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Revision 2

# Hanford Site Excavating, Trenching and Shoring

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Table of Contents

1.0 PURPOSE ..... 2

2.0 SCOPE ..... 2

3.0 IMPLEMENTATION ..... 2

4.0 REQUIREMENTS ..... 2

5.0 PROCESS ..... 2

    5.1 Preparing for and Performing Emergency Excavation Work ..... 3

    5.2 Initial Planning for Normal or Routine Excavation Work ..... 4

    5.3 Excavation Permit Preparation ..... 5

    5.4 Performing Excavation Work ..... 9

6.0 FORMS ..... 16

7.0 RECORD IDENTIFICATION ..... 16

8.0 REFERENCES ..... 17

APPENDIX A: Excavation Process Flow ..... 18

APPENDIX B: Definitions ..... 19

APPENDIX C: Color Code and Marking Standards ..... 22

APPENDIX D: Hanford Site Excavation Permit and Instructions ..... 23

APPENDIX E: Excavation Permit Review and Approval Guidance ..... 25

APPENDIX F: Site Map ..... 28

APPENDIX G: Engineered Drawings ..... 29

APPENDIX H: User Guide Checklist for Insulating Rubber Gloves ..... 33

APPENDIX I: Competent Person Training and Designation Requirements ..... 35

ATTACHMENT 1: Hanford Site Excavation, Trenching and Shoring Procedure Committee (HSETSP) Charter ..... 36

## 1.0 PURPOSE

This procedure promotes safe work practices by establishing the minimum requirements and authorizations for working in and around excavations and trenches. It provides for the planning, permitting, administration, execution and completion of excavation activities.

## 2.0 SCOPE

This procedure is applicable to employees performing administration, planning, and field execution of excavation work.

Excavations include any operation in which earth, rock, or other material in the ground (below original grade) is moved, removed or otherwise displaced by means or use of any hand tools, mechanical equipment or explosives.

This procedure is **not** intended to address requirements relating to blind penetration work (concrete core drilling), harvesting, non-mechanical surface cleanup of localized biological contamination or radiological area and other soil sampling, replacement of missing/damaged markers, replacement of fence and sign posts, or other penetrations in original location and at or less than original depth.

**NOTE:** *The performance of such blind penetration activities may involve hazards similar to traditional excavation work and may require the performance of scope definition, hazard identification, analysis, and mitigation prior to performing work.*

## 3.0 IMPLEMENTATION

Effective upon publication.

## 4.0 REQUIREMENTS

All excavation activities performed on the Hanford site shall comply with the requirements of the Occupational Safety and Health Administration (OSHA) regulations in 29 Code of Federal Regulations (CFR) 1926, Subpart P, “Excavations”; 10 CFR 851, “Worker Safety and Health Program”; and the Department of Energy ([DOE](#)) [M 450.4-1](#) *Integrated Safety Management System Manual*.

At Hanford, soil is classified as Type C per 29 CFR 1926 Subpart “P.” Soil that is considered any other classification must be verified by a Hanford prime contractor’s Registered Professional Engineer (RPE) prior to excavation.

## 5.0 PROCESS

Prior to conducting excavation activities, all requirements applicable to the scope of work shall be reviewed to ensure that appropriate requirements are implemented.

**NOTE:** *Refer to the Excavation Process Flow Diagram ([Appendix A](#)) for an overview of the process. Definitions used in this process are listed in [Appendix B](#).*

**5.1 Preparing for and Performing Emergency Excavation Work**

An emergency excavation is any excavation that requires immediate action to prevent or minimize potential harm to personnel or property.

**NOTE:** *Excavation permits are not required when the excavation is determined by the Responsible Person, and approved by management, to be emergency in nature and immediately necessary to ensure worker safety or to protect the environment, site systems, services, or structures.*

<i>Actionee</i>	<i>Step</i>	<i>Action</i>
Responsible Person	a.	If performing emergency excavation within an area posted for radiological hazards, or which has the potential to involve radiological hazards, notify the Radiological Control Point of Contact of the sponsoring project or organization. Do this before conducting any walk-down or completing hazards identification.
	b.	Notify the appropriate company environmental organization, for evaluation of environmental impact.
Facility/ System Owner	c.	Perform a walk-down of the work site and review any applicable information. Clearly define the scope of work, the hazards, potential environmental impacts, and controls to the workers assigned responsibility for conducting the emergency excavation.
Responsible Person	d.	Analyze hazards for the job as part of the work planning and execution process.
	e.	Notify applicable system/facility and utility owners and/or applicable off-site utility companies directly.
	f.	If the emergency excavation is within 100 yards of a security protected area, notify the Hanford Patrol Operations Center ( <b>373-0911</b> ).
	g.	Notify the Site Excavation Coordinator that an emergency excavation is in progress within 24 hours of beginning work.
Facility/ System Owner	h.	Ensure control of known or expected hazards, then authorize or release the emergency excavation work.
Responsible Person	i.	Conduct the excavation work in accordance with supervisory directions and safe work practices.
Facility/ System Owner	j.	Update configuration documentation for use in future excavations with as-found and as-installed information provided by the Responsible Person or Competent Person.

## 5.2 Initial Planning for Normal or Routine Excavation Work

<i>Actionee</i>	<i>Step</i>	<i>Action</i>
Responsible Person	a.	Initiate a National Environmental Policy Act (NEPA) review, which includes a <i>Request for Cultural and/or Ecological Resources Review for the Hanford Site</i> (Site Form <a href="#">RL-665</a> or equivalent). Request as far in advance as practical to allow for seasonal or biological activity considerations.
		<p><b>NOTE:</b> <i>The Hanford Tank Farms have received an exclusion from Cultural Resources Review requirements. The exclusion covers new construction and maintenance within the 18 fenced tank farms and within ~492 feet of those areas. It also excludes modifying, adding, or removing mobile trailers in those areas. This exclusion was granted in Battelle letter number 9405630, dated August 16, 1994. The exclusion does not include removing existing tanks or modification or demolition of permanent structures (buildings, water towers, etc.).</i></p>
	b.	Consult with the facility environmental reviewer to determine what environmental documentation is required for the proposed excavation by completing an <i>Environmental Activity Screening form (Form #?) or equivalent</i> (refer to applicable company procedures).
	c.	Consult with a qualified Radiological Work Screener or owning project/activity Radiological Work Planner/Engineer to determine the appropriate radiological controls required for the proposed excavation work.
	d.	Determine proximity of the excavation to existing waste sites by contacting the Environmental Information Systems group (call 375-WIDS), the Stewardship Information System (SIS) (call 372-9207), or by querying the Qmap tool on the Hanford Intranet ( <a href="http://www.rl.gov/qmap">www.rl.gov/qmap</a> ).
		<p><b>NOTE:</b> <i>Contacting the facility Environmental Compliance Officer (ECO) or delegate for assistance may be helpful.</i></p>
	e.	Determine if the intended excavation work is conducted within 20 feet of existing groundwater wells to avoid causing damage and the potential for regulatory non-compliance issues. Consult with the applicable ECO or the Groundwater/Vadose Zone group (376-5660 or 373-3994) for guidance on controlling work near groundwater wells.
	f.	Request a geophysical evaluation/scan. Provide the surveying or scanning organization with a copy of the composite sketch to aid in locating existing utilities. Request refreshed ground markings during excavation activities, as required.

<i>Actionee</i>	<i>Step</i>	<i>Action</i>
Geophysical Evaluation/ Scanning Services	g.	<p>Scan area to be excavated, identify and mark underground obstructions on the ground and on paper, or electronically as requested by the project, to be included in the work package.</p> <p>Geophysical evaluation or scanning information are a part of the applicable work package and shall be made available to workers at the excavation site for reference use. Use appropriate ground marking color codes specified by the American Public Works Association (APWA 1997). The use of an alternative color code system is permissible only if clearly noted on the scan report (Refer to <a href="#">Appendix C</a>).</p> <p>Written justification for not requiring a geophysical evaluation/scan shall be approved by the Facility/System Owner, Technical Representative, or as required by the company and Safety Representative. The approved document shall be included in the job hazard analysis or the work package.</p> <p>Examples of ground scan exemptions may include:</p> <ol style="list-style-type: none"> <li>1. Characterization or stabilization activities on known radiation waste sites (such as ponds, cribs, ditches).</li> <li>2. The 600 Area where no underground lines exist.</li> </ol>
Responsible Person	h.	<p>Identify the need for an excavation permit. (See Excavation Process Flow, <a href="#">Appendix A</a>, for information to aid in this identification.)</p>

**5.3 Excavation Permit Preparation**

1. Exceptions:

An excavation permit is required for all excavations, with the following exceptions:

- Hand digging or vacuum excavation that is outside of culturally sensitive areas and less than 12 inches deep.
- Annual cutting and maintenance of firebreaks, performed inside protected areas as authorized by the Hanford Fire Department (HFD). This authorization shall be in accordance with annual pre-fire planning conducted between Pacific Northwest National Laboratory (PNNL) and the HFD.
- Leased and permitted land, easements, and right-of-ways on the Hanford Site that are under the control of state agencies, private companies, or public utilities, unless directed by DOE to use a permit.
- Excavation is determined to be an emergency in nature (see [Section 5.1](#) for a more detailed explanation).

2. Excavation Permit Waiver:

Occasionally it may be appropriate to request a waiver from the excavation permit process for excavations in areas that have been controlled by a single project. A geophysical evaluation/scan and engineering drawing research of the excavation area shall be done prior to requesting a waiver.

Written justification for not requiring an excavation permit must be approved by the Facility/System Owner, or Technical Representative, or as required by your company. The approved document must be included in the job hazard analysis or the work package.

