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2.0 UNIT DESCRIPTION AND GENERAL PROVISIONS

This chapter briefly provides a general overview of the 331-C Storage Unit, including:

- Topography
- Location information
- Performance standards
- Buffer monitoring zones

2.1 331-C STORAGE UNIT

The 331-C Storage Unit is a dangerous waste storage unit owned and operated by DOE and co-operated by PNNL. The unit is used for the collection, consolidation, packaging, storage, and preparation for transport and disposal of dangerous waste. It is an integral part of the Hanford Site's waste management system.

The 331-C Storage Unit is a one-story metal building with fenced exterior areas constructed in the early 1970s. The unit is located within the south portion of the 300 Area, as shown in Chapter 1.0, and was formerly used for equipment storage. Unit upgrades were completed in 2006 to meet requirements for storage of dangerous waste. Waste storage began in March 2006 in accordance with a Temporary Authorization granted by the Department of Ecology.

Varieties of small volume chemical wastes are generated by PNNL's research laboratory activities under contract to DOE. These wastes are brought to the 331-C Storage Unit and segregated by compatibility for storage in the unit until enough waste is accumulated to fill a labpack or bulking container, usually a 30- to 55-gallon drum. When a sufficient number of shipping containers of waste have accumulated, they are manifested for shipment, generally to permitted off-site recycling, treatment or disposal facilities.

Dangerous wastes are stored in Room 1 of the building and in the covered area adjacent to the building. The indoor storage area has been equipped with a secondary containment system to facilitate storage of containerized wastes. In addition, four storage "cells" have been constructed within the bay area for segregated storage of incompatible waste streams. Each of the cells is 12' × 18', enclosed by 6"-high angle iron bolted and sealed to the floor and a grated containment trench at the opening of each cell to prevent any migration of waste spills. Each cell is its own separate secondary containment system. Drum-quantity storage for incompatible wastes is allowed in these cells and has also been provided in separate areas of the building. A detailed description of these areas is given in Chapter 4.0.

The 331-C Storage Unit is equipped with electric heaters and a cooling system with a capacity of 5 tons, to provide relatively constant temperatures during storage of dangerous wastes. These systems are adequate to maintain interior temperatures in the range of 50-85°F during normal ambient temperatures of 10-100°F.

A small, laboratory-style fume hood installed on the south wall in the storage area is used for waste verification, compatibility testing, and small-volume waste work.

A simplified building layout and individual storage cell descriptions are shown in Chapter 4.0.

2.2 TOPOGRAPHIC MAP

Refer to Chapter 1.0 for map information.

2.3 PERFORMANCE STANDARD

The 331-C Storage Unit was designed to minimize the exposure of personnel to dangerous wastes and hazardous substances and to prevent dangerous wastes and hazardous substances from reaching the environment.

In addition, measures are taken to confirm that 331-C Storage Unit is maintained and operated, to the maximum extent practicable given the limits of technology, in a manner that prevents:

- Degradation of groundwater quality
- Degradation of air quality by open burning or other activities
- Degradation of surface water quality
- Destruction or impairment of flora or fauna outside of the unit
- Excessive noise
- Negative aesthetic impacts
- Unstable hillsides or soils
- Use of processes that do not treat, detoxify, recycle, reclaim, and recover waste material to the extent economically feasible
- Endangerment to the health of employees or the public near the unit.

The measures taken to prevent each of the above negative effects from occurring are described in the following sections.

2.3.1 Measures to Prevent Degradation of Groundwater Quality

Degradation of groundwater quality is prevented by storing waste containers within an enclosed building with a sealed concrete floor. All drains and sumps in areas where wastes are stored are blocked to prevent release of spilled material to the environment. The 331-C Storage Unit accepts only those packages meeting applicable DOT requirements. Opening of containers is done only in areas with spill containment. Design and administrative controls significantly reduce the possibility of release of dangerous waste to the environment through soil or groundwater contamination.

2.3.2 Measures to Prevent Degradation of Air Quality by Open Burning or Other Activities

No open burning occurs at the 331-C Storage Unit. There is no vegetation around the 331-C Storage Unit, and the area around the unit is paved or graveled, thereby reducing the risk of fire or wind erosion. Combustible and flammable waste is packaged in a manner that reduces the potential for fire and stored in fireproof cabinets unless staged for shipment.

