

## Department of Energy

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2001

FEB 23 1999

Mr. James A. Saric, Remedial Project Manager  
U.S. Environmental Protection Agency  
Region V-SRF-5J  
77 West Jackson Boulevard  
Chicago, Illinois 60604-3590

DOE-0455-99

Mr. Tom Schneider, Project Manager  
Ohio Environmental Protection Agency  
401 East 5<sup>th</sup> Street  
Dayton, Ohio 45402-2911

Dear Mr. Saric and Mr. Schneider:

### **PROPOSED PHASE II SOIL SAMPLING AND ANALYSES WITHIN SOIL REMEDIATION AREA 7**

The purpose of this letter is to outline the proposed Phase II soil sampling within Soil Remediation Area 7 to support the future construction activities within the Silos Project Area. The Phase II soil sampling will specifically support elements of the Accelerated Waste Retrieval Project not covered in the Phase I soil sampling. This letter also summarizes the available data on the silo berm for On-Site Disposal Facility (OSDF) Waste Acceptance Criteria (WAC) attainment purposes. Only areas that do not have sufficient information will require WAC attainment sampling and analysis. No additional pre-design sampling for the silo berm is proposed.

Results from the Phase I soil sampling and additional Phase I sampling within the Pilot Plant Drainage Ditch, were previously provided. Phase I soil sampling was performed specifically to support the Infrastructure Road Project and expected future construction activities in the Silos Project Area.

#### Silo Berm Soil Data Summary

The silo berm was first constructed in 1964. The source of the soil was from an area east of Silo 1 and Silo 2, south of the K-65 trench, and north of the Pilot Plant Drainage Ditch. This borrow area is roughly within the footprint of the proposed K-65 Stabilization Facility and within Soil Remediation Area 7. In 1983, the berm was enlarged by the addition of soil from two sources: The footprint of the future construction at the Bio-Surge Lagoon and an area west of Waste Pit No. 5. These two borrow areas are within Soil Remediation Area 6.

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Enclosed in Table 1 is the data summary of the 19 radionuclide, organic, and inorganic contaminants with a WAC for soil and sediment in the OSDF taken from Table 1- 4 of the Site-wide Excavation Plan (SEP), Final dated July 1998. The data summary was the result of a vertical berm sampling program and a slant boring program described in the Operable Unit 4 Remedial Investigation, dated November 1993. Further enclosed in Figure 1, the locations of those borings are shown, along with a summary of those contaminants (i.e., total uranium and technetium-99) in Table 1 that have also been determined as Soil Remediation Area 7, Area Specific WAC Constituents of Concern (ASCOCs) taken from Table 2-7 of the SEP.

Table 1 summarizes the number of samples taken for each constituent. It assists in determining if additional pre-design sampling is warranted for the OSDF WAC to characterize the berm soil and soil beneath the berm. Of the nineteen constituents, sampled, eleven resulted in no detections. With the remaining eight constituents at least one detection was evident and below the constituent's WAC, except for carbazole and chlordane. Carbazole and chlordane were not analyzed. Therefore, further investigation of all existing data for carbazole in the Site-wide Environmental Database within the Soil Remediation Area 7 boundary showed nine analyses for carbazole for soils and sediment; however, resulting in no detections. A separate evaluation for chlordane showed no analyses available. Of the six out of the eight constituents that had at least one detection (strontium-90, total uranium, uranium-238, boron, mercury, and tetrachloroethene), the resulting concentrations were below the constituent's WAC.

Additional analyses, although not presented here, can be found in the OU4 Remedial Investigation, which includes an additional vertical boring 1790 and two earlier slant borings. Boring 1790 was completed to a depth of ten feet and located immediately south of boring 1623 due to a missed storage cooler temperature limit on the top interval sample for boring 1623. Results from these additional analyses showed no detections for the Table 1 constituents. The two earlier slant borings were conducted in 1982 (as presented in Figure 4-13 of the OU4 Remedial Investigation) under Silo 1 and Silo 2. Results from these additional analyses showed eight total uranium concentrations ranging from 0.77 to 9.7 mg/kg.

Figure 1 provides further detail of the Soil Remediation Area 7 ASCOCs listed in Table 1 (i.e., total uranium and technetium-99) with respect to their sample intervals and concentrations. Figure 1 also shows a typical slant boring in profile. Figure 1 is a summary of various figures provided in the OU4 Remedial Investigation.

