damp bottom of stream)

Aug 28, 1991

423 Advised by K. V. Martin that augers will be pulled up only 1 foot above depth to allow water to enter screen (apparently 30 feet of casing was lost at the other hole where work is ongoing).

~~This method has led to the dry~~
This method has been used before but the wells were continually purged dry.

I have OKed this procedure though provided that purging be done slowly so that well is not purged dry.

437 Aggers down 50' BK. Crew preparing to sample 50-52' interval.

50-52 BK #229

7/6

Rec 17"

7/7

UNV 2.0 ppm

Desc: Wet

3" Brown clay underlying
fine-med sand (brown) and silt.

Aug 28, 1991

Augers down 58' at 455

Joe brought auger up 1 foot.

Well being set at 57' BG

~~455 WT 56' 3" 53' 3"~~

Bottom of well 56' 3"

50. Auger lifted another

foot and better

Water table now at 54' 5"

545 R. Patency collects quantity
sample after 10 hours of water
pumping.

555 J. Barnes arrived at 7:05.

Well drilled to 56' BG. Dull

crew purging well.

600 J. Barnes leaves etc.

8/29/91

J Barnes arrives at B-2045

Sample from 49-51' BG just
opened. $\approx 12''$ Reg wet med-fine
light brown sand, trace gravel.
WT $\approx 56''$ BG
49'

9:29 Augers down 51' BG. There is an
approximately 1' sand plug at bottom
of augers.

Dull Creek Rich & Jim
NOS D. Yost
F. Ransy

9:38 D Yost measures WT at 50.4' BG.
9:45 Augers down 56' BG. Crew setting
well (temporary well).

9:51 Larger flyte has been removed.
F. Ransy measured WT inside well:
49.7' BG.

10:03 Crew starting to purge well.

10:15 14 baders of water purged. F. Ransy
collecting sample (21-40ml vials - amber).

10:18 J. Barnes leaves for GM-20D

8/29/91

J. Barner anniversary #215 at 1245
Drillers Joe & Nelson
R. Patarcia WOS

Split spoon sample just collected
from 3-5' BG.

#215 3-5' BG

2/3 Box = 21"

HWS - 4.0

4/2

Desc: Brown - dark brown
fine-medium sand and gravel,
Some pebbles.

Sample placed into sample jars - Engr. ^{parameters} for sample

12⁴⁰ Aug moved to 2' - new hole drilled -
Sampling 3-5' below grade.

#215 3-5' BG 2nd sample
blow count 3/4/2/2

1253 Sample collected in
3' food vial

2 water jars by Patarcia

1258 Auger down to 19 1/2' BG

Crew preparing to sample
from 19 1/2 - 21 1/2' BG.

Aug 29, 1991

19 1/2 - 21 1/2' BG at #215.

9/5 Rec: 13"

4/7 HNU: 0.0 ppm

Desc: brown, med-coarse
sand and gravel, trace
C. phos.

R Patayiti placed sample into 3
40 ml vials and 2 amber jars.

11³⁰ J Burns moves on to #202.

Well at 46-56' BG.

WT 50.3' BG

No readings reported on HNU.
Driller finishing purging well.

1²⁰ Sample collected by F. Kansen (2 amber
40 ml vials).

1:23 Back at #215 - Crew
preparing to sample 40-42' interval.

40-42' BG #215

9/11 Rec: 12"

HNU: 0.0 ppm

8/13

Desc: Brown med sand.