

START

9513357.2690

0041580

DON'T SAY IT --- Write It!

DATE: June 21, 1995

TO: Administrative Records H6-08

FROM: Ellen M. Mattlin *E. Mattlin* As-15

Telephone: 376-2385

cc: Fred A Ruck, III, (w/o attachment) H6-23
Andrea L. Prignano, (w/o attachment) H6-23

SUBJECT: Copies of 216-B-3 Pond field logbooks for the Administrative Records

Please include the attached copies of the field logbooks in the Administrative Records for the 216-B-3 Expansion Ponds (D-2-5).

For Phase 1 sampling:

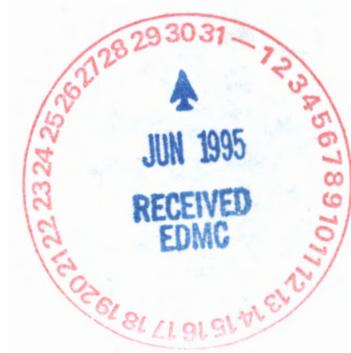
- Field Logbook No. WHC-N-294-1, pages 2 through 38, inclusive, dated from August 1, 1989 to September 28, 1989, logged by Richard Roos/WHC.

For Phase 2 sampling:

- Field Logbook No. WHC-N-205 #15, pages 78 though 94, inclusive, dated from October 5, 1992 to October 7, 1992, logged by C. D. Morrison-Beyer/WHC

For Phase 3 sampling:

- Field Logbook No. WHC-N-376-1, pages 1 through 81, inclusive, dated from February 5, 1991 to April 9, 1991, logged by J. D. Fancher
- Field Logbook No. WHC-N-376-2, pages 1 though 26, inclusive, dated from March 15, 1991 to April 17, 1991, logged by J. D. Fancher
- Well Summary Sheets and Borehole Loges for Well Nos. BH3A-1, BH 3B-2 and BH 3C-1.



9513357.2691

1 August 1989

0900 Pre Job Tailgate meeting held. Conducted by R.C. Reel
Attending were:

- | | | | |
|-----------------|---------|--------------|-----------------|
| Kelly Woodworth | Env Eng | Ron Mitchell | Env Eng |
| Allan Krug | Env Eng | Gudy Vaughn | Health + Safety |
| Sean Call | RPT | Tim Paulsell | Operations |

1000 Sampling platform launched + handled well.
an observer was placed along the south side of the pond to guide the boat to westerly ^{TS}guardianates and an observer along the east side of the pond guided sampling at Northerly guardianates.

Because of the large size of the pond, verbal communication was difficult. Additionally, a Smpth breeze caused drifting of the sampling platform. The combination of breeze and communication problems caused enough uncertainty that the sampling platform was called back to reassess options (1100 time)

1100 Break for lunch and discussion.
Problems - 1) People in boat were unable to tell exactly when to drop a location buoy

2) Even a small breeze caused enough drifting that positioning the platform was difficult. Sampling personnel felt that marking locations wasn't time saving and should be performed at the time sites were originally located

2300 Breeze was high enough that platform was not used. site cleaned up and activities ceased for the day

Richard Reel 2 Aug 89
Signed Date

Read and Understood By

APPROVED FOR PUBLIC RELEASE
v. Burkland 6/19/95
Continued on Page

Signed Date

SUBJECT _____

Continued From Page _____

2 Aug 89

0700 Tailgate meeting conducted by Richard Roos and
Gudy Vaughn. ATTENDING were:
Kelly Woodworth Env Eng Chris Kramer Env Eng
Bill Frein Env Eng

0715 Background sample locations staked around perimeter
of B-pond system

900 Sample locations staked in B expansion lobe

945 wind came up, RPT support was leaving for a meeting
- site secured for the day

Continued on Page _____

Read and Understood By

Signed _____

Date _____

Signed Richard RoosDate 2 Aug 89

9513357-2693

3 August 1989

0815 Tailgate meeting conducted by Richard Rees

Attending were:

Ron Mitchell	Env Eng	Chris Kramer	Env Eng
Kelly Woodworth	Env Eng	Allan Krug	Env Eng
Judy Vaughn	H+S	Tim Paulsell	Operator
Sean Call	RPT		

Sampling crew suited up in standard whites, canvas shoe covers, plastic shoe covers, life preserver, sawnax with backs cut out, skull cap, gloves

0850 Sampling crew launched reconnaissance craft for reconnaissance sounding of pond depth and sediment thickness.

Sean Call, Ron Mitchell, and Kelly Woodworth in boat. Allen Krug on South Shore, & Tim Paulsell on North shore to spot locations. Results recorded on large map and will be available in project file.

1235 Two sampling crews sent out - R. M. Mitchell and Sean Call sent to collect samples at the contingency pond.

H. A. Woodworth and T. Paulsell collected samples from 216-B-3B pond. A. D. Krug was informal Team quality assurance by assuring that samples were collected and handled properly. R. C. Rees drove from Team to Team give technical assistance and collect samples on ice following soil being collected in sample jars.

Continued on Page

Read and Understood By

Signed

Date

Signed

Date

Richard Rees 4 Aug 89

9513357.2694

LET B-Pond 3 Aug 89

amples were labeled as follows. Requested analysis is included on labels.

Environmental Engineering, WHC
R. C. Roos L4-92 376-9218
Sample #: _____
Date/Time Col: _____

VOA 40ml or 125ml (G) # 750

Environmental Engineering, WHC
R. C. Roos L4-92 376-9218
Sample #: _____
Date/Time Col: _____

~~ORG~~ 250ml (G) # 760/H79, A20, A22, A23, A51, A21, C78, C70

Environmental Engineering, WHC
R. C. Roos L4-92 376-9218
Sample #: _____
Date/Time Col: _____

VOA 40ml or 125ml (G) # 750

Environmental Engineering, WHC
R. C. Roos L4-92 376-9218
Sample #: _____
Date/Time Col: _____

~~ORG~~ 250ml (G) # 742, C80

Environmental Engineering, WHC
R. C. Roos L4-92 376-9218
Sample #: _____
Date/Time Col: _____

30ml (G) # 111, 112

This series of labels (Bottles) is sent to us Testing for each individual sample

Continued on Page _____

Read and Understood By

Signed

Date

Richard C. Roos
Signed

4 Aug 89
Date

9513557.2695

Environmental Engineering, WHC
R. C. Roos L4-92 376-9218

Sample #: _____
Date/Time Col: _____

125ml (G) # H62

Environmental Engineering, WHC
R. C. Roos L4-92 376-9218

Sample #: _____
Date/Time Col: _____

30ml (G) # 752

Environmental Engineering, WHC
R. C. Roos L4-92 376-9218

Sample #: _____
Date/Time Col: _____

250ml (G) # 121, 998

*This series of labels (bottles)
is sent to US Testing for
analysis of composite samples*

Environmental Engineering, WHC
R. C. Roos L4-92 376-9218

Sample #: _____
Date/Time Col: _____

250ml (G) # 751, 739, 734, 729

Environmental Engineering, WHC
R. C. Roos L4-92 376-9218

Sample #: _____
Date/Time Col: _____

120ml (G) # 737

Continued on Page

Read and Understood By

Richard C. Roos
Signed

4 Aug 87
Date

Signed

Date

JECT B-Pond 3 Aug 89

Continued From Page _____

Environmental Engineering, WHC
R. C. Roos L4-92 376-9218
Sample #: _____
Date/Time Col: _____

250ml (G) EPA# 1310-EP TOX;
9030-Sulfide; 9010-Cyanide

Environmental Engineering, WHC
R. C. Roos L4-92 376-9218
Sample #: _____
Date/Time Col: _____

250ml (G) EPA# 300-Anions;
ASTM # 1426-C/D- Ammonium

Environmental Engineering, WHC
R. C. Roos L4-92 376-9218
Sample #: _____
Date/Time Col: _____

30ml (G) EPA# 9310-Gross Alpha,
9310-Gross Beta

*This series of labels (Bottles)
is sent to PNL for analysis
of split samples*

Continued on Page _____

Read and Understood By

Signed _____

Date _____

R. C. Roos
Signed _____

4 Aug 89
Date _____

9513057.2697

Ken Mitchell collected samples # B-101, B-102, B-103, B-104 and B-105 Background from Contingency Pond
 Kelly Woodworth collected samples # B-106, B-107, B-108, B-109, B-110, B-111, B-112 from 216-B-3B
 Richard Ross prepared the equipment/Field Blank # B-113

Samples were collected as follows:

- B-101 Time 1355, individual sample, at N 44900, W 42800
- B-102 Time 1340, individual sample at N 45100, W 42600
- B-103 Time 1310, individual sample at N 44800, W 43500
- B-104 Time 1252, N 44600, W 43200, individual sample
- B-105 Time 1329, individual sample, at N 45400, W 42500
- B-106 Time 1315, individual sample, at N 42300, W 40550
- B-107 Time 1320, individual sample, at N 42300, W 40650
- B-108 Time 1340, Split sample (UST), at N 42800, W 40650
- B-108 Time 1340, Split sample (PNL), at N 42800, W 40650
- B-109 Time 1340, Duplicate sample (UST), at N 42800, W 40650
- B-110 Time 1335, Individual sample, at N 42850, W 40650
- B-111 Time 1335, Individual sample, at N 42850, W 40950
- B-112 Time 1355, Composite Sample
- B-113 Time 1326, Equipment/Trip Blank - clean silica sand

Continued on Page

Read and Understood By

Richard Ross 4 Aug 87
 Signed Date

Signed

Date

JECT B-Pond 3 Aug 89

Continued From Page _____

y The time samples were packaged and site cleaned up, no time remained to deliver samples to the laboratory prior to closure. Ice was checked in coolers, and coolers locked in storage overnight

Additional Information -
day clear and warm/hot 75°am - 85°pm
wind 5-15 mph
RS

Continued on Page

Read and Understood By

Signed

Date

Richard Rees
Signed

4 Aug 89
Date

PROJECT B-Pond 10 Aug 89 ^{9513357.2700}

Continued From Page _____

2800 Tailgate Safety Meeting held - R. C. Rees Conducted

Attending were:

Kelly Woodworth

Jeff Ammerman

Allan Krug

John Ralyea

Tim Paulsell

Ed Caraway

Sean Call

Preparations were made to send sampling crew out to collect samples

Operators put plastic and aluminum paper in one boat

Samplers (K.A. Woodworth, Jeff Ammerman, Allan Krug) were briefed on operation of sampling equipment. Plan is to collect 3 samples then return to shore for evaluation. Samples will be collected with Augers. Material will be placed in bowls, quickly stirred to homogenize, placed in jars. Jars will be labeled, placed on ice in a large plastic bag. Once on shore, labels will be checked and samples packaged for shipment to lab.

Samples B-114, B-115, B-116 collected as follows

220 Sample B-114 collected from sediments at B-Pond at coordinates N 43400, W 43300

245 Sample B-115 collected from sediments at B-Pond at coordinates N 43500, W 43200

00 Samples B-116 collected from sediments at B-Pond at coordinates N 43500, W 43300

The pond sampling team was collecting samples in B-Pond, R. M. Mitchell led a team collecting background samples. Background sample numbers began at B-120

Continued on Page _____

Read and Understood By

Signed _____

Date _____

Signed _____

Date _____

R. C. Rees 10 Aug 89

9513357.2701

- 1120 Sample B-120 collected as a background sample
Sample B-120 will be sent to PNL for analysis
as Today's split sample
Location is south of B-Pond and toward the west end
Two additional samples were collected from the same
location B-121 and B-122. These will be
shipped to U.S. Testing as duplicate samples.
- 1156 Sample B-123 collected as a background sample
from west of 216-B-3C expansion lobe
- 1210 Sample B-124 collected as a background sample
from south of 216-B-3C expansion lobe
- 1239 Sample B-117 collected from clean silica sand
This was collected using cleaned stainless steel
equipment. B-117 will be Today's Equipment/Tool
blank
- 1245 Sample B-125 collected as Background from
East of the 216-B-3B expansion lobe
- 1258 Sample B-126 collected as Background from
North of the North-east corner of B-Pond

Weather Today was clear and warm with a breeze 2-5 mph
Temperature $\approx 85^{\circ}F$

Continued on Page

Read and Understood By

Signed

Date

Signed

Date

Richard Reos 10 Aug 89

Tailgate safety meeting held. R. C. Roes Conducted

Attending were:

K. A. Woodworth

R. G. McCain

R. A. Carlson

B. Tattle

S. M. Call

E. R. Caraway

B. C. Wyre

Day is sunny + warm breeze 2-5 mph

001 Sample B-118 collected at N 43500 W 43400
A 2 1/2' sampler was used, but only about 8" of sample was collected before sediments were too hard to penetrate. Sample was fine grained soil with organic components

032 Sample B-119 collected at N 43800 W 43400
Soil was very rocky which allowed only ≈ 2 " of sediment to be collected. Two sample barrels were used to collect this sample. The 1st had rocks stuck in the butterfly valve. The sediments were retained and another sample barrel without a valve was used. ≈ 3 " of sediment was collected. These two samples were collected as nearly as possible from the same spot on the pond bottom. They were mixed to form Sample B-119

1055 Sample B-127 was collected as a composite of B-118, B-119 and B-116. A clean 125 ml bottle was sealed, kept on ice in chain-of-custody storage. This was used as part of the composite to store sample B-116

235 Because of the hardness of the sediments, only two samples were taken, plus a composite. No material was available to collect a split. Samples were sealed, bagged + placed on ice for transport to US Testing

300 Sample B-128 is a blank. It was ^{labeled,} sealed + placed on ice ^{continued on Page} with other samples
Read and Understood By _____

Kelly A. Woodworth

11/Aug/89

Signed

Date

Signed

Date

9513357-2703

Tailgate Safety Meeting held - R.C. Roos conducted. ATTENDING
 were: Wayne Johnson Env Eng Steve Weiss Env Eng
 Kelly A. Woodworth Env Eng Ed Caraway Opp
 Jake McMullen Opp Sean Call RPT
 Gady Vaughan safety

0955 Sample B-128 collected at N 43600, W 43000
 Sample prepared as an individual sample for US Testing

0957 Sample ~~B-128~~^{RS} B-129 collected at 43600^{RS} N,
 W 43000 This prepared as a split sample
 for ~~PN~~^{RS} Analysis at US Testing

To collect the samples, a single auger barrel was filled with
 sediment sample. Contents placed in a bowl, stirred quickly
 to homogenize, then both sample B-128 and B-129
 collected from the same bowl

attempt was made to collect deeper sample by using the
 2 1/2' auger. The auger was turned about 1 foot into the
 sediments but became so wedged that the auger-barrel
 had to be abandoned in the pond bottom. No sample
 could be collected. water at N 43600 W 43000
 was about

6 ft deep.
↓

1044 Sample B-130 collected at W 42900, N 43500
 (the above numbers are reversed from previous convention
 it should be properly recorded as N 43500, W 42900
 This is an individual sample to be sent to US Testing
 for analysis.

1108 Sample ~~B-131~~^{RS} collected at N 43500, W 42900
 water was about 7' deep sample is an individual
 sample for analysis at US Testing. This sample
 will be used for the material for the composite sample
 insufficient material was brought up with

Continued on Page

Read and Understood By

Signed

Date

Signed

Date

Richard Roos 17 Aug 1989

9513357, 2704

ROJEC: B-Pond Sampling 17 Aug 89

The last sample barrel for both the sample and the composite

1125 sample B-131 collected from N 43400, W 42800

1140 Sample B-132 collected from N 43300, W 42900

Two samples were collected and numbered B-130.

One sample was sent to US Testing for analysis and one sample sent to PM2 for analysis. A single sample barrel was collected for both of the B-130 samples. A second sample barrel from as near as possible the same location was collected to give material for the composite sample.

1157 Sample B-133 collected as a composite sample from splits from samples B-128, B-130, B-131, B-132

Sample B-130 was found to have approximately 100 cpm above background - background 50 cpm B-130 ¹⁰⁰ ~~150~~ cpm
100

Samples B-128, B-129, B-131, B-132, B-133 shipped to US testing on non-radioactive samples by K.A. Woodward.

Sample (pair) B-130 shipped to The 300 Area and through the 1100 area as radioactive samples by R.C. Rees to US Testing

Read and Understood By

Richard C. Rees

17 August 89

Signed

Date

Signed

Date

9513357.2705

Tailgate safety meeting conducted by A. C. Ross. ATTENDING

WERE:

Kelly A. Woodworth	Env Eng	Steve G. Weiss	Env
Rich A. Carlson	Env Eng	Jim V. Mohatt	Safety
Judy Vaughn	Safety	Ed Caraway	Opp
Tim Paulsell	app	Sean M. Call	RPT

0931 Sample B-134 collected at N 43100, W 42800
 Water depth $\approx 5'$, sample sandy with no apparent
 organic matter in the soil. A survey with a GM
 showed no radiation. Sample Tube was full, so bottom
 of sample was $\approx 12''$

~~0950~~ Sample B-135 collected at N 43100, W 42800
 Both sample B-134 and B-135 collected from the same
 location and sampler barrel of soil. The soil was placed
 in a clean stainless bowl, quickly stirred to homogenize.
 Then both sets of bottles filled. The sample time
 of 0950 was written on the sample bottles to disclose
 the fact that they were split samples

0959 Sample B-136 collected at N 43100, W 42600
 Sample B-136 sent to US Testing for analysis
 Sample B-137 collected from the same sediment
 batch (as above) B-137 sent as a split to PNL
 Water depth is $\approx 6'$ soil is sandy with little or
 no organic matter

1028 Sample B-138 collected at N 43400, W 42500
 Sample sent to U.S. Testing for analysis
 Water depth $\approx 10'$, soil sandy with lots of
 organic sludge. Measurement with an Eberline
 E 14 0B (GM) detected no radiation

Continued on Page

Read and Understood By

Signed

Date

Signed

Date

A. C. Ross
 Signed

18 Aug 89
 Date

135 Sample B-139 collected from N 43500, W 42500
Sample analysis at U.S. Testing. Water depth
≈ 10' Soil is sandy with some organic sludge.
An odor of rotting organics was strong

134 Sample B-140 collected from N 43700, W 42100
Sample analysis for U.S. Testing. Water depth ≈ 6'
Soil is sandy with some organic sludge.
No reading on the GM

130 Sample B-141 collected as a composite of
B-134/135, B-136/137, B-138, B-139, B-140
samples packaged, signed to K.A. Woodward for transport
to the analytical laboratories

135 Sample B-142 collected from clean silica sand
as an equipment blank

Continued on Page

Read and Understood By

Signed

Date



Signed

17 Aug 89

Date

9513357.2707

0730 Tailgate meeting conducted by R. C. Roos
Attending was W. L. Johnson

Background sample locations were sighted in with a Brunton using permanent landmarks

0750 Background sample South of 216-B-3 Pond
214.5° Transportable Grout Facility
234° North Stack of East area Power Plant
13° Antenna at peak (East end) of Gable M

0830 Background sample West of 216-B-3C
2° Antenna at peak (East end) of Gable M
81° Well near S.E. corner of ~~216-B-3C~~
No number is evident at the well site for reference

Tailgate safety meeting conducted by R. C. Roos

Attending were:

- | | | | |
|-----------------|---------|-------------------|---------|
| W. L. Johnson | Env Eng | M. A. Wass Miller | Env En. |
| K. A. Woodworth | Env Eng | g Vaughn | Safety |
| T. B. Paulsell | OPP | R. V. Gutierrez | OPP |
| S. M. Call | RPT | | |

0941 Sample B-143 collected from N42800, W 42 water depth was ≈ 10'. A full sample barrel was collected. Soil was black with a silty/sandy appear. B-143 will be sent to US Testing for analysis

Sample B-144 collected from the same stainless steel bowl of sediment as B-143. B-144 will be sent to PNL as a split sample

Survey of sediment collected at N42800, W 42000

Continued on Page

Read and Understood By

R. C. Roos
Signed

25 August 1989
Date

Signed

Date

JECT B-Pond Sampling 25 August 89

Continued From Page _____

indicated no organic vapors when surveyed with an HNU model P1-101 and a 10.2 EV Probe

37 Sample B-145 and B-146 collected from N 43200, W 42000. Water depth is $\approx 11'$ soil is black silty sand (based upon visual observation only) Both samples will be sent to US Testing for analysis. Sample B-146 was labeled as Time 1042 To disguise the fact that it was a duplicate. HNU survey results 0

59 Sample B-147 collected at N 43200, W 41900 Water depth $\approx 11'$, soil black sandy loam, HNU reading 0

19 Sample B-148 collected at N 43300, W 42000 water depth $\approx 10'$, soil sandy and not as much black from organic matter. Plants were growing from the bottom of the pond nearly to the surface of the water

37 Sample B-149 collected at N 43500, W 42000 Water depth 3-4' soil more brown, less black and less sticky than most others. Sample seems sandier (sandier) than usual. HNU reading 0

45 Sample B-150 collected as a composite of samples number: B-143/144, B-145/146, B-147, B-148, B-149

Day is sunny with partial clouds, Temperature 70-75° breeze from south at 2-7 mph

348 Sample B-151 collected as an equipment blank from clean silica sand. Sand poured into a cleaned stainless steel bowl, mixed with a cleaned stainless steel spoon, and put into sample jars

Continued on Page _____

Read and Understood By

Signed _____

Date _____

Signed Richard Ross

Date 25 Aug 89

951357, 2709

p. 20

- 1437 Background sample south of 216-B-3C
359° from Antennae at peak of Gable Mtn
185.5° from Observatory at peak of Rattlesnake mtn
90° from Marker pole at well 39-89 South
and east of 216-B-3C ≈ 400 yards
- 1503 Background sample East of 216-B-3B
5° from Antennae at peak of Gable Mtn
230° from Purx Stack
183.5° from BWIP Monitoring Borehole #4240 A
- 1522 Background sample North of 216-B-3 Pond / 216-B-3
244° from B-Plant Water Tower
230° from North stack of Eastaven Power Plant
13° from Antennae at peak of Gable Mtn

Continued on Page _____

Read and Understood By _____

Richard P. Ross
Signed25 August 1989
Date

Signed _____

Date _____

EGT B-Pond Sampling ^{9513357 2710} 28 August 1989

Continued From Page _____

Gate safety meeting held. Conducted by R.C. Rees
 Attending were: K. A. Woodward Jeff J. Ammann
 Judy Vaughan Tim Paulsell
 Richard Y. Gutierrez Sean M. Call

Today's plan is to sample the 216-B-33 Ditch. Hand augers will be used where sediments are deep enough, stainless steel shovels will be used where sediments are too shallow for augers.

12 Sample B-152 collected from the location 1300' East of the confluence of A-29 and B-33 ditch. The exact location was too rocky to collect a sample, so sample was collected 21' west of the specified location.

Sample B-153 collected as a duplicate from the same location. Sample shoveled into a bowl, and brought into the support zone. Sample bottles filled from sediment collected into bowl. Sample B-153 labeled as 1150 for time of collection.

Samples and shovel surveyed clean out of the zone. Boots all had to be discarded because of contamination. A survey of the other boots "clean" from laundry showed contamination with the Eberline GM and P-11 probe. It is likely that boots were "hot" before entering zone.

12 Sample B-154 collected from 1200' East of A-29 B-33 confluence.

Sample B-155 collected as a duplicate from the 1200' location. B-155 will be sent to PNH for analysis.

Samples B-152, B-153, B-154 will be sent to US Testing for analysis.

Radiative background is rather high along the ditch, between 100-200 cpm.

Continued on Page _____

Read and Understood By

Richard Rees
 Signed

31 Aug 89
 Date

Signed

Date

1336 Sample B-156 collected from clean silica sand as an equipment blank

Samples packaged and signed to Jeff Ammerman for transport to the laboratory

The day was mostly sunny and warm with a breeze ≈ 5 mph

Samples collected at the 1300' location contained several li fresh water clams. The clams were not included in samples

All reusable sampling equipment is decontaminated in the laboratory according to stringent procedures except shovels. Shovels are stainless steel. Decontamination of shovels is accomplished as follows:

- 1) shovel washed with DI water and non-phosphate detergent
- 2) shovel rinsed with DI water
- 3) shovel wiped with Methanol
- 4) shovel rinsed with 2X or 3X quart distilled water

if shovel is not to be used immediately, it is wrapped in aluminum foil

Continued on Page

Read and Understood By

Richard P. Ross
Signed

31 Aug 89
Date

Signed

Date

9513357 2712
 SUBJECT B-Pond Sampling 30 August 1989

Continued From Page _____

tailgate Safety Meeting held. Conducted by R. C. Peas
 ATTENDING were Margo J. Anthony DOE
 W. L. Johnson Kelly A. Wandsworth
 R. A. Carlson Judy Vaughn
 Tim Paulsell R. V. Gutierrez
 Sean M. Call

Wind was from North at ≈ 10 mph. This prevented sampling from the sampling platform in B-Pond.

It was felt that the bank was too steep and not enough standing area was available without standing in the water at B-3 Ditch so sampling was deferred until better (taller) boots were obtained.

Sampling was also attempted in the B-3C lobe, however, not enough sediment is available to collect samples.

Continued on Page _____

Read and Understood By

Signed _____

Date _____

Signed R. C. PeasDate 31 Aug 89

7513357.2713

p. 24

Tailgate Safety meeting conducted by R.C. Rees Attending were:

K. A. Woodworth	M. A. Wash Miller
W. A. Skelly	B. A. Tuttle
T. B. Paulsell	B. V. Gutierrez
S. M. Coll	

Wind conditions prevent sampling on pond, however concern of yesterday have been addressed and sampling will occur in The 216-B-3-3 Ditch. K. A. Woodworth can fit her feet plus substantial footgear plus plastic booties into The size 11 waders. She will collect samples.

0948 Samples collected from location 900' East of ditch confluence. Actual samples collected \approx 50' East of The 900' location
 Sample B-157 collected as a split for PNL
 Sample B-158 collected for analysis at U.S. Testing
 Sample B-159 collected as a duplicate for analysis at U.S. Testing. Time marked on B-159 is 0952

Samples were collected using a hand core auger. The auger was filled 4 times with soil from the same location (\approx 1.5' diameter area) to collect enough soil. Soil placed in 55 bowl, stirred briefly & placed in bottles. No radioactive contamination was detected using an Eberline GM with a P-11 probe GM # 1925 P-11 # 375 calibration expires 2/29/90

1038 Sample B-160 collected at The 300' location of B-3-3 Ditch. A Hand Auger was used to collect The sample

1108 Sample ~~B-160~~^{B-161} B-161 collected at The confluence of A-29 Ditch and B-3-3 Ditch using a 55 hand auger

Continued on Page

Read and Understood By

R. C. Rees
 Signed

31 Aug 89

Date

Signed

Date

9513357-2714

JECT B-Pond Sampling 31 Aug 89

Composite sample collected from splits of B-152, B-154, B-157, B-160, B-161. Splits from samples B-152 and B-154 were collected 28 August and preserved on ice and in C-O-C until use Today 1123.

123 Composite sample collected B-162

120 Sample B-163 collected from clean silica sand as the equipment blank

Continued on Page

Read and Understood By

Id Johnson
Signed

9/5/89
Date

Richard [Signature]
Signed

31 Aug 89
Date

9515597.2/15

Tailgate Safety meeting conducted by R. C. Roos

Attending were: Steve G. Weiss

Chris D. Kramer

Kelly A. Woodworth

Judy Vaughn

Bill J. Bachmann

Ed R. Caraway

Mike A. Copeland

0954 Sample B-164 collected from a location 45' East and 8' North of the location that B-3-B Ditch empties into B-Road. This location is in the channel of moving water about the place where the current dissipates. Water is $\approx 2'$ deep. Soil is fine sand with $\approx 2''$ of sludgy sediment on top.

1003 Sample B-165 collected from the same location as B-164. Samples were collected from ^{two} separate sample barrels of soil collected from as near as possible the same location. The initial observation of the black organic material on top of the fine sand is in core. Fine sand overlies the organic layer.

1029 Sample B-166 collected from N 43100, W 42200. Water depth $\approx 10'$. Sediment appears sludgy with lots of organic matter (black organic sludge) some undecomposed plant material was present in the sample.

1039 Sample B-167 collected from N 43100, W 42200 as a split to be sent for analysis at PNL. Samples B-167 and B-166 were collected from the same sample barrel of sediment. Insufficient sediment remained for the composite sample. A second sample barrel of material was collected for the composite.

Composite samples throughout this project are collected, packed in clean 1 liter 125ml bottles, and stored on ice until soil is mixed and used for the composite sample.

Continued on Page

Read and Understood By

Signed

Date

Signed

Date

7 Sept 89

2 Sample B-168 collected at N 43090, W 42000
This location was determined by sounding the bottom
with a pole to find the deepest point in the pond.
Water depth is $\approx 15'$ soil is a grey sandy, silty soil.
some vegetation is present in the soil.

9 Sample B-169 collected as a composite from samples
collected at the B-3-3 Ditch Inflow, N43100, W42200,
and the deepest point in the pond

0 Sample B-170 collected from clean silica sand as an
equipment blank

Weather today is sunny + warm (70°-80°) breeze from North-West
5-10 mph

Continued on Page

Read and Understood By

Signed

Date

Signed

Date



7 Sept 89

9513357.2717

Tailgate safety meeting conducted by R. C. Roos

Attending were K. A. Woodworth

Chris Keams

Mark A. Wassmiller

Ed R. Caraway

Bill J. Bachmann

Mike A. Copeland

Sampling will not take place on the pond today due to wind conditions. Sampling will be attempted in the 216-B-3C expansion holes. Sampling locations will be measured using a Rolatape, model 62. As specified in the sampling plan measurements are in feet from the north end of each trench. In practice, the ditches were 2200' long, and measurements were made beginning at the south end of each ditch and measured to the proper location. As example, if a sample was specified at 1800', it would be marked 400' from the south end of the ditch ($2200 - 400 = 1800$)

0950 Sample B-171 collected from 500' in ditch #8 (the ditch farthest east in the pond). Sample was collected in 2"-3" of water. ditch was dry beginning $\approx 15'$ south of the sample location. Sample was sandy and contained rocks.

0955 Sample B-172 collected from 500' in ditch #8. This is a duplicate sample to be sent to U.S. Test. A stainless steel bowl was filled with soil, homogenized and sample bottles filled.

1020 Sample B-173 collected from 400' in ditch #7. water was 6"-10" deep. soil was sandy and rocky. This sample sent to PNL for analysis.

1010 Sample B-174 collected from 400' in ditch #7. This sent to U.S. Testing for analysis.

Continued on Page

Read and Understood By

Signed

Date

Signed

Date

R. C. Roos
Signed

8 Sept 89
Date

175 collected at 1050 (Time) from 2100' in ditch # 6
There was evidence that this location has been wetted,
however currently it is dry.

Samples collected to this point have been collected using
laboratory cleaned bowls. Subsequent samples are
collected using shovels and bowls field-decontaminated as
described earlier.

10 Sample B-176 collected from 1800' in ditch # 5
Sample soil is similar to the previous location in
being a dry sample

27 Sample B-177 collected from ~~1200'~~^{25300'} in ditch # ~~4~~³ ~~15~~
water was ≈ 12 " deep. This sample contained lots
of plant material

30 Sample B-178 collected from 1200' in ditch # 4
water depth was 4"-6". soil was rocky and sandy

55 Sample B-179 collected from 900' in ditch # 2
water depth was ≈ 18 " sample was gravelly sand with
lots of black organic muck

25 Sample B-180 collected from 1300' in ditch # 1
(The ditch furthest west in the pond). Water depth was
 ≈ 24 ". Sample was gravelly sand with lots of black
organic sludge.

09 Sample B-181 collected as a composite from samples
B-175 and B-176 - These are the dry samples

10 Sample B-182 collected as a composite from samples
B-171, B-173, B-177, B-178, B-179, B-180

Continued on Page _____

Read and Understood By

Signed _____

Date _____

Signed Richard Ross

Date 8 Sept 89

9513357 2719

p.30

1315 Sample B-183 collected from clean silica sand as an equipment blank.

Samples packaged and signed To C. D. Kramer - for delivery To U.S. Testing and PNH for Analysis

Weather was ~~shiny~~ sunny and warm. Temperature $\approx 80^\circ$ wind from North 10-15 mph

Continued on Page

Read and Understood By

Signed

Date

Signed

Date

9513357-2720

JECT B-Pond Sampling 11 Sept 89

act of operator support prevented collection of samples.
 Request for additional sampling in the 216-B-3 ditch
 from A-29 ditch, up stream to the beginning of B-3 ditch
 length of this portion of the ditch was measured with
 a ReloTape, model 623-D, showed 2,382'
 Random number sampling locations will be based upon
 24 100' units

Continued on Page

Read and Understood By

Signed

Date

Richard [Signature]

Signed

18 Sept 89

Date

Tailgate safety meeting conducted by R. C. Roos

Attending are Chris D. Kramer

Craig E. Heider

Janette M. Swindoll

Richard V. Gutierrez

Today we will sample in the upper portion of the 216-B-3-Ditch. Sampling locations were selected from random number table generated by Symphony @Int (@Rand 24). Sample loca. will be at 500', ~~1000'~~, 1,400', 2,000', 2,300', 1,000'

0956 Sample B-184 collected at 2300' from the head of 216-B-3-3 Ditch. This is to be sent to US Testing as a regular sample. Soil is sandy, with silt

1000 Sample B-185 collected at 2300' from the head of the ditch. This will be sent to US Testing as a split sam,

1006 Sample B-186 collected at 2300' from the head of the ditch. This will be sent to PNL as split samples

To collect material for samples B-184/185/186, and the comp a stainless steel auger was filled 3 times with sediment & emptied into a stainless steel bowl. The contents were quickly stirred and placed in jars from the same bowl full of material

1046 Sample B-187 collected from 2,000' from head of ditch. Soil coarse sand. Cabbles were encountered several inches below surface, so auger was partially fill two times to gather sufficient material for the sample

1114 Sample B-188 collected from 1,400' from head of B-3-3 ditch. Soil is sandy with quite a bit of silt

Continued on Page

Read and Understood By

R. C. Roos
Signed

18 Sept 89

Date

Signed

Date

Day is sunny and warm 75°-80° breeze \approx 5 mph with gusts of 10 mph

18 Sample B-189 collected from 1,000' East of the head of B-3-3 Ditch

15 Sample B-190 collected from 500' from the head of B-3-3 Ditch

47 Sample B-191 collected from the head of B-3-3 Ditch about 30' from where water enters the ditch. Attempts were made to sample closer to the influent, but large cobbles, concrete structures, and lack of sediment prevented sample collection

27 Sample B-192 collected as a composite of all samples collected today.

RPT survey of soil from each sample location showed no detectable radioactive contamination at 2,000', 1,500', 1,000', and 500' from head of ditch. Sample^{IV} soil collected at 2,300' from the head of the ditch read possibly 50 cpm, and soil from the head end read 100-150 cpm. Instrument was an Eberhard GM # 1011 with a P-11 probe # 882

Continued on Page

Read and Understood By

Signed

Date

Signed

Date



18 Sept 89

9513357.2723

p. 34

Tailgate Safety meeting conducted by R. C. Ross
 ATTending were Chris D. Kramer EE Jeff J. Ammerman
 Craig E. Heiden EE Steve G. Weiss EE
 Frank W. Gustafson EE Kristina M. Cook EE
 Brad R. Allison H+S Bob M. Fredericks RPT

Day is sunny and warm 75°-80° breeze 2 mph from Nout

1045 Sample B-194 collected from N 42700, W 41525
 Sample is coarse black sand and water depth \approx 6'
 This sample was from inside the Trench

1045 Sample B-195 collected from N42700, W 41525
 as a split to be sent to PNL for analysis

1045 Sample B-196 collected from N 42700, W 41525
 as a split to be sent with B-194 to ^{US Post Office} ~~PNL~~ for
 analysis. These ~~split~~ samples collected by bringing
 soil into the boat with a stainless steel auger and
 hold in a stainless steel bowl until sufficient material
 was collected. The material was then stirred briefly
 to homogenize, and placed in bottles. Sample
 B-196 was labeled with the Time 1050

1120 Sample B-197 collected at N 43000, W 414 W414
 water depth \approx 8', soil coarse black sand

1147 Sample B-198 collected at N 43200 W 41550
 Sample soil finer sand with considerable silt fraction. A
 organic odor is present.

1219 Sample B-200 collected at N 43250, W 41625 ~~W 41550~~
 Sample brown color, sandy with quite a bit of silt
 and some clay. water depth \approx 18"

Continued on Page

Read and Understood By

Richard Ross
 Signed

21 Sept 89

Date

Signed

Date

JECT _____

Continued From Page _____

- 36 Sample B-201 collected from ~~N 41400~~ ^{N 43100}, W 41400
 a black sediment layer overlay a ~~B~~ brown soil layer. Soil is fine sandy with silt. The HNU showed an inconsistent reading as high as 1 ppm
- 52 Sample B-202 collected from N 43150, W 41300
 A layer of black sediment $\approx 3'$ thick overlay a thin brown layer $\approx \frac{1}{2}''$. The deeper soil was coarse sand
- 30 Sample B-203 collected from N 43200 W 42500
 water depth $\approx 18''$. A layer of fine sediment $\approx 2''$ thick overlay coarse sand
- 46 Sample B-204 collected from splits of samples B-200, B-201, B-203, ~~B-204~~ B-202
 These samples were collected outside the Trench
 B-204 is a composite sample
- Sample B-199 collected as splits of B-194, B-197, B-198. These samples were collected in the Trench. This is a composite sample
- 03 Sample B-205 collected from clean silica sand or an equipment blank
- 411 samples were surveyed clean out of the zone
 all equipment, including the sampling platform were surveyed clean out of the zone
- 411 samples today collected from 216-B-3A Expansion lobe

Continued on Page _____

Read and Understood By

Signed _____

Date _____

Signed Richard P. Pees

21 Sept 89

Date

515357-2725

Tailgate Safety Meeting conducted by R. C. Rees
 ATTending were Chris D. Kramer
 Emory J. Rink Brad R. Allison
 Jake W. McMullen Judy K. Watts
 Bob M. Fredericks

Sample Bottles were prepared with preservatives in the laboratory
 this morning, prior to transport to site

1147 - 1109 Sample B-206 collected as a water sample
 from The South East corner of the pond. Vegetation
 blown by the wind has collected in The pond corner, so
 samples were actually collected 60' West of the corner
 along The south side of the pond

^{RS B-207}
 1105 - 1120 Sample ~~B-207~~ collected as a split sample
 at The South East corner of the B-Pond

The sample coordinates for samples B-164 and B-165 collected
 on 7 Sept 89 from approximately The inlet To B-Pond.
 coordinates are N 43175, W 43150

1148 - 1201 Sample B-208 collected at The South West
 corner of B-Pond at the location where B-3-3
 Ditch empties into The Pond

^{RS B-209}
 1225 - 1238 Sample ~~B-209~~ collected at The North West
 corner of B-Pond

1249 - 1303 Sample B-210 collected from The North East
 corner of B-Pond

1252 Sample B-211 collected as a composite of all 4
 sampling locations. The 3 composite bottles were
 each filled 1/4 full at each location, so The 1st parti
 was placed in The bottles at 11:00

Continued on Page

Read and Understood By

Signed

Date

Signed

Date

OBJECT _____

Continued From Page _____

Day is sunny and warm, $\approx 80^\circ$ breeze from The North West
at 2-5 mph

insufficient sample was collected to complete the composite
sample. Only 1 liter bottle, and $\approx 3/4$ gallon of sample
was collected

samples were labeled as followed

Environmental Engineering, WHC
R. C. Roos L4-92 376-9218
Sample #: _____
Date/Time Col: _____
Preservative: None
VOA 40ml (G) # 750

Environmental Engineering, WHC
R. C. Roos L4-92 376-9218
Sample #: _____
Date/Time Col: _____
Preservative: 1ml con HNO_3
500ml (G) # A21

Environmental Engineering, WHC
R. C. Roos L4-92 376-9218
Sample #: _____
Date/Time Col: _____
Preservative: None
VOA 40ml (G) # 750

Environmental Engineering, WHC
R. C. Roos L4-92 376-9218
Sample #: _____
Date/Time Col: _____
Preservative: 1ml (6N) NaOH
500ml (P) # C78

Environmental Engineering, WHC
R. C. Roos L4-92 376-9218
Sample #: _____
Date/Time Col: _____
Preservative: None
1,000ml (P) # 760/H79

Environmental Engineering, WHC
R. C. Roos L4-92 376-9218
Sample #: _____
Date/Time Col: _____
Preservative: 1ml (6N) NaOH
500ml (P) # C78

Environmental Engineering, WHC
R. C. Roos L4-92 376-9218
Sample #: _____
Date/Time Col: _____
Preservative: 2ml con HNO_3
1,000ml (P) # A20, A22, A23, A51,

Environmental Engineering, WHC
R. C. Roos L4-92 376-9218
Sample #: _____
Date/Time Col: _____
Preservative: 2ml (6N) NaOH
1,000ml (P) # C70

p. 38

Environmental Engineering, WHC
R. C. Roos L4-92 376-9218
Sample #: _____
Date/Time Col: _____
Preservative: 2ml (6N) NaOH
1.000ml (P) # C70

Environmental Engineering, WHC
R. C. Roos L4-92 376-9218
Sample #: _____
Date/Time Col: _____
Preservative: None
125 or 250ml (P) # 742

Environmental Engineering, WHC
R. C. Roos L4-92 376-9218
Sample #: _____
Date/Time Col: _____
Preservative: 1ml con H₂SO₄
500ml (G) # C80

Environmental Engineering, WHC
R. C. Roos L4-92 376-9218
Sample #: _____
Date/Time Col: _____
Preservative: 2ml con HNO₃
1,000ml (P) # 111, 112

Above and on previous page are labels for regular samples

Environmental Engineering, WHC
R. C. Roos L4-92 376-9218
Sample #: _____
Date/Time Col: _____
Preservative: None
4,000ml (AG) # 751, 739, 734, 729,
737, 752

Labels used for composite samples

Environmental Engineering, WHC
R. C. Roos L4-92 376-9218
Sample #: _____
Date/Time Col: _____
Preservative: 2ml con HNO₃
1,000ml (p) # 121, 998

Continued on Page

Read and Understood By

Signed

Date

Signed

Date

RECORD COPY
NOT FOR CIRCULATION

JUN 13 1989

RECEIVED WHC BCSR
DOCUMENT CONTROL

NOTEBOOK NUMBER

WHC-N-294 1

DATE OF ISSUE

7-13-89

SERIES AND COPY

- 1

TITLE (INDICATE SUBJECT CONTENT)

216-B-3 Pond: Soil and
Sediment Characterization
Effort

AUTHOR (S) - DEPARTMENT AND SECTION

BC Roos

PERIOD COVERED (INCLUSIVE - MONTH, DAY, YEAR)
FROM TO

IF CONTINUED FROM ANOTHER NOTEBOOK,
GIVE NOTEBOOK NUMBER

IF CONTINUED IN ANOTHER NOTEBOOK,
GIVE NOTEBOOK NUMBER

ROUTE TO	P. R. NO.	LOCATION	ROUTE DATE	SIGNATURE & DATE
BC Roos	58230	H4-55	JUL 13 1989	
DB Blumenkranz	82637	H4-55		D.B. Blumenkranz

7/31/89

Sampling Platform tried out in Columbia River at Old White Bluffs Ferry Landing

Chris Kramer and Richard Roos set platform up

Jim Mohatt, Judy Vaughan, and Bill Tyler were present from Health + Safety to inspect platform performance

Platform was somewhat heavy to lift, but proved to be very stable, and handled well with paddles.

