THE CONTENTS OF THIS
DOCUMENT ARE THE HIGHEST
QUALITY OBTAINABLE
INITIAL BAE DATE 10/15/92

INEL
Idaho National Engineering Laboratory
Environmental Restoration

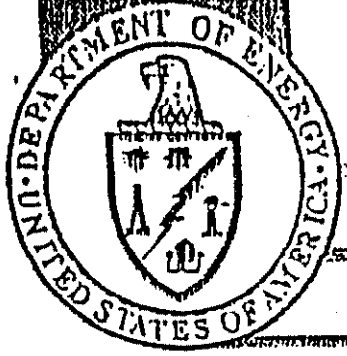
REV 1

ORIGINAL SIGNATURES INCLUDED

WINCO Environmental Restoration

Track 1 Decision Documentation Package
Waste Area Group
Operable Unit 6

Site CPP-47
Pilot Plant Storage Area West of CPP-620

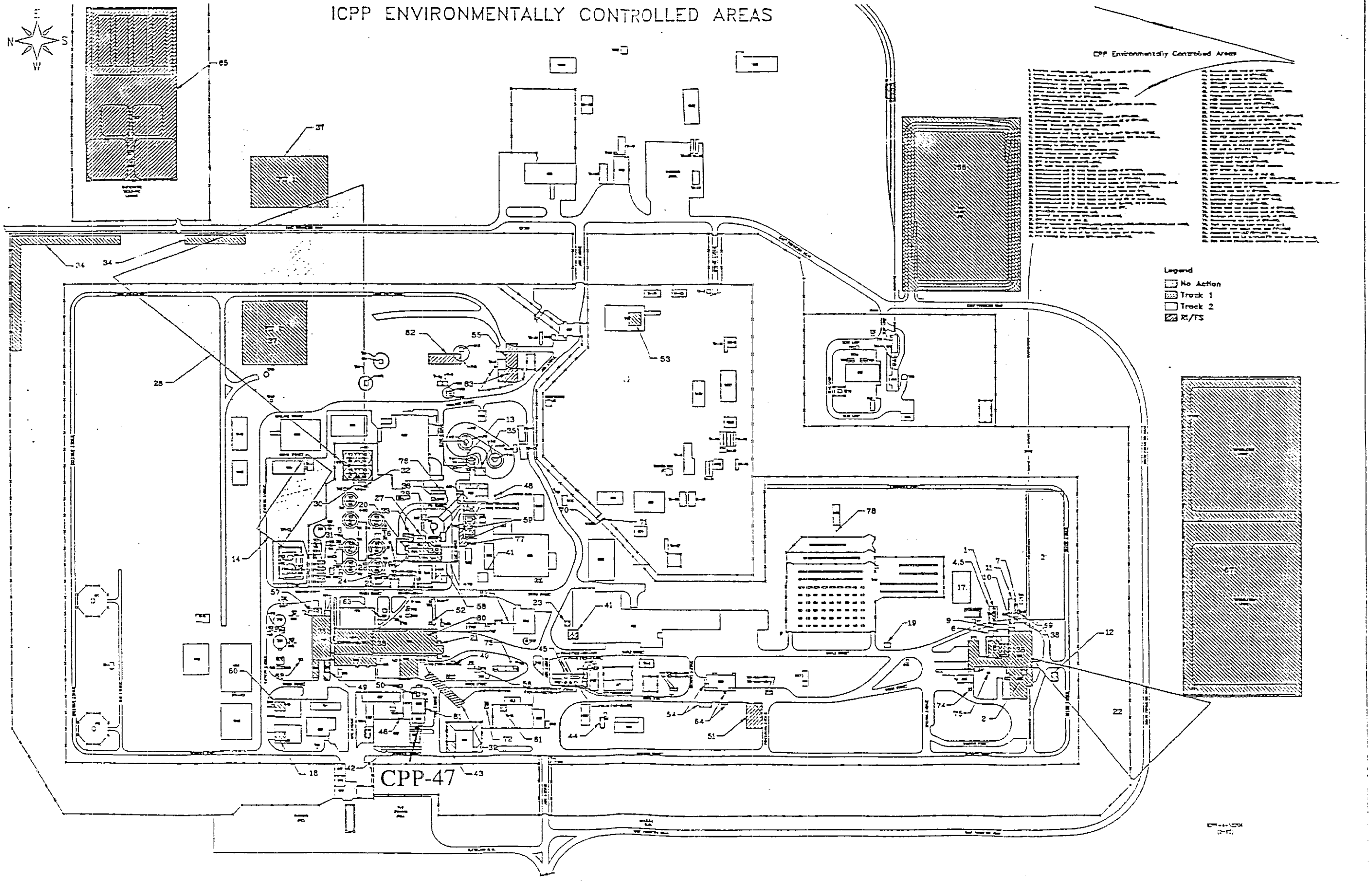


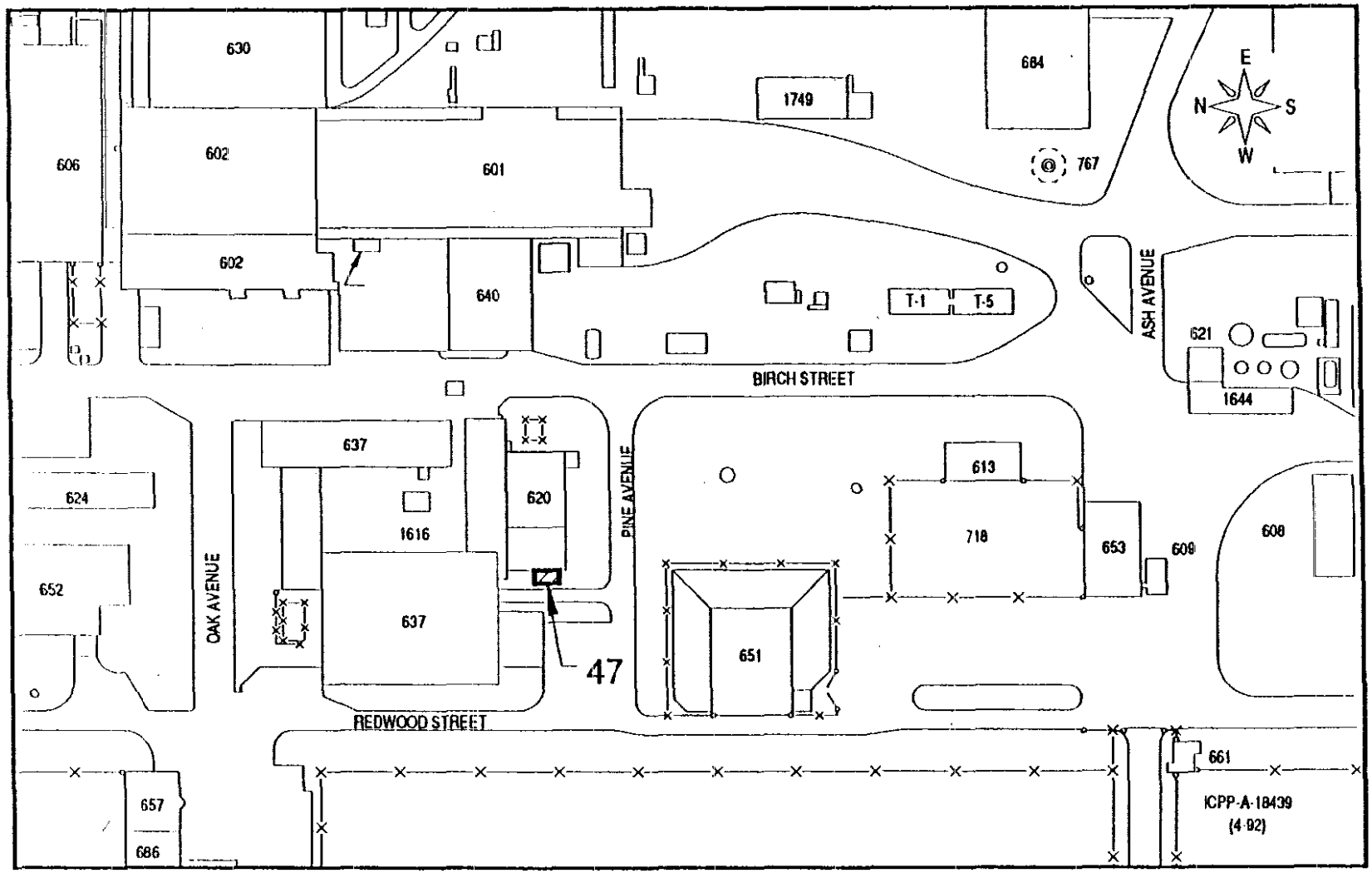
Westinghouse Idaho Nuclear Company, Inc.

Idaho National Engineering Laboratory

U.S. Department of Energy, Idaho Field Office

ICPP ENVIRONMENTALLY CONTROLLED AREAS




630
606
602
601
602
640
1749
684
767
E
N
S
W
T-1
T-5
ASH AVENUE
621
1644
BIRCH STREET
624
637
620
1616
637
652
OAK AVENUE
PINE AVENUE
613
718
653
609
608
651
47
REDWOOD STREET
661
657
686
ICPP-A-18439
(4-92)

Site CPP-47

NO FURTHER ACTION DETERMINATION

The U. S. Department of Energy, U.S. Environmental Protection Agency-Region 10 and the State of Idaho have completed a review of the referenced information for CPP-47 hazardous site, as it pertains to the INEL Federal Facility Agreement of 12-9-91. Based on this review, the Parties have determined that no further action for purposes of investigation or study is justified. This decision is subject to review at the time of issuance of the Record of Decision.

Brief Summary of the basis for no further action:

EPA - 2 gal HF spill to soil, low level F found in sampling

DOE - See attached

IDHW - See attached

References:

EPA - Rev 1, Track I documentation

DOE - Track 1 documentation

IDHW - Track 1 documentation package

DOE Project Manager Lisa A Green for J. L. Lyle 9/14/92
date

EPA Project Manager Wayne Pierre 9/14/92
date

Idaho Project Manager R. D. Hall for Dean Nygard 9/14/92
date

DECISION DOCUMENTATION PACKAGE
COVER SHEET

PREPARED IN ACCORDANCE WITH

TRACK 1 SITES:
GUIDANCE FOR ASSESSING
LOW PROBABILITY HAZARD SITES
AT INEL

SITE DESCRIPTION: PILOT PLANT STORAGE AREA WEST OF CPP-620

SITE ID: CPP-47 **OPERABLE UNIT:** 02

WASTE AREA GROUP: 03

I. SUMMARY - PHYSICAL DESCRIPTION OF THE SITE:

CPP-47 is located in the western portion of the ICPP, just west of the southwest corner of building CPP-620. This area was used to store 44 M hydrofluoric acid (HF) for use in the ICPP Pilot Plant Operations from 1965 to 1986. One to three 55-gallon drums were stored on pallets. As small quantities of HF were needed, the HF was transferred to a smaller container and taken inside building CPP-637 for use.

Sometime in 1984 a small spill (approximately 2 gallons) was known to have occurred.

All barrels, pallets, etc., have been removed from this site.

DECISION RECOMMENDATION

II. SUMMARY - Qualitative Assessment of Risk:

The overall reliability of the information on this site is high, and the qualitative risk assessment is low. The data collected and confirmed for this site shows no conflicting information is apparent. Sample results indicate fluoride concentrations in the soils do not pose a health risk as they are well below the risk based concentration.

III. SUMMARY - Consequences of Error:

If no further action is taken and undetected hazardous constituents exist at the site, there may be the potential for migration via the groundwater pathway resulting in a higher risk than anticipated. However, the risk of this occurring is believed to be very low.

Further remediation on a clean site would result in a low return in environmental benefit from a high investment in clean-up expenditures.

IV. SUMMARY - Other Decision Drivers:

No other decision drivers are apparent for this site.

Recommended action:

Site CPP-47 should be reclassified to no action status and removed from the FFA/CO list of Environmentally Controlled Areas. Sampling results from representative samples confirm that the site presents no hazard above acceptable levels of risk. Adequate remediation was performed during the drums and pallets, and the site appears clean. Further action on this site would require expenditure of funds that could be dedicated to remediation elsewhere with higher return in environmental benefits.

Signatures	# Pages:	Date:
Prepared By:	DOE WAG Manager:	
Approved By:	Independent Review:	

DECISION STATEMENT
(by DOE RPM)

Date Received: 9/14/92

Disposition: CPP-47 presents very low risk to human health and the environment based on the minimal size of the unit, amount of hazardous substances, low soil concentrations, and unlikely potential for exposure. No further action should be pursued for this site.