Examples of waivers previously granted include:

- Tilling of soil for revegetation purposes
- Maintenance of roads, ditches, laydown areas, and parking lots that do not change the original grade or drainage
- Machine excavations within tank farm fences that include a hazard evaluation signed by a Level 1 Manager

3. Initiating the excavation permit

<i>Actionee</i>	<i>Step</i>	<i>Action</i>
Company Excavation Coordinator	a.	Provide interface between Site Excavation Coordinator and company personnel involved with work covered by this procedure.
	b.	Provide advice to Responsible Person on need to obtain excavation permit.
	c.	Provide direction to originating person on how to fill out and obtain approvals on the excavation permit or perform these responsibilities.
Permit Originator/ Responsible Person	d.	Initiate preparation of the <i>Hanford Site Excavation Permit</i> (see <a href="#">Appendix D</a> and Site Form A-7400-373) and an associated work package as required by the work control process. Call the Hanford Site Excavation Coordinator (see <a href="#">Hanford Site Excavation Safety Program Web Site</a> for contact information) and request the <i>Hanford Site Excavation Permit</i> number.
	e.	Obtain or prepare a composite sketch (or line-crossing list with facility drawings) of the intended excavation area, including excavation boundaries, identifying existing buried utilities/systems within a given area. Identify the location and ownership of utilities (e.g., electrical, water, sewer, etc.), Waste Information Data System (WIDS) sites, or other underground installations that may be encountered during excavation work.
Site Excavation Coordinator	f.	Log and issue the <i>Hanford Site Excavation Permit</i> number.

4. Confirming the accuracy of permit data, drawing research, subsurface interferences, and obtaining review concurrence.

<i>Actionee</i>	<i>Step</i>	<i>Action</i>
Responsible Person	<ol style="list-style-type: none"> <li>a.</li> <li>b.</li> <li>c.</li> <li>d.</li> <li>e.</li> <li>f.</li> </ol>	<p>Notify utilities owners of intent to perform excavation activities. Provide utilities owners with a composite sketch of excavation area and request identification of utility lines in area of excavation.</p> <p>Ensure proper identification of underground objects within area of jurisdiction on the composite sketch.</p> <p>Ensure that a qualified Radiological Work Screener or owning project/activity Radiological Work Planner/Engineer screens the excavation work scope to ensure that the appropriate radiological controls are implemented for the known or potential radiological hazards. (Refer to your applicable Radiological Control practices).</p> <p>Perform a physical walk-down of the excavation area, involving the appropriate excavation work team and utility personnel as necessary. Observe work area conditions, completed scan interference markings, status of nearby systems, other job coordination, or interface issues.</p> <p>Ensure that a job hazard analysis of the excavation work scope and all associated activities is in development.</p> <p>Obtain applicable <a href="#">Hanford Site Excavation Permit</a> signatures for review/concurrence (Permit Blocks 10 through 25), as explained in the <i>Hanford Site Excavation Permit</i> form instructions and detailed in Appendices <a href="#">D</a> and <a href="#">E</a>.</p> <p><b>NOTE:</b> <i>Additional signatures may be necessary or required by results from hazard analysis and controls information, or as directed by the Site Excavation Coordinator or Company Interpretive Authority. <a href="#">Hanford Site Excavation Permit</a> signatures confirm that reviews of composite maps, excavation permit data, hazard controls, and other work documents/permits reflect acceptable conditions and that the work can be completed safely in consideration of their respective discipline or area of expertise.</i></p> <p>When excavation depth exceeds 20 feet, obtain <a href="#">Hanford Site Excavation Permit</a> signature from a Registered Professional Engineer (RPE) to ensure proper protective systems are designed/installed.</p> <p><b>NOTE:</b> <i>29 CFR 1926.652 (Appendices A, D, and E), manufacturer specifications, other tabulated data, or design approved by an RPE are used for shoring or shielding support systems.</i></p>

- h. Ensure to properly identify and contact the appropriate site, building, facility, or waste site owners of known or suspected underground interferences (structures and utilities). Verify ownership with appropriate site utilities or manager of nearby facilities.

**NOTE:** Give consideration to the possibility of tie-ins to/from adjacent buildings or areas. Ownership of buried utility lines may be the responsibility of either Site Utilities or of nearby affected facilities.

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|--|---|
| Permit Reviewers                             | <ul style="list-style-type: none"> <li>i. Incorporate all review comments onto <a href="#">Hanford Site Excavation Permit</a> form (Block 8) or include as attachments.</li> <li>j. Review all historical and current configuration documentation for area of discipline expertise in relation to the geographical location being excavated.</li> <li>k. Verify that reference documents and drawing numbers are properly noted on the <a href="#">Hanford Site Excavation Permit</a> and attached as appropriate.</li> <li>l. Verify that location of items on composite sketch matches information provided to the Responsible Person and/or ground scan/field walk-down information.</li> <li>m. If needed, inspect the proposed excavation job site to physically review and confirm field locations of interferences, markings, and hazard controls to ensure they coincide with configuration documentation.</li> <li>n. Indicate on the permit any special controls, requirements, prerequisites, etc., including notification points-of-contact with phone numbers, as appropriate. Sign and date excavation permit form in the appropriate block.</li> <li>o. Assist the Responsible Person or the scanning organization, as necessary, to locate and visibly mark the underground structures within your discipline, area of expertise, or jurisdiction.</li> <li>p. Assist the Responsible Person in resolution of conflicts between as-located items and configuration documentation, as well as conflicts of ownership for system status.</li> </ul> |
| Permit Originator/ Responsible Person        | <ul style="list-style-type: none"> <li>q. Contact required <i>Hanford Site Excavation Permit</i> reviewers for final reviews and signatures if (1) changes to the excavation permit will expand the scope of work or excavation dimensions, or (2) changes or corrections to the work site may affect their previous reviews or instructions.</li> <li>r. Ensure that a Competent Person has been assigned to the excavation activity, as applicable.</li> </ul>  |
| Facility/ System Owner or Responsible Person | <ul style="list-style-type: none"> <li>s. When excavations are performed within or adjacent to an active or deactivated facility or waste site, the person responsible for the facility shall review and sign the excavation permit. If excavation will be in proximity to multiple facilities, this signature block may have several approvals.</li> </ul>   |

Responsible Manager t. Perform the final review and concurrence for the [Hanford Site Excavation Permit](#) in signature Block 25, assuring that the *Hanford Site Excavation Permit* has been completed satisfactorily and that safe work is achievable.

Responsible Person u. In the upper right corner of the *Hanford Site Excavation Permit*, enter the “Latest Start Date.” If the excavation does not begin by the “Latest Start Date,” obtain a review and concurrence from the facility/system owner and any affected utilities, to verify that no configuration changes have been made, prior to beginning work. Re-signing and re-dating blocks on the first page will document concurrence.

**NOTE:** *This date should be no more than 90 calendar days from the date of the last signature. The 90-day time limit ensures the most current information is used when releasing the work.*

If the activity was started but was stopped/delayed for more than 90 days, obtain a review and concurrence from the facility/system owner and any affected utilities prior to resuming work. This review is not required for long term projects that have clearly maintained control of the work area. Long term projects that extend beyond 12 months shall have the project Responsible Person review the excavation permit annually and revise as necessary. The review and excavation permit form shall document any scope changes or support utilities added during the activity. Re-signing and re-dating blocks on the first page will document concurrence.

v. Ensure a copy of the completed excavation permit is provided to the Site Excavation Coordinator and any company document control service if required by the individual contractor’s procedures.

**5.4 Performing Excavation Work**

1. Confirming readiness to work.

<i>Actionee</i>	<i>Step</i>	<i>Action</i>
Responsible Person	a.	Review the work package (as defined in <a href="#">Appendix B</a> ) to ensure compliance with specified construction windows, time limits, or operating schedules as applicable.  <b>NOTE:</b> <i>For example, some biological/ecological reviews are only good for a certain number of months and must be redone. There may also be time frames specified during which excavation cannot be performed due to the presence of interim/temporary biological concerns or issues.</i>
	b.	Ensure the work package correctly identifies the excavation work scope as defined in the <a href="#">Hanford Site Excavation Permit</a> , as applicable.
	c.	Contact the free public Underground Utility Locate <b>1-800-424-5555</b> (Utility

<i>Actionee</i>	<i>Step</i>	<i>Action</i>
		<p>Notification Center) or access the web site (<a href="http://www.callbeforeyoudig.org">http://www.callbeforeyoudig.org</a>) a no less than two (2) and no more than 10 workdays prior to starting excavation work. Notification will allow the Utility companies (telecommunication cable company, Benton PUD, and natural gas company) time to physically locate and mark their lines and identify any underground interference. Requester should be prepared to provide the following excavation location coordinate information to Notification Center representative:</p> <ol style="list-style-type: none"> <li>1. Identify the locate service is for the Hanford Nuclear Reservation in south-central Washington State,</li> <li>2. Provide survey GPS latitude/longitude coordinates (either NAT 27 or 83) if possible or Township, Range, Section, (reference <a href="#">Appendix F</a> - Site Map Provided by MSA Mapping Services) to the representative.</li> <li>3. Record the assigned service request number on the excavation permit form.</li> </ol> <p><b>NOTE:</b> <i>Utility locate is a Washington State Law (reference RCW 19.122.030, web-link: <a href="#">One-Number Locate Service</a> .) “The notice shall be communicated to the owners of underground facilities not less than two business days or more than ten business days before the scheduled date for commencement of excavation, unless otherwise agreed by the parties”.</i></p> <p><b>NOTE:</b> It is recognized that utility coordination can be an effective method for advance planning and design purposes. However, advance planning and design efforts do not eliminate the utility locate request and associated timing requirements noted above.</p> <ol style="list-style-type: none"> <li>d. Make direct contact with the affected onsite organizations a minimum of 24 hours before excavation begins, (e.g., facility/system owners, emergency services, and building occupants). If affected organizations are within an operational plant, make direct notification with Operations Center/Shift Office for the respective plant.</li> <li>e. Verify that completed scan ground markings remain visible. If markings have diminished or are not visible, request scanning services reapply ground markings.</li> <li>f. Erect excavation warning systems (barricades, signs, etc).</li> </ol>

2. Releasing excavation work.

<i>Actionee</i>	<i>Step</i>	<i>Action</i>
Facility/ System Owner or Responsible Manager	<ol style="list-style-type: none"> <li>a.</li> <li>b.</li> </ol>	<p>When applicable physically review the <a href="#">Hanford Site Excavation Permit</a> ground scan data and field markings (such as "locates").</p> <p>Establish expectations for maintaining excavation area and interference markings.</p>

<i>Actionee</i>	<i>Step</i>	<i>Action</i>
	c.	Ensure the facility/system is in proper configuration to support excavation safety, including lockout/tagout requirements.
	d.	Authorize or release excavation work through formal work control processes only after ensuring requirements for safe and environmentally protective boundaries are established.

