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SEP 16 1992

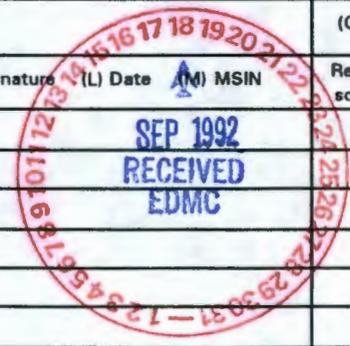
ENGINEERING DATA TRANSMITTAL

1. EDT 155379

2. To: (Receiving Organization) Distribution	3. From: (Originating Organization) Environmental Field Services Groundwater Well Services W81243 J812A	4. Related EDT No.: NA
5. Proj./Prog./Dept./Div.: Environmental	6. Cog. Engr.: B. W. Volk	7. Purchase Order No.: NA
8. Originator Remarks: Transmittal for approval and release		9. Equip./Component No.: NA
		10. System/Bldg./Facility: NA
11. Receiver Remarks:		12. Major Assm. Dwg. No.: NA
		13. Permit/Permit Application No.: NA
		14. Required Response Date: TBD

15. DATA TRANSMITTED					(F)	(G)	(H)	(I)
(A) Item No.	(B) Document/Drawing No.	(C) Sheet No.	(D) Rev. No.	(E) Title or Description of Data Transmitted	Impact Level	Reason for Transmittal	Originator Disposition	Receiver Disposition
1	WHC-S-0105	NA	0	Specification for DRILLING GEOTECHNICAL TEST BORINGS	3Q	1/2	1	
16. KEY								
Impact Level (F)		Reason for Transmittal (G)			Disposition (H) & (I)			
1, 2, 3, or 4 (see MRP 5.43)		1. Approval 2. Release 3. Information 4. Review 5. Post-Review 6. Dist. (Receipt Acknow. Required)			1. Approved 2. Approved w/comment 3. Disapproved w/comment 4. Reviewed no/comment 5. Reviewed w/comment 6. Receipt acknowledged			

(G)	(H)	17. SIGNATURE/DISTRIBUTION (See Impact Level for required signatures)								(G)	(H)
Reason	Disp.	(J) Name	(K) Signature	(L) Date	(M) MSIN	(J) Name	(K) Signature	(L) Date	(M) MSIN	Reason	Disp.
1	1	Cog. Eng. B. W. Volk	<i>B. W. Volk</i>	8/3/92	N3-05						
1	1	Cog. Mgr. D. J. Moak	<i>D. J. Moak</i>	8-3-92							
1	1	QA W. R. Thackaberry	<i>W. R. Thackaberry</i>	8/24/92							
NA		Safety Not required									
NA		Env. Not required									
1		W. H. Price, Mgr. Env. Field Services <i>W. H. Price</i> 8/24/92									
1		K. R. Fecht, Mgr. Geosciences <i>K. R. Fecht</i> 8/24/92									
18. <i>R. K. Ledgerwood</i> R. K. Ledgerwood 8-3-92 Signature of EDT Date Originator		19. Not applicable Authorized Representative Date for Receiving Organization				20. <i>D. J. Moak</i> <i>D. J. Moak</i> 8-1-92 Cognizant/Project Date Engineer's Manager				21. DOE APPROVAL (if required) Ltr. No. Not required <input type="checkbox"/> Approved <input type="checkbox"/> Approved w/comments <input type="checkbox"/> Disapproved w/comments	



INSTRUCTIONS FOR COMPLETION OF THE ENGINEERING DATA TRANSMITTAL

(USE BLACK INK OR TYPE)

