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2 **Appendix 7A**

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4 **Emergency Response Plan**

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**APPENDIX 7A**  
**EMERGENCY RESPONSE PLAN**

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## **1.0 GENERAL INFORMATION**

The Waste Treatment and Immobilization Plant (WTP) will be a dedicated treatment plant that will treat mixed waste transferred from the United States Department of Energy, Richland Operations Office (DOE-RL) Double-Shell Tank System Unit at the Hanford Site. The WTP is located on the Hanford Site, a 560-square-mile (1,450-square kilometer) United States Department of Energy (DOE) site in southeastern Washington State. The WTP is located in the East portion of the 200 Area near the center of the Hanford Site. Figures 7A-1 and 7A-2 show the location of the WTP with respect to the Hanford Site and the 200 East Area of the Hanford Site.

The Hanford Site Emergency Preparedness Program is based on the incident command system that allows a graded approach for response to emergency events. This plan contains a description of WTP facility specific emergency planning and response and is used in conjunction with *Hanford Emergency Management Plan* (DOE/RL-94-02). Response to events is performed using WTP and/or Hanford Site level emergency procedures.

This plan is being issued to meet permitting requirements. This plan will be updated to provide additional necessary information prior to the introduction of bulk quantities of hazardous chemicals into the WTP.

### **1.1 FACILITY NAME**

United States Department of Energy Hanford Site  
Waste Treatment and Immobilization Plant

### **1.2 FACILITY LOCATION**

Benton County, Washington, within the 200 East Area.

Facilities covered by this plan are:

- Pretreatment Facility (PTF)
- Analytical Laboratory (Lab)
- Low-Activity Waste Facility (LAW)
- High-Level Waste Facility (HLW)
- Balance of Facilities (BOF) (e.g., support buildings)

### **1.3 OWNER**

United States Department of Energy  
Office of River Protection  
P.O. Box 450  
Richland, Washington 99352

**1 Facility Manager:**

2  
3 Bechtel National, Inc.  
4 2435 Stevens Center Place  
5 Richland, Washington 99354  
6

**7 1.4 DESCRIPTION OF THE WTP FACILITY AND OPERATIONS**

8 The WTP will be composed of a pretreatment facility that includes the waste receipt tanks, an  
9 analytical laboratory, two vitrification facilities, and an assortment of other support facilities  
10 collectively referred to as the Balance of Facility (BOF). Figure 7A-3 shows the layout of the  
11 WTP, with the major buildings identified.  
12

13 The WTP will receive waste from the double-shell tank (DST) system located in the 200 Area of  
14 the Hanford Facility. The waste to be treated meets the regulatory definition of “radioactive high  
15 level waste” referred to in the Land Disposal Restriction Treatment Standards (40 CFR 268.40).  
16 The WTP will pretreat the tank waste by separating the waste into Low Activity Waste (LAW)  
17 feed and High Level Waste (HLW) feed. After separating the waste into two feed streams, the  
18 waste will be piped to the vitrification facilities; LAW and HLW to be immobilized in a glass  
19 matrix. The vitrification process involves mixing waste feed with glass-forming materials,  
20 pouring the mixture into a melter, heating until it is liquefied, pouring it into stainless steel  
21 containers (called canisters), and then welding on a lid after each canister finishes cooling.  
22

23 The canisters of immobilized HLW will remain on the Hanford Site until a permanent repository  
24 is available. The immobilized LAW, containing relatively small amounts of radioactive  
25 material, will be disposed of on the Hanford Site.  
26

27 The air emissions (off-gas) from the pretreatment and vitrification processes will be treated to  
28 ensure safe levels before being released to the atmosphere. Air emissions are regulated by the  
29 Washington State Departments of Ecology and Health, and the United States Environmental  
30 Protection Agency, and will be treated to a level protective of human health and the  
31 environment. The WTP will discharge air emissions through four primary stacks, one each for  
32 pretreatment, LAW facility, HLW facility, and the laboratory.  
33

34 The WTP will use the following four types of permitted dangerous waste management units:

- 35 • Storage in containers
  - 36 • Treatment and storage in tanks
  - 37 • Treatment in miscellaneous units (the melters)
  - 38 • Containment buildings
- 39

40 The locations of these dangerous waste management units are summarized in Table 7A-1.  
41

42 The buildings used for treating and storing waste will be constructed of reinforced concrete and  
43 structural steelwork. Below-grade portions of buildings will be reinforced concrete construction,  
44 and the superstructure will be made of reinforced concrete and structural steelwork with a metal  
45 roof. The plant structure will be supported by a reinforced concrete mat foundation.

