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1 **Addendum B** **Waste Analysis Plan**

2 **Executive Summary**

3 The 325 Hazardous Waste Treatment Units (325 HWTUs) collect, consolidate, and prepare dangerous
4 waste for shipment. Waste is primarily received from onsite generators and offsite Pacific Northwest
5 National Laboratory (PNNL) facilities. The purpose of this Waste Analysis Plan (WAP) is to document
6 the process to confirm PNNL's knowledge about dangerous waste before storing waste at the
7 325 HWTUs, as required in [WAC 173-303-300](#). The purpose of waste analysis at permitted facilities is
8 to assure that waste can be stored properly.

9 *Waste analysis* at permitted facilities consists of obtaining and reviewing a *detailed chemical, physical,*
10 *and/or biological analysis* of a waste prior to storage. This detailed analysis can consist of *knowledge* of
11 the wastes as defined in [WAC 173-303-040](#), typically provided by the generator, data obtained by direct
12 testing, or a combination of both. When the analysis provided by the generator relies upon knowledge,
13 that knowledge must be documented and confirmed. The waste analysis performed by PNNL waste
14 management staff is used to determine the acceptability of the waste for storage at the 325 HWTUs.

15 This WAP describes the process for inspection and, if necessary, analysis of wastes received at the
16 325 HWTUs to confirm that the waste matches the identity of the waste on the accompanying shipping
17 documentation. The WAP also contains a description of the sampling methodologies, analytical
18 techniques, and processes that are undertaken for confirmatory sampling and analysis of dangerous waste
19 managed in the 325 HWTUs. Finally, the WAP describes the records that are maintained in order to meet
20 requirements specified in the Hanford Facility Dangerous Waste Permit.

21

1 **Definitions**

Term	Definition
Analysis	Obtaining and reviewing information provided by the waste generator and/or provided by other means to confirm the information provided concerning a waste stream.
Compatible	As applied to suitability of containers, tanks or sampling equipment, <i>compatible</i> means the waste will not react with or otherwise damage the container, tank, or sampling equipment such that the ability of the equipment to contain the waste is not impaired. For determination of compatibility for storage, refer to definition of <i>incompatible waste</i> .
Database	The PNNL waste management database (the Integrated Waste Management System) containing profile, confirmation, storage, and shipment information on each container of waste.
Fingerprint Analysis	Testing of significant parameters expected from a waste (as documented in its approved profile) performed after physical transfer of the waste to the 325 HWTUs. Fingerprint analysis is intended to verify that the waste transferred to the 325 HWTUs matches the profile provided. Fingerprinting is usually performed by visual examination of the waste and/or use of readily available testing methods such as test kits.
Incompatible Waste	Materials/wastes unsuitable for placement in a particular device or facility because it may corrode or decay the containment materials, or is unsuitable for mixing with another waste or material because the mixture might produce heat or pressure, fire or explosion, violent reaction, toxic dusts, fumes, mists, or gases, or flammable fumes or gases. Refer to Table 1.
Inspection	Viewing of the contents of the container, container markings and labeling, number of containers, and/or the container itself as a means of confirming the identity of the waste
Knowledge	Sufficient information about a waste to substitute reliably for direct testing of the waste. To be sufficient and reliable, the <i>knowledge</i> used must provide information necessary to manage the waste in accordance with the requirements of this chapter. [WAC 173-303-040] Note: <i>Knowledge</i> may be used by itself or in combination with testing to designate as waste pursuant to WAC 173-303-070(3)(c) , or to obtain a detailed chemical, physical, and/or biological analysis of a waste as required in WAC 173-303-300(2) .
Profile	A detailed physical, chemical, and/or biological analysis of a dangerous waste provided by the waste generator in order to allow the 325 HWTUs staff to perform waste analysis. The Chemical Disposal/Recycle Request (CDRR) and/or Radioactive Waste Disposal Request (RWDR) at PNNL currently serve as the waste profile. A sample CDRR is shown in Table B.3.
Testing	Performance of a procedure that yields a quantitative or qualitative evaluation of the type and/or quantity of materials present. Sometimes referred to as <i>analysis</i> or <i>laboratory analysis</i> , but for purposes of this procedure, the term <i>testing</i> is used to distinguish it from waste analysis (refer to definition of <i>analysis</i> above).
Verification	Determination that the waste in question is that waste described on the approved profile. Verification may include inspection and/or fingerprint analysis.
Waste Stream	Wastes that are physically or chemically different from each other; wastes that are generated from different types of processes; or wastes that are of the same type, but generated at different points in the process or at different process locations.

1 B. WASTE ANALYSIS PLAN

2 B.1 UNIT DESCRIPTION

3 The 325 HWTUs are ~~two~~ dangerous waste treatment and storage units owned and operated by DOE and
4 co-operated by Pacific Northwest National Laboratory (PNNL). The 325 HWTUs are used for the
5 collection, consolidation, packaging, storage, treatment, and preparation for transport and disposal of
6 dangerous waste, universal waste, and recyclables, including mixed waste. It is an integral part of the
7 PNNL waste management system.

Commented [HT1]: Deletes the “two” to accommodate the addition of the three units being added; also allows for partial closure at a future date if necessary. Class 3, F.1.a.

8 B.1.1 Description of Unit Processes and Activities

9 The 325 HWTUs are ~~two~~ units within the 325 Building, located in the 300 Area on the Hanford Facility
10 (refer to Addendum A for location). ~~These dangerous waste management units are referred to as the~~
11 ~~Shielded Analytical Laboratory (SAL), and the Hazardous Waste Treatment Unit (HWTU).~~

Commented [HT2]: Deletes the “two” and the names of the two units in order to accommodate the addition of three units. The deleted sentence is redundant to other information in the Addenda. Class 3, F.1.a.

12 The 325 Building includes the following: (1) a central portion (completed in 1953) that consists of three
13 floors (basement, ground, and second) containing general-purpose laboratories, provided with special
14 ventilation and work enclosures; (2) a south (front) wing containing office space, locker rooms, and a
15 lunch room; and (3) east and west wings containing shielded enclosures with remote manipulators. The
16 Shielded Analytical Laboratory (SAL) is located in Rooms 32, 200, 201, 202, and 203. The HWTU is
17 located in Rooms 520, 524 and 528. ~~The Cask Handling Area is located in Rooms 603 and 604A in the~~
18 ~~east wing. The Truck Lock is Room 610 of the east wing. The 3714 Pad is a concrete pad and~~
19 ~~surrounding soil located just northeast of the 325 Building that contains the foundation for the former~~
20 ~~3714 Building, which was demolished in 2011.~~

Commented [HT3]: Adds location of the three units being added in the same format as the other two units are described here. Class 3, F.1.a.

21 The 325 HWTUs store and treat dangerous waste generated by Hanford Facility programs (primarily from
22 research activities in the 325 Building and other ~~Pacific Northwest National Laboratory (PNNL)~~
23 facilities) and potentially from other onsite/offsite laboratories. Storage in containers ~~occurs in each unit,~~
24 and bench- or small-scale treatment of dangerous waste ~~in containers~~ occurs in ~~both~~ the HWTU, ~~the Cask~~
25 ~~Handling Area, and the SAL. Larger-scale treatment in containers is limited to macroencapsulation,~~
26 ~~solidification or stabilization and takes place in the Cask Handling Area, the Truck Lock, or at the 3714~~
27 ~~Pad. At the SAL, dangerous waste liquid is stored in a tank in Room 32. As described in further detail in~~
28 ~~Addendum C, permit conditions applicable to container management in both dangerous waste~~
29 ~~management unit~~ the 325 HWTUs are established in accordance with ~~WAC 173-303-630~~. Similarly,
30 permit conditions applicable to the SAL tank have been established in accordance with
31 ~~WAC 173-303-640~~.

Commented [HT4]: Acronym already defined in Section B.1. Class 1, A.1.

32 The fire water-collection tank, which serves rooms 520 and 528 of the HWTU, is located beneath Room
33 520 in the basement of the 325 Building. The rectangular tank measures 1.65 meters by 2.25 meters by
34 1.92 meters, and has a 22,710-liter capacity. The sides and floor of the tank are constructed of epoxy-
35 coated carbon-steel plate. The steel sides and floor provide support for the chemical-resistant
36 polypropylene liner. The tank is secured to the concrete floor of the 325 Building with 1.3-centimeter
37 bolts at 1.82-meter intervals.

Commented [HT5]: Reworded to describe the process and activity descriptions for the three new units and conforming changes to previous language. Class 3, F.1.a.

38 B.1.1.1 How Waste is Accepted, Moved, Processed, and Managed

39 PNNL’s waste management organization maintains a waste management database to support the
40 identification and tracking of waste from profiling through final disposition, and maintain the information
41 required by permit conditions established in accordance with ~~WAC 173-303-380~~. This section contains
42 information on waste acceptance and analysis. Waste movement, processing, and management are
43 discussed in Addendum C.