#### PROPOSED PHASE II SOIL SAMPLING AND ANALYSES

Figure 2 locates the proposed sample locations and depths for Phase II soil sampling. Based on the above discussion, existing data is adequate to demonstrate that silo berm soil and soil beneath the berm meet the OSDF WAC and do not require additional pre-design investigation for WAC attainment purposes. However, additional sampling for total uranium and technetium-99 is necessary in two areas. The first location is a potential site

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for a construction staging area located south of Silo 1, represented by sample locations G1 through G6. High Purity Germanium (HPGe) measurements, that were not included in the Phase I sampling, will also be planned for the construction staging area. The second is a site slated for future pipe supports represented by sample locations G7 through G12 for piping from Silo 4 to the proposed Transfer Tank Area for use in simulation training. The Phase II soil sampling will be presented as a variance to the existing Phase I sampling Project Specific Plan.

If you have any questions or comments regarding this report, please contact Robert Janke at (513) 648-3124.

Sincerely,



Johnny W. Reising  
Fernald Remedial Action  
Project Manager

FEMP:R.J. Janke

Enclosures

cc w/enclosures:

G. Jablonowski, USEPA-V, SRF-5J  
R. Beaumier, TPSS/DERR, OEPA-Columbus  
T. Schneider, OEPA-Dayton (3 copies of enclosures)  
F. Bell, ATSDR  
M. Schupe, HSI GeoTrans  
R. Vandegrift, ODH  
F. Barker, Tetra Tech  
D. Carr, FDF/52-2  
J. D. Chiou, FDF/52-0  
T. Hagen, FDF/65-2  
J. Harmon, FDF/90  
AR Coordinator, FDF/78

cc w/o enclosures:

N. Hallein, EM-42/CLOV  
A. Tanner, OH/FEMP  
R. Heck, FDF/2  
S. Hinnefeld, FDF/90  
EDC, FDF/52-7

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AREA 7: EXISTING SILO BERM DATA SUMMARY