The winch and crane were a small hindrance by restricting movement in the boat. Also, the winch was somewhat questionable if faced with a heavy load. In operation no loads > 100 pounds are expected

Platform pass ~~exp~~^{ins} inspection and will be used in pond sampling with no special restrictions. Crane loads will not exceed 100 pounds

Continued on Page _____

Read and Understood By

Signed _____

Date _____

Signed Richard RoosDate 8/1/89

SAF # 92-294

Charge Code: PV2AD

Transportation: Emery Air Express Overnight Delivery

Destination: Weston / Ecotech Air Bill #: 252 156 8214

Offsite Property Control #: W93-0-0002 #7

Coolers #: LISTED BELOW

C.O.C. #: LISTED BELOW

SML-186

003046

SML-108

003052

SML-212

003059

SML-7

003056

NJ BOUND

003058

SML-210

003057

~~DESTINATION~~ = ~~W93-0-0002~~ 10/5/92

Offsite Property Control #: ~~Weston / Ecotech~~ ^{10/5/92} ~~W93-0-0002~~ #9

Cooler #: SML-15

C.O.C. #: 003053

SML-15

003054

Destination (Split Lab): TMA / NORCAL AIR BILL #: 252 156 8225

Offsite Property Control #: W93-0-0002 #8

Cooler #: SML-44

COC #: 003055

10/5/92

COC for 222-S Lab: 003040, 003042, 003041, 13

TYPE OF PROTOCOL: RCRA # of Photos Attached: 8

Purpose: This project was designed to determine the feasibility of clean closure to the 216-B Pond Lobes A, B and C. The Dept. of Ecology is sampling the 216-B Pond Lobes A, B and C because data packages from previous sampling projects lacked detailed data such as enough raw data and QA information. WHC also is sampling for the same parameters and at the same sample locations and matrix in order to provide comparison information against the Ecology data. D.O.H. is taking RAD samples where Ecology does.

Location: 216-B-3 Pond System, directly east of 200 East Area, including lobes A, B, C. See the attached map as to the location of each lobe and the sample points.

Field Contacts: R. Allan Danielson Dept. of Health (D.O.H.) Continued on Page 79

R. Allan Danielson

Signed

105-92

Date

APPROVED FOR PUBLIC RELEASE

Read and Understood By

V. Burkland 19/95

Signed

Date

PRC
C

(Cont.) Field Contacts:

J.R. LAWS	Project Coordinator
D.B. Blumentkrantz	Field Team Leader
Elaine Titus	HPT
Elizabeth Wiley	Dept. of Ecology

Lead Sampler: Karl B. Hulse

Samplers: LINDA A. GUERRA
Roberto M. Arnold
CAROL D. Morrison-Beyer

Assisting Personnel:

Billie Mauss	Dept. of Ecology
Steve Arbogast	Dept. of Ecology
Bruce Tuttle	SSO
Bob McLeod	DOE
Lynn Melby Albin	DOH
Fred Zwieslar	WHC
Fred Schmorae	WHC
Craig Rowley	WHC
Dave Klug	WHC

WHC

Sample Points: Samples were obtained from each B-Pond lobe, A, B and C. Three soil/sediment samples were obtained from the near-surface sediment of A-lobe. One sample point was used to obtain a water sample, a duplicate water sample, and a split water sample from A-lobe. Since B-lobe was dry, no water samples were taken. There were 2 sample points in B-lobe where soil/sediment samples were taken from. One sample point from B-lobe had a sample from below 6-inches, and a duplicate and split were taken from below 6-inches (for RADIOLOGICAL ANALYSIS ONLY on the Duplicate and Split). The other sample point in B-lobe has a surface soil/sediment sample taken from the top 6-inches and a sample taken from below 6-inches. A duplicate and split were taken from below 6-inches for all analysis except Radiological analysis. See the attached MAP for sample locations.

Continued on Page 80

Read and Understood By

C.D. Morrison-Beyer 10-5-92

Signed

Date

COPY - FOR INFO ONLY

Signed

Date

WTE Sample points continued: 3 soil/sediment samples and one water sample were taken from C-lobe. Sample locations can be found on the attached map.

Dept of Ecology Sample Points: Samples were obtained from of the lobes A, B and C. Three soil/sediment were obtained from near-surface soil/sediment of B-Pond's A-lobe from three sample locations. Three water samples were obtained from three sample locations in A-lobe. No water samples were obtained from B-lobe because there was none present. Soil/sediment samples were obtained from two sample locations in B-lobe. One water and three soil/sediment samples ^{from} ₁₀₋₆₋₉₂ locations were located and sample obtained from C-lobe.

D.O.H. Sample Points: One water and one soil/sediment sample points were located in A-lobe. One soil/sediment sample was located in B-lobe. One soil/sediment sample point was located in C-lobe. See the attached map for sample locations.

Type of Process: The B-Pond was designed to receive discharges from the 200 East Area facilities and from the PUREX plant. The effluents discharged into the pond contained atmospheric condensate, cooling water, potable water and steam condensate. These discharges have the potential of being contaminated with radionuclides.

Sample method: Each lobe was sample using a different method. Ecology and D.O.H. provided bottles of their own.

A-lobe water samples: A dip method was used to collect water samples from lobe-A. All samples were collected by S+M L personnel including Ecology and D.O.H. samples. Ecology and D.O.H.

Continued on Page 81

Read and Understood By

C. Morrison Beyer 10-6-92

Signed

Date

COPY - FOR INFO ONLY

Signed

Date

Sample Method Continued - provided sample containers for all sampling. A stainless steel dip beaker that was new and pre-cleaned by the manufacturer by an equivalent method the EII 5.5 was used for water collection. The ~~containe~~ ^{cont} stainless steel beaker was rinsed with Astm Type II water prior to use. The water sample was collected with the beaker and transferred into the appropriate sample containers. 10-6-92

A-lobe soil/sediment samples: The soil/sediment samples were collected using ~~an~~ ^{drills} augers made of stainless steel and pre-cleaned according to EII 5.5. ~~The auger was rinsed with pond water in between sampling points.~~ ^{A different auger was used at each location.} 10-6-92 The VOA samples ~~was~~ ^{samples} were collected first than the sediment was composited in a stainless steel pre-cleaned bowl and the sample was homogenized in the bowl. The sediment was then transferred with a stainless steel pre-cleaned spoon into the appropriate sample containers. 10-6-92

B-lobe soil/sediment: The trowel and spoons used were stainless steel and pre-cleaned to EII 5.5. For one sample the top 6 inches were removed with a shovel. The next 2 inches removed with a trowel. Another trowel was used to collect the sediment sample. First the VOA samples were collected with a spoon and transferred into the appropriate container. Then the sediment was homogenized with a trowel and transferred into the appropriate container. For the other sample point. The top 6 inches was used for a sample. The VOA was collected with a spoon first. Next the top 6-inches in an area approximately 1 ft x 1 ft, was homogenized. Continued on Page 82

Read and Understood By

CD Morrison Beyer 10-6-92

Signed

Date

COPY - FOR INFO ONLY

Signed

Date

SAF # 92-294 200 East B-Ponds Prescott

B-lobe soil/sediment continued: ~~and transferred~~ ^{casno} with a trowel and transferred with a spoon ₁₀₋₆₋₉₂ to the appropriate sample container (see attached map, location E)

C-lobe Water Samples: A stainless steel pan, precleaned to EII 5.5 was used to obtain water samples from C-lobe. The water was collected with the pan and transferred to the appropriate bottles, filling the VOA first, (see attached map, sample location F).

C-lobe Soil/Sediment Samples: All shovels, trowels, Augers, spoons and bowls used were stainless steel and precleaned to EII 5.5. A shovel was used to obtain a sediment sample from below the trench water near the outfall in C-lobe, (see attached map, sample location F). First the VOA samples were collected and then the sediment was homogenized and transferred to the appropriate containers. Another sediment sample was taken using an auger. First the VOA sample was collected, then the sediment was homogenized and transferred with a spoon to the appropriate sample container, (see attached map, sample location F). The other sediment sample was collected from a dried out trench using a trowel. First the VOA was collected and then the remaining sediment was homogenized and transferred to the appropriate container, (see attached map, sample location F).

PPE

A-lobe: Initially Coveralls, Anti-C's, Waterproof saranex, a surgeon's gloves with outer waterproof gloves, hood, canvas boots and rubbers, safety glasses. After the first day on the boat the HPT changed the requirements to only coveralls and waterproof saranex (No anti-C's) with all other equipment as stated above.

Continued on Page 83

Read and Understood By

COPY - FOR INFO ONLY

CD Morrison-Beyer 10-6-92

Signed _____ Date _____ Signed _____ Date _____

P.P.E. Continued

B-lobe - Level D required only. Did not enter an SCA or RCA area. Steel toed work boots and surgeon's gloves, safety glasses

C-lobe - For the water sample from C-Lobe the PPE was required: SWP's (Anti-c's), waterproof waders, hood, Canvas boots, surgeon's gloves, waterproof butergloves, safety glasses

For other sample locations in C-Lobe: SWP's (anti-c's), waterproof knee high rubber boots, Canvas boots, hood, surgeon's gloves and Canvas gloves, safety glasses

CRMB 10-7-92 CRMB

E #	Sample Number	Date Collected	Time Collected	Number and Type of Sample Containers/Analysis Requested	LOT #
5425	B06D85 SE 9	10-1-92	1323	(2) 125 mL (G) VOA (8240)	2092011 CRMB 10-7-92 2092011 2092011 CRMB 10-7-12 2092011 F2234010
			1337	(1) 500 mL (AG) SEMI VOA (8270) PCB/PEST (8080)	
			1332	(1) 250 mL (G) ICP METALS (6010) GEAA METALS (7000 SERIES) Hg (7471) CN (9010)	
CRMB 10-7-92					
5421	B06D85 SE 9	9-30-92	1526	(2) 125 mL (G) VOA (8240)	2092011, 9118013 W2019010 F2234010 2092011
			1531	(1) 500 mL (AG) SEMI VOA (8270) PCB/PEST (8080)	
			1534	(1) 250 mL (G) ICP METALS (6010) GEAA METALS (7000 SERIES) Hg (7471) CN (9010)	
CRMB 10-7-92					
5420	B06D90 SE 2	9-29-92	0745	(2) 125 mL (H) VOA (8240)	2092011
CRMB 10-7-92					

*Type of Sample
 A = Air L = Liquid SE = Sediment T = Tissue X = Other
 DL = Drum Liquids O = Oil SL = Sludge W = Water
 DS = Drum Solids S = Soil SO = Solid WI = Wipe

CRMB 10-7-92

Continued on Page 84

CA Morrison-Beyer 10-7-92

Signed

Date

COPY - FOR INFO ONLY

Signed

Date

CDMB 10-7-92

E #	Sample Number	Date Collected	Time Collected	Number and Type of Sample Containers/Analysis Requested	LOT #
5415	B06D79 SE	9-29-92	1417	(2) 125 ml (G) VOA (8240)	2092011
			1417	(1) 500 ml (AG) Semi VOA (8270)	432019010
				PCB/PEST (8080)	
			1417	(1) 250 ml (G) ICP Metals (6010)	F2234010
				GFAA Metals (7000 Series) Hg (7471), Cu (9010)	
			1441	(1) 1000 ml (G) Gross Alpha/Gross Beta (RL-2302), Gamma Spec. (RL-4303, 4304), (RL-2314) Apr Sr-90	2085011

CDMB 10-7-92

* SE = Sediment

Weston C.O.C. #: 003046 for Samples #15 - B06D79, B06D85, (ECOTEK), B06D89, B06D92 (TRIP BLANK).

Bill of Lading #: 252 156 8214

Ice Chest #: SML-186, Offsite Property Control #: W93-0-0002 #7

CDMB 10-7-92

E #	Sample Number	Date Collected	Time Collected	Number and Type of Sample Containers/Analysis Requested	LOT #
3409	B06D58 L	9-29-92	1319	(2) 40 ml (G) VOA (8240)	B2155010
			1331	(3) 2360 ml (NG) Semi VOA (8270)	A1347010
				PCB/PEST (8080)	
				(1) 1000 ml (P) ICP Metals (6010)	1260061
				GFAA Metals (7000 Series), Hg (7471) (H102)	
			1337	(1) 1000 ml (P) Cu (9010) preserv./N/AOH	1260061
			1342	(1) 4000 ml (P) Gross Alpha/Gross Beta (RL-2302), Gamma Spec. (RL-4303, 4304) Sr-90 (RL-2314)	5T2296020
5414	B06D63 L	9-29-92	0745	(2) 40 ml (G) VOA 8240	B2057030

CDMB 10-7-92

* L = Liquid

Weston C.O.C. #: 003052 for Sample #s - B06D58, B06D63 (B06D63 TRIP BLANK)

Bill of Lading #: 252 156 8214

Ice Chest #: SML-108, Offsite Property #: W93-0-0002 #7

CDMB 10-7-92

Continued on Page 85

Read and Understood By CD Morrison-Beyer 10-7-92

COPY - FOR INFO ONLY

Signed _____ Date _____ Signed _____ Date _____

PROJECT SAF #92-294 200 East B-Ponds Phase II

2/10/93
10-7-92

CRMB 10-7-92

E#	Sample Number	Date Collected	Time Collected	Number and Type of Sample Containers/Analysis Requested	LOT #
5422	B06D86	SE	10-1-92	(2) 125ml (G) VOA (8240)	9118013
				(1) 500ml (AG) Semi VOA (8270)	W2035010
				PCB/PEST (8080)	
				(1) 250ml (G) ICP Metals (6010)	F2234010
				GFAA Metals (7000 series) Hg (7471)	
				CN (9010)	
5423	B06D87	SE	10-1-92	(2) 125ml (G) VOA (8240)	9118013
				(1) 500 ml (AG) Semi VOA (8270)	W2035010
				PCB/PEST (8080)	
				(1) 250ml (G) ICP Metals (6010)	F2234010
				GFAA metals (7000 series) Hg (7471)	
				CN (9010)	
				(1) 100ml (G) Gross Alpha / Gross Beta	2085011
				(Gamma Spec (RL-2302, 4304) & RL-2314) for Sr-90	
5424	B06D88	SE	10-1-92	(2) 125 ml (G) VOA (8240)	9118013
				(1) 500 ml (AG) Semi VOA (8270)	W2035010
				PCB/PEST (8080)	
				(1) 250ml (G) ICP Metals (6010)	F2234010
				GFAA Metals (7000 series) Hg (7471)	
				CN (9010)	
5428	B06D95	SE	10-1-92	(2) 125 ml (G) VOA (8240)	2092011

* SE = Sediment

Western C.O.C. # 003059 for Sample #'s - B06D86, B06D87, B06D88, B06D95 (TRIP BLANK)
BILL OF LADING # 252 156 8214, Ice Chest # = SML-212
Offsite Property # = W93-0-0002 # 7

CRMB 10-7-92

2/10/93
10-7-92

E#	Sample Number	Date Collected	Time Collected	Number and Type of Sample Containers/Analysis Requested	LOT #
5410	B06D59	L	9-30-92	(2) 40 ml (G) VOA (8240)	B2155010
				(3) 2360 ml (AG) Semi VOA 8270	A1347010
				PEST/PCB (8080)	
				(1) 1000 ml (P) ICP Metals (6010)	1260061
				GFAA Metals (7000 series) Hg (7471)	
				(1) 1000 ml (P) CN (9010)	1260061
				(1) 4000 ml (P) Gross Alpha (RL-2302)	ST2246020
				Gross Beta (RL-2302)	
				(Gamma Spec (RL-4302, 4304) Sr-90 (RL-2314)	
5414	B06D76	L	9-30-92	(2) 40 ml (G) VOA 8240	B2057030

* L = Liquid

Western C.O.C. # 003057 for Sample #'s B06D59 and B06D76 (TRIP BLANK), BILL OF LADING # : 252 156 8214
offsite property control # : W93-0-0002 # 7 Ice Chest # : SML-210

Read and Understood By

CD Morrison-Beyers 10-7-92
Signed Date

COPY - FOR INFO ONLY

CRMB 10-7-92

SAF # 92-294 200 East B-Ponds Phase II

WAC-N-205#15
85

CRM B 10-7-92

E#	Sample Number	Date Collected	Time Collected	Number and Type of Sample Containers/Analysis Requested	LOT #
5413	B06D62	L	9-30-92	0905 (2) 40 ml (Gs) VOA (8240)	B2155010
				0906 (3) 2360 ml (A6) Semi VOA (8270)	A1347010
				↓	↓
				0907 (1) 1000 ml (P) ICP metals (9010)	1260061
				↓	GFAA Metals (7000 series)
				↓	(Preserv. HNO ₃) Hg (7471)
5414	B06D64	L	9-30-92	0908 (1) 1000 ml (P) CN (9010) (Preserv. NaOH)	1260061
				0910 (1) 4000 ml (P) Gross Alpha (RL-2302)	ST2246030
				↓	
				↓	(Preserv. HNO ₃) Gamma Spec. (RL-4303, 4304)
5414	B06D64	L	9-30-92	0745 (2) 40 ml (Gs) VOA (8240)	82057030

CRM B 10-7-92

* L = Liquid

Weston C.O.C. # 003056 for Sample #'s B06D62 and B06D64 (TRIP BLANK) (B06D62 is an Equipment Blank)
 BILL OF LADING # : 252 156 8214
 ICE Chest # : SML-7, Offsite Property Control # : W93-0-0002 # 7

CRM B 10-7-92

E#	Sample Number	Date Collected	Time Collected	Number and Type of Sample Containers/Analysis Requested	LOT #
5411	B06D60	L	9-30-92	1119 (2) 40 ml (Gs) VOA (8240)	B2155010
				1130 (3) 2360 ml (A6) Semi VOA (8270)	A1347010
				↓	↓
				1136 (1) 1000 ml (P) ICP metals (9010)	1260061
				↓	GFAA Metals (7000 series)
				↓	Hg (7471) Presv. (HNO ₃)
5414	B06D78	L	9-30-92	1137 (1) 4000 ml (P) Gross Alpha (RL-2302)	ST2246020
				↓	
				↓	(Preserv. HNO ₃) Gamma Spec. (RL-4303, 4304)
				↓	Sr-90 (RL-2314)
5414	B06D78	L	9-30-92	1137 (1) 1000 ml (P) CN (9010) Preserv. (NaOH)	1260061
5414	B06D78	L	9-30-92	0745 (2) 40 ml (Gs) VOA (8240)	82057030

CRM B 10-7-92

* L = Liquid

Weston C.O.C. # 003058 for Sample #'s B06D60 and B06D78 (TRIP BLANK)
 BILL OF LADING # : 252 156 8214
 ICE Chest # : NJ BOUND
 Offsite Property Control # : W93-0-0002 # 7

CRM B 10-7-92

Continued on Page 87

Read and Understood By

CAMORRISON BEYER 10-7-92

COPY - FOR INFO ONLY

Signed

Date

Signed

Date

951557.2759

PROJECT SAF # 92-294 200EAST B-Ponds Phase II

Notebook No. WHC-N-205 #15
Continued from Page 86 87

CRMB 10-7-92

CRMB 10-7-92

E #	Sample Number	Date Collected	Time Collected	Number and Type of Sample Containers/Analysis Requested	LOT #	
5420	BO6D84 SE	9-30-92	1403	(1) 125 ml (G) VOA 8240	2092011	
SPLIT OF BO6D82	↓	↓	1415	(1) 500 ml (AG) Semi VOA 8270, Pst/PCB 6000	W2019010	
			1420	(1) 250 ml (G) ICP metals (6010)	F2234010	
				GFAA metals (7000 series) Hg (7471), CN (9010)		
5416	BO6D98 SE	9-30-92	1330	(1) 1000 ml (G) Gross Alpha (EA-82)	2085011	
RAD SPLIT FROM BO6D80	↓	↓	Gross Beta (EA-82)			
	↓	↓	Gamma Spec (RC-30)			
5412	BO6D61 SE	9-30-92	1119	Sr-90 (RC-306, 303, 309, 304)	B2155010	
SPLIT OF BO6D59	↓	↓	1131	(3) 40 ml (GS) VOA (8240)	A1347010	
				(3) 2300 ml (AG) Semi VOA (8270)		
				↓	PCB/PEST (8080) (Pres. HNO ₃)	
				1137	(1) 1000 ml (P) ICP metals (6010)	1260061
				↓	GFAA metals (7000 series)	
	↓	(Pres. HNO ₃) Hg (7471)				
	1137	(1) 1000 ml (P) CN (9010) (Pres. NaOH)	1260061			
	1145	(1) 4000 ml (P) Gross Alpha (EA-82)	ST 2246020			
	↓	↓	Gross Beta (EA-82), Gamma Spec (RC-30)	↓		
	↓	↓	Sr-90 (RC-306, 303, 309, 304) (Pres. HNO ₃)			
5428	BO6D94 SE	9-30-92	0745	(1) 125 ml (G) VOA (8240)	2092011	
5414	BO6D77 L	9-30-92	0730	(3) 40 ml (GS) VOA (8240)	B2057030	

CRMB 10-7-92

* L = liquid, SE = Sediment
 TMA, ~~Wester~~ C.O.C # 003055 for Sample #'s BO6D84, BO6D98, BO6D61, BO6D94 (TRIP BLANK), BO6D77 (TRIP BLANK).
 NORCAL
 BILL OF LADING #: 252 156 8225 ICE CHEST #: SML-44
 Offsite Property Control #: W93-0-0002 #8

CRMB-B
10-7-92

Continued on Page 88

AM Morrison-Beyer 10-7-92

Read and Understood By

COPY - FOR INFO ONLY

Signed

Date

Signed

Date

E#	Sample Number	Date Collected	Time Collected	Number and Type of Sample Containers/Analysis Requested	LOT #
5427 Equipment Blank CAMB 10-7-92	B06D91 SE	9-30-92	0709	(2) 125 ml (G) VOA (P240)	2092011
			0908	(1) 500 ml (AG) Semi VOA (8270)	W2019010
			0409	PCB/PEST (8080)	F2234010
			0910	(1) 250 ml (G) ICP METALS (6010) GFAA METALS (7000 SERIES) Hg (7471) CN (9010)	2085011
				(1) 1000 ml (G) GROSS ALPHA (RL-2302) GROSS BETA (RL-2302) GAMMA SPEC (RL-4302, 4304) SR-90 (RL-2314)	9118013
5428	B06D96 SE	9-30-92	0715	(2) 125 ml (G) VOA (P240)	

E#	Sample Number	Date Collected	Time Collected	Number and Type of Sample Containers/Analysis Requested	LOT #
5416 CAMB 10-7-92	B06D80 SE	9-30-92	1316	(2) 125 ml (G) VOA (8240)	2092011
			1321	(1) 500 ml (AG) Semi VOA (8270)	W2019010
			1324	PCB/PEST (8080)	F2234010
			1330	(1) 250 ml (G) ICP METALS (6010) GFAA METALS (7000 SERIES) Hg (7471) CN (9010)	2085011
				(1) 1000 ml (G) GROSS ALPHA (RL-2302) GROSS BETA (RL-2302) GAMMA SPEC (RL-4302, 4304) SR-90 (RL-2314)	
5417 TOP 6 inches of Sediment CAMB 10-7-92	B06D81 SE	9-30-92	1342	(2) 125 ml (G) VOA (8240)	2092011
			1348	(1) 500 ml (AG) Semi VOA (8270)	W2019010
			1348	PCB/PEST (8080)	F2234010
			1348	(1) 250 ml (G) ICP METALS (6010) GFAA METAL (7000 SERIES) Hg (7471) CN (9010)	2085011
			1348	(1) 1000 ml (G) GROSS ALPHA (RL-2302) GROSS BETA (RL-2302) GAMMA SPEC (RL-4302, 4304) SR-90 (RL-2314)	

Bill of Lading #: 252 156 8214 Ice Chest #: SML-15

Offsite Property Control #: W930-0002 #9

* SE = Sediment

Weston C.O.C. # 003053

Continued on next page

CAMB 10-7-92

Morrison-Beyer 10-7-92

Signed

Date

Read and Understood By

COPY - FOR INFO ONLY

Signed

Date

PROJECT SAF # 92-294 WEST B-Ponds Phase II

E#	Sample Number	Date Collected	Time Collected	Number and Type of Sample Containers/Analysis Requested	LOT#
5419	B06D83 SE	9-30-92	1402	(2) 125 mL (G) VOA (8240)	2092011
Duplicate of B06D82	↓	↓	1417	(1) 500 mL (AG) SEMI VOA (8270)	W2019010
			↓	PCB/PEST (8080)	
			1420	(1) 250 mL (G) ICP METALS (6010)	
5416	B06D97 SE	9-30-92	1330	GFAA METALS (7000 SERIES)	F2234010
				Hg (7471)	
				Cd (9010)	
RAD Duplicate of B06D80	↓	↓	↓	(1) 1000 mL (G) Gross Alpha (RL-2302)	2085011
				Gross Beta (RL-2303)	
				Gamma Spec (RL-2304)	
5418	B06D82 SE	9-30-92	1405	(2) 125 mL (G) VOA (8240)	2092011
↓	↓	↓	↓	(1) 500 mL (AG) SEMI VOA (8270)	W2019010
				PCB/PEST (8080)	
				(1) 250 mL (G) ICP METALS (6010)	
				GFAA METALS (7000 SERIES)	
				Hg (7471)	F2234010
				Cd (9010)	

CMMB 10-7-92 CMMB

* SE = Sediment
Weston C.O.C # 003054 for sample #'s : B06D83,
B06D97, B06D82

Ice Chest # : 5ML-15
Bill of Lading # : 252 156 8214
Offsite Property Control # : W93-0-0002 # 9

222-S Lab SAMPLE #'S
C.O.C. #'S : 003040 - B06D58, B06D79, B06D92, B06D83,
003042 - B06D62, B06D91, B06D59, B06D60,
B06D61, B06D80, B06D81, B06D82,
B06D83, B06D84, B06D85.
003013 - B06D86, B06D87, B06D88,
B06D89.

(Corresponding E#'s found in previous tables)

Weather Conditions - 9/29/92 - Clear and Sunny, approximately 80°F.
9/30/92 - Clear and Sunny, approximately 85°F,
10/1/92 - Clear and Sunny, approximately 75°F.

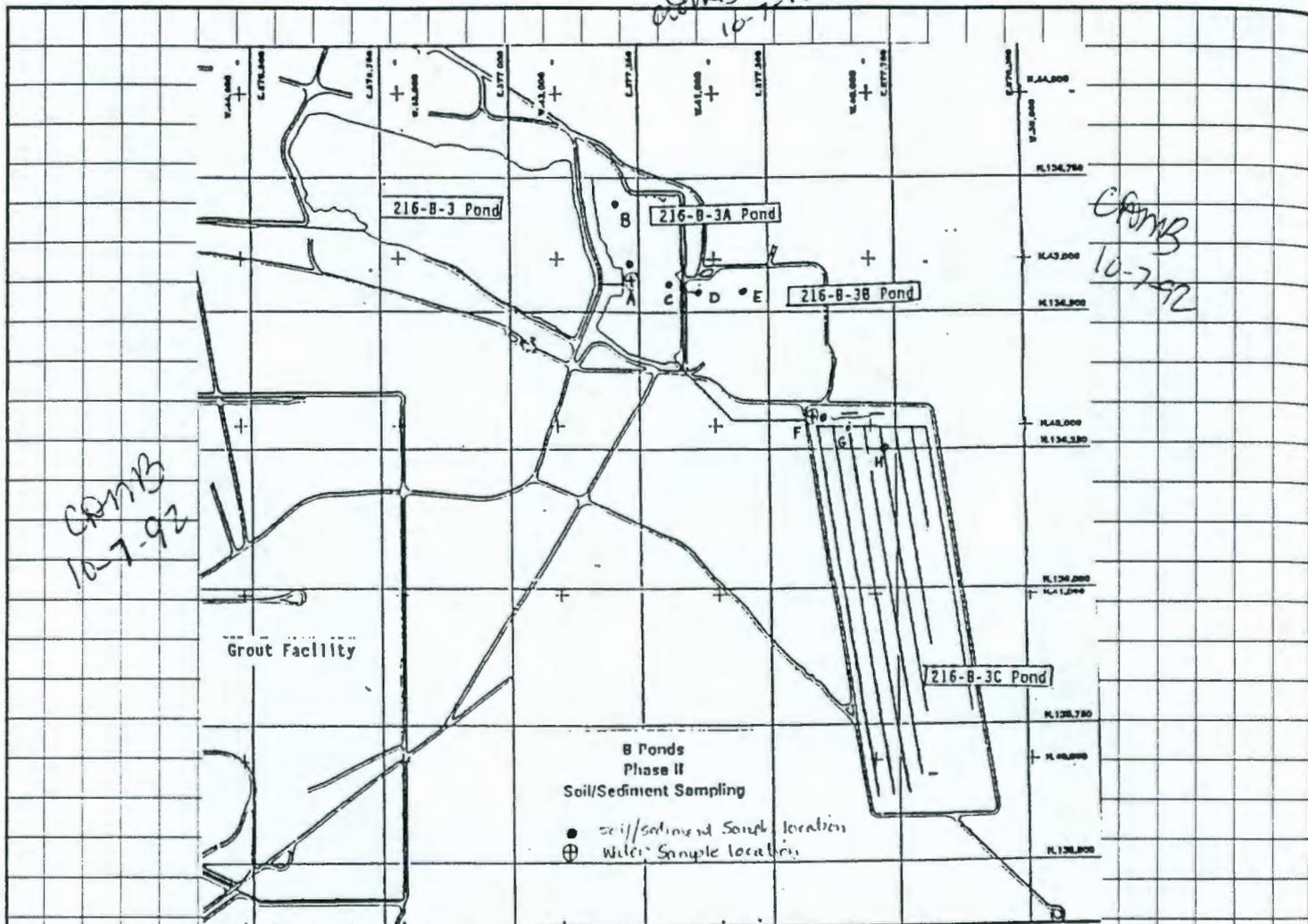
CMMB 10-7-92

CD Morrison-Beyer 10-7-92
Signed Date

Read and Understood By

COPY - FOR INFO ONLY

Signed Date



The above diagram is the sample locations for WHC sediment and water samples taken by S+ML personnel. The following table gives the corresponding sample #'s to the sample locations. Additionally all samples for the Dept. of Ecology and Dept of Health were taken by S+ML personnel. The sample bottles were provided by Dept. of Ecology for their samples and the Dept. of Health for their samples. S+ML provided the bottles for WHC samples. A representative from DOH and Ecology were present to witness all sample collection by S+ML and to

Continued on Page 91

CA Morrison-Beyer 10-7-92

Signed

Date

Read and Understood By

COPY - FOR INFO ONLY

Signed

Date

give direction to S+ML as to what analysis they wanted for each sample point.

Diagram	Sample location	Sample #	Matrix #
	Sediment A	B06D86	5422
	Water A	B06D59	5410
	↓	B06D60 (DUPLICATE)	5411
	↓	B06D61 (B06D59 SPLIT)	5412
	¹⁰⁻⁷⁻⁹² Sediment B	B06D87	5423
	Sediment C	B06D88	5424
	Sediment D	B06D80 (below 6 inches)	5416
	↓	B06D97 (RAD DUPLICATE B06D80)	5416
	↓	B06D98 (RAD SPLIT OF B06D80)	5416
	Sediment E	B06D81 (TOP 6 inches)	5417
	↓	B06D82 (below 6 inches)	5418
	↓	B06D83 (Duplicate of B06D82)	5419
	↓	B06D84 (Split of B06D82)	5420
	Sediment F	B06D79	5415
	Water F	B06D58	5409
	Sediment G	B06D89	5425
	Sediment H	B06D85	5421

¹⁰⁻⁷⁻⁹² Sediment B

Matrix + Type	Blank	Sample #	Matrix #
Sediment - Trip		B06D92	5428
Sediment - Trip		B06D95	5428
Sediment - Trip		B06D94	5428
Sediment - Trip		B06D96	5428
Water - Trip		B06D63	5414
Water - Trip		B06D76	5414
Water - Trip		B06D78	5414
Water - Trip		B06D77	5414
Water - (Equipment-Field)		B06D62	5413
Sediment - (Equipment-Field)		B06D91	5427
Water - Trip		B06D64	5414

Continued on Page 92

CA Morrison-Beyn 10-7-92

Read and Understood By

COPY - FOR INFO ONLY

Signed

Date

Signed

Date

Comments: In addition to the samples taken for WHC listed on page 91 of WHC-N-205 #15, Ecology also had two additional water samples taken from B-Pond, A-lobe; one sample at location B of the diagram on page 90 of WHC-N-205 #15 and one sample from location C of the same diagram. Ecology did not have split samples taken. The Dept. of Health took one water and three sediments samples all together. The D.H. water sample was taken from location A, lobe A, of the diagram on page 90, WHC-N-205 #15 logbook. The D.P.H. sediment samples were taken from three locations, one from each of the following locations: B, D, and F from the diagram on page 90 of WHC-N-205 #15 logbook.

All samples obtained from A-lobe^{estm 10-7-92} were taken from a sampling boat. Samples taken from B and C lobes did not have to be drawn from a boat, but by foot. A sample for total Activity was taken from each sample location. The E # listed are the corresponding total Activity analysis sample #.

COMB
10-7-92

Continued on Page 93

Read and Understood By

COPY - FOR INFO ONLY

Morrison-Beyer 10-7-92

Signed

Date

Signed

Date

7513557.2/95

PROJECT SFA# 92-294 200 EAST B-Ponds

Notebook No. WHC N-205 #15 93

Continued From Page 92

10-7-92

10-7-92

Heis# B06D79



200 EAST B-Ponds Lobe C Sediment Sample 140 9-29-92 CMB

200 East Area Heis# B06D58



B-Ponds Phase II 9-29-92 1312 lobe C, Aqueous Sample

10-7-92

10-7-92

10-7-92

10-7-92

Heis# B06D79 Stairway by Outfall



200 EAST B-Ponds Lobe C Sediment Sample 140 9-29-92 CMB

200 East Area Heis# B06D58



B-Ponds Phase II 9-29-92 1326 lobe C, Aqueous Sample Collection

10-7-92

10-7-92

10-7-92

10-7-92

Continued on Page 94

DR. Mervin Eyer 10-7-92

Signed

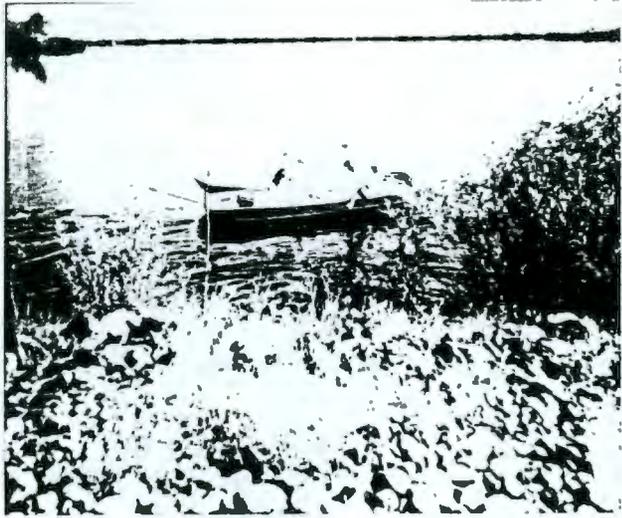
Date

Read and Understood By

COPY - FOR INFO ONLY

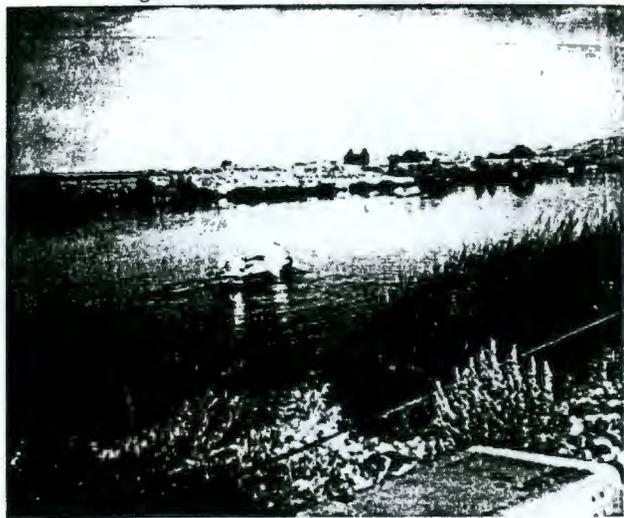
Signed

Date



9-30-92 NORTH WEST OF THE POND A LOBE B-Ponds Phase II

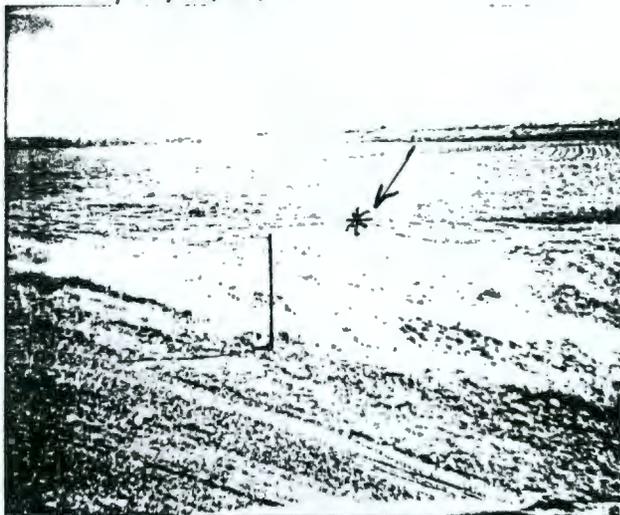
Sam Auen



9-30-92 3-Ponds, A Lobe LONB Phase II

306081, 82, 83, 84

NSW



9-30-92 B-LOBE B-PONDS SCA-AREA Phase II

Sam Auen

306080 - 3-LOBE POND B-Phase II



9-30-92 Outside SCA AREA Phase II

Sam Auen

Read and Understood By

CD Morrison Beyer 10-7-92

Signed

Date

COPY - FOR INFO ONLY

Signed

Date

Continued on Page none

RECORD COPY NOT FOR CIRCULATION FEB 27 1990 RECEIVED WMC BCSR DOCUMENT CONTROL	NOTEBOOK NUMBER		WHL-N-376-1	
	DATE OF ISSUE		2-27-90	
	SERIES AND COPY		— 1	
	TITLE (INDICATE SUBJECT CONTENT)			
216-B-3 Remedial Investigation Phase 3 Vadose Zone Soil Sampling				
AUTHOR(S) - DEPARTMENT AND SECTION				
T.W. Spicer				
Re-assigned to Richard Roos on 10/10/90 J.Wd				
PERIOD COVERED (INCLUSIVE - MONTH, DAY, YEAR)				
FROM TO				
IF CONTINUED FROM ANOTHER NOTEBOOK. GIVE NOTEBOOK NUMBER				
IF CONTINUED IN ANOTHER NOTEBOOK. GIVE NOTEBOOK NUMBER				
ROUTE TO	P. R. NO.	LOCATION	ROUTE DATE	SIGNATURE & DATE
T.W. Spicer	67599	SO-04	FEB 27 1990	J.W. Spicer 3/19/90
R.C. Roos	58230	H4-55	Oct. 10, 1990	

APPROVED FOR
 PUBLIC RELEASE
 V. Berkland
 6/19/95

2-5-91

Began morning with a Site Specific HWOP Pre-Job Safety meeting @ 0935. Meeting was conducted by MJ Hartney of KEH. Those attending were R.C. Roos, G.B. Gould, R.L. Jones JR, R.Z. Steffler, T.A. Gifford, S.A. Hodges, J.G. Hagan, T.B. Bruno attended. Thoroughly discussed the plan and answered all questions. The Fire dept and 200 East First Aid Station were notified of our location.