1 **B.1.1.1.1 Narrative Process Descriptions**

2 Wastes to be managed at the 325 HWTUs are generated by PNNL's research laboratory and support
3 activities, usually in small quantities. These wastes are managed in accordance with generator
4 requirements prior to being submitted for transfer to the 325 HWTUs during the accumulation period.

5 **B.1.1.1.2 Narrative Waste Characterization**

6 Waste streams accepted for storage at the 325 HWTUs can be categorized as follows:

7 **Listed Waste from Specific and Nonspecific Sources**

8 Certain wastes from specific and nonspecific sources identified in [WAC 173-303-9904](#) (designated with
9 'F' waste codes) are accepted at the 325 HWTUs for storage and subsequent shipment. Addendum A
10 identifies the dangerous waste numbers and estimated annual management quantities for each. These
11 estimated annual management quantities are the maximum allowable amounts for storage or treatment in
12 the 325 HWTUs.

13 Spent solvents may be halogenated or non-halogenated. Spent degreasing solvents (F001) as well as
14 spent halogenated solvents (F002) are generated primarily in research activities, with a few generated by
15 maintenance activities. Spent non-halogenated solvents (F003, F004, and F005) are also primarily
16 generated by research activities, with a few generated by maintenance activities. WPCB state source
17 waste (PCB electrical equipment waste) has been generated in limited amounts in the past and could be
18 stored at the 325 HWTUs if future generating activities occur.

19 **Discarded Commercial Chemical Products**

20 Discarded commercial chemical products are those described in [WAC 173-303-081](#). Addendum A
21 identifies all of the discarded commercial chemical products listed in [WAC 173-303-9903](#), as research
22 activities have the potential to generate any of these wastes. Estimated annual management quantities are
23 given based on prior experience.

24 These wastes ('P' and 'U' waste codes) are typically received at the 325 HWTUs in the manufacturer's
25 original container. These containers are usually 4 liters or less in volume, and are glass or polyethylene
26 jars or bottles, or metal cans. Such wastes may be discarded at the end of a project, as part of a lab
27 cleanout, or after the passage of an expiration date, that renders the chemical non-useable due to quality
28 assurance requirements of Laboratory projects.

29 **Characteristic Waste**

30 Some wastes from research activities and maintenance, although not listed pursuant to [WAC 173-303-081](#)
31 or [-082](#), exhibit one or more characteristics of dangerous waste described in [WAC 173-303-090](#).
32 Although wastes exhibiting any of these characteristics are routinely managed at the 325 HWTUs, the
33 most prevalent waste types are ignitable wastes (D001), corrosive wastes (D002), solid corrosives
34 (WSC2), and wastes containing chromium (D007) and/or lead (D008). All characteristic waste codes and
35 estimated annual management quantities are given in Addendum A. These estimated annual management
36 quantities are the maximum allowable amounts for storage or treatment in the 325 HWTUs.

37 **Criteria Waste (Toxic and/or Persistent)**

38 Wastes from research or maintenance activities that is not a listed waste and does not exhibit a
39 characteristic of dangerous waste may designate as state dangerous waste criteria wastes, pursuant to
40 [WAC 173-303-100](#). Wastes exhibiting the criteria of toxicity (WT02) are PNNL's most prevalent waste
41 type. All criteria waste codes and their estimated annual management quantities are given in
42 Addendum A.

43 **B.1.1.1.3 Waste Acceptance Process**

44 Waste Submittal

1 The waste analysis process for the 325 HWTUs begins when the generating unit completes and transmits
2 a profile to the waste management organization for the waste stream. This profile is currently submitted
3 electronically into the waste management database by field-deployed waste management staff. The
4 profile provides the *detailed physical, chemical, and/or biological analysis* of each waste submitted.
5 Information required includes a physical description of the waste, accounting for 100% of the contents,
6 and identity and concentration of the hazardous constituents known or reasonably expected to be in the
7 waste; location and container information; identity of the waste generator; and the hazards of the waste.
8 Profile information includes process knowledge and any available testing data on the waste.

9 Profile information must meet the following four distinct information needs for management of dangerous
10 waste at the 325 HWTUs.

- 11 • Verify that wastes are properly designated in accordance with WAC 173-303 and whether those
12 wastes are DW or EHW;
- 13 • Identify or verify the applicable treatment standards under WAC 173-303-140 and whether the waste
14 complies with applicable treatment standards under [WAC 173-303-140](#);
- 15 • Identify and verify specific characteristics of waste in solid, liquid, or solution form;
- 16 • Determine how to safely handle, transport, analyze, store, and dispose of the waste.

17 Evaluation and Acceptance

18 After a profile is submitted, waste management staff first performs a consistency check of profile
19 information. For instance, profile data is checked to confirm that percentages of waste constituents listed
20 add to 100%, physical state is consistent with chemical description, and that chemicals are compatible
21 with container type. The purpose of this check is to determine if any process knowledge provided
22 constitutes *knowledge* for purposes of the Dangerous Waste Regulations, i.e. is adequate to substitute for
23 testing information in order to quantify constituents and characteristics, and enable proper management of
24 the waste in accordance with the Dangerous Waste Regulations. Any information discrepancies are noted
25 and resolved with the profile submitter. Discrepancies that cannot be resolved result in rejection of the
26 waste profile.

27 Once the consistency check is complete, waste designation information is verified. Any constituent
28 regulated under other regulations is also checked (e.g. PCBs, asbestos) and DOT hazard class and packing
29 group information is determined based on the hazard description given in DOT regulations. Applicable
30 LDR treatment standards are identified and underlying hazardous constituents (UHC) are identified, as
31 appropriate. The verified waste codes, other identification, LDR treatment standard and UHC
32 information, and DOT hazard class and packing group information associated with the waste are
33 confirmed for correct entry in the waste management database.

34 Once designation verification is complete, the waste management staff determines if a waste is
35 unacceptable for storage (e.g. waste code not listed in Addendum A), and storage capacity limits are
36 checked. If the waste is confirmed to meet the storage type and quantity limitations of Addenda A, B, and
37 C, it meets the waste acceptance criteria, and is acceptable for storage. The approved waste is assigned a
38 unique identification number, cell location, and hazard classification. The profile is noted as *approved*.

39 Confirmation of Knowledge

40 In PNNL's experience, process knowledge from the generator is generally sufficient to meet the
41 requirements for a *detailed chemical, physical, and/or biological analysis* of wastes accepted at the
42 325 HWTUs for the following reasons:

- 43 • Wastes stored at the 325 HWTUs are generated on the Hanford Site and/or by PNNL research
44 programs who maintain effective administrative control over individual waste generating units (i.e.,
45 the same organization generates the waste and operates the storage unit).

- 1 • Some wastes stored at the 325 HWTUs are discarded chemical products for which knowledge of
2 waste characteristics is available without further analysis.
- 3 • Most of the waste stored at the 325 HWTUs is a result of research activities that are carefully
4 controlled and documented; this documentation includes information on chemical constituent inputs
5 and outputs.

6 To confirm the sufficiency and reliability of the knowledge provided by generators, waste management
7 activities (e.g. satellite accumulation areas) are co-managed by field-deployed waste management staff.
8 These staff assists in obtaining the data and other information utilized to prepare the profile, and review
9 the quality and sufficiency of the information provided in order to confirm that it is adequate for safely
10 managing the waste. Other methods for confirmation noted in [WAC 173-303-300\(2\)\(a\)](#) may be used
11 instead of or in conjunction with onsite visits and data review in special situations.

12 Instances where the 325 [HWTUs](#) require testing [HWTUs](#) to corroborate process knowledge include the
13 following:

- 14 • when waste management personnel have reason to suspect a change in the waste based on
15 inconsistencies on the profile or in packaging or labeling of the waste
- 16 • when the information submitted previously by a generator does not match the characteristics of the
17 waste that was submitted
- 18 • when a receiving TSD facility rejects the waste because waste verification at that facility reveals an
19 inconsistency with the waste profile provided by the 325 HWTUs

20 Testing is not required when the inconsistency deals with a listing based on process usage (e.g. F001
21 designation based on use as a solvent).

22 If a waste stream is profiled and multiple shipments of the same waste stream are accepted using the same
23 approved profile, it must be reevaluated when the generator and/or the 325 HWTUs personnel have
24 reason to believe the process generating the waste, or the characteristic or the chemical constituents of the
25 waste stream, have changed, or there is a manifest discrepancy (for wastes received from off-site),
26 shipping paper discrepancy (receipt of wastes from on-site dangerous waste management units) or failure
27 of the waste verification process. Even if no such instances occur, the waste stream will be re-profiled
28 and re-evaluated at least annually.