DATE: 9/14/92	# PAGES (decision statement):
NAME: Lisa A Green for JLL	SIGNATURE: Lisa A Green for JLL

DECISION STATEMENT
(by the State of Idaho)

Date Received: 9/14/92

Disposition: CPP-47 OU-02

Associated HF spill (≈ 2 gal) from drum storage area (1-3 drums). Spill occurred in about 1984. Caption for site map CPP-47 is in error and should not be "Mercury Contamination" but "HF contamination" Dee Williams 9/14/92 personal communication. Maximum soil concen. conc. of "F" under CoCA Closure plan is 240 ppm with no rad contamin. found above background during site investigations. Based on conservative risk evaluations, small size of the identified site, no further action is warranted based on information supplied in this report

DATE: 9/14/92	# PAGES (decision statement):
NAME: R. David Hovland	SIGNATURE: R. David Hovland

DECISION STATEMENT
(by the EPA)

Date Received: 9/14/92

Disposition: CPP-AT

HF spill from 3 drum storage area ~ 2 gal spill in mid 80's. Analysis of soil samples for RCRA closure under COCA showed F concentrations under 240 ppm soil. size of spill & residual soil concentrations do not support unacceptable risk from F nor was the initial volume of acid sufficient to mobilize a significant mass of naturally occuring heavy metals to present a threat to ground water resources. No further investigation is warranted based on above informatio

DATE: 9/14/92	# PAGES (decision ~~statement~~):
NAME: Wayne Pierce	SIGNATURE: Wayne Pierce

PROCESS/WASTE WORKSHEET
SITE ID CPP-47

Col 1 Processes Associated with this Site	Col 2 Waste Description & Handling Procedures	Col 3 Description & Location of any Artifacts/Structures/Disposal Areas Associated with this Waste or Process
Process Drum storage area for HF use in ICPP Pilot Plant Operations	Small quantities of HF were transferred from the drums to a small container and taken inside building CPP-637 for use. A small leak (2 gallons) occurred in 1984.	Artifact: 1 to 3 55-gallon drums Location: West of CPP-620 - no longer used Description: Storage area for HF
Process		Artifact Location Description
Process		Artifact Location Description

CONTAMINANT WORKSHEET
SITE ID CPP-47
PROCESS (Col 1) Drum Storage Area for HF
WASTE (Col 2) HYDROLFUORIC ACID (HF)

Col 4 What known/potential hazardous substances/constituents are associated with this waste or process?	Col 5 Potential sources associated with this hazardous material	Col 6 Known/estimated concentration of hazardous substances/ constituents[a]	Col 7 Risk based concentration mg/kg	Col 8 Qualitative risk assessment (Hi/Med/Lo)	Col 9 Overall reliability (Hi/Med/Lo)
Fluoride	Contaminated Soil	2.48E+02	1.6E+04	Low	High

a. ND = not detected
DL = detected limit in ppm

PROCESS CPP-47

Question 1. What are the waste generation process locations and dates of operation associated with this site?

Block 1 Answer:

CPP-47 area was used for storage and transfer of HF to smaller containers from approximately 1965 to 1986.

Block 2 How reliable is/are the information source/s? X High ___Med __Low (check one)

EXPLAIN THE REASONING BEHIND THIS EVALUATION.

Information was obtained based on historical operating information.

Block 3 Has this INFORMATION been confirmed? _XYes __No (check one)

IF SO, DESCRIBE THE CONFIRMATION.

Information was obtained based on historical operating information.

Block 4 **SOURCES OF INFORMATION** (check appropriate box/es & source number from reference list)

No available information	[ ]		Analytical data	[ ]	
Anecdotal	[ ]		Documentation about data	[ ]	
Historical process data	[X]	1	Disposal data	[ ]	
Current process data	[ ]		Q.A. data	[ ]	
Areal photographs	[ ]		Safety analysis report	[ ]	
Engineering/site drawings	[ ]		D&D report	[ ]	
Unusual Occurrence Report	[ ]		Initial assessment	[ ]	
Summary documents	[ ]		Well data	[ ]	
Facility SOPs	[ ]		Construction data	[ ]	
OTHER	[ ]				

PROCESS CPP-47

Question 2. What are the disposal process locations and dates of operation associated with this site?

Block 1 Answer:

As small quantities of HF were needed, the HF was transferred from drums to a small container and taken inside building CPP-637 for use. Sometime in 1984, a small spill (≈2 gallons) of HF was known to have occurred. In 1984-1985, a bed of dolomite was placed under the storage pallets for neutralizing spills or leaks, however, it is not known if the dolomite was in place prior to the spill.

Block 2 How reliable is/are the information source/s? _XHigh ___Med __Low (check one)

EXPLAIN THE REASONING BEHIND THIS EVALUATION.

Information was obtained from historical information and summary documents prepared for closure of this site.

Block 3 Has this INFORMATION been confirmed? _XYes __No (check one)

IF SO, DESCRIBE THE CONFIRMATION.

Information was obtained from historical information and summary documents prepared for closure of this site.

Block 4 **SOURCES OF INFORMATION** (check appropriate box/es & source number from reference list)

No available information	[ ]		Analytical data	[ ]	
Anecdotal	[ ]		Documentation about data	[ ]	
Historical process data	[X]	1	Disposal data	[ ]	
Current process data	[ ]		Q.A. data	[ ]	
Areal photographs	[ ]		Safety analysis report	[ ]	
Engineering/site drawings	[ ]		D&D report	[ ]	
Unusual Occurrence Report	[ ]		Initial assessment	[ ]	
Summary documents	[X]	2	Well data	[ ]	
Facility SOPs	[ ]		Construction data	[ ]	
OTHER	[ ]				

PROCESS CPP-47

Question 3. Is there empirical, circumstantial, or other evidence of migration? If so, what is it?

Block 1 Answer:

No. Sample results from shallow borings taken in CPP-47 indicate high fluoride levels in the approximate spill area. Surrounding samples were below the background Upper Tolerance Limit (6.55 mg/kg). No evidence of migration exists.

Block 2 How reliable is/are the information source/s? _X_High __Med __Low (check one)

EXPLAIN THE REASONING BEHIND THIS EVALUATION.

Information was obtained from Closure Plan for CPP-47 p.19. (Reference #2)

Block 3 Has this INFORMATION been confirmed? _X_Yes __No (check one)

IF SO, DESCRIBE THE CONFIRMATION.

Information was obtained from Closure Plan for CPP-47 p.19. (Reference #2)

Block 4 **SOURCES OF INFORMATION** (check appropriate box/es & source number from reference list)

No available information	[ ]		Analytical data	[ ]	
Anecdotal	[ ]		Documentation about data	[ ]	
Historical process data	[ ]		Disposal data	[ ]	
Current process data	[ ]		Q.A. data	[ ]	
Areal photographs	[ ]		Safety analysis report	[ ]	
Engineering/site drawings	[ ]		D&D report	[ ]	
Unusual Occurrence Report	[ ]		Initial assessment	[ ]	
Summary documents	[X]	2	Well data	[ ]	
Facility SOPs	[ ]		Construction data	[ ]	
OTHER	[ ]				

PROCESS CPP-47

Question 4. Is there evidence that a source exists at this site? If so, list the sources and describe the evidence.

Block 1 Answer:

Yes. Sample results from shallow borings indicate fluoride exceeds the Upper Tolerance Limits (6.55 mg/kg) in 9 of 13 samples. However, the measured levels are well below the risk based concentration.

Block 2 How reliable is/are the information source/s? X High __Med __Low (check one)

EXPLAIN THE REASONING BEHIND THIS EVALUATION.

Information was based on sampling results from Closure Plan for Land Disposal Unit CPP-47.

Block 3 Has this INFORMATION been confirmed? X Yes __No (check one)

IF SO, DESCRIBE THE CONFIRMATION.

Information was based on sampling results from Closure Plan for Land Disposal Unit CPP-47.

Block 4 **SOURCES OF INFORMATION** (check appropriate box/es & source number from reference list)

No available information	[ ]		Analytical data	[ ]	
Anecdotal	[ ]		Documentation about data	[ ]	
Historical process data	[ ]		Disposal data	[ ]	
Current process data	[ ]		Q.A. data	[ ]	
Areal photographs	[ ]		Safety analysis report	[ ]	
Engineering/site drawings	[ ]		D&D report	[ ]	
Unusual Occurrence Report	[ ]		Initial assessment	[ ]	
Summary documents	[X]	2	Well data	[ ]	
Facility SOPs	[ ]		Construction data	[ ]	
OTHER	[ ]				

PROCESS CPP-47

Question 5. Does site operating or disposal historical information allow estimation of the pattern of potential contamination? If the pattern is expected to be a scattering of hot spots, what is the expected minimum size of a significant hot spot?

Block 1 Answer:

Yes. Approximately 2 gallons of HF was spilled in the area where storage and transfer occurred. It is estimated that the highest fluoride concentration is located in an area 8 to 10 feet in diameter at a maximum of 6 feet in depth, situated between boreholes 47-02, 47-03 and 47-05.

Block 2 How reliable is/are the information source/s? X High __Med __Low (check one)

EXPLAIN THE REASONING BEHIND THIS EVALUATION.

Information obtained from Closure Plan for LDU CPP-47.

Block 3 Has this INFORMATION been confirmed? _XYes __No (check one)

IF SO, DESCRIBE THE CONFIRMATION.

Information obtained from Closure Plan for LDU CPP-47.

Block 4 **SOURCES OF INFORMATION** (check appropriate box/es & source number from reference list)

No available information	[ ]	Analytical data	[X] 2
Anecdotal	[ ]	Documentation about data	[ ]
Historical process data	[ ]	Disposal data	[ ]
Current process data	[ ]	Q.A. data	[ ]
Areal photographs	[ ]	Safety analysis report	[ ]
Engineering/site drawings	[ ]	D&D report	[ ]
Unusual Occurrence Report	[ ]	Initial assessment	[ ]
Summary documents	[X] 2	Well data	[ ]
Facility SOPs	[ ]	Construction data	[ ]
OTHER	[ ]		

PROCESS CPP-47

Question 6. Estimate the length, width, and depth of the contaminated region. What is the known or estimated volume of the source? If this is an estimated volume, explain carefully how the estimate was derived.

Block 1 Answer:

The entire storage area is suspect to contamination.

Approximate Area: 15′ x 20′ x 2′ = 600 ft.^{3}

Approximately 2 gallons of 44M HF spilled.

Block 2 How reliable is/are the information source/s? _X_High __Med __Low (check one)

EXPLAIN THE REASONING BEHIND THIS EVALUATION.

Information based on historical process data.

Block 3 Has this INFORMATION been confirmed? _X_ Yes __No (check one)

IF SO, DESCRIBE THE CONFIRMATION.

Information based on historical process data.

Block 4 **SOURCES OF INFORMATION** (check appropriate box/es & source number from reference list)

No available information	[ ]		Analytical data	[ ]	
Anecdotal	[ ]		Documentation about data	[ ]	
Historical process data	[X]	1	Disposal data	[ ]	
Current process data	[ ]		Q.A. data	[ ]	
Areal photographs	[ ]		Safety analysis report	[ ]	
Engineering/site drawings	[ ]		D&D report	[ ]	
Unusual Occurrence Report	[ ]		Initial assessment	[ ]	
Summary documents	[X]	2	Well data	[ ]	
Facility SOPs	[ ]		Construction data	[ ]	
OTHER	[ ]				

PROCESS CPP-47

Question 7. What is the known or estimated quantity of hazardous substance/constituent at this source? If the quantity is an estimate, explain carefully how the estimate was derived.

Block 1 Answer:

Using 2 gallons of HF as the estimated quantity of hazardous substance; 600 $ft.^3$ volume of soil and assuming that the contamination is homogeneously spread throughout the soil. The total concentration of fluoride in the soil was calculated.

Storage Area = 600 ft^3. Approximately 2 gallons of 44M HF spilled = 6328.52 g fluoride.

600 $ft.^3$ x 28317.016 cm^3/ft^3 = 16990209.6 cm^3
16990209.6 cm^3 x 1.5 g/cm^3 = 25485314.4 grams soil
6328.58g F /25485314.4g x $\frac{10^3 mg}{g}$ X $\frac{10^3 g}{kg}$ = 248.3 mg/kg

248.3 mg/kg F

Block 2 How reliable is/are the information source/s? _XHigh __Med __Low (check one)
EXPLAIN THE REASONING BEHIND THIS EVALUATION.

