WCH-R & DC 5/03/06 DD

WORK INSTRUCTION

FOR

CONFIRMATORY SAMPLING OF THE 331 LIFE SCIENCES LABORATORY TRENCHES 1 AND 2 (331 LSLT1 AND 331 LSLT2)

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	RIVER CORRIDOR CLOSURE PROJECT	Job No. 14655
		Work Instruction No. 0300X-WI-G0004
		Sheet 1 of 24

300-FF-2

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300 AREA REMAINING SITES
APPROVAL PAGE

331 Life Sciences Laboratory Trenches 1 and 2 (331 LSLT1 and 331 LSLT2)

Work Instruction No. 0300X-WI-G0004

Approved By:

_____ **DOE/RL Lead** **Date:** 4/3/06
D. C. Smith

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A. L. Boyd

1.0 PURPOSE

This work instruction provides documentation to support a no action or remedial action decision for the 331 Life Sciences Laboratory Trenches 1 and 2 (331 LSLT1 and 331 LSLT2) waste sites as required by the *300 Area Remedial Action Sampling and Analysis Plan* (DOE-RL 2004a).

2.0 SITE DESCRIPTION

The Waste Information Data System (WIDS) (Appendix A) describes the 331 Trenches as abandoned rectangular leaching trenches that have been backfilled. The trenches were approximately 2 m (7 ft) deep, and at that depth, measured 12 m (40 ft) by 4.5 m (15 ft) (GE 2000b). Also included in this work instruction are the Animal Waste Pit and a diversion chamber that connected the waste from the Animal Waste Pit and the 331-B Septic Tank to the 331 Trenches. Design drawings (GE 2000a) show that the diversion chamber has been removed. The Animal Waste Pit and the diversion chamber are included in the waste site with the north leaching trench (Trench 1) and are collectively called 331 LSLT1. The south leaching trench (Trench 2) consists only of Trench 2 and is called 331 LSLT2.

2.1 Location

The 331 Trenches are located near the east side of the 331 Building with a portion of Trench 1 located underneath the 331 Building. The Animal Waste pit is located just to the north of the 331 Building at coordinates N 115429.4, E 594544.8 (Figure 1). As these areas are located near, and even possibly underneath, the 331 Building, which is currently an active facility, there potentially could be many utility interferences, and investigation of utility locations should be conducted prior to excavation.

2.2 History

The 331 Trenches were used to dispose sanitary and animal wastes to the soil column. Sanitary waste flowed from the 331-B Septic Tank and animal waste flowed from the Animal Waste Pit, entered the diversion chamber, and was subsequently discharged to Trench 1 and Trench 2. Since most of the animal studies involved the use of radioisotopes, animal waste was segregated on the basis of activity. Solid animal waste exceeding 200 pCi/g specific activity was transported to the 100-F Area trenches on a regular basis. All other solid animal waste (less than 200 pCi/g specific activity) was allowed to flush into the 331 waste system.

According to WIDS, Trench 1 was used until 1969 when a portion was removed during the construction of the 331 Building, at which time Trench 2 replaced Trench 1. However, historical drawings (GE 1965a, 1965b) suggest that both trenches were constructed and began receiving discharges at the same time. Also indicated by design drawings, both trenches and the Animal Waste Pit were filled and abandoned in place. Figure 2 (GE 2000b) shows a portion of the as-built drawing for the trenches and Animal Waste Pit prior to construction of the 331 Building.

Figure 1. Location of the 331 LSLT1 and 331 LSLT2.

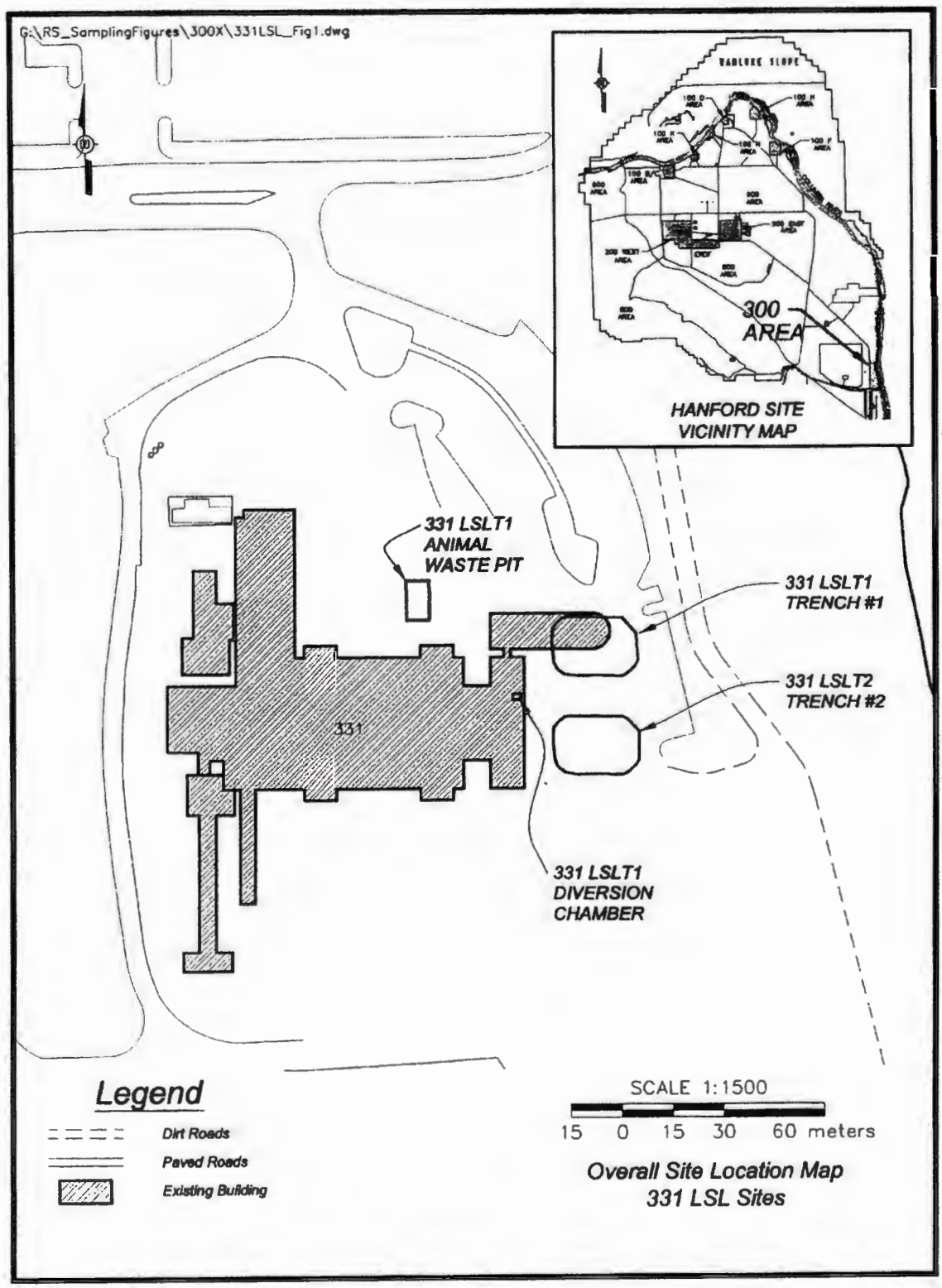
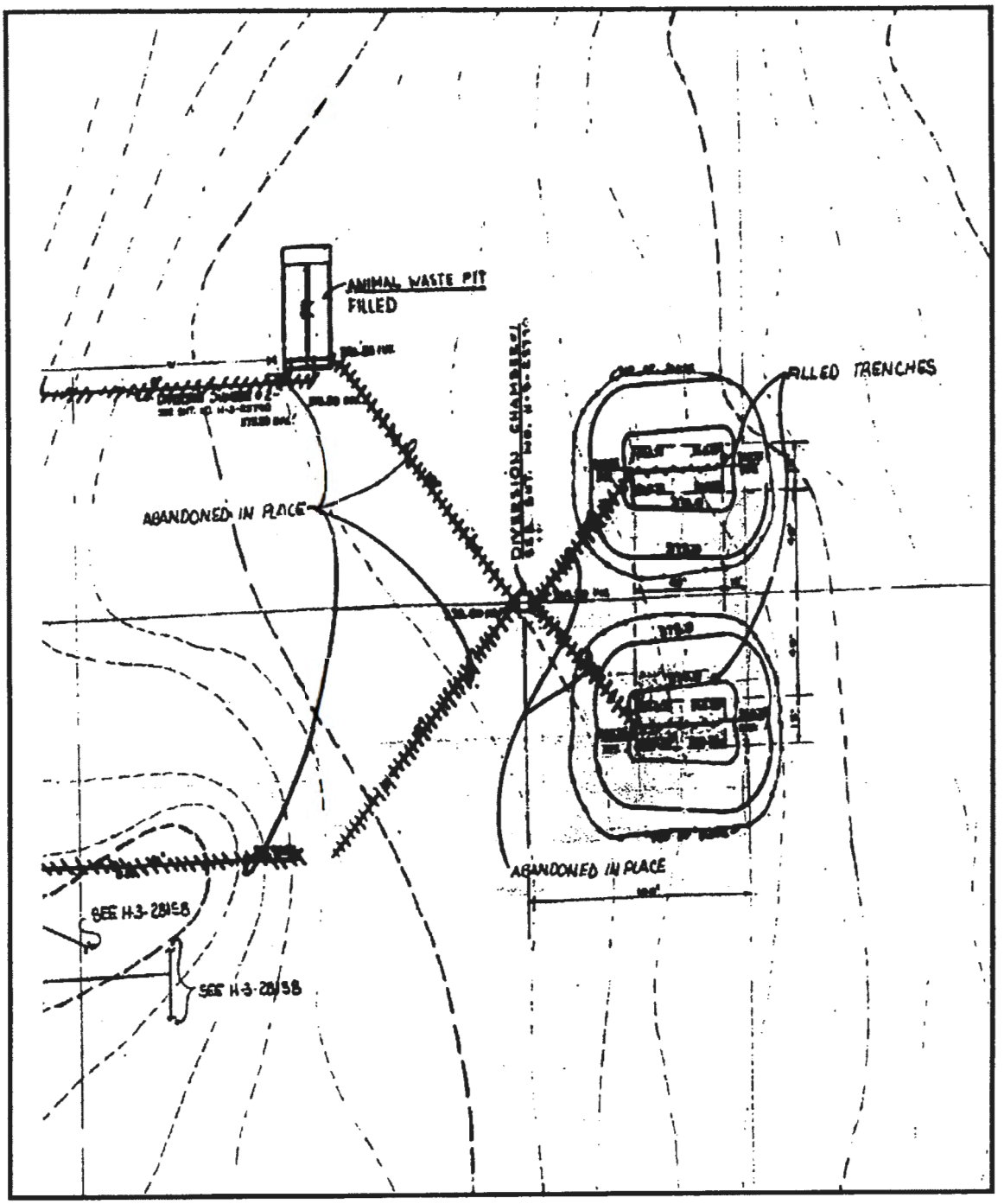