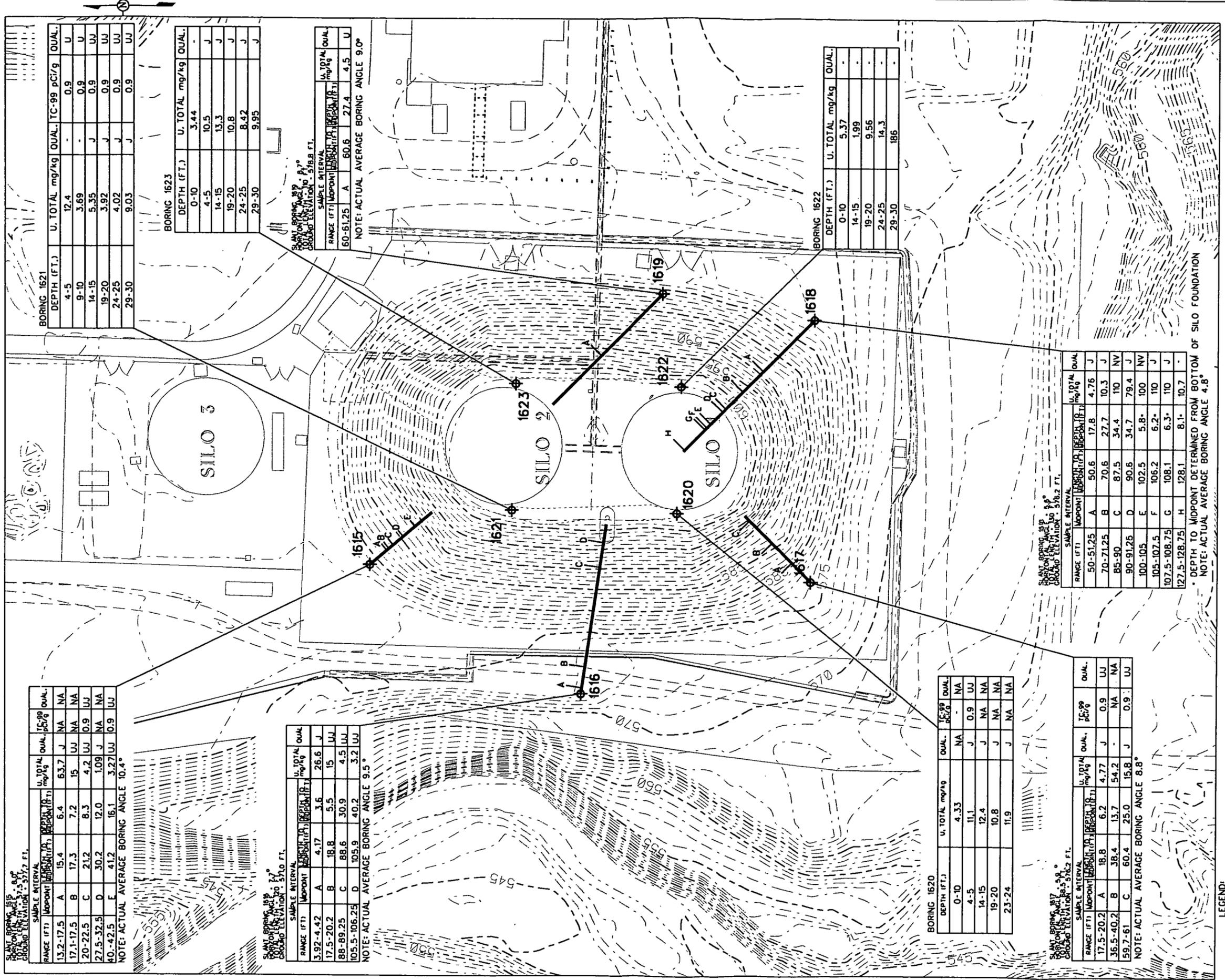
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Constituent	WAC	No. of Samples	No. of Detections	Range of Detections/Qual.	Maximum Non-Detection Concentration
<u>Radionuclides (pCi/g)</u> Neptunium - 237	3.12E+09	11	No Detections	No Detections	0.6U
Strontium - 90	5.67E+10	11	1	0.816-	0.5U
Technetium - 99	2.91E+01	11	No Detections	No Detections	0.9U
Uranium, Total (mg/kg)	1.03E+03	48	39	1.09J to 110J	15UJ
Uranium - 238	3.46E+02	44	44	0.76J to 53.4 -	0.6U
<u>Inorganics (ug/kg)</u> Boron	1.04E+03	1	1	24J	None
Mercury	5.66E+04	17	3	0.11J to 0.13J	0.124UNV; 0.12U
<u>Organics (ug/kg)</u> Bis (2-chloroisopropyl) ether	24.4	23	No Detections	No Detections	430U <sup>Note 1</sup>
Bromodichloromethane	903	22	No Detections	No Detections	6U
Carbazole	7.72E+07	NA	NA	NA	NA
Chlordane	2890	NA	NA	NA	NA
Chloroethane	3.92E+08	23	No Detections	No Detections	13U
1,1 - Dichloroethene	11,400	22	No Detections	No Detections	6U
1,2 - Dichloroethene	11,400	22	No Detections	No Detections	6U
Tetrachloroethene	128,000	22	1	4J	6U
Trichloroethene	128,000	22	No Detections	No Detections	6U
Toxaphene	1.06E+08	11	No Detections	No Detections	210U
Vinyl Chloride	1510	22	No Detections	No Detections	13U
4 - Nitroaniline	44.2	23	No Detections	No Detections	2100UJ <sup>Note 1</sup>

NA: Not Analyzed  
 U: Not Detected  
 J: Estimated  
 UJ: Estimated, Non-Detected  
 UNV: Not Validated, Not Detected  
 -: Actual  
 Note 1: High detection limit due to sample dilution during analysis

TABLE 1

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SLANT BORING 1621  
SLANT BORING ANGLE: 8.7°  
TOTAL DEPTH: 29.30 FT.  
GROUND ELEVATION: 577.2 FT.

DEPTH (FT.)	U. TOTAL mg/kg	TC-99 pCi/g	OUAL.
4-5	12.4	-	0.9 U
9-10	3.69	-	0.9 U
14-15	5.35	J	0.9 UJ
19-20	3.92	J	0.9 UJ
24-25	4.02	J	0.9 UJ
29-30	9.03	J	0.9 UJ

BORING 1623  
SLANT BORING ANGLE: 8.7°  
TOTAL DEPTH: 29.30 FT.  
GROUND ELEVATION: 578.8 FT.