3. Beginning excavation work and establishing protective systems.

<i>Actionee</i>	<i>Step</i>	<i>Action</i>
Responsible Person	a.	Ensure any required locks and tags are in place and underground hazardous energy sources (e.g., electrical, mechanical, chemical) are physically verified as isolated and controlled (e.g., safe to work check). Refer to DOE-0336, Hanford Site <i>Lockout/Tagout Procedure</i> .
	<b>NOTE:</b> <i>All excavations that have the potential for radiological hazards are to be properly controlled to ensure worker protection.</i>	
	b.	Ensure that the building or facility operations work release has been provided to proceed with the excavation.
	c.	Ensure that when an excavation activity is 4 feet or greater in depth, a Competent Person is assigned. If conditions warrant, Competent Person involvement may be assigned at depths less than 4 feet..
Competent Person	d.	Conduct a pre-job meeting to assure that affected excavation workers, including mechanical equipment operators, are briefed on all requirements and special conditions in the excavation area. Discuss shoring and other protective systems.
	e.	Implement the requirements of this procedure and the requirements of 29 CFR 1926 Subpart P (Excavations). Be able to recognize and abate potential hazards associated with the excavation. Halt any operation in the event of an emergency, to correct unsafe work practices, or to initiate corrective action(s).
	f.	Conduct daily excavation area inspections in active excavation areas and maintain inspection logs. Daily inspections are not needed in areas where work will not be performed on or in the excavation that day (areas within the excavation permit that are on hold waiting for sample results, etc., and when no personnel are accessing the area). Increase frequency when conditions change due to rainstorms or other hazard-creating conditions.
	<b>NOTE:</b> <i>The Daily Excavation/Trenches Safety Inspection Log (Site Form <a href="#">A-6001-937</a>-or equivalent) may be used.</i>	
	g.	Determine and direct the installation of protective system methods (benching, sloping, shoring, and shielding) where the excavation depth is planned to exceed 5 feet or if the potential for cave-in otherwise exists at lesser depths.

<i>Actionee</i>	<i>Step</i>	<i>Action</i>
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Responsible Person

- h. Ensure that selection of protective shoring and shielding systems is in accordance with manufacturer's instructions, engineered designs, or in accordance with 29 CFR 1926.652 *Requirements for Protective Systems*. Engineered approved drawings for timber shoring used on the Hanford Site are located in [Appendix G](#).
- i. Contact Electrical Utilities, to perform a site visit if the excavation work will be performed within 25 feet of overhead power lines. Based on the site visit, ensure to exercise controls for any potential exposure of excavating machinery to energized overhead power lines. Evaluate any unplanned damages, injury, releases, etc., for input to the reporting of occurrences.

**NOTE:** Safe working distances from overhead power lines:

	Vehicles in Transit	Vehicles Performing Work	Cranes in Transit	Cranes Performing Work
Communication Wire	Avoid Contact	Avoid Contact	Avoid Contact	Avoid Contact
50-750 v	4 feet	10 feet	4 feet	10 feet
2.4-13.8 kV	4 feet	10 feet	3 feet	10 feet
115 kV	3 feet, 2 inches	12 feet, 2 inches	10 feet	15 feet
230 kV	10 feet	16 feet	10 feet	20 feet
500 kV	19 feet	25 feet	19 feet	25 feet

- j. Contact the BPA liaison for excavations within 50 feet of BPA power lines. Go to the [web site](#) for contact information.
- k. Place barriers and signs at excavation openings to prevent exposure to co-located personnel and passersby, and ensure that wells, pits, and shafts are barricaded (at a minimum of 6 feet back from the edge) or covered.
  - l. Protect workers from exposure to vehicular traffic.
- m. Ensure fall protection (barricades, guardrails, etc.) is provided when employees are exposed to a fall hazard that is 6 feet or greater. Fall protection is not needed for excavations with a slope of 1.5/1 or greater.
- n. Request the performance of radiological surveys and monitoring of soils or other materials, including potentially contaminated piping exposed by excavation, as required by the excavation permit, Radiological Work Permit, or work instructions.
- o. Establish and implement safe work practices before entry is made into an excavation that has been determined to be a confined space.
- p. Address expectations for maintaining markings in appropriate controlling documents such as work packages, specific contract language in construction specifications, etc.

Actionee	Step	Action
	q.	<p>Comply with the following measures to prevent accidental damage or disturbance of utility or underground obstruction when machine excavating.</p> <ol style="list-style-type: none"> <li>1. Ensure the review of scan data including facility drawings and underground obstructions identified and evaluated for protective measures.</li> <li>2. Use only hand digging, vacuum guzzler, or other non-mechanical means within 5 feet of suspected transfer lines.</li> <li>3. Prior to commencing machine excavation where subsurface obstructions are anticipated or identified on a subsurface scan/geophysical evaluation report, use a non-mechanical potholing technique to locate and expose the obstruction. For this application, a vacuum guzzler or hand digging may be used. Use of picks, breaker bars or any other sharp-tipped instruments is not permitted. Such technique(s) shall be used at a sufficient number of locations to verify the horizontal and vertical position of the obstruction. Completion of the potholing process(es) shall be documented with the written verification maintained on the work site as part of the work authorization/pre-job planning documents. Communicate the potholing documentation to the designated excavation/trenching Competent Person(s) and employees prior to performing additional excavation activities.</li> </ol> <p><b>EXCEPTION:</b> <i>If use of potholing has the potential to create a greater physical hazard or risk to employees, written authorization for excavating mechanically prior to potholing shall be obtained from the responsible Construction Manager or Facility Manager.</i></p> <p><b>NOTE:</b> <i>In areas determined to have potential radiological contamination, potholing may be performed using a guzzler controlled as a Radiological Control Vehicle (RCV).</i></p> <ol style="list-style-type: none"> <li>4. Use only hand digging or other non-mechanical means when within 5-feet (or greater if specified by the utility owner) of exposed active or potentially active underground utilities. <ol style="list-style-type: none"> <li>a. Mechanical excavation may commence within 5-foot boundary, up to within 2-feet of the obstruction, only after written permission from the utility owner and/or the Project Manager is obtained. Maintain authorizations in the associated work authorization and pre-job planning documents on the work site.</li> </ol> <p><b>Exception:</b> <i>When a non-contaminated utility is known, located, and isolated, according to DOE-0336 or an air-gap is performed, and the utility will be removed, partially removed, or abandoned in place, then mechanical equipment may be used within the 5-foot boundary.</i></p> </li> <li>5. Once the active underground utility is located, establish and place a physical barrier where hand-digging or other non-mechanical means are required from either side of the obstruction to maintain the safe work boundary for mechanical excavation. This barrier must be capable of</li> </ol>

Actionee	Step	Action
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withstanding environmental conditions, without failing/degradation. The use of paint or tape (for markings) as a barrier is not acceptable.

*Exception: A physical barrier is not required when a non-contaminated utility is known, located, and isolated, according to DOE-0336 or an air-gap is performed, and the utility will be removed, partially removed, modified, or abandoned in place.*

6. Utilize a spotter, in direct communication with the equipment operator, if machine excavating within 5 feet of an active or potentially active underground utility. The spotter shall not perform spotting duties for more than one equipment operator at a time and may not perform any other duties.

**NOTE:** *The method of communication must take into account needs for enhanced spotter visibility and potentially high noise levels common with heavy equipment operation.*

- r. Comply with the following measures to prevent accidental damage or disturbance to underground utilities/obstructions when hand digging.

1. Ensure the review of scan data including facility drawings and underground obstructions identified and evaluated for protective measures.
2. Direct-buried electrical cables shall be de-energized and put into a safe condition prior to performing any excavation activity within 5-feet of the utility. If it is not known if the utility is direct buried, protected by conduit, or encased in concrete, it shall be treated as direct buried.

*Exception: Hard, dense soils where conventional hand excavation tools are not effective may require the use of hand held power equipment. These methods have the potential to damage conduit and energized cables must be de-energized.*

3. Where it has been determined that de-energizing direct buried cables is impractical or creates a greater hazard, only hand digging is permitted within 5 feet of the utility and the following safety precautions shall be followed:
  - a. Use only non-conductive hand tools (e.g., shovel with fiberglass handle), vacuum excavation, or an air lance to loosen soils. Use of picks, breaker bars, or any other sharp tipped instruments is not permitted.
  - b. Use properly rated electrical protective, insulated gloves per the appropriate ASTM D120, Standard Specification for Rubber Insulating Gloves. Refer to [Appendix H](#) for User Guide Checklist for Insulating Rubber Gloves.

<i>Actionee</i>	<i>Step</i>	<i>Action</i>
		<ul style="list-style-type: none"> <li>c. Ensure that a qualified person trained in Cardio Pulmonary Resuscitation (CPR), First Aid, and emergency electrical practices during excavation is in the vicinity of live electrical power sources.</li> <li>d. Periodically verify suspected cable locations with hand-held detection equipment or other acceptable means of locating utility installations.</li> <li>e. Ensure that a qualified electrical worker is assigned to handle any direct buried cable that cannot be de-energized or needs to be moved.</li> <li>f. Mark energized direct buried electrical cable uncovered by excavation with red “Danger” tape and protect cable from damage.</li> </ul>
		<ul style="list-style-type: none"> <li>s. If unidentified field conditions or deviations between the composite map and existing drawings are discovered during excavation, stop work, then notify the Technical Representative (TR) and obtain approval before proceeding.</li> </ul> <p><b>NOTE:</b> <i>Deviations include unrecorded and misrecorded utilities, as well as expected items that are not found.</i></p> <ul style="list-style-type: none"> <li>t. If a suspect waste site (discovery sites) or existing waste sites are disturbed unintentionally during excavation, stop work, and report immediately to the Facility/System Owner or project environmental compliance contact.</li> </ul>
Equipment operator	u.	Excavate in accordance with the work package.
4. Completion of excavation activity.		