Figure 2. Life Sciences Laboratory Trenches and Animal Waste Pit As-Built Drawing (GE 2000b).



2.3 Ecological and Cultural

Reconnaissance surveys for natural or cultural resources have not been performed to date. Such surveys will be performed prior to initiation of any sampling or remedial efforts to assist in the assessment of potential impacts to sensitive sites or receptors.

3.0 SITE VISIT SUMMARY

A site visit was conducted in January 2006. The objectives were to (1) verify site location, (2) confirm the presence of waste site surface features as identified by previous investigations, and (3) evaluate field conditions and possible sampling logistics.

Trench 1 and Trench 2 are located underneath the landscaping (grass and sidewalks) on the east side of the 331 Building. The Animal Waste Pit is located near the front entrance (north side) of the building. The current landscaping over the Animal Waste Pit is river rock and sidewalk. The 331 Building is an active facility; therefore, there are many potential interferences (proximity to building, sprinkler system, fire hydrant water lines, etc.) to gaining access to this site with heavy equipment.

4.0 GEOPHYSICAL SURVEY

A geophysical survey was performed at 331 LSLT1 and 331 LSLT2 in January 2006 to locate and map subsurface features (Mitchell and Wiegman 2006). The geophysical survey was performed using ground-penetrating radar; interpreted results of Trench 1 and Trench 2 are shown in Figure 3 and the Animal Waste Pit is shown in Figure 4.

Several linear/utility features were detected that can all be correlated with utilities shown on historical maps including storm drains, fire protection water lines, sanitary water, and cathodic ground wires around the 331 Building. Centered at about N157/E119 is an anomalous area where Trench 1 was located. Hints of shallow geologic changes in the ground-penetrating radar data and potential excavation boundaries were also observed at about N152/E118. These features could suggest remnants of the excavations for the trench, although the shallow depths of the anomaly over the likely trench location are not logical unless some sort of cover was installed over the trench. Additionally, it has not been determined how much fill material now covers the original grade of Trench 1 and Trench 2.

The east-west linear along N140, associated with the supply line for a fire hydrant, parallels the approximate centerline of Trench 2. It is not known if the horizon, at about 2- to 3-m (6.6- to 9.8-ft)-depth surrounding the water line to the hydrant, could be related to Trench 2. In this area, the surface appears to have been built up a few meters around the building, which could put the trench bottom several meters below this flat horizon. A cover/barrier, if present over the trench, might produce this sort of anomaly.

The backfilled Animal Waste Pit, or potentially-associated features, on the north side of the 331 Building is not evident in the geophysical data (Figure 4).

Figure 3. Trench 1 and Trench 2 Geophysical Interpretation Map.