1  
2 Except for two outdoor on-ground storage tanks surrounded by a concrete berm for secondary  
3 containment, all other tanks and treatment processes managing dangerous waste will be located  
4 inside buildings. Container storage areas will be located in buildings or covered storage areas.  
5 Where floors and walls provide secondary containment they will either be lined with stainless  
6 steel, a protective coating, or a combination of both. The WTP dangerous waste management  
7 units will be equipped with leak detection systems and inspected regularly.

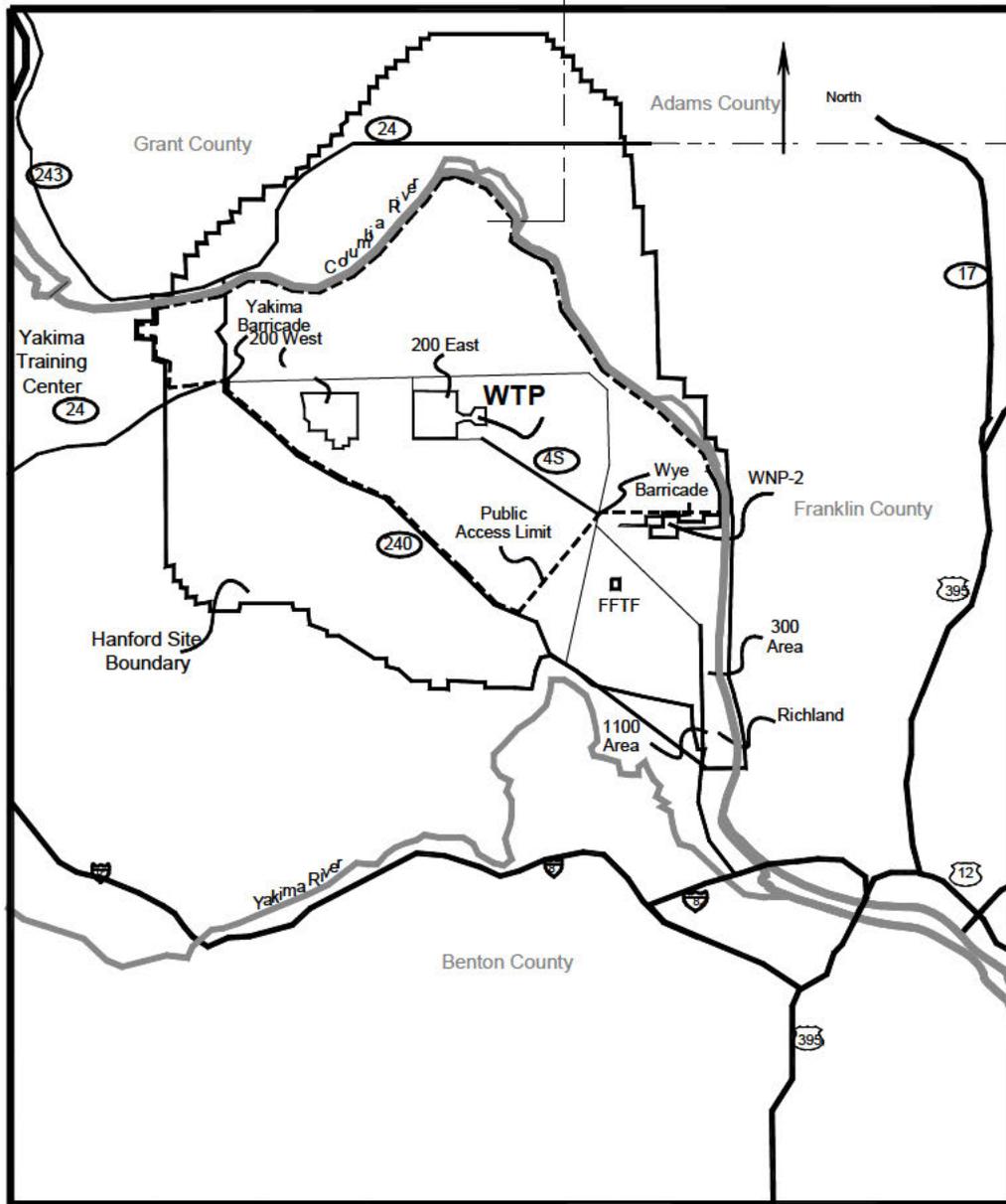
8  
9 The waste and off-gas treatment processes will generate “secondary wastes,” such as used  
10 equipment, laboratory waste, and other chemically and radiologically contaminated materials.  
11 (These “newly generated wastes” also are referred to as “miscellaneous wastes”). Secondary  
12 waste will either be transferred elsewhere in the WTP for treatment or transferred to another  
13 permitted treatment, storage, or disposal (TSD) facility. Non-radiological dangerous waste may  
14 also be generated by laboratory and maintenance activities. Such waste will be managed in  
15 containers at the WTP until it can be transferred to a permitted TSD facility.