Information based on historical process data.

Block 3 Has this INFORMATION been confirmed? X Yes __No (check one)
IF SO, DESCRIBE THE CONFIRMATION.

Information confirmed by sampling conducted for Closure Plan for LDU CPP-47.

Block 4 **SOURCES OF INFORMATION** (check appropriate box/es & source number from reference list)

No available information	[ ]		Analytical data	[ ]	
Anecdotal	[ ]		Documentation about data	[ ]	
Historical process data	[X]	1	Disposal data	[ ]	
Current process data	[ ]		Q.A. data	[ ]	
Areal photographs	[ ]		Safety analysis report	[ ]	
Engineering/site drawings	[ ]		D&D report	[ ]	
Unusual Occurrence Report	[ ]		Initial assessment	[ ]	
Summary documents	[X]	2	Well data	[ ]	
Facility SOPs	[ ]		Construction data	[ ]	
OTHER	[ ]				

PROCESS CPP-47

Question 8. Is there evidence that this hazardous substance/constituent is present at the source as it exists today? If so, describe the evidence.

Block 1 Answer:

Yes. Sampling results from shallow borings taken in CPP-47 indicate high fluoride levels in the estimated spill area.

Block 2 How reliable is/are the information source/s? _X_High __Med __Low (check one)

EXPLAIN THE REASONING BEHIND THIS EVALUATION.

Information was obtained from Closure Plan for LDU CPP-47

Block 3 Has this INFORMATION been confirmed? _X_ Yes __No (check one)

IF SO, DESCRIBE THE CONFIRMATION.

Information was obtained from Closure Plan for LDU CPP-47

Block 4 **SOURCES OF INFORMATION** (check appropriate box/es & source number from reference list)

No available information	[ ]		Analytical data	[ ]	
Anecdotal	[ ]		Documentation about data	[ ]	
Historical process data	[ ]		Disposal data	[ ]	
Current process data	[ ]		Q.A. data	[ ]	
Areal photographs	[ ]		Safety analysis report	[ ]	
Engineering/site drawings	[ ]		D&D report	[ ]	
Unusual Occurrence Report	[ ]		Initial assessment	[ ]	
Summary documents	[X]	2	Well data	[ ]	
Facility SOPs	[ ]		Construction data	[ ]	
OTHER	[ ]				

REFERENCES

1. ICPP LDU Assessment for IAG Negotiations January 30, 1990.

2. Closure Plan for Land Disposal Unit CPP-47, Pilot Plant Storage Area. West of CPP-620, August 1991. DCN #004282.

Reference 1

CPP-47. Pilot plant storage area west of CPP-620.

1. YEARS OF OPERATION (size, environmental setting, and contaminant description).

   The CPP-47 area was used for storage from approximately 1965 to 1986.

2. NARRATIVE DESCRIPTION OF UNIT (waste generating process, types and quantities of waste)

   LDU CPP-47, is an area West of CPP-620 that was used to store 44 M Hydroflouric acid (HF) for ICPP Pilot Plant operations. Normally, 1-2 55 gallon drums of HF, but as many as three drums, were stored on pallets adjacent to the southwest corner of CPP-620. As small quantities of HF were needed, the HF was transferred from the drums to a small container and taken inside building CPP-637 for use. Sometime in 1984, a small spill of HF was known to have occurred. In 1984-1985, a bed of dolomite was place under the pallets for neutralizing spills or leaks, however it is not known if the dolomite was in place prior to the spill. It was estimated that a maximum of 300 ft^2 (15 x 20 ft) of soil may have been contaminated.

3. IDENTIFY ALL WASTE (HAZARDOUS AND SOLID) GENERATING PROCESS ASSOCIATED WITH EACH LDU (types and amounts of waste generated by trade name, IUPAC chemical name, physical state, DOT hazard classification, and years of operation).

   Only one spill of HF is "known" to have occurred. However, no documentation is known to exist and the knowledge of the spill is based on hearsay.

4. DOCUMENTATION SUPPORTING THE DETERMINATION THAT THE WASTE IS A RCRA HAZARDOUS WASTE.

   No documentation is known to exist.

5. IDENTITY OF INDIVIDUAL WHO DIRECTLY MANAGED HAZARDOUS WASTE DISPOSAL AT THE UNIT (name, phone number, address and job title/ responsibility).

6. IDENTITY OF INDIVIDUAL WHO AND OBSERVED FIRSTHAND THE DISPOSAL OF HAZARDOUS WASTE AT THE UNIT. INCLUDE SUMMARY OF INDIVIDUALS OBSERVATION (name, phone number, address and job title/ responsibility).

000320

7. LIST BY DATE, HAZARDOUS WASTE CODE AND QUANTITY OF EVERY KNOWN OR SUSPECTED DISPOSAL OF HAZARDOUS WASTE (provide applicable documentation and name, phone number, address and job title/ responsibility of those knowledgable of incidents).

Reference 2

007330

CLOSURE PLAN FOR
LAND DISPOSAL UNIT CPP-47
Pilot Plant Storage Area
West of CPP-620

TABLE OF CONTENTS

007550

FIGURES

TABLES

APPENDICES

007330

LIST OF ACRONYMS

ANSI/ASME	American National Standards Institute/American Society of Mechanical Engineers
COCA	Consent Order and Compliance Agreement
CSWP	Construction Safe Work Permit
DOE-HQ	U.S. Department of Energy Headquarters in Washington, D.C.
DOE-ID	U.S. Department of Energy, Idaho Operations Office
DOT	U.S. Department of Transportation
EPA	Environmental Protection Agency
FFA/CO	Federal Facilities Agreement/Consent Order
FPR	Fuel Processing Restoration / Federal Procurement Regulation
HEA	Health Environment Assessment
HF	Hydrofluoric Acid
ICPP	Idaho Chemical Processing Plant
INEL	Idaho National Engineering Laboratory
LDU	Land Disposal Unit
NQA-1	Quality Assurance Program Requirement for Nuclear Facilities
PNELI	Pacific Northwest Environmental Laboratory, Incorporated
QA/QC	Quality Assurance/Quality Control
QASP	Quality Assurance Sampling Plan
RCRA	Resource Conservation and Recovery Act
RFD	Chronic Reverence Dose
RPP	Relative Percent Difference
SRPA	Snake River Plain Aquifer
SWMU	Solid Waste Management Unit
USDA	United States Department of Agriculture
UTL	Upper Tolerance Limits
UURI	University of Utah Research Institute

EXECUTIVE SUMMARY

This closure plan is being submitted to comply with the Idaho National Engineering Laboratory (INEL) Consent Order and Compliance Agreement (COCA), which requires the submittal of a closure plan for each Land Disposal Unit (LDU). LDU CPP-47 is located in the western portion of the ICPP, just west of the southwest corner of building CPP-620. This area was used to store 44 M hydrofluoric (HF) acid drums for use in the ICPP Pilot Plant operations. A small spill of HF is known to have occurred sometime in 1984. HF can be classified as a listed waste, a discarded commercial chemical product (U134), or a characteristic corrosive waste (D002) if it was generated as a process waste with a pH<2.

LDU CPP-47 was characterized in accordance with the INEL COCA. CPP-47 was listed as an LDU because of the potential of HF contamination to the soils resulting from acid spills in the storage area. The primary objectives for the characterization of LDU CPP-47 were to 1) determine the nature and extent of contamination due to the release of HF from the storage area into the soil column and 2) determine if the HF or any other fluoride compound poses an unacceptable risk to human health and safety and the environment.

The only known hazardous waste released to LDU CPP-47 was HF. No radiological wastes were suspected at this site, nor was radioactive contamination found above background during routine site characterization field surveys.

Analyses of soil samples from five shallow boreholes (1 to 6 feet deep) located within the storage area were conducted to determine the presence of unreacted HF and fluoride in the soil. Although analytical results show fluoride was detected in soil samples above the background Upper Threshold Limits (UTL) at all depths of investigation, none were found exceeding the maximum allowable soil concentrations based on the Chronic Reference Dose (RfD).

No hazardous waste was detected in the vicinity of the Pilot Plant Storage Area, and the concentrations of the fluoride detected at LDU CPP-47 do not pose an unacceptable risk to human health and safety or the environment. Although elevated levels of fluoride were detected in samples that correspond to the maximum depth of investigation, soil conditions known to exist in the soils beneath LDU CPP-47 should prevent the transport of significant quantities of fluoride to any great depth. This is due to the relatively small volumes of moisture available for transport and the soil chemistry found at LDU CPP-47. Based on these results, there is no need to conduct any soil removal in the storage area to close this facility under RCRA. In addition, no further action should be required under the INEL Federal Facilities Agreement/Compliance Order (FFA/CO). Therefore, closure procedures should be largely administrative under RCRA, and a No Action Determination is warranted under the FFA/CO.

1.0 FACILITY CONDITIONS

1.1 Idaho Chemical Processing Plant

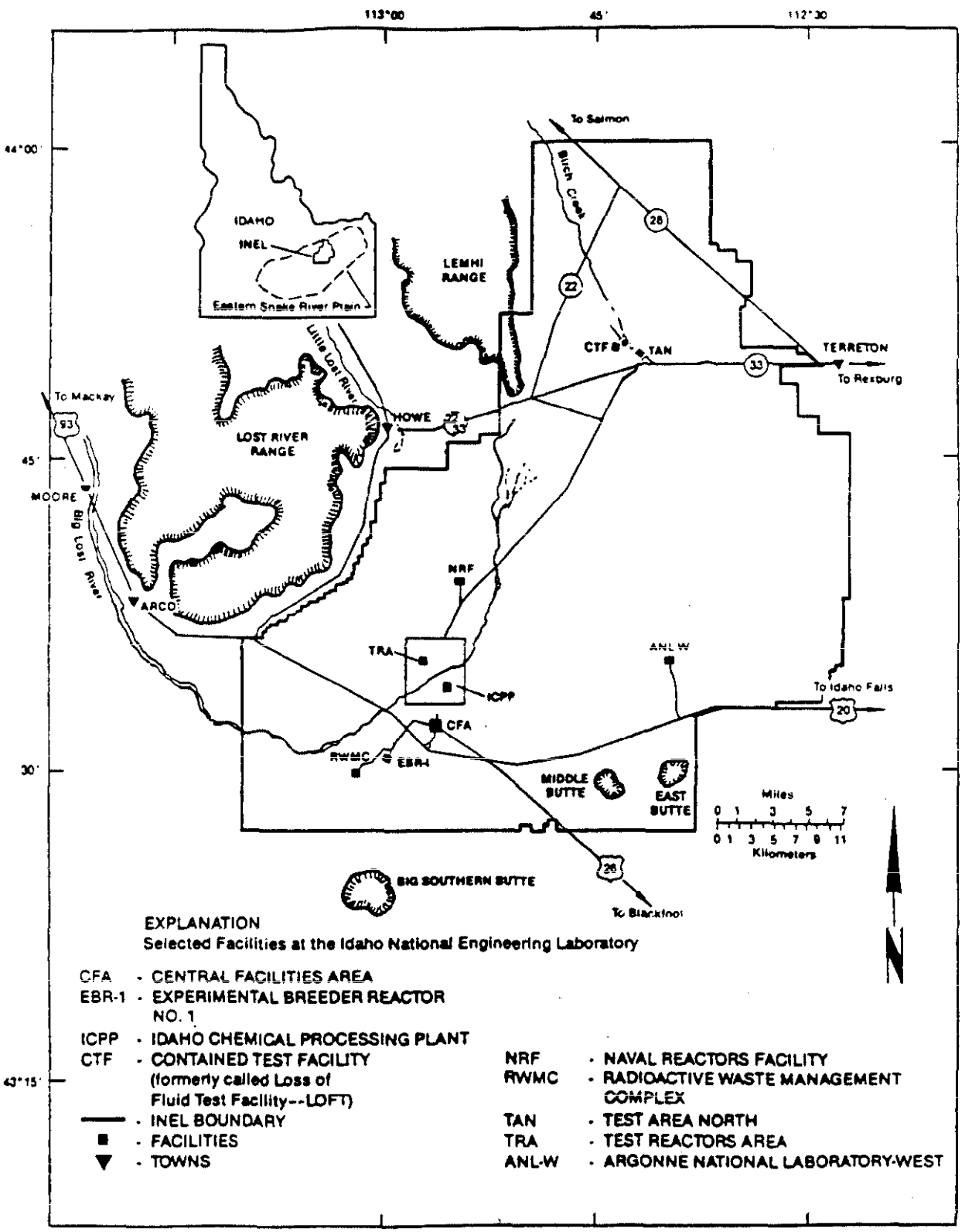
The Idaho Chemical Processing Plant (ICPP) is located at the Idaho National Engineering Laboratory (INEL) within a fenced security area of more than 200 acres. The location of the ICPP at the INEL is shown on Figure 1.