<i>Actionee</i>	<i>Step</i>	<i>Action</i>
TR	a.	If backfilling is not part of the work scope, skip to step e.
	b.	Ensure that there is no physical damage to exposed installations and that the installations are properly supported to prevent subsequent damage from backfilling.
	c.	Install or replace equipment or installation identification marking or identification tape, as required.
	d.	Coordinate backfilling activities with the removal of protective and support systems.
	e.	If no installations are to be retained, then skip to step h.
	f.	Notify facility/system owner(s) of any deviations between what was actually found and/or installed, and configuration indicated on drawings or in work

<i>Actionee</i>	<i>Step</i>	<i>Action</i>
Permit Reviewers or Facility/System Owner	g.	Update configuration documentation (drawings) for use in future excavations with as-found and as-installed information, provided by the Responsible Person or Competent Person.
Site Excavation Coordinator	h.	Note that the permit is completed. Scan the copy of the permit and save in the shared area.

**6.0 FORMS**

[Daily Excavation/Trenches Safety Inspection Log, A-6001-937](#)

[Environmental Activity Screening Form, A-6003-727 or equivalent](#)

[Hanford Site Excavation Permit, A-7400-373](#)

*Request for Cultural and/or Ecological Resources Review for the Hanford Site, [RL-665](#) or equivalent*

**7.0 RECORD IDENTIFICATION**

Performance of this process generates the following records as applicable. Records are maintained in accordance with contractor records management processes.

**Records Capture Table**

<b>Name of Document</b>	<b>Submittal Responsibility</b>	<b>Retention Location</b>
Hanford Site Excavation Permit	Responsible Person, Facility/System Owner	Project File/Work Package
Geophysical Evaluation	Responsible Person, Facility/System Owner	Project File/Work Package
Daily Excavation/Trenches Safety Inspection Log	Responsible Person, Facility/System Owner	Project File/Work Package
Environmental Activity Screening (EAS) form or Natural Resources Disturbance/Excavation Checklist or equivalent.	Responsible Person, Facility/System Owner	Project File/Work Package
Cultural and/or Ecological Resource Review	Responsible Person, Facility/System Owner	Project File/Work Package

## 8.0 REFERENCES

10 CFR 851, “Worker Safety and Health Program,” *Code of Federal Regulations*, as amended.

29 CFR 1926, Subpart P, “Excavations,” *Code of Federal Regulations*, as amended.

ANSI/ASTM D120-02, *Standard Specification for Rubber Insulating Gloves*.

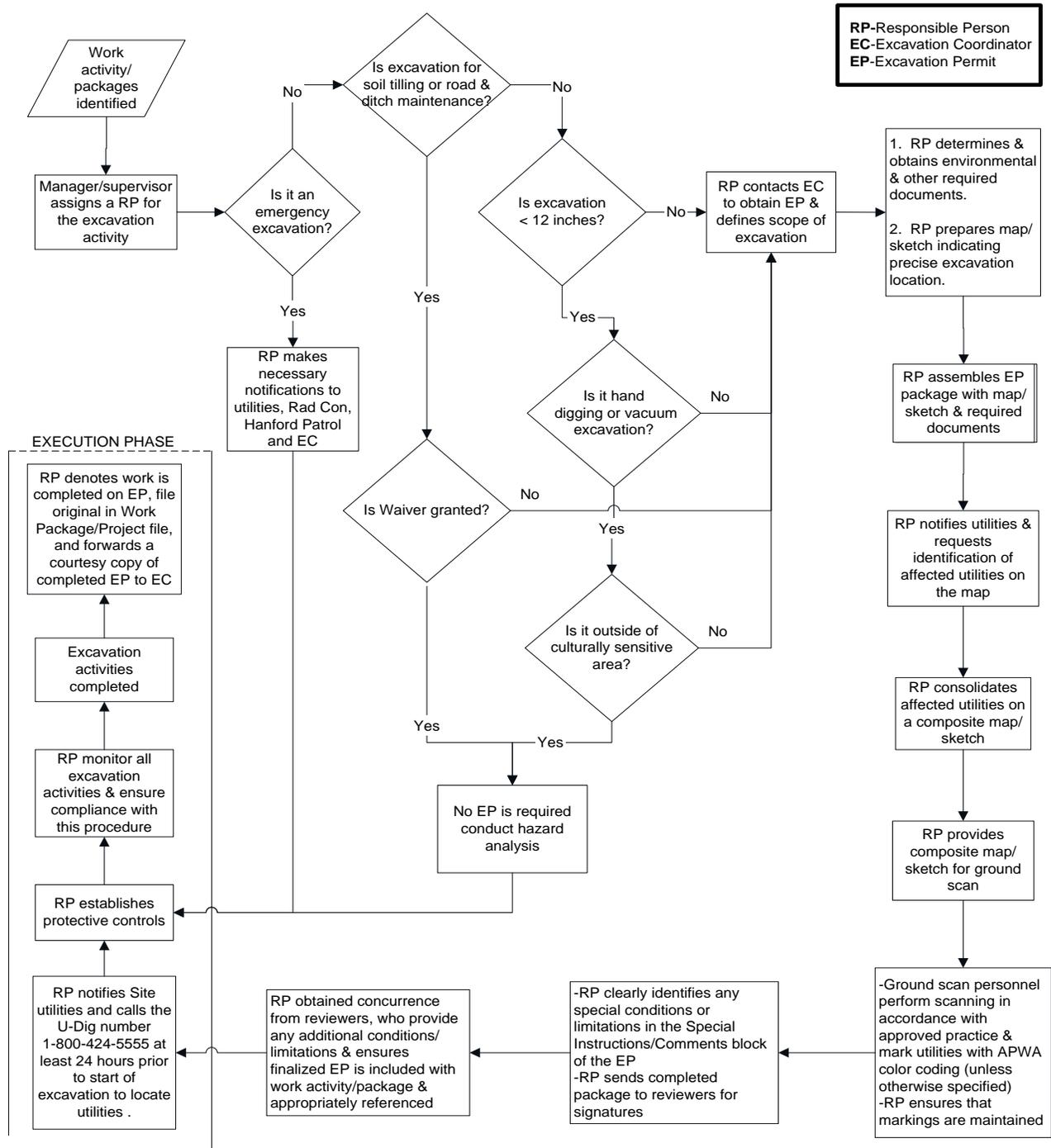
APWA 1997, *Excavator’s Damage Prevention Guide*, American Public Works Association.

DOE-0336, *Hanford Site Lockout/Tagout*, U.S. Department of Energy, Richland Operations Office.

[DOE M 450.4-1](#), *Integrated Safety Management System Manual*, U.S. Department of Energy.

Revised Code of Washington (RCW) 19.122, *Underground Utilities*.

APPENDIX A: Excavation Process Flow



## APPENDIX B: Definitions

Term	Definition
<b>Benching</b>	A method of protecting employees from cave-ins by shaping the sides of an excavation to form one or a series of horizontal levels or steps, usually with near-vertical surfaces between levels.
<b>Competent Person</b>	A person capable of identifying existing and predictable hazards in the surroundings, or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them. See <a href="#">Appendix I</a> for list of requirements and duties.
<b>Company Excavation Coordinator</b>	The individual(s) assigned company-wide responsibility as the initial and continuing point-of-contact for excavation requirements and related matters, such as maintaining a permit logging system, managing an excavation web site, coordinating multi-contractor work interfaces, and providing technical guidance when necessary or requested.
<b>Composite Sketch</b>	A collection of data or drawings that depict the excavation area identified or potential excavation interferences. This may include drawing research, interviews, aerial photographs, and scan data. The composite sketch evolves throughout the excavation permitting process, beginning as a sketch showing the location of the excavation, and ending as a sketch showing the location with all nearby interferences (utilities, wells, waste sites, etc.).
<b>Cultural/Ecological Resources Review</b>	A review of the biological, cultural and ecological resources of an area (e.g., plants, animals) and potential impacts to those resources due to a proposed activity. This may include a review of archaeological, historical, or paleontological resources of identified areas.
<b>Excavation</b>	Any man-made cut, cavity, trench, or depression in an earth surface, formed by earth removal. Subsurface penetrations (e.g., installing ground rods, trailer anchors, etc.) are considered to be excavations for the purpose of this procedure.
<b>Excavation Permit</b>	A permit used to document the excavation location, reason for the excavation-related work, package or project number, and required drawing changes. It also documents conditions for, and review/acceptance of, the excavation activities.
<b>Facility/System Owner</b>	A person responsible for a facility or a system, i.e., Plant or Utility manager.
<b>Hanford Site</b>	For the purposes of this procedure, Hanford Site refers to all lands controlled by the U.S. Department of Energy (DOE).
<b>National Environmental Policy Act (NEPA) Documentation</b>	Documentation (e.g., Site-Wide Categorical Exclusion, Environmental Assessment) that identifies potential environmental impacts that could result from a planned activity.

Term	Definition
<b>Permit Originator</b>	<p>The individual assigned responsibility for identifying the need for an excavation. Typically, this is:</p> <ol style="list-style-type: none"> <li>1. <u>Force Account Work</u>. Construction manager, construction superintendent, or construction engineer.</li> <li>2. <u>Contractor Work</u>. Contract field engineer or project manager.</li> <li>3. <u>Maintenance/Facility Work</u>. Technical Representative, Person-In-Charge (PIC), or planner.</li> </ol>
<b>Potholing</b>	<p>Use of non-mechanical techniques, such as hand digging or use of a vacuum extractor (guzzler or similar) at a sufficient number of locations to verify both horizontally and vertically the position of an obstruction.</p>
<b>QMap</b>	<p>QMap (Query Map) is a web based geospatial data portal that is a shared resource for use by all the Hanford Contractors. It can be accessed on the Hanford Intranet (<a href="http://environet.rl.gov/qmap/">environet.rl.gov/qmap/</a>). Map additions and corrections are updated regularly. QMap has replaced the Hanford Atlas.</p> <p>All HLAN (Hanford local area network) users can view the General Access Map. A more detailed map set is also available on QMap. Security issues require users be provided official access to the detailed mapping tools. Official access can be requested by calling the Environmental Information Systems group (375-WIDS) or by selecting the "Request" button on the QMap main mapping page. A list of QMap Points of Contact is on the QMap Home Page.</p>
<b>Registered Professional Engineer</b>	<p>A person who is registered as a professional engineer in the state where the work is to be performed.</p>
<b>Responsible Manager</b>	<p>The person that determines the need for the excavation and can authorize the work.</p>
<b>Responsible Person</b>	<ol style="list-style-type: none"> <li>1. Planning Activities. The designated individual(s) who initiates and coordinates the development or revision of a work package, including the excavation permit.</li> <li>2. Field Work Activities. Depending on the organization performing the work, this function is typically called a Field Work Supervisor (FWS), Person-In-Charge (PIC), Construction Engineer, Construction Superintendent, or Construction Field Engineer. Within this procedure, the term "Responsible Person" is used generically to refer to this designated person. In some cases, when appropriately trained and qualified, the Responsible Person may also be assigned as the Competent Person (see <a href="#">Appendix I</a> for duties).</li> </ol>