29 **B.1.2 Identification and Classification of Waste**

30 The 325 HWTUs dangerous waste management units are used for container and tank storage and
31 treatment of dangerous waste. As a result, the following waste types are not accepted for storage:

- 32 • Bulk solids (non-containerized)

33 Dangerous waste containing source, special nuclear, or byproduct material under the Atomic Energy Act
34 (i.e. mixed waste) is only accepted when already containerized or when it is to be managed in the
35 permitted tank in Room 32 of the SAL.

36 Refer to Addendum C, Sections C.1.10, C.1.11, and C.2.1.5 for precautions taken in the storage of
37 various types of wastes (e.g. ignitable, reactive, or incompatible wastes).

38 A wide range of waste container sizes/volumes is typically used to manage wastes at the 325 HWTUs due
39 to the variety of research and maintenance activities supported. Refer to Addendum C for a description of
40 secondary containment and container types and sizes managed. No individual container of material
41 requiring secondary containment per [WAC 173-303-630\(7\)](#) in excess of the secondary containment
42 capacity of the location where the waste will be managed in OUG-5 dangerous waste management units
43 will be accepted or managed at the unit without management approval and additional secondary
44 containment system capacity provided as required by permit conditions established pursuant to

Commented [HT6]: Typo fix. Class 1, A.2.

1 [WAC 173-303-630](#)(7). No shipment of bulk liquid greater than the operational capacity of the storage
2 tank (1218 liters) will be accepted.
3 Containerized wastes managed include labpacks conforming to the standards of [WAC 173-303-161](#), and
4 hazardous debris and contaminated soil as defined in [40 CFR 268.2](#) (incorporated by reference at
5 [WAC 173-303-140](#)).
6 Along with waste received for storage and treatment, the 325 HWTUs also generates dangerous waste as
7 a byproduct of waste handling and treatment activities. Typically, these wastes include personal
8 protective equipment, rags, and other spent materials that designate as hazardous waste when discarded.
9 Such wastes are accumulated at the 325 HWTUs in satellite or 90-day accumulation areas (as appropriate)
10 and a profile submitted for formal acceptance into the unit.

11 **B.1.2.1 Dangerous Waste Numbers, Quantities, and Design Capacity**

12 Refer to Addendum A for the waste numbers, quantities, types of treatment performed, and design
13 capacity for the 325 HWTUs.

14 **B.2 WASTE CONFIRMATION**

15 **B.2.1 Pre-Shipment Review**

16 Once a waste profile has been approved per the process in Section B.1.1.1.2, it is scheduled for pickup by
17 Waste Management staff. At pickup, waste management organization staff visits the generator storage
18 area and make a final inspection of the waste containers to determine whether the profile and contents
19 label information match completely, and whether the containers are adequate for transport to and storage
20 at the 325 HWTUs. [Examples of acceptable packaging include laboratory reagents in their original
21 bottles, U.S. Department of Transportation-approved containers, spray cans, sealed ampules, paint cans,
22 and leaking containers that have been over packed. Waste management organization staff have the
23 authority to determine whether a container is in poor condition or inadequate for storage using the criteria
24 referenced by WAC 173-303-190 and to use professional judgment to determine whether the packaging
25 could leak during handling, storage, and/or treatment.](#) The purpose of visual inspection is to confirm that
26 the waste matches the description in the profile. As a quality assurance/quality control measure, only
27 trained and experienced personnel conduct visual inspection of wastes to verify that the waste being
28 picked up matches the description provided by the waste generator and evaluated during the waste
29 verification/waste acceptance process.

30 If the waste is a discarded commercial chemical product, the contents of the container are inspected to
31 verify that they match the description of the product. For other waste, e.g., spent solvents, waste
32 descriptions are compared with the products in use at the generating unit to determine if the profile
33 description is accurate. If, after visual inspection of the waste, any doubt remains as to the identity of the
34 waste, the waste is not picked up. The generator is required to resubmit the profile with accurate
35 information.

36 After inspection of the waste at the generating unit, and the information in the profile matches with the
37 container labeling and visual inspection, the waste is picked up for transport to the 325 HWTUs. Any
38 appropriate DOT labeling is applied. In addition, each waste container is labeled with a physical
39 description of the waste (accounting for 100% of the contents), identity, and concentration of the
40 hazardous constituents known or reasonably expected to be in the waste, and major risk(s). This
41 information helps the waste handlers verify safe handling, storage, retrieval, and transportation of
42 dangerous waste.

43 Most of the waste stored at the 325 HWTUs is generated on the Hanford Site and/or by PNNL research
44 programs within the 300 Area. All transportation of dangerous waste to the 325 HWTUs will be
45 according to the requirements of Permit Condition ILN. Additional requirements for waste generated
46 outside the 300 Area include proper manifesting (if appropriate) to the 325 HWTUs and utilizing proper
47 packaging for transport over public roadways. Although PNNL waste generated outside of the 300 Area

Commented [HT7]: This detail was moved here from Section C.1.2.1, as it is applicable to all units in the 325 HWTUs and is performed prior to pick-up rather than after. Removed "etc." after the list of examples to use "mandatory" language per Ecology AG. Changed "Unit operations personnel" to "waste management organization staff" for context clarity. Class 1, A.1.

1 is considered to be generated offsite since it may be transported to the 325 HWTUs on roads accessible to
2 the public, it is generated under the same administrative controls as wastes that are generated *onsite*
3 (i.e., in the 300 Area). Therefore, no distinction is necessary between *on-site* and *off-site* for PNNL waste
4 with respect to the waste analysis requirements of this WAP.

5 **B.2.2 Receipt Verification**

6 The waste acceptance procedure for receipt of waste from both on- and off-site is based on the following
7 requirements. These verification procedures are summarized in Table B.2.

8 **B.2.2.1 Physical Verification Process**

9 **B.2.2.1.1 Inspection of Shipping Papers/Documentation**

10 Document Verification

11 The necessary documentation (e.g. manifest or onsite shipping paper) for the entire shipment are verified
12 (i.e., signatures are dated, all waste containers included in the shipment are accounted for and correctly
13 indicated on the shipment documentation, there is consistency throughout the different shipment
14 documentation, and the documentation matches the labels on the containers).

15 B.2.2.1.1.1 Response to Significant Discrepancies. The primary concern during acceptance of
16 containers for storage is improper packaging or manifest discrepancies. Containers with such
17 discrepancies are not accepted at the 325 HWTUs until the discrepancy has been resolved. Depending on
18 the nature of the condition, such discrepancies can be resolved using one or more of the following
19 alternatives.

- 20 • Incorrect or incomplete entries on the uniform hazardous waste manifest or on-site shipping
21 documentation can be corrected or completed with concurrence of the onsite generator or offsite
22 generator. Corrections are made by drawing a single line through the incorrect entry. Corrected
23 entries are initialed and dated by the individual making the correction.
- 24 • The waste packages can be held and the onsite generator or offsite waste generator requested to
25 provide verbal or written instructions for use in correcting the condition before the waste is accepted.
- 26 • Waste packages can be returned as unacceptable.
- 27 • If a noncompliant dangerous waste package is received from an offsite waste generator, the waste
28 package is non-returnable because of condition, packaging, etc., and if an agreement cannot be
29 reached among the involved parties to resolve the noncompliant condition, then the issue will be
30 referred to DOE for resolution. Ecology will be notified in writing if a discrepancy is not resolved
31 within 15 days after receiving a noncompliant shipment. Pending resolution, such waste packages,
32 although not accepted, might be placed in the 325 HWTUs. The package(s) will be segregated from
33 other waste, and an entry will be made into the 325 HWTUs logbook describing the actions that were
34 taken to store the packages in a safe manner until a resolution has been reached.

35 B.2.2.1.1.1.2 Activation of Contingency Plan for Damaged Shipment. If waste shipments arrive at the
36 325 HWTUs in a condition that presents a hazard to public health or the environment, the Building
37 Emergency Procedure is implemented as described in Addendum J, Contingency Plan.

38 Inspection of Waste Containers

39 The condition of waste containers is checked to verify that the containers are in good condition (i.e., free
40 of holes and punctures). Shielded, classified, and remote-handled mixed waste is not physically inspected
41 except for examination of the external container.

42 Inspection of Container Labeling

1 Shipment documentation is used to verify that the containers are labeled with the appropriate
2 Hazardous/Dangerous Waste labeling and associated markings according to the contents of the waste
3 container.

4 Acceptance of Waste Containers. The 325 HWTUs personnel sign the shipment documents and retain a
5 copy. Any discrepancies and their resolution are recorded in the waste management database and the
6 Hanford Facility Operating Record, 325 HWTUs File.

7 **B.2.2.2 Chemical Verification Process**

8 The purpose of chemical verification is to verify that the waste received matches that described in the
9 waste profile. Onsite and offsite waste received at the 325 HWTUs will receive chemical verification
10 at the unit according to the following process.