1.2 General Description

As shown in Figure 2, Land Disposal Unit (LDU) CPP-47 is located in the western portion of the ICPP, just west of the southwest corner of building CPP-620. A more detailed view of the unit and a photograph is shown in Figures 3 and 4, respectively. This area was used to store 44 M hydrofluoric acid (HF) for use in the ICPP Pilot Plant operations. One to three 55-gallon drums of HF were stored on pallets at any one time [Westinghouse Idaho Nuclear Company, Inc. (WINCO), 1987]. As small quantities of HF were needed, the HF was transferred from the drums to a small container and taken inside building CPP-637 for use. Sometime in 1984, a small spill of HF is known to have occurred (WINCO, 1987). A bed of dolomite was placed under the pallets for neutralizing spills or leaks in 1984 or 1985. The unit was taken out of service in March 1986.

1.3 Unit Characterization Objectives

LDU CPP-47 was characterized in accordance with the INEL Consent Order and Compliance Agreement (COCA). CPP-47 was listed as an LDU because of the potential of HF contamination to the soils resulting from acid spills in the storage area. Regardless of whether the site is cleaned up under the COCA or Federal Facilities Agreement and Consent Order (FFA/CO),



*Note: LDU CPP-47 is located at ICPP

FIGURE 1.

GENERAL INEL SITE MAP

EG & G/CPP-47/ID

(after Bartholomay, et al, 1989)

PROJECT NO. 893-1195.850 DWG. NO. 24763 DATE 3/19/91 DRAWN CW

Golder Associates

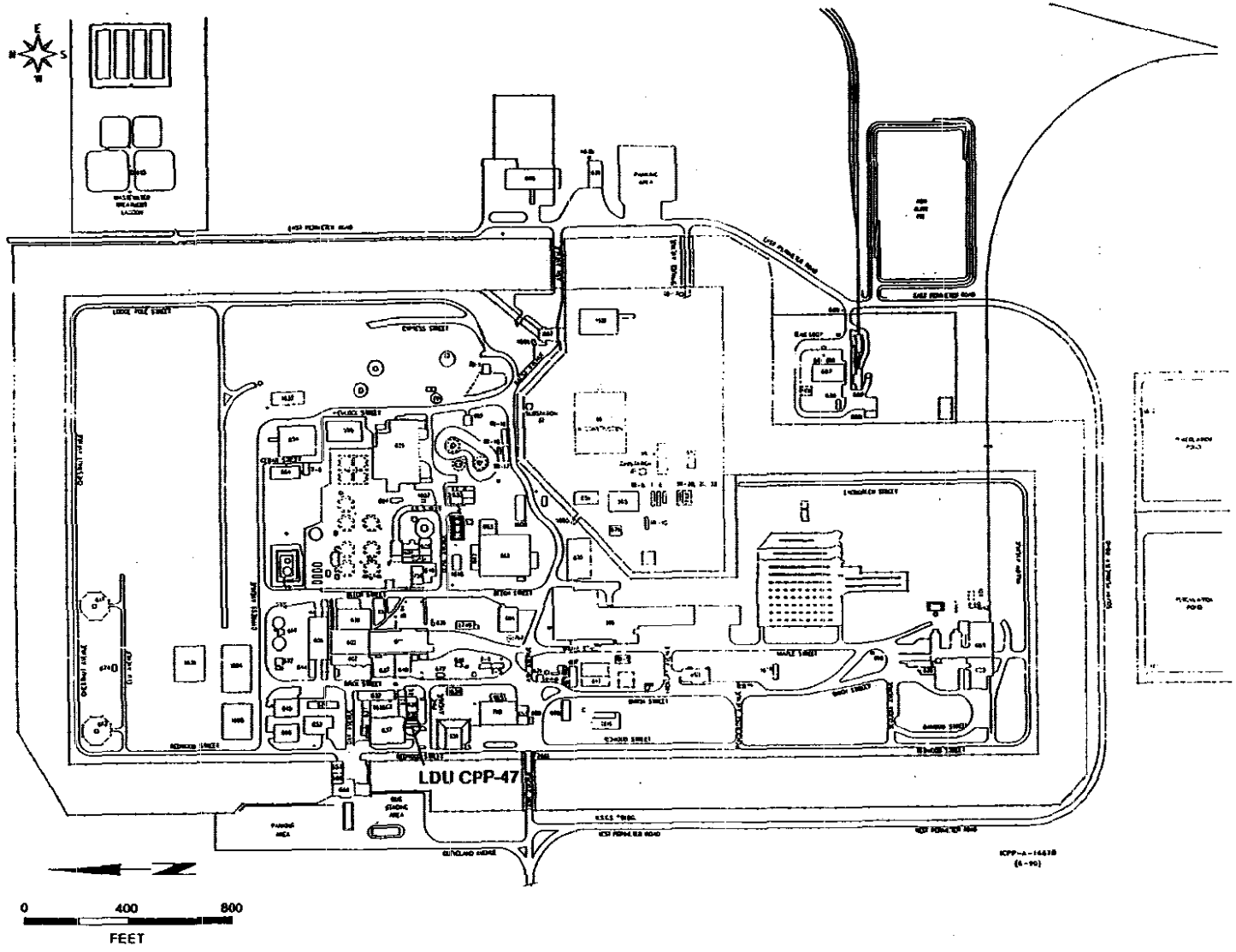


FIGURE 2.
ICPP SITE PLAN
EG & G/CPP-47/ID

Golder Associates

PROJECT NO. 893-1195.850 DWG NO. 24765 DATE 3/19/91 DRAWN CW

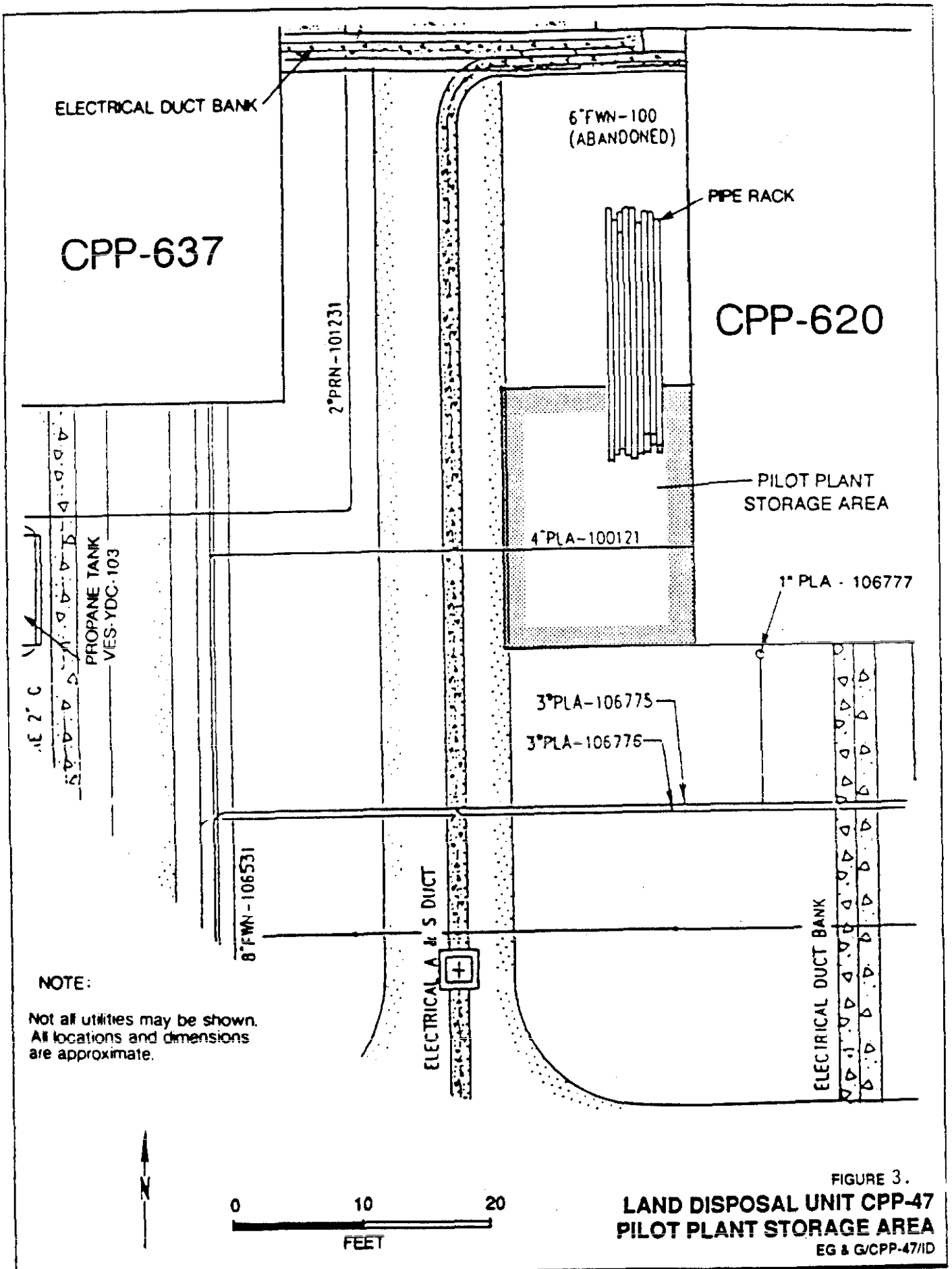


FIGURE 3.

LAND DISPOSAL UNIT CPP-47
PILOT PLANT STORAGE AREA

EG & G/CPP-47/ID

PROJECT NO. 880-1195.850 DWG. NO. 24764 DATE 3/19/91 DRAWN CW

Golder Associates

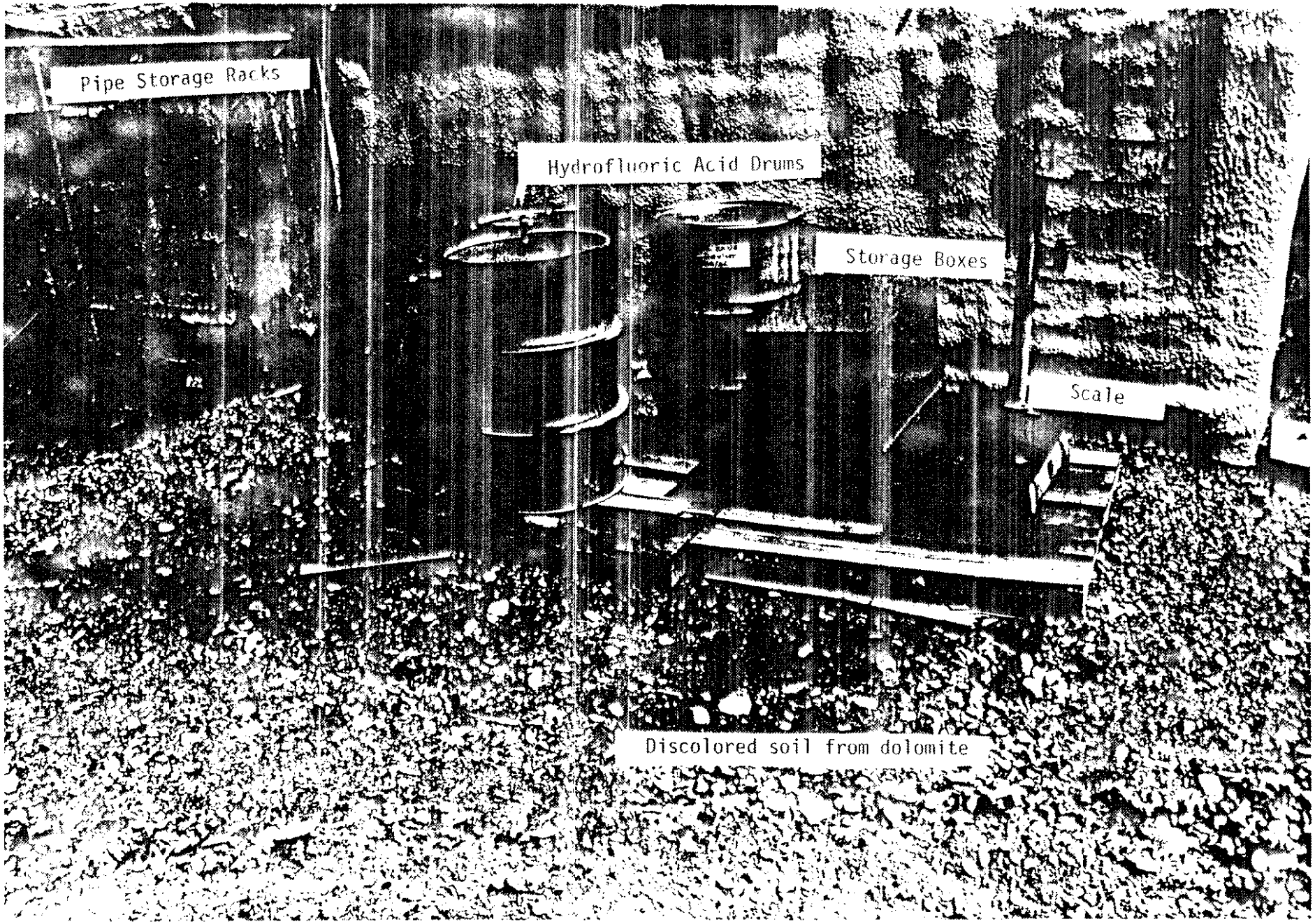


Figure 4. Pilot Plant Storage Area West of CPP-620

clean closure will be the objective. The primary objectives for the characterization of LDU CPP-47 were to 1) determine the nature and extent of contamination due to the release of HF from the storage area into the soil column and 2) determine if the HF or any other fluoride compound poses an unacceptable risk to human health and safety and the environment.