Term	Definition
<b>Site Excavation Coordinator</b>	The single individual assigned site-wide responsibility as the initial and continuing point-of-contact for excavation requirements and related matters, such as maintaining a permit logging system, managing an excavation web site, coordinating multi-contractor work interfaces, and providing technical guidance when necessary or requested. Maintains a list of Company Excavation Coordinators; a list of contacts for permit review and concurrence, referenced by Hanford Site area; the Hanford Site Excavation Safety Program Web site.
<b>Survey/Scanning Group</b>	Organization that provides qualified personnel to operate ground penetrating radar or other forms of geophysical evaluation/scanning equipment and interpret their output.
<b>System Engineer</b>	Person technically qualified to represent the configuration of a specific system.
<b>Technical Representative</b>	<p>A person that has the authority and knowledge to authorize portions of or a complete project. This may be a Director, Manager, or any of the following examples:</p> <ol style="list-style-type: none"> <li data-bbox="474 877 1435 947">1. <u>Construction Projects</u>. This is the Technical Representative for the user/sponsor organization throughout the life of the project.</li> <li data-bbox="474 968 1435 1073">2. <u>Engineering</u>. The engineer assigned responsibility for obtaining operations, safety, and engineering approvals and permits before excavation work is started.</li> <li data-bbox="474 1094 1435 1163">3. <u>Environmental Compliance Officer</u>. This is the Technical Representative for environmental input throughout the life of the project.</li> </ol>
<b>Tolerance Zone</b>	The area 2 feet or 5 feet from the outside dimensions of all sides of the underground utility, for locating and marking the underground utility.
<b>Trench</b>	A narrow excavation made below the surface of the ground. In general, the depth is greater than the width, but the width measured at the bottom is not greater than 15 feet. If forms or other structures are installed or constructed in an excavation so as to reduce the dimension measured from the forms or structure to the side of the excavation to 15 feet or less (measured at the bottom of the excavation) is also considered to be a trench.
<b>Work Package</b>	A package consisting of forms, documents, procedures, permits, work instructions, etc., as required by a work control process, utilized by workers to accomplish a defined task. For construction project work, the work order/project controlling document is the work package.
<b>Waste Information Data System (WIDS)</b>	A database containing information about existing waste sites. The WIDS database can be accessed via the Hanford intranet or by calling <b>375-WIDS</b> .

**APPENDIX C: Color Code and Marking Standards**

**American Public Works Association Uniform Color Code**

Red	Electric
Yellow	Gas-oil
Orange	Telephone-CATV
Blue	Water
Green	Sewer
Pink	Survey
White	Proposed excavation
Purple*	Reclaimed water lines

\*This color will be used to indicate unknown linear anomalies.

**APPENDIX D: Hanford Site Excavation Permit and Instructions**

<b>HANFORD SITE EXCAVATION PERMIT</b> NOTE: Use Formal Operations Work Release to Control Work			EXCAVATION PERMIT NO.		
			LAST PERMITTED START DATE		
1. Work Package No.	2. W.O./Project No.	3. Location of Excavation			
4. Originated By/Phone		Date	5. Change Notice (ECN, DCN or FMP) Number.		
6. Drawings, Plans/Procedures Required (Identification Numbers)					
7. Description of Work (Attach composite drawing of excavation location and all known interferences)					
8. Special Instructions and Comments (Notify Site Utilities and call the U-Dig number (1-800-424-5555) at least 24 hours prior to digging. Walk down the excavation site and verify that scan marks are still visible - if not, call scanning organization to refresh marks. When anything unusual or unexpected is identified in an excavation, STOP until the discovery can be properly evaluated. Also refer to any company-specific safety procedures.)					
9. List Facilities, Services, Utilities, and Groundwater Wells Affected by Excavation					
REVIEW/CONCURRENCE: Insure Permit is Completed Acceptably and Safe Work Conditions are Achievable					
10. Design Authority / Technical Representative		Date	18. Traffic Engineer		Date
11. Environmental		Date	19. Road and Track Maintenance		Date
12. Radiological Control		Date	20. Safeguards and Security		Date
13. Steam System		Date	21. Land Use Planning/600 Area Landlord		Date
14a. Electrical Utilities (Transmission/Distribution)		Date	22. Sanitary Sewer		Date
14b. Facility Electrical Systems (Secondary)		Date	23. Facility/System Owner(s)		Date
15. Water Utilities		Date	24. Other		Date
16. Telecommunications		Date	25. Responsible Manager		Date
17. Transfer Lines & Process Sewer		Date	26. U-Dig Ticket # _____		
Contact any affected parties (such as U-Dig) at least two days prior to start of excavation.					

<b>Excavation Permit No.</b>	Call the Hanford Site Excavation Coordinator, 376-9770, to log in your permit data and receive a permit number.
<b>Last Permitted Start Date.</b>	Enter the last permitted start date for this excavation permit. This date should be no more than 90 days from the last signature. Refer to this procedure for more details.
<b>Block 1 &amp; 2</b>	Enter Work Package Number or appropriate source of funds or project number, if known.
<b>Block 3</b>	Enter brief location where excavation work is to be performed (include Section, Township, Range, and GPS Coordinates).
<b>Block 4</b>	Enter permit Originator name, phone number, and date of preparation.
<b>Block 5</b>	If excavation associated with an Engineering Change Notice or Facility Modification Package, enter ECN/ FMP Number.
<b>Block 6</b>	List drawings and plans/procedures that describe the work to be performed.
<b>Block 7</b>	Describe the purpose of the excavation work. Attach a composite map identifying each of the areas to be excavated and all known interferences in the area of excavation. NOTE: The composite map is part of the excavation permit.
<b>Block 8</b>	Enter special instructions/comments or requirements relating to the excavation.
<b>Block 9</b>	List utilities, services, facilities, and groundwater wells that will or may be affected by the excavation.
<b>Blocks 10 - 25</b>	Obtain review/concurrence from designated organizations. Refer to Appendix E of the Site Excavation Procedure. Each reviewer shall print, sign, and date.
<b>Block 26</b>	Enter the Ticket number provided when the U-Dig number (1-800-424-5555) was called.
<b>Points of Contact</b>	Web page at <a href="http://www7.ri.gov/rapidweb/excavation/index.cfm?pagenum=1">http://www7.ri.gov/rapidweb/excavation/index.cfm?pagenum=1</a> Excavation Coordinator: Dave Havens: 376-9770

The original completed Hanford Site Excavation Permit is to be maintained in the Work Package/Project file. A courtesy copy shall be provided to the Hanford Site Excavation Permit Coordinator.

**APPENDIX E: Excavation Permit Review and Approval Guidance**

The following guidance identifies the required reviewers and provides information related to contractor interfaces to assist in completing the Hanford Site Excavation Permit.

Each proposed excavation location requires an assessment of site conditions to determine the required notifications and permit approvals. If the excavation location is adjacent to an active facility (e.g., the 100-K or 300 Areas), additional steps, such as activity coordination and extra signature approvals, may be required.

**Approval Block Details**

A current list of potential reviewer names, phone numbers and fax numbers may be obtained from the Excavation Permit Coordinator or from the Excavation [web site](#).

**• Technical Representative (Block 10)**

Signature Block 10 is signed by the Technical Representative.

**• Environmental (Block 11)**

The responsible environmental contact reviews the permit for ecological and cultural compliance and for compliance with environmental regulatory requirements. Block 11 will be signed when all the items on the environmental activity screening form or equivalent have been addressed. This is a mandatory signature and cannot be determined to be "N/A."

**• Radiological Control (Block 12)**

A qualified Radiological Work Screener or owning project/activity Radiological Work Planner/Engineer shall be consulted to determine if a radiological work permit (RWP) is required for the proposed excavation. Their concurrence is noted by signing the "Radiological Control" signature block.

**• Steam Utility (Block 13)**

A permit review is required from the steam utility contractor (Excavation Permit Coordinator maintains a current list of contacts) for excavations proposed near active steam utility equipment or underground natural gas pipe lines in the 300 Area. Facility-specific steam generating plants are located inside the 200 Areas, 300 Area, and 400 Area.

**• Electrical Utilities (Transmission/Distribution) (Block 14A)**

The Hanford Site Electrical Utilities group is required to review all excavations where mechanical equipment may come within 10 feet of known energized underground and overhead lines or within 20 feet of power poles or utility equipment. A map or a sketch clearly showing the excavation location and geophysical evaluation/scan data (if applicable) will be provided to the electrical utilities representative in areas where an electrical utilities review is required. In some cases, precise coordinates may be required. The Electrical Utilities representative is responsible for the electrical transmission/distribution system. The Excavation Permit Coordinator maintains a current list of contacts.

**• Facility Electrical Systems (Block 14B)**

Secondary electrical systems owned by facilities need to be reviewed by the Facility Owner and the Contractor's Utilities group (if applicable) to identify electrical system and lines to facilitate safe work and to prevent damage to the building electrical systems. Signature indicates that secondary electrical systems are properly identified and protected from damages during excavation work. The Excavation Permit Coordinator maintains a current list of contacts.

**• Water Utilities (Block 15)**

The site water utilities or facility-specific utilities group reviews all excavations that are within 5 feet horizontally or vertically of water utility lines. A map with coordinates or a sketch clearly showing the excavation location and geophysical scan data (if applicable) shall be provided in areas where a water utilities review is required. It is possible that multiple contractor reviews may be required to address Block 15 issues.

**• Telecommunications (Block 16)**

Site telecommunications contractor reviews the Hanford Site Excavation Permit? for underground and aerial lines and communications equipment concerns. Send the form and a sketch of the excavation location to the Hanford Site telecommunications representative.