DEPTH (FT.)	U. TOTAL mg/kg	OUAL.
0-10	3.44	-
4-5	10.5	J
14-15	13.3	J
19-20	10.8	J
24-25	8.42	J
29-30	9.95	J

SLANT BORING 1619  
SLANT BORING ANGLE: 8.7°  
TOTAL DEPTH: 30.00 FT.  
GROUND ELEVATION: 578.8 FT.

RANGE (FT.)	MIDPOINT (FT.)	U. TOTAL mg/kg	OUAL.
60-61.25	A	60.6	27.4 U

NOTE: ACTUAL AVERAGE BORING ANGLE 9.0°

BORING 1622  
SLANT BORING ANGLE: 8.7°  
TOTAL DEPTH: 29.30 FT.  
GROUND ELEVATION: 578.2 FT.

DEPTH (FT.)	U. TOTAL mg/kg	OUAL.
0-10	5.37	-
14-15	1.99	-
19-20	9.56	-
24-25	14.3	-
29-30	186	-

SLANT BORING 1615  
SLANT BORING ANGLE: 17°  
TOTAL DEPTH: 32.50 FT.  
GROUND ELEVATION: 577.2 FT.

RANGE (FT.)	MIDPOINT (FT.)	U. TOTAL mg/kg	TC-99 pCi/g	OUAL.
13.2-17.5	A	15.4	63.7	J NA NA
17.1-17.5	B	17.3	7.2	15 UJ NA NA
20-22.5	C	21.2	8.3	4.2 UJ 0.9 UJ
27.5-32.5	D	30.2	12.0	1.09 J NA NA
40.-42.5	E	41.2	16.1	3.27 UJ 0.9 UJ

NOTE: ACTUAL AVERAGE BORING ANGLE 10.4°

SLANT BORING 1616  
SLANT BORING ANGLE: 17°  
TOTAL DEPTH: 32.50 FT.  
GROUND ELEVATION: 578.0 FT.

RANGE (FT.)	MIDPOINT (FT.)	U. TOTAL mg/kg	OUAL.	
3.92-4.42	A	4.17	3.6	26.6 J
17.5-20.2	B	18.8	5.5	15 UJ
88-89.25	C	88.6	30.9	4.5 UJ
105.5-106.25	D	105.9	40.2	3.2 UJ

NOTE: ACTUAL AVERAGE BORING ANGLE 9.5°

BORING 1620  
SLANT BORING ANGLE: 8.7°  
TOTAL DEPTH: 23.24 FT.  
GROUND ELEVATION: 578.2 FT.

DEPTH (FT.)	U. TOTAL mg/kg	TC-99 pCi/g	OUAL.
0-10	4.33	NA	NA NA
4-5	11.1	J	0.9 UJ
14-15	12.4	J	NA NA
19-20	10.8	J	NA NA
23-24	11.9	J	NA NA

SLANT BORING 1617  
SLANT BORING ANGLE: 8.5°  
TOTAL DEPTH: 59.7-61 FT.  
GROUND ELEVATION: 576.2 FT.

RANGE (FT.)	MIDPOINT (FT.)	U. TOTAL mg/kg	TC-99 pCi/g	OUAL.
17.5-20.2	A	18.8	6.2	4.77 J
36.5-40.2	B	38.4	13.7	54.2 NA NA
59.7-61	C	60.4	25.0	15.8 J

NOTE: ACTUAL AVERAGE BORING ANGLE 8.8°

SLANT BORING 1618  
SLANT BORING ANGLE: 8.9°  
TOTAL DEPTH: 127.5-128.75 FT.  
GROUND ELEVATION: 576.2 FT.

RANGE (FT.)	MIDPOINT (FT.)	U. TOTAL mg/kg	TC-99 pCi/g	OUAL.
50-51.25	A	50.6	17.8	4.76 J
70-71.25	B	70.6	27.7	10.3 J
85-90	C	87.5	34.4	110 NV
90-91.25	D	90.6	34.7	79.4 J
100-105	E	102.5	5.8	100 NV
105-107.5	F	106.2	6.2	110 J
107.5-108.75	G	108.1	6.3	110 J
127.5-128.75	H	128.1	8.1	10.7 -

DEPTH TO MIDPOINT DETERMINED FROM BOTTOM OF SILO FOUNDATION  
NOTE: ACTUAL AVERAGE BORING ANGLE 4.8°

LEGEND:  
 NA : NOT ANALYZED  
 U : NON DETECTED  
 J : ESTIMATED  
 UJ : ESTIMATED, NON DETECTED  
 U : ACTUAL

2001'