In late afternoon drills drove 10" casing to 3 ft deep. For further information refer to the Field activity report.

J.D. Fancher 2/5/91 J.D. Fancher.

~~JOY~~

Reference Document	WHC-SD-AP-016	Rev.	1	Date App.	9/5/89
Date	2/4/91	Site Location	B-Pond, A Lobe	Borehole	BH-3A1
Site Description	30' x 40' Gravel pad				
Weather	high clouds, cool	Temp.	30°F	Wind:	from the west. 5 mph
On site: Samplers	J.D. Fancher - Scientist; R.Z. Steffler - Technician				
On Site: Geologist	G.B. Gould	H & S	M.J. Hartney	Engineer	N/A
Borehole Log	1-01-2/CK1	Safety Log	KEH	Drill Act. Rpt. #	3

KEH delivered with basin to collect basin level water. Basins had a quantity of soil in them.

At 0945 Site Safety Officer had to leave for a meeting. Drill site was shut down until after lunch.

Next Page

~~JOY~~

2 2-6-91

Sample # B00FK5 Type Soil, Chemical Date 2-6-91
 Weather high clouds Temp 54°F wind 5 mph from W Time 1315
 Drill Int. 4.25-6.5 RCV 75% Type of Sample 5"OD Split Spool
 Mnu/OVA Reading NAB PH --- RAD. 30ET
 EII References 5.1, 5.2 App A/B, 5.11

Qty.	Size	Type	Analysis	Preservative
<u>2</u>	<u>250ml</u>	<u>Amber glass</u>	<u>PCDD, PCDF & plus Pesticides</u>	<u>Chill on Ice</u>
<u>1</u>	<u>120ml</u>	<u>Amber glass</u>	<u>As, Cd, Cr, Cu, Ni, Pb, Se, Si, S, Zn</u>	<u>Chill on Ice</u>
<u>2</u>	<u>120ml</u>	<u>Amber glass</u>	<u>Soil wa, Herbicide, Pesticide, PCB, Arochl, beta, gamma, Tritium</u>	<u>Chill on Ice</u>
<u>1</u>	<u>60ml</u>	<u>Amber glass</u>	<u>ICP metals As, Hg, Pb</u>	<u>Chill on Ice</u>
<u>2</u>	<u>40ml</u>	<u>Amber glass</u>	<u>VDA</u>	<u>Chill on Ice</u>

Field Observations Sent to K-25 Lab - Oak Ridge
 Potential Contamination none observed

Drillers Drove Casing and cleaned site prior to departure

Sampling Summary for 2-6-91
 Sample # B00FK5 Type Soil Sent To K-25

Net Type Wet Quantity 10 Lbs Condition Good - frozen
 Special request Signature Security + Overnight Delivery
 Labels Applied This Side UP, Address
 Surveyed by RPT T. B. Bruno Time 1320
 Relinquished Custody: to N/A Samples in Sampling Trailer Time N/A

Shipped To K-25 Oak Ridge Shipping Container Box #3 BL # ---
 Sampler Signature J. J. Fulk Date 2-6-91

END of Days Activities J.J. Fulk 2-6-91

Reference Document WAC-SD-AP-016 Rev. 1 Date App. 9/5/89 2-7-91
 Date 2-7-91 Site Location B-Pond A Lobe Borehole BH-3A1
 Site Description 30x40 gravel pad
 Weather Sunny, high clouds Temp. 41°F Wind: Calm Time 0930
 On site: Samplers J.D. Funcher - Scientist
 On Site: Geologist G.B. Gould H & S M.J. Hartney Engineer N/A
 Borehole Log BH-3A1 2-7-91 Safety Log KEH Drill Act. Rpt. # 4
 Sample # B00FK6 Type Soil, chemical Date 2-7-91
 Weather Sunny, high clouds Temp. 41°F Wind Calm Time 0842
 Drill Int. 4.95 - 5.0755 RCV 75% Type of Sampler 5' OD Split Spoon
 Hnu/OVA Reading NAB pH 7.6 Radiation LOT
 Ell References S.1, S.2 App B, S.11 Jan 27 1991

Qty.	Size	Type	Analysis	Preservative
2	40ml	Amber Glass	VOA	Chill on ICE
1	120ml	Amber Glass	Cross Alpha Beta, Gamma Scan	SR-90 Chill on ICE
1	120ml	Amber glass	Ammonium Arsenic, Co, Sulfide	Chill on ICE
1	60ml	Amber glass	As, Se, Pb, Tl, ICP Metals, Hg.	Chill on ICE
1	120ml	Amber glass	Herbicides Pesticides/PCB, Semi-VOA	Chill on ICE
1	250ml	Amber glass	Dioxin	Chill on ICE
1	250ml	Amber glass	Phos. Pesticides	Chill on ICE

Field Observations Sent to K-25 Oak Ridge

Potential Contamination welding on using

NOTE - Sample B00FK5 was not sent to the lab. After viewing the next sample it was determined B00FK5 was fill & not pond bottom.

next page

2-7-91 Sample # BOOFK7 Type Soil, chemical Date 2/7/91
 Weather Sunny, high clouds Temp 58°F Wind calm Time 1001
 Int 6.9 - 10.2 RCV 90% Type of sampler 5" OD Split Spore
 nu/OVA Reading NAB pH 7 Rad SDT
 References S.1, S.2 App. B, S.11

Qty.	Size	Type	Analysis	Preservative
2	40ml	Amber Glass	VOA	Chill on ICE
1	120ml	Amber Glass	Gross Alpha Beta, Gamma Scan, Sr-90	Chill on ICE
1	60ml	Amber Glass	As, Se, Pb, Tl, ICP metals, Hg.	Chill on ICE
1	120ml	Amber Glass	Ammonium, Anions, CN, Sulfide	Chill on ICE
1	120ml	Amber Glass	Herbicides, Pesticides/PCB, Semi-VOA	Chill on ICE
1	250ml	Amber Glass	Dioxin	Chill on ICE
1	250ml	Amber Glass	Phosphorus Pesticides	Chill on ICE

Field Observations

Sent to K-25 Lab - Oak Ridge

Potential Contamination None observed

Sample # BOOFK8 Type Soil (chemical) Date 2/7/91
 Weather Sunny, high clouds Temp 60°F Wind calm Time 1102
 Int 9.6 - 11.75' RCV 100% Type of sampler 5" OD Split Tube
 nu/OVA Reading NAB pH 7 Radiation SDT
 References S.1, S.2 App. B, S.11

Qty.	Size	Type	Analysis	Preservative
2	40ml	Amber Glass	VOA	Chill on ICE
1	120ml	Amber Glass	Gross Alpha Beta, Gamma Scan, Sr-90	Chill on ICE
1	60ml	Amber Glass	As, Se, Pb, Tl, ICP metals, Hg.	Chill on ICE
1	120ml	Amber Glass	Ammonium, Anions, CN, Sulfide	Chill on ICE
1	120ml	Amber Glass	Herbicides, Pesticides/PCB, Semi-VOA	Chill on ICE
1	250ml	Amber Glass	Dioxin	Chill on ICE
1	250ml	Amber Glass	Phosphorus Pesticides	Chill on ICE

Field Observations

Sent to K-25 Lab at Oak Ridge

Potential Contamination Potential contamination from filing of threads required to Remove Sampler Head. Hand Sampling. Filing was required for Removal, though bottom liners were used.

JDT
2/7/91

Sample # BOOFK9 Type Soil, Chemical Date 2/7/91
 Weather Sunny, high clouds Temp. 62°F Wind Calm Time 1350
 Drill Int. 11.8-17.0 RCV 100% Type of Sampler 5'OD - Split Spoon
 Hnu/OVA Reading NAP pH 7 Radiation <DT
 EII References S.1, S.2 App B, S.11

Qty.	Size	Type	Analysis	Preservative
2	40ml	Amber Glass	VOA	CHILL ON ICE
1	120ml	Amber Glass	Gross Alpha Beta, Gamma Scan, Sr-90	CHILL ON ICE
1	60ml	Amber Glass	As, Se, Pb, Tl, ICP metals, Hg	CHILL ON ICE
1	120ml	Amber Glass	Ammonium, Anions, Cu, Sulfide	CHILL ON ICE
1	120ml	Amber Glass	Herbicide, Pesticides/PCB, Semi VOA	CHILL ON ICE
1	250ml	Amber Glass	Dioxin	CHILL ON ICE
1	250ml	Amber Glass	Phosphorus Pesticides	CHILL ON ICE

Field Observations

Sent to K-25 Lab at Oak Ridge

Potential Contamination None observed

Sample # BOOFLO Type Soil, chemical Date 2/7/91
 Weather Sunny, high clouds Temp. 62°F Wind Calm Time 1420
 Drill Int. 13.5-15.7 RCV 75% Type of Sampler 5'OD split Spoon
 Hnu/OVA Reading NAB pH 7 Radiation <DT
 EII References S.1, S.2 App B, S.11

Qty.	Size	Type	Analysis	Preservative
2	40ml	Amber Glass	VOA	CHILL ON ICE
1	120ml	Amber Glass	Gross, Alpha Beta, Gamma Scan, Sr-90	CHILL ON ICE
1	60ml	Amber Glass	As, Se, Pb, Tl, ICP metals, Hg	CHILL ON ICE
1	120ml	Amber Glass	Ammonium, Anions, Cu, Sulfide	CHILL ON ICE
1	120ml	Amber Glass	Herbicide, Pesticides/PCB, Semi VOA	CHILL ON ICE
1	250ml	Amber Glass	Dioxin	CHILL ON ICE
1	250ml	Amber Glass	Phosphorus pesticides	CHILL ON ICE

Field Observations

Sent to K-25 Lab at Oak Ridge

Potential Contamination None observed

6

2-7-91

B-pond A-Lobe Drill Site, looking South

JD-7



2/7/91 1313hrs
JD-7
JD-7

JD-7



2/7/91 1314hrs
JD-7

B-pond A Lobe Drill Site Looking S.E.

2-8-91

Reference Document WHC-SD-AP-016 Rev. I Date App. 9-5-89
 Date 2-8-91 Site Location B-Pond A-lobe Borehole BH-3A1
 Site Description 30' x 40' gravel Pad on N. end of B-Pond
 Weather Sunny, High Clouds Temp. 30°F Wind: Calm Time 0700
 On site: Samplers B.E. Tunis, J.D. Foraker - Scientists
 On Site: Geologist G.B. Gould H & S M.J. Hartney (KEH) Engineer NIA
 Borehole Log BH-3A1 for 2-8-91 Safety Log KEH Drill Act. Rpt. # 5

Sample # BH-3A1 Type Soil, Chemical Date 2-8-91
 Weather Sunny, high clouds Temp. 42°F Wind Calm Time 1100
 Drill Int. 14.7-17.0' RCV 100% Type of Sampler: 5" OD. Split Spoon (stainless steel)
 Hnu/OVA Reading NAB μ R radiation <DT
 EII References 5.1, 5.2 app. B, 5.11

Qty.	Size	Type	Analysis	Preservative
2	40 ml.	Amber glass	VOA	Chilled on ice
1	120 ml.	Amber glass	Gross alpha, beta, gamma, Sr-90	Chilled on ice
1	60 ml.	Amber glass	As, Se, Pb, Hg, Tl, ICP metals	Chilled on ice
1	120 ml.	Amber glass	Ammonium, Anions, Cyanide, Sulfide	Chilled on ice
1	120 ml.	Amber glass	Herbicides, Pesticides, PCB, Semi-VOA	Chilled on ice
1	250 ml.	Amber glass	Dioxin	Chilled on ice
1	250 ml.	Amber glass	Phosphorous Pesticides	Chilled on ice

Field Observations Sent to K-25 lab - Oak Ridge Tennessee

Potential Contamination None observed.

PNL (Allen Pensor) arrived and logged the borehole.

2-8-91

Casing was Reduced and an attempt at Sampling was made from 20.45 to 20.7 ft. The Recovery was very poor. Hence no samples were collected. The Reduced casing size is now 8".

Bill Price + Hal Downey Visited the Site this Afternoon.

Ice: Type Wet Quantity 20 Lbs. Condition Frozen
 Special request Signature Security, Overnight Delivery
 Labels Applied This Side Up Address
 Surveyed by RPT T. B. Bruno @ Time 1100
 Relinquished Custody: to Not Relinquished @ Time N/A

Shipped To K-25 Oak Ridge Shipping Container Coder - RM #8 BL # 246453 8901
Brian E. Ennis 2-8-91
 Sampler Signature Brian E. Ennis Date 2-8-91

Samples were not shipped tonight. The samples were locked in the sampling trailer for the weekend.

	Sampling Summary for 2-8-91			
Sample #	Type	Analysis	Oak Ridge ← Lab	Interval
B00FL1	Chemical	Long List	OAK Ridge	14.7-17.0

END OF Day
 J. D. Farney B. E. Ennis
 Brian E. Ennis

NA

2-11-91

Reference Document WHC-SD-AP-016 Rev. 1 Date App. 9/5/89
 Date 2/1/91 Site Location B-Pond A Lobe Borehole BH-3A1
 Site Description 30' x 40' Gravel pad on N. shore of A Lobe
 Weather Foggy Temp. 37°F Wind: Calm Time 0729
 On site: Samplers Scientist - J.O. Fancher Technician J. Hagan
 On Site: Geologist G.B. Gould H & S M.J. Hartney Engineer R.C. Roop
 Borehole Log BH-3A for 2-11-91 Safety Log KEH Drill Act. Rpt. # 6

The Day began with a Tail Gate Safety meeting conducted by M.J. Hartney
 Drillers began installing 8" casing.

Sample # B0072 Type Soil, physical Date 2/1/91
 Weather Foggy Temp. 42°F Wind Calm Time 0945
 Drill Int. 20.4-23 RCV 100% Type of Sampler 6" Drive Barrel
 Hsu/OVA Reading NAB pH 7.5 Radiation <DT
 EII References S.1, S.2 App B, S.11

Qty.	Size	Type	Analysis	Preservative
1	1Lb Tin	Tin Can	Moisture Content	Seal in Tin
1	1Lb	Plastic Bag	Moisture Retention Curves	Seal Double bag
1	10Lb	Plastic Bag	Grain Size Analysis	Seal & Double bag

Field Observations Sample to be sent to ETAL. Sample will be held
in locked building pending HPT Release to ETAL.

Potential Contamination Welding on casing

Closed one Borehole

Sample # B00FL3 Type Soil, Chemical, Equip/Bank Date 2/11/91
 Weather Foggy Temp. 40° F Wind Calm Time 1024
 Drill Int. N/A RCV N/A Type of Sampler N/A
 Hnu/OVA Reading NAB pH N/A Radiation N/A
 EII References 5.1, 5.2 App B, 5.11

Qty.	Size	Type	Analysis	Preservative
2	40ml	Amber Glass	VOA	Chill on ICE
1	120ml	Amber Glass	Grav Alpha Beta, Gamma Scan, Sr-90	Chill on ICE
1	60ml	Amber Glass	As, Se, Pb, Tl, ICP metals, Hg	Chill on ICE
1	120ml	Amber Glass	Ammonium Anions, Cyanide, Sulfide	Chill on ICE
1	120ml	Amber Glass	Herbicides, Pesticides/PCB, Semi-VOA	Chill on ICE
1	250ml	Amber Glass	Dioxin	Chill on ICE
1	250ml	Amber Glass	Phosphorus Pesticides	Chill on ICE
Field Observations <u>Sent to Oak Ridge</u>				

Potential Contamination None Observed

Sample # B00FL4 Type Soil, Chemical Date 2/11/91
 Weather Foggy Temp. 40° F Wind Calm Time 1107
 Drill Int. 26.4-29.3 RCV 100% Type of Sampler 5" OD Split Spool
 Hnu/OVA Reading NAB pH 7 Radiation <DT
 EII References 5.1, 5.2 App B, 5.11

Qty.	Size	Type	Analysis	Preservative
2	40ml	Amber Glass	VOA	Chill on ICE
1	120ml	Amber Glass	Grav Alpha Beta, Gamma Scan, Sr-90	Chill on ICE
1	60ml	Amber Glass	As, Se, Pb, Tl, ICP metals, Hg	Chill on ICE
1	120ml	Amber Glass	Ammonium Anions, Cu, Sulfide	Chill on ICE
1	120ml	Amber Glass	Herbicides, Pesticides/PCB, Semi-VOA	Chill on ICE
1	250ml	Amber Glass	Phos. pesticides	Chill on ICE
Field Observations <u>Sent to Oak Ridge</u>				

Potential Contamination welding on casing

2-11-91

Sample # BOOGR 9 Type Soil Chemical, Duplicate Date 2/11/91
 Weather Foggy Temp. 40° F Wind Caln Time 1124
 Drill Int. 26.4-27.3 RCV 100% Type of Sampler 5" 60 Split Spoon
 Hnu/OVA Reading NAB pH 7 Radiation <DT
 EII References 5.1, 5.2 App B, 5.11

Qty.	Size	Type	Analysis	Preservative
<u>2</u>	<u>40</u>	<u>Amber Glass</u>	<u>VDA</u>	<u>Chill on ICE</u>
<u>1</u>	<u>120 ml</u>	<u>Amber Glass</u>	<u>Group Alpha, Beta, Gamma Scan, Sr-90</u>	<u>Chill on ICE</u>
<u>1</u>	<u>60 ml</u>	<u>Amber Glass</u>	<u>As, Se, Pb, Tl, ICP metals, Hg</u>	<u>Chill on ICE</u>
<u>1</u>	<u>120 ml</u>	<u>Amber Glass</u>	<u>Ammonium, Arsenic, Sulfide</u>	<u>Chill on ICE</u>
<u>1</u>	<u>120 ml</u>	<u>Amber Glass</u>	<u>Herbicides, Pesticides/PCB, Sem-VDA</u>	<u>Chill on ICE</u>
<u>1</u>	<u>250 ml</u>	<u>Amber Glass</u>	<u>Phos. Pesticides</u>	<u>Chill on ICE</u>

Field Observations Sent to Oak Ridge

Potential Contamination Welding on casing

This sample is a Duplicate of BOOFLY, The Time is marked different, but actual collection time is identical.

Drove casing, cleanup & break for lunch.

Sample # BOOGSD Type Chemical, soil Date 2-11-91
 Weather Cloudy Temp. 39° F Wind 2-4 mph from SE Time 1349
 Drill Int. 32.5'-32.6' RCV 75% Type of Sampler 5" O.D. Split tube (spoon)
 Hnu/OVA Reading NAB pH 7.5 Radiation <DT
 EII References 5.1, 5.2 App B, 5.11

Qty.	Size	Type	Analysis	Preservative
<u>1</u>	<u>120 ml</u>	<u>Amber Glass</u>	<u>Alpha Gamma Beta Scan</u>	<u>Chill on ICE</u>
<u>1</u>	<u>60 ml</u>	<u>Amber Glass</u>	<u>ICP metals As, Hg, Pb</u>	<u>Chill on ICE</u>
<u>1</u>	<u>120 ml</u>	<u>Amber Glass</u>	<u>NH₄, Arsenic</u>	<u>Chill on ICE</u>

Field Observations Ship to Oak Ridge

Potential Contamination None Detected

NA

Ice: Type Wet Quantity 10 Lbs Condition Frozen
 Special request Signature Security Overnight Delivery
 Labels Applied Evidence Tape Survey for shipment
 Surveyed by RPT. C. Radford @ Time N/A
 Relinquished Custody: to Not Relinquished @ Time N/A

Shipped To	Shipping Container	BL #
<u>ETAL onsite Lab</u>	<u>hold for RPT Release in lab/bldg</u>	<u>N/A</u>
<u>Oak Ridge</u>	<u>Poly Cooler</u>	<u>2467538923</u>

[Signature] 2-11-91
 Sampler Signature Date

Sampling Summary for 2/11/91

Sample #	Interval	Type	Analysis	Lab
B00FL2	20.4-23	Soil	sox Long Physical	ETAL
B00FL3	N/A	Equip Blank	Chem-Long list	Oak Ridge
B00FL4	26.4-29.3	Soil	Chem-Long list	Oak Ridge
B00GR9	26.4-29.3	Soil-Duplicate	Chem-Long list	Oak Ridge
B00G50	30.5-32.6	Soil	Chem-Short list	Oak Ridge

} duplicate

NA

Sample # B00FS1 Type Soil, Chemical Date 2/10/91
 Weather Cloudy Temp. 42°F Wind 2 mph from NW Time 1122
 Drill Int. 35.55-37.71 RCV 100% Type of Sampler 5" ID Split Tube
 Hnu/OVA Reading NAB pH 7 Radiation <DT
 EII References S.1, S.2 App B, S.11

Qty.	Size	Type	Analysis	Preservative
1	120ml	Amber glass	Gross Alpha, Gross beta	Chill on ICE
1	60ml	Amber glass	ICP metals, As, Hg, Pb	Chill on ICE
1	120ml	Amber glass	NH4, Anions	Chill on ICE

Field Observations Sam to K-25 Lab at Oak Ridge

Potential Contamination Building on casing

Used drive barrel to deepen borehole, then broke for lunch

Sample # _____ Type _____ Date _____
 Weather _____ Temp. _____ Wind _____ Time _____
 Drill Int. _____ RCV _____ Type of Sampler _____
 Hnu/OVA Reading _____ pH _____ Radiation _____
 EII References _____

Qty.	Size	Type	Analysis	Preservative
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

Field Observations _____

Potential Contamination _____

2-13-91

Reference Document HHC-SD-AP-016 Rev. 1 Date App. 9-5-89
 Date 2-13-91 Site Location B-Pond A-lobe Borehole BH-3A1
 Site Description 30'x40' Gravel Pad on N. shore of B^A A-lobe
 Weather Cloudy, light rain Temp. 35°F Wind: 3-5 mph from NW Time 0730
 On site: Samplers B.E. Innis, J. Hogan (Tech.)
 On Site: Geologist G.B. Gould H & S M. Hartney (KEH) Engineer R.C. Roos
 Borehole Log BH-3A1 Safety Log KEH Drill Act. Rpt. # 8

Sample # B00GS2 Type Soil, Chemical Date 2-13-91
 Weather Cloudy Temp. 35°F Wind 3 mph NW Time ~~0830~~ 0825
 Drill Int. 40.4'-43.25' RCV 100% Type of Sampler 5" O.D. Stainless steel split spoon
 Hnu/OVA Reading NAB pH 7 Radiation <DT
 EII References 5.1, 5.2 App B, 5.11

Qty.	Size	Type	Analysis	Preservative
<u>1</u>	<u>120 ml.</u>	<u>Amber glass</u>	<u>Gross alpha, beta</u>	<u>Chill on ice</u>
<u>1</u>	<u>60 ml.</u>	<u>Amber glass</u>	<u>ICP metals As, Hg, Pb</u>	<u>chill on ice</u>
<u>1</u>	<u>120 ml.</u>	<u>Amber glass</u>	<u>NA₄, Anions</u>	<u>chill on ice</u>
<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>

Field Observations Sent to K-25 lab at Oak Ridge

Potential Contamination None observed

Sample # B00653 Type Soil, Chemical Date 2-13-91
 Weather Cloudy Temp. 46°F Wind 3 mph W. Time 1010
 Drill Int: 45.45-48.00 RCV 10070 Type of Sampler 5" O.D. Stainless steel Split Spoon
 Hnu/OVA Reading NAB pH 7 Radiation LDT
 EII References S.1, S.2 App. B, S.11

Qty.	Size	Type	Analysis	Preservative
<u>1</u>	<u>120 ml</u>	<u>Amber glass</u>	<u>gross alpha, beta</u>	<u>Chilled on ice</u>
<u>1</u>	<u>60 ml</u>	<u>Amber glass</u>	<u>ICP Metals, As, Hg, Pb</u>	<u>Chilled on ice</u>
<u>1</u>	<u>120 ml</u>	<u>Amber glass</u>	<u>NH₄, Anions</u>	<u>Chilled on ice</u>
<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>

Field Observations Sent to the K-25 lab at Oak Ridge.

Potential Contamination None observed.

Ice: Type Wet Quantity 10 lbs. Condition Frozen
 Special request Signature Security Service, Overnight Delivery
 Labels Applied Survey for shipment stickers
 Surveyed by RPT T. Burns @ time 1445
 Relinquished Custody: to G.B. Gould @ time 1530

Shipped To	Shipping Container	BL #
<u>Oak Ridge</u>	<u>/</u>	<u>/</u>

B.E. Lewis Sampler Signature 2-13-91 Date

Sampling Summary

Sample #	Interval	Type	Analysis	Lab
<u>B00652</u>	<u>40.4-43.25'</u>	<u>Soil, chemical</u>	<u>short list</u>	<u>Oak Ridge</u>
<u>B00653</u>	<u>45.45-48.00'</u>	<u>Soil, chemical</u>	<u>short list</u>	<u>Oak Ridge</u>

End of Shift B.E. Lewis

B Pond, A Lobe (BH-3A1)

February 14, 1991

reference Document WUC-CD-AP-016 Rev. 1 Date App. 9/5/89
 Date 2/14/91 Site Location B Pond, A Lobe Borehole BH-3A1
 Site Description 30'x40' GRAVEL PAD ON N. SHORE OF ALOBE.
 Weather overcast Temp. 44°F Wind: 3-5 mph, west Time 0800
 On site: Samplers J.G. HOGAN, W.D. THOMPSON, R. TOOS.
 On Site: Geologist G.B. GOULD H & S M. Hartney Engineer N/A
 Borehole Log BH-3A1 Safety Log KEM Drill Act. Rpt. # 9

0730 Site Safety meeting was held prior to beginning operations for the day. The SSO, discussed the ^{hand} signals used in the zone with the field team.

0800 Getting ready to split spoon sample.

Sample # BOOGS4 Type soil, Chemical Date 2/14/91
 Weather overcast Temp. 44°F Wind 3-5 mph, west Time 0825
 Drill Int. 51.13 - 54.10 RCV 100% Type of Sampler 5" O.D. SPLIT SPOON
 Hnu/OVA Reading NAB pH 6.6 Radiation <DT.
 EII References WUC-CM-7-7; EII 5.1, 5.2, APP.B, 5.4, 5.5; 5.11

I-chemical #
 B0206033
 0015013
 8295123
 0015013
 0015013
 9230013

Qty.	Size	Type	Analysis	Preservative
2	40ml.	AMBER GLASS	VOA	Chill on ice
1	120ml.	AMBER GLASS	Gras ALPHA, Beta, Gamma SR-40;	Chill on ice
1	60ml.	AMBER GLASS	As, Se, Pb, TL, Hg, FC Metals;	Chill on ice
1	120ml.	AMBER GLASS	Ammonium, Anions, CN, Sulfide;	Chill on ice
1	120ml.	AMBER GLASS	Herbicides; Pesticides/PCB;	semi-voa; Chill on ice
1	250ml.	amber glass	Phosphorous Pesticides	Chill on ice

Field Observations This sample was collected from the bottom two line on the split spoon (75% clay material - top 25% silt-pepper sand) - the top two liners were collected for a physical sample (see geologists).

Potential Contamination none observed during sampling.
This sample was split and a sample collected for ^{internal} use. OAK RIDGE +
 WST 2/14/91 FOR WEST

at the direction of Mr. Rick and Toos.
 Sample # BOOGS4 goes to OAK RIDGE

W.D. Thompson

BH-3A1

Sample # B00G55 Type Soil ^{split} chem. Date 2/14/91
 Weather overcast Temp. 44°F Wind 3-5 mph west Time 0825
 Drill Int. 51.13-54.10 RCV 100% Type of Sampler 5" O.D. ss split spoon
 Hnu/OVA Reading NAB pH 6.2 Radiation <DT
 EII References WUC-CM-7-7; EII 5.1; 5.2 APP B

I-Chem lot #'s	Qty.	Size	Type	Analysis	Preservative
B0206033	2	40ml.	amber glass	VOA;	chill on ice
8134523	1	500ml	clear glass	gross alpha; gross beta; gamma scan; Sr-90	chill on ice
0015013	1	120ml	amber glass	A metals (As, Se, Pb, Th); ICP metal;	H ₂ Cyande; chill on wet ice
9230013	1	250ml.	amber glass with ^{under glass with} pesticides	pesticides; semi-VOA	chill on wet ice

Field Observations This sample was retrieved from the bottom 2 liners. The VOA's were collected after liner removed into bowl & then soil homogenized. The soil was then VOAs after so. collected
 Potential Contamination None observed. This sample is to be delivered to Weston LAB at the direction of Richard Roos.

actual drilled (51.13-54.10) 51.63-52.13 ^{WST 2/14/91}
 Sample # B00G56 Type Soil ^{Bulk density + eff. por. hydraulic conductivity} hydraulic Date 2/14/90
 Weather overcast Temp. 44°F Wind 3-5 mph west Time 0825
 Drill Int. 51.13-54.10 RCV 100% Type of Sampler 5" O.D. ss split spoon
 Hnu/OVA Reading NAB pH 6.2 Radiation L.D.T.
 EII References WUC-CM-7-7; EII 5.1; 5.2 APP B

Qty.	Size	Type	Analysis	Preservative
1	4x6" ss.	liner; bagged	Hydraulic cond.	ETAL02
			Bulk density	ETAL16
			effective porosity	
1	≈ 4lb	bag; soil	GRAIN SIZE	ETAL07
1	≈ 8oz	moisture tin; soil	Moisture content	ETAL14

Field Observations sample was the ^{1st} 3rd liner from the bottom of the sampler. The material was a salt & pepper sand just above the clay sample - chem. sample # B00G55 + B00G54
 Potential Contamination None observed. Sample will be delivered to Z101M physical prop. lab

H. S. Thompson

BH-3A1

2/14/91

Sample # BOOGS7 Type Soil, physical Date 2/14/91
 Weather overcast Temp. 50°F Wind 3-5 mph, west Time 0930
 Drill Int. 53.0-55.6 RCV 100% Type of Sampler 5" O.D. Split Spoon
 Hnu/OVA Reading NAB pH 7.5 Radiation <DT
 EII References W40-CM-7-7; 5.1; 5.2 APPB;

Qty.	Size	Type	Effect. porosity	Analysis	Preservative
1	4x6" liner	Bulk Density		Hyd. Cond; ETAL16 + ETAL02	sealed in <u>left</u> on tape on wet ends/endcaps, bagged
1	8oz tin	Moisture Content		ETAL14	Sealed in tin + double bagged
1	5/16 bag	Grain Size Analysis		ETAL07	double plastic bag
1	≈ 1 lb bag	Soil Moisture Retention		Curves; ETAL17	double plastic bagged

Field Observations All samples taken from one split spoon, bagged and then bagged again in one bag and sent to the Physical Properties Laboratory unconditional release by HPT's.
 Potential Contamination Samples locked in Bldg on site until HPT release. no contamination observed

Sample # BOOGS8 Type Soil Chemical Date 2/14/91
 Weather overcast Temp. 50°F Wind 3-5 mph west Time 1110
 Drill Int. 56-58.4 RCV 100% Type of Sampler 5" O.D. SS split spoon
 Hnu/OVA Reading NAB pH 7.5 Radiation <DT
 EII References W40-CM-7-7; EII 5.1, 5.2 APPB; 5.4; 5.5; 5.11

Qty.	Size	Type	Analysis	Preservative
0015013	120ml	amber glass	Gross Alpha; Gross Beta	Chill on ice
8295123	60ml	amber glass	ICP metals; As; Hg; Pb	Chill on wet ice
0015013	120ml	amber glass	NH ₄ ; Anions	Chill on wet ice

Field Observations The sample was collected from the bottom two liners. The soil was homogenized and then the sample was containerized. The sample will be sent to OAR Ridge for analysis.
 Potential Contamination None observed during this sampling event.

H. S. Thompson

February 15, 1991

BH-3A1

Reference Document WMC-SD-AP-016 Rev. 1 Date App. 9/5/89
 Date 2/15/91 Site Location B-Pond, A lobe Borehole BH-3A1
 Site Description 30'x40' GRAVEL PAD ON NORTH SHORE OF A LOBE
 Weather overcast, drizzly Temp. 47°F Wind: 3-5mph;WSW Time 0730
 On site: Samplers W. S. THOMPSON
 On Site: Geologists B.B. GOULD h & S M. HARTNEY Engineer N/A
 Borehole Log BH-3A1 Safety Log KEH Drill Act. Rpt. # 10

A SITE SAFETY MEETING WAS HELD AT 0730. Pinch points on the rig were discussed. Casing welded on and borehole cleaned out for this upcoming sample.

Sample # B00659 Type SOIL, CHEMICAL Date 2/15/91
 Weather overcast Temp. 47°F Wind 3-5mph. wsw Time 0930
 Drill Int. 65.35-67.6 RCV 95% Type of Sampler 5" O.D. SS SPLIT SPOON
 Hnu/OVA Reading NAB pH 6.5 Radiation LDT
 EII References WMC-CM-7-7; EII 5.1, 5.2 A&B; 5.4, 5.5, 5.11

Lot # 5
 I - Chem bottles

	Qty.	Size	Type	Analysis	Preservative
	2	40ml.	AMBER GLASS	VOA	CHILL ON WET ICE
9079163	1	120ml.	AMBER GLASS	Gross Alpha Gross Beta	Gamma Scan Sr-90 CHILL ON WET ICE
8295123	1	60ml.	Amber Glass	ICP Metals, As, Se, Pb, Th, U	CHILL ON WET ICE
9079163	1	120ml.	Amber Glass	NH ₄ , Arsenic, CN, Sulfide	Chill on wet ice
9079163	1	120ml	Amber GLASS	HERB; PESTICIDES; PCB; SemivOA	Chill on wet ice
9230013	1	250ml.	Amber GLASS	Drugs/Pesticides	Chill on wet ice

Field Observations no hazards indicated by field instruments. The sample was collected from the bottom 2 liners Top 2 liners discarded. The VOA's were collected and then soil homogenized for remaining sample containerization.
 Potential Contamination no contamination observed.

This sample # B00659 is being shipped to Oak Ridge after unconditional release from Health Physics.

N/A

Wendy S. Thompson

February 15, 1991

BH-3A1

Sample # B006T0 Type Soil, physical Date 2/15/91
 Weather overcast Temp. 51°F Wind 3 mph, wsw Time 1025
 Drill Int. 67.5-69.65 RCV 85% Type of Sampler 5" O. D. Split Spoon
 Hnu/OVA Reading NAB pH 7.7 Radiation 4DT
 EII References WHC-CN-7-7, EII 5.2, APP. K, 5.1

Qty.	Size	Type	Analysis	ETAL16	Preservative	ETAL02
1	4x6" liner	soil, Bulk Density	Effect. Procs.	Hydraulic Cond.	sealed liner	
			N/A			

Field Observations The second from the bottom liner was teflon (finer material) Taped and sealed with end caps for analysis at ZI01M Lab (Enviro. Lab. Application Lab). There was a lithology change in the top liners. Two top liners were split in 2/15/91. Top liners seal 2/15/91.
 Potential Contamination pepper sand, bottom liners, brown fine silty sand. (Quick lithology change)
 No contamination observed.

Ice: Type wet Quantity 25# per cooler Condition dry
 Special request overnight delivery to Weston; Saturday delivery to OAK RIDGE
 Labels Applied Signature security service
 Surveyed by RPT Janis Bruce @ Time 1145
 Relinquished Custody: to not relinquished @ Time at NA wst 2/15/91

Shipped To	Shipping Container	BL #
<u>OAK RIDGE</u>	<u>Box #3 POLYCOOLER</u>	<u>2464 539044</u>
<u>WESTON</u>	<u>EPSILON-2 POLYCOOLER</u>	<u>2464539033</u>

Kendy J. Thompson Sampler Signature
2/15/91 Date

SAMPLE SUMMARY FOR FEB. 15, 1991

Sample #	TYPE	ANALYSIS	LAB
<u>2/15/91 B00659 (67.35-67.45)</u>	<u>SOIL, Chemical.</u>	<u>Long list</u>	<u>OAK RIDGE</u>
<u>wst B006T0 (67.5-69.65) 2/15/91</u>	<u>Soil, physical</u>	<u>ETAL16; ETAL02</u>	<u>ZI01M</u>

2/15/91

Feb 15, 1991

SHIPPING SUMMARY FOR 2/15/91

<u>SAMPLE#</u>	<u>Type</u>	<u>Destination</u>	<u>WUC#</u>	<u>date shipped</u>
B00G55	Chemical (Split)	Weston	W91-0-0159#4 Car	2/15/91
B00G52	Chemical	Oak Ridge	W91-0-0159#5	2/15/91
B00G53	chemical	Oak Ridge	W91-0-0159#5	2/15/91
B00G54	chemical	Oak Ridge	W91-0-0159#5	2/15/91
B00G58	Chemical	Oak Ridge	W91-0-0159#5	2/15/91

On Feb 15, 1991, two coolers were shipped. One cooler to Oak Ridge with Saturday delivery. OSM was notified to arrange lab pickup readiness. A Blewitt said he would call OSM & make necessary arrangements.

A second cooler, containing one split sample was sent to Weston lab at the request of Mr. Richard Ross. OSM didn't want to ship yet because contract was not yet final & in place - but would be shortly. Ross directed personnel to ship the sample. OSM was notified the sample was shipped on 2/15/91. Will be at the lab Monday. OSM said the lab would not run the sample until contract was in place, but would hold it there until contract authorized. (OSM suggested the sample be held in the field under security till contract in place.)

Copies of paperwork were faxed to OSM, for their required information.

End of Day
2/15/91

Kendy J. Thompson

2-19-91

~~2-18-91~~

2-19-91

Reference Document LWH-SD-AP-016 Rev. 1 Date App. 9/5/89
 Date 2/15/91 Site Location B-Pond A lobe Borehole BH-3A1
 Site Description 30x40 Gravel pad on North Shore of A lobe
 Weather high clouds windy Temp. 50° F Wind: 15 mph from the south Time 0740
 On site: Samplers Scientist: J. D. Fancher
 On Site: Geologist C. B. Gohl H & S M. J. Hartney Engineer R. C. Ross
 Borehole Log BH-3A1 Feb 15/91 Safety Log KEH Drill Act. Rpt. # 1

Sample # BOGST1 Type Soil, Chemical Date 2/19/91
 Weather windy, cloudy Temp 60°F Wind 11 mph from S Time 1102
 Drill Int. 75.7-77.9 RCV 100% Type of Sampler 5" OD Split Tube
 Hnu/OVA Reading NAB pH _____ Radiation <DT
 EII References S.2 App B, S.1, S.11

2-19-91
~~2-18-91~~

Qty.	Size	Type	Analysis	Preservative
1	120ml	Amber Glass	alpha & Beta	Chill on ICE
1	60ml	Amber Glass	ICP metals, As, Hg, Pb	Chill on ICE
1	120ml	Amber Glass	Arsonic Ammonium	Chill on ICE

Field Observations Send to Outridge. During Above Cleanup hard to get channel to stay in drive barrel. Very moist

Potential Contamination None observed

Sample # BOGST2 Type Soil-physical Date 2/19/91
 Weather windy, cloudy Temp 60°F Wind 11 mph from S Time 1102
 Drill Int. 75.7-77.9 RCV 100% Type of Sampler 5" OD Split Tube
 Hnu/OVA Reading NAB pH _____ Radiation <DT
 EII References S.1, S.2 App B, S.11

Qty.	Size	Type	Analysis	Preservative
1	1 lb	Tin	Moisture - ETAL 14	Seal in Tin
1	1 lb	plastic bag	Moisture Retention ETAL 17	Seal in Bag
1	4 lb	Plastic bag	Grain Size ETAL 07	Seal in Bag

Field Observations Hold pending HP release.

Potential Contamination sluff from above - in drive barrel

After Lunch casing was driven & borehole extended to approx 80 ft. no further samples were collected.

2-19-91

Sampling Summary

Sample #	Interval	Analysis	Lab
BOOGT 1	75.7-77.9	Short List	Oak Ridge
BOOGT 2	75.7-77.9	ETAL 7, 14, 17	ETAL @ 2101 M

Oak Ridge Samples were maintained under chain of custody in the Sampling Trailer overnight pending HP release.
 ETAL Samples were maintained under chain of custody in the Sample Storage building pending HP release.