<u>BLOCK</u>	<u>TITLE</u>	
(1)*	EDT	● Enter the assigned EDT number.
(2)	To: (Receiving Organization)	● Enter the individual's name, title of the organization, or entity (e.g., Distribution) that the EDT is being transmitted to.
(3)	From: (Originating Organization)	● Enter the title of the organization originating and transmitting the EDT.
(4)	Related EDT	● Enter EDT numbers which relate to the data being transmitted.
(5)*	Project/Program/Dept./Div.	● Enter the Project/Program/Department/Division title or Project/Program acronym or Project Number, Work Order Number or Organization Code.
(6)	Cognizant/Project Engineer	● Enter the name of the individual identified as being responsible for coordinating disposition of the EDT.
(7)	Purchase Order No.	● Enter related Purchase Order (P.O.) Number, if available.
(8)*	Originator Remarks	● Enter special or additional comments concerning transmittal, or "Key" retrieval words may be entered.
(9)	Equipment/Component No.	● Enter equipment/component number of affected item, if appropriate.
(10)	System/Bldg./Facility	● Enter appropriate system, building or facility number, if appropriate.
(11)	Receiver Remarks	● Enter special or additional comments concerning transmittal.
(12)	Major Assm. Dwg. No.	● Enter applicable drawing number of major assembly, if appropriate.
(13)	Permit/Permit Application No.	● Enter applicable permit or permit application number, if appropriate.
(14)	Required Response Date	● Enter the date a response is required from individuals identified in Block 17 (Signature/Distribution).
(15)*	Data Transmitted	
	(A)* Item Number	● Enter sequential number, beginning with 1, of the information listed on EDT.
	(B)* Document/Drawing No.	● Enter the unique identification number assigned to the document or drawing being transmitted.
	(C)* Sheet No.	● Enter the sheet number of the information being transmitted. If no sheet number, leave blank.
	(D)* Rev. No.	● Enter the revision number of the information being transmitted. If no revision number, leave blank.
	(E) Title or Description of Data Transmitted	● Enter the title of the document or drawing or a brief description of the subject if no title is identified.
	(F) Impact Level	● Enter the appropriate Impact Level (Block 15). Use NA for non-engineering documents.
	(G) Reason for Submittal	● Enter the appropriate code to identify the purpose of the data transmittal (see Block 16).
	(H) Originator Disposition	● Enter the appropriate disposition code (see Block 16).
	(I) Receiver Disposition	● Enter the appropriate disposition code (see Block 16).
(16)	Key	● Number codes used in completion of Blocks 15 (G), (H), and (I), and 17 (G), (H) (Signature/Distribution).
(17)	Signature/Distribution	
	(G) Reason	● Enter the code of the reason for transmittal (Block 16).
	(H) Disposition	● Enter the code for the disposition (Block 16).
	(J) Name	● Enter the signature of the individual completing the Disposition 17 (H) and the Transmittal.
	(L) Date	● Enter date signature is obtained.
	(M) MSIN	● Enter MSIN. Note: If Distribution Sheet is used, show entire distribution (including that indicated on Page 1 of the EDT) on the Distribution Sheet.
(18)	Signature of EDT Originator	● Enter the signature and date of the individual originating the EDT (entered prior to transmittal to Receiving Organization). If the EDT originator is the Cognizant/Project Engineer, sign both Blocks 17 and 18.
(19)	Authorized Representative for Receiving Organization	● Enter the signature and date of the individual identified by the Receiving Organization as authorized to approve disposition of the EDT and acceptance of the data transmitted, as applicable.
(20)*	Cognizant/Project Manager	● Enter the signature and date of the Cognizant/Project Engineer's manager. (This signature is authorization for release.)
(21)	DOE Approval	● Enter DOE approval (if required) by letter number and indicate DOE action.

* Asterisk denote the required minimum items checked by Configuration Documentation prior to release; these are the minimum release requirements.



Westinghouse
Hanford Company

P.O. Box 1970
Richland, Washington 99352

Hanford Operations and Engineering Contractor
for the U.S. Department of Energy
under Contract No. DE-AC06-87RL10930.

WHC-S-0105
Revision 0
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SPECIFICATION FOR

DRILLING GEOTECHNICAL TEST BORINGS
WHC-S-0105, Revision 0

Building: NA
Project: NA
Impact Level: 3Q

OFFICIAL RELEASE
BY WHC 11
DATE SEP 16 1992
Station # 21

Prepared By:

R. K. Ledgerwood, 376-2193 N3-05

Principal Scientist, Groundwater Well Services

Approved By:

	Date
B. W. Volk (Cognizant Engineer) <i>Ben W. Volk</i>	<u>7-21-92</u>
D. J. Moak (Cognizant Manager) <i>D. J. Moak</i>	<u>8-3-92</u>
K. R. Fecht (Manager Geosciences) <i>K. R. Fecht</i>	<u>8/11/92</u>
W. H. Price (Manager Environmental Field Services) <i>W. H. Price</i>	<u>9/14/92</u>
W. R. Thackaberry (Quality Assurance) <i>W. R. Thackaberry</i>	<u>8-26-92</u>

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SPECIFICATION FOR DRILLING
GEOTECHNICAL TEST BORINGS
WHC-S-0105
Revision 0

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SECTION 01010

SUMMARY OF WORK

PART 1 GENERAL

1.1 REFERENCES

- 1.1.1 Washington Administrative Code (WAC)
WAC 173-160, Minimum Standards for Construction and
Maintenance of Wells. WAC 173-160-030
Definitions

1.2 INTRODUCTION

1.2.1 This specification is for drilling of geotechnical test borings for the purpose of collecting soil, sediment, rock, gas and liquid samples for characterization purposes.

1.2.2 Drilling locations are on the Hanford Site. Specific locations and data objectives are defined in project or operable unit specific Letters of Instruction (LOI).

1.2.3 Requirements for environmental investigation and characterization activities are provided by Sampling and Analysis Plans contained within applicable Operable Unit Work Plans or other governing documents referenced within the specific LOI.

1.3 SCOPE OF WORK

1.3.1 This task consists of drilling geotechnical test borings to provide material representative of the lithology drilled. The material will be sampled for purposes of characterizing the subsurface for lithology, and radiological and chemical contamination.

1.3.2 Work included: The work sequence for drilling includes the following elements and is not all inclusive:

- 1.3.2.1 Site preparation.
- 1.3.2.2 Mobilization/site setup.
- 1.3.2.3 Drilling.
- 1.3.2.4 Waste management.
- 1.3.2.5 Borehole abandonment.
- 1.3.2.6 Demobilization and decontamination.
- 1.3.2.7 Location surveys.

1.4 SCHEDULING OF WORK

1.4.1 Project specific expected work schedules will be contained in applicable LOIs.

1.5 DEFINITIONS

1.5.1 Geotechnical test boring: Temporary cased (or uncased) test borings completed primarily for the purpose of obtaining geologic, or geotechnical data about subsurface soil or rock conditions and/or for determining groundwater levels, (WAC-173-160-030-23).