16  
17 The three primary processes at the WTP (pretreatment, LAW vitrification, and HLW  
18 vitrification) and the LAB are supported by BOF systems and utilities. The BOF will include  
19 support systems and utilities required for the waste treatment processes within the main process  
20 areas (pretreatment, LAW vitrification, and HLW vitrification). The BOF support systems and  
21 utilities will include, but not be limited to, heating and cooling, process steam, process water,  
22 chilled water, and compressed air.

## 23 24 **1.5 BUILDING EVACUATION ROUTING**

25 Figure 7A-1 shows evacuation routes for the Hanford Site. Identification of the primary and  
26 secondary staging areas, a general layout of the evacuation routes and evacuation routes for each  
27 of the primary buildings which comprise the WTP will be provided in a revision of this  
28 document before the introduction of bulk quantities of hazardous chemicals into the WTP.  
29 These evacuation routes will be placed in Appendix 7A-B. Alternate evacuation routes will be  
30 used on a case-by-case basis, based on meteorological conditions at the time of an event.  
31

1 **Figure 7A-1** **Location of the WTP on the Hanford Site**



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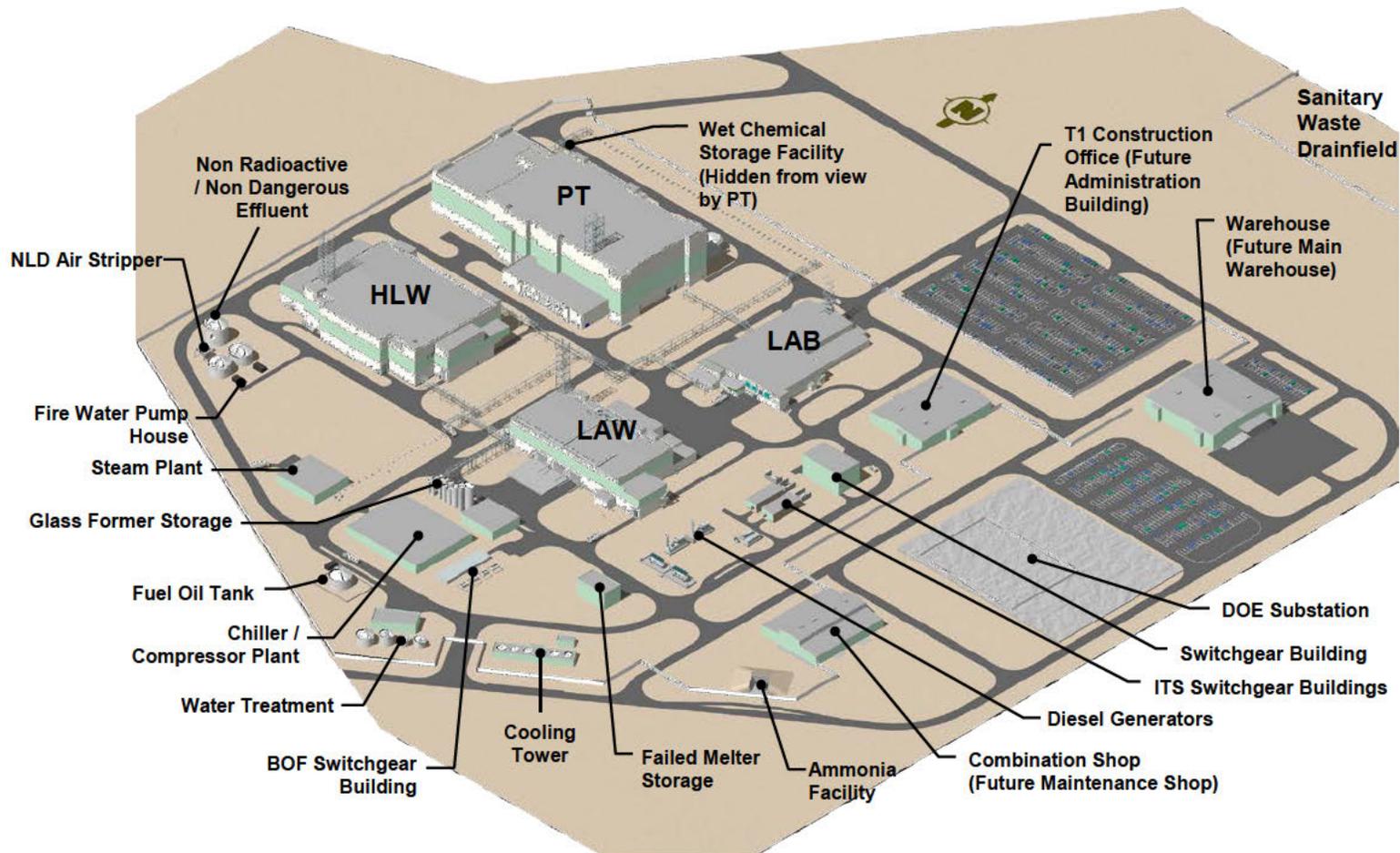
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1 **Figure 7A-2** WTP Site Layout

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# Waste Treatment Plant Project



October 2008

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**Table 7A-1 Locations of Dangerous Waste Management Units**

<b>Dangerous Waste Management Unit</b>	<b>General Location</b>
Container Storage Areas (see Chapter 4.0, Tables 4-1 and 4-7)	Immobilized LAW (ILAW) storage in LAW Facility.
	Immobilized HLW (IHLW) storage in HLW Facility
	Miscellaneous secondary waste container storage in pretreatment facility, LAW Facility, HLW Facility, and failed melter storage areas.
Tank Systems (see Chapter 4.0, Tables 4-1 through 4-5)	Pretreatment Facility tank systems