**• Transfer Lines and Process Sewer (Block 17)**

Signing the permit indicates that transfer and/or process sewer lines are identified, controlled, and protected as necessary. The web site lists the various area representatives responsible for this review. The applicable facility or system representatives shall review the permit to protect radioactive waste transfer lines, process sewer systems, and workers. (Signing the permit indicates that transfer and/or process sewer lines are identified and appropriate control measures are defined.)

**• Traffic Engineer (Block 18)**

Any excavation that will interrupt the flow of traffic, interfere with the movement of safety vehicles, inhibit emergency egress of personnel, installation of signs along road shoulder, or new access roads onto the main traffic routes shall require the notification and signature of the Hanford Traffic Safety Engineer.

**• Road and Track Maintenance (Block 19)**

Site Transportation Services reviews excavations within 25 feet of the center line of any railroad track or within 25 feet of any road base (outside edge of road shoulder). Excavations affecting railroad track may require the track to be restored to its original condition after the project is completed.

**• Safeguards and Security (Block 20)**

Hanford Site Safeguards and Security shall be notified of any excavations within, through, or adjacent to protected areas, security fences and secured facilities, or any excavations that may interfere with security alarm systems or operations of security forces.

**• Land-Use Planning/600 Area Landlord (Block 21)**

When a site evaluation is required for a construction activity anywhere on the Hanford Site, approval of the excavation permit is required by the Hanford organization assigned the responsibility of Land Management. If an excavation is planned to occur in the 600 Area, approval from the 600 Area Landlord is required.

The 600 Area Landlord is responsible for all borrow pits. A notification of intent to remove material from a borrow pit is required prior to borrow pit entry. Active borrow pits require an annual excavation permit review and concurrence for long-term projects. The 600 Area Landlord shall initial and date the permit to acknowledge ongoing activity.

**• Sanitary Sewer (Block 22)**

Site Water Utilities and the Contractor's Utilities Operations and Closure groups (if applicable) shall review excavation permits where activities are within 5 feet horizontally or vertically of sanitary sewer lines for potential interference. It is possible that multiple contractor review/concurrence may be needed to adequately address certain specially located excavations. Signature indicates that sanitary sewer systems are properly identified, isolated, controlled, or protected from damage during excavation work.

**• Facility/System Owner (Block 23)**

When excavations are performed within or adjacent to an active or deactivated facility or waste site, the person responsible for the facility shall review and sign the excavation permit. If excavation will be in proximity to multiple facilities, this signature block may have several approvals.

The Hanford Site Well Coordinator is responsible for concurring with excavations proposed within 20 feet of completed wells or the removal or modification of the access road to a completed well and to acknowledge his/her review by signing in Block 23. Comments or excavation instructions should be placed in Block 8 or included as an attachment.

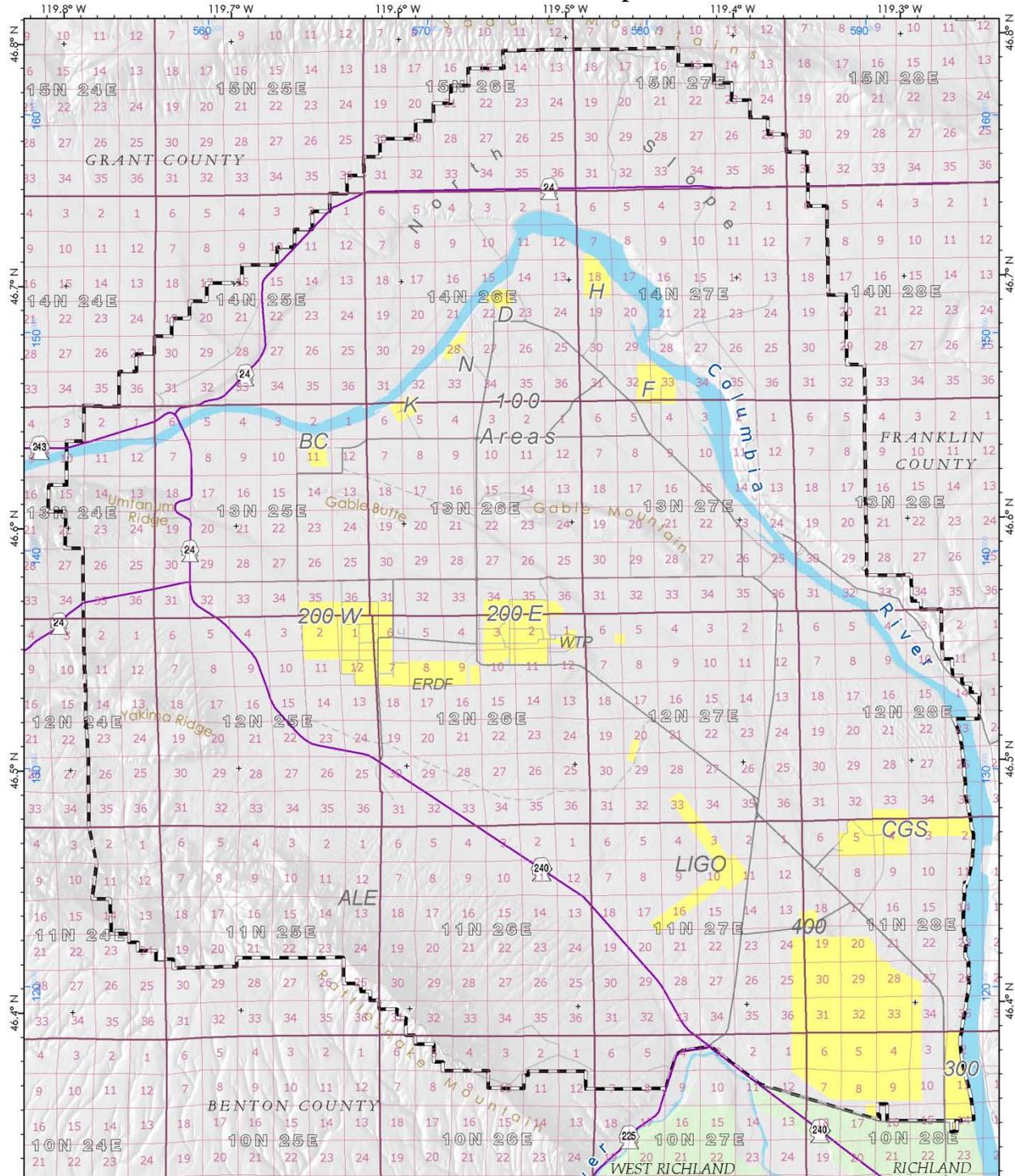
**• Other (Block 24)**

Additional signature(s) if required other than those listed in the previous blocks.

**• Responsible Manager (Block 25)**

This signature is for the Responsible Manager and is signed after all the other signatures have been obtained. This signature indicates the excavation permit has been properly completed and approved prior to performing any excavation.

APPENDIX F: Site Map



Hanford Site, Public Land Survey System

Prepared for:  
 US DEPARTMENT OF ENERGY  
 RICHLAND OPERATIONS OFFICE  
 Created by:  
 Property and Land Management  
 Mission Support Alliance, Richland, WA  
 INTENDED USE: REFERENCE ONLY  
 Projection: Lambert Conformal Conic  
 Coordinate Reference Grid:  
 Geographic Lat/Aud/L/Longitude, Decimal Degrees  
 Washington State Plane, South Zone, Meters

State Road  
 City

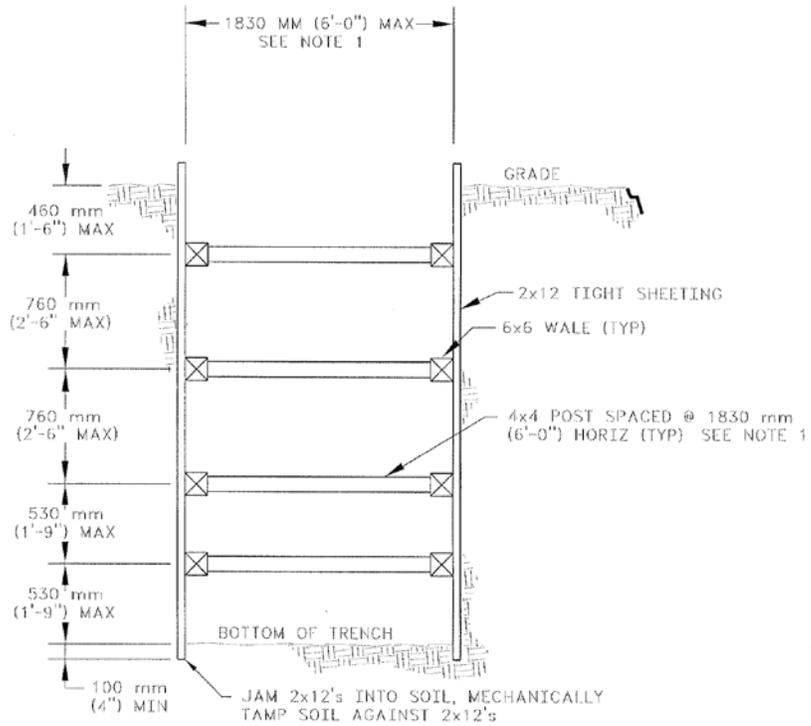


Township  
 Section  
 Hanford Site

100712\_ExcavationPLSS\_Overview\_8x11\_Rev0.mxd

APPENDIX G: Engineered Drawings

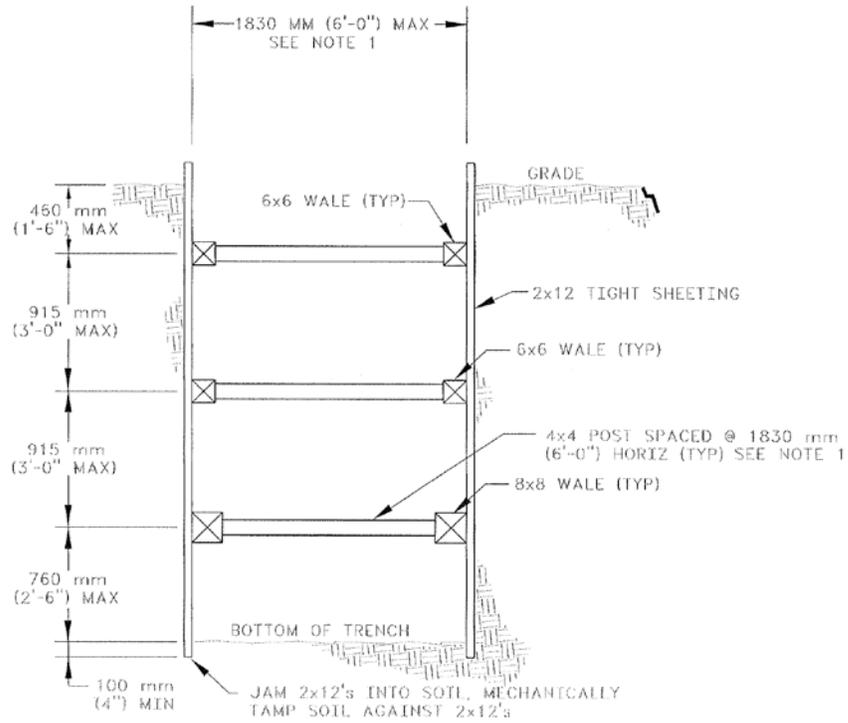
SHORING FOR TRENCHES  
 UP TO 3M (10 FEET) DEEP  
 (OPTIONAL)