1.5.2 Letter of Instruction (LOI): A letter to the construction contractor from WHC containing instructions implementing this specification. The LOI contains the following information:

1.5.2.1 Map or drawing of site showing location of test boreholes.

1.5.2.2 Applicable safety documentation.

1.5.2.3 A data sheet providing required sizes, depths, casing, sampling requirements, drilling techniques, and abandonment requirements for boreholes.

1.5.3 Drilling Contractor: The drilling contractor provides drilling services including applicable quality assurance, quality control, safety, scheduling, estimating and cost control during drilling.

1.5.3.1 Drilling activities controlled by this specification will be performed by the onsite construction contractor or a subcontractor.

1.6 APPLICABILITY

1.6.1 This specification provides requirements for drilling of uncased or temporary cased geotechnical test borings by the drilling contractor. Included are prerequisites and requirements for execution, inspection and documentation of those drilling activities.

PART 2 PRODUCTS: Not used

PART 3 EXECUTION: Not used

END OF SECTION

SECTION 01019

ITEMS FURNISHED FOR DRILLING

PART 1 - GENERAL

1.1 REFERENCES

- 1.1.1 Washington Administrative Code (WAC)
WAC 173-160, Minimum Standards for Construction and
Maintenance of Wells. WAC 173-160-010(4)
- 1.1.2 American Society for Testing and Materials (ASTM)
ASTM C150 Standard Specification for Portland Cement
ASTM A53 Welded and Seamless Steel Pipe
- 1.1.3 American Petroleum Institute (API)
Specification 5CT Casing and Tubing

1.2 SUBMITTALS Not used

1.3 GENERAL

1.3.1 Materials and equipment furnished by the drilling contractor and WHC are detailed in this section.

1.3.2 The drilling contractor shall supply or make available the following drilling material and equipment:

1.3.2.1 Drill rigs as required in the applicable LOI.

1.3.2.2 Drill tools may consist of rope sockets, stems, fishing jars, drive barrels, bits, bailers, wrenches, drive clamps, etc.. These items shall be readily available and in good working order.

1.3.2.3 Drilling aids, lubricants, etc.

1.3.2.3.1 Drilling aids such as bentonite, other clay-based agents, water or any foreign matter capable of affecting the characteristics of the ground water shall not be placed in the borehole without prior approval of the RI Coordinator or Cognizant Engineer/FTL.

1.3.2.3.2 Lubricant used for making up drill strings, threaded casing or other downhole tools must be environmentally compatible as per industry standards. For example: GREEN-STUFF, ORANGE AID, WELL GUARD may be acceptable. Petroleum based lubricants are not acceptable.

1.3.2.4 Casing, drill bits and drive shoes required to drill the borings will be identified in the project specific LOI data sheets. Casing used in a geotechnical test borehole is intended to be in place only temporarily. The casing shall conform to referenced ASTM or API Standards.

1.3.2.4.1 The casing shall not contain any paint markings, coatings, lubricants, shellac, etc. on the inside surface. The outside of the casing shall be free of visible dirt, markings and paint.

1.3.2.5 Materials required to abandon the borehole (i.e. bentonite, cement, brass markers, etc.).

1.3.2.5.1 Bentonite or cement grout shall be used to abandon the borehole. This shall be done in accordance with WAC 173-160 and at the direction of the Cognizant Engineer/FTL and as specified in the applicable LOI.

1.3.2.5.1.1 Granular bentonite, bentonite pellets, bentonite chunks or high-solids bentonite slurry may be used as directed.

1.3.2.5.1.2 Portland Cement shall be used as a minimum where cement grout is required, (ASTM C-150, Type I or II).

1.3.2.6 Tools and gang boxes required for drilling operations (i.e. welders, bevelers; torches, grinders, hand tools, welding rod, etc.).

1.3.2.7 Raw Columbia River or potable water for drilling and decontamination activities.

1.3.3 WHC will supply the following drilling equipment and materials:

1.3.3.1 Sampling equipment (e.g. split spoon samplers, liners, shoes, shipping containers, etc.)

1.3.3.2 Miscellaneous equipment available in inventory.

PART 2 PRODUCTS: Not used

PART 3 EXECUTION: Not used

END OF SECTION

SECTION 01040

COORDINATION

PART 1 GENERAL

1.1 REFERENCES

1.1.1 American Society of Mechanical Engineers (ASME)
ASME NQA-1-1989, Quality Assurance Program Requirements for
Nuclear Facilities.

1.1.2 WHC Quality Assurance Manual (WHC-CM-4-2)

1.1.3 Environmental Investigations and Site Characterization Manual
(WHC-CM-7-7)
EII 1.7, Indoctrination, Training and Qualification

1.1.4 Radiation Protection (WHC-CM-4-10).

1.1.5 KEH Engineers Hanford Generic Quality Assurance Program Plan for
Drilling Construction Activities, No. 27 Latest Revision

1.2 SUBMITTALS Not used

1.3 RESPONSIBILITIES

1.3.1 Westinghouse Hanford Company

1.3.1.1 The Environmental Division of WHC has primary responsibilities for
conducting these investigations. Drilling activities shall be conducted and
documented according to applicable Environmental Investigation and Site
Characterization Instructions (EIIs) contained in WHC-CM-7-7.