2.3.3 Measures to Prevent Degradation of Surface Water Quality

The potential for degradation of surface water quality is extremely low, due to the manner in which the Unit is designed and operated. All waste handling activities (i.e., loading/unloading, container opening, waste transfer) presenting the opportunity for spills are conducted inside the unit. All exits from storage areas of the 331-C Storage Unit are equipped with spill collection sumps to prevent spilled material from escaping. The Unit is 500 feet from, and has no pipes to the Columbia River.

2.3.4 Measures to Prevent Destruction of Impairment of Flora or Fauna Outside of the Unit

The 331-C Storage Unit is located in the southern portion the 300 Area. The 300 Area is highly developed, and areas not occupied by buildings are generally paved or graveled. As a result, flora or fauna are generally absent within the 300 Area except for several grassed areas. Measures to prevent destruction or impairment of flora or fauna outside the 300 Area are the same as those to prevent releases from the unit (i.e., all waste handling is performed within an enclosed area having spill collection sumps).

2.3.5 Measures to Prevent Excessive Noise

During normal operations at the 331-C Storage Unit, excessive noise is not generated. The major sources of noise are waste transport and handling equipment (e.g., forklifts, light vehicles). The noise generated at the 331-C Storage Unit is compatible with the types of activities generated at neighboring facilities in the 300 Area.

2.3.6 Measures to Prevent Negative Aesthetic Impacts

The 331-C Storage Unit does not injure or destroy the surrounding flora and fauna. The Unit stores waste in approved containers within the confines of the structure. The building's appearance is similar to neighboring facilities. For these reasons, the unit presents no negative aesthetic impacts.

2.3.7 Measures to Prevent Unstable Hillsides or Soils

There are no naturally unstable hillsides near the 331-C Storage Unit. The soil beneath and around the unit was compacted prior to construction.

2.3.8 Measures to Prevent the Use of Processes That Do Not Treat, Detoxify, Recycle, Reclaim, and Recover Waste Material to the Extent Economically Feasible

The 331-C Storage Unit was established, in part, to enhance DOE's and PNNL's efforts to eliminate or minimize dangerous waste generation, and to treat, detoxify, recycle, reclaim, and recover waste materials.

Offsite waste management options for dangerous wastes being shipped from the 331-C Storage Unit are evaluated according to the following order of preference:

1. Recycling, including solvent reprocessing, oil recycling, metals recovery, burning for energy recovery, etc.
2. Treatment, including incineration, volume and/or toxicity reduction, chemical destruction, etc.
3. Land disposal is viewed as the least favored option and is generally only used for treatment residues, spill cleanup residues, or when treatment is not feasible.

When permitted by law and/or contractual obligations, the 331-C Storage Unit staff tries to use this hierarchy without regard to minor variations in cost, e.g., if recycling is available but slightly more expensive than land disposal, recycling is utilized.

2.3.9 Measures to Prevent Endangerment to the Health of Employees or the Public Near the Unit

The 331-C Storage Unit is within the southern portion of the 300 Area, which is located approximately 1 mile north of the corporate limits of the City of Richland. Public entry to the 300 Area is not allowed; members of the public, therefore, cannot enter the 331-C Storage Unit. Exposure of members of the

public or employees to dangerous and mixed waste constituents is prevented through administrative controls over the designation, packaging, loading, transporting, and storing of the wastes received at the 331-C Storage Unit. In addition, physical controls exist (e.g., spill collection sumps) to prevent release of wastes or waste constituents in the event of a spill.

Employees are trained to handle and store waste packages (Chapter 8.0). The training includes dangerous waste awareness, emergency response, and workplace safety. Protective equipment, safety data, and hazardous materials information are supplied by operations management and are readily available for employee use.

A contingency plan, including emergency response procedures, is in place and is implemented for spill prevention, containment, and countermeasures to reduce safety and health hazards to employees, the environment, and the public. The contingency plan is described in Chapter 7.0.