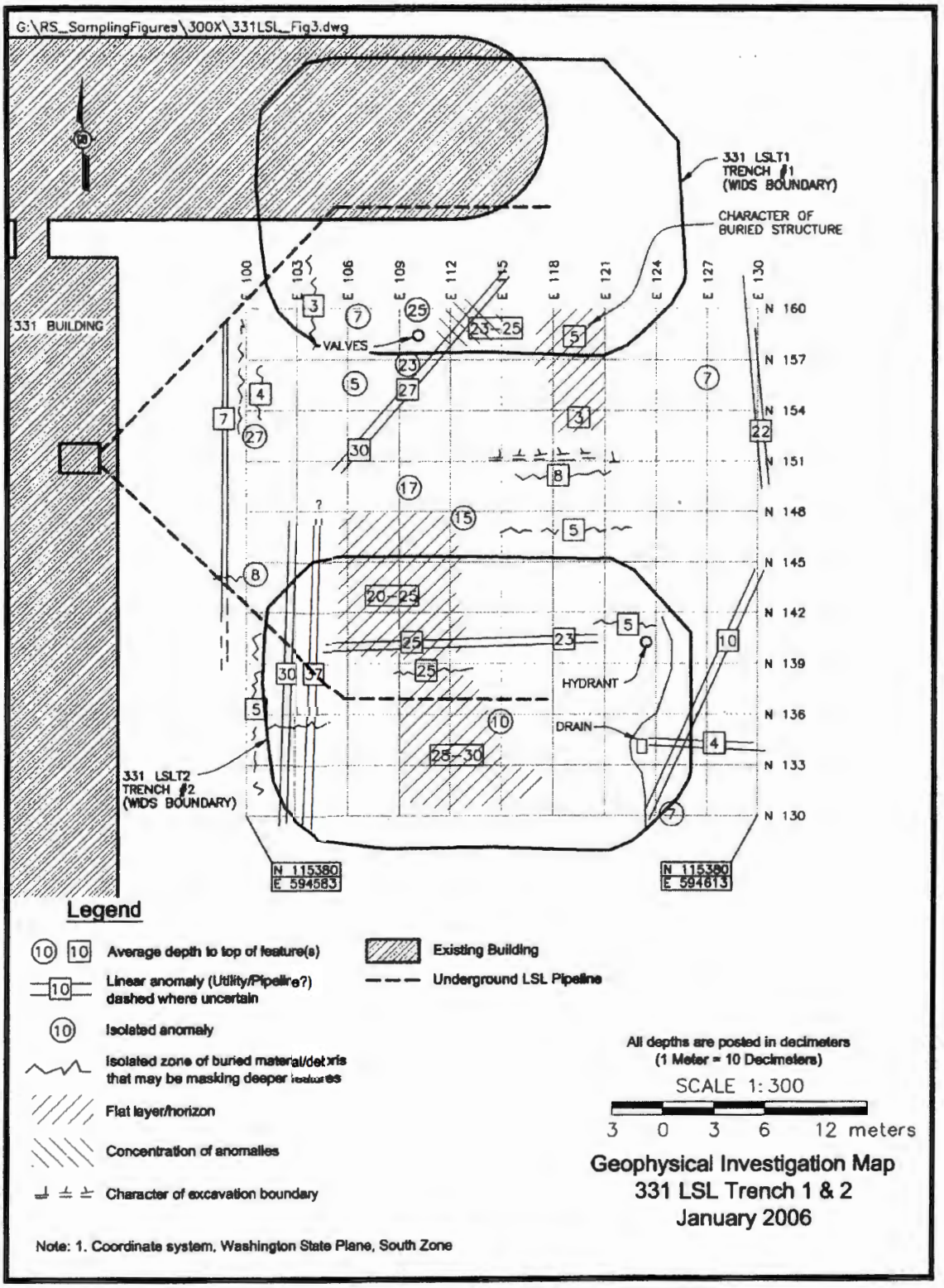
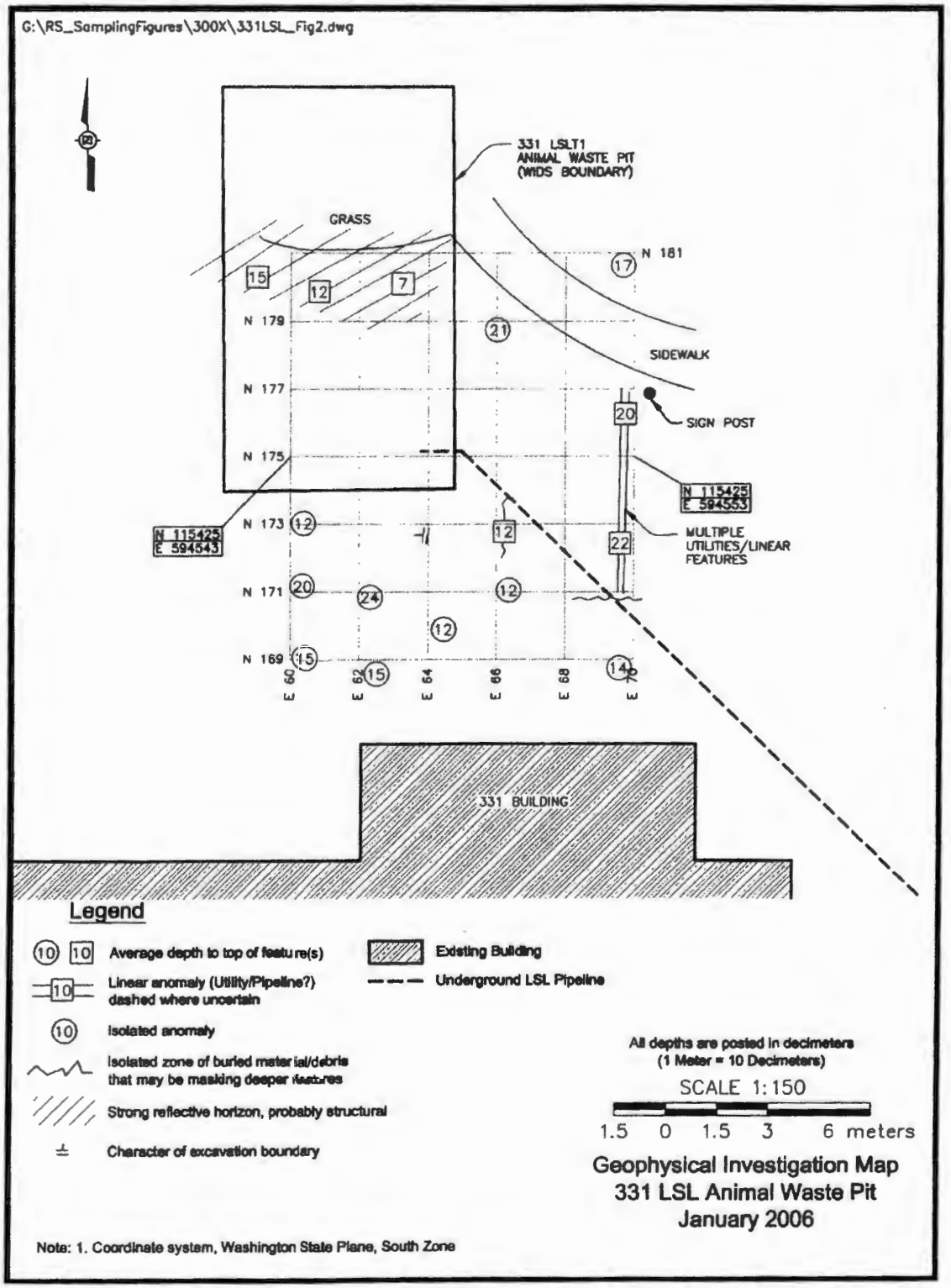


Figure 4. 331 LSLT1 Animal Waste Pit Geophysical Interpretation Map.



5.0 SAMPLE DESIGN

Historical data, process knowledge of septic systems, geophysical survey results, site visit observations, and other available information were used to develop a site-specific sample design for 331 LSLT1 and 331 LSLT2. Analytical sample results will be evaluated against the cleanup criteria specified in the *Remedial Design Report/Remedial Action Work Plan for the 300 Area* (DOE-RL 2004b) to support a no action or remedial action decision. The primary objective of sampling is to ascertain if constituents associated with these waste sites present an adverse risk to human health or the environment and to evaluate if the sites meet the remedial action objectives and goals specified in the *Interim Action Record of Decision for the 300-FF-2 Operable Unit* (ROD) (EPA 2001).

5.1 Contaminants of Potential Concern

The contaminants of potential concern (COPCs) for the 331 LSLT1 and 331 LSLT2 waste sites were identified based on existing historical information for the site. The COPC list provided in the ROD (EPA 2001) includes americium-241, curium-244, neptunium-237, plutonium-238, plutonium-239, uranium-232, uranium-233, cadmium, chromium, lead, and total uranium. Historical information for the Hanford Site shows that there are no likely sources of the uranium-232 isotope; therefore, uranium-232 will be eliminated as a COPC. Based on process knowledge of septic systems, polychlorinated biphenyls, hexavalent chromium, semivolatile organic compounds (SVOCs), gamma energy analysis, gross alpha, gross beta, mercury, nitrates, nitrites, and other inorganic anions will be evaluated. The expanded list of inductively coupled plasma metals will be performed to include arsenic, antimony, barium, beryllium, boron, cadmium, cobalt, copper, manganese, molybdenum, nickel, selenium, silver, vanadium, and zinc to support evaluation of the presence of additional metals.

Field screening for volatile organic compounds (VOCs) will be performed during sampling using an organic vapor monitor (OVM), and volatile organic analysis (VOA) will be included only if detected in the field. The OVM will be operated and calibrated in consideration of the COPCs suspected to be present at the site and as specified in the health and safety document governing this activity.
If oily soil or evidence of burning is observed during field activities, a sample will be collected and submitted for total petroleum hydrocarbons (TPH) in addition to the remaining list of laboratory analysis. If suspect asbestos-containing material is identified during field activities, a note will be made in the field logbook and, if needed to support evaluation of the presence of asbestos, a sample collected for laboratory asbestos analysis.