1.3.1.2 WHC Remedial Investigation (RI) Coordinator: Management within
the Environmental Division assigns an RI Coordinator responsible for
applicable RI/FS work plans. The RI Coordinator has technical responsibility
for the implementation of the work plan/governing documents to accomplish the
data collection objectives.

1.3.1.3 Cognizant Engineer: Geotechnical test borehole drilling not
within the scope of an RI/FS work plan will be the coordinated by a WHC
Cognizant Engineer who will have the technical responsibility for the work and
data collection objectives.

1.3.1.4 WHC Field Team Leader: The WHC Field Team Leader (FTL) is
responsible for the coordination of all on-site activities and personnel. The
FTL provides technical direction and oversight to insure work is conducted in
accordance with this specification and approved work plans and procedures.

1.3.1.5 WHC Site Geologist and Sampling Scientist: The assigned WHC
site geologist(s) and sampling scientists are responsible for proper
lithologic description, sample point selection, sampling, sample screening,
sample control and chain-of-custody documentation.

1.3.1.6 WHC Health Physics: WHC Health Physics is responsible for the preparation of Radiation Work Permits (RWP) and radiological site monitoring in accordance with the RWP. Health Physics Technicians (HPT) will coordinate all field changes to the RWP. HPTs are responsible for releasing equipment and materials off site in accordance with WHC-CM-4-10.

1.3.1.7 WHC Quality Assurance: WHC Quality Assurance is responsible for performance of overview in the form of reviews, surveillance, and audits to assure compliance with applicable requirements. WHC Quality Assurance activities are performed in accordance with WHC-CM-4-2 which uses as its basis ASME NQA-1 1989.

1.3.2 Drilling Contractor

1.3.2.1 The drilling contractor is responsible for providing site personnel and related services defined in the letter of instruction.

1.3.2.2 The drilling contractor must furnish completed Safety, Training and Personnel Requirement forms per EII 1.7 to WHC FTL for all of the drilling contractor and its' contractors personnel prior to commencing operations.

1.3.2.3 Drilling Point of contact: The drilling contractor shall appoint a point of contact (Foreman/Supervisor) to interface and coordinate equipment, materials, and related personnel needs with the WHC FTL.

1.3.2.4 Site Safety: The drilling contractor is responsible for monitoring/documenting non-radiological safety and personnel exposure for all site personnel. Site safety is also responsible for preparation of the Hazardous Waste Operations Permit (HWOP).

1.3.2.4.1 The drilling contractor is responsible for providing a fully trained Site Safety Officer (SSO).

1.3.2.5 Drillers and Drilling Support Personnel

1.3.2.5.1 The drilling contractor will provide qualified drillers, driller's helpers, laborers, and related service personnel to conduct the work activities identified in this specification.

1.4 DAILY ACTIVITY DOCUMENTATION

1.4.1 Documentation of geotechnical test boring shall be according to EII 6.1 (Latest Revision), "Activity Reports of Field Operations." The report will be prepared by the WHC FTL or site geologist. The drilling contractor's representative or drill rig operator shall review the report on a daily basis and sign the report in the appropriate block indicating acceptance of the contents.

PART 2 PRODUCTS Not used

PART 3 EXECUTION Not used

END OF SECTION

SECTION 01050
FIELD ENGINEERING

PART 1 GENERAL

1.1 REFERENCES

- 1.1.1 U.S. Environmental Protection Agency.
EPA/540/P-87/001, 1987 "A Compendium of Superfund Field
Operational Methods,"
- 1.1.2 Environmental Investigations and Site Characterization Manual
(WHC-CM-7-7)
EII 6.7, Resource Protection Well and Test Borehole Drilling.

1.2 SUBMITTALS Not used

1.3 SURVEY REQUIREMENTS

1.3.1 Vertical and horizontal surveys are done on the brass pin placed in the concrete marker of abandoned characterization boreholes, (EII 6.7, Section 6.5). Such requirements or additional survey requirements will be detailed in the applicable LOI.

1.3.2 All survey work shall be performed by experienced survey personnel, supervised by a licensed land surveyor.

1.3.3 Horizontal positioning shall be according to standards for third-order plane surveys contained in Section 14 of "A Compendium of Superfund Field Operations Methods."

1.3.4 Report vertical elevations of surveys to the nearest 0.03 m (0.1-ft). Report horizontal coordinates of surveys to the nearest 0.3 m (1-ft).

1.3.5 Surveys shall utilize the Washington State Plane Coordinates (south zone), of North American Datum of 1983. The vertical control survey shall be referenced to NGVD of 1929.

PART 2 PRODUCTS

2.1 SURVEY DATA REPORT

2.1.1 Provide a survey data report which includes the Hanford Coordinates as location references only. Each Survey Data Report must indicate the horizontal and vertical datums used.

PART 3 EXECUTION

3.1 SURVEYING

3.1.1 Survey as specified in applicable LOI data sheets.

END OF SECTION

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SECTION 01090

REFERENCES

PART 1 GENERAL

1.1 REFERENCES: The following codes, standards and specifications (latest date or addendum in effect), listed below form a part of this specification to the extent designated herein.