11 **B.2.2.2.1 Exceptions to Chemical Verification**

- 12 • Laboratory reagents and commercial products such as paint, lubricants, solvent, or cleaning products
13 are not subject to analytical verification when received in their original containers.
- 14 • Heterogeneous wastes (such as discarded machinery, shop rags, labpacks, and debris) that do not
15 yield a representative sample are only subject to the physical screening process.
- 16 • Asbestos wastes.
- 17 • Spill cleanup wastes resulting from the spill or release of known materials.
- 18 • Wastes previously receiving chemical verification at the accumulation area (e.g. North Richland) in
19 accordance with the requirements of this section B.2.2.2.
- 20 • Any mixed waste with a dose rate exceeding 20 millirem/hour at contact.
- 21 • Any transuranic waste (waste containing more than 100 nanocuries/gram of transuranic isotopes).
- 22 • Any shielded, classified, or remote-handled waste.

23 **B.2.2.2.1.1** Waste designated for listing criteria based on process information (e.g. F001 waste
24 identified as a used solvent).

25 **B.2.2.2.2 Number of Verifications**

26 Five percent of waste containers received from PNNL generating locations will receive chemical
27 verification each month. The number of containers to be verified in any month is based on five percent of
28 the number of containers received at the 325 HWTUs during the previous three months, divided by three,
29 exclusive of those exempt from verification as described in Section B.2.2.2.1 above. Fractional numbers
30 are rounded upwards. For example, if 40 qualifying containers are received in June 50 containers in July,
31 and 60 containers in August, an average of 50 per month, 3 containers ($50 \times 5\% = 2.5$, rounded to 3)
32 would be sampled and analytically verified. Note that during the first three months of operation under
33 this WAP, the *previous three months* are the three calendar months preceding the effective date of this
34 Permit.

35 Ten percent of the number of containers on any shipment from offsite (except PNNL generating
36 locations) receives chemical verification. If a shipment contains waste from more than one generator, ten
37 percent of containers from each generator receive chemical verification.

38 **B.2.2.2.3 Selection Process**

39 Randomly selected containers from onsite will receive chemical verification until the required number of
40 verifications necessary for that month is accomplished. A variety of non-PNNL generating locations and
41 waste types, if any, will be analyzed to the extent practicable. However, the number of containers
42 selected from any given shipment will be based on the number of containers scheduled for pickup during

1 the current month as well as the number of containers in the individual shipment that are subject to
2 chemical verification.

3 **B.2.2.2.4 Sampling**

4 Waste containers selected for verification are sampled using the methods in [WAC 173-303-110](#)(2) for
5 representative samples, or utilizing a similar method suitable to the container. For instance, to sample a
6 one-liter bottle of homogeneous liquid, glass tubing, or a pipet would be utilized to obtain a representative
7 sample instead of a COLIWASA. Generally, these samples are analyzed immediately, so preservation
8 techniques are not utilized. If the samples must be stored, they will be preserved in accordance with the
9 requirements of the analytical technique being used (Table B.2).

10 **B.2.2.2.5 Testing Methods**

11 The methods utilized for chemical verification at the 325 HWTUs are selected based on the
12 appropriateness for the waste being verified. Tests performed are selected from the following.

13 **Water Miscibility/Separable Organics.** Performed utilizing water solubility Hazcat© test kits per the
14 instructions given in those kits. These tests are not performed on materials known to be organic
15 peroxides, ethers, and/or water reactive.

16 **Oxidizers:** Performed utilizing oxidizer Hazcat© test kits per the instructions given in those kits. These
17 tests are not performed on materials known to be organic peroxides, ethers, and/or water reactive.

18 **pH:** SW-846 Method 9040, 9041, or 9045 (by pH meter or pH paper). This test will not be performed on
19 organic liquids.

20 **Cyanides:** Performed utilizing cyanide Hazcat© test kits per the instructions given in those kits.

21 **Sulfides:** Performed utilizing sulfide Hazcat© test kits per the instructions given in those kits.

22 **Halogenated/Volatile Organics:** Examination with a photoionizer or flame ionizer to determine if the
23 waste contains volatile organic compounds. Clor-D-Tect© kits may be used to detect organic halogens.

24 **B.2.2.2.6 Quality Assurance/Quality Control for Analytical Verification**

25 Each testing process is subject to QA/QC requirements as follows. The data quality objectives for these
26 analyses are given in Section B.4.5.

27 **Water Miscibility/Separable Organics:** Performed utilizing water solubility Hazcat© test kits per the
28 instructions given in those kits using test kits that are not older than the expiration date specified on the
29 kit. Data interpretations are performed utilizing the manufacturer's instructions for the test kit.

30 **Oxidizers:** Performed according to manufacturer's instructions utilizing test kits that are not older than
31 the expiration date specified on the kit. Data interpretations are performed utilizing the manufacturer's
32 instructions for the test kit.

33 **pH:** Calibration of pH meters and pH paper is performed as required by the appropriate method being
34 used (SW-846 method 9040, 9041, or 9045).

35 **Cyanides:** Performed according to manufacturer's instructions utilizing test kits that are not older than
36 the expiration date specified on the kit. Data interpretations are performed utilizing the manufacturer's
37 instructions for the test kit.

38 **Sulfides:** Performed according to manufacturer's instructions utilizing test kits that are not older than the
39 expiration date specified on the kit. Data interpretations are performed utilizing the manufacturer's
40 instructions for the test kit.

41 **Halogenated/Volatile Organics.** The photoionizer is calibrated daily (when in use) to a standard gas
42 mixture in accordance with manufacturer's instructions. Data interpretations are performed utilizing
43 observed data (meter readings) with adjustment as necessary based on the relative responsiveness of the
44 waste compared to the standard mixture utilized for calibration. These adjustments are given in

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1 photoionizer manufacturer's literature. Clor-D-Tect© tests are performed according to manufacturer's
2 instructions utilizing test kits that are not older than the expiration date specified on the kit. Data
3 interpretations are performed utilizing the manufacturer's instructions for the test kit.

4 **B.2.3 Waste Acceptance**

5 Once waste items have been confirmed by physical and necessary chemical verification, as described
6 above, the waste is considered *accepted* and placed in the designated location in the unit determined prior
7 to pickup. Containers of dangerous waste are managed according to the requirements of Addendum C.

8 **B.3 SELECTING WASTE ANALYSIS PARAMETERS**

9 Physical and chemical screening parameters are chosen from those in Sections B.3.1 and B.3.2,
10 respectively, as described in Section B.2.2.2 and B.2.2.3 of this WAP. Parameters for confirmation of
11 designation and compliance with LDR requirements are given in Section B.3.3. Parameters, methods,
12 and rationale for physical and chemical screening parameters and the pre-shipment review (Section B.2.1)
13 are summarized in Table B.2.

14 **B.3.1 Physical Screening Parameters**

15 **B.3.1.1 Visual Inspection, Rationale**

16 Waste containers (and contents visible through the container or through an easily and safely opened lid)
17 are examined to confirm that waste matches the physical description given in the waste profile
18 documentation. Labeling examination also identifies waste prohibited by LDR requirements related to
19 downstream TSD unit acceptance criteria. For instance, an organic destined for incineration might
20 contain acids that the intended facility does not have permit authorization to treat by DEACT.

21 **B.3.1.2 Visual Inspection, Method**

22 Waste containers are inspected by trained, experienced personnel to verify that it matches the description
23 in the profile. If the waste is a discarded product, the contents of the container are inspected to verify that
24 they match the description of the product. For other waste, e.g., spent solvents, waste descriptions are
25 compared with the products in use at the generating unit. This information is compared to the description
26 of the waste in the profile. If, after visual inspection of the waste and inquiry of the generating unit
27 personnel, any doubt remains as to the identity of the waste, the waste is not picked up and required to be
28 re-profiled by the generator.

29 **B.3.1.3 Visual Inspection, Failure Criteria**

30 Waste does not correlate with the description of the waste (e.g. color, layering, consistency).

31 **B.3.2 Chemical Screening Parameters**

32 **B.3.2.1 Water Miscibility**

33 **Rationale:** Water miscibility/separable organics testing is chosen to confirm that waste matches that
34 described on waste acceptance documentation, identify separable organics, and/or identify waste
35 prohibited by downstream TSD unit acceptance criteria. Not performed on organic peroxides, ether, or
36 water-reactive wastes.

37 **Method:** Performed using water solubility Hazcat© test kits per the instructions given in those kits.

38 **Failure Criteria:** Test results do not confirm the presence or absence of constituents of interest.

39 **B.3.2.2 Oxidizer**

40 **Rationale:** The oxidizer test is performed to confirm that waste matches that described on waste
41 acceptance documentation, and verify waste requires oxidizer management pursuant to

1 [WAC 173-303-395](#) (1)(b) at the 325 HWTUs. Not performed on organic peroxides, ether, or water-
2 reactive compounds.