2.3.10 Seismic Considerations

The 331-C Storage Unit was constructed according to the Uniform Building Code, 1976 edition. Zone 2B was used for the Seismic Design and the load determinations. Currently the governing Code is the 2003 International Building Code. Section 3403 addresses Additions, Alterations or Repairs and section 3403.2 addresses the structural implications of an alteration, which is what was used during the building modification process. The International Building Code requires that alterations shall not increase the force on any element of an existing structure by more than 5% and if so, the element must be in compliance with Code (2003 IBC). Also, the strength of any element of the existing structure shall not be decreased unless it is shown to be in compliance with Code (2003 IBC). During the 331-C Storage Unit modification process that was completed in February of 2006, the shear bracing was revised from the center bay area, and both adjacent bays. This additional bracing nearly doubles the shear capacity of the wall. No additional mass or external load was added to the building, so there was no negative affect to the structure with respect to any condition, seismic included. Since there was no affected change to the loading conditions or reduced structural capacity of the building, compliance with the 1976 Uniform Building Code is considered compliant with the 2003 Uniform Building Code.

2.3.11 Traffic Information

The DOE-controlled Hanford Site is traversed by numerous primary and secondary roads. The DOE roadways inside the site, except for Routes 4S and 10 south of the Wye Barricade, are restricted to authorized personnel and cannot be accessed by the general public. The majority of the site traffic consists of light duty vehicles. The primary routes are constructed of bituminous asphalt with an underlying aggregate base in accordance with the U.S. Department of Transportation requirements. The secondary routes are constructed of layers of an oil and rock mixture with an underlying aggregate base. Currently, no load bearing capacities of these roads are available; however, loads are large as 140 pounds per square inch have been transported without observed damage to road surfaces.

Wastes generated at other onsite facilities outside the 300 area are transported over Government maintained roads. These roads are accessible to the general public only south of the Wye Barricade. In addition, waste shipments from the 331-C storage Unit to offsite treatment, disposal or recycling facilities are shipped over public accessible roads enroute to the consignee.

The loading/unloading areas at the 331-C Storage Unit are constructed of 8" thick reinforced 3000 psi concrete with #4 rebar set 12" on center each way. Heavy duty steel grating was installed over the containment sump with a uniform safe loading of 4,744 psf.

2.4 BUFFER MONITORING ZONES

Buffer and monitoring zones around the 331-C Storage Unit are described in the following sections.

2.4.1 Ignitable or Reactive Waste Buffer Zone

Ignitable and reactive wastes are stored in the 331-C Storage Unit in compliance with the requirements of the 1988 Uniform Fire Code, Article 79, Division II (International Conference of Building Officials 1991). Quantity limits for storage are established to comply with requirements for Class B occupancy. Structures surrounding the 331-C Storage Unit are laboratory and office buildings, which are occupied during normal working hours. The nearest adjacent facility is the 331 Building, which is approximately 350 ft north of the 331-C Storage Unit. The closest 300 Area boundary is to the east fence, which is approximately 450 ft east of the 331-C Storage Unit.

2.4.2 Reactive Waste Buffer Zone

Storage of certain reactive wastes listed in WAC 173-303-630(8)(a) occurs at the 331-C Storage Unit. These wastes have special storage requirements more stringent than those shown in Section 2.4.1. They are stored in accordance with this section and with the Uniform Building Code's Table 77.201, latest edition. The 1988 edition requires buffer zones in Class B occupancies of 44 inches for storage of such wastes, and the storage locations in the 331-C Storage Unit reflecting appropriate buffer zones are noted in Chapter 4.0. These wastes are only occasionally stored at the unit, depending on generation by individual research projects.

The occupancy storage limitations imposed by UBC for Class B occupancy are as follows:

- Explosives: 1 lb
- Organic Peroxide, unclassified, detonatable: 1 lb
- Pyrophoric: 4 lbs
- Unstable (reactive), Class 4: 1 lb.

These limits are allowed to be doubled when stored in flammable storage cabinets, as is done at the 331-C Storage Unit; hence, the practical storage limits at the 331-C Storage Unit are double those shown here.