Shipping Summary for 2-19-91

Sample #	Type	Destination	WAC #	Date Shipped
BOOGS9	chemical	Oak Ridge	W91-0776	2-19-91

After Sample Release Samples were transported to WAC shipping for off site shipment to the Lab.
END OF DAY J.D. Fancher 2-19-91

2-20-91

Reference Document: WIK-SD-AP-EN-016 Rev. 1 Date App. 9/5/89
 Date 2-20-91 Site Location B-pond - A-Lobe Borehole BH-3A1
 Site Description 30x40 Gravel Pond on North Shore of A-Lobe
 Weather high clouds Temp. 50°F Wind: 2 mph from E Time 0849
 On site: Samplers Scientist J.D. Fancher Tech J. Hagan
 On Site: Geologist G.B. Gould H & S M. Hartney Engineer N/A
 Borehole Log BH-3A1 Safety Log KEH Drill Act. Rpt. # 12

M.J. Hartney conducted Tailgate Meeting.
 PNL on Site Logging Borehole.

2-20-91

Sample # BOOGT 3 Type Sand-Equip Blank Date 2-20-91
 Weather high clouds Temp. 50°F Wind 2 mph from E Time 09:50
 Drill Int. N/A RCV N/A Type of Sampler S'OP Split Tube
 Hnu/OVA Reading N/A pH N/A Radiation N/A
 Ell References S.1, S.2 App B, S.11

Qty.	Size	Type	Analysis	Preservative
1	120 ml	Amber Glass	Alpha/Beta	Chill on ICE
1	60 ml	Amber Glass	ICP metals, As, Hg, Pb	Chill on ICE
1	120 ml	Amber Glass	NH ₄ Anions	Chill on ICE

Field Observations Sand Equipment blank, poured thru Liner, Shoe, Bucket, Rin into SS bowl & immediately transferred to I-Chem bottles.

Potential Contamination None observed

Ice Type Wet Quantity 20 lbs. Condition Frozen
 Special request Overnight Delivery, Signature Security Service
 Labels Applied Packed in Wet ICE This Side up
 Surveyed by RPT T. Bruno @ Time 1145
 Relinquished Custody: to Signal Col & Sealed in cooler @ Time 1130

Shipped To Oak Ridge Shipping Container Box 6 Igloo poly Cooler BL # 2464539669

J.D. Family 2-20-91
 Sampler Signature Date

Sample # BOOGT 3 Type Sand - Equip blank Sampling Summary Analysis Short List Lab Oak Ridge

Sample # BOOGT 1 Type Chemical Shipping Destination Oak Ridge WAC # W91-0178 CG Date Shipped 2/20/91
BOOGT 2 Type Chemical-Equip Blank Shipping Destination Oak Ridge WAC # W91-0178 CG Date Shipped 2/20/91

END OF SHIFT
J.D. Family

2-21-91

Reference Document WAC-50-AP-EN-016 Rev. 1 Date App. 9/5/89
 Date 2-21-91 Site Location A-Lake, North Shore-Broad Borehole BH-3A1
 Site Description 20x30 Gravel Pail
 Weather High clouds Temp. 33°F Wind Calm Time 0730
 On site: Samplers Scientist: J.D. Funder
 On Site: Geologist R. C. Ross H&S M.J. Hartney Engineer N/A
 Borehole Log BA-3A1 Safety Log. KEH Drill Act. Rpt. # 13

M.J. Hartney conducted Tail-gate meeting. Topic - Emergency Communications, Phone #'s etc.
 R. C. Ross on site.
 Drilling (drive barrel) began

Sample # BOGT 4 Type Soil, Chemical Date 2/21/91
 Weather High clouds Temp. 42°F Wind Calm Time 0900
 Drill Int. 841-8668 - RCV 100% Type of Sampler 5" DD Soft Spoon
 Hnu/OVA Reading NAD pH 7 Radiation N/A
 EIL References S.I. S2 App B, S.11

Qty.	Size	Type	Analysis	Preservative
1	120ml	Amber Glass	Alpha & Beta	Chill on ICE
1	60ml	Amber Glass	ICP metals As, Hg, Pb	Chill on ICE
1	120ml	Amber Glass	Anions, Ammonium	Chill on ICE

Field Observations 2-107 Drive barrel, then split spoon sampled
Sent to Oak Ridge. From Bottom 2 liters

Potential Contamination None Observed

All samples are containerized in I-chem clamp bottles

2/21/91

Sample # BOGTS Type Soil, Chemical, Replicate Date 2/21/91
 Weather High clouds Temp. 42° F Wind Calm Time 0900 ← actual
 Drill Int. 84.1-86.64 RCV 100 Type of Sampler 5' 00" Split Spoon
 Hnu/OVA Reading NAB pH 7 Radiation N/A
 EII References S.1, S.2 App B, S.11

Qty.	Size	Type	Analysis	Preservative
1	120ml	Amber Glass	Alpha/Beta	Chill on ICE
1	60ml	Amber Glass	IC metals, As, Hg, Pb	Chill on ICE
1	120ml	Amber Glass	As, Hg, Pb, Ni	Chill on ICE

Field Observations This is a replicate of BOGTS. Both samples were collected from the same Homogenized Bowl. Chain of Custody Time listed as 0945.

Potential Contamination None Observed

Sample # BOG6 Type Soil, Chemical, inter-lab split Date 2/21/91
 Weather High clouds Temp. 42° F Wind Calm Time 0900
 Drill Int. 84.1-86.64 RCV 100 Type of Sampler 5' 00" Split Spoon
 Hnu/OVA Reading NAB pH 7 Radiation N/A
 EII References S.1, S.2 App B, S.11

Qty.	Size	Type	Analysis	Preservative
1	120ml	Amber Glass	As, Pb, IC metals, Hg	Chill on ICE
1	500ml	Clear Glass	Alpha, Beta	Chill on ICE

Field Observations This sample is a inter-lab split collected from the same Homogenized Bowl as BOG4 and BOG5. Sent to Weston.

Potential Contamination None Observed

Draw cassy & clean out & draw out clean out prior to sampling

2/21/91

Sample # BOOGT 7 Type Soil, Chemical Date 2/21/91
 Weather high clouds Temp. 54°F Wind Calm Time 1320
 Drill Int. 95.7-96.3 RCV 50' Type of Sampler 5' on Split Spoon
 Hnu/OVA Reading NAB pH 7 Radiation N/A
 EII References S.1; S.2 ApB S.11

Qty.	Size	Type	Analysis	Preservative
2	40ml	Amber Glass	VOA	Chill on ICE
1	120ml	Amber Glass	Alpha Beta Gamma, Sr-90	Chill on ICE
1	60ml	Amber Glass	As, S, Pb, Tl, ICP metals, H ₂	Chill on ICE
1	120ml	Amber Glass	Ammonium, Anions, Cu, Sulfide	Chill on ICE
1	120ml	Amber Glass	Herbicide, Pesticides/PCB, SemiVOA	Chill on ICE
1	250ml	Amber Glass	Dioxin, plus Pest	Chill on ICE

Field Observations Slightly different lithology - refer to Geologic log.
Sample to be sent to Oak Ridge

Potential Contamination None observed

Ice: Type Wet Quantity 10 lbs. Condition Frozen
 Special request Overnight Delivery, Signature Security Service
 Labels Applied Packed in wet ICE, This Side Up
 Surveyed by RPT N/A @ Time N/A
 Relinquished Custody to not returning soil stored in Trailer @ Time N/A

Shipped To Oak Ridge Shipping Container Weston BL # _____
J. D. Family 2-21-91
 Sampler Signature Date

SAMPLING SUMMARY

Sample #	Type	Analysis	LAB
BOOGT 4	Soil-chem	Short List	Oak Ridge - Repture
BOOGT 5	Soil-chem	Short List	Oak Ridge
BOOGT 6	Soil-chem	Short List	Weston - Lab Split
BOOGT 7	Soil-chem	Long List	Oak Ridge

END OF Day
 J. D. Family

2-22-91

Reference Document WHC-SD-EN-AP-016 Rev. 1 Date App. 9-5-89
 Date 2-22-91 Site Location B-POND A Lobe Borehole BH-3-A
 Site Description 20x30 Gravel Pad on N. Shore A Lobe
 Weather High cloudy Temp: 57°F Wind: 2 mph from SW Time 0730
 On site: Samplers Scientist: J.D. Fambor
 On Site: Geologist G.B. Sault H & S Ms. Hartney Engineer N/A
 Borehole Log BH-3A1 Safety Log KEH Drill Act. Rpt. # 17

SSO M.J. Hartney conducted tailgate meeting, topic: Action levels for organic vapors detected.

Drillers began drive burrowing & Driving casing
 Drilling was hard.
 Apparent lithologic change. Refer to Geologic log

Sample # B00578 Type Soil, Chemical Date 2-22-91
 Weather Sunny Temp. 51° F Wind Calm Time 1050
 Drill Int. 101.6-102.2 RCY 100% Type of Sampler 5" OD
 Humidity Reading N/A pH Radiation N/A
 El References 5.1 5.2 Appendix, 5.11

Qty.	Size	Type	Analysis	Preservative
1	120ml	Amber Glass	Alpha, Beta	Chill on ICE
1	60ml	Amber Glass	Alpha, Beta, ^{Fe} metals, ^{As, Hg, Pb}	Chill on ICE
1	120ml	Amber Glass	Alpha, Beta, ^{NH4, Arsenic}	Chill on ICE

Field Observations Hard drilling, dry sample media. Sent to Oak Ridge

Potential Contamination Welding on casing

All Samples containerized in pre-cleaned F-chem bottles.

2-22-91

Ice: Type Wet Quantity 20Lbs Condition Frozen
 Special request Amighty Drilling, Signature Security Service
 Labels Applied Packed in wet ICE, this end up
 Surveyed by RPT N/A @ Time N/A
 Relinquished Custody: to Not Relinquished @ Time N/A

Shipped To Oak Ridge Shipping Container Poly cooler BL # ETAL
ETAL N/A NA

J.D. Fry 2/22/91
 Sampler Signature Date

Sample #	Interval	Sampling Type	Summary Analysis	Lab
B00GT8	101.6-102.2	Soil, Chem	Shot List	Oak Ridge
B00GT9	101.6-102.2	Soil, Chem	ETAL Mithun Control & Ref. Control	ETAL

Shipping Summary

Sample #	Type	Destination	WIC #	Date Shipped
B00GT4	Soil-Chem	Oak Ridge	W91-0185	2/22/91
B00GT5	Soil-Rep. Int.	Oak Ridge	W91-0185	2/22/91
B00GT6	Soil-Instr. Lab Spks.	Woston	W91-0185	2/22/91
B00GT7	Soil-Chem	Oak Ridge	W91-0185	2/22/91

Drilling bit harder & eventually was switched over to Hand Tool Drilling.
 Refer to Activity Report for Specifics

END OF DAY J.D. Fry

2-25-91

Reference Document WTR-SO-EN-AP-016 Rev. 1 Date App. 9-5-89
 Date 2/25/91 Site Location B-Pond A-Lake Borehole BH-3A1
 Site Description 30x40 Gravel Pad on north shore
 Weather Sunny Temp. 36°F Winds Calm Time 0735
 On site: Samplers J.O. Farber
 On Site: Geologist G.B. Gould H & S M.J. Hartney Engineer N/A
 Borehole Log BH-3A1 Safety Log KEH Drill Act. Rpt. # 15

M.J. Hartney conducted Tailgate Safety meeting, Topic was organic vapor action levels.
 Driller began hand tool Drilling. Drilling improved & sun was used to drive barrel. ~~raw water~~
 was added to add in soil remedy. Drilling still remained hard.

Sample #	Type	Shipping Destination	Work #	Date Shipped
B00578	Soil - chemical	Out Ridge	W91-0192	2-25-91

Drilling continued hard remainder of the shift. Refer to field Activity Report for further details.

END OF DAY Jan Feb 2/25/91

2-26-91

Reference Document WTR-SO-EN-AP-016 Rev. 1 Date App. 9-5-89
 Date 2/26/91 Site Location B-Pond A-Lake Borehole BH-3A1
 Site Description 30x40 Gravel Pad on North Shore
 Weather Sunny Temp. 38°F Wind: 2 mph from SW Time 0735
 On site: Samplers J.O. Farber - Scientist
 On Site: Geologist G.B. Gould H & S M.J. Hartney Engineer N/A
 Borehole Log BH-3A1 Safety Log KEH Drill Act. Rpt. # 16

Drive Barrel in the morning, drilling got better. Susan Harris on Site

107

2-26-91

Sample # BOOGVO Type Soil, chemical Date 2/26/91
 Weather Sunny Temp. 50° F Wind 2 mph from W Time 1106
 Drill Int. 100.7-123.2 RCV 100 Type of Sampler S' OOSPHT Spru
 Hnu/OVA Reading NAB pH 7.5 Radiation N/A
 EII References S.1 S.2 App. 5.11

Qty.	Size	Type	Analysis	Preservative
1	500ml	Clear Glass	Alpha Beta	Chill on ICE
1	250ml	Amber Glass	Ice metals As Pb Cd	Chill on ICE
1	500ml	Clear Glass	NH4 Anions	Chill on ICE

Field Observations Sample taken in 3x Quantity for interval - Lab QA/QC.
Sands from bottom 2 liners in Sampler - Sent to Oak Ridge

Potential Contamination None observed

Sample	Interval	Sampling Type	Summary Analysis	Lab
BOOGVO	100.7-123.2	Soil, chemical	Short list	Oak Ridge

Continued Drive Barring Remainder of Shift

Ice: Type Wet Quantity 20 Lbs. Condition Frozen
 Special request Overnight Delivery, Signature Security Service
 Labels Applied This End up, Packed in Wet ICE
 Surveyed by RPT N/A @ Time N/A
 Relinquished Custody: to not relinquished @ Time N/A

Shipped To Oak Ridge Shipping Container Poly Cooler BL # 242 615 8944

J.M. Family Sampler Signature Date 2/26/91

END OF SHIFT

J.M. Family

2-27-91

Reference Document WHC-SD-EN-AR-016 Rev. + Date App. 9-5-89
 Date 2-27-91 Site Location B-Pond A lobe Borehole BA-3A-1
 Site Description 30x40 Gravel Pad
 Weather Sunny Temp. 34°F Wind: 2 mph from E. Time 0757
 On-site: Samplers J.D. Gander
 On Site: Geologist S.B. Gould H & S M.J. Harrag Engineer N/A
 Borehole Log BA-3A-1 Safety Log KEH Drill Act. Rpt. # 16

SSO Mark Harrag Conducted Tailgate meeting - topics: parking and eye wash changes.
 Drilling began, very wet, possibly on TD. Additional Drive Barreling

Sample # B00GV1 Type Soil, Equip Blank Date 2-27-91
 Weather Sunny Temp. 38°F Wind 2 mph from SE Time 0835
 Drill Int: N/A RCV N/A Type of Sampler 5" OD Split Spoon
 Hnu/OVA Reading N/A pH N/A Radiation N/A
 EII References 5.11

Qty.	Size	Type	Analysis	Preservative
1	120 ml	Amber Glass	Alph. Beta	Chill on ICE
1	60 ml	Amber Glass	ICP mark As 1/2 in. Pb	Chill on ICE
1	100 ml	Amber Glass	NH4 Anions	Chill on ICE

Field Observations clean silica sand of known chemical composition was poured thru a decontaminated stainless steel liner, shoe basket & ring into a decontaminated bowl & contained in 5 chambers
 Potential Contamination Shoe very hard to remove, had to wrench it off, possibly thread shavings as a contaminant (though none were visible).

Additional Drive Barreling + Retrieval of Casing.

2-27-91

9513357.2787

Sample # B006V2 Type Soil, Chemical Date 2-27-91
 Weather Sunny Temp. 40°F Wind 2 mph from SE Time 0855
 Drill Int. 129.9-132.05 RCV 75% Type of Sampler 5'00 Split Spoon
 Hnu/OVA Reading NAB pH 7.6 Radiation N/A
 EII References S.1, S.2 App B, S.11

Qty.	Size	Type	Analysis	Preservative
1	120 ml	Amber Glass	Alpha Beta	Chill on ICE
1	60 ml	Amber Glass	ICP metals, As, Hg, Pb	Chill on ICE
1	120 ml	Amber Glass	NH4, Anions	Chill on ICE
<hr/>				

Field Observations from middle twillous. media homogenized. Bottled in I-Chem bowls. Sent to Out Ridge

Potential Contamination - none observed

Sample # B006V3 Type Soil, Chemical, Replicates Date 2-27-91
 Weather Sunny Temp. 40°F Wind 2 mph from SE Time 0855
 Drill Int. 129.9-132.05 RCV 75% Type of Sampler 5'00 Split Spoon
 Hnu/OVA Reading NAB pH 7.6 Radiation N/A
 EII References S.1, S.2 App B, S.11

Qty.	Size	Type	Analysis	Preservative
1	120 ml	Amber Glass	Alpha Beta	Chill on ICE
1	60 ml	Amber Glass	ICP metals, As, Hg, Pb	Chill on ICE
1	120 ml	Amber Glass	NH4, Anions	Chill on ICE
<hr/>				

Field Observations This is a Field Replicate, Taken from the same bowl as B006V2. The Time on the SAR label was listed as 0815-307 0915.

NO Contamination. Observed.

Sample # B00GV4 Type Soil, Chemical, Interlab Split Date 2/27/91
 Weather Sunny Temp. 40°F Wind 2 mph from SE Time 0855
 Drill Int. 129.9-132.05 RCV 75% Type of Sampler 5" OD Split Spoon
 Hnu/OVA Reading NAP pH 7.6 Radiation N/A
 EII References S-1, S-2, App B, S-11

Qty.	Size	Type	Analysis	Preservative
1	500ml	Cba Glass	Alpha, Beta	Chill on ICE
1	120ml	Ambro. Glass	As, Pb, Hg, ICP metals	Chill on ICE

Field Observations This is a interlab split, taken from the same bowl as B00GV2 + B00GV3. Sent to Weston

NO Contamination observed.

Welded on more casing & cleaned out.

Ice: Type Wet Quantity 2/26F Condition Frozen
 Special request Overnight Delivery
 Labels Applied Packed in Wet Ice, This End Up
 Surveyed by RPT N/A @ Time N/A
 Relinquished Custody to Not Relinquished @ Time N/A

Shipped To Oak Ridge Shipping Container Cidman Alpha 3 BL # 2426158971
Weston Rubbermaid 044 2426158985

J.D. Fancher J.D. Fancher
 Sampler Signature

2/27/91
 Date

Sample #	Interval	Sampling Type	Summary Analysis	Lab
B00GV1	N/A	Grip Blank	Short List	Oak Ridge
B00GV2	129.9-132.05	Soil	Short List	Oak Ridge
B00GV3	129.9-132.05	Soil-Replicat	Short List	Oak Ridge
B00GV4	129.9-132.05	Soil-Split	Short List	Weston

9513357.2789

2-27-91

Shipping Summary

Sample # 800GV0 Type Soil Destination Oak Ridge Wt # W91-0-0200 Date Shipped 2/27/91

Drilling Continued until welder Broke. Refer to Field Activity Reports for further information.

END OF SHIFT *J.M. Johnson*

2-28-91

Reference Document WHL-SD EN-AP-016 Rev. 1 Date App. 9-5-89
Date 2-28-91 Site Location B-Pool - A Lobe Borehole _____
Site Description 30x40 Gravel Pad - on north shore of A-Lobe
Weather Sunny Temp. 3°C Wind 1 mph from west Time 0755
On site: Samplers Schroeder, J.W. Fowler - Tech J. Hogan
On Site: Geologist G.B. Gould H & S M.J. Haring Engineer N/A
Borehole Log BH 3A-1 Safety Log KEH Drill Act. Rpt. # 17

SSO mark Haring conducted PM Job meeting. Topic: Tritium Uranalysis
Welder still not working, drillers waiting for welder repair.

Sample # 800GV5 Type Soil, Chemical Date 2/28/91
Weather Sunny Temp. 55°C Wind Calm Time 1145
Drill Int. 142.75-142.85 RCV 5% Type of Sampler S-100 Spk-Spoon
Hnu/OVA Reading NAB pH 7.5 Radiation N/A
EII References S.1 S.2 App B

Qty.	Size	Type	Analysis	Preservative
2	40ml	Amber Glass	VDA	Chill on ICE
1	120ml	Amber Glass	Alpha Beta Gamma, Sr-90	Chill on ICE
1	60ml	Amber Glass	As, Se, Pb, Tl, Hg, ICP metals	Chill on ICE
1	120ml	Amber Glass	Ammonium, Arsenic, CN, Sulfide	Chill on ICE
1	120ml	Amber Glass	Hexavalent, Pentavalent, Pb, Sr, Van	Chill on ICE
1	250ml	Amber Glass	Dioxin, Phos. Possibility	Chill on ICE

Field Observations Last Sample from borehole. Very wet; Com barrel dripping water. Sent to Oak Ridge

Potential Contamination Welding on casing

2779 VOL

Ice: Type Wet Quantity 1.2 Lbs Condition Frozen 2-28-91

Special request Overnight Delivery

Labels Applied This End up Packed in wet ICF

Surveyed by RPT NIA @ Time N/A

Relinquished Custody: to me Relinquished @ Time N/A

Shipped To Oak Ridge Shipping Container Weston BL #

J. D. Fankly 2-28-91
Sampler Signature Date

Sampling Summary

Sample #	Interval	Type	Analysis	Lab
800GV5	142.75-143.85	Soil, Chem	Long List	Oak Ridge

Shipping Summary

Sample #	Type	Destination	WHC #	Date Shipped
Box #1	Soil - Equip Blank	Oak Ridge	W91-0-0202	2-28-91
Box #2	soil	Oak Ridge	W91-0-0202	2-28-91
Box #3	soil - duplicate	Oak Ridge	W91-0-0202	2-28-91
Box #4	Soil - split	Weston	W91-0-0203	2-28-91

Box #1 Rmkt/TD in the afternoon. S.E. Kos received this field logbook to witness the pre-job safety meeting while I took the above samples to shipping.

J. D. Fankly 2-28-91

2/28/91 WELL # BH3B-1 B-POND B-LOBE

1354 A PRE-JOB SAFETY MEETING WAS CONDUCTED RELATIVE TO BE^{JK} WORKING ON WELL # BH3B-1. IT IS ANTICIPATED THAT DRILLING WILL COMMENCE ON 3/1/91. THE SAFETY MEETING WAS CONDUCTED BY GREG FUNK (KEH) WHO WILL BE THE SITE SAFETY OFFICER. THOSE IN ATTENDANCE WERE: DRILLER - C. WAMSLEY; D. HELPER - G. THOMAS; GEOL. - S. KOS; SAMPLER - J. NOGAN; FIELD TEAM LEADER - B. GOULD; ALT. DRILLER - R. JONES; ALT SSO - M. HARTNEY. SUBJECTS DISCUSSED: PPE, RIG SAFETY AND WELDING SAFETY. ALL PRESENT SIGNED HWOP. THE MEETING WAS COMPLETED AT 1415

Steven E. Kos 2/28/91
STEVEN E. KOS

3/1/91 B-pond.

PNZ Logged Well BH-3A-1. No drillers on site. WHC personnel performed Site Cleanup. Departed Site.

Well BH3B-1. No drillers on site. KEH mechanic performed minor maintenance on rig. Departed Site.

3-4-91

Reference Document WHL-SD-EN-APP-016 Rev. 1 Date App. 9-5-89
 Date 3-4-91 Site Location B-Pond B-Lake Borehole BH 3B1
 Site Description 20' x 30' Gravel Pad in center of Lake
 Weather cloudy Temp. 51°F Wind: 3 mph from S Time 0830
 On site: Samplers Sam. St. J. G. Fisher Tech. J. H. ...
 On Site: Geologist SE Kus H & S Greg J. Furst Engineer G. B. Gould
 Borehole Log BH 3B1 Safety Log KEH Drill Act. Rpt. # 4

Began taking up rig, preparing for sampling. J. W. Rubin, on site today.
 Frank cond: 1st tailgate safety meeting at 1030. Topic Emergency Signk

Ice: Type _____ Quantity _____ Condition _____
 Special request _____
 Labels Applied _____
 Surveyed by RPT _____ @ Time _____
 Relinquished Custody: to _____ @ Time _____

Shipped To	Shipping Container	BL #
_____	_____	_____
_____	_____	_____
_____	_____	_____

 Sampler Signature _____ Date _____

Ice: Type _____ Quantity _____ Condition _____
 Special request _____
 Labels Applied _____
 Surveyed by RPT _____ @ Time _____
 Relinquished Custody: to _____ @ Time _____

Shipped To	Shipping Container	BL #
_____	_____	_____
_____	_____	_____
_____	_____	_____

 Sampler Signature _____ Date _____

EX
 3/91
 WILL
) BY
 JOSE
 G.
 1
 :ARTNEY.
 Y.
 17 1415

NA J07 3-11-91

3-4-91

Sample # BOSCV6 Type Soil, Chemical Date 3-4-91
 Weather Cloudy to Rain Temp. 48°F Wind 3 mph from NW Time 1109
 Drill Int. 0'-2' RCV 50% Type of Sampler 5' OD Split Spoon
 Hnu/OVA Reading NAB pH 7 Radiation N/A
 EII References S-1, S-2 App B, S-11

Qty.	Size	Type	Analysis	Preservative
2	40ml	Amber Glass	VDA	Chill on ICE
1	120ml	Amber Glass	Alpha, Beta Gamma, Sr-90	Chill on ICE
1	60ml	Amber Glass	IC metals As, Hg, Pb, Se, Tl	Chill on ICE
1	120ml	Amber Glass	NH4, Anions CN, Sulfide	Chill on ICE
1	120ml	Amber Glass	Semi-VDA Herb, Pst/Pc/B	Chill on ICE
1	250ml	Amber Glass	Plus Pres, Pst/Pc/Pc/B	Chill on ICE

Field Observations Fresh Sample from Drill

Potential Contamination Airborne & Surface contaminants? WMT source
 smell present but air in room did not smell source toilet until after
 samples collected

Sample # BOSV7 Type Soil, Chemical Date 3-4-91
 Weather Cloudy, Some Temp. 48°F Wind 4 mph from N Time 1316
 Drill Int. 2.5-4.5 RCV 50% Type of Sampler 5' OD Split Spoon
 Hnu/OVA Reading NAB pH 7 Radiation N/A
 EII References S-1, S-2 App B, S-11

Qty.	Size	Type	Analysis	Preservative
2	40ml	Amber Glass	VDA	Chill on ICE
1	120ml	Amber Glass	Alpha, Beta Gamma, Sr-90	Chill on ICE
1	60ml	Amber Glass	IC metals As, Hg, Pb, Se, Tl	Chill on ICE
1	120ml	Amber Glass	NH4, Anions CN, Sulfide	Chill on ICE
1	120ml	Amber Glass	Semi-VDA, Herb, Pst/Pc/B	Chill on ICE
1	250ml	Amber Glass	Plus Pres, Pst/Pc/Pc/B	Chill on ICE

Field Observations SSD was not present when sample pulled from bottom (1316).

Sample wrapped in plastic until SSD arrived at 1327. Then sample was
 homogenized and containerized

Potential Contamination None observed

3-7-91

Sample # BOOGV6 Type Soil, Chemical Date 3-7-91
 Weather Cloudy Temp. 49° F Wind 2 mph from W Time 1350
 Drill Int. 4-655 RCV 50% Type of Sampler 5" DD Spdr Spoon
 Hnu/OVA Reading N/A pH 7 Radiation N/A
 EII References S1, S.2 App B, S.11

Qty.	Size	Type	Analysis	Preservative
2	40ml	Amber Glass	VUA	Chill on ICE
1	120ml	Amber Glass	Alpha beta Gamma, Sr-90	Chill on ICE
1	60ml	Amber Glass	ICP metals As, Hg, Pb, Sr, Tl	Chill on ICE
1	120ml	Amber Glass	Semi-VOA, Herb, Pestic/PCB	Chill on ICE
1	120ml	Amber Glass	NH4, Anions, Cu, Sulfide	Chill on ICE
1	250ml	Amber Glass	phos. prot, PCOP/PCOF	Chill on ICE

Field Observations Casing was drilled cleaned out prior to sampling

Potential Contamination none observed

Sample # BOOGV9 Type Soil, chemical Date 3-7-91
 Weather Cloudy Temp. _____ Wind _____ Time 0830
 Drill Int. _____ RCV _____ Type of Sampler 5" DD Spdr Spoon
 Hnu/OVA Reading _____ pH _____ Radiation _____
 EII References S.1, S.2, App B, S.11

Qty.	Size	Type	Analysis	Preservative
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

Field Observations _____

Potential Contamination _____

43

3-4-91

Ice: Type Wet Quantity 20 lbs Condition Frozen
 Special request Over night Delivery
 Labels Applied Pack in Wet Ice, This End up
 Surveyed by RPT N/A @ Time N/A
 Relinquished Custody Controlled Release @ Time N/A

Shipped To Oak Ridge Shipping Container Poly Code-1910 Epulor 3 BL # _____

J.D. Fambury 3-4-91
 Sampler Signature Date

Sampling Summary

Sample #	Interval	Type	Analysis	Lab
B00GV6	0-2' - 4-6.55'	Soil	Long list	Oak Ridge
B00GV7	2.5' - 4.5'	Soil	Long list	Oak Ridge
B00GV8	4-6.55'	Soil	Long list	Oak Ridge

END OF SHIFT
J.D. Fambury

3-5-91

Reference Document WAK-SD-EN-AP-016 Rev. 1 Date App. 9/5/89
 Date 3-5-91 Site Location B-Pond B-Lab Borehole BH 3B-1
 Site Description 30' to ground Pol in center
 Weather sun scattered clouds Temp. 33° Wind: calm Time _____
 on site: Samplers Siemens J.D. Fambury Engineer N/A
 On Site: Geologist S.G. KOS H & S _____
 Borehole Log BH 3B-1 Safety Log KEH Drill Act. 5
 Drill Activity Report 5

J.W. Roberts on site today

3-5-91

Sample # B006W0 Type SOIL, CHEMICAL Date 3/5/91
 Weather Sunny Temp. 50 F Wind CALM Time 1006
 Drill Int. 62-8.4 RCV 100 Type of Sampler 5" OD SPLIT STON
 Hnu/OVA Reading NAP pH 7 Radiation KIT
 EII References S. 1; S. 2 APP. B; S. 11

Qty.	Size	Type	Analysis	Preservative
2	40 ml	Amber glass	VOA	Chill on ice
1	120 ml	Amber glass	Alpha, Beta, Gamma, Si ⁷⁰	Chill on ice
1	60 ml	Amber glass	ICP metals, As, Hg, Pb, Se, Tl	Chill on ice
1	120 ml	Amber glass	Hg, Arsenic, Cu, Sulfide	Chill on ice
1	120 ml	Amber glass	Semi-VOA, Herb. Pest/PCB	Chill on ice
1	250 ml	Amber glass	Herb. Pest, PCDF/PCDD	Chill on ice

Field Observations Fine-grained material throughout

Potential Contamination Welding on casing

Sample # B006W1 Type SOIL, CHEMICAL Date 3/5/91
 Weather Sunny Temp. 48 C Wind Light (1-2 mph) Time 1048
 Drill Int. 7-2-10.85 RCV 100 Type of Sampler 5" OD SPLIT STON
 Hnu/OVA Reading NAP pH 7 Radiation <10
 EII References S. 1; S. 2 APP. B; S. 11

Qty.	Size	Type	Analysis	Preservative
2	40 ml	Amber glass	VOA	Chill on ice
1	120 ml	Amber glass	Alpha Beta Gamma, Si ⁷⁰	Chill on ice
1	60 ml	Amber glass	ICP metals, As, Hg, Pb, Se, Tl	Chill on ice
1	120 ml	Amber glass	Hg, Arsenic, Cu, Sulfide	Chill on ice
1	120 ml	Amber glass	Semi-VOA, Herb. Pest/PCB	Chill on ice
1	250 ml	Amber glass	Herb. Pest	Chill on ice

Field Observations Taken from bottom 2 liters

Potential Contamination None observed

3-591

Sample # BOOGW2 Type Soil, Physical Date 3-5-91
 Weather Sunny Temp. 34°F Wind 4 mph from NW Time 10:48
 Drill Int. 8.2-10.85 RCV 100 Type of Sampler 5" OD Split-Spoon
 Hnu/OVA Reading NAB pH 7 Radiation <DT
 EII References S.I. S. 1, P. 5.11

Qty.	Size	Type	Analysis	Preservative
1	Liner	Sample Bag	ETA-16+02	Seal Ends
1	1 lb	Plastic Bag	ETA-17	Seal bag
1	1/2 lb	Tin	ETA-14	Seal
1	10 lb	Plastic Bag	ETA-107	Seal bag

Field Observations Tubes from upper liners

Potential Contamination None

Sample # BOOGW3 Type Soil, Chemical Date 3-5-91
 Weather windy Temp. 29°F Wind 11 mph from W Time 1133
 Drill Int. 11.1-14.1 RCV 100% Type of Sampler 5" OD Split-Spoon
 Hnu/OVA Reading NAB pH 7.5 Radiation <DT
 EII References S.I. S. 2 App B, S.11

Qty.	Size	Type	Analysis	Preservative
2	40ml	Amber Glass	VDA	Chill on ICE
1	120ml	Amber Glass	Alpha Beta Gamma Sr-90	Chill on ICE
1	60ml	Amber Glass	ICP metals, As, Hg, Pb, Se, Tl	Chill on ICE
1	120ml	Amber Glass	Nitry Anions CN, sulfide	Chill on ICE
1	120ml	Amber Glass	Semi-VDA, Herb, Pest / PCB	Chill on ICE
1	250ml	Amber Glass	phos, pest.	Chill on ICE

Field Observations Soil from R. 1/2

Potential Contamination None

3-5-91

Sample # 20065W1 Type Soil - Dupl. int. Date 3-5-91
 Weather windy Temp. 31°F Wind 7 mph from W Time 11:33
 Drill Int. 11-14-1 RCV 100 Type of Sampler 5" US Spill Spoon
 Hnu/OVA Reading NAB pH 7.5 Radiation <DT
 EII References S.1, S.2 App B S.11

Qty.	Size	Type	Analysis	Preservative
2	40 ml	Amber Glass	VQA	Chill on ICE
1	120 ml	Amber Glass	Alpha Beta Gamma, Sr-90	Chill on ICE
1	60 ml	Amber Glass	ICP metals As, Hg, Pb, Se, Tl	Chill on ICE
1	120 ml	Amber Glass	NH ₄ , Anions CN, sulfide	Chill on ICE
1	120 ml	Amber Glass	Semi-VQA, Herb, Pest/PCB	Chill on ICE
1	250 ml	Amber Glass	phos. pest.	Chill on ICE

Field Observations no visible contamination

Potential Contamination None observed

Sample # 20065W5 Type Soil - Intake split Date 3-5-91
 Weather windy Temp. 31°F Wind 7 mph from W Time 11:33
 Drill Int. 11-14-1 RCV 100 Type of Sampler 5" US Spill Spoon
 Hnu/OVA Reading NAB pH 7.5 Radiation <DT
 EII References S.1, S.2 App B S.11

Qty.	Size	Type	Analysis	Preservative
1	120 ml	Amber Glass	VQA	Chill on ICE
1	500 ml	Clear Glass	Alpha Beta Gamma, Sr-90	Chill on ICE
1	120 ml	Amber Glass	As, Se, Pb, Tl, ICP metals Hg, CN	Chill on ICE
1	250 ml	Amber Glass	Pest/PCB, Semi-VQA	Chill on ICE

Field Observations See to Weston

Potential Contamination None observed

3-5-91

Sample # B00GW6 Type Soil, chemical Date 3-5-91
 Weather Sun light breeze Temp. 54°F Wind 7 mph from W Time 1425
 Drill Int. 14.4-17.1 RCV 100% Type of Sampler 5" OD Split Spoon
 Hnu/OVA Reading NAB pH 7.5 Radiation SDT
 Ell References S.1, S.2 App B, S.11

Qty.	Size	Type	Analysis	Preservative
1	120ml	Amber Glass	Alpha Beta	Chill on ICE
1	60ml	Amber Glass	ICP metals, As, Hg, Pb	Chill on ICE
1	120ml	Amber Glass	NH4, Ammon	Chill on ICE

Field Observations variable lithology - see borehole log.