3 **Method:** HazCat© Oxidizer Screen Test Kit

4 **Failure Criteria:** Test results do not confirm the presence or absence of constituents of interest.

5 **B.3.2.3 pH**

6 **Rationale:** Used to confirm that waste matches that described on waste acceptance documentation and to
7 verify compliance with [WAC 173-303-395](#)(1)(b) concerning separation of incompatible wastes. (Not
8 used for solids or organic liquids).

9 **Method:** pH Screen [SW-846](#) Method 9040C or 9045 (pH meter) or 9041A (pH paper).

10 **Failure Criteria:** Test result does not match the pH given in the profile within a 4.0 pH unit tolerance, or
11 the observed pH results in a designation change (e.g. profiled as non-corrosive, but exhibits a pH ≤ 2.0 or
12 ≥ 12.5).

13 **B.3.2.4 Cyanides**

14 **Rationale:** Confirm that waste matches that described on waste acceptance documentation; verify waste
15 requires compliance with [WAC 173-303-395](#)(1)(b) concerning separation of incompatible wastes.

16 **Method:** HazCat© Cyanide Screen Test Kit

17 **Failure Criteria:** Test results do not confirm the presence or absence of cyanide.

18 **B.3.2.5 Sulfides**

19 **Rationale:** Confirm that waste matches that described on waste acceptance documentation; verify waste
20 requires compliance with [WAC 173-303-395](#)(1)(b) concerning separation of incompatible wastes.

21 **Method:** HazCat© Sulfide Screen Test Kit

22 **Failure Criteria:** Test results do not confirm the presence or absence of sulfide.

23 **B.3.2.6 Halogenated/Volatile Organic Compounds**

24 **Rationale:** Confirm that waste matches that described on waste acceptance documentation

25 **Method:** Photoionizer or Flame Ionizer, or Clor-D-Tect Kits©

26 **Failure Criteria:** Test results do not confirm the presence or absence of organics (photoionizer or flame
27 ionizer testing) or of halogenated organics (Clor-D-Tect Kits).

28 If a waste is determined to have failed any of the tests performed above, the discrepancy resolution
29 process described in Section B.2.2.1.1.1 of this WAP is utilized to resolve the discrepancy. If the
30 discrepancy cannot be easily resolved, the waste is returned to the generator and must be re-profiled prior
31 to consideration for acceptance.

32 **B.3.3 Other Analysis Parameters**

33 The 325 HWTUs does not have any process vents that manage hazardous waste with organic
34 concentrations of at least 10 parts per million by weight percent, or pumps, or compressors used more
35 than 300 hours per year that come into contact with hazardous waste with an organic concentration of at
36 least 10 percent by weight. As a result, no special waste analysis requirements for volatile organics are
37 required by [WAC 173-303-690](#) or [-691](#).

38 A variety of small volume chemical wastes is generated by PNNL's research laboratory activities. These
39 containers typically range in sizes from 10 ml to 5 gallons. These wastes are brought to the 325 HWTUs
40 and segregated by compatibility for storage (refer to *incompatible waste* in the definitions section of this
41 WAP) in the unit until enough waste is accumulated to fill a labpack or bulking container, usually a 30- to

1 55-gallon drum. All containers having a design capacity greater than 0.1 m³ to less than or equal to
2 0.46 m³ are equipped with a cover and comply with all applicable Department of Transportation
3 regulations on packaging hazardous waste for transport under [49 CFR 178](#).

4 DOT approved intermediate bulk packaging may be used for some ~~solid (non-dangerous)~~ wastes in a
5 solid form and not subject to WAC 173-303-692 (Subpart CC requirements containing less than 500 parts
6 per million volume (ppmw) volatile organics and/or meets the LDR treatment standards for the waste
7 with regard to organic hazardous constituents. These containers range in size from 0.1 cu yard (27 cu ft)
8 to 1.6 cu yard (43 cu ft) ~~and are approved for solid waste only~~. When intermediate bulk packaging is used
9 for dangerous waste, determination of organics content will comply with waste determination procedures
10 of 40 CFR 264.1083, incorporated by reference at WAC 173-303-692(2). Alternatively, waste will be
11 containerized compliant with 40 CFR 264.1086, as described in Addendum C, Section C.3, prior to being
12 placed in the intermediate bulk packaging for transport ~~With these limitations in place, no special waste~~
13 ~~analysis requirements for volatile organics are required by WAC 173-303-692 (Subpart CC~~
14 ~~requirements).~~

15 B.4 SELECTING SAMPLING PROCEDURES

16 B.4.1 Sampling Strategies

17 Samples are collected for chemical screening as required by Section B.2.2.2 of this WAP. Sample
18 collection methods conform to the representative sample methods referenced in [WAC 173-303-110\(2\)](#).

19 B.4.2 Sampling Methods

20 In all instances, sampling methods will conform to the representative sample method referenced in
21 [WAC 173-303-110\(2\)](#), i.e., ASTM standards for solids and [SW-846](#) for liquids. Some adaptation of the
22 method may be necessary for small containers being sampled for chemical screening, as discussed in
23 Section B.2.2.2.4. Exceptions to the methods may also be used if permissible pursuant to
24 [WAC 173-303-110](#), NRC/EPA *Clarification of RCRA Hazardous Waste Testing Requirements for Low-*
25 *Level Radioactive Mixed Waste – Final Guidance* ([62 Federal Register 62080](#), November 20, 1997), Data
26 Quality Objectives, and/or an alternative approved by Ecology pursuant to the permit modification
27 process. The specific sampling methods and equipment used varies with the chemical and physical nature
28 of the waste material and the sampling circumstances.

29 B.4.3 Selecting Sampling Equipment

30 Representative samples of liquid waste from containers (vertical *core sections*) are typically obtained
31 using a composite liquid waste sampler (COLIWASA) or tubing, as appropriate. The sampler is long
32 enough to reach the bottom of the container in order to provide a representative sample of all phases of
33 the containerized liquid waste. If a liquid waste has more than one phase, each phase is separated for
34 individual testing, depending on the waste management pathways of the phases.

35 Other waste types that might require sampling are sludges, powders, and granules. In general, nonviscous
36 sludges are sampled using a COLIWASA. Highly viscous sludges and cohesive solids are sampled using
37 a trier, as described in [ASTM](#) Standard D1452-80. Dry powders and granules are sampled using a thief,
38 as described in [ASTM](#) Standard D346-75.

39 Samplers are constructed of material compatible with the waste. In general, aqueous liquids are sampled
40 using polyethylene samplers, organic liquids using glass samplers, and solids using polyethylene
41 samplers. Disposable samplers are used whenever possible to eliminate the potential for cross-
42 contamination. If non-disposable sampling equipment is used, it is decontaminated between samples as
43 necessary to ensure subsequent samples are representative of the wastes being sampled.

Commented [HT8]: Revises to allow stabilization of dangerous or mixed waste in larger containers as long as the wastes contain less than 500 ppm VOC pursuant to Subpart CC exemption at 40 CFR 264.1082(c)(1) and (c)(4), or if the waste is containerized in compliance with Subpart CC prior to placement in the larger container. Note that these requirements do not apply to the SAL or Cask Handling Area units, which only handle mixed waste and thus are exempt per WAC 173-303-692(1)(b)(vi). Class 3, F.1.a.

1 **B.4.4 Sample Preservation**

2 All sample containers, preservation techniques, and hold times follow [SW-846](#) protocol. Many samples
3 are immediately analyzed at the 325 HWTUs or in nearby laboratories in the 325 Building and are not
4 preserved.

5 **B.4.5 Establishing Quality Assurance and Quality Control for Sampling**

6 Pacific Northwest National Laboratory is committed to maintaining a high standard of quality for all of its
7 activities. A crucial element in maintaining that standard is a quality-assurance program that provides
8 management controls for conducting activities in a planned and controlled manner and enabling the
9 verification of those activities.

10 The QA/QC objective of the 325 HWTUs is to control and characterize errors associated with collected
11 data and to illustrate that waste testing has been performed according to specification in this waste
12 analysis plan.

13 The data-quality objectives (DQO) for the waste sampling and data analyses are as follows:

- 14 • Determine if waste samples are representative of the contents of the containers at the time the samples
15 were taken.
- 16 • Determine if waste accepted for storage meets the 325 HWTUs waste-acceptance criteria
17 (Addendum B).
- 18 • Determine if waste to be accepted match the corresponding waste description in the approved waste
19 profile.

20 **B.5 LABORATORY SELECTION AND QUALITY ASSURANCE/QUALITY CONTROL**

21 **B.5.1 Evaluation of Laboratories**

22 Laboratory selection is limited. Preference will be given to any PNNL facility or other laboratories on the
23 Hanford Facility that exhibit-demonstrated experience and capabilities in four major areas:

- 24 • comprehensive written QA/QC program based on DOE-RL requirements specifically for that
25 laboratory
- 26 • audited for effective implementation of QA/QC program
- 27 • participate in performance-evaluation samples to demonstrate analytical proficiency
- 28 • demonstrated ability to produce analytical data meeting the data quality requirements of this WAP.