1.4 Closure Determinations

Unit closure will be based on the presence of hazardous waste as defined by RCRA or concentration of hazardous constituents and the level of risk posed to human health and safety and the environment. If the hazardous waste is not detected or the hazardous constituent is present in quantities that do not pose an unacceptable risk to human health and safety or the environment, a proposal will be submitted to the EPA and the State of Idaho requesting clean closure without removal.

If the contaminants analyzed for pose an unacceptable risk to human health and safety or the environment, all contaminated soil that exceeds the regulatory or risk-based levels will be excavated and disposed of according to the applicable regulations. The unit will be clean closed in accordance with the requirements of 40 CFR 265, Subpart G (Closure and Post-Closure).

The action level requiring Resource Conservation and Recovery Act (RCRA) closure of LDU CPP-47 will be based on the pH of the soils. In addition, since HF spills are known to have occurred on this site, an additional action level will be established based on total fluoride. The action level associated with pH is ≤ 2 or ≥ 12.5 (40 CFR 261), and the action level for total fluoride will be based on an unacceptable risk to human health and safety.

1.5 Closure Goals

DOE's closure goals, based on the characterization results described herein, are to:

- Eliminate this unit from further consideration under the COCA, since no RCRA hazardous waste or constituent (pH and fluoride) were detected above regulatory limits, and the constituent detected does not pose a risk to human health or the environment.

- Consider the unit clean closed without removal.

The drilling and sampling plan at CPP-47 was directed at the soils that would have been directly under or proximal to the position where drums of HF were most likely situated. They were, therefore, logical sites for identification of soil contamination that may have occurred as a result of storage activities at LDU CPP-47.

2.0 GEOLOGY

2.1 General Geology

The ICPP is located on alluvial materials deposited by the Big Lost River. Surficial sediments at the ICPP can be divided into two distinct layers. The surface layer to a depth of 35 to 40 feet is a gravel to gravelly sand that averages about 60% gravel and 40% sand. This coarse surface layer is underlain in many places with a layer (0 to 10 feet) of finer-grained materials composed of clayey sands and sand-clay mixtures that directly overlie the sequence of basalt flows. The fine-grained layer has an average sand content of 33% and an average silt-plus-clay content of 64%. The interface between surficial sediments and underlying basalt generally occurs at a depth of 40 to 50 feet below the original land surface (WINCO, 1989a and WINCO, 1989b).

Underlying the surficial sediments are 2000 to 3000 feet of basalt flows with interbedded sedimentary materials. One of the most important of these sedimentary interbeds is a clayey layer that locally occurs at a depth of about 110 feet below land surface and varies in thickness, from 15 to 30 feet thick. Recent drilling data in the vicinity of the tank farm show the interbed to vary between 0.5 and 11.2 feet. The interbed commonly consists of moderate reddish-to-yellowish brown, damp, non-stratified, stiff-to-hard, silty clay to clayey silt (Golder Associates, 1991c). This interbed is continuous over a large area of the INEL and may be locally continuous under the ICPP.

The sequence of interbedded basalt and sediments continues to well below the water table. There is some evidence of a sedimentary bed at a depth of 750 feet below land surface, which may be the effective bottom of the aquifer below the ICPP (WINCO, 1989a and WINCO, 1989b).

0073330

Fractures in the basalts commonly have silt and clay filling material where the basalt has been exposed on the surface. There are also volcaniclastic layers within the basalts that are composed primarily of sand- and gravel-sized material. Sedimentary interbeds are likely to be composed of sand-, silt-, and clay-sized materials (WINCO, 1989a and WINCO, 1989b).

2.2 Site-Specific Geology

At LDU CPP-47, the alluvial materials have been disturbed and regraded to a variable depth estimated at 6 to 8 feet below the land surface. The surface area at LDU CPP-47 consists of unvegetated sandy gravel. Surface gravels are well-rounded similar to the alluvial gravels in the area. Sand grains are subangular to subrounded. Soil samples from the shallow disturbed zone consist of unstratified, well-graded, sandy gravel (30% to 50% sand). In four of the five boreholes, large (greater than 3 inches) cobbles were encountered at depths varying between 1.5 and 3 feet. This is not an unusual occurrence due to regrading of the area. The sand content was seen to increase with depth, and at depths greater than 3 feet, the sediments were predominantly well-graded, fine-to-coarse sands. However, in two of the boreholes (CPP-47-04,-05), large cobbles were still encountered within these sands.

3.0 HYDROLOGY

3.1 Surface Water

The Big Lost River is the major surface water feature on the INEL with its headwaters located west of the site. The Big Lost River flows to the southeast past the town of Arco, Idaho, onto the Snake River Plain, then turns to the northeast flowing onto the INEL and terminating in four playa lakes (Figure 5). As the river flows onto the plain the channel branches into many distributaries and the flow is spread broadly, losing water by infiltration into the channel bottom (Pittman, 1988). The Big Lost River is ephemeral and flows onto the site only during periods of high runoff. The INEL Diversion Dam, located approximately 9 miles upstream from the ICPP (Figure 5), was designed to control flooding on the INEL site by diverting water into designated spreading areas.

3.2 Groundwater

The depth to the water table of the Snake River Plain Aquifer (SRPA) at the ICPP is approximately 450 feet below land surface (Golder Associates, 1990e). The direction and rate of groundwater movement in the vicinity of the ICPP are well documented from monitoring contaminant plumes in the Snake River Aquifer. The direction of flow in the vicinity of the ICPP is generally north-northeast to south-southwest. The rate of flow ranges from 5 to 15 feet/day (WINCO, 1989a and WINCO, 1989b).

Perched groundwater zones are known to exist below the ICPP. One perched zone, described by Hull, 1988, is located at an approximate depth of 40 feet at the contact between the surficial alluvial sediments and the uppermost Snake River Plain basalt flow. The groundwater is locally perched by a silty/clayey layer overlying the basalt and/or similar fine-grained material infilling fractures in basalt. Drilling currently in

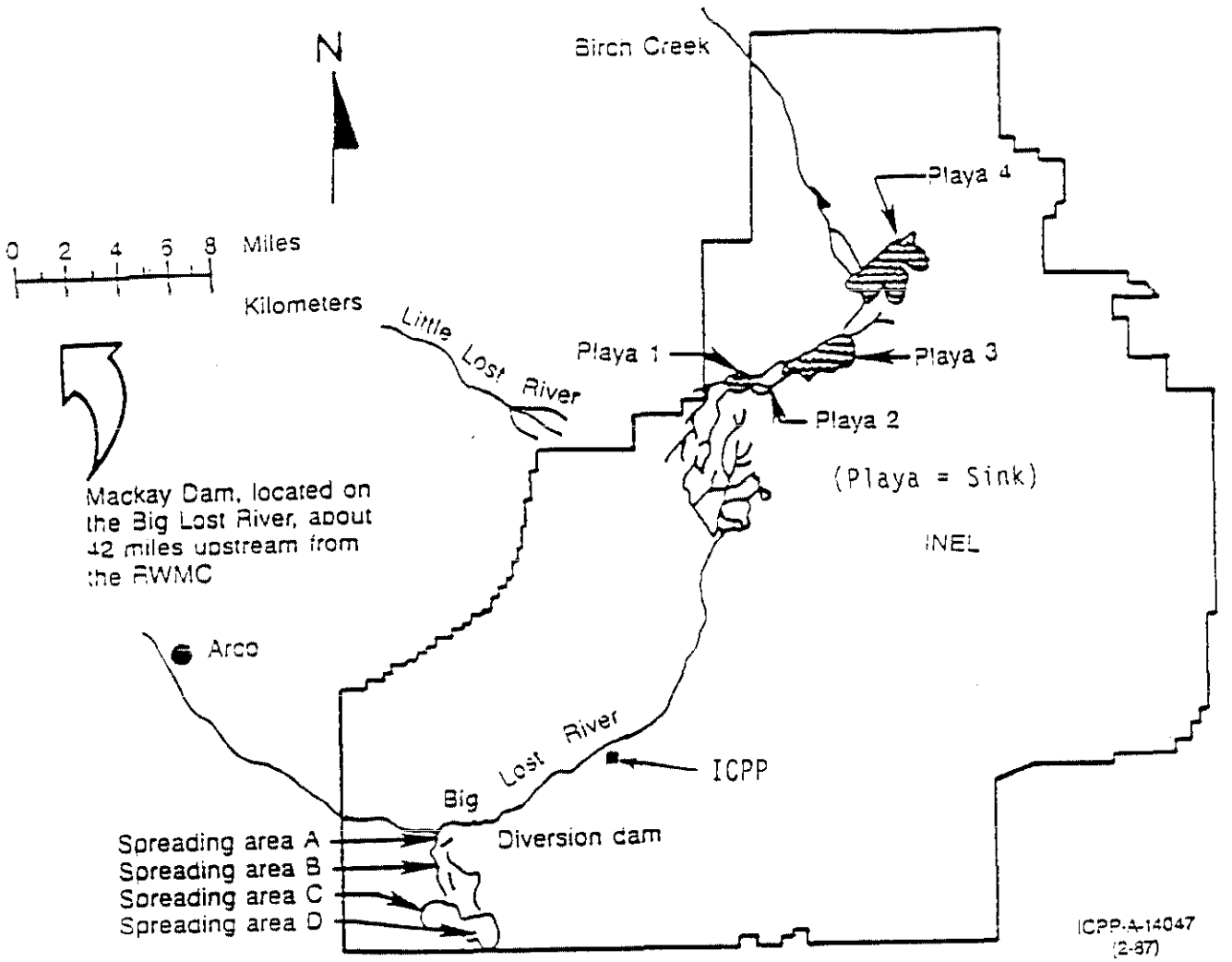


Figure 5. Surface water features at or near the INEL (Robertson, et al., 1974)

progress at the tank farm has not encountered groundwater perched upon this contact (Golder Associates, 1991c).

A second zone is located along the top of a low permeability sedimentary interbed located at approximately 110 feet below land surface. This perched zone does not appear to be laterally continuous under the ICPP. Although previous drilling at the ICPP did encounter this perched zone, several boreholes in the vicinity of the tank farm gave no indication of significant perched waters above the interbed (Golder Associates, 1991c).

Recent drilling has also identified several perched zones that have developed in fractured basalt overlying upon the relatively impermeable underlying massive basalt. These perched groundwater zones occur irregularly within the Snake River Plain basalts. In general, the interconnection, direction of flow, and extent of these perched zones is not currently known.

4.0 METEOROLOGY

4.1 Temperature

Average monthly maximum temperatures at the INEL range from 87°F in July to 28°F in January. Average monthly minimum temperatures range from 49°F in July to 4°F in January. The warmest temperature recorded was 101°F, and the coldest temperature through January 1982 has been -40°F.

4.2 Wind

The average wind speed at the INEL is about 5 miles per hour in December and maximum of 9 miles per hour in April and May. The highest maximum hourly average speed was 51 miles per hour, measured at the 20-foot level at CFA from the west-southwest. Peak gusts of 78 and 87 miles per hour have been observed. Calm conditions prevail 11% of the time.