Potential Contamination Fuel truck nearby, delivering fuel and persons walking on casing

Sample # B00GW7 Type Soil, Physical Date 3-5-91
 Weather Sun light breeze Temp 54°F Wind 7 mph from W Time 1425
 Drill Int. 14.4-17.1 RCV 100% Type of Sampler 5" OD Split Spoon
 Hnu/OVA Reading NAB pH 7.5 Radiation SDT
 Ell References S.1, S.2 App B, S.11

Qty.	Size	Type	Analysis	Preservative
1	4"	Liner-SS	ETAL 16+02	Seal Ends
1	1 Lb	Plastic Bag	ETAL 17	Seal
1	1/2 Lb	Tim	ETAL 14	Seal
1	Sub 10" to 12" bag	Plastic Bag	ETAL 07	Seal

Field Observations Take from same interval as B00GW6

Potential Contamination None observed

54 3-5-91

Ice Type Wet Quantity 15 lbs Condition Frozen
 Special request Overnight Delivery
 Labels Applied Packed in Wet Ice, This End up
 Surveyed by RPT N/A @ Time NA
 Relinquished Custody to not relinquished @ Time NA

Shipped To Oak Ridge Shipping Container _____ BL # _____
Weston _____

J. D. Farber 3-5-91
 Sampler Signature _____ Date _____

SAMPLING SUMMARY

Sample #	Interval	Type	Analysis	Lab
BOOGV9	N/A	Equip Blank	Long list	Oak Ridge
BOOGW0	6.2-8.4	Long list	Soil	Oak Ridge
BOOGW1	8.2-10.8	Soil	Long list	Oak Ridge
BOOGW2	8.2-10.8	Soil	Physical	ETAL
BOOGW3	11.4-14.1	Soil	Long list	Oak Ridge
BOOGW4	11.4-14.1	Soil Dupl.	Long list	Oak Ridge
BOOGW5	11.4-14.1	Soil analysis	Long list	Weston
BOOGW6	14.4-17.1	Soil	Short list	Oak Ridge
BOOGW7	14.4-17.1	Soil	Physical	ETAL

Sample #	Shipping Type	Summary Destination	WHC #	Date shipped
BOOGV6	Soil	Oak Ridge	W91-0-0207 #1	3-5-91
BOOGV7	Soil	Oak Ridge	W91-0-0207 #1	3-5-91
BOOGV8	Soil	Oak Ridge	W91-0-0207 #1	3-5-91

END OF SHIFT

J. D. Farber

3-6-91

Reference Document WNC-S1)-EN-AP-016 Rev. 1- Date App. 7-5-87
 Date 3-6-91 Site Location B-Pond B Lobe Borehole B11 3B1
 Site Description 20x30 Ground pad
 Weather Sunny Temp. 40°F Wind: 3 mph from W Time 0850
 On site: Samplers JO Funder, S. Hogan
 On Site: Geologist S.E. Kos H & S C. Funk Engineer N/A
 Borehole Log B11 3B1 Safety Log KEH Drill Act. PA #6

Below is check out form of samplers in use on site

ROCKE SAMPLE PREP FACILITY
MATERIAL OUT

QUANTITY	ITEM WITHDRAWN	JOB LOCATION
3	5" SACC RETAINER & BASKET	B-12ND
17	2" LINERS	B-12ND
6	LARGE SCOONS	B-POND
23	SCOOPULAS	B-12ND
15	SCOONS	B-POND
5	BOWLS	B-POND

ALL EQUIPMENT WAS CLEARED PER E11 5 5 REV 1 DECONTAMINATION OF EQUIPMENT FOR RCRA/CERCLA SAMPLING
 SIGNATURE [Signature] PRINT NAME PIERRE FARLAN DATE 3-5-91
 WITHDRAWN BY [Signature] PRINT NAME PIERRE FARLAN DATE 3-5-91

3-6-91

Sample # 800GW8 Type Soil, chemical Date 3-6-91
 Weather Sunny Temp. 49°F Wind 2 mph from W Time 0907
 Drill Int. 19.2-22.5 RCV 100% Type of Sampler 5" OD Split Spoon
 Hnu/OVA Reading NAB pH 7.5 Radiation <107
 EII References S.1, S.2 App B, S.11

Qty.	Size	Type	Analysis	Preservative
<u>2</u>	<u>40 ml</u>	<u>Amber Glass</u>	<u>VOA</u>	<u>Chill on ICE</u>
<u>1</u>	<u>120 ml</u>	<u>Amber Glass</u>	<u>Alpha Beta Gamma S, 90</u>	<u>Chill on ICE</u>
<u>1</u>	<u>60 ml</u>	<u>Amber Glass</u>	<u>ICP metals As, Hg, Pb, Se, Tl</u>	<u>Chill on ICE</u>
<u>1</u>	<u>120 ml</u>	<u>Amber Glass</u>	<u>NH4 Anions, Cu, Sulfide</u>	<u>Chill on ICE</u>
<u>1</u>	<u>100 ml</u>	<u>Amber Glass</u>	<u>Semi VOA, Herb, Pest</u>	<u>Chill on ICE</u>
<u>1</u>	<u>250 ml</u>	<u>Amber Glass</u>	<u>Phos pes</u>	<u>Chill on ICE</u>

Field Observations Collected four bottles - two liners

Potential Contamination Geopaget tubes, fuel tank nearby, no down wind. Working on survey

Sample # 800GW9 Type Soil chemical Date 3-6-91
 Weather Scattered clouds Temp. 54°F Wind 2 mph from SW Time 1323
 Drill Int. 25.7-29.6 RCV 100% Type of Sampler 5" OD Split Spoon
 Hnu/OVA Reading NAB pH 7.5 Radiation N/A
 EII References S.1, S.2 App B, S.11

Qty.	Size	Type	Analysis	Preservative
<u>1</u>	<u>120 ml</u>	<u>Amber Glass</u>	<u>Alpha Beta</u>	<u>Chill on ICE</u>
<u>1</u>	<u>60 ml</u>	<u>Amber Glass</u>	<u>ICP metals As, Hg, Pb</u>	<u>Chill on ICE</u>
<u>1</u>	<u>120 ml</u>	<u>Amber Glass</u>	<u>NH4 Anions</u>	<u>Chill on ICE</u>

Field Observations Bottom two liners

Potential Contamination Working on survey

3-6-91

Sample # B00G X0 Type Soil, Physical Date 3-6-91
 Weather Scattered clouds Temp. 54°F Wind 2 mph from SW Time 1323
 Drill Int. 25.7-28.0 RCV 60 Type of Sampler 5" OP Soil Spoon
 Hnu/OVA Reading N/A pH 7.5 Radiation N/A
 EII References S.1 S.2 App B S.11

Qty.	Size	Type	Analysis	Preservative
1	4'	Liner	ETAL1600	Soil En/s
1	12b	Plastic Bag	ETAL17 17	Soil
1	1/2b	Tin	ETAL14	Soil

Field Observations ETAL

Potential Contamination None Observed

Sample # B00G X1 Type Soil physical Date 3-6-91
 Weather Scattered clouds Temp. N/A Wind N/A Time 1340
 Drill Int. 25.7-27.6 RCV N/A Type of Sampler Drive Barrel
 Hnu/OVA Reading N/A pH N/A Radiation N/A
 EII References S.11

Qty.	Size	Type	Analysis	Preservative
1	10b	Plastic Bag	ETAL07	Soil

Field Observations From Drive barrel cleanest

Potential Contamination None Contamination observed

3-6-91

Via # B00G X2 Type Soil Chem Date 3/6/91
 Weather Sunny (clouds) Temp. 59.5 Wind calm Time 1401
 Drill Int. 29.5-32.2 RCV _____ Type of Sampler Spoon 50.5 x 5.0
 Hnu/OVA Reading N/A pH 7.5 Radiation N/A
 EII References S1, S.2 App B, S.11

Qty.	Size	Type	Analysis	Preservative
1	120ml	Amber Glass	Alpha Beta	Chill on ICE
1	60ml	Amber Glass	ICP metals, As, Hg, Pb	Chill on ICE
1	120ml	Amber Glass	NH4, Anions	Chill on ICE

Field Observations From Bottom Two Levels
 Potential Contamination None observed

Ice Type Wet Quantity 5 lbs Condition Frozen
 Special request Next Day Delivery
 Labels Applied Pack in Wet ICE, This End up
 Surveyed by RPT N/A @ Time N/A
 Relinquished Custody to Not Relinquished @ Time N/A

Shipped To Oak Ridge Shipping Container Colman #9's cooler BL # _____
J. D. Funch 3-6-91
 Sampler Signature Date

3-7-91

WAC-SSO EN 016
 Reference Document WAC-EM-7-7 Rev. Date App. 7-5-87
 Date 3-7-91 Site Location B-pond B Lobe Borehole BH 38-1
 Site Description 20-30 Gravel Ppt in center of B-pond 1 3/4" Lobe
 Weather Sunny Temp. 44°F Wind: 2 mph from W Time 0740
 On Site: Samplers Scienc. J.D. Fenley
 On Site: Geologist S.E. Kos H & S G. Funk Engineer N/A
 Borehole Log 84-381 Safety Log KEH Drill Act. Rpt. # 7

SSO Conducted Safety meeting then Drillers began welding casing

Sample # BOGEX3 Type sol. chemical Date 3-7-91
 Weather hazy clouds Temp. 58°F Wind 4 mph from SW Time 0943
 Drill Int. 34.0-36.5 RCV 75% Type of Sampler 5" DO split spoon
 Hru/OVA Reading N/A pH 7.5 Radiation N/A
 References WAC-EM-7-7 S-1, S-2, 4, 5, 11

Qty.	Size	Type	Analysis	Preservative
1	120 ml	Amber Glass	Alpha Beta	^{10/3/37/01} Beta Chill on ICE
1	60 ml	Amber Glass	^{10/3/37/01} Alpha Beta	^{10/3/37/01} Beta Chill on ICE
1	120 ml	Amber Glass	NH4 Amion	Chill on ICE

Field Observations Taken from bottom two liters

Potential Contamination Working on casing

Drillers welded casing and drove pipe

157

3-7-91

Sample # B00G7-4 Type Soil chemical 111 3-7-91
 Weather High winds Temp 58°F Wind 11 mph from SW Time 12:4
 Drill Int. 33.8-41.4 RCV _____ Type of Sampler 5700 Split Spoon
 Hnu/OVA Reading NAB PH _____ Radiation < DT
 References WAC CM-7-7, S.1, S.2A, B, S.11

Qty.	Size	Type	Analysis	Preservative
1	100ml	Amber Glass	Alpha-Beta	Chill on ICE
1	60ml	Amber Glass	ICP metals As, Hg, Pb	Chill on ICE
1	100ml	Amber Glass	NH4, Ammonia	Chill on ICE

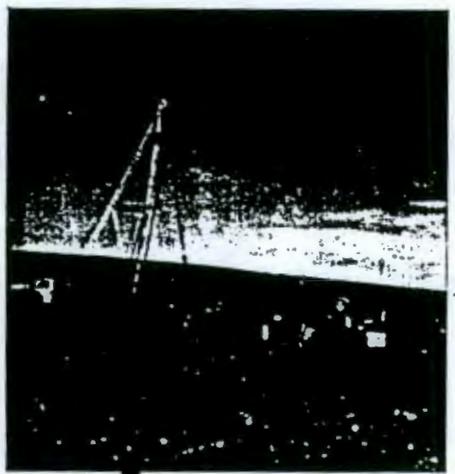
Field Observations Taken from Bottom two lines

Potential Contamination Walking on/using

Drillers continued to Drill, with casing & drive pipe remainder of shift

107

107



107

107

3-7-91
@0830 JST

3-7-91
@0826 JST

107

107

3-8-91

63

Sample # B0UGX5 Type Soil, Chemical Date 3-8-91
 Weather Sunny Temp. 47°F Wind Calm Time 0930
 Drill Int. 50.8 to 52.95 RCV 75% Type of Sampler 5" OD Split Spoon
 Hnu/OVA Reading NAB pH 8 Radiation N/A
 EII References WHC-CM-7-7, EII 5.1, 5.2 App B 5.11

Qty.	Size	Type	Analysis	Preservative
1	120ml	Amber Glass	Alpha, Beta	Chill on ICE
1	60ml	Amber Glass	ICP metals, As, Hg, Pb	Chill on ICE
1	120ml	A-Glass	NH4, Anions	Chill on ICE

Field Observations Taken from R₁ to top line

Potential Contamination unidentified

Sample # B0UGX6 Type Soil, Chemical Date 3-7-91
 Weather Sunny Temp. 56°F Wind 2 mph from S. Time 11:30
 Drill Int. 10.0 - 10.6 RCV 100 Type of Sampler 5" OD Split Spoon
 Hnu/OVA Reading NAB pH 7.5 Radiation <0.1
 EII References WHC-CM-7-7 EII 5.1, 5.2 App B 5.11

Qty.	Size	Type	Analysis	Preservative
2	400ml	Amber Glass	VOA	Chill on ICE
1	120ml	Amber Glass	Alpha Beta, Gamma Scint	Chill on ICE
1	60ml	Amber Glass	ICP metals, As, Hg, Pb, Se, Tl	Chill on ICE
1	120ml	Amber Glass	NH4, Anions, Cu, Sulfide	Chill on ICE
1	100ml	Amber Glass	Seas VOA, Herb, Pestic	Chill on ICE
1	250ml	Amber Glass	phos, P20	Chill on ICE

Field Observations Taken from top line

Potential Contamination unidentified

64 3-8-91

Sample # BOGS-11 Type Soil Date 3-8-91
 Weather Sunny Temp. 54° Wind 2 mph from S Time 11:03
 Drill Int. 60.0 to 6.6 RCV 100 Type of Sampler 5'00 Split Spoon
 Hnu/OVA Reading NAB pH 7.5 Radiation ZDT
 EII References WHC-CM-7-7, S.1, S.2 App. 5.1

Qty.	Size	Type	Analysis	Preservative
1	4"x6"	Storage	ETA 16+02	Seal End & Cap
1	3 lb.	plastic bag	ETA 107	Seal Bag
1	1 lb.	plastic bag	ETA 17	Seal Bag
1	1 lb.	Tin	ETA 14	Seal Lid

Field Observations From Lower 2 Lines

Potential Contamination none observed

Drill is welded (casings continued drilling (joint handling))

Sample # BOGS-8 Type Soil Date 3-8-91
 Weather Sunny Temp. 69° Wind 10 mph from S. Time 11:45
 Drill Int. 69.6-71.8 RCV 100% Type of Sampler 5'00 Split Spoon
 Hnu/OVA Reading NAB pH Radiation
 EII References WHC-CM-7-7 S1 S2 App. 5.1

Qty.	Size	Type	Analysis	Preservative
1	120ml	Amber Glass	Alpha Beta	Chill on ICE
1	200ml	Amber Glass	ICP method for Hg, Pb	Chill on ICE
1	120ml	Amber Glass	NH4 Arsenic	Chill on ICE

Field Observations From bottom two lines

Potential Contamination none observed

Ice: Type W+ Quantity 2 cubs Condition Frozen 3-8-91
 Special request Overnight Delivery
 Labels Applied This End Up, Packed in Leak RC
 Surveyed by RPT N/A @ Time N/A
 Relinquished Custody: to not Relinquished @ Time N/A

Shipped To	Shipping Container	BL #
<u>Out Ridge</u>		

J. D. Fancher 3-8-91
 Sampler Signature Date

Sample #	Sampling Interval	Summary Type	Analysis	Lab
Box # 5	50.0 - 50.95	Soil	Short list	Not P. Log
Box # 6	60.0 - 60.6	Soil	Long list	Out Ridge
Box # 7	60.6 - 61.1	Soil	physical	ETAL
Box # 8	69.6 - 71.8	Soil	Short list	Out Ridge

END of Shift
J. D. Fancher

3-11-91

Reference Document W. H. S. ... Rev. 1 Date App. 7-5-81
 Date 3-11-91 Site Location B-Peak B ldr Borehole BH-36-1
 Site Description 2 or 3' Gravel Pad in center of site
 Weather Sunny Temp. 30°F Wind: Dry from East Time 0738
 On site: Samplers J. D. Fancher
 On Site: Geologist S. E. Kars H & S G. Furr Engineer N/A
 Borehole Log BH-36-1 Safety Log KEH Drill Act. Rpt. # 9

Target Safety: mixing, stop - higher protection when or track water table

68

3-11-91

9513357, 2813

Sample# B05X9 Type Soil, physical Date 3-11-91
 Weather Sunny Temp. 40°F Wind calm Time of 5
 Drill Int. 73 25-7415 RCV Type of Sampler S"LD Sp. Spoon
 Hnu/OVA Reading NAB pH 7.5 Radiation <DR
 EII References WHC-CM-7-7 5.1, 5.3 App B, 5.11

Qty.	Size	Type	Analysis	Preservative
1	Line	Line	ETAL 16	Seal & etc.
1	5 lb	bag	ETAL 07	Seal
1	1 lb	bag	ETAL 17	Seal
1	1/2 lb	tin	ETAL 14	Seal

Field Observations moderately dry

Potential Contamination none observed

Driller continued drive searching & cleaning casing & waiting

Sample# B05Y0 Type Soil, chemical Date 3-11-91
 Weather _____ Temp. _____ Wind _____ Time _____
 Drill Int. _____ RCV _____ Type of Sampler S"LD Sp. Spoon
 Hnu/OVA Reading _____ pH _____ Radiation _____
 EII References WHC-CM-7-7 5.1, 5.3 App B, 5.11

Qty.	Size	Type	Analysis	Preservative
1	120 ml	Amber Glass	Alpha Beta	Chill on ICE
1	60 ml	Amber Glass	ICP metals As, Hg, Pb	Chill on ice
1	120 ml	Amber Glass	ICP metals Arsenic	Chill on ICE

Field Observations _____

Potential Contamination _____

The above sample was not collected today, due to delays following Geophysical logging

68

3-11-91

9513357.2815

Ice: Type N/A Quantity N/A Condition N/A
 Special request N/A
 Labels Applied N/A
 Surveyed by RPT N/A @ Time _____
 Relinquished Custody to N/A @ Time _____

Shipped To _____ Shipping Container _____ BL # _____

J. J. Funk _____ 3/11/91 _____
 Sampler Signature Date

Sampling Summary for 3/11/91

Sample # B00GX 9 Interval 7:20 - 7:40 Type Soil Analysis Project Lab ETAL

END OF Shift. J. J. Funk

Shipping Summary - Chemical

Sample #	Type	Location	Well #	Date shipped
B00GV6	Soil	Oak Ridge	W91-0207#1	3-6-91
B00GV7	Soil	Oak Ridge	W91-0207#1	3-6-91
B00GV8	Soil	Oak Ridge	W91-0207#1	3-6-91
B00GW5	Soil	Weston	W91-0207#2	3-6-91
B00GV9	Soil	Oak Ridge	W91-0207#3	3-6-91
B00GW0	Soil	Oak Ridge	W91-0207#3	3-6-91
B00GW1	Soil	Oak Ridge	W91-0207#3	3-6-91
B00GW3	Soil	Oak Ridge	W91-0207#3	3-6-91
B00GW4	Soil	Oak Ridge	W91-0207#3	3-6-91
B00GW6	Soil	Oak Ridge	W91-0207#3	3-6-91
B00GW8	Soil	Oak Ridge	W91-0207#5	3-7-91
B00GW9	Soil	Oak Ridge	W91-0207#5	3-7-91
B00GX2	Soil	Oak Ridge	W91-0207#5	3-7-91
B00GX3	Soil	Oak Ridge	W91-0207#6	3-8-91
B00GX4	Soil	Oak Ridge	W91-0207#6	3-8-91
B00GX5	Soil	Oak Ridge	W91-0207#8	3-11-91
B00GX6	Soil	Oak Ridge	W91-0207#8	3/11/91
B00GX8	Soil	Oak Ridge	W91-0207#8	3/11/91

J. J. Funk 3/11/91

3-12-91

Reference Document WAC SD-AP-EN-016 Rev. 1 Date App. 9/5/89
 Date 3-12-91 Site Location B Pond B Lobe Borehole BH 38-1
 Site Description 20x30 Gravel Pad
 Weather cloudy Temp. 40°F Wind: 3 mph from S Time 0810
 On site: Samplers Scientist: J. D. Farber Technician: J. Hogan
 On Site: Geologist SE Kos H & S G. Funk Engineer N/A
 Borehole Log BH-38-1 Safety Log KEH Drill Act. Rpt. # 10

Sample # 800GY0 Type Silica Sand Equipment Blank Date 3-12-91
 Weather cloudy Temp. 40°F Wind 3 mph from S Time 0810
 Drill bit N/A RCV N/A Type of Sampler 5'00 Split Spin Sampler
 H₂O₂ Reading N/A pH N/A Radiation N/A
 Ell References WAC-CM-7-7, 5.11

Qty.	Size	Type	Analysis	Preservative
1	120ml	Amber Glass	Alpha, Beta	Chill on ICE
1	100ml	Amber Glass	ICP metals As, Hg, Pb	Chill on ICE
1	120ml	Amber Glass	NH ₄ ⁺ Anions	Chill on ICE

Field Observations Clean Silica Sand, poured through Sample Size, bucket + Liner.
was performed in sampling trailer by Jim Hogan.

Potential Contamination none observed

Remarks continued welding 6' casing of Ruonig at down the bore hole

3-12-91

Sample # BOOBY1 Type Soil, Chemical Date 3-12-91
 Weather Cloudy Temp. 50°F Wind Calm Time 1131
 Drill Int. 79.75-81.5 RCV 50% Type of Sampler 5" DP Split Spoon
 Hnu/OVA Reading NAB pH 7 Radiation <DT
 EII References WHC-CM-7-7 S.1, S.2 App B, S.11

Qty.	Size	Type	Analysis	Preservative
1	120ml	Amber Glass	Alpha, Beta	Chill on ICE
1	60ml	Amber Glass	ICP metals, As, Hg, Pb	Chill on ICE
1	120ml	Amber Glass	NH ₄ , Arsenic	Chill on ICE

Field Observations Taken from Bottom two liners
Sent to Oak Ridge

Potential Contamination welding on 6" casing

Sample # BOOBY2 Type Soil, Chemical, Duplicate Date 3-11-91
 Weather Cloudy Temp. 50°F Wind Calm Time 1131
 Drill Int. 79.75-81.5 RCV 50% Type of Sampler 5" DP Split Spoon
 Hnu/OVA Reading NAB pH 7 Radiation <DT
 EII References WHC-CM-7-7 S.1, S.2 App B, S.11

Qty.	Size	Type	Analysis	Preservative
1	120ml	Amber Glass	Alpha Beta	Chill on ice
1	60ml	Amber Glass	ICP metals, As, Hg, Pb	Chill on ice
1	120ml	Amber Glass	NH ₄ , Arsenic	Chill on ice

Field Observations Taken from same homogenized bowl as BOOBY1, Chain
of Custody + label marked time 1148. Sent to Oak Ridge

Potential Contamination welding on casing

Sample # B00G49 Type Soil, Chem. interlab split Date 3-12-91
 Weather Cloudy Temp. 50°F Wind Calm Time .1131
 Drill Int. 7.75-8.5 RCV 50% Type of Sampler 5'00 Split Sprom
 Hnu/OVA Reading NAB pH 7 Radiation <Dr
 EII References WHC-CM-7-7 S.1 S.2 App B S.11

Qty.	Size	Type	Analysis	Preservative
1	500 ml	Clear Glass	Alpha, Beta	Chill on ICE
1	100 ml	Amber Glass	ICP metals, Hg, As, Pb	Chill on ICE

Field Observations Taken from same homogenized bowl as B00G41 + B00G42.
Sent to Weston

Potential Contamination welding on casing.

Sample # B00G20 Type Soil, Physical Date _____
 Weather cloudy Temp. 50°C Wind 7 mph from W Time 1306
 Drill Int. 8.50-8.54 RCV 75% Type of Sampler 5'00 Split Sprom
 Hnu/OVA Reading NAB pH _____ Radiation <Dr
 EII References WHC-CM-7-7 S.1 S.2 App B S.11

Qty.	Size	Type	Analysis	Preservative
1	liner	liner	ETA 100 10	Seal Ends
1	3lb	bag/plastic	ETA 07	Seal
1	1lb	photo. bag	ETA 17	Seal
1	3lb	Tin	ETA 17	Seal

07 3/12/91

Field Observations good recovery, but due to cobbles insufficient volume for
Grain Size analysis Sample (ETA 07).

Potential Contamination none obs. val

72 3-12-91

9513357.2819

Sample # 800521 Type Soil, Physical Date 3-12-91
 Weather Cloudy Temp. 57.5 Wind 4 mph from W Time 2:44 PM Jan 1991
 Drill Int. 30-359 RCV 100 Type of Sampler 5" Drive barrel
 Hnu/OVA Reading N/A pH N/A Radiation N/A
 EII References WHC-CM-7-7 5-11

Qty.	Size	Type	Analysis	Preservative
1	100g	Plastic Bag	ETAL 07	Seal

Field Observations From Drive Barrel Cleanest

Potential Contamination none observed

Sample # 800522 Type Soil, Chemical Date 3-12-91
 Weather Cloudy Temp. 58°F Wind Swift from W Time 2:50 PM Jan 1991
 Drill Int. 37-4185 RCV Type of Sampler 5" HD Split Spore
 Hnu/OVA Reading N/A pH 7 Radiation <DT
 EII References WHC-CM-7-7 5.1, 5.2A, B, 5.11

30x 3-15-91
 Sample # 800522
 ✓ 102

Qty.	Size	Type	Analysis	Preservative
2	100 ml	Amber Glass	VPA	Chill on ICE
1	120 ml	Amber Glass	Plate Bact Counts, S+T	Chill on ICE
1	60 ml	Amber Glass	ICR Munk Ag, Hg, Pb, Se, Tl	Chill on ICE
1	120 ml	Amber Glass	NH ₄ , Arsenic, Cr, Sulfide	Chill on ICE
1	120 ml	Amber Glass	Semi-VOA, Herb, Pestic / PCB	Chill on ICE
1	250 ml	Amber Glass	plus. prod	Chill on ICE

Field Observations _____

Potential Contamination _____

3-12-91

Ice: Type Wet Quantity 20 lbs Condition Frozen
 Special request Overnight Delivery
 Labels Applied Packet in Wet: ICE; this end up
 Surveyed by RPT N/A @ Time N/A
 Relinquished Custody: to not Relinquished @ Time N/A

Shipped To Oak Ridge Shipping Container Alpha 3 cooler BL # 242 615 9197
Weston Coleman cooler 242 615 9208

J.D. Farley 3-12-91

Sampler #	Interval	Sampling Summary	Type	Analysis	Lab
B00510	N/A		Equip blank-s.t.c	Short list	Oak Ridge
B00511	79.75-81.5	> Dupt- > Split	Chemical	Short list	Oak Ridge
B00512	79.75-81.5		Chemical- Duplicates	Short list	Oak Ridge
B00519	79.75-81.5		Chem-intract split	Short list	Weston
B00520	83.0-85.9		Physical	partial	ETAL
B00521	83.0-85.9		Physical	Grain size	ETAL
B00522	89-91.85		Chemical	Long list	Oak Ridge

Below is Decontaminated Equipment Delivered by P. McFarlan

1706-KE SAMPLE PREP FACILITY
MATERIAL OUT

QUANTITY	ITEM WITHDRAWN	JOB LOCATION
24	5 INCH LINERS	B-POND
6	5 INCH SHOES, RETAINERS AND BASKETS	B-POND
20	SPOONS	B-POND
1	BOWL	B-POND

ALL EQUIPMENT WAS CLEANED PER EII 5.5 REV.2. DECONTAMINATION OF EQUIPMENT FOR RECRA/CERCLA SAMPLING
 SIGNATURE P. McFarlan PRINT NAME P. McFarlan DATE 3-11-91
 WITHDRAWN BY P. McFarlan PRINT NAME P. McFarlan DATE 3-11-91

END OF SHIFT J. D. Farley JDF

3-13-91

Reference Document WAC-SD-APEN-016 Rev. 1 Date App. 9-5-89
 Date 3-13-91 Site Location B Pond B Lake Borehole BA 38-1
 Site Description 20x30 Gravel Pad, center of lake
 Weather Sunny Temp. 48°F Wind: Smth from W Time 0852
 On site: Samplers Scientist: J. Fancher Tech: F. Hogan
 On Site: Geologist S.E. Kos H & S G. Funk Engineer N/A
 Borehole Log BH 38-1 Safety Log KEH Drill Act. Rpt. # 11

Drillers welded casing then began drilling, doing a cleanout. Drilling got harder, had to switch over to hand tool drilling. Very slow progress. No samples collected. For further information refer to the Field Activity Reports

END OF DAY, J.D. Fancher

3-14-91

Reference Document WAC-SD-APEN-016 Rev. 1 Date App. 9-5-89
 Date 3-14-91 Site Location B Pond B Lake Borehole BA 38-1
 Site Description 20x30 Gravel pad
 Weather Sunny Temp. 50°F Wind: Calm Time 0955
 On site: Samplers Scientist: J.D. Fancher Tech: J. Hogan
 On Site: Geologist S.E. Kos H & S G. Funk Engineer N/A
 Borehole Log BH 38-1 Safety Log KEH Drill Act. Rpt. # 12

Hand tool drilling continued in the morning, finally breaking thru. cleaned out other S, H spaced
 Sample # 800023 Type Soil chemical Date 3-14-91
 Weather Sunny Temp. 54°F Wind Calm Time 1126
 Drill Int. 153.9-154.35 RCV 50% Type of Sampler 5" OD Split Spoon
 Hnu/OVA Reading N/A pH 7.5 Radiation N/A
 EII References WAC-CM-7-7 S.I. S-2 App B, 5.11

Qty.	Size	Type	Analysis	Preservative
1	500 ml	clear glass	Alpha, Beta	Chill on ICE
1	850 ml	Amber glass	237 metals, Ac, Hg, Pb	Chill on ICE
1	500 ml	Amber glass	NH ₄ , Arsenic	Chill on ICE

Field Observations 3x Volume taken for Mercury Lab QA/QC

Potential Contamination Hand tool drilling (adding water) & working

Sample # BOUGZ 4 Type Soil, physical Date 3-14-91 3-14-91
 Weather Sunny Temp 58° F Wind Calm Time 1126
 Drill Int. 103.9-104.35 RCV 50% Type of Sampler 500 split Spindles Split Barrel 307 3/11/91
 Hnu/OVA Reading NAB pH 7.5 Radiation N/A
 EII References WHC-CM-7-7 S.1, S.2 App B S.11

Qty.	Size	Type	Analysis	Preservative
1	4"x6"	Linev	ETAL 16	Seal End
 				
 				

Field Observations Taken from Split Tube

Potential Contamination none observed

Sample # BOUGZ 5 Type Soil, physical Date 3-14-91
 Weather Sunny Temp 58° F Wind Calm Time 1135
 Drill Int. 103.9-104.35 RCV N/A Type of Sampler Drive Barrel
 Hnu/OVA Reading N/A pH N/A Radiation N/A
 EII References WHC-CM-7-7 S.11

Qty.	Size	Type	Analysis	Preservative
1	5lb Bag	Plastic bag	ETAL 07	Seal
1	1lb Bag	Plastic bag	ETAL 17	Seal
1	4x6	Tin	ETAL 14	Seal lid
 				

Field Observations Taken from Drive Barrel Cleanout after Split Spinn Sample

Potential Contamination none observed

Drilling got hard again had to switch back to hand tool drilling

3-14-91

Ice: Type Wet Quantity 15lb Condition Frozen
 Special request Overnight Delivery
 Labels Applied Packed in Wet ICE, This Side UP
 Surveyed by RPT N/A @ Time N/A
 Relinquished Custody: to has relinquished @ Time N/A

Shipped To Oak Ridge Shipping Container _____ BL # _____

J.D. Funcher 3-14-91
 Sampler Signature Date

Samples were kept overnight pending HPT release in the Site Storage Facility.

Sample #	Sampling Interval	Summary Type	Analysis	Lab
B00G23	103.7-106.35	Soil-Chem	Short Run	Oak Ridge
B00G24	103.7-106.35	Soil-phys	Physical-	ETAL
B00G25	103.7-106.35	Soil-phys	physical-GSA	ETAL

END OF DAY J.D. Funcher

Reference Document W46-SD-AP-EP-016 Rev. 1 Date App. 9-589
 Date 3-14-91 Site Location B-Pond B Lobe Borehole B4-3B1
 Site Description 2x30 Grand Pad
 Weather Sunny Temp. 60 F Wind: Calm Time 1245
 On site: Samplers S. G. Funcher S.D. Funcher Tech J. Hogan
 On Site: Geologist S.G. Funcher H & S C. Funcher Engineer N/A
 Borehole Log B43B1 Safety Log KGH Drill Act. Rpt. # 13

3-15-91

77

Sample # B00GZ6 Type Soil, chemical Date 3-15-91
 Weather Sunny Temp. 6°F Wind Cal Time 1251
 Drill Int. 117.5-117.3 RCV 100 Type of Sampler 5' OD Split Spun
 Hnu/OVA Reading NAB pH 7 Radiation LOT
 EII References WHC-CM-7-7 6.1 5.2 App 8 5.11

Qty.	Size	Type	Analysis	Preservative
2	40 ml	Amber Glass	VOA	Chill on ICE
1	120 ml	Amber Glass	Alpha Bm, Gamma, Sr-90	Chill on ICE
-1	60 ml	Amber Glass	ICP metals, As, Pb, Se, Tl	Chill on ICE
1	120 ml	Amber Glass	NH ₄ Anions, Cu, Sulfide	Chill on ICE
1	120 ml	Amber Glass	Semi-VOA, Hex, Pbi/PCB	Chill on ICE
1	250 ml	Amber Glass	Phos. Pist.	Chill on ICE

Field Observations One VOA bottle broke, so a second 40 ml was returned + filled for VOA's report
Swims later than the first VOA. All samples for bottom 1 liter.

Potential Contamination None observed

Sample # B00GZ7 Type Soil, Physical Date 3-15-91
 Weather Sunny Temp. 6°F Wind Cal Time 1251
 Drill Int. 117.5-117.3 RCV 100 Type of Sampler 5' OD Split Spun
 Hnu/OVA Reading NAB pH 7 Radiation <DT
 References WHC-CM-7-7 5.1 5.2 App 8 5.11

Qty.	Size	Type	Analysis	Preservative
1	4x6	Line	ETA 16+10	Seal Ends
1	4x6	Line	ETA 17, 14 07	Seal Ends

Field Observations bottom 2+3 lines

Potential Contamination None observed

3-18-91

79

Sample # B00628 Type Soil, Chemical Date 3-18-91
 Weather Sunny cloudy Temp. 55°F Wind 3 mph from NE Time 0816
 Drill Int. 122.3-124.7 RCV 100% Type of Sampler 5" 00 Split Spoon
 Mn/OVA Reading NAB pH _____ Radiation N/A
 EII References WHG-CM-7.7 5.1 5.2 App B 5.11

Qty.	Size	Type	Analysis	Preservative
2	40 ml	Amber Glass	VVA	Chill on ICE
1	120 ml	Amber Glass	Alpha Beta Gamma Sr-90	Chill on ICE
1	60 ml	Amber Glass	ICP metals As, Hg, Pb, Se, Tl	Chill on ICE
1	120 ml	Amber Glass	NH4, Anions, Cu, Zn, Fe, de	Chill on ICE
1	120 ml	Amber Glass	Semi-VVA, Herb, Res, PCB	Chill on ICE
1	250 ml	Amber Glass	Phos. pest.	Chill on ICE

Field Observations from Bottom Two liters

Potential Contamination none observed

Final Sample from Birchdale Sampling Summary

Sample # B00628 Interval 122.3-124.7 Sample Type Chemical Analysis Longlist Lab. Oak Ridge

Ice: Type twet Quantity 10 lbs Condition Frozen

Special request Overnight Delivery

Labels Applied Packaged in wet ICE, this End up

Surveyed by RPT N/A @ Time N/A

Relinquished Custody: to not Relinquished @ Time N/A

Shipped To Oak Ridge Shipping Container _____ BL # _____

J.D. Family
 Sampler Signature _____ Date 3-18-91

END OF DAY J.D. Family

4/9/91

B POND VADOSE SAMPLING
BOREHOLE SUMMARY
A LOBE

BH 3A-1

<u>SAMPLE#</u>	<u>INTERVAL</u>	<u>TYPE</u>	<u>ANALYSIS</u>	<u>LAB</u>	<u>SHIP DATE</u>	<u>OFFSITE #</u>
BOOFK6	4.95-7.55	chemical	long list	Oak Ridge	2-8-91	W91-0-0159#1
BOOFK7	6.9-10.2	chemical	long list	Oak Ridge	2-8-91	W91-0-0159#1
BOOFK8	9.6-11.75	chemical	long list	Oak Ridge	2-8-91	W91-0-0159#1
BOOFK9	11.8-14.0	chemical	long list	Oak Ridge	2-8-91	W91-0-0159#1
BOOFLO	13.5-15.7	chemical	long list	Oak Ridge	2-8-91	W91-0-0159#1
BOOFL1	14.7-17.0	chemical	long list	Oak Ridge	2-11-91	W91-0-0159#2
BOOFL2	20.4-23	physical	physical	ETAL	2-20-91	N/A
BOOFL3	N/A	equip blank	long list	Oak Ridge	2-12-91	W91-0-0159#3
BOOFL4	26.4-29.3	chemical	long list	Oak Ridge	2-12-91	W91-0-0159#3
BOOGR9	26.4-29.3	duplicate	long list	Oak Ridge	2-12-91	W91-0-0159#3
BOOGS0	30.5-32.6	chemical	short list	Oak Ridge	2-12-91	W91-0-0159#3
BOOGS1	35.55-37.71	chemical	short list	Oak Ridge	2-13-91	W91-0-0167 klc
BOOGS2	40.4-43.25	chemical	short list	Oak Ridge	2-15-91	W91-0-0159#5
BOOGS3	45.45-48.0	chemical	short list	Oak Ridge	2-15-91	W91-0-0159#5
BOOGS4	51.13-54.10	chemical	long list	Oak Ridge	2-15-91	W91-0-0159#5
BOOGS5	51.13-54.10	split	long list	Weston	2-15-91	W91-0-0159#4
BOOGS6	51.13-54.10	physical	physical	ETAL	2-20-91	N/A
BOOGS7	53.0-55.6	physical	physical	ETAL	2-20-91	N/A
BOOGS8	56-58.4	chemical	short list	Oak Ridge	2-15-91	W91-0-0159#5
BOOGS9	65.35-67.65	chemical	long list	Oak Ridge	2-19-91	W91-0176
BOOGT0	67.5-69.65	physical	physical	ETAL	2-20-91	N/A
BOOGT1	75.7-77.9	chemical	short list	Oak Ridge	2-20-91	W91-0178 cg
BOOGT2	75.7-77.9	physical	physical	ETAL	2-20-91	N/A
BOOGT3	N/A	equip blank	short list	Oak Ridge	2-20-91	W91-0178 cg
BOOGT4	84.1-86.68	chemical	short list	Oak Ridge	2-22-91	W91-0185
BOOGT5	84.1-86.68	duplicate	short list	Oak Ridge	2-22-91	W91-0185
BOOGT6	84.1-86.68	split	short list	Weston	2-22-91	W91-0184
BOOGT7	95.7-98.3	chemical	long list	Oak Ridge	2-22-91	W91-0185
BOOGT8	101.6-102.2	chemical	short list	Oak Ridge	2-25-91	W91-0192
BOOGT9	101.6-102.2	physical	physical	ETAL	2-25-91	N/A
BOOGV0	120.7-123.2	chemical	short list	Oak Ridge	2-27-91	W91-0-0200
BOOGV1	N/A	equip blank	short list	Oak Ridge	2-28-91	W91-0-0202
BOOGV2	129.9-132.05	chemical	short list	Oak Ridge	2-28-91	W91-0-0202
BOOGV3	129.9-130.05	duplicate	short list	Oak Ridge	2-28-91	W91-0-0202
BOOGV4	129.9-130.05	split	short list	Weston	2-28-91	W91-0-0203
BOOGV5	142.75-143.85	chemical	long list	Oak Ridge	3-1-91	W91-0-0207

All samples received an unconditional radiological release from health physics prior to shipment to the lab. Samples were maintained under chain of custody prior to shipment.

Physical properties analysis samples were transported to the on site Environmental Technology Applications Laboratory(ETAL) after release by health physics.

Summary of BH 3A-1 Vadose samples. Compiled 4/9/91

J. D. Family

The above List of samples has been compiled to summarize sampling at BH 3A-1

J. D. Family 4/9/91

4/9/91

B POND VADOSE SAMPLING
BOREHOLE SUMMARY
B LOBE

BH 38-1

SAMPLE#	INTERVAL	TYPE	ANALYSIS	LAB	SHIP DATE	OFFSITE #
BOOGV6	0-2	chemical	long list	Oak Ridge	3-5-91	W91-0-0207#1
BOOGV7	2.5-4.5	chemical	long list	Oak Ridge	3-5-91	W91-0-0207#1
BOOGV8	4-6.55	chemical	long list	Oak Ridge	3-5-91	W91-0-0207#1
BOOGV9	N/A	equip blank	long list	Oak Ridge	3-6-91	W91-0-0207#3
BOOGW0	6.2-8.4	chemical	long list	Oak Ridge	3-6-91	W91-0-0207#3
BOOGW1	8.2-10.85	chemical	long list	Oak Ridge	3-6-91	W91-0-0207#3
BOOGW2	8.2-10.85	physical	physical	ETAL	3-11-91	N/A
BOOGW3	11.4-14.1	chemical	long list	Oak Ridge	3-6-91	W91-0-0207#3
BOOGW4	11.4-14.1	duplicate	long list	Oak Ridge	3-6-91	W91-0-0207#3
BOOGW5	11.4-14.1	split	long list	Weston	3-6-91	W91-0207#2
BOOGW6	14.4-17.1	chemical	short list	Oak Ridge	3-6-91	W91-0-0207#3
BOOGW7	14.4-17.1	physical	physical	ETAL	3-11-91	N/A
BOOGW8	19.2-22.5	chemical	long list	Oak Ridge	3-7-91	W91-0207#5
BOOGW9	25.9-29.6	chemical	long list	Oak Ridge	3-7-91	W91-0207#5
BOOGX0	25.9-29.6	physical	physical	ETAL	3-11-91	N/A
BOOGX1	25.9-29.6	physical	physical	ETAL	3-11-91	N/A
BOOGX2	29.5-32.2	chemical	short list	Oak Ridge	3-7-91	W91-0207#5
BOOGX3	34.0-36.8	chemical	short list	Oak Ridge	3-8-91	W91-0207#6
BOOGX4	38.8-41.1	chemical	short list	Oak Ridge	3-8-91	W91-0207#6
BOOGX5	50.8-52.95	chemical	short list	Oak Ridge	3-11-91	W91-0207#8
BOOGX6	60.0-62.6	chemical	long list	Oak Ridge	3-11-91	W91-0207#8
BOOGX7	60.0-62.6	physical	physical	ETAL	3-11-91	N/A
BOOGX8	69.6-71.8	chemical	short list	Oak Ridge	3-11-91	W91-0207#8
BOOGX9	72.25-74.15	physical	physical	ETAL	3-22-91	N/A
BOOGY0	N/A	equip blank	short list	Oak Ridge	3-13-91	W91-0207#9
BOOGY1	79.75-81.5	chemical	short list	Oak Ridge	3-13-91	W91-0207#9
BOOGY2	79.75-81.5	duplicate	short list	Oak Ridge	3-13-91	W91-0207#9
BOOGY9	79.75-81.5	split	short list	Weston	3-13-91	W91-0214#1
BOOGZ0	83.0-85.9	physical	physical	ETAL	3-22-91	N/A
BOOGZ1	83.0-85.9	physical	physical	ETAL	3-22-91	N/A
BOOGZ2	89-91.85	chemical	long list	Oak Ridge	3-13-91	W91-0207#9
BOOGZ3	103.9-106.35	chemical	short list	Oak Ridge	3-15-91	W91-0207#10
BOOGZ4	103.9-106.35	physical	physical	ETAL	3-22-91	N/A
BOOGZ5	103.9-106.35	physical	physical	ETAL	3-22-91	N/A
BOOGZ6	117.5-119.3	chemical	long list	Oak Ridge	3-18-91	W91-0207#11
BOOGZ7	117.5-119.3	physical	physical	ETAL	3-22-91	N/A
BOOGZ8	122.3-124.7	chemical	long list	Oak Ridge	3-19-91	W91-0207#13

All samples received an unconditional radiological release from health physics prior to shipment to the lab. Samples were maintained under chain of custody prior to shipment.

Physical properties analysis samples were transported to the on site Environmental Technology Applications Laboratory (ETAL) after release by health physics.

Summary of BH 38-1 Vadose Samples. Compiled 4/9/91

J. D. Fancher

The above List of samples has been compiled to summarize sampling at BH 38-1

J. D. Fancher
4/9/91

RECORD COPY NOT FOR CIRCULATION FEB 27 1990 RECEIVED WHC BCSR DOCUMENT CONTROL	NOTEBOOK NUMBER		WHC-N-376 2	
	DATE OF ISSUE		2-27-90	
	SERIES AND COPY		— 1	
TITLE (INDICATE SUBJECT CONTENT)				
216-B-3 Remedial Investi-				
gation Phase 3 Vadose				
Zone Soil Sampling				
AUTHOR (S), DEPARTMENT AND SECTION				
T.W. Spicer				
Re-Assigned to Richard Roos on 10/10/90				
PERIOD COVERED (INCLUSIVE - MONTH, DAY, YEAR)				
FROM TO				
IF CONTINUED FROM ANOTHER NOTEBOOK. GIVE NOTEBOOK NUMBER				
IF CONTINUED IN ANOTHER NOTEBOOK. GIVE NOTEBOOK NUMBER				
ROUTE TO	P. R. NO.	LOCATION	ROUTE DATE	SIGNATURE & DATE
T.W. Spicer	62599	50-04	FEB 27 1990	T.W. Spicer 3-19-90
R.C. Roos	58230	44-55	10/10/90	
J.D. Farber	81502	N3-05	3/11/91	J.D. Farber 9/21/91

APPROVED FOR
 PUBLIC RELEASE
 V. Birkhead 6/19/95

216-B-3 Pond Vadose Zone Drilling and Sampling Project.