NOTES

1. IN LIEU OF 4x4 POSTS, DN40 (NPS 1-1/2") PIPE WITH 32 mm (1-1/4") DIA SOLID SCREW JACKS MAY BE USED IN TRENCHES UP TO 1220 mm (4'-0") WIDE, DN50 (NPS 2") SCHEDULE 80 PIPE WITH 32 mm (1-1/4") DIA SOLID SCREW JACKS MAY BE USED IN TRENCHES UP TO 1830 mm (6'-0") WIDE.
2. 2x12's AND 4x4's SHALL BE DOUGLAS FIR NO. 2 OR BETTER.
3. 6x6's AND 8x8's SHALL BE DOUGLAS FIR NO. 1 OR BETTER.

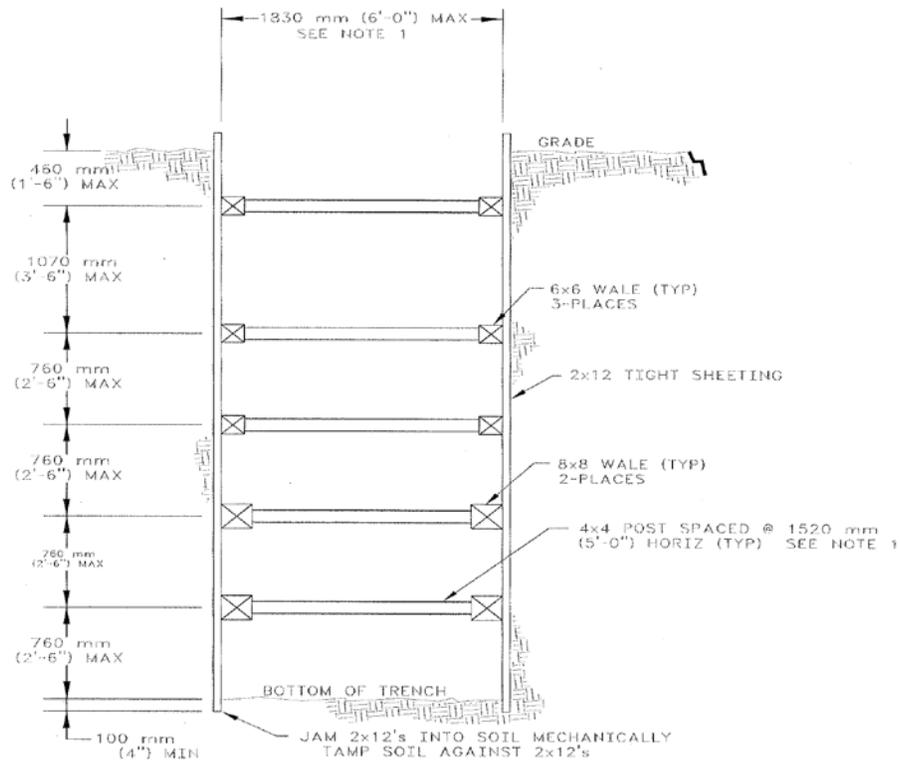
SHORING FOR TRENCHES  
 UP TO 3M (10 FEET) DEEP



NOTES

1. IN LIEU OF 4x4 POSTS, DN40 (NPS 1-1/2") PIPE WITH 32 mm (1-1/4") DIA SOLID SCREW JACKS MAY BE USED IN TRENCHES UP TO 1220 mm (4'-0") WIDE, DN50 (NPS 2") SCHEDULE 80 PIPE WITH 32 mm (1-1/4") DIA SOLID SCREW JACKS MAY BE USED IN TRENCHES UP TO 1830 mm (6'-0") WIDE.
2. 2x12's AND 4x4's SHALL BE DOUGLAS FIR NO. 2 OR BETTER.
3. 6x6's AND 8x8's SHALL BE DOUGLAS FIR NO. 1 OR BETTER.

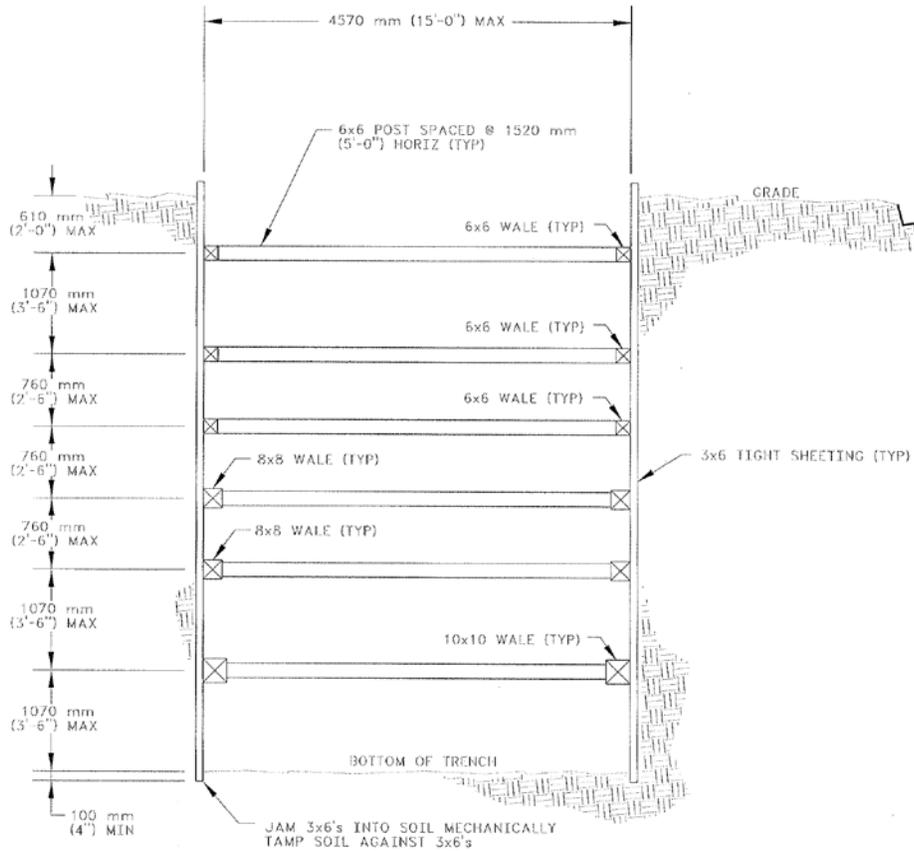
SHORING FOR TRENCHES 3M (10 FEET)  
 UP TO 4.5M (15 FEET) DEEP



NOTES

1. IN LIEU OF 4x4 POSTS, DN40 (NPS 1-1/2") PIPE WITH 32 mm (1-1/4") DIA SOLID SCREW JACKS MAY BE USED IN TRENCHES UP TO 1220 mm (4'-0") WIDE, DN50 (NPS 2") SCHEDULE 80 PIPE WITH 32 mm (1-1/4") DIA SOLID SCREW JACKS MAY BE USED IN TRENCHES UP TO 1830 mm (6'-0") WIDE.
2. 2x12's AND 4x4's SHALL BE DOUGLAS FIR NO. 2 OR BETTER.
3. 6x6's AND 8x8's SHALL BE DOUGLAS FIR NO. 1 OR BETTER.

SHORING FOR TRENCHES 4.5M (15 FEET)  
 WIDE x 6.1M (20 FEET) DEEP



NOTES

1. 3x6's SHALL BE DOUGLAS FIR NO. 2 OR BETTER.
2. 10x10's, 8x8's AND 6x6's SHALL BE DOUGLAS FIR NO. 1 OR BETTER.

**APPENDIX H: User Guide Checklist for Insulating Rubber Gloves**

This checklist is primarily intended to help ensure the safety of non-electrical workers who occasionally use insulating rubber gloves for blind penetrations, hand excavations, and other tasks where hidden energized electrical circuits may be accidentally contacted. It also may be a useful refresher for workers who receive in-depth Personnel Protective Equipment (PPE) training, in NFPA 70E, *Standards for Electrical Safety*, or similar electrical safety-related courses. This checklist should be reviewed, completed, and signed by the PPE user and the supervisor or Person-In-Charge (PIC) before using insulating rubber gloves. Those who have little or no experience with this equipment should seek assistance from a person who is trained in and knowledgeable of the use and care of insulating rubber gloves, e.g., an electrician.

**I. Manufacturer, Marking, and Voltage Ratings**

- [ ] AC voltage ratings:
- |             |          |              |         |
|-------------|----------|--------------|---------|
| 500 volts   | Class 00 | 17,000 volts | Class 2 |
| 1,000 volts | Class 0  | 26,500 volts | Class 3 |
| 7,500 volts | Class 1  | 36,000 volts | Class 4 |
- [ ] Cuff marked with manufacturer's name, ANSI/ASTM D 120, type, class, and size.
- [ ] Marked with date of issue by Electrical Utilities (EU) or manufacturer's test date.