4.3 Precipitation

The average annual precipitation at the INEL is 9.07 inches of water. The yearly totals range from 4.50 to 14.40 inches. Individual months have had as little as no precipitation to as much as 4.42 inches. Maximum observed 24-hour precipitation amounts are less than 2.0 inches and maximum 1-hour amounts are just over 1.0 inches.

About 26.0 inches of snow fall each year. The maximum yearly total was 40.9 inches, and the smallest total was 11.3 inches. The greatest 24-hour total snowfall was 8.6 inches. The greatest snow depth observed on the ground was 27 inches. January and February average about 7.0 inches for a monthly maximum snow depth on the ground. The ground is usually free of snow from mid-April to mid-November.

4.4 Evaporation

While extensive evaporation data has not been collected on the INEL, evaporation information is available from Aberdeen and Kimberly, both located on the Snake River Plain in southeastern Idaho, which is similar to the climatic conditions of the INEL. The data from these areas would be representative of the INEL region and indicates that the average annual evaporation rate is about 42 inches. Recent data from Rexburg, Idaho, located approximately 75 miles east northeast of the ICPP indicates a similar evaporation rate. About 80% of the evaporation, 29 inches/year, occurs from May through October.

4.5 Summary

The above information is provided as a general overview of the climatic conditions at the ICPP. Relatively small volumes of moisture are available for transport of hazardous or radioactive constituents to the underlying soils and/or aquifers (Thomas, 1988, estimates an average annual recharge rate equal to 0.5 inches/year). Thus, there would be

weak hydraulic driving conditions to force the migration of contamination in the subsurface.

5.0 KNOWN OR SUSPECTED WASTE TYPES

5.1 Chemical-Hazardous Waste

The only known hazardous waste released to CPP-47 was HF (WINCO, 1987). HF can be classified as a listed waste, a discarded commercial chemical product (U134), or a characteristic corrosive waste (D002) if it was generated as a process waste with a pH<2.

5.2 Radioactivity

No radiological wastes were suspected at LDU CPP-47, nor was radioactive contamination found above background during routine site characterization field surveys.

6.0 PRE-CLOSURE SAMPLING AND ANALYTICAL RESULTS

6.1 Unit Sampling

To meet the objectives of the sampling program at LDU CPP-47, samples were collected at the five locations shown in Figure 6.

As can be seen, accessibility to the site was limited by the presence of a pipe rack that extended into the storage area, a propane tank that was situated nearby (around which a 50-foot exclusion zone must be maintained), as well as frequently used service roads that bound the site. Because of these considerations and because only shallow boreholes were required, a hand auger was the method chosen to collect samples for this investigation.

Drilling, sampling, and logging of the surficial soils were conducted in accordance with Golder Associates Technical Procedure TP-1.2-5. This procedure is contained in the Technical Work Plan, "Drilling, Sampling, and Logging of Soils." Soils were identified by the Drilling Project Engineer (DPE) and Lead Project Geologist (LPG) as specified in Golder Associates Technical Procedure TP-1.2-6, "Field Identification of Soils" and classified in accordance with U.S. Department of Agriculture (USDA) soil classification procedures included in Table 4-1 of the Quality Assurance Program Plan (QAPP). All samples were handled in accordance with the chain-of-custody procedures specified in Golder Associates Technical Procedure TP-1.2-23.

Hawley Brothers Drilling of Blackfoot, Idaho, was contracted by WINCO to conduct the hand augering operations. All work was conducted in accordance with the WINCO Construction Safe Work Permit (CSWP) process. All personnel working at the drill sites wore safety boots, hard hats, and safety glasses. Augering and sampling activities were conducted from January 29-31, 1991. Borehole logs are presented in Appendix A.

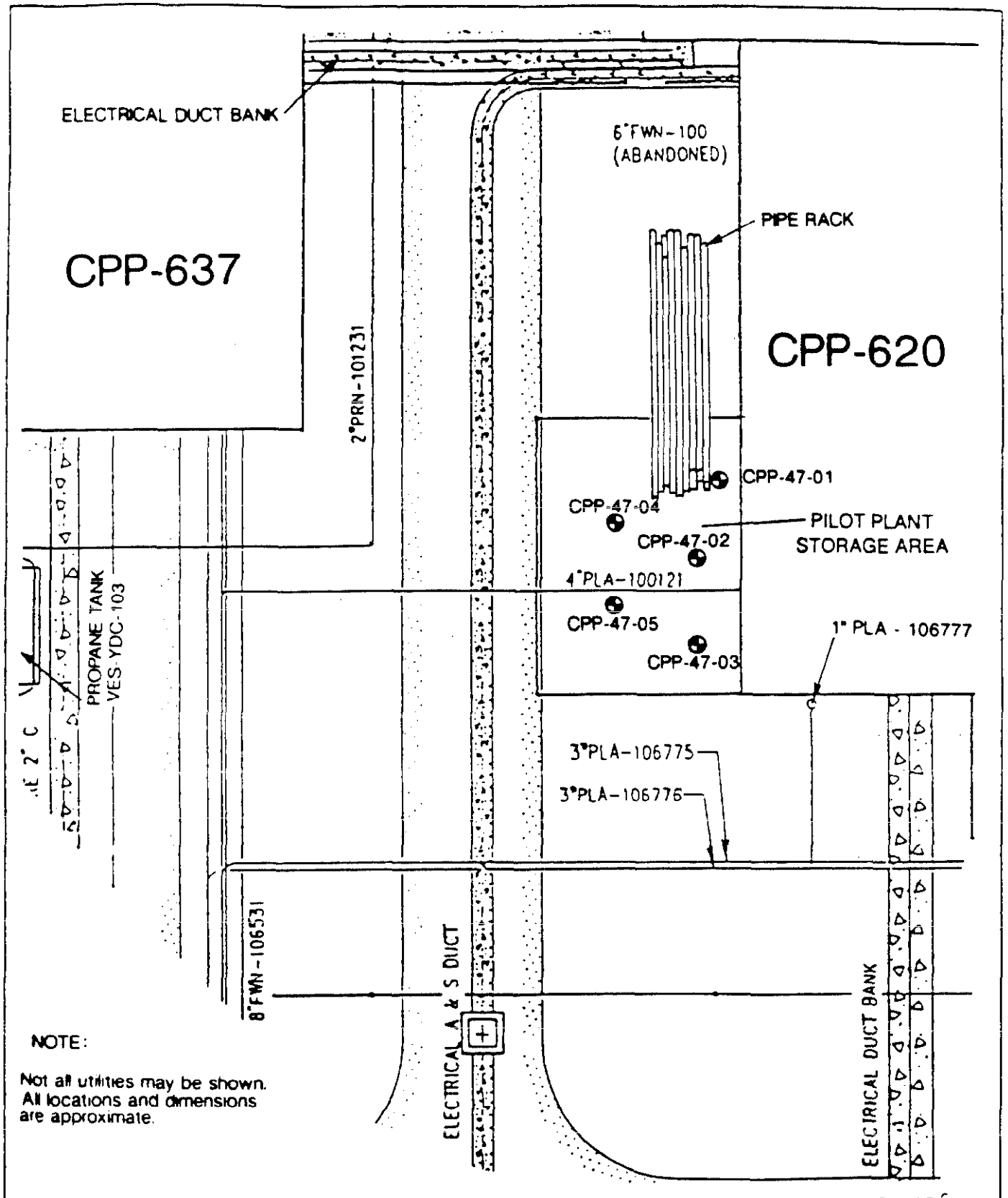


FIGURE 6.

SAMPLING LOCATIONS AND BOREHOLE NUMBERS LAND DISPOSAL UNIT CPP-47: PILOT PLANT STORAGE AREA

EG & G/CPP-47/ID

PROJECT NO. 893-1195.850 DWG. NO. 24762 DATE 3/19/91 DRAWN CW

Golder Associates

Soil samples were transferred under chain-of-custody to Pacific Northwest Environmental Laboratory, Inc. (PNELI) of Redmond, Washington, where they were analyzed for total fluoride and pH (see Appendix D, Table D-1). Copies of all laboratory data reports are provided in Appendix C.

Due to time constraints work was accomplished during the winter. At the time of augering, the ground was partially covered with snow and ice, and the temperature was below freezing all day. These temperatures resulted in frozen ground conditions underlying the storage area, which could not be penetrated with the hand auger. An Interim Change Notice was issued authorizing the use of a jackhammer to break up soil at ground surface to below frozen ground.

Frozen ground was encountered to a depth of about 0.7 feet in the three boreholes (i.e., CPP-47-01, -02, -03) closest to Pilot Plant CPP-620. However, as augering activities were conducted further from the Pilot Plant (i.e., CPP-47-04, -05), the frost line was found to persist down to a depth of about 3 feet.

The Technical Work Plan (Golder Associates, 1991a) called for all borings to be taken to a depth of 6 feet or until refusal. In four of the five boreholes, large cobbles were encountered that were impassible with the hand auger. The jackhammer, with a decontaminated steel chisel, was then used to try to break up the obstruction. This procedure was limited to depths of about 3 feet or less, due to the length of the jackhammer.

Samples were obtained by augering to the planned target sampling depth and, using a decontaminated hand auger, sampling one auger volume of the boring material. Samples were taken with either a 4- or 5-inch diameter stainless steel auger. Where frozen ground could not be penetrated by hand auger, samples at ground surface to below frozen ground were collected by first breaking up the soil with a jackhammer and then removing the soil with the auger. The jackhammer chisel was

decontaminated prior to use for each sampling interval. Samples were obtained for all borings from the surface to 1-foot interval. The next sampling objective was the 1-to 2-foot interval. Boreholes CPP-47-01 and CPP-47-03 hit refusal (when hand auger could no longer be turned) at a depth of 1.5 feet and 1.6 feet, respectively. Samples representative of these diminished intervals were randomly selected from the boring material.

Soil samples from two (i.e., CPP-47-04 and CPP-47-05) of the remaining three boreholes hit refusal prior to achieving the next sampling objective: the 5- to 6-foot interval. In the case of CPP-47-04, a sample of the interval 4 to 4.2 feet was taken prior to hitting refusal. A sample was obtained from CPP-47-05 over the 4.7- to 5.0-foot interval. These boreholes were then terminated as cobbles prohibited further progress. A soil sample was collected from borehole CPP-47-02 at the planned target interval of 5 to 6 feet. Depths of soil samples for each borehole are summarized in Table 1 and in the borehole logs in Appendix A.

Samples were processed on a fresh length of protective plastic on the processing table. The upper 2 inches of material in the auger was discarded. The sample was then placed into a decontaminated stainless steel mixing bowl and mixed thoroughly using decontaminated stainless steel utensils, and granular material larger than 2 inches was discarded. Sample was then transferred to one 16-ounce plastic jar for pH and fluoride analyses. Any remaining sample material was discarded into a 55 gallon U.S. Department of Transportation (DOT) approved waste drum for subsequent disposal by WINCO personnel.

All samples were labeled, sealed individually with a security seal, and placed into a shipping container with the necessary amount of coolant for maintaining the samples at 4°C. Samples were packed in styrofoam for protection during shipment. Samples were then transferred by overnight carrier under chain-of-custody to the analytical laboratory.

TABLE 1

INORGANIC ANALYSIS RESULTS
LAND DISPOSAL UNIT CPP-47

Borehole	Depth (feet)	Fluoride (mg/Kg)	pH
CPP-47-01	1	6.77	6.73
CPP-47-01	2	8.32	7.45
CPP-47-02	1	196	7.17
CPP-47-02	2	121	7.25
CPP-47-02	6	197	7.23
CPP-47-03	1	240	7.15
CPP-47-03	2	189	7.36
CPP-47-04	1	5.04	7.38
CPP-47-04	2	3.50	7.45
CPP-47-04	4	5.53	7.14
CPP-47-05	1	13.6	7.40
CPP-47-05	2	8.31	7.46
CPP-47-05	5	1.63	7.47
Maximum Value		240	7.47
Minimum Value		1.63	6.73
Contract Required Quantitation Limit		0.33	N/A
Background UTL		6.55	N/A

All samples were screened by WINCO Health Physics personnel who were periodically on site with instrumentation to monitor for alpha, beta, and gamma radiation. Radiation instrumentation was available to personnel on site at all times for self-screening purposes. The DPE periodically monitored for volatilized HF with Draeger Tubes. In all cases, the responses of the monitoring equipment were those typical of background measurements.