5.2 Laboratory Analytical Methods

The laboratory analyses that will be performed to evaluate samples for the COPCs are identified in Table 1.

Table 1. Laboratory Analytical Methods.

Analytical Method	Contaminants of Potential Concern
ICP metals[a] – EPA Method 6010	Lead, cadmium, total chromium, total uranium
SVOA – EPA Method 8270	Semivolatile organic compounds
PCB – EPA Method 8082	Polychlorinated biphenyls
Cr VI – EPA Method 7196	Hexavalent Chromium
Mercury – EPA Method 7471	Mercury
Americium-241/Curium-244	Americium-241, Curium-244
Neptunium-237	Neptunium-237
Isotopic Plutonium	Plutonium-238, Plutonium-239
Isotopic Uranium	Uranium-233
GEA – Gamma Spectroscopy	Gamma-emitting radionuclides
Gross alpha[b]– Proportional counting	Alpha-emitting radionuclides
Gross beta[c]– Proportional counting	Beta-emitting radionuclides
Nitrate/nitrite – EPA Method 353.2	Nitrate/nitrite
IC Anions – EPA Method 300.0	Inorganic anions
VOA[d] – EPA Method 8260	Volatile organic compounds
TPH[e] – EPA Method 418.1	Petroleum hydrocarbons
Bulk asbestos[f] – NIOSH Method 7400	Asbestos

[a] The expanded list of ICP metals will be performed to include arsenic, antimony, barium, beryllium, boron, cadmium, chromium, cobalt, copper, lead, manganese, molybdenum, nickel, selenium, silver, vanadium, and zinc in the analytical results package.
[b] If gross alpha activity is detected above background, the GEA data will be evaluated to determine if further alpha-specific analysis is necessary.
[c] If gross beta activity is detected above background, then strontium analysis will be performed
[d] VOA will be performed only if VOCs are detected in the field.
[e] TPH will be performed if oily or burned soil areas are observed.
[f] Samples for asbestos analysis will only be collected if suspect asbestos-containing material is identified during field activities.

IC = ion chromatography
ICP = inductively coupled plasma
GEA = gamma energy analysis
NIOSH = National Institute for Occupational Safety and Health
SVOA = semivolatile organic analysis
TPH = total petroleum hydrocarbons
VOA = volatile organic analysis
VOC = volatile organic compound

5.3 Basis for Sample Design

Focused sampling will be used to characterize the 331 LSLT1 and 331 LSLT2 waste sites. Test trenches will be excavated to evaluate locations within Trench 1 and Trench 2 representing the highest potential for contamination. A test pit will be excavated to evaluate the Animal Waste Pit at a location representing the highest potential for contamination. The GE (2000b) design drawing showing the construction and piping for 331 LSLT1 and 331 LSLT2 (Figure 2) was used to develop the sampling

locations for the waste sites. The objectives of sampling at the 331 LSLT1 and 331 LSLT2 waste sites are as follows:

- Determine the presence or absence of any environmental contaminants, as provided for in the ROD (EPA 2001)

- Determine the nature and estimate the extent of potential contamination, as provided for in the ROD (EPA 2001).

5.4 Sample Design Details

5.4.1 Trench 1 Sampling

Based on historical drawings (GE 1965a, 1965b, 2000b), a leaching pipe is present at the base of the middle of Trench 1 with the inlet located at approximate coordinates N 115416.0, E 594588.4. A test trench will be excavated across the inlet side of the trench to locate this pipe. The test trench location is shown in Figure 5. Samples of the pipe contents, soil directly underlying the pipe at the interface with the trench bottom and native soil, and soil underlying the trench at a depth of 4.6 m (15 ft) will be collected. The sampling protocol will be as follows:

1. An OVM will be used to field screen the excavation prior to sample collection. If organics are detected in the field, VOA will be added to the list of laboratory analyses for all samples collected from this area. The OVM will be operated and calibrated in consideration of the COPCs suspected to be present at the site and as specified in the health and safety document governing this activity.

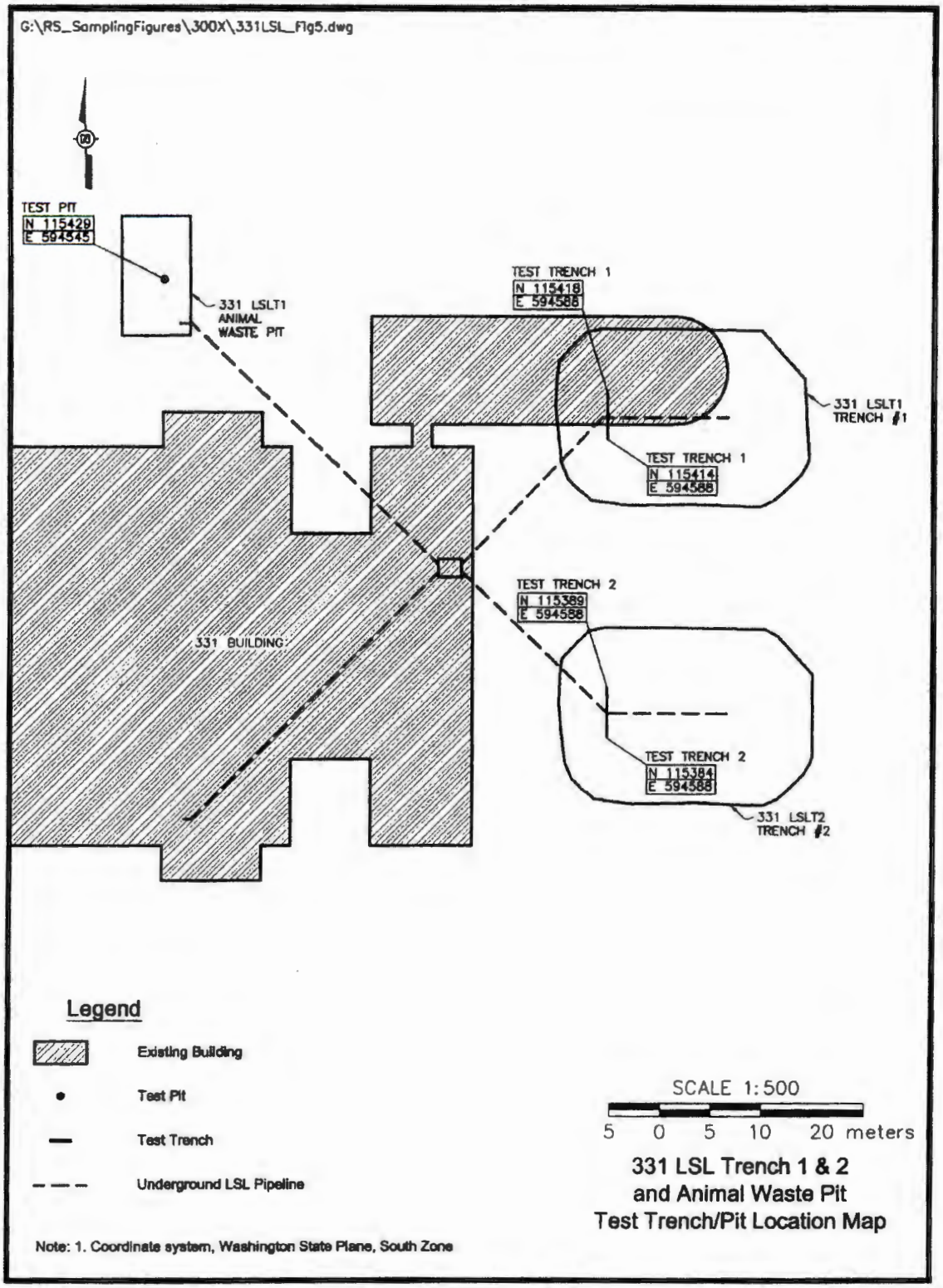
2. Field radiological surveys will be performed using instrumentation capable of detecting alpha, beta, and gamma radiation during excavation to identify potential radiologically contaminated materials. If any radiation is detected above background levels, a sample of the material exhibiting the highest radiological activity will be collected for laboratory analysis. The locations and values of any elevated radiological measurements will also be noted in the field logbook.