- 1.1.1 American Society of Mechanical Engineers (ASME)
ASME NQA-1-1989, Quality Assurance Program Requirements for
Nuclear Facilities.
 - 1.1.2 American Society for Testing and Materials (ASTM)
ASTM C150 Standard Specification for Portland Cement
ASTM A53 Welded and Seamless Steel Pipe
 - 1.1.3 American Petroleum Institute (API)
Specification 5CT Casing and Tubing
 - 1.1.4 Environmental Investigations and Site Characterization Manual
(WHC-CM-7-7)
 - 1.1.5 Radiation Protection, (WHC-CM-4-10)
 - 1.1.6 WHC Quality Assurance Manual (WHC-CM-4-2)
 - 1.1.7 Code of Federal Regulation (CFR)
29 CFR 1910.120, Hazardous Waste Operations and Emergency
Response.
29 CFR 1910.147, The Control of Hazardous Energy (Lockout/Tagout)
40 CFR 260-265, Resource Conservation and Recovery Act Hazardous
Waste Regulations.
 - 1.1.8 Federal Standards (FED STD)
FED-STD-3136 Material Safety Data Sheets
 - 1.1.9 U.S. Environmental Protection Agency.
EPA/540/P-87/001, 1987 A Compendium of Superfund Field
Operational Methods,"
 - 1.1.10 Washington Administrative Code (WAC)
WAC 173-160, Minimum Standards for Construction and
Maintenance of Wells.
WAC 173-162, Rules and Regulations Governing the Regulation
and Licensing of Well Contractors and Operators.
WAC 173-303, Dangerous Waste Regulations.
 - 1.1.11 KEH Engineers Hanford Generic Quality Assurance Program Plan for
Drilling Construction Activities, No. 27 Latest Revision
- 1.2 SUBMITTALS Not used.

PART 2 **PRODUCTS:** Not used

PART 3 **EXECUTION:** Not used

END OF SECTION

SECTION 01100
SPECIAL PROJECT PROCEDURES

PART 1 **GENERAL**

1.1 **REFERENCES**

- 1.1.1 Environmental Investigations and Site Characterization Manual
 (WHC-CM-7-7)
- EII 1.1, Hazardous Waste Site Entry Requirements
 - EII 2.1, Preparation of Hazardous Waste Operation Permits
 - EII 2.2, Occupational Health Monitoring
 - EII 3.2, Health and Safety Monitoring Instruments
 - EII 4.2, Interim Control of Unknown, Suspected Hazardous
 and Mixed Waste.
 - EII 5.4, Field Decontamination of Drilling, Well
 Development and Sampling Equipment.
 - EII 5.5, 1706 KE Laboratory Decontamination of
 RCRA/CERCLA Sampling Equipment.
- 1.1.2 Code of Federal Regulations (CFR)
 29 CFR 1910.120 Hazardous Waste Operations and Emergency
 Response
 29 CFR 1910.147 The Control of Hazardous Energy (Lockout/Tagout)
- 1.1.3 Federal Standards (FED STD)
 FED-STD-3136 Material Safety Data Sheets
- 1.1.4 Washington Administrative Code (WAC)
 WAC 173-162, Rules and Regulations Governing the Regulation
 and Licensing of Well Contractors and Operators.

1.2 **SUBMITTALS** Not used

1.3 **HAZARDOUS MATERIALS REQUIREMENTS**

1.3.1 Use of hazardous materials in support of or during geotechnical
test drilling shall be governed by the requirements of FED-STD-3136

1.4 **SUSPENSION OF WORK**

1.4.1 The WHC FTL, HPT or drilling contractor SSO may suspend work if
radiation control practices or working conditions are determined to be unsafe.
Any person at the drilling site may stop work if eminent danger exists.
Such practices and conditions include but are not limited to the following:

1.4.1.1 Potential contamination resulting from excessive winds or
uncovering of surface contamination.

1.4.1.2 Increase of employees' average dose rates above anticipated levels
as a result of inadequate control.

1.4.1.3 Noncompliance with regulations and procedures.

1.4.1.4 Potential contamination resulting from poor work practices.

1.5 WORK SITE CONDITIONS

1.5.1 Geotechnical test borehole sites may be characterized as hazardous waste operations sites and therefore subject to requirements of 29 CFR 1910.120. EII 1.1, "Hazardous Waste Site Entry Requirements" shall apply to all such sites.

1.5.2 EII 1.1 has specific site access and training requirements. Applicable requirements are:

1.5.2.1 Site Safety Officer: The SSO must be a Qualified Hazardous Waste Worker per EII 1.1.

1.5.2.1.1 The assigned SSO in conjunction with the FTL will be responsible for training record verification and site access. The SSO shall coordinate all field changes to the HWOP with concurrence of the FTL. The SSO shall provide the FTL with copies of the Site Safety Logbook entries as requested.

1.5.2.1.1.1 The preparation of and changes to the HWOP shall be in accordance with EII 2.1.

1.5.2.1.1.2 Monitoring and documenting personnel exposure shall be in accordance with EII 2.2.

1.5.2.1.1.3 Health and Safety monitoring equipment shall be managed in accordance with EII 3.2.

1.5.2.2 Drillers and all other support personnel shall have the following minimum qualifications. Additional qualifications may be required in accordance with the applicable site safety plan or LOI.