29 All laboratories (onsite or offsite) are required to have the following QA/QC documentation:

- 30 • Daily analytical data generated in the contracted analytical laboratories are controlled by the
31 implementation of an analytical laboratory QA plan.
- 32 • Before commencement of the contract for analytical work, the laboratory will have its QA plan
33 available for review. At a minimum, the QA plan will document the following:
- 34 • sample custody and management practices
- 35 • requirements for sample preparation and analytical procedures
- 36 • instrument maintenance and calibration requirements
- 37 • internal QA/QC measures, including the use of method blanks
- 38 • required sample preservation protocols

- 1 • analysis capabilities

2 **B.5.2 Quality Assurance/Quality Control Objectives**

3 The objective of the QA/QC program is to control and characterize any errors associated with the
4 collected data and to confirm that the data collected is adequate for its intended purpose. Quality-
5 assurance activities, such as the use of standard methods for locating and collecting samples, are intended
6 to limit the introduction of error. Quality-control activities, such as the collection of duplicate samples
7 and the inclusion of blanks in sample sets, are intended to provide the information required to characterize
8 any errors in the data. Other QC activities, such as planning the QC program and auditing ongoing and
9 completed activities, verify that the specified methods are followed and that the QA information needed
10 for characterizing error is obtained. To illustrate that waste testing has been performed according to
11 requirements of this waste analysis plan, activities include:

- 12 • Field inspections—performed and documented by waste management staff at the generating location.
13 The inspections primarily are visual examinations but might include measurements of materials and
14 equipment used, techniques employed, and the final products. The purpose of these inspections is to
15 confirm the sufficiency and reliability of the knowledge used for the waste profile.
- 16 • Field-testing—performed onsite by the 325 HWTUs staff (or designee) according to specified
17 procedures or protocol identified by the manufacturer’s instructions supplied in the field test kits.
- 18 • Laboratory analyses—performed by onsite or offsite laboratories on samples of waste. The purpose of
19 the laboratory analyses is to determine constituents or characteristics present and the concentration or
20 level.

21 The 325 HWTUs will assess analytical data used for decision making according to the following quality
22 standards, as appropriate for the data considered:

- 23 • Precision: Agreement between the collected samples/duplicates for the same parameters, at the same
24 location, subjected to the same preparation and analytical techniques. Analytical precision also
25 includes agreement among individual test portions taken from the same sample.
- 26 • Accuracy: Agreement between the observed data and the result of QA samples (e.g. certified
27 standards, in-house standards, and performance evaluation samples).
- 28 • Representativeness: The degree to which the data accurately represent the waste stream. Criteria
29 evaluated include number and adequacy of sampling locations, use of appropriate sampling and
30 analytical methods, and documentation of environmental conditions at time of sampling.
- 31 • Completeness: Amount of data obtained versus amount requested.
- 32 • Comparability: Ability to compare one data set to another. Usually addressed by evaluating proper
33 use of standard methods prescribed in this WAP.

34 These practices verify that all data and the decisions based on that data are technically sound, statistically
35 valid, and properly documented.

36 The primary purpose of waste testing is to confirm the waste is acceptable for treatment or storage at the
37 325 HWTUs in compliance with the requirements of this WAP. Waste testing also is performed to verify
38 the safe management of waste being stored and control of the acceptance of waste for storage. The
39 specific objectives of the waste-sampling and analysis program at the 325 HWTUs are as follows:

- 40 • Identify the presence of waste that is incompatible with waste currently stored.
- 41 • Provide a detailed chemical and physical analysis of the waste before the waste is accepted at the
42 325 HWTUs to ensure proper management and disposal.
- 43 • Provide an analysis that is accurate and up-to-date.

- 1 • Ensure safe management of waste undergoing storage at the 325 HWTUs.
- 2 • Demonstrate compliance with applicable LDR treatment standards, for waste treated at the
- 3 325 HWTUs.
- 4 • Identify and reject waste that does not meet the 325 HWTUs acceptance requirements
- 5 (e.g., incomplete information).

6 **B.5.3 Laboratory Quality Assurance/Quality Control**

7 All analytical work performed by independent laboratories, is defined, and controlled by a Statement of
8 Work, prepared in accordance with administrative procedures and requirements of this WAP. The daily
9 quality of analytical data generated in the analytical laboratories will be controlled by the implementation
10 of an analytical laboratory QA plan. At a minimum, the plan will document the following:

- 11 • sample custody and management practices
- 12 • requirements for sample preparation and analytical procedures
- 13 • instrument maintenance and calibration requirements
- 14 • internal QA/QC measures, including the use of method blanks
- 15 • required sample preservation protocols following receipt of samples at the laboratory
- 16 • analysis capabilities

17 The types of internal quality-control checks are as follows and are used as specified in the analytical
18 laboratory's program as described in Section B.5.1:

- 19 • Method Blanks—Method blanks usually consist of laboratory reagent-grade water treated in the same
20 manner as the sample (i.e., digested, extracted, distilled) that is analyzed and reported as a standard
21 sample would be reported.
- 22 • Method Blank Spike—A method blank spike is a sample of laboratory reagent-grade water fortified
23 (spiked) with the analytes of interest, which is prepared and analyzed with the associated sample
24 batch.
- 25 • Laboratory Control Sample—A QC sample introduced into a process to monitor the performance of
26 the system.
- 27 • Matrix Spikes—An aliquot of sample spiked with a known concentration of target analyte(s). The
28 spiking occurs prior to sample preparation and analysis.
- 29 • Laboratory Duplicate Samples—Duplicate samples are obtained by splitting a field sample into two
30 separate aliquots and performing two separate analyses on the aliquots. The analyses of laboratory
31 duplicates monitor the precision of the analytical method for the sample matrix; however, the
32 analyses might be affected by nonhomogeneity of the sample, in particular, by nonaqueous samples.
33 Duplicates are performed only in association with selected protocols. Duplicates are performed only
34 in association with selected protocols. Laboratory duplicates are performed on 5 percent of the
35 samples (1 in 20) or one per batch of samples. If the precision value exceeds the control limit, then
36 the sample set must be reanalyzed for the parameter in question.
- 37 • Known QC Check Sample—This is a reference QC sample as denoted by [SW-846](#) of known
38 concentration, obtained from the EPA, the National Institute of Standards and Technology, or an
39 EPA-approved commercial source. This QC sample is taken to check the accuracy of an analytical
40 procedure. The QC sample is particularly applicable when a minor revision or adjustment has been
41 made to an analytical procedure or instrument. The results of a QC-check standard analysis are
42 compared with the true values, and the percent recovery of the check sample is calculated.

1 PNNL Analytical Chemistry Laboratory QA/QC

2 PNNL's analytical chemistry laboratory may need to be used to analyze samples of potentially radioactive
3 dangerous waste. It has a rigorous QA plan that verifies that data produced are defensible, scientifically
4 valid, and of known precision and accuracy, and meets the requirements of its clients.

5 **B.5.4 DATA ASSESSMENT**

6 Analytical data will be communicated clearly and documented to verify that laboratory data-quality
7 objectives are achieved.

- 8 • The acquired data need to be scientifically sound, of known quality, and thoroughly documented.
9 The DQOs for the data assessment are given in Section B.5.2.

10 **B.6 SELECTING WASTE RE-EVALUATION FREQUENCIES**

11 **B.6.1 Periodic Re-Evaluation**

12 Periodic re-evaluation is an evaluation of a waste stream that provides verification that the results from
13 the initial verification are still valid. Periodic re-evaluation of a waste stream also checks for changes in
14 the waste stream. Most waste stream containers are individually profiled, and hence subject to both
15 physical and chemical analysis as described in Section B.2.2.1 and B.2.2.2 of this WAP, each time they
16 are received at the 325 Hazardous Waste Treatment Units. Any waste stream received by the 325
17 Hazardous Waste Treatment Units not re-profiled each time containers of that waste stream are submitted
18 (i.e. *standing profiles*) will be re-evaluated at least annually.

19 **B.6.2 Re-Evaluation for Cause**

20 Re-evaluation of a waste stream under a *standing profile* will also be required if any of the following
21 occur:

- 22 • The 325 Hazardous Waste Treatment Units personnel have reason to suspect a change in the waste,
23 based on inconsistencies in packaging, labeling, or visual inspection of the waste.
24 • The information submitted previously does not match the characteristics of the waste submitted as
25 identified through fingerprint testing.
26 • The process generating the waste changes

27 **B.7 SPECIAL WASTE ANALYSIS PROCEDURAL REQUIREMENTS**

28 **B.7.1 Procedures for Receiving Onsite and Offsite Waste**

29 Most of the waste stored at the 325 Hazardous Waste Treatment Units is generated on the Hanford Site
30 and/or by PNNL research programs within the 300 Area. Additional requirements for waste generated off
31 the Hanford Site include proper manifesting (if required) to the 325 Hazardous Waste Treatment Units
32 and proper packaging for transport over public roadways. Offsite waste is subject to more stringent
33 chemical verification (Section B.2.2.2.2). Although PNNL waste generated outside of the 300 Area is
34 considered to be generated offsite since it may be transported to the 325 Hazardous Waste Treatment
35 Units on roads accessible to the public, it is under the same administrative controls as wastes that are
36 generated onsite (i.e., in the 300 Area).