3. A test trench will be excavated from approximately N 115413.7, E 594588.4 to N 115418.3, E 594588.4 at Trench 1. If sediment/sludge is present within the pipe, a representative sample will be collected from the contents of the pipe. Otherwise, a sample will be collected from soil immediately underlying/adjacent to a discharge point in the leach pipe. If the pipe/discharge point is not located, the Task Lead shall be contacted to determine alternative sampling.

4. The excavation will be extended beneath the pipe until the interface of the bottom of the trench with native soil is encountered. One soil sample will be collected at this interface (underlying the footprint of the pipe).

5. The excavation will continue to a depth of 4.6 m (15 ft) and one soil sample will be collected at this depth.

Figure 5. 331 LSLT1 and 331 LSLT2 Sampling Locations.



5.4.2 Trench 2 Sampling

Based on historical drawings (GE 1965a, 1965b, 2000b), a leaching pipe is present at the base of the middle of Trench 2 with the inlet located at approximate coordinates N 115387.0, E 594588.4. A test trench will be excavated across the inlet side of the trench to locate this pipe. The test trench location is shown in Figure 5. Samples of the pipe contents, soil directly underlying the pipe at the interface with the trench bottom and native soil, and soil underlying the trench at a depth of 4.6 m (15 ft) will be collected. The sampling protocol will be as follows:

1. An OVM will be used to field screen the excavation prior to sample collection. If organics are detected in the field, VOA will be added to the list of laboratory analyses for all samples collected from this area. The OVM will be operated and calibrated in consideration of the COPCs suspected to be present at the site and as specified in the health and safety document governing this activity.

2. Field radiological surveys will be performed using instrumentation capable of detecting alpha, beta, and gamma radiation during excavation to identify potential radiologically contaminated materials. If any radiation is detected above background levels, a sample of the material exhibiting the highest radiological activity will be collected for laboratory analysis. The locations and values of any elevated radiological measurements will also be noted in the field logbook.

3. A test trench will be excavated from approximately N 115384.8, E 594588.4 to N 115389.4, E 594588.4 at Trench 2. If sufficient sediment/sludge is present within the pipe, a representative sample will be collected from the contents of the pipe. Otherwise, a sample will be collected from soil immediately underlying/adjacent to a discharge point in the leach pipe. If the pipe/discharge point is not located, the Task Lead shall be contacted to determine alternative sampling.

4. The excavation will be extended beneath the pipe until the interface of the bottom of the trench with native soil is encountered. One soil sample will be collected at this interface (underlying the footprint of the pipe).

5. The excavation will continue to a depth of 4.6 m (15 ft) and one soil sample will be collected at this depth.

5.4.3 Animal Waste Pit Sampling

The Animal Waste Pit is located at coordinates N 115429.4, E 594544.8. A test pit will be excavated until the Animal Waste Pit is encountered. Representative samples will be collected from within the Animal Waste Pit and from the soil below. The test pit location is shown in Figure 5.

1. An OVM will be used to field screen the excavation prior to sample collection. If organics are detected in the field, VOA will be added to the list of laboratory analyses for all samples collected from this area. The OVM will be operated and calibrated in consideration of the COPCs suspected to be present at the site and as specified in the health and safety document governing this activity.

2. Field radiological surveys will be performed using instrumentation capable of detecting alpha, beta, and gamma radiation during excavation to identify potential radiologically contaminated materials.

If any radiation is detected above background levels, a sample of the material exhibiting the highest radiological activity will be collected for laboratory analysis. The locations and values of any elevated radiological measurements will also be noted in the field logbook.

3. A test pit will be excavated at coordinates N 115429.4, E 594544.8 until the Animal Waste Pit is encountered. If residual sediment/sludge is present within the Animal Waste Pit, a representative sample will be collected. If the Animal Waste Pit is not located, the Task Lead shall be contacted to determine alternative sampling.

4. The excavation will be extended until the interface of the Animal Waste Pit with the underlying soil is encountered. One soil sample will be collected at the base of the excavation (underlying the footprint of the Animal Waste Pit).

5. The excavation will continue to a depth of 4.6 m (15 ft) and one soil sample will be collected at this depth.

5.4.4 Debris/Anomalous Media

During excavation, the field sampler will inspect sidewalls and excavated material for the presence of stained soil, evidence of burning, and/or debris. If anomalous media are discovered during excavation, the sampler will document the nature, quantity/volume, and location of the media in the field logbook based on visual evaluation. Representative samples of suspect material and potentially impacted underlying soils will be collected as is appropriate and practical.

5.4.5 Sample Summary

A summary of the sampling requirements for the 331 LSLT1 and 331 LSLT2 waste sites is provided in Table 2.

Table 2. 331 LSLT1 and 331 LSLT2 Sample Summary Table. (4 Pages)

Sample Location	Sample Media	HEIS Number	Coordinate Locations	Depth	Sample Analysis
Trench 1	Pipe contents	TBD	Trench from N 115413.7 E 594588.4 to N 115418.3 E 594588.4	TBD	ICP metals,[a] mercury, SVOA, nitrate/nitrite, IC anions, PCBs, hexavalent chromium Americium-241, Curium-244, Neptunium-237, isotopic Plutonium, isotopic Uranium, GEA, gross alpha, gross beta VOA (if detected in the field), TPH (if oily soil or burning is evident), asbestos (if suspect ACM is discovered in the field)

Table 2. 331 LSLT1 and 331 LSLT2 Sample Summary Table. (4 Pages)

Sample Location	Sample Media	HEIS Number	Coordinate Locations	Depth	Sample Analysis
Trench 1 (continued)	Soils underlying trench	TBD	Trench from N 115413.7 E 594588.4 to N 115418.3 E 594588.4	TBD	ICP metals,[a] mercury, SVOA, nitrate/nitrite, IC anions, PCBs, hexavalent chromium Americium-241, Curium-244, Neptunium-237, isotopic Plutonium, isotopic Uranium, GEA, gross alpha, gross beta VOA (if detected in the field), TPH (if oily soil or burning is evident), asbestos (if suspect ACM is discovered in the field)
	Soils at 4.6 m (15 ft)	TBD		TBD	ICP metals,[a] mercury, SVOA, nitrate/nitrite, IC anions, PCBs, hexavalent chromium Americium-241, Curium-244, Neptunium-237, isotopic Plutonium, isotopic Uranium, GEA, gross alpha, gross beta VOA (if detected in the field), TPH (if oily soil or burning is evident), asbestos (if suspect ACM is discovered in the field)
Trench 2	Pipe contents	TBD	Trench from N 115384.8 E 594588.4 to N 115389.4 E 594588.4	TBD	ICP metals[a], mercury, SVOA, nitrate/nitrite, IC anions, PCBs, hexavalent chromium Americium-241, Curium-244, Neptunium-237, isotopic Plutonium, isotopic Uranium, GEA, gross alpha, gross beta VOA (if detected in the field), TPH (if oily soil or burning is evident), asbestos (if suspect ACM is discovered in the field)
	Soils underlying trench	TBD		TBD	ICP metals[a], mercury, SVOA, nitrate/nitrite, IC anions, PCBs, hexavalent chromium Americium-241, Curium-244, Neptunium-237, isotopic Plutonium, isotopic Uranium, GEA, gross alpha, gross beta VOA (if detected in the field), TPH (if oily soil or burning is evident), asbestos (if suspect ACM is discovered in the field)

Table 2. 331 LSLT1 and 331 LSLT2 Sample Summary Table. (4 Pages)