1.5.2.2.1 Must be a qualified Hazardous Waste Worker per EII 1.1. One year of experience working with hazardous or radioactive waste is preferred.

1.5.2.3 Drillers shall be a licensed Well Driller per WAC 173-162.

1.6 DRILLING EQUIPMENT INSPECTION

1.6.1 An inspection of the drilling equipment to be used shall be conducted by the drilling contractor or the drilling contractor and the WHC FTL prior to use.

1.7 CLEANING

1.7.1 All casings and other metal items used to drill the borehole shall have been cleaned to remove all oils, greases, solvents, glues and waxes.

1.7.2 The drilling contractor shall steam clean and decontaminate the drill rig (tools, cables) per EII 5.4 prior to use.

1.7.3 Plastic or fabric material shall be placed beneath drills and equipment to catch grease, oil or other potential contaminants coming from the equipment when directed by the FTL.

1.7.4 At all times during the progress of work or when the site is unattended, the borehole shall be protected in such a manner as to prevent either tampering with the borehole or the entrance of foreign matter into it.

1.8 DECONTAMINATION

1.8.1 The drilling contractor shall supply the equipment necessary for decontamination. Temporary decontamination sites are to be set up at locations approved by the FTL. Rinsate fluid collection and temporary storage shall be conducted per EIIs 4.2 and 5.4.

1.8.2 The FTL or designee shall be allowed to observe rig decontamination and inspect the rig to ensure that visible dirt, excess oil, and grease are removed. Fittings are to be greased and fluids added to the rig before cleaning. Periodic lubrication can be performed after steam cleaning only as part of routine equipment maintenance. The FTL or designee will inspect downhole tools, and casing to insure that all visible dirt, rust flakes, paint, oil, grease, solvents and waxes are removed.

1.9 DECONTAMINATION OF SAMPLING EQUIPMENT

1.9.1 Sampling equipment shall be decontaminated to control radiological hazards and to preclude chemical cross-contamination of the samples. Field sampling equipment that comes into direct contact with the sample shall be decontaminated prior to use or reuse. Field sampling equipment decontamination shall be conducted in accordance with EII 5.4 and/or EII 5.5.

1.10 CONTROL OF DRILLING AND FORMATION WATER

1.10.1 Water from saturated sediments shall be contained as directed by the WHC FTL and according to EII 4.2.

1.11 CONTROL OF DRILL CUTTINGS

1.11.1 Drill cuttings shall be handled per EII 4.2.

1.12 CONTROL OF HAZARDOUS ENERGY

1.12.1 All drilling related activities shall meet lockout/tagout requirements of 29 CFR 1910.147. Requirements shall include, but are not limited to, the following:

1.12.1.1 Establish energy control procedure and personnel training to ensure that before working on machines or equipment where unexpected energizing, startup or release of stored energy could occur and cause injury, machines, or equipment are isolated and rendered inoperative in accordance with 29 CFR 1910.147.

1.12.1.2 Certify that personnel training has been accomplished and is being kept up-to-date. Certification shall include employee's name and dates of training.

1.12.1.3 Coordinate with the WHC FTL on lockout/tagout procedures involving operations.

PART 2 PRODUCTS: Not used

PART 3 EXECUTION: Not used

END OF SECTION

SECTION 01300

SUBMITTALS

PART 1 GENERAL

1.1 REFERENCES

1.1.1 WAC 173-160, Minimum Standards for Construction and Maintenance of Wells.

1.1.2 Federal Standards (FED STD)
FED-STD-3136 Material Safety Data Sheets

1.2 SUBMITTALS

1.2.1 Records Required by WAC 173-160

1.2.1.1 The start card is the "Notice of Intent to Begin Well Construction" that is filed with the Washington State Department of Ecology (Ecology), in accordance with WAC 173-160-055, "Well Construction Notification (start card)," at least 72 hours prior to starting of drilling.

1.2.2 The drilling contractor shall submit the following as applicable to WHC:

1.2.2.1 Cost estimates and drilling schedules required by applicable LOIs.

1.2.2.2 Drilling contractor surveillance and audit reports.

1.2.2.3 Borehole survey reports (per Section 01050, Part 2).

1.2.2.4 Records of personnel exposure to radiological or non-radiological constituents.

1.2.2.5 Site Safety Program. The drilling contractor's safety program shall include an HWOP or Job Safety Analysis specific to the task defined in the applicable LOI.

1.2.2.6 Training Certifications: Submit each employee's certification of Hazardous Waste Training and energy control training.

1.2.2.7 Employee Medical Clearance: Submit copy of medical clearance for hazardous waste work for each employee.

1.2.2.8 Hazardous Material Listing: Submit a list of hazardous materials anticipated for drilling including MSDS.

1.2.2.9 Copies of the Site Safety Logbook entries

1.2.2.10 Copies of drilling personnel licenses and resumes.

1.2.2.11 Copies of applicable start cards.

PART 2 **PRODUCTS:** Not used

PART 3 **EXECUTION:** Not used

END OF SECTION

SECTION 01400
QUALITY CONTROL

PART 1 GENERAL

1.1 REFERENCES

1.1.1 Quality Assurance Manual, (WHC-CM-4-2)
QI 15.1 Nonconforming Item Reporting

1.1.3 Kaiser Engineers Hanford Generic Quality Assurance Program Plan
for Drilling Construction Activities, No 27, Latest Revision

1.2 SUBMITTALS Not used

1.3 REQUIREMENTS

1.3.1 The drilling contractor shall implement and operate to the provisions specified in "Kaiser Engineers Hanford Generic Quality Assurance Program Plan for Drilling Construction Activities," No. 27 Latest Revision.