37 The procedures for receiving waste at the 325 Hazardous Waste Treatment Units are given in Section B.2.

38 **B.7.2 Provisions for Complying with Land Disposal Restriction Requirements**

39 The *Dangerous Waste Regulations* prohibit the land disposal of certain types of wastes. Most of the
40 waste types stored at the 325 Hazardous Waste Treatment Units falls within the purview of these land-

1 disposal restrictions (LDRs). Occasionally, treatment takes place that is intended to meet the applicable
2 LDRs for a stored waste. Information presented below describes how generators and the 325 Hazardous
3 Waste Treatment Units personnel characterize, document, and certify waste subject to LDR requirements.

4 **B.7.2.1 Waste Treatment**

5 Permitted waste treatment occurs at the 325 Hazardous Waste Treatment Units. Waste received may or
6 may not meet the applicable LDR treatment standards determined during the acceptance process
7 (Section B.2). Waste received for storage that does not meet the applicable LDR treatment standards at
8 the *point of generation* will receive treatment at the 325 Hazardous Waste Treatment Units, and/or by
9 offsite facilities.

10 Shipments of waste shall not be accepted from any non-PNNL generator without any required LDR
11 certification accompanying each shipment. For waste received from non-PNNL generators, the
12 325 Hazardous Waste Treatment Units shall receive the information required by [WAC 173-303-140](#)
13 regarding LDR wastes. The generator must sign the LDR certification.

14 The types and quantities of waste treated at the 325 Hazardous Waste Treatment Units are described in
15 Addendum A. When these treatments are performed to meet applicable LDR treatment standards, the
16 requirements of this section apply.

17 Since treatments conducted at the 325 Hazardous Waste Treatment Units are generally conducted as small
18 bench-scale operations (except for [stabilization in larger containers and in-tank treatments](#)), trace
19 contaminants in wastes are usually not a threat to the safety or conduct of these treatments. However,
20 before accepting waste for treatment via thermal treatment (T11-T18) or biological treatment (T67-T77)
21 technologies given in [WAC 173-303-380](#)(2)(d), 325 HWTUs staff will review, and amend if necessary,
22 this WAP to include any additional data needs expected to be triggered by those technologies and the
23 need to demonstrate compliance with applicable LDR treatment standards.

24 **B.7.2.2 Sampling and Analytical Methods**

25 Testing of treated waste will be performed as provided in [40 CFR 268.7](#)(b) according to the treatment
26 standards of [40 CFR 268.40](#) (adopted by reference at [WAC 173-303-140](#)). Sampling methods for treated
27 wastes will be chosen from the methods given in Section B.4 appropriate to the treated waste. Analytical
28 methods used for confirmation that the specified treatment standard(s) of [40 CFR 268.40](#) (incorporated by
29 reference at [WAC 173-303-140](#)) and any applicable state-specific LDRs will be selected from those
30 specified in [WAC 173-303-110](#)(3) as appropriate for the treated waste being analyzed.

31 Since most wastes are submitted as individual waste streams, sampling and analysis of treated waste is
32 performed on each batch as specified in [40 CFR 268.40](#)(b), adopted by reference at [WAC 173-303-140](#).

33 **B.7.2.3 Land Disposal Restriction Certification of Treatment**

34 Permitted waste treatment occurs at the 325 Hazardous Waste Treatment Units. Certification of treatment
35 related to waste treated at the 325 Hazardous Waste Treatment Units is managed in accordance with the
36 recordkeeping process described in Section B.8.

37 **B.8 RECORDKEEPING**

38 Records associated with the waste-analysis plan and waste-verification program are maintained by the
39 waste-management organization and are placed in the Hanford Facility Operating Record, 325 HWTUs
40 File. A copy of the profile for each waste stream accepted at the 325 Hazardous Waste Treatment Units
41 shall be placed in the Hanford Facility Operating Record, 325 HWTUs File. Organizational units
42 associated with generator activities maintain their sampling and analysis records. The waste analysis plan
43 shall be revised through the permit modification process whenever regulation changes affect the waste
44 analysis plan.

45 The 325 Hazardous Waste Treatment Units has and will continue to receive and store restricted or
46 prohibited waste. Because the 325 Hazardous Waste Treatment Units personnel verify designations and

Commented [HT9]: Adds an exception for stabilization in larger containers taking place in the Cask Handling Area, Truck Lock, and 3714 Pad. Class 3, F.1.a.

1 characterization, including LDR determinations, qualified staff for PNNL-generated waste prepare all
2 notifications and certifications, as required by [40 CFR 268](#), incorporated by reference by
3 [WAC 173-303-140](#). The 325 Hazardous Waste Treatment Units staff collects information from
4 generators via the waste profile to assure that applicable LDR treatment standards have been properly
5 identified, as well as any information documenting compliance with applicable LDR treatment standards.
6 The notifications and certifications are submitted to onsite and offsite TSD units during the waste-
7 shipment process. Additionally, any necessary LDR treatment variance requests are prepared by PNNL
8 qualified staff for U.S. DOE submittal to Ecology for approval.

9 The 325 Hazardous Waste Treatment Units staff requires applicable LDR information/notifications from
10 non-PNNL generators.

11 Where a restricted or prohibited waste does not meet the applicable treatment standards set forth in
12 [40 CFR 268](#), Subpart D, the 325 Hazardous Waste Treatment Units provides to the onsite dangerous
13 waste management unit or offsite TSD facility a written notice that includes the information required by
14 [40 CFR 268.7](#).

15 In instances where the 325 HWTUs staff determines that a restricted waste is being managed that can be
16 land-disposed without further treatment, the 325 HWTUs staff submits a written notice and certification
17 to the onsite dangerous waste management unit or offsite TSD facility where the waste is being shipped,
18 stating that the waste meets applicable treatment standards set forth in [40 CFR 268](#), Subpart D,
19 incorporated by reference by [WAC 173-303-140](#), and includes the information required by [40 CFR 268.7](#).

20 The certification accompanying any of the notices previously described is signed by an authorized
21 representative of the generator and states the following:

22 *I certify under penalty of law that I personally have examined and am familiar with the waste through*
23 *analysis and testing or through knowledge of the waste to support this certification that the waste*
24 *complies with the treatment standards specified in [40 CFR 268](#), Subpart D and all applicable*
25 *prohibitions set forth in [40 CFR 268.32](#) or RCRA Section 3004(d). I believe that the information I*
26 *submitted is true, accurate, and complete. I am aware that there are significant penalties for*
27 *submitting a false certification, including the possibility of a fine and imprisonment.*

28 Certifications and notifications of treatment are prepared and submitted in accordance with the applicable
29 requirements of [40 CFR 268.7](#)(b), incorporated by reference by [WAC 173-303-140](#).

30 Copies of all notices and certifications described are placed in the Hanford Facility Operating Record, 325
31 HWTUs File and retained ~~for at least 5 years from the date that the waste was last sent to an onsite~~
32 ~~dangerous waste management unit or offsite TSD facility. After that time, the notices and certifications~~
33 ~~are sent to Records Storage in accordance with the requirements of the Hanford Facility RCRA Permit~~
34 ~~general conditions for recordkeeping.~~

35 B.9 REFERENCES

36 U.S. Environmental Protection Agency. 1994. *Waste Analysis At Facilities That Generate, Treat, Store,*
37 *And Dispose of Hazardous Waste: A Guidance Manual.* [OSWER 9938.4-03](#), Washington, DC.

38 Washington Administrative Code. ~~2005~~2009. *Dangerous Waste Regulations.* [WAC 173-303](#), Olympia,
39 WA.

40 Washington Department of Ecology. 2008. *Hanford Facility Resource Conservation and Recovery Act*
41 *Permit*, Revision ~~98~~, as amended.

Commented [HT10]: Revised to conform to general permit conditions allowing transfer to offsite storage sooner than 5 years if retrievability requirements are met. Class 1, B.2.3.

Commented [HT11]: Update to current version of WAC. Class 1, A.1.

Commented [HT12]: Corrects typo. Class 1, A.2.