C-Lobe Drilling for Borehole: BH 3C-1

March 15, 1991. A pre-Job safety meeting prior to beginning C-Lobe drilling was begun at 0912. Attending were SSO IKE Spring, G.B. Gould, M.J. Harney, J.A. Sanchez, J. Hogan, C. Wamsley, and helper Brian Mackey & HPT Tim Brand. A variety of Safety topics were discussed.

Reference Document WIK-SH-APEN-016 Rev. 1 Date App. 7-5-87
 Date 3-15-91 Site Location B-pond C Lobe Borehole BH 3C-1
 Site Description 20x30 Gravel Pad
 Weather Sunny Temp. 66°F Wind: Calm Time 1000
 On site: Samplers J.D. Fambler Scientist J. Hogan Tech.
 On Site: Geologist G.B. Gould H & S I. Spivak Engineer NA
 Borehole Log BH 3C1 Safety Log KEH Drill Act. Rpt. #

Sample # B00 H00 Type Soil, Chemical Date 3-15-91
 Weather Sunny Temp. 66°F Wind: Calm Time 1008
 Drill Int. 0-2' RCV 45' Type of Sampler 5" OD Spks Spoon
 Hrw/OVA Reading NAR pH 8 Radiation <DT
 EII References WHC-CM-7-7 S.I. 5.2 App B S. 11

Qty.	Size	Type	Analysis	Preservative
<u>2</u>	<u>40ml</u>	<u>Amber Glass</u>	<u>VOA</u>	<u>Chill on ICE</u>
<u>1</u>	<u>120ml</u>	<u>Amber Glass</u>	<u>Alpha Beta Gamma Spn</u>	<u>Chill on ICE</u>
<u>1</u>	<u>60ml</u>	<u>Amber Glass</u>	<u>ICP metals, As, Ag, Pb, Se, Ti</u>	<u>Chill on ICE</u>
<u>1</u>	<u>120ml</u>	<u>Amber Glass</u>	<u>NH₄ Anions, Cu, Sulfide</u>	<u>Chill on ICE</u>
<u>1</u>	<u>120ml</u>	<u>Amber Glass</u>	<u>Semi-VOA, Herb, Pest, PCB</u>	<u>Chill on ICE</u>
<u>1</u>	<u>250ml</u>	<u>Amber Glass</u>	<u>Plus pest, PCDD/PCDF</u>	<u>Chill on ICE</u>

Field Observations From Top of hole bottom two hours

Potential Contamination Surface

2 3-15-91

Sample # B00H01 Type Soil Chemical Date 3-15-91
 Weather Sunny Temp 60F Wind: calm Time 1031
 Drill Int. 1.5-4 RCV 65% Type of Sampler 5'00 Split Spoon
 Hnu/OVA Reading NAB pH 8 Rad <DT
 EII References WHC-CM-7-7 S.I. S.2 App B S-11

Qty.	Size	Type	Analysis	Preservative
2	40ml	Amber Glass	VOA	Chill on ICE
1	120ml	Amber Glass	Alpha Beta Gamma Sr-90	Chill on ice
1	60ml	Amber Glass	ICP metals, As, Hg, Pb, Se, Tl	Chill on ice
1	120ml	Amber Glass	NH4, Arsenic, Cr, Sulfide	Chill on ICE
1	120ml	Amber Glass	Semi-VOA, Herb, Pest/PBB	Chill on ice
1	250ml	Amber Glass	phos, pest, PCB/PCB	Chill on ICE

Field Observations Bottom Two liters

Potential Contamination none observed

Sample # B00H02 Type Soil Chemical Date 3-15-91
 Weather Sunny Temp 62F Wind 4 mph from W Time 1346
 Drill Int. 3.87-5.4 RCV 65% Type of Sampler 5'00 Split Spoon
 Hnu/OVA Reading NAB pH 8.1 Rad <DT
 EII References WHC-CM-7-7 S.I. S.2 App B S-11

Qty.	Size	Type	Analysis	Preservative
2	40ml	Amber Glass	VOA	Chill on ICE
1	120ml	Amber Glass	Alpha Beta Gamma Sr-90	Chill on ice
1	60ml	Amber Glass	ICP metals, As, Hg, Pb, Se, Tl	Chill on ice
1	120ml	Amber Glass	NH4, Arsenic, Cr, Sulfide	Chill on ice
1	120ml	Amber Glass	Semi-VOA, Herb, Pest/PBB	Chill on ice
1	250ml	Amber Glass	phos, pest, PCB/PCB	Chill on ice

Field Observations Bottom 2 liters

Potential Contamination Drilling Casing

3-15-91

Ice: Type Wet Quantity 20 lbs Condition Frozen
 Special request Overnight Delivery
 Labels Applied Packed in Wet Ice
 Surveyed by RPT N/A @ Time NA
 Relinquished Custody: to Not Relinquished @ Time N/A

Shipped To Oak Ridge Shipping Container Vh7 BL# PSC 2426159175
Cedman-Lynn Co. 4891

J.D. Fancher
 Sampler Signature J.D. Fancher Date 3-15-91

Sample #	Sampling Summary		Analysis	Lab
	Interval	Type		
BWH00	0-2	Soil-chem	Long List	Oak Ridge
BWH01	1.5-4	Soil-chem	Long List	Oak Ridge
BWH02	3.87-5.8	Soil-chem	Long List	Oak Ridge

END OF DAY J.D. Fancher J.D. Fancher

3-15-91

Reference Document WHC-SPAR-EN-016 Rev. 1 Date App. 9-5-89
 Date 3-15-91 Site Location B Pond C Lake Borehole BH-3C-1
 SSS Description 20x30 Ghaul Pad
 Weather Cloudy Temp. 50°E Wind: 2 mph from W Time 0910
 On site: Samplers Scientist: J.D. Fancher Technician: J. Hogan
 On Site: Geologist S.G. Kos H & S Ike Spitzer Engineer N/A
 Borehole Log BH-3C-1 Safety Log KEH Drill Act. Rpt #

9513357.2833

3-18-91

Sample # B00403 Type Soil, chemical Date 3-18-91
 Weather cloudy Temp. 50.5 Wind 2 mph from W. Time 0915
 Drill Int. 5.93-7.95 RCV 7.5 Type of Sampler 5" DD Split Spoon
 Hnu/OVA Reading NAS pH 7.5 Radiation <DT
 EII References WHC-CM-7-7 5.1 5.2 App B 5.11

Qty.	Size	Type	Analysis	Preservative
1	40ml	Amber Glass	VOA	Chill on ICE
1	120ml	Amber Glass	Alpha, Beta, Gamma, Sr-90	Chill on ice
1	60ml	Amber Glass	ICP metals, As, Hg, Pb, Se, Tl	Chill on ice
1	120ml	Amber Glass	NH4, Anions, Cu, Sulfide	Chill on ice
1	120ml	Amber Glass	Semi-VOA, Herb, Pest, PCB	Chill on ice
1	250ml	Amber Glass	phos. Pest, PCDD/PCDF	Chill on ice

Field Observations Taken from Bottom Two liners

Potential Contamination Welding on casing

3-18-91

Sample # B00404 Type Soil chemical Date 3-18-91
 Weather cloudy Temp. 58.5 Wind Calm Time 1022
 Drill Int. 7.93-9.73 RCV 6.5 Type of Sampler 5" DD Split Spoon
 Hnu/OVA Reading NAB pH 7.5 Radiation <DT
 EII References WHC-CM-7-7 5.1 5.2 App B 5.11

Qty.	Size	Type	Analysis	Preservative
2	40ml	Amber Glass	VOA	Chill on ICE
1	120ml	Amber Glass	Alpha, Beta, Gamma, Sr-90	Chill on ice
1	60ml	Amber Glass	ICP metals, As, Hg, Pb, Se, Tl	Chill on ICE
1	120ml	Amber Glass	NH4, Anions, Cu, Sulfide	Chill on ice
1	120ml	Amber Glass	Semi-VOA Herb, Pest, PCB	Chill on ice
1	250ml	Amber Glass	phos. pest.	Chill on ice

Field Observations Taken from Bottom 3 liners

Potential Contamination none observed

Sample # Bowl 5 Type Soil, Chemical - Duplicate Date 10/3/07 3-18-91
 Weather cloudy Temp. 58°F Wind Calm Time 1022 h ml -1043 on
 Drill Int. 7.23-9.73 RCV 65% Type of Sampler 5" OD Split Spoon C-of-C and Sample Label
 Hnu/OVA Reading NAB pH 7.5 Radiation LDT
 EII References WHC-CM-7-7 S.1, S.2 App B, S.11

Qty.	Size	Type	Analysis	Preservative
2	40ml	Amber Glass	VOA	Chill on ICE
1	120ml	Amber Glass	Alpha beta Gamma Sr-90	Chill on ICE
1	60ml	Amber Glass	ICP metals As, Hg, Pb, Se, Tl	Chill on ICE
1	120ml	Amber Glass	NH4, Anions, Cu, Sulfide	Chill on ice
1	120ml	Amber Glass	Semi-VOA, Hex, PAK/PCB	Chill on ice
1	250ml	Amber Glass	phos. post	Chill on ice

Field Observations Taken from bottom 3 liners. The 60ml was also collected from the shoe

Potential Contamination none observed

Sample # B00406 Type Soil, Chemical Date 3-18-91
 Weather Cloudy Temp. 58°F Wind Calm Time 1345
 Drill Int. 10.6-11.93 RCV 85% Type of Sampler 5" OD Split Spoon
 Hnu/OVA Reading NAB pH 7.5 Radiation LDT
 EII References WHC-CM-7-7 S.1, S.2 App B S.11

Qty.	Size	Type	Analysis	Preservative
2	40ml	Amber Glass	VOA	Chill on ICE
1	120ml	Amber Glass	Alpha Beta Gamma Sr-90	Chill on ice
1	60ml	Amber Glass	ICP metals As, Hg, Pb, Se, Tl	Chill on ice
1	120ml	Amber Glass	NH4, Anions, Cu, Sulfide	Chill on ice
1	120ml	Amber Glass	Semi-VOA, Hex, PAK/PCB	Chill on ice
1	250ml	Amber Glass	phos post	Chill on ice

Field Observations Bottom 3 liners

Potential Contamination leaking on casing

6 3-18-91

J07

1706-KE SAMPLE PREP FACILITY
MATERIAL OUT

QUANTITY	ITEM WITHDRAWN	JOB LOCATION
12	5 INCH LINERS	B-POND
3	5 INCH SHOES WITH RETAINERS AND BASKETS	B-POND
10	BOWLS	B-POND
17	SPOONS	B-POND
 		

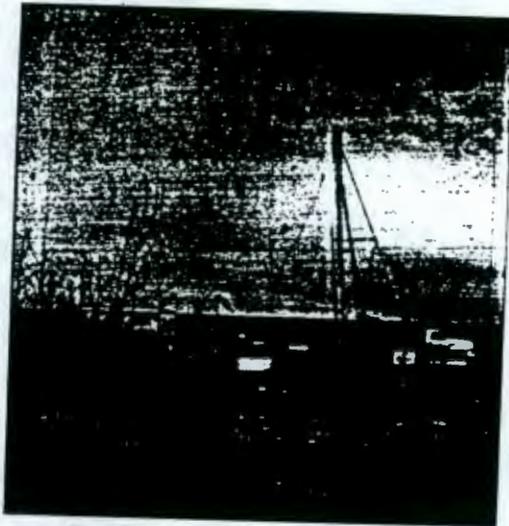
J07

J07

ALL EQUIPMENT WAS CLEANED PER EII 5.5 REV.2. DECONTAMINATION OF EQUIPMENT FOR RECRA/CERCLA SAMPLING

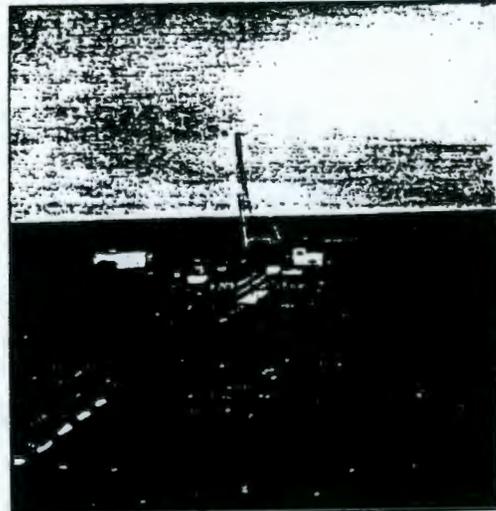
SIGNATURE *P. MacFarlan* PRINT NAME P. MacFarlan DATE 3-15-91
 WITHDRAWN BY *P. MacFarlan* PRINT NAME P. MacFarlan DATE 3-15-91

Above is list of sampling Equipment currently in use at B-pond
J07



J07

3-18-91 @1250 C-Lobe



J07

3-18-91 @1250 C-2lobe

J07

J07

Sample # B00H07 Type Soil, Chem, Intern Lab Soil Date 3-18-91
 Weather cloudy Temp. 59°F Wind Calm Time 1348
 Drill Int. 10.6-11.93 RCV 5% Type of Sampler 5"00 Split Spoon
 Hru/OVA Reading NAB pH 7.5 Radiation <DT
 EII References WHC-CM-7-7 5.1, 5.2 App B 5.11

Qty.	Size	Type	Analysis	Preservative
1	120ml	Amber Glass	VOA	Chill on ICE
1	500ml	Clear Glass	Alpha Beta Gamma Srgs	Chill on ice
1	120ml	Amber Glass	As & Pb, TL, IC, metals, Hg, Cu	Chill on ICE
1	250	Amber Glass	Res/PCB, Srgs VOA	Chill on ICE

Field Observations Taken from same horizontal level as B00H06
Sent to Weston

Potential Contamination Welding on casing

Ice: Type Wet Quantity 20lbs Condition Frozen
 Special request Overnight Delivery
 Labels Applied This End up, Packed in Wet ICE
 Surveyed by RPT N/A @ Time N/A
 Relinquished Custody to not relinq. actual @ Time N/A

Shipped To Oak Ridge Shipping Container Admin Lab Waste BL # 2974256510
Weston Dohy code B00H07 -2974256504

J. D. Fisher 3-18-91
 Sampler Signature Date

Sample #	Sampling Interval	Summary Type	Analysis	LAB
B00H03	5.93-7.95	Soil	Long list	Oak Ridge
B00H04	7.93-9.73	dipl. soil	Long list	Oak Ridge
B00H05	7.93-9.73	Soil	Long list	Oak Ridge
B00H06	10.6-11.93	int. lab	Long list	Oak Ridge
B00H07	11.6-11.93	split	Long list	Oak Ridge

END OF DAY
J. D. Fisher

8

3-19-91

Reference Document WHC-SD-AD-EN-016 Rev. 1 Date App. 9-5-89
 Date 3-19-91 Site Location B-pond C. Lake Borehole B4-3C1
 Site Description 20x30 Gravel pad
 Weather Cloudy Temp. 78°F Wind: Calm Time 0800
 On site: Samplers Scientist: J.O. Fawcett Technician: J. Hogan
 On Site: Geologist S.E. Kos H&S Ike Sperry Engineer N/A
 Borehole Log B43C-1 Safety Log KEH Drill Act. Rpt. # 7

Began moving collecting a sample for physical properties analysis.
 Drove sampler, but had to wait for HPT Arrival to pull sampler

Sample # 800H08 Type Soil-Physical Date 3-19-91
 Weather cloudy Temp. 57°F Wind Calm Time 0917
 Drill Int. 11.7-13.7 RCV 10" B Type of Sampler S100 Split Spoon & Drive Barrel
 Hnu/OVA Reading N/A pH Radiation <BT
 EIT References WHC-CM-7-7 S-1, S-2 App B

Qty.	Size	Type	Analysis	Preservative
1	Slieve	Slieve	ETAL 1602	Seal Bags
1	5 lb	bag	ETAL 07	Seal Bag
1	1 lb	plastic bag	ETAL 17	Seal Bag
1	1 lb	Tin	ETAL 14	Seal Bag

Field Observations Slieve from Split-Spoon. The remaining samples
were collected from the Drive Barrel

Potential Contamination none observed

Sample # 600-109 Type Soil, Chemical Date 3-19-91
 Weather Cloudy Temp. 58°F Wind Calm Time 1100
 Drill Int. 15.0-17.0 RCV 50% Type of Sampler 5" O.D. Split Spoon
 Hnu/OVA Reading NAS pH 7.5 Radiation Lot
 EII References WHC-CM-7-7 S1, S2 App B S-V

Qty.	Size	Type	Analysis	Preservative
1	120ml	Amber Glass	Alpha Beta	Chillonia
1	60ml	Amber Glass	ICP metals, As, Hg, Pb	Chillonia
1	120ml	Amber Glass	NH ₄ Anions	Chillonia
 				

Field Observations Taken from bottom line

Potential Contamination within occasion

Samplers and material used in sampling at C-4000:
 ↓ JF

1706-KE SAMPLE PREP FACILITY
 MATERIAL OUT

QUANTITY	ITEM WITHDRAWN	JOB LOCATION
8	5 INCH LINERS	B-POND
2	5 INCH SHOES WITH RETAINERS AND BASKETS	B-POND
8	BOWLS	B-POND
2	LARGE SPOONS	B-POND
 		

ALL EQUIPMENT WAS CLEANED PER EII 5.5 REV.2. DECONTAMINATION OF EQUIPMENT FOR RECRA/CERCLA SAMPLING

SIGNATURE [Signature] PRINT NAME P. MacFarland DATE 3-18-91
 WITHDRAWN BY [Signature] PRINT NAME P. MacFarland DATE 3-18-91

↓ JF

10

3/20/91

Ice Type Wet Quantity 10 lbs Condition Fresh
 Special request Overnight Delivery
 Labels Applied Packed in Wet-ICE - This End Up
 Surveyed by RPT N/A @ Time N/A
 Relinquished Custody to Not Relinquished @ Time N/A

Shipped To Oak Ridge Shipping Container Colusa 610 BL # 207456543

J.D. Fambro
 Sampler Signature J.D. Fambro Date 3/20/91

Sample #	Sampling Interval	Summary	Analysis	Lab
B00866	11.7-13.7		Physical	ETAL
B00869	15.0-17.0		Shrink	Oak Ridge

END OF Shift J.D. Fambro

3-20-91

Reference Document WHC-SD-AP-EN-016 Rev. 1 Date App. 9-5-89
 Date 3-20-91 Site Location B-pond C Lobe Borehole BH-3C-1
 Site Description 20x30 Gravel pad
 Weather Sun + low Fog Temp. 41°F Wind: Calm Time 7:40
 On site: Samplers Scientist J.D. Fambro
 On Site: Geologist S.E. Kus H & SR A. Spivey Engineer N/A
 Borehole Log BH-3C-1 Safety Log KEH Drill Act. Rpt. # 8

3-20-91

Sample # RU0H10 Type Sand, Equip Blank Date 3-20-91
 Weather Sunny Temp 44°F Wind Calm Time 0801
 Drill Int. N/A RCV N/A Type of Sampler 5" O.D. Split Spoon
 Hru/OVA Reading N/A PH N/A Rad N/A
 EII References WHC-CM-5.11, 5.1

Qty.	Size	Type	Analysis	Preservative
2	40 ml	Amber Glass	VOA	Chill on Ice
1	120 ml	Amber Glass	Alpha, Beta Gamma, Sr-90	Chill on ice
1	60 ml	Amber Glass	ICP metals: As, Hg, Pb, Se, Tl	Chill on ice
1	120 ml	Amber Glass	NH ₄ , Arsenic, Cd, Sulfide	Chill on ice
1	120 ml	Amber Glass	Semi-VOA, Herb, Pesticides	Chill on ice
1	250 ml	Amber Glass	Phos. Pest	Chill on ice

Field Observations Glean Silicon Sand of known origin was poured through a decontaminated sample shoe basket, filling it into a decontaminated stainless steel bowl.
 potential Contamination None observed

Sample # RU0H11 Type Soil, Chemical Date 3-20-91
 Weather Sunny Temp 44°F Wind Calm Time 0850
 Drill Int. 19.5-21.5 RCV 50's Type of Sampler 5" O.D. Split Spoon
 Hru/OVA Reading NAB PH 7 Radiation < DL
 EII References WHC-CM-7.7 5.1, 5.2 App B, 5.11

Qty.	Size	Type	Analysis	Preservative
1	120 ml	Amber Glass	Alpha, Beta	Chill on Ice
1	60 ml	Amber Glass	ICP metals: As, Hg, Pb	Chill on Ice
1	120 ml	Amber Glass	NH ₄ , Arsenic	Chill on Ice

Field Observations The accuracy & completeness of "Glean" is questioned. The Drilling of the sample was complete and per protocol & IIS. Due to the poor recovery a split sample was not collected, only a short list sample. The next sample will be split.
 potential Contamination Welding on casing

9513357.2841

I2 3-20-91

Sample # BDDH12 Type Soil, Physical Date 3-20-91
 Weather Sunny Temp. 64F Wind Calm Time 1319
 Drill Int. 256 27.8 RCV 50% Type of Sampler 5" OD Split Spoon
 Hnu/OVA Reading NAB pH _____ Radiation <DT
 EII References WHC-CM-7-7 S-1, S-2, S-3, S-4, S-5, S-6, S-7, S-8, S-9, S-10, S-11

Qty.	Size	Type	Analysis	Preservative
1	4 1/2 lb	liner	ETA-16	Seal Ends
1	5 lb	bag	ETA (07, 07, 07, 07)	Seal bag

Field Observations Poor Recovery - wet ground. Sealed bag sent to ETA
Recovery poor

Potential Contamination Drilling of casing

Due to no recovery a 25 ft chemical sample was not collected.
poor recovery prevented any further samples today

Sample # _____ Type _____ Date _____
 Weather _____ Temp. _____ Wind _____ Time _____
 Drill Int. _____ RCV _____ Type of Sampler _____
 Hnu/OVA Reading _____ pH _____ Radiation _____
 EII References WHC-CM-7-7

Qty.	Size	Type	Analysis	Preservative

Field Observations _____

Potential Contamination _____

3-26-91

Ice: Type WET Quantity 10 Lbs Condition Frozen
 Special request Overnight Delivery
 Labels Applied Packed To Wet ICE, This End up
 Surveyed by RPT N/A @ Time N/A
 Relinquished Custody: to N/A @ Time N/A

Shipped To Oak Ridge Shipping Container Isln #6 BL# 2474256554

J.D. Family
 Sampler Signature _____ Date 3-26-91

Samples were kept overnight in a secure WHC Sample Storage facility

Sampling Summary

Sample #	Interval	Type	Analysis	Lab	
Booth 10	N/A	Equip blank	Long list	102-2-2001	Oak Ridge
Booth 11	19.5-21.5	Soil	Short list	Oak Ridge	
Booth 12	25.6-27.8	Soil	Physical - partial	ETAL	

END OF DAY J. J. Family

3-27-91

Reference Document WHC SD-AP-016 Rev. 1 Date 9-5-89
 Date 3-26-91 Site Location B-Pond C Lobe Borehole BH 3C-1
 Site Description 20x30 Ground Pad
 Weather Sunny Temp. 30S Wind: Calm Time 0810
 On site: Samplers Scientist J. Hogan
 On Site: Geologist G.B. Gould H & S R.A. Spivey Engineer N/A
 Borehole Log BH 3C-1 Safety Log KAH Drill Act. Rpt # 9

SSD had Safety meeting Topic: MSDS sheets at Site

3-21-91

1706-KE SAMPLE PREP FACILITY
MATERIAL OUT

QUANTITY	ITEM WITHDRAWN	JOB LOCATION
12	5 INCH LINERS	B-POND
3	5 INCH SHOES WITH RETAINERS AND BASKETS	B-POND

ALL EQUIPMENT WAS CLEANED PER EII 5.5 REV.2. DECONTAMINATION OF EQUIPMENT FOR RECRA/CERCLA SAMPLING

SIGNATURE P. J. MacFarlan PRINT NAME P. J. MacFarlan DATE 3-19-91
 WITHDRAWN BY P. J. MacFarlan PRINT NAME P. J. MacFarlan DATE 3-19-91

The above equipment, decontaminated on 1706 is currently in use at B-Pond.

Sample # B00413 Type Soil, Physical Date 3-21-91
 Weather Sunny Temp. 58F Wind Calm Time 0830
 Drill Int. 25-6878 RCV 100% Type of Sampler 8" Drive Barrel
 HnuOVA Reading NAB pH N/A Radiation <M
 EI References WHC-CM-7-7 57-5-11

Qty.	Size	Type	Analysis	Preservative
1	10lb	Plastic bag	GSA-RAL 07	Seal Bag

Field Observations From Drive Barrel Cleanout. 2' Standing Water in Borehole.

~~Observation~~ none observed

3-21-91

Sample # BOOH14 Type Soil, Chemical Date 3-21-91
 Weather Sunny Temp 62°F Wind Cal m 1042
 Drill Int. 29-31 RCV 90% Type of Sampler 5' DP Split Spoon
 Hru/OVA Reading NAB pH 7.4 Radiation LOT
 EI References WHC-CM-7-7 51, 52 app B, 5.11

Qty.	Size	Type	Analysis	Preservative
2	40ml	Amber Glass	VOI	Chill on ICE
1	120ml	Amber Glass	Alpha Beta Gamma S-90	Chill on ICE
1	60ml	Amber Glass	ICP metals, As, Hg, Pb, Se, Tl	Chill on ICE
1	120ml	Amber Glass	NH4, Arsenic, CN, Sulfide	Chill on ICE
1	120ml	Amber Glass	Semi-VOA, Herb, Pest/PCB	Chill on ICE

Field Observations Very Wet. Sent to Oak Ridge

Potential Contamination none observed

very difficult Drilling - very Gravelly

Ice Type Wet Quantity 20 lbs Condition Frozen

Special request Overnight Delivery

Labels Applied Packed in Wet ICE, this End up

Surveyed by RPT N/A

@ Time N/A

Relinquished Custody to Not Released

@ Time N/A

Shipped To Oak Ridge Shipping Container Islo #24 BL # 247 425 6576

J. Fancher Sampler Signature 3-21-91 Date

Samples were held pending HPT Release in a secure storage facility at Rypool

Sampling Summary

Sample #	Interval	Type	Analysis	Lab
BOOH13	25.6-27.8	Soil-Physical	CRAL 87 physical	ETA
BOOH14	29-31	Soil-chem	Long list	Oak Ridge

END OF SHIFT J. Fancher

3-25-91

Reference Document WHA SD-APEN-016 Rev. 1 Date App. 9-5-89
 Date 3-25-91 Site Location B-Pond C Lobe Borehole BH 3C-1
 Site Description 20x30 Gravel Pad
 Weather Cloudy, Sprinkles Temp. 40°F Wind: 2 mph from W Time 0737
 On site: Samplers Scientists: J.D. Fancher
 On Site: Geologist G.B. Gould H & S G. Funk Engineer MA
 Borehole Log BH 3C-1 Safety Log KEL Drill Act. Rpt. # 11

SSO G. Funk cleared Borehole, and then drillers began welding & running the remaining 8' casing.

Drilling & cleanup continued

Sample # 800415 Type Soil, Chemical Date 3-25-91
 Weather Cloudy Temp. 41°F Wind 10 mph from N Time 0900
 Drill Int. 34.8-37.6 RCVS 5/0 Type of Sampler 5'00 Split Spoon
 Hnu/OVA Reading NAB pH 7.5 Field # CP1
 EI References WHC-CM-7-7 5.1, 5.2 App B, 5.4

Qty.	Size	Type	Analysis	Preservative
1	120ml	Amber Glass	Alpha, Beta	Chill on ICE
1	60ml	Amber Glass	ICP metals, As, Hg, Pb	Chill on ICE
1	120ml	Amber Glass	NH4, Anions	Chill on ICE

Field Observations Taken from bottom Two liners. Sent to Oak Ridge

Potential Contamination none observed

Continued Drilling & Driving Casing

3-25-91

Sample # B00H16 Type Soil, chemical Date 3-25-91
 Weather cloudy Temp. 44°F Wind 5 mph from N Time 10:02
 Drill Int. 37.5' 34.5' RCV 80% Type of Sampler 5" OD Split Spoon
 Hnu/OVA Reading NAB pH 7 Radiation <DT
 EI References WHC-CM-7-7 5-1, 5-2 App B, 5-11

Qty.	Size	Type	Analysis	Preservative
1	120ml	Amber Glass	Alpha Beta	Chill on ICE
1	60ml	Amber Glass	ICP metals, As, Hg, Pb	Chill on ice
1	120ml	Amber Glass	NH4, Anions	Chill on ice

Field Observations Taken from bottom two liners

Potential Contamination none observed

Sample # B00H17 Type Soil, chemical Duplicate Date 3-25-91
 Weather cloudy Temp. 44°F Wind 5 mph from N Time 10:02 actual - 10:55 on label
 Drill Int. 39-41.5' RCV 80% Type of Sampler 5" OD Split Spoon C.C.
 Hnu/OVA Reading NAB pH 7 Radiation <DT
 EI References WHC-CM-7-7 5-1, 5-2 App B, 5-11

Qty.	Size	Type	Analysis	Preservative
1	120ml	Amber Glass	ICP metals Alpha Beta	Chill on ICE
1	60ml	Amber Glass	ICP metals, As, Hg, Pb	Chill on ice
1	120ml	Amber Glass	NH4, Anions	Chill on ice

Field Observations from Bottom Two liners

Potential Contamination NONE observed

9513357.2847

✓✓✓

18 3-25-91

1706-KE SAMPLE PREP FACILITY
MATERIAL OUT

QUANTITY	ITEM WITHDRAWN	JOB LOCATION
12	5 INCH LINERS	B-POND
3	5 INCH RETAINERS AND BASKETS	B-POND
6	BOWLS	B-POND
16	SPOONS	B-POND
3	LARGE SPOONS	B-POND
/		

✓✓✓

✓✓✓

ALL EQUIPMENT WAS CLEANED PER EII 5.5 REV.2. DECONTAMINATION OF EQUIPMENT FOR RECRA/CERCLA SAMPLING

SIGNATURE P. MacFarlan PRINT NAME P. MACFARLAN DATE 3-25-91
 WITHDRAWN BY P. MacFarlan PRINT NAME P. MACFARLAN DATE 3-25-91

✓✓✓

The above decontamination equipment was delivered to the site this morning by P.J. MacFarlan.

Sample # B001FB Type Soil, Chemical Date 3-25-91
 Weather cloudy Temp. 47 F Wind 5 mph from W Time 1435
 Drill Int. 49.8-50.8 RCV 80% Type of Sampler 5" OD Split Spoon
 Hnu/OVA Reading NAB pH 7 Radiation LOT
 EI References WHC-CM-7-7 S-1, S-2 App B, S-11

✓✓✓

Qty.	Size	Type	Analysis	Preservative
1	120ml	Amber Glass	Alpha, Beta	Chill on ICE
1	60ml	Amber Glass	ICP metals, As, Hg, Pb	Chill on ICE
1	120ml	Amber Glass	NH ₄ , Arsenic	Chill on ICE

Field Observations from Bottom Two liners

Potential Contamination none observed

20 8/26/91

Sample # B00H19 Type SOIL-CHEMICAL Date 8/26/91
 Weather SUNNY Temp. 56°F Wind < 2 MPH FROM NW Time 1252
 Drill Int. 59.3 - 61.1' RCV 60% Type of Sampler 5" OD SPLIT SPOON
 Hru/OVA Reading N.A.S pH 7.6 Radiation < DET
 EII References WHC-CM-7-7 5.1, 5.2 APP B, 5.11

Qty.	Size	Type	Analysis	Preservative
2	40 ML	AMBER GLASS	VOA	CHILL ON ICE
1	120 ML	AMBER GLASS	ALPHA, BETA, GAMMA R-90	CHILL ON ICE
1	60 ML	AMBER GLASS	ICP METALS, AS, HG, Pb, Cr, T	CHILL ON ICE
1	120 ML	AMBER GLASS	URANIONS ON SULFIDES	CHILL ON ICE
1	120 ML	AMBER GLASS	SEMI-VA HEAVY METALS	CHILL ON ICE
1	250 ML	AMBER GLASS	PHAS - PERT	CHILL ON ICE

Field Observations SAMPLE MATERIAL WAS TAKEN FROM THE
BOTTOM TWO (2) LINERS

Potential Contamination NONE OBSERVED

~~Sample # _____ Temp. _____ Date _____
 Weather _____ Temp. _____ Time _____
 Drill Int. _____ RCV _____ Type of Sampler _____
 Hru/OVA Reading _____ pH _____ Radiation _____
 EII References WHC-CM-7-7~~

Qty.	Size	Type	Analysis	Preservative

~~Field Observations _____
 Potential Contamination _____~~

3/26/91

Net Type WET Quantity 15 LBS Condition FROZEN
 Special request OVERNIGHT DELIVERY
 Labels Applied PACKED IN WET ICE / THIS END UP
 Surveyed by RPT NA @ Time NA
 Relinquished Custody: to WT RELINQUISHED @ Time NA

Shipped To	Shipping Container	BL #
<u>OAK RIDGE</u>	<u>70109</u>	<u>247 425 661T</u>
<u>NA</u>	<u>NA</u>	<u>NA</u>
<u>NA</u>	<u>NA</u>	<u>NA</u>

Steven E. Kos 3/26/91
 Sampler Signature Date

SAMPLES WERE STORED OVERNIGHT IN LOCKED STORAGE BUILDING AT B-POND STAGING AREA PRIOR TO OBTAINING HEALTH PHYSICS RELEASE FOR OFFSITE SHIPMENT

SAMPLING SUMMARY

SAMPLE #	INTERVAL	TYPE	ANALYSES	LAB
<u>BOOM 19</u>	<u>59.3' - 61.1'</u>	<u>SOIL</u>	<u>CHEMICAL-LONG LIST</u>	<u>OAK RIDGE</u>

* END OF SHIFT 3/26/91 Steven E. Kos STEVEN E. KOS

3-2791

Reference Document WHC-SBAR-016 Rev. 1 Date App. 9-5-89
 Date 3-27-91 Site Location B-POND C Lake Borehole BH 3C1
 Site Description 2.0 -> 3.0 Gavel Pond
 Weather Sunny Temp. 47°F Wind. Calm Time 0820
 On-site Samplers Scientist J.O. Fancher
 On-Site Geologist E.B. Gould H&S G. Funk Engineer N/A
 Borehole Log BH 3C1 Safety Log KEH Data Act. Rpt. # 12

Drillers began day welding casing. After welding drillers drove casing and drilled

22

3-27-91
 Sample # 800 H20 Type Soil, chemical Date 3-27-91
 Weather Sunny Temp. 59°F Wind Calm Time 0956
 Drill Int. 69.3-71.5 RCV 40 Type of Sampler 5'00 Split Spoon
 Hnu/OVA Reading NAB pH 7 Radiation CDT
 EII References WHC-CM-7-7 5.1, 5.2, 4, 8, 5.11

Qty.	Size	Type	Analysis	Preservative
<u>1</u>	<u>120ml</u>	<u>Amber Glass</u>	<u>Alpha, Beta</u>	<u>Chill on ICE</u>
<u>1</u>	<u>60ml</u>	<u>Amber Glass</u>	<u>IC elements, As, Hg, Pb</u>	<u>Chill on ICE</u>
<u>1</u>	<u>120ml</u>	<u>Amber Glass</u>	<u>NH4, Anions</u>	<u>Chill on ICE</u>
1	120ml	Amber Glass	Alpha, Beta	Chill on ICE
1	60ml	Amber Glass	IC elements, As, Hg, Pb	Chill on ICE
1	120ml	Amber Glass	NH4, Anions	Chill on ICE

Field Observations Taken from bottom Two liners

Potential Contamination none observed

Sample # 800 H21 Type Sand Equipment Blank Date 3-27-91
 Weather Sunny Temp 63°F Wind Calm Time 1335
 Drill Int. N/A RCV N/A Type of Sampler 5'00 Split Spoon
 Hnu/OVA Reading N/A pH N/A Radiation N/A
 EII References WHC-CM-7-7 5.1, 5.2, 4, 8, 5.11

Qty.	Size	Type	Analysis	Preservative
<u>1</u>	<u>120ml</u>	<u>Amber Glass</u>	<u>Alpha, Beta</u>	<u>Chill on ICE</u>
<u>1</u>	<u>60ml</u>	<u>Amber Glass</u>	<u>IC elements, As, Hg, Pb</u>	<u>Chill on ICE</u>
<u>1</u>	<u>120ml</u>	<u>Amber Glass</u>	<u>NH4, Anions</u>	<u>Chill on ICE</u>
1	120ml	Amber Glass	Alpha, Beta	Chill on ICE
1	60ml	Amber Glass	IC elements, As, Hg, Pb	Chill on ICE
1	120ml	Amber Glass	NH4, Anions	Chill on ICE

Field Observations Clean siltan - Sand of known origin was poured through a liner, shot with a Ring into a stainless steel bowl and immediately containerized

Potential Contamination none observed

Sample # B-00722 Type Soil, physical Date 3/27/91
 Weather Sunny Temp 66° F Wind 6 mph from S. Time 1358
 Drill Int. 76.9-79.4 RCV 80% Type of Sampler 5" OD Split Spoon
 Hnu/OVA Reading NAB pH 7 Radiation SDI
 EI References WHC-CM-7-7 S-1, S-2 App B, S-11

Qty.	Size	Type	Analysis	Preservative
1	4x6	Linn	ETAL-16	Seal
1	3.45	Tin	ETAL-14	Seal
1	145	sub bag	ETAL-17	Seal

Field Observations Slightly Rocky

Potential Contamination none observed

Sample # B-00723 Type Soil, chemical Date 3-27-91
 Weather Sunny Temp. 61° F Wind 6 mph from S Time 1410
 Drill Int. 79.4-80.9 RCV 75% Type of Sampler 5" OD Split Spoon
 Hnu/OVA Reading NAB pH 7 Radiation SDI
 EI References WHC-CM-7-7 S-1 S-2 App B, S-11

Qty.	Size	Type	Analysis	Preservative
2	40ml	Amber Glass	VOA	Chill on ice
1	120ml	Amber Glass	Alpha, Beta Gamma S90	Chill on ice
1	60ml	Amber Glass	ICP metals ASH, P, S, T	Chill on ice
1	120ml	Amber Glass	NH4, Anions, Cu, Sulfide	Chill on ice
1	120ml	Amber Glass	Semi-VOA, Herb, Pesticides	Chill on ice
1	250ml	Amber Glass	phos pest.	Chill on ice

Field Observations VOA Samples Taken from Bottom Two liners All tubes taken from Bottom 3 liners.

Potential Contamination none observed

24 3-27-97

Sample # B00H24 Type Soil, Chemical, interlab Spn Date 3-27-97
 Weather Sunny Temp. 65 Wind 6 mph from S Time 1410
 Drill Int. 19.4-20.9 RCV TS4 Type of Sampler 5" DP Split Spoon
 Hnu/OVA Reading NA8 pH 7 Radiation <01
 EIL References WHC-CM-7-7 S.I. S.2 App B, 5.11

Qty.	Size	Type	Analysis	Preservative
<u>1</u>	<u>500ml</u>	<u>Clear Glass</u>	<u>Alpha, Beta</u>	<u>Chill on ICE</u>
<u>1</u>	<u>120ml</u>	<u>Amber Glass</u>	<u>Ice metals, Hg, As, Pb</u>	<u>Chill on ICE</u>
 	 	 	 	
 	 	 	 	

Field Observations from same bowl as B00H23. Sent to Weston

Potential Contamination None observed

Ice: Type Wet Quantity 15 lbs Condition Frozen
 Special request Overnight Delivery
 Labels Applied Packed in Wet ICE, This END UP
 Surveyed by RPT not surveyed @ Time N/A
 Relinquished Custody: to not Relinquished @ Time N/A

Shipped To Oak Ridge Shipping Container Ialoo "Dew." BL # 247 425 6631-B
Weston Iglui Beta "3" 247 425 662-D

J. D. Tank 3/27/97
 Sampler Signature Date

END OF Shift.