**II. Inspection and Testing**

- [ ] Verify PPE is within retest period (no more than 6 months from date on gloves).
- [ ] Visually inspect for cracks, holes, tears, rough spots, and other visible defects. Pay special attention to working area of gloves – palm, fingers, and thumb. **Do not use damaged gloves!**
- [ ] If contrasting colors (two-colored layers) are seen during examination, gloves are not safe to use.
- [ ] Visually inspect for foreign substances – oil, grease, dirt, etc. Gloves shall be CLEAN.
- [ ] Demonstrate air leakage test. Perform this test before use.
- [ ] Periodically examine gloves during work, especially if exposed to damage, metal shavings, etc.
- [ ] Examine leather gauntlets for embedded objects, contamination, tears and holes, etc.

**III. Use**

- [ ] Leather gauntlets shall be used to provide mechanical protection for the rubber gloves.
- [ ] Gauntlets do not provide insulating protection from energized conductors and circuit parts.
- [ ] Do not use leather gauntlets as normal work gloves.
- [ ] Periodically examine rubber gloves and gauntlets during work, especially if exposed to damage, metal shavings, etc.



**APPENDIX I: Competent Person Training and Designation Requirements**

Contractors shall maintain documentation and demonstrate methods used in designation of Competent Person(s). To be a Competent Person the individual shall complete training and be designated in accordance with the criteria listed below.

**Competent Person Training Requirements**

Competent Person for Excavations training shall provide the individual with the knowledge and/or skills for the following topics:

- OSHA regulations pertaining to excavation safety
- Competent Person responsibilities as required by 29CFR1926, Subpart P
- Classify soil and rock deposits as Stable Rock, Type A, B, or C using the visual and manual methods described in 29CFR1926, Subpart P, Appendix A
- Design requirements for structural ramps used for access or egress of personal or equipment
- Selection and proper operation of water removal equipment for control of or preventing water accumulation in excavations
- Identifying the affects of heavy rains on evacuations
- Inspecting excavations, areas adjacent to excavations, and protective systems for evidence of situations that could result in possible cave-ins, indications of failure of protective systems, hazardous atmosphere, or other hazardous conditions

**Criteria for Designation of a Competent Person(s):**

- Training which meets the knowledge and skills requirements in the above section
- Knowledge of the applicable procedures and regulations as it relates to the excavation
- Experience in recognizing existing and predictable hazards as they relate to the excavation
- Management authorization and ability to correct unsafe acts and hazardous conditions as they relate to the excavation

**ATTACHMENT 1:**

**Hanford Site Excavation, Trenching & Shoring Procedure (HSETSP) Committee Charter**

The Hanford Site Excavation, Trenching & Shoring (HSETS) Committee is established to serve as the advisory group providing consensus direction for the consistent administration and implementation of the HSETS, herein called the Procedure. The participating contractors and organizations are responsible for appointing representatives to the committee.

The Department of Energy (DOE) Richland Operations Office (RL), DOE Office of River Protection (ORP), and affected Contractors acknowledge that a joint committee provides the best approach for implementing a consistent, effective, and compliant interpretation of requirements for the Procedure. The parties agree to cooperate in a teambuilding manner to ensure that the full intent of the Procedure is met and will be responsibly carried out by their respective organizations.

**1.0 Mission**

The mission of the HSETS Committee is to ensure consistent and standard application of the Procedure to promote and maintain a safe work environment. The Committee will achieve this consistent approach through sharing best practices, lessons learned, and matters that affect multiple contractors to foster continuous improvement.

**2.0 Committee Structure/Membership/Qualification**

The Committee shall be comprised of two primary representatives each from the following prime contracts to the DOE at Hanford:

- Mission Support Contract (MSC)
- Plateau Remediation Contract (PRC)
- River Corridor Contract (RCC)
- Tank Operations Contract (TOC)

One representative shall be the contractor's Technical Representative for the HSETS Procedure as determined by their contractor; the second representative shall be a Hanford Atomic Metal Trades Council (HAMTC) representative (as appointed by the HAMTC President or delegate).

In addition, one representative each from the following organizations shall be appointed to serve on the Committee:

- Central Washington Building and Construction Trades Council (CWB&CTC) (as approved by the Union President or delegate)
- HAMTC
- Hanford Site Excavation Coordinator

These representatives comprise the voting membership. An alternate member shall be identified to serve during any absence of a primary representative. The alternate shall have the same authority as the primary representative.

Representatives from Volpentest HAMMER Training and Education Center, Training Department (HAMMER) shall attend meetings as non-voting member to address matters pertaining to their area of responsibility. An alternate member shall be identified to serve during any absence of a primary representative.

A Committee member's length of duty may be indeterminate, but rotation of representative assignments is encouraged by all parties.

A chair and co-chair shall be elected by a simple majority of the voting membership of the Committee every two years. The chair and co-chair may be reelected to their respective positions.

Meetings shall be open to others to observe and to give their organizations' impact, perspectives, and technical advice for consideration of the voting body, however, participation in consensus decisions resides solely with the Committee members described herein. The Committee has the authority to develop sub-committees and invite ad hoc participants as needed.

Representatives of RL and ORP shall be invited to participate at each meeting as non-voting attendees.

The MSC shall provide a recording secretary for the Committee. The recording secretary is a non-voting position that provides administrative support to the chairperson. A facilitator shall be provided by the MSC as requested by the Committee.

### **3.0 Functions of the HSETS Committee**

The functions of the Committee shall be:

- Assist the MSC with the maintenance of the written Procedure
- Communicate and submit Procedure changes to RL and ORP through the MSC
- Maintain the Committee charter and review annually
- Review and verify that training is consistent and appropriately covers the content of the Procedure
- Evaluate trends in performance and recommend actions for improvement
- Review excavation, trenching, and shoring related events, issues, and lessons learned as appropriate
- Ensure distribution of lessons learned as necessary
- Maintain communication with the Contractor Excavation/Safety Committees and collaborate to resolve worker level issues, concerns, or events in a way that maintains site-wide consistency
  - Since the core function of a Site-wide Safety Procedure is “worker protection,” it is imperative to have a structure that fosters and encourages input and feedback from the working level. Affected contractors will convene a working level committee (also referred to as a lower tier committee) to discuss issues, concerns, or events that occur in the area of excavation, trenching, and shoring

within their organizations. These working level committees shall include equal representation of bargaining unit (as appointed by the bargaining unit president or delegate) and non-bargaining unit employees and ensure good communication up through each group's representative(s) on the HSETS Committee.

- Evaluate and recommend resolution for issues/disputes pertaining to the Procedure
- Issues shall not include any actions regarding applicable Collective Bargaining Agreements
- Recommend topics/information for communication to the workforce
- Provide Procedure status to the Senior Management Team (SMT) and DOE management when requested

#### **4.0 Roles and Responsibilities**

##### **4.1. Chair Roles and Responsibilities**

- Schedule meetings
- Facilitate meetings in an orderly fashion
- Limit disruptions
- Ensure meeting agendas are prepared
- Ensure meeting minutes are taken and comments are documented
- Function as a point of contact and spokesperson for the Committee
- Interface with other site-wide safety Procedure committees as necessary
- Ensure action item list is maintained and members complete their assignments in a timely manner
- Coordinate assignments of sub-committee(s)

##### **4.2. Co-Chair Roles and Responsibilities**

- Act as the Chair when the Chair is absent
- Perform roles and responsibilities as delegated by the Chair

##### **4.3. Member Roles and Responsibilities**

- Provide the chairperson with the identity of an alternate Committee member who is designated as the organizational representative
- Attend and participate in meetings when scheduled or notify their alternate when unable to attend
  - Alternates are responsible to attend and participate in meetings when the primary cannot attend
  - If the primary and alternate are both unable to attend, the Chair shall be notified
- Foster communication between the Committee and affected organizations relative to issue identification, interpretations, and consensus resolution

- Work in good faith toward consensus on issues without compromising safety or Procedure compliance
- Maintain a safety and requirements focus when addressing issues; avoid facility, craft, job function, or contractor biases when participating in discussions or voting
- Maintain current knowledge of the requirements of the Procedure
- Participate in issue discussions representing respective organization
- Bring up issues or speak in discussions only after being recognized by the chairperson
- Listen respectfully and refrain from interrupting others
- Refrain from disruptive side conversations

### **5.0 Meetings**

- Meet regularly as necessary, but no less than quarterly, via scheduled meetings
- Hold special meetings to address urgent or emerging issues
- Record and retain meeting minutes and action items, and distribute to the membership, alternates, and DOE
- Document and maintain record copies of voting decisions

### **6.0 Meeting Agenda**

- The chairperson shall ensure an agenda is prepared for each meeting, using input from the membership, and forward a copy to all members, alternates, and DOE in advance of the meeting time and date
- Action items shall be assigned and tracked

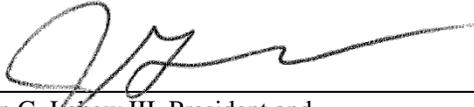
### **7.0 Quorum and Voting**

The Committee shall be considered to have a quorum when all Committee members who are eligible to vote (or their designated alternates) are present. One or more dissenting votes from the voting membership will be cause for an issue to elevate into a secondary phase of discussion and comment.

### **8.0 Secondary Phase of Discussion and Issue Resolution**

Matters not agreed upon by the Committee through the initial voting process shall be elevated to the secondary phase of discussion. This phase may include up to two additional meetings. Further discussion/investigation beyond the two additional meetings may be conducted if there is unanimous agreement by the Committee.

If consensus cannot be reached by the Committee, the issue may be elevated to the SMT and/or DOE. The SMT shall provide a status of their resolution process to the Committee at scheduled meetings.



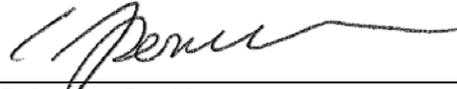
John G. Lehen III, President and  
Chief Executive Officer  
CH2M HILL Plateau Remediation Company



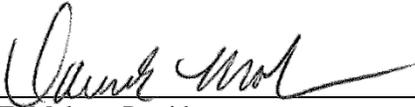
J. Frank Armijo, President and General Manager  
Mission Support Alliance LLC



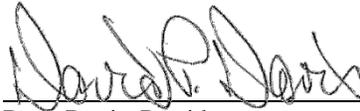
M.N. Brosee, President  
Washington Closure Hanford LLC



C.G. Spencer, President  
Washington River Protection Solutions LLC



David E. Molnaa, President  
Hanford Atomic Metal Trades Council



Dave Davis, President  
Central Washington Building and  
Construction Trades Council