	<ul style="list-style-type: none"> <li>• Cesium nitric acid recovery process (CNP)</li> </ul>
	<ul style="list-style-type: none"> <li>• Cesium ion exchange process (CXP)</li> </ul>
	<ul style="list-style-type: none"> <li>• Waste feed receipt process (FRP)</li> </ul>
	<ul style="list-style-type: none"> <li>• Waste feed evaporation process (FEP)</li> </ul>
	<ul style="list-style-type: none"> <li>• HLW Lag Storage and Feed Blending Process (HLP)</li> </ul>
	<ul style="list-style-type: none"> <li>• Treated LAW Concentrate Storage Process (TCP)</li> </ul>
	<ul style="list-style-type: none"> <li>• Treated LAW Evaporation Process (TLP)</li> </ul>
	<ul style="list-style-type: none"> <li>• Spent Resin Collection and Dewatering Process (RDP)</li> </ul>
	<ul style="list-style-type: none"> <li>• Radioactive Liquid Waste Disposal (RLD)</li> </ul>
	<ul style="list-style-type: none"> <li>• Plant Wash and Disposal (PWD)</li> </ul>
	<ul style="list-style-type: none"> <li>• Ultrafiltration Process (UFP)</li> </ul>
	<ul style="list-style-type: none"> <li>• Pretreatment Vessel Vent Process (PVP)</li> </ul>
	<ul style="list-style-type: none"> <li>• Pretreatment In-Cell Handling (PIH)</li> </ul>
	<ul style="list-style-type: none"> <li>• LAW intermediate waste storage in pretreatment facility</li> </ul>
	<ul style="list-style-type: none"> <li>• HLW feed receipt in pretreatment facility</li> </ul>
	<ul style="list-style-type: none"> <li>• HLW ultrafiltration in pretreatment facility</li> </ul>
	LAW facility tank systems
	<ul style="list-style-type: none"> <li>• LAW Concentrate Receipt Process (LCP)</li> </ul>
	<ul style="list-style-type: none"> <li>• LAW Melter Feed Process (LFP)</li> </ul>
	<ul style="list-style-type: none"> <li>• LAW Primary OffgasProcess System (LOP)</li> </ul>
	<ul style="list-style-type: none"> <li>• LAW Secondary Offgas/Vessel Vent Process System (LVP)</li> </ul>
	<ul style="list-style-type: none"> <li>• Radioactive Liquid Waste Disposal System (RLD)</li> </ul>
HLW facility tank system	