Augering equipment, sample preparation tools, and the jackhammer chisel were decontaminated between each sample interval to minimize the potential for cross contamination. Augering and sampling decontamination procedures, as specified in Section 4.6 of the Technical Work Plan, Volume II (Golder Associates, 1991b), included the following:

- steam clean equipment with deionized water and wipe dry;
- wipe with a towel or rag dampened with methanol and allow to air dry;
- rinse with deionized water and wipe dry; and:
- seal in plastic until needed.

Rinseate solutions were captured in a trough and pumped into a 55-gallon, DOT-approved container at the end of each day for subsequent disposal by WINCO personnel.

6.2 Background Sampling

Background data for metal concentrations in soils at the ICPP were obtained by the University of Utah Research Institute (UURI) during two studies conducted in 1986 and 1987. Background soils data were obtained at four locations outside the ICPP during an investigation of the Fuel Processing Restoration (FPR) Warehouse Site in 1986. According to the Quality Assurance Sampling Plan (QASP) for this study, background subsurface soils collected were to be geologically comparable to soils in

the FPR site sampling area. The QASP indicated the FPR site soils were to be sampled at depths of 6 inches below the pre-fill surface of the area and at 18 to 24 inches below the top of the first horizon samples. The actual depth interval sampled for background soils is noted in the final report of the investigation (UURI 1986a and UURI 1986b).

In 1987, background data were obtained at three locations outside the ICPP during an investigation of the Chemical Feed and Zirconium Feed Tank Storage Areas. Samples were obtained at surface to 4 inches and at 24 inches at these locations for a total of six samples (UURI 1987a and UURI 1987b).

6.3 Quality Assurance Samples

Quality assurance/quality control (QA\QC) procedures were implemented during the sampling and analysis program. These procedures are summarized below:

- Trip blank and equipment blank samples were collected and analyzed to monitor potential contamination that may have been introduced from the decontamination procedures and shipping process.

- Field duplicate samples were collected to measure overall field and laboratory precision.

6.3.1 Blanks

A trip blank was submitted for pH and fluoride analysis. The fluoride results were below the detection. One equipment blank was prepared for fluoride and pH analysis. The blank was prepared by decontamination of the sample processing equipment as described in

Section 9 of the Technical Work Plan, Volume II (Golder Associates, 1991b) followed by a final rinse with deionized water and collection in proper containers. No fluoride was detected in the equipment blank and the pH was 5.21. No compounds were detected in the respective laboratory blanks.

6.3.2 Field Duplicates

Field duplicate sample analysis results from LDU CPP-47 are presented in Table C-1. The samples were collected and prepared as described in Section 6.1. The table presents the relative percent difference (RPD) between duplicate samples for analyses that exhibit results greater than the sample detection limit. Although no data quality criteria exist for field duplicates, the EPA recommends that the RPD fall within a control limit of $\pm$20% for water samples and $\pm$35% for soils when sample values are greater than 5 times the sample detection limit. All analytes were within the recommended control limits.

6.4 Data Validation

All sample analysis results were reviewed and validated in accordance with Section 8 of the Technical Work Plan, Volume II - Quality Assurance Project Plan (Golder Associates, 1991b) and with the EPA data validation guidelines (EPA, 1988a).

All soil samples were analyzed for fluoride and pH only. The holding time for pH (immediate analysis) was exceeded on all samples except CPP-47-04-1, CPP-47-04-2, and the trip blank sample due to overnight shipment from the site to the laboratory. Fluoride was detected in all of the soil samples with levels ranging from 1.63 to 240 mg/Kg, and pH ranging from 6.73 to 7.47. The results are summarized in Table 1. The data does

not indicate that the integrity of analytical results, for those samples exceeding holding times, are compromised.

Fluoride and soluble fluoride method blank results were below detection for each sample group analyzed. Matrix spikes were performed on two method blanks and an equipment blank with recoveries ranging from 90.8% to 92.2%. Matrix spike analyses were performed on both soil and water matrices. The percent recoveries ranged from 90.8% to 341%. Two soil samples that were spiked for soluble fluoride (samples CPP-47-04-4 and CPP-47-01-1) reported as 341% and 92.3%, respectively. The data was not requalified based on the spike recovery for CPP-47-04-4 because of the excessive spike recovery value.

Duplicate analyses were performed on soil and water matrices for pH and fluoride. The RPDs were 3, 1, and 2 for pH and 20 and 26 for soluble fluoride.

6.5 Data Evaluation

6.5.1 Background Data

The background data obtained from the UURI investigations is compared with CPP-47 results in Table 1. This table includes the one-sided Upper Tolerance Limits (UTL) for the background data assuming a normal distribution with 95% coverage of the samples at a 95% confidence coefficient. Tolerance intervals establish a concentration range that is constructed to contain a specified proportion of coverage, P%, of the population with a specified confidence coefficient, Y (EPA, 1989a).

There are potential limitations that should be considered in the use of the data obtained by University Utah Research Institute (UURI)

for determining action levels based on background concentrations. These limitations include the following:

- All UURI background data were obtained in the shallow surface soils (0 to 24 inches) and may not be representative of other soil types or horizons.

- Many areas of the ICPP have been graded and/or filled. Background soils sampled by UURI may not be representative of soils used for fill at the ICPP.

- There may be widespread elevated concentrations of certain constituents above natural background values at the ICPP from both point and non-point sources as a result of site activities. It is not appropriate to establish action levels for LDUs based on natural background if there are widespread elevated concentrations of constituents at the ICPP unrelated to releases from the LDUs.

6.5.2 Results of Inorganic Analysis for LDU CPP-47

Sample results for pH and fluoride analyses from the shallow borings at LDU CPP-47 are shown in Table 1. Also shown on this table are the Upper Tolerance Limits (UTLs) for the background soils described in Section 6.5.1. Fluoride exceeded the background UTL in 9 of 13 samples. The maximum concentration of fluoride detected was 240 mg/Kg compared to the background UTL of 6.55 mg/Kg.

Fluoride concentrations are highest in the vicinity of boreholes CPP-47-02 and -03. Results from the former show little variation in fluoride levels with depth, as the concentration fluctuated from 196 to 121 to 197 mg/Kg. These concentrations correspond to depths of 0 to 1, 1 to 2, and 5 to 6 feet, respectively. Maximum concentrations

of fluoride were detected in the near-surface sample (0 to 1 foot) of borehole CPP-47-03. Concentration levels of soil underlying this interval, (i.e., 1- to 2-foot interval) were found to decrease somewhat, but the relatively high levels detected (189 mg/Kg) indicate these soils are also impacted by the reported HF spills.

Results from the other three boreholes show fluoride levels significantly lower than those discussed above. Their peripheral locations with respect to CPP-47-02 and -03 provide a sense of the directions in which the fluoride levels appear to be rapidly decreasing.

As can be seen from Table 1, the results of the pH analyses from all boreholes indicate that pH is approximately neutral for the first 6 feet of underlying soils for LDU CPP-47.

7.0 CLOSURE PROCEDURES

Remediation of CPP-47 was to be based on the presence of hazardous waste or concentrations of hazardous constituents and the level of risk posed to human health and safety and the environment. The action level requiring RCRA closure of LDU CPP-47 was to be based on the pH of the soils and/or the presence of total fluoride at concentrations that pose an unacceptable risk to human health and safety. The action level associated with pH is ≤ 2 or ≥ 12.5.

Although analytical results show fluoride (1.63 to 240 mg/Kg) was detected in soil samples above the background UTLs at all depths of investigation, none were found exceeding the maximum allowable soil concentrations based on the most conservative Chronic Reference Dose (RfD) of 4800 mg/Kg. The RfD, discussed in detail in Appendix B, is the daily intake of the constituent at which even a sensitive individual might be exposed without developing associated critical toxic effects. The pH analytical results (6.73 to 7.47) in the borehole soil samples were all below the pH-based action levels and remained approximately neutral over the site for all depths of investigation.

The Health and Environmental Assessment of LDU CPP-47 is contained in Appendix B.

No hazardous waste (due to a neutral pH) was detected in the vicinity of the Pilot Plant Storage Area, and the concentrations of the fluoride detected at LDU CPP-47 do not pose an unacceptable risk to human health and safety or the environment. Although elevated levels of fluoride were detected in samples that correspond to the maximum depth of investigation, soil conditions known to exist in the soils beneath LDU CPP-47 should prevent the transport of significant quantities of fluoride to any great depth as in B.1.2, and none of the analytical results were found to exceed the maximum allowable soil concentrations based on the Chronic Reference Dose (RfD) as detailed in Appendix B. Based on these

results, there is no need to conduct any soil removal in the storage area to close this facility under RCRA. In addition, no further action should be required under the INEL FFA/CO. Therefore, closure procedures should be largely administrative under RCRA, and a No Action Determination is warranted under the FFA/CO.

8.0 POST-REMOVAL SAMPLING AND ANALYTICAL PROCEDURES

No hazardous waste was detected in the vicinity of the Pilot Plant Storage Area and concentrations of fluoride detected at LDU CPP-47 do not pose an unacceptable risk to human health and safety or the environment. Thus, no removal should be required. After certifying LDU CPP-47 as a site suitable for administrative closure, post-removal sampling or analysis will be unnecessary.

9.0 CLOSURE QUALITY ASSURANCE AND QUALITY CONTROL PROCEDURES

All sampling and analysis activities were performed in accordance with sound QA/QC procedures. These procedures are outlined in the Quality Assurance Project Plan for Drilling and Sampling Activities at Land Disposal Units CPP-37, CPP-40, CPP-47, CPP-48 and CPP-63 and Solid Waste Management Units CPP-36 (Golder Associates, 1991a). These plans establish appropriate QA program controls for conducting unit characterizations at ICPP LDUs and SWMUs. The plans incorporate all applicable requirements of ANSI/ASME NQA-1, Quality Assurance Program Requirements for Nuclear Facilities, which is defined as the preferred standard for all projects conducted at nuclear facilities by DOE Order 5700.6B, Quality Assurance. In addition, the QA Project Plan was written in compliance with the guidelines provided by Interim Guidelines for Preparation of Quality Assurance Project Plans (QAMS/005). Interpretations of QAMS/005 and expanded guidance provided by other applicable EPA guidance documents were considered during the preparation of the QA Project Plan.

10.0 CLOSURE CERTIFICATION

Closure certification should not be required if the site is closed administratively without removal. However, if closure certification is required it will be provided, documenting completion of sampling activities in accordance with the approved closure plan per 40 CFR 265.115, Subpart G, Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage and Disposal Facilities.

11.0 AREA RESTORATION

As no hazardous waste was detected in the vicinity of the Pilot Plant Storage Area and concentrations of fluoride detected at LDU CPP-47 do not pose an unacceptable risk to human health and safety or the environment, administrative closure without removal is anticipated. Thus, no remedial actions are warranted for LDU CPP-47, and area restoration will not be required.

12.0 OTHER TOPICS OF CONCERN

Based on the health and environmental assessment there are no other concerns dealing with this site.

13.0 SCHEDULE OF ACTIVITIES

No further activities are required if the site is closed administratively. A No Action Determination under the FFA/CO, will be prepared for this site.

14.0 POST-CLOSURE CARE

No hazardous waste was detected, and the constituent detected does not pose an unacceptable risk to human health and safety or the environment; therefore, post-closure requirements under RCRA (40 CFR 265.117 - 120) and the COCA will not be required for the soils in the vicinity of the Pilot Plant Storage Area.

15.0 REFERENCES

ASME NQA-1-1986, Quality Assurance Program Requirements for Nuclear Facilities.

Barraclough, J.T., B.D. Lewis, and R.G. Jensen, 1981, Hydrologic Conditions at the Idaho National Engineering Laboratory, Idaho, Emphasis: 1974-1978, U.S. Geological Survey Water-Resources Investigations Open-file Report 81-526 (IDO-22060), U.S. Department of the Interior, Geological Survey, Idaho Falls, Idaho.

Baselt, R.C. and R.H. Cravey, 1989, Disposition of Toxic Drugs and Chemicals in Man, 3rd Edition, Year Book Medical Publishers, Inc., Chicago, Illinois.

DOE ORDER 5700.6b, 9-23-86, Quality Assurance.

EPA, 1988a, Laboratory Data Validation Functional Guidelines for Evaluating Inorganics Analyses, U.S. Environmental Protection Agency, Division, Washington, D.C.

EPA, 1988b, Laboratory Data Validation Functional Guidelines for Evaluating Organics Analyses, U.S. Environmental Protection Agency, Division, Washington, D.C.