Sample Location	Sample Media	HEIS Number	Coordinate Locations	Depth	Sample Analysis
Trench 2 (continued)	Soils at 4.6 m (15 ft)	TBD	Trench from N 115384.8 E 594588.4 to N 115389.4 E 594588.4	TBD	ICP metals,[a] mercury, SVOA, nitrate/nitrite, IC anions, PCBs, hexavalent chromium Americium-241, Curium-244, Neptunium-237, isotopic Plutonium, isotopic Uranium, GEA, gross alpha, gross beta VOA (if detected in the field), TPH (if oily soil or burning is evident), asbestos (if suspect ACM is discovered in the field)
Animal Waste Pit	Pit contents (sediment/ sludge)	TBD	N 115429.4 E 594544.8	TBD	ICP metals[a], mercury, SVOA, nitrate/nitrite, IC anions, PCBs, hexavalent chromium Americium-241, Curium-244, Neptunium-237, isotopic Plutonium, isotopic Uranium, GEA, gross alpha, gross beta VOA (if detected in the field), TPH (if oily soil or burning is evident), asbestos (if suspect ACM is discovered in the field)
	Soils underlying pit	TBD		TBD	ICP metals[a], mercury, SVOA, nitrate/nitrite, IC anions, PCBs, hexavalent chromium Americium-241, Curium-244, Neptunium-237, isotopic Plutonium, isotopic Uranium, GEA, gross alpha, gross beta VOA (if detected in the field), TPH (if oily soil or burning is evident), asbestos (if suspect ACM is discovered in the field)
	Soils at 4.6 m (15 ft)	TBD		TBD	ICP metals[a], mercury, SVOA, nitrate/nitrite, IC anions, PCBs, hexavalent chromium Americium-241, Curium-244, Neptunium-237, isotopic Plutonium, isotopic Uranium, GEA, gross alpha, gross beta VOA (if detected in the field), TPH (if oily soil or burning is evident), asbestos (if suspect ACM is discovered in the field)

Table 2. 331 LSLT1 and 331 LSLT2 Sample Summary Table. (4 Pages)

Sample Location	Sample Media	HEIS Number	Coordinate Locations	Depth	Sample Analysis
Trench 1/ Trench 2/ Animal Waste Pit	Debris/ anomalous media[b]	TBD	TBD	TBD	ICP metals[a], mercury, SVOA, nitrate/nitrite, IC anions, PCBs, hexavalent chromium Americium-241, Curium-244, Neptunium-237, isotopic Plutonium, isotopic Uranium, GEA, gross alpha, gross beta VOA (if detected in the field), TPH (if oily soil or burning is evident), asbestos (if suspect ACM is discovered in the field)
Duplicate	Animal waste pit (preferred), sediments, or soil	TBD	TBD	TBD	ICP metals[a], mercury, SVOA, nitrate/nitrite, IC anions, PCBs, hexavalent chromium Americium-241, Curium-244, Neptunium-237, isotopic Plutonium, isotopic Uranium, GEA, gross alpha, gross beta VOA (if detected in the field), TPH (if oily soil or burning is evident), asbestos (if suspect ACM is discovered in the field)
Equipment blank	Silica sand	TBD	TBD	TBD	ICP metals[a], SVOA, mercury

[a] The expanded list of ICP metals will be performed to include arsenic, antimony, barium, beryllium, boron, cadmium, chromium (total), cobalt, copper, lead, manganese, molybdenum, nickel, selenium, silver, uranium (total), vanadium, and zinc in the analytical results package.
[b] The COPCs for debris/anomalous media may be adjusted (added/eliminated) based on the type of debris that is sampled and the analysis needed to characterize the debris.

ACM = asbestos-containing material
COPC = contaminant of potential concern
GEA = gamma energy analysis
IC = ion chromatography
ICP = inductively coupled plasma
SVOA = semivolatile organic analysis
TBD = to be determined
TPH = total petroleum hydrocarbons
VOA = volatile organic analysis

6.0 QUALITY CONTROL

Field quality control samples are to be collected as required in the *300 Area Remedial Action Sampling and Analysis Plan* (DOE-RL 2004a). One equipment blank will be collected to verify the cleanliness of equipment and supplies used for sample collection. The equipment blank will be collected using silica sand (e.g., Colorado Silica Sand) that is poured over the sampling equipment that will come in direct contact with the sample media submitted for laboratory analysis. The equipment blank will be analyzed for ICP metals, mercury, and semivolatile organic compounds by the appropriate analytical methods listed in Section 5.2.

One field duplicate sample will be collected to verify the precision (reproducibility) of the laboratory analysis. The field duplicate will be collected by first homogenizing the sample media and then distributing approximately equal portions of sample media to the appropriate sample containers as required by the sample authorization form. The duplicate sample will be analyzed for the full suite of analytes stipulated for the primary sample. It is preferred that the duplicate sample be collected from a location that will produce detectable levels of contamination, if present. Any deviations from the planned quality control sampling shall be documented in the field logbook.

7.0 REFERENCES

DOE-RL, 2004a, *300 Area Remedial Action Sampling and Analysis Plan,* DOE/RL-2001-48, Rev. 1, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

DOE-RL, 2004b, *Remedial Design Report/Remedial Action Work Plan for the 300 Area,* DOE/RL-2001-47, Rev. 1, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

EPA, 2001, *Interim Action Record of Decision for the 300-FF-2 Operable Unit, Hanford Site, Benton County, Washington*, U.S. Environmental Protection Agency, Region 10, Seattle, Washington.

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GE, 2000b, "Sanitary Waste System, Radioactive Inhalation Facility, Biology Laboratory Facilities," Drawing H-3-25788, Rev. 3, General Electric Company, Richland, Washington.

Mitchell, T. H., and R. S. Wiegman, 2006, *Results of Geophysical Investigations at 300 Area Sites 331 LSLT1, 331 LSLT2, and 331 LSLDF*, Interoffice Memorandum to R. A. Carlson, CCN 124807, dated January 30, 2006, Washington Closure Hanford, Richland, Washington.

APPENDIX A

WASTE INFORMATION DATA SYSTEM GENERAL SUMMARY REPORTS

Waste Information Data System
General Summary Report

01/18/2006

Site Code: 331 LSLT1 **Site Classification: Accepted** Page 1

Site Names:	331 LSLT1, 331 LSL Trench 1, 331 Life Sciences Laboratory Trench #1		
Site Type:	Trench	**Start Date:**	1966
Status:	Inactive	**End Date:**	1969
Operable Unit:	300-FF-2		
Hanford Area:	300	**Pipe Type:**	

Site Description: The trench is currently marked with a single sign at the site centerline and surrounded with Underground Radioactive Material signs. The 331 Life Sciences Laboratory Trench 1 (LSLT1) is an abandoned leaching trench that has been backfilled. The site was a rectangular excavation. The site includes connecting waste transfer lines.

Location Description: The unit was located underneath or near the east end of the 331 Building. The north leaching trench has been arbitrarily designated as the 331 LSLT1 unit. The site is located just north of the 331 LSLT2.

Process Description: The 331 Leaching Trenches disposed of sanitary and animal wastes to the soil column. Sanitary waste flowed from the 331-B Septic Tank and animal waste flowed from the animal waste unloading pit, entered Diversion Chamber No. 1, and was subsequently discharged to the leaching trenches.

Associated Structures: The structures associated with this site include the 331 LSLT2 trench immediately to the south, the No. 1 and No. 2 Diversion Chambers, the animal waste unloading pit, the 331-B Sanitary Septic Tank, the 331-B (and possibly 331-A) Building, and the waste transfer lines. Other associated structures are the 331 Life Sciences Laboratory Drain Field and the 331-D Animal Waste Treatment Facility.

Site Comment: Cramer 1987 mentioned that 331 LSLT1 was used until 1969, when a portion of the pit was removed during the construction of 331 Building. Additionally, BHI-00012 states that 331 LSLT2 replaced 331 LSLT1 in 1969. Information obtained from H-3-25786, H-3-25789, and H-3-25790 suggest that both trenches were constructed and began receiving discharges at the same time. It is possible that 331 LSLT1 or both trenches were removed during construction of 331 Building.