1 **Figure B.1. Waste Confirmation and Acceptance Process for the 325 Hazardous Waste**
2 **Treatment Units**

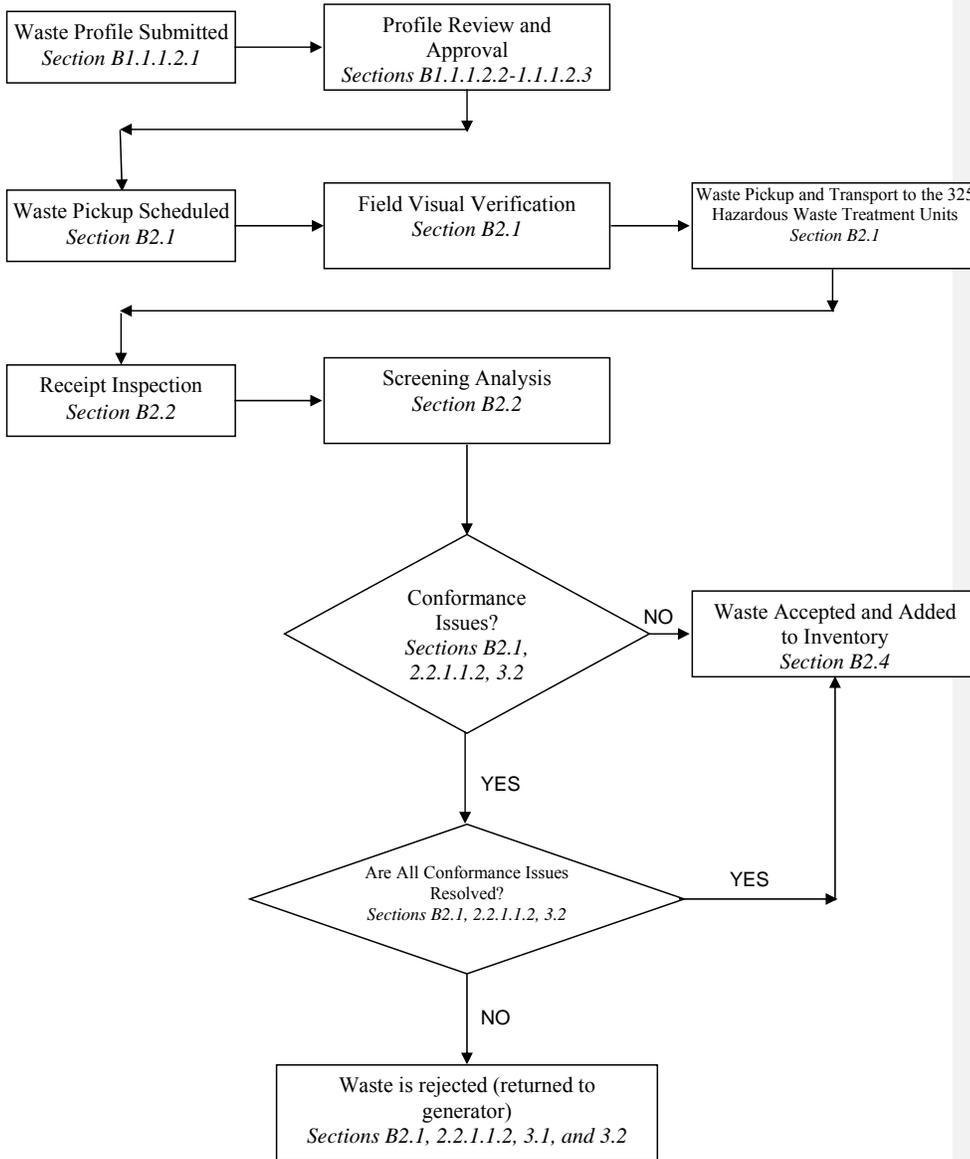


Table B.1. Waste Compatibility Chart

Class or Division ¹		Notes	1.1 1.2	1.3	1.4	1.5	1.6	2.1	2.2	2.3 Gas Zone A	2.3 Gas Zone B	3	4.1	4.2	4.3	5.1	5.2	6.1 Liquids PGI Zone A	7	8 Liquids Only
Explosives	1.1 1.2	A	*	*	*	*	*	X	X	X	X	X	X	X	X	X	X	X	X	X
Explosives	1.3		*	*	*	*	*	X	X	X	X	X	X	X	X	X	X	X	X	X
Explosives	1.4		*	*	*	*	*	O		O	O	O		O				O		O
Very insensitive explosives	1.5	A	*	*	*	*	*	X	X	X	X	X	X	X	X	X	X	X	X	X
Extremely insensitive explosives	1.6		*	*	*	*	*													
Flammable gases	2.1		X	X	O	X				X	O							O	O	
Non-toxic, non-flammable gases	2.2		X			X														
Poisonous gas Zone A	2.3		X	X	O	X		X				X	X	X	X	X	X			X
Poisonous gas Zone B	2.3		X	X	O	X		O				O	O	O	O	O	O			O
Flammable liquids	3		X	X	O	X				X	O					O		X		
Flammable solids	4.1		X			X				X	O							X		O
Spontaneously combustible materials	4.2		X	X	O	X				X	O							X		X
Dangerous when wet materials	4.3		X	X		X				X	O							X		O
Oxidizers	5.1	A	X	X		X				X	O	O						X		O
Organic peroxides	5.2		X	X						X	O							X		O
Poisonous liquids PG I Zone A	6.1		X	X	O	X		O				X	X	X	X	X	X			X
Radioactive materials	7		X			X		O												
Corrosive liquids	8		X	X	O	X				X	O		O	X	O	O	O	X		

(Key on following page)

¹ For definition of these hazard classes, refer to [49 CFR 173.2](#).

B.19

Class 4-3 Modification
September 31, 2009/May 2014

WAT 890000 8967, Operating Unit
325 Hazardous Waste Treatment Units

Table B.1 Key

Notation Description

- (blank) No incompatibility restrictions apply; materials may be stored together. Also true for any hazard class not shown (e.g. state-only dangerous waste)
- X Materials may not be stored together in the same cell; separate secondary containment is required.
- O Materials may not be stored together in the same secondary containment, but may be stored in the same cell if necessary, provided individual secondary containment devices are provided.
- * Explosives compatibility is described in [49 CFR 174.81](#)(f) (refer to Table given there)
- A Notwithstanding the 'X' in the table, ammonium nitrate fertilizer may be stored with Division 1.1 or 1.5 materials if necessary.

Source: [49 CFR 174.81](#)

Table B.2. Summary of Test Parameters, Rationales, and Methods

Parameter ^(a)	Method ^(b)	Rationale for Selection
Physical Screening		
Visual inspection	Field method—observe phases, presence of solids in waste	Confirm that waste matches that described on waste acceptance documentation; identify waste prohibited by LDR requirements related to downstream TSD unit acceptance criteria
Chemical Screening		
Water miscibility/separable organics (c)	Water solubility Hazcat © test kits	Confirm that waste matches that described on waste acceptance documentation; identify separable organics; identify waste prohibited by LDR requirements related to downstream TSD unit acceptance criteria
Oxidizer	Oxidizer Screen Hazcat © test kits	Confirm that waste matches that described on waste acceptance documentation; verify compliance with WAC 173-303-395(1)(b)
pH	pH screen SW-846 Method 9040, 9041, or 9045	Confirm that waste matches that described on waste acceptance documentation; verify compliance with WAC 173-303-395(1)(b)
Cyanides	Cyanide screen Hazcat © test kits	Confirm that waste matches that described on waste acceptance documentation; verify compliance with WAC 173-303-395(1)(b)
Sulfides	Sulfide screen Hazcat © test kits	Confirm that waste matches that described on waste acceptance documentation; verify compliance with WAC 173-303-395(1)(b)
Halogenated/Volatile Organic Compounds	Photoionizer or Flame Ionizer, or Clor-D-Tect Kits©	Confirm that waste matches that described on waste acceptance documentation
Pre-Shipment Review		
Mercury (total)	Generator knowledge or SW-846 Method 7470/7471	Identify waste prohibited by LDR requirements related to downstream TSD unit acceptance criteria.
Toxicity characteristic organic compounds (d)	Generator knowledge or SW-846 Methods 1311 and 8260 (volatile organic compounds) and 8270 (semi volatile organic compounds)	Identify waste not identified in Addendum A, Part A Form
Polycyclic aromatic hydrocarbons	Generator knowledge or SW-846 Method 8270 or 8100	Identify waste not identified in Addendum A, Part A Form, (for waste with >1% solids and for which WP03 could apply)

- (a) Addition parameters can be used on current waste acceptance criteria of the downstream TSD unit. Operation limits transfer/shipments are based on current waste acceptance criteria.
- (b) Procedures based on EPA [SW-846](#), unless otherwise noted. When regulations require a specific method, the method shall be followed.
- (c) These tests will not be performed on materials known to be organic peroxides, ether, and/or water reactive compounds.
- (d) This test is only performed on waste to be stored in tank TK-1 in addition to any other appropriate chemical screening.