EPA, 1989a, Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Final Guidance, U.S. Environmental Protection Agency, Office of Solid Waste, Washington, D.C.

EPA, 1989b, RCRA Facility Investigation (RFI) Guidance, Volume I: Interim Final, EPA/530/SW-89-031, OSWER Directive 9502.00-6D, U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, D.C.

EPA, 1988a, Laboratory Data Validation Functional Guidelines for Evaluating Inorganics Analyses, U.S. Environmental Protection Agency, Division, Washington, D.C.

EPA, 1991, Integrated Risk Information System, access date March 6, 1991, U.S. Department of Health and Human Services, National Library of Medicine Toxicology Data Network (TOXNET), Bethesda, Maryland.

Golder Associates, 1991a, Technical Work Plan For the Idaho Chemical Processing Plant Soil Sampling and Analysis Program at Land Disposal Units CPP-37, CPP-40, CPP-47, CPP-48, and CPP-63 and Solid Waste Management Unit CPP-36; Technical Work Plan, Volume I.

Golder Associates, 1991b, Quality Assurance Project Plan For Drilling and Sampling Activities at Land Disposal Units CPP-37, CPP-40, CPP-47, CPP-48, and CPP-68 and Solid Waste Management Unit CPP-36; Technical Work Plan, Volume II.

Golder Associates, 1991c, (currently in progress), Report for the Idaho Chemical Processing Plant Drilling and Sampling Program at the ICPP Tank Farm, Golder Associates Inc., Redmond, Washington.

Golder Associates, 1990d, Report for the Idaho Chemical Processing Plant Drilling and Sampling Program at Land Disposal Unit CPP-55, Golder Associates Inc., Redmond, Washington.

Golder Associates, 1990e, Well Completion Report for Wells 121, 122, and 123 at the Idaho Chemical Processing Plant, Golder Associates Inc., Redmond, Washington.

Gosselin, R.E., R.P. Smith, and H.C. Hodge, Clinical Toxicology of Commercial Products, 1984, Williams and Wilkins, Baltimore, Maryland.

Hull, L.C., 1988, Attachment I, Hydrogeologic Assessment of Land Disposal Unit, CPP-37, ICPP Gravel Pit #2, EG&G Idaho, Inc., Hydrology Unit, Idaho National Engineering Laboratory.

Kabata - Pendias, Alina, 1986, Trace Elements in Soils and Plants, CRC Press, Boca Raton, Florida.

Pittman, J.R., R.G. Jensen, and P.R. Fischer, 1988, Hydrologic Conditions at the Idaho National Engineering Laboratory, 1982 to 1985, U.S. Department of the Interior, Geological Survey, Idaho Falls, Idaho, U.S. Geological Survey Water-Resources Investigations Report 89-4008.

QAMS-005/80, December 29, 1980, Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans.

Robertson, J.B., R. Schoen, and J.T. Barraclough, 1974, The Influence of Liquid Waste Disposal on the Geochemistry of Waters at the NRTS, Idaho: 1952-1970, IDO-22053, U.S. Geological Survey, Idaho Falls, ID.

Thomas, T.R., 1988, Modeling Hypothetical Groundwater Transport of Nitrates, Chromium and Cadmium of the Idaho Chemical Processing Plant, Nov. 1988, Westinghouse Idaho Nuclear Company, Inc., Idaho Falls, Idaho.

UURI, 1986a, Quality Assurance Sampling Plan; FPR Warehouse Site Idaho Chemical Processing Plant, University of Utah Research Institute, Last Lake City, Utah.

UURI 1986b, Final Report; FPR Warehouse Site Idaho Chemical Processing Plant, University of Utah, Salt Lake City, Utah.

UURI 1987a, Quality Assurance Sampling Plan; Chemical Storage and Zirconium Feed Tank Storage Areas, Idaho Chemical Processing plant, University of Utah Research Institute, Salt Lake City, Utah.

UURI 1987b, Final Report; Chemical Storage and Zirconium Feed Tank Storage Areas, Idaho Chemical Processing Plant, University of Utah Research Institute, Salt Lake City, Utah.

WINCO 1989a, Closure Plan for CPP-34 Contaminated Soil Storage Area in the NE Corner of CPP, prepared for the U.S. Department of Energy, Idaho Operations Office, Idaho Falls, Idaho.

WINCO, 1989b, Closure Plan for CPP-55 Mercury Contaminated Area (South of ICPP T-15), prepared for the U.S. Department of Energy, Idaho Operations Office, Idaho Falls, Idaho.

WINCO, 1987, Draft Closure Plan for CPP-47 Pilot Plant Storage Area West of CPP-620.

APPENDIX A

BOREHOLE LOGS

PROJECT: WINCO/ICCP/ID

PROJECT LOCATION: INEL

PROJECT NUMBER: 893-1195.850

RECORD OF BOREHOLE CPP-47-1

BORING DATE: 28JAN91

BORING LOCATION: ICPP-LDU-40

SHEET: 1 OF 1

DATUM: MSL

DEPTH IN FEET	BORING METHOD	SOIL PROFILE: DESCRIPTION	SOIL PROFILE: USCS	SOIL PROFILE: GRAPHIC LOG	SOIL PROFILE: ELEV / DEPTH	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS / 6 in	SAMPLES: N	SAMPLES: REC/ATT	PENETRATION RESISTANCE BLOWS/FT ■ / WATER CONTENT, PERCENT Wp — ○ᵂ — Wl	PIEZOMETER OR STANDPIPE INSTALLATION
0	Air Hammer	Moderate yellowish brown (10YR5/4) unstratified, well-graded, fine-to-coarse GRAVEL and fine-to-coarse sand. Trace of clay.	GW			1	G	N/A		N/A		
		Ground frozen to 0.7 feet.										
1	Hand Auger	Large cobble at 1.5 feet				2	G	N/A		N/A		
		Refusal at 1.5 feet			1.5							
2												
3												
4												
5												
6												
7												
8												

DRILL RIG: HAND AUGER

DRILLING CONTRACTOR: Hawley Brothers

DRILLER: D. Hawley

LOGGED: S. Harrison

CHECKED:

DATE: 28JAN91

Golder Associates

PROJECT: WINCO/ICCP/ID

PROJECT LOCATION: INEL

PROJECT NUMBER: 893-1195.850

RECORD OF BOREHOLE CPP-47-2

SHEET: 1 OF 1

DATUM: MSL

SORING DATE: 30JAN91

BORING LOCATION: ICPP-LDU-40

DEPTH SCALE FEET	BORING METHOD	SOIL PROFILE: DESCRIPTION	SOIL PROFILE: USCS	SOIL PROFILE: GRAPHIC LOG	SOIL PROFILE: ELEV / DEPTH	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS / 6 in	SAMPLES: N	SAMPLES: REC/ATT	PENETRATION RESISTANCE BLOWS/FT @ / WATER CONTENT PERCENT Wp — W — Wl	PIEZOMETER OR STANDPIPE INSTALLATION
0	Air Hammer	Moderate yellowish brown (10YR5/4) unstratified, well-graded, fine-to-coarse GRAVEL and fine-to-coarse sand. Trace of clay [ALLUVIUM]. Ground frozen to 0.66 feet.	GW			1	G	N/A		N/A		
1						2	G	N/A		N/A		
2												
3	Hand Auger											
4												
5						3	G	N/A		N/A		
6		End of hole at 6 feet.			6.00							
7												
8												

DRILL RIG: HAND AUGER

DRILLING CONTRACTOR: Hawley Brothers

DRILLER: D. Hawley

Golder Associates

LOGGED: B. Harrison

CHECKED:

DATE: 30JAN91

PROJECT: WINCO/ICCP/ID

PROJECT LOCATION: INEL

PROJECT NUMBER: 883-1196.850

RECORD OF BOREHOLE CPP-47-3

BORING DATE: 30JAN91

BORING LOCATION: ICPP-LDU-40

SHEET: 1 OF 1

DATUM: MSL

DEPTH SCALE FEET	BORING METHOD	SOIL PROFILE: DESCRIPTION	USCS	GRAPHIC LOG	ELEV / DEPTH	SAMPLES: NUMBER	TYPE	BLOWS / 6 in	N	REC/ATT	PENETRATION RESISTANCE BLOWS/FT ⊠ / WATER CONTENT, PERCENT wp — w — wl	PIEZOMETER OR STANDPIPE INSTALLATION
0	Air Hammer	Moderate yellowish brown (10YR5/4), unstratified, well-graded, fine-to-coarse GRAVEL and fine-to-coarse sand. Trace of clay.	GW			1	G	N/A		N/A		
1	Hand Auger	Color change to dark yellowish orange (10YR6/6) between 0.3 feet and 0.4 feet. Ground frozen to 0.7 feet and damp below 0.7 feet.				2	G	N/A		N/A		
		Large cobble at 1.5 feet.										
		End of hole at 1.6 feet. Drilled with air hammer from 1.5 to 1.6 feet. Refusal at 1.6 feet.			1.60							
2												
3												
4												
5												
6												
7												
8												

DRILL RIG: HAND AUGER

DRILLING CONTRACTOR: Hawley Brothers

DRILLER: D. Hawley

Golder Associates

LOGGED: S. Harrison

CHECKED:

DATE: 30JAN91

PROJECT: WINCO/ICCP/ID

PROJECT LOCATION: INEL

PROJECT NUMBER: 893-1195 850

RECORD OF BOREHOLE CPP-47-4

BORING DATE: 31JAN91

BORING LOCATION: ICPP-LDU-40

SHEET: 1 OF 1

DATUM: MSL

DEPTH SCALE FEET	BORING METHOD	SOIL PROFILE: DESCRIPTION	USCS	GRAPHIC LOG	ELEV / DEPTH	SAMPLES: NUMBER	TYPE	BLOWS / 6 in	N	REC/ATT	PENETRATION RESISTANCE BLOWS/FT ■ / WATER CONTENT PERCENT Wp — W — Wl	PIEZOMETER OR STANDPIPE INSTALLATION
0	Air Hammer	Moderate yellowish brown (10YR5/4) unstratified, well-graded, fine-to-coarse GRAVEL and fine-to-coarse sand. Trace of clay.	GW			1	G	N/A		N/A		
1		Ground frozen to 3.2 feet.										
						2	G	N/A		N/A		
2												
3					3.20							
	Hand Auger	Moderate yellowish brown (10YR5/4) unstratified, well-graded, fine-to-coarse SAND. Some (25%-30%) fine-to-coarse gravel. Trace clay. Damp	SW									
4		Large cobble at 4.2 feet				3	G	N/A		N/A		
		Refusal at 4.2 feet			4.20							
5												
6												
7												
8												

DRILL RIG: HAND AUGER

DRILLING CONTRACTOR: Hawley Brothers

DRILLER: D Hawley

LOGGED: B. Harrison

CHECKED:

DATE: 31JAN91

Golder Associates

PROJECT: WINCO/ICCP/ID

PROJECT LOCATION: INEL

PROJECT NUMBER: 893-1196.850

RECORD OF BOREHOLE CPP-47-5

BORING DATE: 31JAN91

BORING LOCATION: ICPP-LDU-40

SHEET: 1 OF 1

DATUM: MSL

DEPTH BC-FEET	BORING METHOD	SOIL PROFILE: DESCRIPTION	USCS	GRAPHIC LOG	ELEV / DEPTH	SAMPLES: NUMBER	TYPE	BLOWS / 6 in	N	RECOVERY	PENETRATION RESISTANCE BLOWS/FT @ / WATER CONTENT, PERCENT Wp — W — Wl	PIEZOMETER OR STANDPIPE INSTALLATION
0	Air Hammer	Moderate yellowish brown (10YR5/4) unstratified, well-graded, fine-to-coarse GRAVEL and fine-to-coarse sand. Trace clay.	GW			1	G	N/A		N/A		
1		Ground frozen to 3 feet.										
1						2	G	N/A		N/A		
2												
3	Hand Auger	Moderate yellowish brown (10YR5/4), unstratified, well-graded, fine-to-coarse SAND. Some (25%-30%) fine-to-coarse gravel. Little clay. Damp.	SW		3.00							
4						3	G	N/A		N/A		
5		Large cobble at 5 feet										
		Refusal at 5 feet.			5.00							
6												
7												
8												

DRILL RIG: HAND AUGER

DRILLING CONTRACTOR: Hawley Brothers

DRILLER: D. Hawley

Golder Associates

LOGGED: S. Harrison

CHECKED:

DATE: 31JAN91