SCALE  
 40 20 0 40 FEET  
 SHEET 1 OF 2  
 AREA 7 - EXISTING BERM DATA SUMMARY

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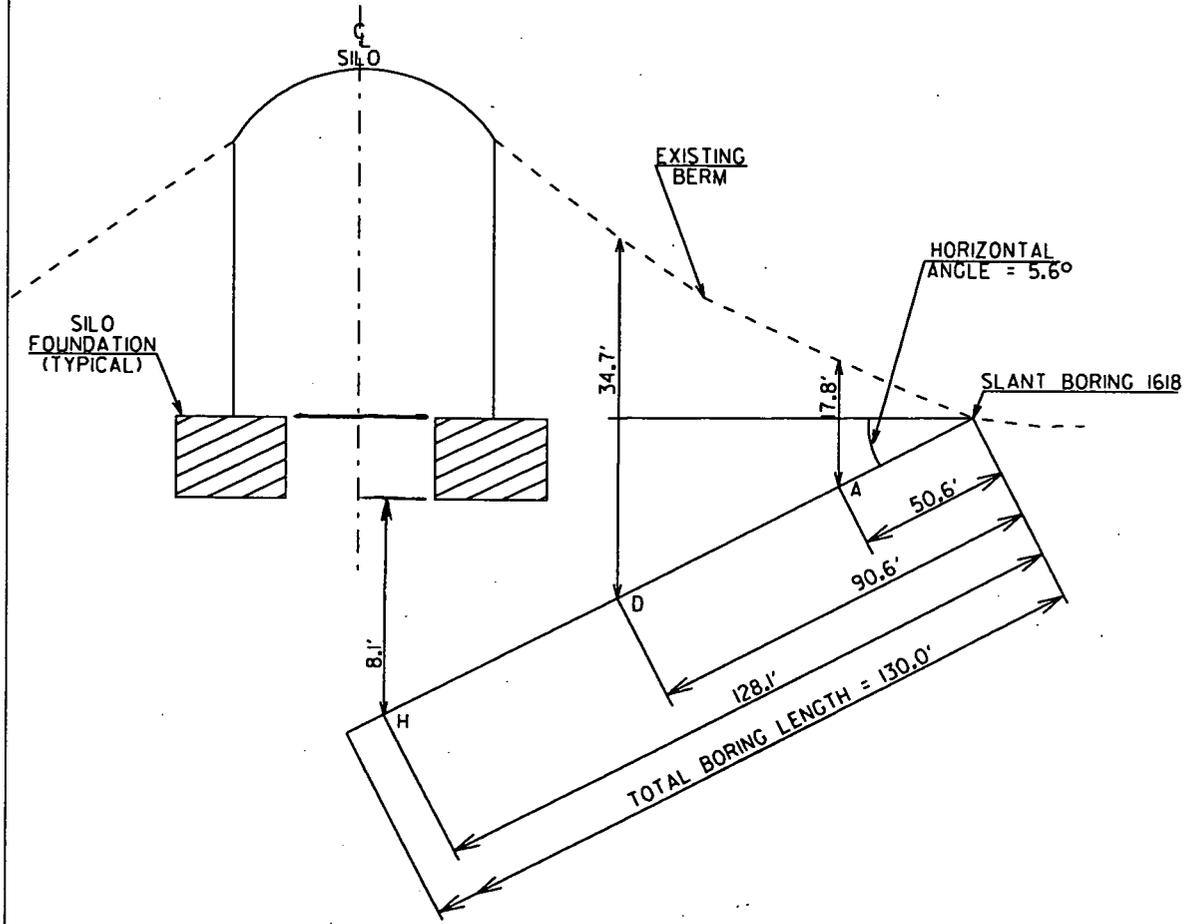
FIGURE 1