J. D. Tank 3-27-97

4/9/91

25

B POND VADOSE SAMPLING
BOREHOLE SUMMARY
C LOBE

BH 3C-1

SAMPLE#	INTERVAL	TYPE	ANALYSIS	LAB	SHIP DATE	OFFSITE #
B00H00	0-2	chemical	long list	Oak Ridge	4-18-91	W91-0207#11
B00H01	1.5-4	chemical	long list	Oak Ridge	4-18-91	W91-0207#11
B00H02	3.87-5.8	chemical	long list	Oak Ridge	4-18-91	W91-0207#11
B00H03	5.93-7.95	chemical	long list	Oak Ridge	3-19-91	W91-0207#13
B00H04	7.93-9.73	chemical	long list	Oak Ridge	3-19-91	W91-0207#13
B00H05	7.93-9.73	duplicate	long list	Oak Ridge	3-19-91	W91-0207#13
B00H06	10.6-11.93	chemical	long list	Oak Ridge	3-19-91	W91-0207#13
B00H07	10.6-11.93	split	long list	Weston	3-19-91	W91-0214#2
B00H08	11.7-13.7	physical	physical	ETAL	3-22-91	N/A
B00H09	15.0-17.0	chemical	short list	Oak Ridge	3-20-91	W91-0207#14
B00H10	N/A	equip blank	long list	Oak Ridge	3-21-91	W91-0207#14
B00H11	19.5-21.5	chemical	short list	Oak Ridge	3-21-91	W91-0207#14
B00H12	25.6-27.8	physical	physical	ETAL	3-22-91	N/A
B00H13	25.6-27.8	physical	physical	ETAL	4-1-91	N/A
B00H14	29-31	chemical	long list	Oak Ridge	3-22-91	W91-0207#16
B00H15	34.8-37.6	chemical	short list	Oak Ridge	3-26-91	W91-0207#17
B00H16	39-41.8	chemical	short list	Oak Ridge	3-26-91	W91-0207#17
B00H17	39-41.8	duplicate	short list	Oak Ridge	3-26-91	W91-0207#17
B00H18	48.8-50.8	chemical	short list	Oak Ridge	3-26-91	W91-0207#17
B00H19	59.3-61.1	chemical	long list	Oak Ridge	3-27-91	W91-0207#18
B00H20	69.3-71.5	chemical	short list	Oak Ridge	3-28-91	W91-0207#19
B00H21	N/A	equip blank	short list	Oak Ridge	3-28-91	W91-0207#19
B00H22	76.9-79.4	physical	physical	ETAL	4-1-91	N/A
B00H23	79.4-80.9	chemical	long list	Oak Ridge	3-28-91	W91-0207#19
B00H24	79.4-80.9	split	short list	Weston	3-28-91	W91-0214#3

All samples received an unconditional radiological release from health physics prior to shipment to the lab. Samples were maintained under chain of custody prior to shipment.

Physical properties analysis samples were transported to the on site Environmental Technology Applications Laboratory(ETAL) after release by health physics.

J. D. Fambly 4/9/91

The above list was prepared to summarize

Sampling at BH 3C-1

J. D. Fambly 4/9/91

4-17-91

The following is a summary of recent activities at B-Pond Vadose Drilling & Sampling Sites:

On 4-4-91: KEH removed the Bridges from C-lobe and transported them to the WHC pipeyard. The Ramp was moved to the N.W. corner of C-lobe and placed in a permanent location in the NW portion of C-lobe. The Ramp placement was done at the request of Dave Erb of Tank Farms & witnessed by Tank Farms Personnel. WHC personnel present included J.D. Fancher, G.B. Gould & D. Palmer. All drilling equipment was removed from the site.

On 4-12-91:

KEH Laborers and a tractor driver began removal of the posts, signs and chain delimiting the C-lobe corridor drill site. This was a few KEH Gunder scarified and bladed the corridor. Dave Erb visited the site in the afternoon and gave verbal approval to the grading work. Gunder completed work in late morning and laborers were over halfway completed by end of shift.

At B-lobe a KEH bulldozer began removing the access ramp and stockpiling the soil near the gate. Then the pond bottom was scarified to match the original contours.

WHC Personnel included J.D. Fancher, G.B. Gould & T. Bruno.

On 4-15-91

KEH Laborers arrived in the morning to remove the remainder of the corridor. No tramster was available, therefore laborers had to carry the posts out of the corridor. The laborers' gloves rapidly wore out and WHC had to provide gloves for KEH. KEH did not provide bags to bag chains & WHC had to provide bags. By 11:05 AM all site work was done and area was secured.

WHC personnel were J.D. Fancher & T. Bruno

J. D. Fancher 4-17-91

<p>VALIDATED 26 of 26 Susan Stein 9-24-91 SIGNATURE/DATE</p>

9513357.2856

WELL SUMMARY SHEET

Well Number BH 3A-1 Geologist G.B. Gould Page 1 of 3
 Reviewed By Susan F. Harris Date 4/22/91

CONSTRUCTION DATA

Depth
in
Feet

GEOLOGIC/HYDROLOGIC DATA

Description

Diagram

Graphic
Log

Lithologic Description

Casing; 10" Nom dia., CS,
Sch. 40 with .98' o.d. -
.85' i.d. casing shoe

2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
32
34
36
38
40
42
44
46
48
50
52
54
56
58
60
62
64
66

0'-4' ^{SL 45'} SILTY SANDY GRAVEL
4'-6.45' SILTY SANDY GRAVEL
6.45'-9.4' ^{SL 2-13-91} SILTY SAND
9.4'-11.0' SAND
11.0'-36.0' SANDY GRAVEL

8" Nom dia., CS, Sch. 40
Casing, with .59' o.d.

6" Nom. dia., CS, Sch. 40
Casing.

10" Nom. dia casing string
set at 20.41'

Note: Contact of fill
and pond bottom observed
at 6.45' Jan 4-18-91

APPROVED FOR
PUBLIC RELEASE
Y. Burkland
6/20/95

36.0'-36.6' SLIGHTLY SILTY SAND
36.6'-37.71' SAND
37.71'-40.7' SANDY GRAVEL
40.7'-51.0' SAND
51.0'-52.2' SILTY SAND
52.2'-55.2' SANDY SILT
55.2'-58.0' SAND
58.0'-66.0' SANDY GRAVEL

9513357.2857

WELL SUMMARY SHEET

Well Number BH 3A-1 Geologist G.B. Gould Page 2 of 3
 Reviewed By Susan F. Harris [Signature] Date 4/22/91

CONSTRUCTION DATA		Depth in Feet	GEOLOGIC/HYDROLOGIC DATA	
Description	Diagram		Graphic Log	Lithologic Description
		0.0		
		68		67.4-68' SAND 10YR 3/2
		70		68.0'-94.0' SAND 10YR 5/2
		72		
		74		
		76		
8" O.D. CASING SET AT		78		
77.658'		80		
6" O.D. CASING NOW BEING UTILIZED.		82		
		84		
		86		
		88		
		90		
		92		
		94		94.0'-101.0' SANDY GRAVEL
		96		
		98		
		100		101.0'-102.6' SLIGHTLY SILTY SLIGHTLY GRAVELLY SAND
		102		
		104		102.6'-105.2' Undetermined. <small>2-25-91</small>
		106		105.2'-132' SANDY GRAVEL
		108		
		110		
		112		
		114		
		116		
		118		
		120		
		122		
		124		
		126		
		128		
		130		
		132		

9513357.2858

WELL SUMMARY SHEET

Well Number BH 3A-1 Geologist G.B. Gould Page 3 of 3
 Reviewed By Susan F. Harris [Signature] Date 4/22/91

CONSTRUCTION DATA

GEOLOGIC/HYDROLOGIC DATA

Description

Diagram

Depth
in
Feet

Graphic
Log

Lithologic Description

6" O.D. Casing set at
142.16'

A.N.

132
134
136
138
140
142
144



132.0' - 143.85' SANDY GRAVEL

Water level at 142.75'
Bottom of borehole at 143.85'

Borehole was abandoned
according to EIT 6.5 using
bentonite crumbles and
Hole Plug (3 bags). Hole
Plug was ^{at 3-11-91} installed
at bottom portion of
borehole.

9513357.2859

BOREHOLE LOG

Boring or Well No. BH 3A-1

Sheet 1 of 18

Location 216-B-3 Pond hole A

Project 216 B-3 Pond Lakes Vadose Drilling/Sampling

Elevation UNKNOWN

Drilling Contractor KEH

Driller Tim Gifford

Drilling Method and Equipment Cable tool, Walker Nce 45-31

Logged By G.B. Gould

Date 2-5-91

Checked By S.E. Kos J.E. Kos

Date 4/10/91

Depth (0) FEET	Sample		Graphic Log	Sample Description Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
	Type and No.	Blows or Recovery			
0				2-5-91 h3h Slightly Silty Sandy Gravel 0-4'	10" O.D. casing (10' casing), .80" O.D. drive barrel
0.5				10YR 3/4 Dark yellow-brown	
1				Sand: 50% med-coarse, angular-subrounded, Basalt = 30%, Qtz & other 70%	
1.5				Gravel: 48%, V.F. pebbles to coarse pebbles, subround to well rounded; Qtz & other 65%	pH of deionized H ₂ O = 7
2	NA	NA		basalt 35%, Silt 52%, PH=7	
2.5				Moist. No rx to 10% HCl. Soil is known to be fill material	
3				No plasticity. Poorly sorted	
3.5				No haz or rad detected	
4				4' - End of shift for 2-5-91	Casing driven to 4'
4.5				Begin drilling 2-6-91	
5	Split spoon sample h3h 2-6-91	NA		4' - 6.44' SILTY SANDY GRAVEL	
5.5	h3h 2-6-91	NA		Describe as above. No haz or rad (<D)	
6	5" O.D. split spoon sample B00FA6	100% Recovery		Drive	
6.5	4.75-7.55	100% Recovery		Drive barrel driven to 6.15' unable to return sample. Re-tooled to ST.	Q-1120 pH = 7
7	5" O.D. ST	100% Recovery		SS split spoon sampler driven to 6.44' 75% recovery. End of shift	Casing driven to 6.25' for 2-6-91
7.5	sample # B00FA7	100% Recovery		Begin drilling 2-7-91	Contact of filled pond bottom at 6.45'
8				6.45-7.55 SILTY SAND 10YR 3/3	
				Dr brown sand: 70%, Angular- and well sorted. Very fine to med	
				h3h 2-7-91 Silt Basalt 15%, Qtz & other 85%	Q-11,0 pH = 7
				Silt: 30% Moist. No rx to 10% HCl. No plasticity pH = 6	
				No haz or rad detected (<D)	

Location 216 B-3 Pond Lake A Project 216 B-3 Pond Lakes Vadose Drilling/Sampling
 Elevation UNKNOWN Drilling Contractor KEH
 Driller R.L. Jones Drilling Method and Equipment Cable tool, Walker-Neer 415-31
 Logged By C.B. Gould Date 2-7-91 Checked By S.E. Kos A.E. Kra Date 4/10/91

Depth (Feet)	Sample		Graphic Log	Sample Description	Comments
	Type and No.	Blows or Recovery			
8					
8.9	SAMPLE # BOOFK9 5" O.D. ST	100%		6.9-10.2' SILTY SAND 10YR3/3 Described as above. No line or had detected (S.D) pH=7	10" Nom dia. P.S. Sched. 40 Casing driven to 8.1'
9.6-11.75				11-10.2-7-91 9.4-10.2' SAND 10YR3/1 very dark grey. Fine and medium sand. Sub Angular - rnded. Basalt 50%, Qtz & others 30% Well sorted No rx with 10% HCl. No plasticity pH=6.5 Moist. "salt & pepper"	Casing driven to 10.6'
10	10.2' ST Sample Boofk8 5" O.D. ST	100%		10.2- 11.0-11.75' SANDY GRAVEL 10YR4/1 dark grey. Moist. sand: 60% Fine to coarse. angular to sub-rnd Basalt 40%, Qtz & other 60%, Gravel: 40% Basalt 50%, Qtz & other 50% Very fine - coarse pebbles. Well rounded. Well sorted with "caliche" stringers with 10% HCl. Poorly sorted. pH=7 Caliche lenses noted at 11.9'	
11					
12					
13	5" O.D. ST sampler # BOOFK9 X delete SEK 4/5/91	100%			
14					
15	5" O.D. ST HAS Sample # BOOFK10 BOOFLO	75%			Casing driven to 14.7'
16	BOOF11	100%		End of shift at 15.7' for 2-7-91 Begin drilling 2-8-91	

9513357.2861

BOREHOLE LOG

Boring or Well No. 1311 3A-1

Sheet 3 of 18

Location 216-B-3 Pond Loba Project 216-B-3 Pond Lobes Drilling/Sampling

Elevation UNKNOWN Drilling Contractor KEH

Driller Tim Gifford Drilling Method and Equipment Cable Tool, Walker-Neer ^{WB-31}

Logged By G.B. Gould Date 2-8-91 Checked By S.E. KOS S.E. Kra Date 4/10/91

Depth (16) feet	Sample		Graphic Log	Sample Description Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
	Type and No.	Blows or Recovery			
16	Sample # B00FL1 5" O.D. ST 14.7-17.0'	100%	0	15.7'-20.41' SANDY GRAVEL	10" Nom. dia., sch. 40, CS
			0	Same as described as on previous page. Increasing size and number of cobbles noted as bore hole progre- ssed. Extrapolation of retrieved, freshly broken, fragments puts them in the small to large cobble range. pH = 7.5 at ~16.5'	Casing down to 17.6'
17	NA	NA	0	Strong rx to 10% HCl. No haz or rad (<D) detected by field instrumentation. No "caliche" coating.	pH of deionized (DI) water = 7
18			0		
19			0		
20			0		
20.41'			0	END OF DATA at 20.41' on 2-8-91 Begin drilling 2-11-91	10" casing down to 20.41' End of 10" casing string
21	9" O.D. Drive Barrel Sample # B00FL2 6" Physical properties	100%	0	20.41'-23.0' SANDY GRAVEL	pH of DI water = 7
			0	Same as described above but no rx to 10% HCl. No haz or rad (<D) - field instrumentation pH = 7.5 No "caliche" coating.	
22			0		8" casing driven to 22.5' Difficult to drive.
23	NA	NA	0		
			0		
24			0		

9513357.2862

BOREHOLE LOG

Boring or Well No. BH 3A-1

Sheet 4 of 18

Location 216-B-3 Pond Lake A, NE corner Project 216-B-3 Pond Lakes Drilling and Sampling
 Elevation UNKNOWN Drilling Contractor KEH
 Driller Jim Gifford Drilling Method and Equipment Walker-Neer, WS-3
 Logged By G.B. Gould Date 2-11-91 Checked By S.E. KOS J.E. Kos Date 4/10/91

Depth (24) Feet 24	Sample		Graphic Log	Sample Description Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
	Type and No.	Blows or Recovery			
24			0 0	23'-24.5' SANDY GRAVEL	9" New dia. Sch. 40, CS
			0 0	Same as described above	Casing
			0 0	No haz or rad (<D) detected	Drive barrel is .54'
			0 0	by field instruments.	.5 I.D. Max 2-11-91
25	NA	NA	0 0	Soil exhibits slight coherency	Casing driven to 25.3'
			0 0	Mild rx to 10% HCl, pH=7	
			0 0	No "caliche" coating.	
26			0 0		
			0 0		
27	5" O.D. Split Tube Sample #3 BGF4 50 GRS		0 0	26.7'-32.6' SANDY GRAVEL	
			0 0	Same as described on pg 2	
			0 0	Decreased ^{size} amount and	
			0 0	size of gravel largest	
			0 0	grain sizes in course to	Casing driven to 27.5'
			0 0	very coarse pebbles. No	
28	26.4'-29.3'	100%	0 0	rx to 10% HCl, pH=7. No	
			0 0	haz or rad (<D) detected	
			0 0	with field instruments.	
			0 0	No "caliche" coating.	
29			0 0		
			0 0		
30	NA	NA	0 0		
			0 0		
31			0 0		
			0 0		Casing driven to 31.5'
			0 0		
32	5" O.D. ST Sample #2 100% SO	75%	0 0		

BOREHOLE LOG

Boring or Well No 17H 3A-1

Sheet 6 of 18

Location 216-B-3 Pond Lobe A NE Corner Project 216-B-3 Pond Lobes Vadose Drilling and Sampling
 Elevation UNKNOWN Drilling Contractor KELT
 Driller Tim Gifford Drilling Method and Equipment Cable tool, Walker-Neer
 Logged By G.B. Gould Date 2/13/91 Checked By S.E. KOS S.E. Kro Date 4/10/91

Depth feet (40)	Sample		Graphic Log	Sample Description Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
	Type and No.	Blows or Recovery			
40				37.71-40.7' SANDY GRAVEL	8" No. 11 dia. casing, 25' ch. 40
				10YR 4/2 Dk. greyish brown. Moist. Sand: 65% Very fine to coarse. Basalt, 40% sub-angular to round, Qtz. & other 60%	Moist. 17.5 END. at day 2-12-91 Begin day 2-13-91
41				Angular to round poorly sorted lenses of salt & pepper sand	pl of Q water = 58
42				Noted in this interval. Mild rx to 10% HCl pH=7	
43				Gravel: 35% Very fine to coarse pebbles. Basalt 25% Qtz & other, 75% Round to well rounded. No haz or rad by field instruments.	
44				40.7' - 51.0' SAND 10YR 4/1 Dk. Gray moist. Sand: Fine to med. Sub-angular to round. Basalt 50%, Qtz & other 48% "Salt & pepper" sand.	
45				Mild rx to 10% HCl No plasticity 2% or less gravel fine to coarse pebbles. No haz or rad with field instruments	
46				pH=7 Note: Silty lenses observed at intervals with a 10YR 4/2 calc. when Mod rx to HCl. Gravelly lenses noted at ~ 45.2' to 45.5'	
47					
48					

BOREHOLE LOG

Boring or Well No. BH 3A-1

Sheet 7 of 16

Location 216-B-3 Pond Lake A NE corner
 Elevation UNKNOWN
 Driller Tim C. Pford
 Logged By G.B. Gould

Project 216-B-3 Pond Lakes Drilling/Sampling
 Drilling Contractor KEH
 Drilling Method and Equipment Cable tool Walker-Neer, WS-31
 Date 2/14/91 Checked By S.E. KOS & P. Kra Date 4/10/91

Depth feet (48)	Sample		Graphic Log	Sample Description Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
	Type and No.	Blows or Recovery			
48					8" diam. dia. sch 40, CS Casing, 8" Drive barrel with .57 O.D. & .51 I.D.
49					
50					Casing drive to 49.75'
51					
51.13'				51.0' - 52.2' SILTY SAND 10YR 4/1 Moist. Sand: 70%, Very fine & Fine, Angular-subangular Basalt: 20%, Qtz & other: 90%, Silt: 30%	
51.14'				No haz or rad detected by field instrum. - electrical con	End of day 2-13-91 Begin day 2-14-91
52	5" O.D. ST sampler sample # B00G54 & B00G56 B00G57			plasticity pH: 7 strong rx to HCl, No haz or rad detected field instr.	Q-water pH = 6.5
53				52.2' - 55.2' SANDY SILT 10YR 5/2 Moist Sand: 35%, Very fine Angular-subangular, Qtz & other: 90%, Basalt: 10%	Casing to 54.9'
54	5" O.D. ST sampler sample # B00G55			SILT: 65%, Medium plasticity Strong rx to HCl, pH = 6.2 No haz or rad detected with field instruments.	Gravelly lens noted at 55' some coarse pebbles
55	5" O.D. ST sampler sample # B00G57			55.2' - 58.0' SAND 10YR 4/1 Moist Fine to coarse. Basalt: 50% Qtz & other: 50%, Gravel < 1% H, weak rx w/HCl, increasing amounts of gravel downhole. No haz or rad (CP) on field instruments. No plasticity. pH = 7.5 well soiled.	
56					

Location 216-B-3 Pond hole A, NE corner Project 216-B-3 Pond Lakes Drilling and Sampling
 Elevation UNKNOWN Drilling Contractor KEH
 Driller Tim Gifford Drilling Method and Equipment Walker-Neel WS-31
 Logged By G.B. Gould Date 2-14-91 Checked By S.E. KOS ^{Cable} SPK Date 4/10/91

Depth feet (56)	Sample		Graphic Log	Sample Description Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
	Type and No.	Blows or Recovery			
56'	56.0'			55.2'-58.0' SAND 10YR4/1 Same as described on previous pg.	
57'	5" O.D. ST Sample Sample # B00G58	100%			
58'				58.0'-67.4' SANDY GRAVEL 10YR4/1 Gravel: 50%, Well rounded, Very fine ^{pebbles} to small cobbles. Basalt: 60%, Qtz. & other; 40% Moist. No rx to HCl. Sand: 50%, Angular to Well-rounded, Basalt 40% Qtz. & other; 60%. No haz or rad (CD) detected with field instruments. Poorly sorted. pH = 8	Casing driven to 59.5'
59'	59.4'				
60'	N/A				
61'					
62'					
63'					
64'	N/A				End of day 2-14-91 Begin day 2-15-91

Location 210-B-3 Pond Lake A NE CORNER Project 210 B 3 Pond Lakes Drilling and Sampling
 Elevation UNKNOWN Drilling Contractor KEH
 Driller Tim Gifford Drilling Method and Equipment Cable Tool, Walker Neer ⁴⁵⁻³¹
 Logged By G.B. Gould Date 2-15-91 Checked By S.E. KOS & E. Kra Date 4/10/91

Depth	Sample		Graphic Log	Sample Description	Comments		
	Type and No.	Blows or Recovery					
64	N/A		0 0 0	58'-67.4' SANDY GRAVEL, same as described on previous pg.	8" Num. dis. C.S. Sch 40, Casing with 1.81" O.D. shoe pH of Q-11 ₂ D = 6.5 Casing driven to 65.55'		
65							
66							
66.35'	5" C.D. ST Sampler Sample # B00G59 Chemical	95%	0	67.4'-68' SAND, 10YR 3/2 Moist FINE to coarse. Angular to well rounded. Basalt: 50%, Qtz & others 50%. Mold rx to 10% HCl. No haz or rad (<D) detected with field instruments. pH = 6.5 Well sorted	Casing driven to 66.75'		
67			0				
67.65'	5" C.D. ST Sampler Sample # B00GTC	92%	0	68'-75' SAND 10YR 4/4. Moist Very fine to fine sand. Angular to sub angular. Qtz & other 95% Basalt: 15%. Strong rx to HCl No haz or rad (<D). pH = 7.7 Lenses of coarser sand observed with increasing depth. Fine to medium and increased amounts of Qtz. Very micaceous lenses (at least 2 observed) Color change to 10YR 5/2. No longer only in lenses. Constant lith of the 10YR 5/2. Some ^{small} cobbles noted at 74'. Sand well sorted	Casing driven to 68.0'		
68							
69							
69.66'							
70	N/A						
71							
72							

Location 216-B-3 Pond Lobe A, NE corner Project 216-B-3 Pond Lobes Vadose Drilling / Sampling
 Elevation UNKNOWN Drilling Contractor KEH
 Driller Tim Gifford Drilling Method and Equipment Cable tool water - Near
 Logged By G.B. Gould Date 2-15-91 Checked By S.E. KOS & E.KP Date 4/10/91

Depth (72')	Sample		Graphic Log	Sample Description Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
	Type and No.	Blows or Recovery			
72				68'-75' SAND As described on previous page. some gravel noted at 74'	8" Nom dia, CS, Sch 40 Casing. Drive barrel is 0.59" O.D. 0.5 I.D.
73	N/A				
74					at 74.1' End of day 2-15-91 Begin day 2-19-91 pH of Q-H ₂ O 10.6.5
75	N/A			75'-76' SAND 10YR 5/2 Gr. brn. Same as described above. No haz or rad detected with field instruments. pH = 7 Strong rx to 10% HCl. Silt. < 5%	
76	75.7'				
77	5" O.D. ST Sampler Sample # B00GT1	100%			
78	77.7'			Gravel lensc observed at ~ 78.5'. Well-rounded small cobbles to fine pebbles.	8" O.D. Casing set at 77.658'
79	N/A				
80					End of day 2-19-91

Location 216-B-3 Pond Lobe A, NE corner Project 216-B-3 Pond Lobes Drilling & Sampling
 Elevation UNKNOWN Drilling Contractor KEH
 Driller Tim Gifford Drilling Method and Equipment Cable tool, Walker-Neer WS-31
 Logged By G.B. Gould Date 2-20-91 Checked By S.E. KOS A.E. Km Date 4/10/91

Depth (90')	Sample		Graphic Log	Sample Description Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
	Type and No.	Blows or Recovery			
80				Begin day 2-20-91 80'-89' SAND 10YR 5/2 Moist. Well sorted same as described on sheet 9.	6" O.D. CS, 5.64" ID Casing DP, 19.41" ID W.L. 33" I.P.
81					Casing driven to 80.9' 2-20-91 End of day at 81.35'
82				88.0' = 2-21-91	Begin day 2-21-91 pH at G.H ₂ O = 6.5
83					Casing to 83.0'
84					
85	5" O.D. ST sampler sample # BOOGT#8, BOOGT#8 pH = 4 BOOGT#6 2-21-91	100%			Casing to 85.6'
86					
87					Casing to 87.2'
88					

Location 216-B-3 Pond Lake A, NE corner Project 216-B-3 Pond Lobe Drilling and Sampling
 Elevation UNKNOWN Drilling Contractor KEH
 Driller Tim Gifford Drilling Method and Equipment Walker-Neer, cable tool
 Logged By G.B. Gould Date 2-21-91 Checked By S.E. Kos & E. Kra Date 4/10/91

Depth (<u>88'</u>)	Sample		Graphic Log	Sample Description Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
	Type and No.	Blows or Recovery			
88				<u>44'</u> 88.0' - 96.0' SAND: same as described on previous page.	6" Nom. CS, Sch. 40 DB 15.410.0.
89					Casing driven to 89.5'
90					
91					Casing to 91.3'
92					
93					Casing to 93.0'
94				94' - 96.0' SANDY GRAVEL 10YR 4/5 Dk. gr brn. Sand: 50%, Very fine to very coarse Angular to well rounded Basalt: 40%, Qtz & other: 6% Gravel: 70%, Very fine to very coarse pebbles, some small cobbles, Well rounded. Basalt: 70% Qtz & other: 70% < 1% silt. Moist. Strong rx to 10% HCl. No ha- or rad detected (CD) with field instruments. Peely sorted	Casing to 94.0'
95					
96					

2-21-91
96
96

50%
in ST

9513357.2871

BOREHOLE LOG

Boring or Well No. Bit 3A-1

Sheet 13 of 18

Location 216-B-3 Pond Lobe A, NE corner Project 216-B 3 Pond Lobes Drilling/Sampling
 Elevation UNKNOWN Drilling Contractor KEH
 Driller Tim Gifford Drilling Method and Equipment Walker-Neer, cable tool
 Logged By G.B. Gould Date 2-21-91 Checked By S.E. Kos & E. Kra Date 4/10/91

Depth (96')	Sample		Graphic Log	Sample Description	Comments
	Type and No.	Blows or Recovery			
96				96'- 101.0' SANDY GRAVEL	6" c. 11, CS, 5ch 40
				Same as on previous page.	DB c. 11 is .41'
97					
					Casing at 97.5'
98					
					End of day 2-21-91
					Begin day 2-22-91
99					
					pH of Q-water is 6.5
100				Increasing size of cobbles at ~ 99.0'. Increase of number as well. Upto large cobbles (by extrapolation)	
101					
				101.0'- 102.0' SLIGHTLY SILTY SLIGHTLY GRAVELLY SAND	Casing at 100.1'
				10YR 5/1. Dry Sand: 30%, Fine to very coarse. Angular to well rounded. Basalt: 30% (Q12 & other)	
102				70%. Gravel: 10% very fine to coarse pebbles 40% Basalt: 20%	
				Q12 & other: 90% (mainly Q12 & Q14)	
				Well rounded. Poorly sorted.	
				Mild rx to HCl. pH = 7. No haz or rad (<0) by field instr.	
103				Note: above soil described above 2-21-91	
				above may be pulverized soil created by downhole tools when large cobbles and/or boulders encountered.	
104					

Location 216-B-3 Pond Lake A, NE corner Project 216-B-3 Pond Lake's Vadose Drilling/Sampling

Elevation UNKNOWN Drilling Contractor KEH

Driller Tim G. Pford Drilling Method and Equipment Walker-Neer, cable tool

Logged By G. B. Gould Date 2-22-91 Checked By S. E. Kos & E. Kro Date 4/10/91

Depth (104')	Sample		Graphic Log	Sample Description Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
	Type and No.	Blows or Recovery			
104				102.6-105.2 Undetermined because	End of day 2-22-91
	6" O.D. Hard tool bit used or no recovery.		Little	Hard tool used as drilling method.	Begin day 2-25-91
105				105.2'-109.2' SANDY GRAVEL	104.2
				10YR 4/2. Gravel: 50%, well rounded, fine to large very coarse pebbles, apparent. Basalt: 30%, Qtz & other 40%. Sands: Very fine to very coarse. Angular to very coarse well rounded. Basalt 40%, Qtz & other: 60%. Oxidation of grains noted in samples. Color of oxidation is 10YR 5/3 to 10YR 6/8 strong rx to 10% HCl. Soil is moist.	104.2
106					
107					
108					Casing driven to 108 105.5'
109					
110					
111					Casing to 111.1'
112					

9513357.2873
BOREHOLE LOG

Boring or Well No. B11 3A-1

Sheet 15 of 18

Location 216-B-3 Pond Lobe A, NE corner

Project 216-B-3 Pond Lobes Vadose Drilling/Sampling

Elevation UNKNOWN

Drilling Contractor KEH

Driller Tim Gifford

Drilling Method and Equipment Walker-Neer, cable tool

Logged By G.B. Gould

Date 2-25-91

Checked By S.E. KOS & E. Kos^{WS-31}

Date 4/10/91

Depth (112')	Sample		Graphic Log	Sample Description Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
	Type and No.	Blows or Recovery			
112	N	A	0 0	112.0' - 120.0' SANDY GRAVEL Same as described at previous depth.	6" O.D. CS, Sch. 40 casing DB is 0.41' O.D. END of day 2-25-91 Begin day 2-26-91
113			0 0		pH of Q-112.0 = 6.5
114			0 0		
115			0 0		
116	N	A	0 0		
117			0 0		
118			0 0		
119			0 0		
120			0 0		

Clasts of highly plastic clay
Noted at ~115.0'

Casing to 114.9'

Casing to 116.7'

Casing to 118.7'

Casing to 119.6'

Location 216-B-3 Pond Lake A, NE corner Project 216-B-3 Pond Lobes Vadose Drilling/Sampling

Elevation UNKNOWN Drilling Contractor KEH

Driller Tim Gifford Drilling Method and Equipment Walker-Neer, cable tool

Logged By G.B. Gould Date 2-26-91 Checked By S.E. Kos & E. Kos Date 4/10/91

Depth (120')	Sample		Graphic Log	Sample Description Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
	Type and No.	Blows or Recovery			
120				120'-128.0 SANDY GRAVEL	6" C.D. CS, sch 40, casing
				Same as described on page	
				14. M.I.d rx to 10% HCl.	
121					
					Casing to 121.6'
122					
123					
124					
					Casing to 124.4'
125					
126					
					Casing to 125.9'
				125.85'	End of day 2-26-91
				Significant amount of water at bottom of borehole.	Begin day 2-27-91
					pH of Q-water is 6.5
127					
128					Casing to 128.0'

Location 216-B-3 Pond Lake A, NE CORNER Project 216-B-3 Pond Lakes Vadose Drilling/Sampling
 Elevation UNKNOWN Drilling Contractor KEH
 Driller Tim Gifford Drilling Method and Equipment Walker-Neer, WS-31
 Logged By G.B. Gould Date 2-27-91 Checked By S.E. Kos S.E.K. Date 4/10/91

Depth (129')	Sample		Graphic Log	Sample Description Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level	
	Type and No.	Blows or Recovery				
128				128.0' - 136.0' SANDY GRAVEL same as described on page 14	6" O.D. CS, Sch 40 casing .4' O.D. drive barrel	
129	N/A					
130						Casing to 130.1'
131		75%				
132						Casing to 132.0'
133						Casing to 133.0'
134	N/A					
135						Casing at 135.0'
136						

9513357.2876

BOREHOLE LOG

Boring or Well No. BH 3A-1

Sheet 18 of 18

Location 216-B-3 Pond Lake A, NE corner Project 216-B-3 Pond Lake Vadose Drilling and Sampling.

Elevation UNKNOWN Drilling Contractor KEH

Driller Tim Gifford Drilling Method and Equipment Walker-Neer, cable tool

Logged By G.B. Gould Date 2/28/91 Checked By S.E. Kos Date 4/10/91

Depth (136')	Sample		Graphic Log	Sample Description	Comments
	Type and No.	Blows or Recovery			
136			○	136.0' - 143.85' SANDY GRAVEL	6" O.D. C.S. Sch 40 *
			○	Same as described on	0.41" O.D. drive barrel.
			○	page 14.	
137			○		
			○		Casing at 137.6'
138			○	soil below 138.0' noticeably	
			○	higher H ₂ O content.	
139			○		
140			○		
			○	Feb 2-27-91 Pelele line	
			○		2-27-91
			○		End of day 140.55'
			○		Begin day 2-28-91
141			○		
			○		
142			○	Feb 3-1-91	
			▽	Water level	
			○		
			▽	Water level @ 142.15'	
143	142.75'	50% recovery	○		
	5" O.D. ST	10" ST sampler	○		
	# Boogys		○		
	PH = 7.5		○		
	143.85'		○		
			○	Bottom of borehole @ 143.85'	2-28-91
			○		End day 3-1-143.85'
144			○		ORG 2-28-91

BOREHOLE LOG

Boring or Well No. BH 3C-1

Sheet 1 of 11

Location 216-B-3 Pond holes, NW Portion

Project 216-B-3 Pond holes Vadose Drilling

Elevation UNKNOWN

and Sampling
Drilling Contractor KET

Driller Craig Wamsley

Drilling Method and Equipment Cable tool, Walker-Neer

Logged By G.B. Gould

Date 3-15-91

Checked By S.E. Kos & E. Kra

Date 4/10/91

Depth (ft)	Sample		Graphic Log	Sample Description Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
	Type and No.	Blows or Recovery			
0	Ground surface			Mar 3-15-91	
0-2.4	5" S.D. ST Sampler # BCOHCC PH=8	45% IN ST LINERS.	0-2.4 SANDY GRAVEL. 10YR 3/2 Very dark gr. brn. Moist: GRAVEL: 60%, Sub angular to well rounded. Basalt: 65%, Qz and other 35%. Very fine to Very coarse pebbles. Sand: 40%, Angular to sub-rounded Basalt 60%, Qz & other 40%, fine to very coarse. Strong rx to 10% HCl. No plasticity pH=8	10" NOM dia, CS sch 40 casing with 0.98" shoe.	
2.0	5" S.D. ST Sampler # BCOH01 PH=8	70% recovery IN ST LINERS.			Casing driven to 2.0' detected with field instruments
3.0	5" S.D. ST Sampler # BCOH02 PH=8				Casing driven to 3.0'
4.0	5" S.D. ST Sampler # BCOH02 PH=5.1			4.0-5.8 same as described above except color change to 10YR 4/1	Casing to 3.77'
5.8					
5.80					End of day 3-15-91
6	5" S.D. ST SAMPLE # B00403 (CHEM) PH=8.0	75% RECOVERY IN ST LINERS		SANDY GRAVEL; AS DESCRIBED ABOVE.	NO CHEMICAL OR RAD HAZARDS WERE DETECTED
7					
8					

9513357.2879

BOREHOLE LOG

Boring or Well No. BH 3C-1

Sheet 2 of 11

Location Z16-B-3 POND Lobe C, NW PORTION Project Z16-B-3 POND VAPOSE DRILLING & SAMPLING

Elevation _____ Drilling Contractor KEIT

Driller C. WAMSLEY Drilling Method and Equipment CABLE TOOL - RIG # 5307

Logged By S. KOS Date 3/17/91 Checked By S.E. KOS S.E. Kos Date 4/10/91

Depth (FT)	Sample		Graphic Log	Sample Description Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
	Type and No.	Blows or Recovery			
8					
9	5" OD ST SAMPLER #300 HOB (CHEM) PH - 8.0	75% RECOVERY IN ST LINERS			SAMPLE # BOOTHOS (duplicate) ALSO COLLECTED FOR THIS INT
10				SANDY GRAVEL (SG); GRAVEL 70% SAND 25% - 30% SILT < 1% - 5% GRAVEL: VERY FINE PEBBLE TO SMALL COBBLE, SA-SR, POORLY SORTED, 80% BASALT 20% OTHER, SANDY FINE TO COARSE GRAINED, SA-SR, POORLY SORTED, 40% BASALT, 40% QZ, FELDS AND OTHER, 10% R 4/2 DARK GRAYISH BROWN, SLIGHT EX WITH HCL, PH 7.5, MISTY, MOIST	
11	5" OD ST SAMPLER #300 HOB (CHEM) & #300 HOB (LAB SPIN) PH 7.5	35% RECOVERY IN ST LINERS			NO CHEMICAL OR RAD HAZARDS WERE DETECTED
12	5" OD ST SAMPLER #300 HOB (PHYSICAL)	100% RECOVERY IN ST LINERS		SAND (S), MEDIUM TO COARSE GRAINED, A-SR, MODERATELY TO WELL SORTED, 75% BASALT, 25% QZ, FELDS MICA AND OTHER, 10% R 3/1 VERY DARK GRAY, VERY SLIGHT EX WITH HCL, PH 7.5, MOIST	DEPTH OF HOLE 11.93' DEPTH OF CASING 11.5' END OF SHIFT 3/18/91
13					NO CHEMICAL OR RAD HAZARDS WERE DETECTED
14					JT#4 5.03' 10" DIA CS CASING
15	5" OD ST SAMPLER #300 HOB (CHEM) PH 7.5	100% RECOVERY IN ST LINERS		GRAVELLY SAND (GS); Sand: Medium to coarse grained, A-SA well sorted, 85% Basalt, 15% Qz + other. Gravel: Very coarse to very fine grained, WR-R, well sorted, 50% Basalt, 20% Qz + other, 10% R 3/1 Very Dark Gray, no reaction with HCl, pH 7.5, moist	NO Chemical or Rad Hazards were detected.

BOREHOLE LOG

Boring or Well No. BH 3C-1

Sheet 3 of 11

Location 216-P3 3 Pond Lake C, NW portion

Project 216-P3 Pond Vadose Drilling & Sampling

Elevation

Drilling Contractor KELL

Driller C. V. ...

Drilling Method and Equipment Cobb Tool Rys #53057

Logged By S. E. Kos / J. D. FANNEY Date 3/20/91

Checked By S. E. Kos S. E. Kos Date 4/10/91

Depth (ft)	Sample		Graphic Log	Sample Description Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
	Type and No.	Blows or Recovery			
16	5" OD ST Sampler # 1800412	50% Recovery in ST Liners		GRAVELLY SAND AS DESCRIBED ABOVE	
17					
18	NA				JT#5 - 4.9' 10" DIA CS CASING
19	NA				DEPTH OF HOLE 19.0' DEPTH OF CASING 18.0' END OF SHIFT 3/19/91
20	5" OD SPLIT TUBE SAMPLER # 200411 (CHEM) pit - 7.0	50% RECOVERY IN ST LINERS		SANDY GRAVEL (SG); GRAVEL 80%, SAND 20%, GRAVEL VERY FINE FINE TO SMALL COBBLE, SA-R, POORLY SORTED, 85% BASALT, 15% OTHER; SAND: MEDIUM TO COARSE GRAINED, A-SR, MODERATELY SORTED, 60% BASALT 40% QTZ FELS AND OTHER; 10% WL-DARK GRAY, NO RX WITH HCL, PH 7.0, VERY WET.	PH DEIONIZED H ₂ O 7.0 NO CHEMICAL OR RAD HAZARDS WERE DETECTED
21	NA				
22	NA			SANDY GRAVEL (SG): AS DESCRIBED ABOVE	
23	NA				JT#6 - 5.03' 10" DIA CS CASING
24	NA				

9513357.2081

BOREHOLE LOG

Boring or Well No. BH 3C-1

Sheet 4 of 11

Location 216-B-3 POND, NEW PORTION OF LOBE-C Project 216-B-3 POND VAPOSE DRILLING & SAMPLING

Elevation _____ Drilling Contractor KELL

Driller C. WANSLEY Drilling Method and Equipment CABLE TOOL - RIG # 5307

Logged By S. KOS Date 3/21/91 Checked By S. F. KOS & E. KO Date 4/10/91

Depth (ft)	Sample		Graphic Log	Sample Description	Comments
	Type and No.	Blows or Recovery			
24	NA	DRIVE BARREL	[Graphic Log: Large circles representing gravel]	GRAVEL	MATERIAL IS NOT STAYING IN THE DRIVE BARREL
25	NA	DRIVE BARREL			
26	SAMPLE # BOOH12 (PHYSICAL)	5" CO SPLT SPOON SAMPLES RECOVERY - 50%	[Graphic Log: Large circles representing gravel]	GRAVEL (G). GRAVEL 95% SAND <5% COBBLE, SA-SR, POORLY SORTED, 80% BASALT 20% OTHER, SAND WITH FINE TO COARSE GRAINED, A-SA, POORLY SORTED, 65% BASALT, 35% GTZ FIELDS AND OTHER, 10YR/SA VERY DARK GRAY, NO RX WITH HCL, PH 7.5, WET	NO CHEMICAL OR RAD HAZARDS WERE DETECTED
27					Casing at 26.5'
28	NA	10" O.D. DE			Note: Physical properties sample taken from drive barrel at interval 25.6' - 27.8'. Sample # 15 BOOH13.
29					End of day 3-20-91 at 27.8' Began day 3-21-91 pH of Qwater is 6.5
30	5" O.D. ST sampler sample # BOOH14 pH = 7.4	80% recovery IN ST sampler.	[Graphic Log: Small circles representing sand]	31' NA 2-21-91 29.5' - 32' SLIGHTLY GRAVELLY SAND (G) S. 10YR 4/11. Wet. Sand: Very fine - 55%, angular. Fine to Med - angular to sub-round 50%. Coarse to Very coarse 45% Sub-round to rounded. Basalt: 70%; Q12 & other: 30%. Gravel: <10% Fine to v. Coarse pebbles. Small qty. of small - coarse cobbles. pH = 7.4. No hazardous materials or radioactivity detected with field instr.	Casing to 30'
31	NA	NA			
32					(Cont.)

any water in hole

BOREHOLE LOG

Boring or Well No. BH 3C-1

Sheet 5 of 11

Location 216-B-3 Pond Lake C, NW portion Project 216-B-3 Pond Lake Vadose Drilling/Sampling
 Elevation UNKNOWN Drilling Contractor KEH
 Driller Craig Wamoley Drilling Method and Equipment Cable tool, Walker-Neer^{WS-31}
 Logged By G.B. Gould Date 3-21-91 Checked By S.E. Kos S.E. Ko Date 4/10/91

Depth (32')	Sample		Graphic Log	Sample Description	Comments	
	Type and No.	Blows or Recovery				
32	NA			Sand from 30'-31' same as described on previous page. Very little gravel.		
33				40' water in hole	31-32' SANDY GRAVEL sG	END of day 3-21-91 at 33'
				10YR 4/1 Dark gray Sand: 50%	BEGIN day 3-22-91	
				Fine - very coarse. Angular to subrounded. Basalt 70%, Qtz & other	END of day 3-22-91	
34				30% Gravel: 50%, Very fine to very coarse pebbles, small to large cobbles 50% of gravel.	Hole not advanced.	
				Most of cobbles exhibit strong rx.	BEGIN day 3-25-91 at 33.0'	
				No haz or rad detected with field instruments. pH = 7.8	pH of water is 6.5	
35				34.8'	Casing to 34.8'	
				Gravel: Basalt - 60%, Qtz & other 40%. Sub-angular to well rounded	Casing to 35.6'	
36						
37						
38						
39						
40						

5" OD ST sampler sample # 800115 PIT = 7.9
 75% recovery in ST liners.
 75% recovery in ST liners.
 95%

5" OD ST # 800116 80% recovery

Delete line from graphic log. 3-21-91

water in hole?