The 331 Building, located in the Hanford Site's 300 Area, was constructed in 1970. The largest portion is a three-story facility, consisting of laboratories on the first and third floors. The first floor laboratory area initially contained a multi-room, inhalation toxicology, and exposure suite. The third floor laboratories included small animal facilities, and related animal physiology and inhalation toxicology laboratories, low-level and high-level radiochemistry laboratories, as well as tissue culture, virology, histology, hematology, biochemistry, histochemistry, pathology, and microbial physiology laboratories.

Two smaller ancillary structures, 331-A and 331-B, made up another segment of the 331 Building. The 331-A Building is detached and located on the northwest side of the 331 Building and contained 15 pen areas for large animals (e.g., swine). The 331-B Building, connected to the west and southwest portion of the 331 Building, is a one-story concrete block structure with long, narrow, animal runs. The run area originally contained 110 concrete living units for dogs. The north section was comprised of an animal clinic, hospital, food preparation room, and change room. An equipment room and a metabolism room were located at the south end of the animal runs. The dog runs were built as a wing adjacent to 331-B. It also contained dog habitat areas.

A semi-high bay building 331-D, was erected southeast of the 331 Building in 1974. The 331-D Building was to serve as an Animal Waste Treatment Facility. It contained a 94,625 liters per day (25,000 gallons per day) capacity waste treatment plant, which was designed to chemically treat, mechanically flocculate, settle, and gravity filter animal wastes. A sludge dryer also was installed to heat and dry 54.4 kilograms per hour (120 pounds per hour) of sewage sludge product from the treatment facility. This 331-D facility never accepted any animal wastes to process. The 331-D animal waste treatment facility was converted to a Bio-magnetic Effects Laboratory in 1977.

The site was posted with Underground Radioactive Material signs in March 2001.

References:

1. K. H. Cramer, Hanford Site Waste Management Units Report, May 1987.
2. DH DeFord, RW Carpenter, MW Einan, 8/94 300-FF-2 Operable Unit Technical Baseline Report,

BHI-00012, Rev 00.
3. GRADING, STAKING, AND PAVING PLANS, H-3-25786.
4. ANIMAL WASTE PIT DETAILS, H-3-25789.
5. SEPTIC TANK & DIVERSION CHAMBER DETAILS, H-3-25790.
6. Stan Jones, 3/1/98 Workplan/Sample and Analysis Plan - 331 Building WIDS Sites.

Waste Information:

Type:	Sanitary Sewage		
Category:	Nondangerous/nonradioactive		
Physical State:	Liquid		
Start Date:	1966	**End Date:**	1969
Waste Obscured:	Soil Overburden		
Description:	The unit received sanitary wastewater.		
References:	1. GRADING, STAKING, AND PAVING PLANS, H-3-25786.		

Type:	Animal Waste		
Category:	Nondangerous/nonradioactive		
Physical State:	Liquid		
Start Date:	1966	**End Date:**	1969
Waste Obscured:	Soil Overburden		
Description:	The unit received liquid animal waste from the animal waste pit. Since most of the animal studies involved the use of radio isotopes, animal waste was segregated on the bases of activity. Solid animal waste, exceeding 200 picocuries per gram specific activity, was transported to the 100-F Area trenches on a regular basis. All other solid animal waste (less than 200 picocuries per gram specific activity) was allowed to flush into the 331 waste system. However, specific cases of contamination have occurred at the 331 complex. The constituents of concern reflect those contaminants which could potentially still be present in the subsurface at the 331 Building WIDS sites. These include americium-241, curium-244, neptunium-237, plutonium-238, plutonium-239, uranium-232, uranium-233, cadmium, chromium, lead, uranium (total). During a records review to identify the constituents of concern, no evidence of any waste containing PCBs was discovered. A walkthrough of the facility did not reveal the presence of any PCB containing equipment with the exception of possible PCB laden light ballasts. All transformers were of the dry design. Therefore, PCBs are not listed among the constituents of concern.		
References:	1. GRADING, STAKING, AND PAVING PLANS, H-3-25786.		

Dimensions:

Depth/Height:	2.13	Meters	7.00	Feet
Overburden Depth:	2.13	Meters	7.00	Feet
Site Shape:	Rectangle			
References:	1. GRADING, STAKING, AND PAVING PLANS, H-3-25786. 2. ANIMAL WASTE PIT DETAILS, H-3-25789. 3. SEPTIC TANK & DIVERSION CHAMBER DETAILS, H-3-25790.			

Field Work:

Type:	Site Walkdown		
BeginDate:	09/10/1999	**FieldCrew:**	CR Webb, G. MacFarlan
End Date:	09/10/1999		
Purpose:	Transition Site Walkdown		
Comment:	The site is marked with a single sign at the centerline of the trench that reads "Life Science Laboratory Trench 1, WIDS code 331 LSLT1" There are no radiological or hazardous postings .		
References:	1. C. R. Webb, 1/2/97 Field Logbook assigned to Christine Webb, EL-1255 and EL-1255-1.		

Site Code: 331 LSLT1 Site Classification: Accepted Page 3

Regulatory Information:

Programmatic Responsibility

DOE Program:	EM-40	**Confirmed By Program:**	Yes
DOE Division:		ERD - Environmental Restoration Division	
Responsible Contractor/Subcontractor:		BHI. Bechtel Hanford, Inc.	
ResponsibleProject:			

Site Evaluation

Solid Waste Management Unit:	Yes
TPA Waste Management Unit Type:	Waste Disposal Unit

Permitting

RCRA Part B Permit:	No	**TSD Number:**	
RCRA Part A Permit:	No	**Closure Plan:**	No
RCRA PermitStatus:			
Septic Permit:	No	**216/218 Permit:**	None
Inert LandFill:	No	**NPDES:**	No
Air Operating Permit:	No	**State Waste Discharge Permit:**	No

Tri-Party Agreement

Lead Regulatory Agency:	EPA
Unit Category:	CERCLA Past Practice (CPP)
TPA Appendix:	C

Remediation and Closure

Decision Document:	Interim Action Record of Decision, 300-FF-2 (2001)
Decision Document Status:	Final
Remediation Design Group:	
Closure Document:	
Closure Type:	
Post Closure Requirements:	**ResidualWaste:**

Images:

Pathname: \\apwids01\widsimg\300\1088\1088I_01.JPG DateTaken: 09/10/1999

Description: Photo shows the sign marking the centerline of the Life Science Laboratory Trench 1.

Waste Information Data System
General Summary Report

01/18/2006

Site Code: 331 LSLT2 **Site Classification: Accepted** Page 1

Site Names:	331 LSLT2, 331 LSL Trench 2, 331 Life Sciences Laboratory Trench #2		
Site Type:	Trench	**Start Date:**	1966
Status:	Inactive	**End Date:**	1974
Operable Unit:	300-FF-2		
Hanford Area:	300	**Pipe Type:**	

Site Description: The trench is currently marked with a single sign at the site centerline and surrounded with Underground Radioactive Material signs. The 331 LSLT2 is an abandoned leaching trench that has been backfilled. The site was a rectangular excavation. The site includes connecting waste transfer lines.

Location Description: The unit was located underneath or near the east end of the 331 Building. The south leaching trench has been arbitrarily designated as the 331 LSLT2 Unit. The site is located just south of the 331 LSLT1.

Process Description: The 331 Leaching Trenches disposed of sanitary and animal wastes to the soil column. Sanitary waste flowed from the 331-B Septic Tank and animal waste flowed from the animal waste unloading pit, entered Diversion Chamber No. 1, and was subsequently discharged to the leaching trenches.

Associated Structures: The structures associated with this site include the LSLT1, the No. 1 and No. 2 Diversion Chambers, the animal waste unloading pit, the 331-B Sanitary Septic Tank, the 331-B (and possibly 331-A) Buildings, and the waste transfer lines. Other associated structures are the 331 Life Sciences Laboratory Drain Field and the 331-D Animal Waste Treatment Facility.