**Table 7A-1 Locations of Dangerous Waste Management Units**

Dangerous Waste Management Unit	General Location
	<ul style="list-style-type: none"> <li>• HLW Melter Feed Process System (HFP)</li> </ul>
	<ul style="list-style-type: none"> <li>• HLW Vit Primary Offgas Treatment System /Process Vessel Vent System (HOP/PVV)</li> </ul>
	<ul style="list-style-type: none"> <li>• HLW Canister Decontamination Handling (HDH)</li> </ul>
	<ul style="list-style-type: none"> <li>• Radioactive Liquid Waste Disposal System (RLD)</li> </ul>
	<ul style="list-style-type: none"> <li>• HLW Melter Cave Support Handling System (HSH)</li> </ul>
	LAB tank system:
	<ul style="list-style-type: none"> <li>• Radioactive Liquid Waste Disposal System (RLD)</li> </ul>
	Miscellaneous Thermal Treatment Units (melters) (see Chapter 4, Table 4-3)
Containment Buildings (see Chapter 4, Table 4-7)	LAW melters (2 used) in LAW facility
	Pretreatment hot cells, maintenance areas, filter cave, and air filters handling areas.
	LAW locally shielded melter gallery, container finishing, consumable import/export, pour cave, ILAW buffer container storage, and C3 workshops.
	HLW melter caves, pour tunnels, canister handling, canister swabbing and monitoring, waste handling area, C3 workshops, drum swabbing and monitoring, and filter cave.

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## **2.0 PURPOSE**

This plan describes both the facility hazards and the basic responses to upset and/or emergency conditions within the WTP. These events may include spills or releases caused by equipment failure during processing, fires and explosions, transportation activities, movement of materials, packaging, storage of hazardous materials, and natural and security contingencies. When used in conjunction with *Hanford Emergency Management Plan* (DOE/RL-94-02), this plan meets the requirements for contingency planning as required by WAC 173-303. Sections 1.5, 3.1, 4.0, 7.1, 7.1.1, 7.1.2, 7.2, 7.2.1, 7.2.2, 7.2.3, 7.2.4, 7.2.5, 7.2.5.1, 7.3, 8.2, 8.3, 8.4, 9.0, 9.1, 9.2, 9.3, 9.4, 9.5, 9.6, 11.0, 12.0, 13.0 of this plan are enforceable sections meeting Resource Conservation and Recovery Act (RCRA) contingency planning requirements. Enforceable sections cannot be changed without coordinating the change with the Site-wide Permit modification process.