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11-JAN-1988

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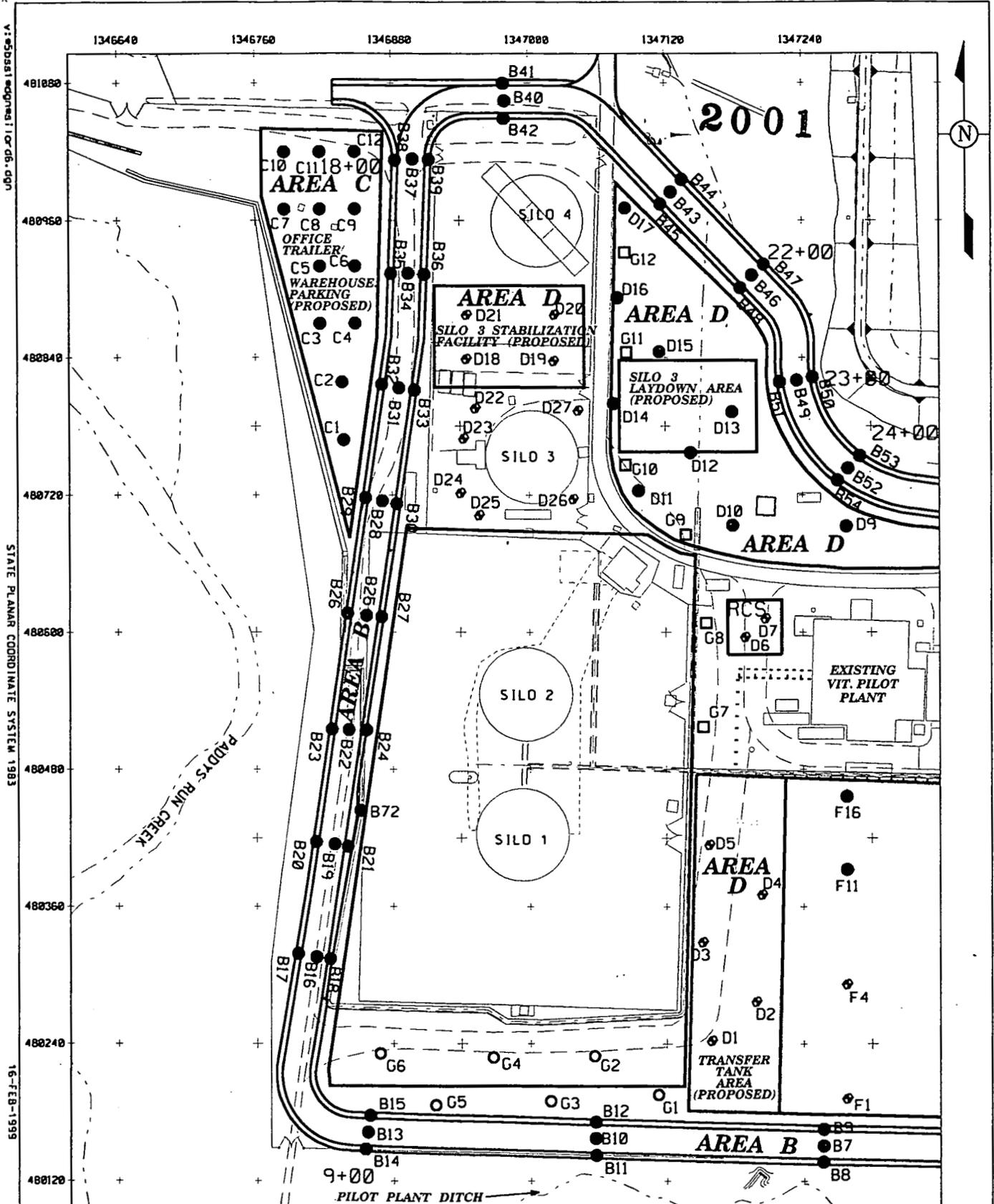
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SLANT BORING PROFILE ILLUSTRATION  
 NOT TO SCALE

NOTE: MIDPOINT "A", "D", AND "H" USED TO ILLUSTRATE THE MIDPOINT LENGTH AND DEPTH FOR THEIR RESPECTIVE "SAMPLE INTERVAL RANGE"

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**LEGEND:**

- PHASE I BORING LOCATION (<5 FEET)
- ◻ PHASE II BORING LOCATION (5 FEET)
- ◉ PHASE II BORING LOCATION (0 - 6 INCHES)
- ◐ PHASE I BORING LOCATION (5 FEET)

SCALE  
 120 60 0 120 FEET

FIGURE 2. SILOS PROJECT AREA, SOIL WAC ATTAINMENT SAMPLING LOCATIONS. (COMPLETED PHASE I AND PROPOSED PHASE II LOCATIONS)

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