Site Comment: Cramer 1987 mentioned that 331 LSLT1 was used until 1969, when a portion of the pit was removed during the construction of 331 Building. Additionally, BHI-00012 states that 331 LSLT2 replaced 331 LSLT1 in 1969. Information obtained from H-3-25786, H-3-25789, and H-3-25790 suggest that both trenches were constructed and began receiving discharges at the same time. It is possible that 331 LSLT2 or both trenches were removed during construction of 331 Building.

The 331 Building, located in the Hanford Site's 300 Area, was constructed in 1970. The largest portion is a three-story facility, consisting of laboratories on the first and third floors. The first floor laboratory area initially contained a multi-room, inhalation toxicology, and exposure suite. The third floor laboratories included small animal facilities, and related animal physiology and inhalation toxicology laboratories, low-level and high-level radiochemistry laboratories, as well as tissue culture, virology, histology, hematology, biochemistry, histochemistry, pathology, and microbial physiology laboratories.

Two smaller ancillary structures, 331-A and 331-B, made up another segment of the 331 Building. The 331-A Building is detached and located on the northwest side of the 331 Building and contained 15 pen areas for large animals (e.g., swine). The 331-B Building, connected to the west and southwest portion of the 331 Building, is a one-story concrete block structure with long, narrow, animal runs. The run area originally contained 110 concrete living units for dogs. The north section was comprised of an animal clinic, hospital, food preparation room, and change room. An equipment room and a metabolism room were located at the south end of the animal runs. The dog runs were built as a wing adjacent to 331-B. It also contained dog habitat areas.

A semi-high bay building, 331-D, was erected southeast of the 331 Building in 1974. The 331-D Building was to serve as an Animal Waste Treatment Facility. It contained a 94,625 liters per day (25,000 gallons per day) capacity waste treatment plant, which was designed to chemically treat, mechanically flocculate, settle, and gravity filter animal wastes. A sludge dryer also was installed to heat and dry 54.4 kilograms per hour (120 pounds per hour) of sewage sludge product from the treatment facility. This 331-D facility never accepted any animal wastes to process. The 331-D animal waste treatment facility was converted to a Bio-magnetic Effects Laboratory in 1977.

The site was posted with Underground Radioactive Material signs in March 2001.

References:

1. K. H. Cramer, Hanford Site Waste Management Units Report, May 1987.
2. DH DeFord, RW Carpenter, MW Einan, 8/94 300-FF-2 Operable Unit Technical Baseline Report, BHI-00012, Rev 00.

3. GRADING, STAKING, AND PAVING PLANS, H-3-25786.
4. ANIMAL WASTE PIT DETAILS, H-3-25789.
5. SEPTIC TANK & DIVERSION CHAMBER DETAILS, H-3-25790.
6. Stan Jones, 3/1/98 Workplan/Sample and Analysis Plan - 331 Building WIDS Sites.

Waste Information:

Type:	Sanitary Sewage
Category:	Nondangerous/nonradioactive
Physical State:	Liquid
Start Date:	1966 **End Date:** 1974
Waste Obscured:	Soil Overburden
Description:	The unit received sanitary wastewater. In 1974, the clean (non-radioactive) animal sewage was connected to the regular 300 Area Sanitary Sewer System.
References:	1. GRADING, STAKING, AND PAVING PLANS, H-3-25786.

Type:	Animal Waste
Category:	Mixed
Physical State:	Liquid
Start Date:	1966 **End Date:** 1974
Description:	The unit received liquid animal waste from the animal waste pit. Animal wastes were the most prominent wastes, in terms of volume, generated by the 331 complex. Originally, liquid animal wastes from the complex including washdowns from the "hog and dog runs" were disposed to a large, unlined pit, east of the 331-D Building. Sewers carrying animal waste from the 331 complex were also connected to this pit. Since most of the animal studies involved the use of radio isotopes, animal waste was segregated on the bases of activity. Solid animal waste, exceeding 200 picocuries per gram specific activity, was transported to the 100-F Area trenches on a regular basis. All other solid animal waste (less than 200 picocuries per gram specific activity) was allowed to flush into the 331 waste system. However, specific cases of contamination have occurred at the 331 complex. The constituents of concern reflect those contaminants which could potentially still be present in the subsurface at the 331 Building WIDS sites. These include americium-241, curium-244, neptunium-237, plutonium-238, plutonium-239, uranium-232, uranium-233, cadmium, chromium, lead, uranium (total). During a records review to identify the constituents of concern, no evidence of any waste containing PCBs was discovered. A walkthrough of the facility did not reveal the presence of any PCB containing equipment with the exception of possible PCB laden light ballasts. All transformers were of the dry design. Therefore, PCBs are not listed among the constituents of concern.
References:	1. GRADING, STAKING, AND PAVING PLANS, H-3-25786.

Dimensions:

Depth/Height:	2.13	Meters	7.00	Feet
Overburden Depth:	2.13	Meters	7.00	Feet
Site Shape:	Rectangle			
References:	1. GRADING, STAKING, AND PAVING PLANS, H-3-25786. 2. ANIMAL WASTE PIT DETAILS, H-3-25789. 3. SEPTIC TANK & DIVERSION CHAMBER DETAILS, H-3-25790.			

Field Work:

Type:	Site Walkdown		
BeginDate:	09/10/1999	**FieldCrew:**	CR Webb, G. MacFarlan
End Date:	09/10/1999		
Purpose:	Transition Site Walkdown		
Comment:	The site is marked with a single sign at the centerline of the trench that reads "Life		

Site Code: 331 LSLT2 Site Classification: Accepted Page 3

	Science Laboratory Trench 2, WIDS code 331 LSLT2" There are no radiological or hazardous postings .
References:	1. C. R. Webb, 1/2/97 Field Logbook assigned to Christine Webb, EL-1255 and EL-1255-1.

Regulatory Information:

Programmatic Responsibility

DOE Program:	EM-40	Confirmed By Program:	Yes
DOE Division:		ERD - Environmental Restoration Division	
Responsible Contractor/Subcontractor:		BHI. Bechtel Hanford, Inc.	
ResponsibleProject:			

Site Evaluation

Solid Waste Management Unit:	Yes
TPA Waste Management Unit Type:	Waste Disposal Unit

Permitting

RCRA Part B Permit:	No	TSD Number:	
RCRA Part A Permit:	No	Closure Plan:	No
RCRA PermitStatus:			
Septic Permit:	No	216/218 Permit:	None
Inert LandFill:	No	NPDES:	No
Air Operating Permit:	No	State Waste Discharge Permit:	No

Tri-Party Agreement

Lead Regulatory Agency:	EPA
Unit Category:	CERCLA Past Practice (CPP)
TPA Appendix:	C

Remediation and Closure

Decision Document:	Interim Action Record of Decision, 300-FF-2 (2001)		
Decision Document Status:	Final		
Remediation Design Group:			
Closure Document:			
Closure Type:			
Post Closure Requirements:		ResidualWaste:	

Images:

Pathname: \\apwids01\widsimg\300\1089\1089_01.JPG DateTaken: 09/10/1999

Description: Photo shows the sign marking the centerline of the Life Science Laboratory Trench 2.

Work Instruction Distribution Sheet

331 Life Sciences Laboratory Trenches 1 and 2
(331 LSLT1 and 331 LSLT2)

Work Instruction No. 0300X-WI-G0004, Rev. 0

TITLE	NAME	MSIN	COPIES
Originator	B. S. Wiegman	H9-03	1
Reviewer	W. S. Thompson		
Reviewer	L. M. Dittmer	H9-02	1
Approver	R. A. Carlson	X0-17	1
Files – Sigma I	K. A. Anselm	H9-02	1
	Records & Doc. Control	H0-30	Original
	C. A. Torres	L6-06	5
	J. W. Darby	L6-06	1
	J. M. Duncan	H9-02	1
	R. T. Fahlberg	L1-06	1