## **3.0 WTP EMERGENCY RESPONSE ORGANIZATION**

The WTP Emergency Response Organization (ERO), as described in this section and in Section 2.2 of the *Hanford Emergency Management Plan* (DOE-RL-94-02, 2006), will be available 24 hours each day to respond to events at the plant. The Building Emergency Director (BED) will be prepared to carry out his or her duties immediately and whenever an imminent or actual emergency exists, as required by *Washington Administrative Code* (WAC) 173-303-360 (2)(a), (b), and (c). The *Hanford Emergency Management Plan* (DOE-RL-94-02, 2006), Section 2.2.1, details the responsibilities of the BED. The on-duty Pretreatment shift operations manager will be the designated primary BED. A designated alternate BED will be available on each shift. Other ERO personnel will be on duty with either primary or alternate responsibilities. A BED, Incident Command Post (ICP) Hazards Communicator, ICP Communicator, and a Hazards Assessor (chemical or radiological, or both, depending on the event) will staff the ERO along with various BED support personnel. In addition, the BED will act as the plant operations specialist for the Hanford Fire Department (HFD) personnel.

### **3.1 BUILDING EMERGENCY DIRECTOR**

Emergency response will be directed by the BED until the Incident Commander (IC) arrives. The incident command system (ICS) and staff, with supporting on-call personnel, fulfill the responsibilities of the Emergency Coordinator as discussed in WAC 173-303-360. During events, WTP personnel perform response duties under the direction of the BED. The ICP is managed by either the senior Hanford Fire Department member present or senior Hanford Patrol member present on the scene (security events only). These individuals are designated as the IC and as such, have the authority to request and obtain any resources necessary for protecting people and the environment.

The BED becomes a member of the ICP and functions under the direction of the IC. In this role, the BED continues to manage and direct WTP operations.

A listing of primary and alternate BEDs by title, work location and work telephone number is contained in Section 13.0 of this plan. The BED will be on the premises or will be available through an "on-call" list 24-hours-a-day. Names and home telephone numbers of the BEDs will be available from the Patrol Operations Center (POC), in accordance with Site-wide Permit, General Condition II.A.3.

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### **3.2 OTHER MEMBERS**

As a minimum, facility management appoints and ensures training is provided to individuals to perform as Personnel Accountability Aides and Staging Area Managers. The Personnel Accountability Aides are responsible for facilitating the implementation of protective actions (evacuation or take cover) and for facilitating the accountability of personnel after the protective actions have been implemented. Staging Area Managers are responsible for coordinating and conducting activities at the staging area. In addition, the BED can identify additional support personnel (radiological control, maintenance, engineering, hazardous material coordinators, etc.) to be part of the WTP Emergency Response Organization as necessary.

The complete WTP Emergency Response Organization listing of positions, names, work locations and telephone numbers will be maintained in a separate location in a format determined appropriate by WTP management. Copies will be distributed to appropriate WTP locations and to the Hanford Emergency Operations Center.

### **4.0 IMPLEMENTATION OF THE PLAN**

This plan will be implemented when the BED has determined that a release, fire, or explosion has occurred at the facility or in adjacent site facilities. Actions determined in *Hanford Emergency Management Plan* (DOE/RL-94-02) and the requirements of WAC 173-303 will be implemented as described below.

The BED ensures that trained personnel identify the character, source, amount, and aerial extent of the release, fire, or explosion to the extent possible. Identification of waste can be made by activities that can include, but are not limited to: visual inspection of involved containers, sampling activities in the field, reference to inventory records, or by consulting with facility personnel.

Samples of materials involved in an emergency may be taken by qualified personnel and analyzed as appropriate. These activities will be performed with a sense of immediacy and will include available information.

The BED will use the following guidelines to determine if an event has met the requirements of WAC 173-303-360(2)(d):

1 The event involved an unplanned spill, release, fire, or explosion,

AND

2 a The unplanned spill or release involved a dangerous waste, or the material involved became a dangerous waste as a result of the event (e.g., product that is not recoverable.), or

2 b The unplanned fire or explosion occurred at the WTP or transportation activity subject to RCRA contingency planning requirements,

AND

3 Time-urgent response from an emergency services organization was required to mitigate the event, or a threat to human health or the environment exists.