1.3.2 Additional requirements for performance of field activities (hold points, etc) will be included in applicable LOIs.

1.3.3 The drilling contractor shall grant access to premises, files, procedures, and records associated with this specification and implementing LOIs for the purpose of WHC Quality Assurance audits and/or surveillances.

1.4 HOLD POINTS/DEVIATIONS

1.4.1 If hold points (verification that must be performed prior to proceeding) are identified in the LOI data sheets, the drilling contractor shall notify the RI Coordinator or FTL prior to proceeding.

1.4.2 Deviations from any specifications shall be brought to the attention of the WHC FTL or RI Coordinator. Any deviation to the specifications shall be documented on a non-conformance report per WHC-CM-4-2.

PART 2 PRODUCTS Drilling contractor surveillance and audit reports.

PART 3 EXECUTION Not used

END OF SECTION

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SECTION 01500

CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

PART 1 GENERAL

1.1 REFERENCES

- 1.1.1 Environmental Investigations and Site Characterization Manual
(WHC-CM-7-7)
EII 5.4, Field Decontamination of Drilling, Well
Development and Sampling Equipment.

1.2 SUBMITTALS Not used.

1.3 REQUIREMENTS

1.3.1 The drilling contractor shall supply the following drilling aids and controls:

1.3.1.1 All non-radiological monitoring equipment and industrial safety equipment for contractors' personnel (eye protection, hard hats, steel-toed footwear, welding hood, ETC.). The drilling contractor shall provide all site specific personal protective equipment (masks, hearing protection, coveralls/Anti-C's, gloves, laundry hampers, etc.) for all site personnel.

1.3.1.2 Equipment/materials required to decontaminate casing, split spoon samplers, drill rigs, tool, etc. (water tanks, pumps, hoses, non-phosphate detergents, steam cleaners, wash trays/catch tanks, etc.).

1.3.1.3 Forklift or appropriate lifting mechanism (e.g. rig tenders) for moving heavy objects.

1.3.1.4 Chemical toilets at drill and support sites.

1.3.1.5 Potable wash water and drinking water to the sites.

1.3.1.6 Raw Columbia River or potable water for drilling and decontamination activities.

1.3.1.7 All signs required for site posting.

1.3.1.8 Fuel for equipment (diesel, gasoline, propane, kerosene).

1.3.1.9 Waste storage drums, pallets and waste storage units.

- 1.3.2 WHC will supply the following equipment and materials:
 - 1.3.2.1 Central site office trailers, change trailers and electrical sources for these trailers.
 - 1.3.2.2 Sampling equipment (e.g. split spoon samplers, liners, shoes, shipping containers, etc.)
 - 1.3.2.3 Field screening laboratory to process samples.

PART 2 PRODUCTS

2.1 RADIOLOGICAL SURVEYS

2.1.1 A surface survey of each drill site will be conducted by WHC Health Physics and documented on a Radiation Survey Report. This action is required prior to the mobilization of equipment into the site. Results of the surveys will be provided to the drilling contractor.

PART 3 EXECUTION

3.1 SITE SETUP

3.1.1 Locate overhead and underground facilities prior to drilling.

3.1.2 Establish command post, exclusion zone and contamination control zones as required by governing safety documents.

3.1.3 Arrange for personal protective equipment, disposal containers, and decontamination/change facility access, as required.

3.1.4 Coordinate logistics/delivery of material and equipment, sanitation facility, potable water, waste disposal containers, sampling containers, purge water containment, etc.

3.2 MOBILIZATION

3.2.1 Fill rig with fuel and other fluids prior to entering the site.

3.2.2 Thoroughly clean drilling rig and accessory equipment in accordance with EII 5.4 prior to entering the site and between wells.

3.2.3 Check all hydraulic pumps, seals, lines and fittings for leaks prior to entering the site.

3.2.3.1 Use only non-contaminating lubricants as prescribed in Section 01019, part 1.3.2.3.2.

3.2.4 Mobilize the drill rig to the site.

3.2.4.1 Keep all accessory drilling equipment off the ground surface.

END OF SECTION

SECTION 01600
MATERIAL AND EQUIPMENT

PART 1 GENERAL

1.1 REFERENCES Not used.

1.2 SUBMITTALS Not used.

1.3 REQUIREMENTS

1.3.1 Handling and Storage of Materials

1.3.1.1 The drilling contractor shall use all means necessary to protect drilling materials before, during and after utilization. All materials shall be kept off the ground on pallets, stands, racks, or sawhorses. All materials shall be stored in their original containers or covered with a water-proof tarp (plastic, nylon or other suitable material) until needed for operations.