Casing to 39.9'

BOREHOLE LOG

Boring or Well No. BH 3C-1

Sheet 6 of 11

Location 216-B-3 Pond Lobe C

Project 216-B-3 Pond Lobe Vadose Drilling/sampling

Elevation Unknown

Drilling Contractor KEH

Driller Craig Wamsley

Drilling Method and Equipment cable tool, Walker-Neer ^{W-31}

Logged By G.B. Gould

Date 3-25-91

Checked By S.E. Kos & E. Ko

Date 4/10/91

Depth (40')	Sample		Graphic Log	Sample Description Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
	Type and No.	Blows or Recovery			
40				40.0' - 48.0' SANDY GRAVEL same as described on sheet 5, pH=7	8" NOM. dia., CS, Sch 40 casing. DB O.D. IS 0.58'
41	3" O.D. ST 34' 1/2 3000# 3000#	80% recovery IN ST LINERS.			
42					
43					
44					
45					
46				45.5' Increasing amounts of very fine and fine sand. Decrease in amount of larger gravels. Silt > 5%. Gravels notably more well rounded and higher degree of sorting.	
47					
48					

BOREHOLE LOG

Boring or Well No. BH 3C-1

Sheet 7 of 11

Location 216-B-3 Pond Lake C., NW Porten Project 216-B-3 Pond Lobe Vadose Drilling/Sampling

Elevation Unknown Drilling Contractor KEH

Driller Craig Wamsley Drilling Method and Equipment Cable tool, Walker-Necr ^{WS-31}

Logged By G.B. Gould Date 3-25-91 Checked By S.E. KOS & E. Ko Date 4/10/91

Depth (48')	Sample		Graphic Log	Sample Description Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
	Type and No.	Blows or Recovery			
48					
49					
49.2'					
49.8'					
50					
50.8'					
51					
52					
53					
54					
55					
56					

5.5" OD ST sampler sample # B00H18
 35% recovery in ST liners

Sandy Gravel (SG)
 70% Gravel, 30% Sand
 Sand: VF, VC, WR-A, poorly sorted
 Basal: 70%, 30% Qtz & others.
 Gravel: VF-VC pebble, SA-WR,
 moist, 10% R 3/1, very Dark gray
 pH 7, Moderately Reactive to HCl

No hazards detected with field instruments

Casing at 50.0'

End day 3-25-91
 Began Day at 50.8'
 on 3/26/91

53' Increasing Amount of sand and silt. Soil moist, but drier than yesterday, somewhat cohesive.

55' Increasing Amount of sand, lighter color 10% R 5/3. Qtz & other
 70%, Gravel 30%, Moist.

BOREHOLE LOG

Boring or Well No. BH 36-1

Sheet 8 of 11

Location 216-B3 Pond Lobe C, NW Traction Project 216-B-3 Pond Lobes Vadose Drilling/Samples

Elevation UNKNOWN Drilling Contractor KEH

Driller Craig Wampler Drilling Method and Equipment CABLE TOOL - WALKER-NEER

Logged By G.B. Gould Date 3-26-91 Checked By S.E. KOS & E.K. Date 4/18/91

Depth (56')	Sample		Graphic Log	Sample Description Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
	Type and No.	Blows or Recovery			
56				56.0' - 61.0' SANDY GRAVEL	3" nom. dia. SS, sub 40
				10YR 5/3. Same as on previous sheet. Increase in sm-ls gcl. at 57.0'. Poorly sorted. Most	Casing.
					DBO: D. is 0.58'
57					pH of Q-water is 6.5
58					
59					Casing to 59'
60				59.3' - 61.1' No haz or rad detected with field instruments.	
61	5" O.D. ST Sample # 300H19 pH = 7.6	60% recovery in ST liners			Casing to 60.8'
62					
63					
64					

9513357.2886

BOREHOLE LOG

Boring or Well No. BH 36-1

Sheet 9 of 11

Location 216-B-3 Pond Lobe C, NW portion Project 216-B-3 Pond Lobes
 Elevation UNKNOWN Drilling Contractor KEH
 Driller Craig Wamsley Drilling Method and Equipment cable tool, Walker-Neer WS-31
 Logged By G.B. Gould Date 3-27-91 Checked By S.E. Kos & E. Koo Date 4/10/91

Depth (64')	Sample		Graphic Log	Sample Description Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
	Type and No.	Blows or Recovery			
64				64.0'-69.3' SANDY GRAVEL Color change to 10YR 4/1 at ~65.0' (Moist. Poorly sorted)	8" Nom CS sch 40 casing DB O.D IS 0.58'
65					Casing to 65.0' End of day 3-26-91 Begin day 3-27-91 pH of Q-water is 6.5
66					
67				~66.5' Clasts of silty material 7.5YR 3/1 with 10YR 5/3 sandy gravel lens below to ~67.0'. Moist above gravel lens, wet below. Gravel now moderately sorted.	Casing to 66.7'
68					Casing to 67.7'
69					Casing to 69.0'
70	69.3'	80% recovery in ST liners.		69.3'-72.0' SANDY GRAVEL (SG) 10YR 5/3 brown, wet to ~70.0', moist below. pH=7, Sand: 60%, Angular to subrounded, VF-VC, pebbles, Basalt 50%, Qtz & other 50%. Gravel: 40% B 5%, VF-VC pebbles and sm cobbles, Angular to rounded, Basalt 60%, Qtz & other 40%. Poorly sorted. No haz or rad detected with field instruments. Silt; ~5% strong rx to HCl on smaller grain sizes.	Casing to 69.9'
71	71.5'				
72					

9513357.2887

BOREHOLE LOG

Boring or Well No. BH 30-1

Sheet 10 of 11

Location 216-B-3 Pond Lobe C, NW portion Project 216-B-3 Pond Lobes Vadose Drilling/Sampling
 Elevation UNKNOWN Drilling Contractor KFH
 Driller Craig Womusley Drilling Method and Equipment cable tool, Walker, Ncer WS-31
 Logged By G.B. Gould Date 3-27-91 Checked By J.E. KOS & E. KO Date 4/10/91

Depth (72')	Sample		Graphic Log	Sample Description Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level	
	Type and No.	Blows or Recovery				
72				72.0' - 80.0' SANDY GRAVEL Same as described on previous sheet.	8" Nom CS, Sch 4 casing	
73						
74					Soil below 74.0' noticeably wetter.	
75						
76					Saturated zones intermittent to 80.0'	F
77	76.7'					Casing to 76.9' final depth
78	5" O.D. ST Sampler Sample # 800H 22 pH = 7	80% recovery in ST liners.				
79	79.4'					
80	5" O.D. ST pH = 7	75%				



WELL SUMMARY SHEET

Well Number BH 3B-1 Geologist S. E. KOS Page 1 of 1
 Reviewed By Susan F. Harris [Signature] 4/22/91 Date 3-18-91

CONSTRUCTION DATA		Depth in Feet	GEOLOGIC/HYDROLOGIC DATA	
Description	8" Diagram 6" 10"		Graphic Log	Lithologic Description
10" NOM DIA CS CASING - SET AT 21.1'; TOTAL LENGTH - 21.72'; SHOE SIZE - .98' OD; CASING WALL THICKNESS - .375"		0		SILTY SANDY GRAVEL (MSG) (0'-6.8')
		5		@ 6.8' SAND (S) to 11.2'
		10		SANDY GRAVEL (SG) (11.2' - 14.4')
		15		SILTY SANDY GRAVEL (MSG) (14.4' - 52.6'); SAND LENSE (16.5' - 16.8')
		20		
		25		
		30		
		35		
		40		
		45		
		50		
		55		
8" NOM DIA CS CASING - SET AT 78.17'; TOTAL LENGTH - 79.14'; SHOE SIZE - .81' OD; CASING WALL THICKNESS - 5/16"		60		SILTY GRAVEL (MG) 52.6' - 53.0' ^{REK 4/19/91} (52.6' - 52.8')
		65		THEN SILTY SANDY GRAVEL (MSG) SAND (S) @ 60.8 - 69.6' THEN
		70		SILTY SANDY GRAVEL (69.6' - 80.3')
		75		
		80		
		85		GRAVELLY SAND (GS) 80.3' - 83.2'
		90		THEN SILTY SANDY GRAVEL (MSG) (83.2' - 115.5')
		95		
		100		
		105		GRAVELLY SILTY SAND (GMS) @ 115.5' - 116.5'; THEN SILT (M) TO TD OF BOREHOLE @ 124.7'
		110		
		115		
	120		SILT (M) (116.5' - 124.7')	
	125			
NOTE: ~4.5' OF OPEN HOLE BELOW 6" DIA CASING				THE BOREHOLE WAS ABANDONED PER WNC-CM-7-7 ETI 6.5; SATURATED ZONE WAS SEALED WITH MOLE PLUG. REMAINDER OF HOLE SEALED WITH GRANULAR NA BENTONITE TO WITHIN 6" OF GS. BENTONITE WAS ADDED AS CASING WAS WITHDRAWN; MARKED AT THE SURFACE WITH 1 FT ² CEMENT PAD WITH BRASS CAP

BOREHOLE LOG

Boring or Well No. B4 - 3B - 1

Sheet 1 of 16

Location 216-B-3 POND LOBE B

Project B-POND 216-B-3

Elevation

Drilling Contractor KEH

Driller T GIFFORD

Drilling Method and Equipment CABLE TOOL RIG #5305

Logged By S. E. VES

Date 3/4/91

Checked By [Signature]

Date 4-11-91

Depth (F)	Sample		Graphic Log	Sample Description Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
	Type and No.	Blows or Recovery			
0					
1	SAMPLE # 300G J 6 (CHEMICAL)	5" OD SPLIT SPOON SAMPLER (REC - 30%)	[Graphic Log]	SILTY SANDY GRAVEL (MSG); SILT <5%, SAND 15%, GRAVEL 80%; GRAVEL - VERY FINE PEBBLE TO VERY COARSE PEBBLE, SA-R, POORLY SORTED, 75% BASALT, 25% OTHER SAND - VERY FINE TO COARSE GRAINED, SA-SP, POORLY SORTED, 80% BASALT 20% QTZ FIELDS AND OTHER. 10YR 4/2 DARK GRAY, MOIST, SLIGHT RX WITH HCL, pH 7	NO CHEMICAL OR RAD HAZARDS WERE DETECTED 10" DEK 3/5/91 JT #1 8" NOM DIA CS CASING 6.01 (WITH SHOE)
2		5" OD SPLIT SPOON SAMPLER (REC - 50%)	[Graphic Log]	SILTY SANDY GRAVEL (MSG); SILT <5% SAND 20%, GRAVEL 75%; AS DESCRIBED ABOVE EXCEPT GRAVEL VERY FINE TO COARSE PEBBLE.	NO CHEMICAL OR RAD HAZARDS WERE DETECTED
3	SAMPLE # 300G J 7 (CHEMICAL)	5" OD SPLIT SPOON SAMPLER (REC - 50%)	[Graphic Log]	SILTY SANDY GRAVEL (MSG); SILT <5% SAND 30% GRAVEL 65%; AS DESCRIBED ABOVE	NO CHEMICAL OR RAD HAZARDS WERE DETECTED
4			[Graphic Log]		
5	SAMPLE # 300G J 8 (CHEMICAL)	5" OD SPLIT SPOON SAMPLER (REC - 50%)	[Graphic Log]	SILTY SANDY GRAVEL (MSG); SILT <5% SAND 30% GRAVEL 65%; AS DESCRIBED ABOVE	NO CHEMICAL OR RAD HAZARDS WERE DETECTED
6			[Graphic Log]		DEPTH OF HOLE 6.5' DEPTH OF CASING 6.5' * END OF SLIFT 3/4/91
7	SAMPLE # 300G W C (CHEMICAL)	5" OD SPLIT SPOON SAMPLER (REC - 100%)	[Graphic Log]	SAND (S); very fine - fine grained, SA-SP well sorted, 10% QTZ 30% BASALT & 3/5/91 FELD, MICA AND OTHER; 10YR 4/2 DARK GRAYISH BROWN MOIST, SLIGHT RX WITH HCL, pH 7	JT #2 10" NOM DIA CS CASING NO CHEMICAL OR RAD HAZARDS WERE DETECTED
8			[Graphic Log]		

BOREHOLE LOG

Boring or Well No. BH 3B-1

Sheet 2 of 16

Location 216-B-3 POND LOBE B Project B POND 216-B-3
 Elevation _____ Drilling Contractor KEH
 Driller T. GIFFORD Drilling Method and Equipment CABLE TOOL RIG# 5305
 Logged By S.E. KOS Date 3/5/91 Checked By G.B. Gould / S. B. Gould Date 4-11-91

Depth (FT)	Sample		Graphic Log	Sample Description Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
	Type and No.	Blows or Recovery			
8	SEE PREVIOUS PAGE				
9	SAMPLE # BOOGW1 (CHEMICAL) AND BOOGW2 (PHYSICAL)	5" OD SPLIT SPOON SAMPLER REC - 100%		SAND (S); LESS THAN 5% GRAVEL; GRAVEL VERY FINE PEBBLE - SMALL COBBLE, SR-R, POORLY SORTED 70% BASALT, 10% QTZ AND OTHER; SAND - VERY FINE - MEDIUM GRAINED, SA; SR, WELL SORTED, 50% BASALT 50% QTZ FIELDS AND OTHER; 10YR 4/2 DARK GRAYISH BROWN, SLIGHT RX WITH HCL, PH 7, MOIST	NO CHEMICAL OR RAD HAZARDS WERE DETECTED
11					
12	SAMPLE #1 BOOGW3, BOOGW4, AND BOOGW5 (CHEMICAL)	DRIVE 5" OD SPLIT SPOON SAMPLER BARREL REC - 100%		SANDY GRAVEL (SG): GRAVEL 30% AT TOP OF SAMPLE TO 80% AT THE BOTTOM OF SAMPLE, SAND 70% TO 20%; GRAVEL - VERY FINE PEBBLE TO SMALL COBBLE, SA-SR, POORLY SORTED, 50% BASALT, 50% FELSIC, SAND VERY FINE TO COARSE GRAINED, SA-SR, POORLY SORTED, 50% BASALT, 50% QTZ, FELDS, MICA AND OTHER; 10YR 4/2 DARK GRAYISH BROWN, MOIST, SLIGHT RX WITH HCL, PH 7.5	NO CHEMICAL OR RAD HAZARDS WERE DETECTED SAMPLES BOOGW4 AND BOOGW5 ARE QC SAMPLES
13					
14					JT#3 5.22' 10" DIA CS CASING
15	SAMPLE # BOOGW6 (CHEMICAL) AND BOOGW7 (PHYSICAL)	5" OD SPLIT SPOON SAMPLER REC - 100%		SILTY SANDY GRAVEL (MSG), GRAVEL 60%, SAND 30% SILT 10%; GRAVEL VERY FINE PEBBLE TO SMALL COBBLE, SR-B, 50% BASALT, 50% OTHER, SAND VERY FINE TO COARSE GRAINED, SA-SR, POORLY SORTED, 60% BASALT, 40% QTZ FIELDS AND OTHER; 10YR 4/2 DARK GRAYISH BROWN, MOIST, SLIGHT RX WITH HCL, PH 7.5	NO CHEMICAL OR RAD HAZARDS WERE DETECTED
16					

9513357.2892

BOREHOLE LOG

Boring or Well No. BH 3B1

Sheet 3 of 16

Location 216-B-3 POND LOBE B Project B-POND 216-B-3

Elevation _____ Drilling Contractor KEH

Driller T. GIFFORD Drilling Method and Equipment CABLE TOOL - RIG # 5305

Logged By S. E. KOS Date 3/6/91 Checked By [Signature] Date 4-11-91

Depth (FT)	Sample		Graphic Log	Sample Description Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
	Type and No.	Blows or Recovery			
16	SEE PREVIOUS PAGE	DRIVE BARREL		SAND LENS 3' THICK AT 16.5'	JT # 4 10" ODM DIA CS CASING - 5.25'
17					DEPTH OF HOLE - 17.1' DEPTH OF CASING - 14.5' END OF SHIFT 3/5/91
18					
19	SAMPLE # 300 GUB 5" OD SPLIT SPOON SAMPLER REC - 100%	DRIVE BARREL		SILTY SANDY GRAVEL (MSG) GRAVEL 70%, SAND 25%, SILT 5%; GRAVEL VERY FINE PEBBLE TO LARGE COBBLE, SR. K, HEAVILY SORTED, 60% BASALT 40% OTHER; SAND VERY FINE TO COARSE GRAINED (80% VERY FINE GRAINED) SA-SR, MODERATELY SORTED, 60% BASALT, 40% QZ FELDS AND OTHER; 10% 5/2 GRAYISH BROWN, MOIST, SLIGHT RX WITH HCL, pH 7.5	NO CHEMICAL OR RAD HAZARDS WERE DETECTED pH DEIONIZED H ₂ O - 7.0
20					
21					PNL GROSS GAMMA LOG INTERVAL 4.5' - 21.7'
22					
23	DRIVE BARREL	DRIVE BARREL		SILTY SANDY GRAVEL (MSG) DESCRIBED AS ABOVE	NO CHEMICAL OR RAD HAZARDS WERE DETECTED
24					CASING DRIVEN TO 24.0'

9513357.2893

BOREHOLE LOG

Boring or Well No. B1 3B-1

Sheet 4 of 16

Location Z16-B-3 POND LOBE B Project B-POND Z16-B-3
 Elevation _____ Drilling Contractor KEH
 Driller T. GIFFORD Drilling Method and Equipment CABLE TOOL - 216 #5305
 Logged By S. E. KOS Date 3/6/91 Checked By J. B. Gould Date 4-11-91

Depth (FT)	Sample		Graphic Log	Sample Description Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
	Type and No.	Blows or Recovery			
24					B ¹ NOM DIA CS CASING JT #1 21.38' (INCLUDES SHOE) JT #2 10.58'
25					
26					
27	SAMPLE # 3006W9 (CHEMICAL) AND SAMPLE # 3006X0 (PHYSICAL) AND SAMPLE # 3006X1 (PHYSICAL)	DRIVE BARREL		SILTY SANDY GRAVEL (MSG); GRAVEL VERY FINE PEBBLE TO SMALL COBBLE (70% OF CLAST < COARSE PEBBLE SR-R, MODERATELY SORTED, 65% BASALT 35% OTHER, SAND FINE TO COARSE GRAINED SA-SR, POORLY SORTED, 70% BASALT 30% QTZ, FELDS MICA AND OTHER, 10% 1/2 DARK GRAYISH BROWN, MOIST, SLIGHT RX WITH NCL, pH 7.5	NO CHEMICAL OR RAD HAZARDS WERE DETECTED
28					
29					
30	SAMPLE # 3006XZ CHEMICAL	5" GD SPLIT SPOON SAMPLE SAMPLE # 3006X1 - DRIVE BARREL REC - 100% WITH SPLIT SPOON		SILTY SANDY GRAVEL (MSG): AS DESCRIBED ABOVE	NO CHEMICAL OR RAD HAZARDS WERE DETECTED
31					
32		DRIVE BARREL			DEPTH OF HOLE - 32.2' DEPTH OF CASING - 29.7'
33					* END OF SHIRT 3/6/91

9513357.2894

BOREHOLE LOG

Boring or Well No. BH 3B-1

Sheet 5 of 16

Location 216-B-3 POND LOBE B

Project B POND 216-B-3

Elevation _____

Drilling Contractor KEH

Driller T. GIFFORD

Drilling Method and Equipment CABLE TOOL UNIT #5305

Logged By SEKOS

Date _____

Checked By GB Gould

Date 4-11-91

Depth (FT)	Sample		Graphic Log	Sample Description Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
	Type and No.	Blows or Recovery			
32					
33		DRIVE BARREL			
34					
35	SAMPLE # B006X3 CHEMICAL	5" OD SPLIT SPOON SAMPLER REC - 75%		SILTY SANDY GRAVEL: AS DESCRIBED ABOVE EXCEPT GRAVEL TO LARGE COBBLE	NO CHEMICAL OR RAD HAZARDS WERE DETECTED PH DEIONIZED H ₂ O - 7.0
36					
37					
38		DRIVE BARREL			
39	SAMPLE # B006X4 CHEMICAL	5" OD SPLIT SPOON SAMPLER REC - 75%	SILTY SANDY GRAVEL (MSG); GRAVEL 70%, SAND 25%, SILT 5%; GRAVEL VERY FINE PERBLE TO SMALL COBBLE, SR- R, POORLY SORTED, 80% BASALT 20% OTHER, SANDY FINE TO COARSE GRAINED, A-SA, POORLY SORTED, 80% BASALT	NO CHEMICAL OR RAD HAZARDS WERE DETECTED	
40					

9513357.2895

BOREHOLE LOG

Boring or Well No. BH 3B-1

Sheet 6 of 16

Location 216-B-3 POND LOBE B

Project 3-POND 216-B-3

Elevation

Drilling Contractor KEH

Driller T BIFFORD

Drilling Method and Equipment CABLE TOOL - RIG #5305

Logged By J.E. KOS

Date

Checked By J.B. Gould

Date 4-11-91

Depth (FT)	Sample		Graphic Log	Sample Description Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level	
	Type and No.	Blows or Recovery				
40				20% QTZ, FLDS AND OTHER; 10YR 4/2 DARK GRAYISH BROWN, MOIST, NO RX WITH HCL, PI 7.5		
41					JT #5 5.18' 8" NOM DIA CS CASING	
42						
43					SILTY SANDY GRAVEL (SMG) AS DESCRIBED ABOVE	
44						
45						
46						45.7' - SAMPLE FOR HPT
47					SILTY SANDY GRAVEL (SMG) AS DESCRIBED ABOVE	
48						DEPTH OF HOLE 48.2' DEPTH OF CASING 45.35' * END OF SHIFT 3/7/91

SEE PREVIOUS
PAGE

DRIVE BARREL

BOREHOLE LOG

Boring or Well No. BH 3B-1

Sheet 7 of 16

Location 216-B-3 POND LOBE B

Project B-POND 216-B-3

Elevation

Drilling Contractor KEH

Driller T. GIFFORD

Drilling Method and Equipment CABLE TOOL RIG #5305

Logged By S.E. KOS

Date 3/17/91

Checked By [Signature]

Date 4-11-91

Depth (FT)	Sample		Graphic Log	Sample Description Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level	
	Type and No.	Blows or Recovery				
48	SEE PREVIOUS PAGE	3/17/91	[Hand-drawn graphic log showing soil layers with circles representing particles]	SILTY SANDY GRAVEL (SMG) AS DESCRIBED ABOVE	JT #6 5.26' 8" NOM DIA CS CASING	
49		DRIVE BARREL				PH DIONIZED H ₂ O - 7.0'
50						
51						
52	SAMPLE #B00 G-15 CHEMICAL	5" 00 SPLIT SPOON SAMPLER REC - 50%				NO CHEMICAL OR RAD HAZARDS WERE DETECTED
53					SILTY GRAVEL (MG): 52.6' - 52.8'; GRAVEL 65%, SILT 25%, SAND 10%; LOW PLASTICITY, 10% 4/2 DARK GRAYISH BRN. NO EX WITH NCL, MORE UNST Y/HAN PREVIOUS SAMPLES, PH 8	JT #7 5.25' 8" NOM DIA CS CASING
54		DRIVE BARREL				
55						
56						55.6' SAMPLE FOR HPT

9513357.2897

BOREHOLE LOG

Boring or Well No. BH 3B-1

Sheet 8 of 14

Location 216-B-3 POND B-LOBE

Project B-POND 216-B-3

Elevation

Drilling Contractor KEH

Driller T. GIFFORD

Drilling Method and Equipment CASE TOOL - RIG # 5305

Logged By S.E. KOS

Date 3/17/71

Checked By [Signature]

Date 4-11-91

Depth (FT)	Sample		Graphic Log	Sample Description	Comments
	Type and No.	Blows or Recovery		Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
56		DRIVE BARREL		SILTY SANDY GRAVEL (SMG) AS DESCRIBED ABOVE	JT #8 5.26' 8" NOM DIA CS CASING
57					
58					
59					
60	SAMPLE # 300GX6 (CHEMICAL) SAMPLE # 300GX7 (PHYSICAL)	5" OD SPLIT SPOON SAMPLER REC. - 100%		SILTY SANDY GRAVEL (SMG); GRAVEL 40% SAND 40%, SILT 20%; GRAVEL VERY FINE PEBBLE - MEDIUM PEBBLE, SA-SR MODERATELY SORTED, 70% BASALT 30% OTHER, SAND FINE TO COARSE GRAINED, A-SA, POORLY SORTED, 50% BASALT 50% QTZ AND OTHER, XDR, REACTIVITY, HUMIDITY AND PH AS ABOVE	NO CHEMICAL OR RAD HAZARDS WERE DETECTED
61				SAND (S) VERY FINE TO MEDIUM GRAINED, A-SA, WELL SORTED, 50% BASALT, 50% QTZ, FELDS AND OTHER, HU	JT #9 10.56' 8" NOM DIA CS CASING
62					
63					
64					

9513357.2898

BOREHOLE LOG

Boring or Well No. BH 3B-1

Sheet 9 of 16

Location 216-B-3 POND LOBE B Project B-POND 216-B-3
 Elevation _____ Drilling Contractor KEI
 Driller T. GIFFORD Drilling Method and Equipment CABLE TOOL - RIG # 5305
 Logged By S.E. KOS Date _____ Checked By UB Gould Date 4-11-91

Depth (FT)	Sample		Graphic Log	Sample Description Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
	Type and No.	Blows or Recovery			
64				SAND(s) As Described Above	
65					
66					66.4' SAMPLE FOR HPT
67					
68					
69					
70	Sample # B00GX 8	5"OD Split Spoon Sampler Rec - 100%	() () () () () () () () () ()	Silty Sandy Gravel (S&G) Gravel 40% Sand 40% Silty fine Gravel Very fine pebbles coarse Silt & GR, poorly sorted 50% Basalt 50% Qtz and Others, color 1/2 PR 5/2, moist, Ph 7.5	NO chemical Hazards were Detected
71					
72					

BOREHOLE LOG

Boring or Well No. BH 3B-1

Sheet 10 of 16

Location 216-B-3 POND (B-LOBE)

Project 216-B-3 POND

Elevation

Drilling Contractor KET

Driller T. GIFFORD

Drilling Method and Equipment CABLE TOOL - RIG #5305

Logged By S. E. KOS

Date 3/11/91

Checked By [Signature]

Date 4-11-91

Depth (FL)	Sample		Graphic Log	Sample Description Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments Depth of Casing, Drilling Rate, Casing Size & Type, Rit Size, Water Level
	Type and No.	Blows or Recovery			
72		DRIVE BARREL			DEPTH OF HOLE 72.6' DEPTH OF CASING 71.7' * END OF SHIFT 3/8/91
73	SAMPLE # 8006X9 PHYSICAL	5" OD SPLIT SPOON SAMPLE REC. 100%		SILTY SANDY GRAVEL (SM G); GRAVEL 15% SAND 25% SILT < 5% GRAVEL VERY FINE PEBBLE TO SMALL COBBLE, A-SR, POORLY SORTED, 60% BASALT, 50% OTHER; SAND: VERY FINE TO COARSE GRAINED, SA-SR, POORLY SORTED, 50% BASALT, 50% QTZ FELDS AND OTHER; WTR 6/1 GRAY, DRY, STRONG RX WITH HCL, PH 7.5	DEIONIZED H ₂ O PH 7.0 NO CHEMICAL OR RAD HAZARDS WERE DETECTED
74		DRIVE BARREL			J# 10 - 5, 25' CS CASING - 8" NOM DIA ADDED 1 GAL RAW WATER
75					
76				SILTY SANDY GRAVEL AS DESCRIBED ABOVE	75.6' HPT SAMPLE
77				SILTY SANDY GRAVEL (SM G); GRAVEL 65% SAND 30% SILT < 5% AS DESCRIBED ABOVE EXCEPT GRAVEL SIZE TO COARSE PEBBLE	
78				SILTY SANDY GRAVEL (SM G); AS DESCRIBED ABOVE EXCEPT GRAVEL TO LARGE COBBLE / SMALL, REC 3/11/91	
79					PUL GROSS GAMMA LOG INT. 4.1' - 78.9'
80					VERY SLOW DRILLING RATE

9513357.2900

BOREHOLE LOG

Boring or Well No. B11 3B-1

Sheet 11 of 16

Location Z16-B-3 POND (B-LOBE)

Project Z16-B-3 POND

Elevation _____

Drilling Contractor KEII

Driller T. GIFFORD

Drilling Method and Equipment CABLE TOOL - RIG # 5305

Logged By S E. KOS

Date 3/12/91

Checked By J. K. Gould

Date 4-11-91

Depth FT	Sample		Graphic Log	Sample Description Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
	Type and No.	Blows or Recovery			
80					DEPTH OF HOLE - 80.0 80.0 APK 3/11/91
81	SAMPLE # 300GZ1, 300GZ2 & 300GZ3 CHEMICAL	5" OD SPLIT SPOON SAMPLER REC - 50%		GRAVELLY SAND (QS): GRAVEL 15%, SAND 80% SILT <5%; GRAVEL TO COARSE PEB; & SAND: VERY FINE TO COARSE GRAINED, SA-SR, POORLY SORTED, 40% BASALT 60% QTZ FELDS AND OTHER SAND (S): <5% SILT; SAND: VERY FINE TO COARSE GRAINED, SA-SR, MODERATELY SORTED, 35% BASALT, 65% QTZ FELDS AND OTHER, 10YR 1/2 LIGHT BROWNISH GRAY, MOIST, MODERATE Rx WITH HCL, PH 7.5	DEPTH OF CASING - 78.17' END OF SHIFT 3/11/91 PH DEIONIZED H ₂ O - 7.0 NO CHEMICAL OR RAD HAZARDS WERE DETECTED
82		DRIVE BARREL			JT'S 1-5, 6" NOM DIA CS CASING - TOTAL - 85.02'
83					
84	SAMPLE # 300GZ0 PHYSICAL & 300GZ1	5" OD SPLIT SPOON SAMPLER REC - 75%		SILTY SANDY GRAVEL (MSG): GRAVEL 60%, SAND 30% SILT 10%; GRAVEL: VERY FINE PEBBLE TO SMALL COBBLE, SA-SR, POORLY SORTED, 60% BASALT 40% OTHER SAND FINE TO COARSE GRAINED, SA-SR, POORLY SORTED, 40% BASALT 60% QTZ, FELDS AND OTHER, 10YR 5/2 GRAYISH BROWN, MOIST, SLIGHT Rx WITH HCL, PH 7.5	NO CHEMICAL OR RAD HAZARDS WERE DETECTED
85					JT# 6 '1.67' 6" NOM DIA CS CASING
86		DRIVE BARREL			
87					
88					

9513357.2901

BOREHOLE LOG

Boring or Well No. 3H 3B-1

Sheet 12 of 16

Location 216-B-3 POND (B-LOBE)

Project 216-B-3 POND

Elevation

Drilling Contractor KEH

Driller T GIFFORD

Drilling Method and Equipment CABLE TOOL - RIG # 5305

Logged By S.E. KOS

Date 3/12/91

Checked By J.B. Gould

Date 4-11-91

Depth (FT)	Sample		Graphic Log	Sample Description Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
	Type and No.	Blows or Recovery			
88	SAMPLE # BOOZZZ CHEMICAL	DRIVE BARREL		SILTY SANDY GRAVEL (MSG): AS DESCRIBED ABOVE EXCEPT NO SAND-SILT LENSES JER 3/12/91	
87					
70	SAMPLE # BOOZZZ CHEMICAL	5" OD SPLIT SPOON SAMPLER REC. - 35%		SILTY SANDY GRAVEL (MSG): GRAVEL 65%, SAND 20%, SILT 15%; GRAVEL VERY FINE PEBBLE TO SMALL COBBLE, SA-SP, POORLY SORTED, 50% BASALT 50% OTHER, SAND VERY FINE TO COARSE GRAINED SA-SP, POORLY SORTED, 50% BASALT, 50% QTZ, FELDS AND OTHER; 10% 5/2 GRAYISH BROWN, MOIST, SLIGHT RX WITH HCL, PH 7.5	NO CHEMICAL OR RAD HAZARDS WERE DETECTED
71					
72					DEPTH OF HOLE - 91.85' DEPTH OF CASING - 87.2' END OF SHIFT 3/12/91
73					PH DEIONIZED H ₂ O - 7.0 JT #7 4.51' 6" NOM DIA CS CASING
74		DRIVE BARREL		SILTY SANDY GRAVEL (MSG): AS DESCRIBED ABOVE EXCEPT GRAVEL TO BOULDERS	JT #8 4.86' 6" NOM DIA CS CASING 5 GAL RAW H ₂ O
75		HARD TOOL			5 GAL RAW H ₂ O
76					

9513357.2902

BOREHOLE LOG

Boring or Well No. BH 3B-1

Sheet 13 of 16

Location 216-B-3 POND (B-LOBE)

Project 216-B-3 POND

Elevation

Drilling Contractor KEH

Driller T. GIFFORD

Drilling Method and Equipment CABLE TOOL - RIG#5305

Logged By S.E. KOS

Date 3/14/91

Checked By [Signature]

Date 4-11-91

Depth (FT)	Sample		Graphic Log	Sample Description Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
	Type and No.	Blows or Recovery			
96		HARD TOOL			
97				SILTY SANDY GRAVEL; SLURRY WITH LITTLE SOLID MATERIAL	10 GAL RAW H ₂ O
					JT #9 4.74' 6" NOM DIA CS CASING
98					DEPTH OF HOLE 98.15' DEPTH OF CASING 97.7' * END OF SHIFT 3/13/91
99					10 GAL RAW H ₂ O
100					SILTY SANDY GRAVEL: AS DESCRIBED ABOVE
101					
102					JT #10 4.79' 6" NOM DIA CS CASING
103				DRIVE BARRE	
104					

BOREHOLE LOG

Boring or Well No. BH 3B-1

Sheet 14 of 16

Location 216-B-3 POND (LOBE-B) Project 216-B-3 POND

Elevation _____ Drilling Contractor KEN

Driller T. GIFFORD/R. JONES Drilling Method and Equipment CABLE TOOL - RIG #5305

Logged By S. E. KOS Date 3/15/91 Checked By [Signature] Date 4-11-91

Depth (FT)	Sample		Graphic Log	Sample Description Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
	Type and No.	Blows or Recovery			
104		DRIVE BARREL			104.3' SAMPLE FOR HPT
105	SAMPLE # B00GZ3, (CHEMICAL) # B00GZ4 AND B00GZ5 (PHYSICAL)	5" OD SPLIT SPRINT SAMPLER REC - 50%		SILTY SANDY GRAVEL (MSG): GRAVEL 75%, SAND 20%, SILT <5%, GRAVEL. VERY FINE PEBBLE TO SMALL COBBLE, SA- SR, POORLY SORTED, 60% BASALT 40% OTHER, SANDY FINE TO COARSE GRAINED, A-SA, POORLY SORTED 60 BASALT 40 ATZ, FELDS AND OTHER; 10%R 6/2 LIGHT BROWNISH GRAY SLIGHTLY MOIST, SLIGHT RX WITH NCL, PH 7.5	NO CHEMICAL OR RAD HAZARDS WERE DETECTED
106					
107		DRIVE BARREL			
108				SILTY SANDY GRAVEL (MSG): AS DESCRIBED ABOVE EXCEPT SAND 15% SILT 10%	JT #11 4.79' (-.12 TRIM) 6" NOM DIA CS CASING 108.7' SAMPLE FOR NPT
109		HARD TOOL BIT			5 GAL RAW H ₂ O DEPTH OF HOLE - 109.2' DEPTH OF CASING - 108.6' * END OF SHIFT 3/14/91
110					5 GAL RAW H ₂ O PH DEIONIZE H ₂ O - 7.0
111					JT #12 4.74' 6" NOM DIA CS CASING
112					

9513357.2904

BOREHOLE LOG

Boring or Well No. BH 3B-1

Sheet 15 of 16

Location 216-B-3 POND (LOBE B)

Project 216-B-3 POND

Elevation

Drilling Contractor KELL

Driller T GIFFORD

Drilling Method and Equipment CABLE TOOL - RIG #5305

Logged By S E. KOS

Date 3/15/71

Checked By [Signature]

Date 4-11-91

Depth (FT)	Sample		Graphic Log	Sample Description Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level	
	Type and No.	Blows or Recovery				
112				SILTY SANDY GRAVEL		
113						
114						
115				GRAVELLY SILTY SAND (qms) GRAVEL 25% SAND 60% SILT 15% GRAVEL VERY FINE TO MEDIUM PEBBLE A-SA, POORLY SORTED, 50% BASALT 50% OTHER, SAND: VERY FINE TO COARSE GRAINED, SA-SR, POORLY TO MODERATELY SORTED, 35% BASALT 65% QZ, FEWS AND OTHER, 10YR 6/1 GRAY, MODERATE RX WITH HCL, PH 7.0	115.5 SAMPLE FOR NPT	
116						
117				SILT (M) - <10% VERY FINE GRAINED SAND; MICACEOUS, CALCAREOUS MATERIAL LINING & VERTICAL FRACTURES 10YR 7/3 VERY PALE BROWN (DRY), VIGOROUS RX WITH HCL, PH 7.0	NO CHEMICAL OR RAD HAZARDS WERE DETECTED	
118	SAMPLE # B00626 (CHEM) AND # B00627 (PHYSICAL)	5" OD SPLIT SPOON SAMPLER REC - 100%			SILT (M) AS DESCRIBED ABOVE	
119						
120						JT#13 4.68' 6" NOM DIA CS CASING

9513357.2905

BOREHOLE LOG

Boring or Well No. BH 3B-1

Sheet 16 of 16

Location 216-B-3 POND (LOBE-13)

Project 216-B-3 POND

Elevation

Drilling Contractor KEH

Driller T. GIFFORD

Drilling Method and Equipment CABLE TOOL - PIC # 5305

Logged By S.E. KOS

Date 3/15/91

Checked By *[Signature]*

Date 4-11-91

Depth (FT)	Sample		Graphic Log	Sample Description Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
	Type and No.	Blows or Recovery			
120				SILT	
121					
122					
123	SAMPLE # B009Z8 (CHEMICAL)	DRIVE BARREL 5" OD SPLIT SPOON SAMPLER REC - 100%		SILT - WET OTHERWISE AS DESCRIBED ABOVE PH 7.0	DEPTH OF HOLE 122.5' DEPTH OF CASING 120.2' END OF SHIFT 3/15/91
124					
125		TD			DEPTH OF HOLE 124.7' DEPTH OF CASING 120.2' * END OF SHIFT 3/18/91
126					
127					
128					