PART 2 PRODUCTS Not used

PART 3 EXECUTION Not used

END OF SECTION

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SECTION 02100
SITE PREPARATION

PART 1 GENERAL

1.1 REFERENCES Not used

1.2 SUBMITTALS Not used

1.3 GENERAL

1.3.1 Requirements for site clearing and drill pad preparation are contained in the site specific LOI.

PART 2 PRODUCTS Not used

PART 3 EXECUTION

3.1 SITE CLEARING

3.1.1 Remove existing shrubs and brush as directed in the LOI. Material shall be released by HPT before removal from site. Stabilize site to grade as staked and specified in LOI.

END OF SECTION

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SECTION 02670

GEOTECHNICAL TEST BORING DRILLING

PART 1 GENERAL

1.1 REFERENCES

- 1.1.1 Environmental Investigations and Site Characterization Manual
(WHC-CM-7-7)
- EII 4.2, Interim Control of Unknown, Suspected Hazardous and Mixed Waste.
 - EII 5.2, Soil and Sediment Sampling.
 - EII 6.1, Activity Reports of Field Operations
 - EII 6.7, Resource Protection Well and Test Borehole Drilling.
- 1.1.2 Washington Administrative Code (WAC)
WAC 173-160, Minimum Standards for Construction and Maintenance of Wells.

1.2 INTRODUCTION

1.2.1 Geotechnical test boreholes are drilled to provide geologic or geotechnical data about subsurface soil or rock conditions and to allow characterization of chemical or radionuclide contamination.

1.2.2 Subsurface soil samples may be obtained by use of standard cable tool drive barrel, split spoon, hard tool or percussion core barrel drilling techniques. Other methods of soil penetration by drilling including auger, hollow-stem auger rigs and sonic drill rigs may be used if specified in applicable LOI data sheets.

1.3 DEFINITIONS Not used

PART 2 PRODUCTS

2.1 Soil or rock material from the borehole, not the borehole itself, is the required product of the geotechnical drilling operation. This is in contrast to water well drilling. The product shall be produced and handled in such a way so as to allow representative sampling. Sampling may include both the lithology and *insitu* subsurface conditions including contamination status.

PART 3 EXECUTION

3.1 DRILLING OF BOREHOLE

3.1.1 Drilling of vadose zone test borings shall be according to EII 6.7. Specific task sequencing shall be the determination of the FTL and according to applicable LOI data sheets.

3.1.2 Standard cable tool drive barrel drilling methods shall be used to drill the boreholes unless otherwise specified in the LOI. When specified or directed by the FTL, special sampling equipment shall be used according to EII 5.2.

3.1.3 The SSO and HPT shall monitor hole and spoils for contamination as specified in the applicable safety plan and RWP.

3.1.3.1 If contamination exceeds the action level (as specified in the applicable safety plan), all in-hole activities shall stop.

3.1.3.2 Personnel shall follow the direction of the SSO and HPT for donning proper level of protective clothing and equipment before continuing.

3.1.3.3 Drilling shall proceed only with approval and under the surveillance of the SSO and HPT as defined in the applicable safety documents.

3.1.4 Drill cuttings shall be handled per EII 4.2.

3.2 BOREHOLE ABANDONMENT

3.2.1 Test borings shall be abandoned as required by WAC 173-160 and EII 6.7. The volume and depths of borehole filled with abandonment materials shall be recorded per EII 6.1.

3.2.2 A small cement pad with a minimum diameter of 12 inches and extending at least 6 inches into the borehole and 2 inches above grade shall be installed. Larger pads may be stipulated in the applicable LOI.

3.2.3 A brass plate and pin inscribed with the borehole number and date of abandonment shall be installed in the cement pad.

3.3 BOREHOLE DESIGNATION

3.3.1 Vadose zone boreholes which are plugged shortly after reaching total depth need not be given a permanent borehole identification number. These may be designated by only a unique project identifier.

3.4 LOCATION SURVEYS

3.4.1 Survey the location marker for horizontal coordinates and vertical elevation in accordance with Section 01050 of this specification when required in the applicable LOI Data Sheet.

END OF SECTION

DISTRIBUTION SHEET

To: Distribution From: R. K. Ledgerwood Date: September 15, 1992

Project Title/Work Order:

Specification for Drilling Geotechnical Test Borings, WHC-S-0105, Revision 0

EDT No.: 155379

ECN No.: NA

Name	MSIN	With Attachment	EDT/ECN & Comment	EDT/ECN Only
M. R. Adams	H4-55	X		
L. O. Amos	N3-06	X		
J. A. Bultena	N3-06	X		
K. R. Fecht (4)	H4-56	X		
M. G. Gardner	N3-06	X		
R. C. Havenor	N3-06	X		
D. G. Farwick	H4-16	X		
D. J. Foucault	E2-11	X		
R. L. Jones	N3-05	X		
R. K. Ledgerwood	N3-05	X		
J. R. McCallum	H4-16	X		
G. W. McLellan	N3-05	X		
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D. E. Skoglie	N3-05	X		
T. W. Spicer	H4-06	X		
W. R. Thackaberry	H4-16	X		
K. M. Thompson	A5-15	X		
W. S. Thompson	N3-05	X		
B. W. Volk	N3-05	X		
R. I. Watkins	E6-41	X		
D. C. Weekes	H5-29	X		
EFS Records Center	N3-05	X		
KEH Construction Document Control	E2-50	X		
EDMC (2)	H4-22	X		
L. Garza	L6-76	Orig.		