1  
2 As soon as possible, after stabilizing event conditions, the BED will determine, in consultation  
3 with the WTP environmental single-point-of-contact, if notification to Ecology is needed to meet  
4 WAC-173-303-360 (2)(d) reporting requirements. If all of the conditions under 1, 2, and 3 are  
5 met, notifications are to be made to Ecology. Additional information is found in *Hanford*  
6 *Emergency Management Plan* (DOE/RL-94-02), Section 4.2.

7  
8 If review of all available information does not yield a definitive assessment of the danger posed  
9 by the incident, a worst-case condition will be presumed and appropriate protective actions and  
10 notifications will be initiated. The BED is responsible for initiating any protective actions based  
11 on his best judgment of the incident.

12  
13 The BED will assess each incident to determine the response necessary to protect the personnel,  
14 facility, and the environment. If assistance from Hanford Patrol, Hanford Fire Department, or  
15 ambulance units is required, the Hanford Emergency Response Number (911) will be used to  
16 contact the POC and request the desired assistance. To request other resources or assistance  
17 from outside the WTP, the POC business number is used (509-373-3800).

## 18 19 **5.0 FACILITY HAZARDS**

20 Chemical and radiological constituent hazards that could occur at the WTP will be identified and  
21 evaluated in the hazards assessment required by the *Hanford Emergency Management Plan*  
22 (DOE-RL 94-02, 2006), Section 1.3.3.2. The objective of this section is to describe in a general  
23 manner the hazards that pose significant risks to human health or to the environment.

24  
25 Prior to the implementation of this plan, before the introduction of bulk quantities of hazardous  
26 chemicals into the WTP, additional information will be provided in this section. Information to  
27 be provided will include the following:

- 28
- 29 • Updates on chemical and radiological hazards upon completion of the hazards assessment
- 30 • Updates based on the Draft Work Plan for Screening Level Risk Assessment for the WTP  
31 (BNFL Inc. 1999b)]

### 32 33 **5.1 HAZARDOUS MATERIALS**

34 Potentially hazardous materials are used for normal operations, maintenance, and support  
35 functions at the WTP. These materials could include acids, caustics, oils, diesel fuel, and  
36 solvents.

37  
38 Material Safety Data Sheets (MSDSs) are provided in the control rooms, storage areas, and  
39 operating areas of the WTP.

40  
41 The following is a representative list of the types of hazardous materials that will be stored and  
42 used in the WTP.

43  
Nitric Acid  
Sodium Hydroxide

Sodium Nitrate  
Sodium Permanganate  
Strontium Nitrate  
Solvents  
Urea

1  
2 Safe design of the plant, Job Safety Analysis, Job Control System Work Packages, and MSDSs  
3 provide the basis for safe use of the materials in the workplace. Plant procedures and training  
4 that address these hazardous materials will be in place before the introduction of bulk chemicals  
5 into the plant. Employees who work with or handle hazardous wastes will be trained according  
6 to requirements identified in the *River Protection Project – Waste Treatment Plant Dangerous  
7 Waste Training Plan* (BNI, 2001a).

8

## 9 **5.2 INDUSTRIAL HAZARDS**

10 Industrial hazards associated with the WTP will include electrical equipment, pressurized  
11 equipment and systems, high temperature equipment, rotating equipment, confined spaces,  
12 forklifts, cranes, lifting operations, and compressed gas cylinders.

13

14 Safe design of the plant, Job Safety Analysis, Job Control System Work Packages, and MSDSs  
15 provide the basis for the safe use of this equipment in the workplace. Plant procedures that  
16 address these hazards will be in place prior to the implementation of this plan. Employees will  
17 be trained in the safe use and handling of compressed gas cylinders, cranes, forklifts etc as  
18 applicable.

19

## 20 **5.3 RADIOACTIVE, DANGEROUS, AND MIXED WASTE**

21 Safe design of the plant, Job Safety Analysis, and Job Control System Work Packages provide  
22 the basis for safe handling of radioactive, dangerous, and mixed waste. Plant procedures that  
23 address the management of these wastes will be in place prior to operation of the WTP.

24

25 Dangerous waste categories treated at the WTP will be identical to the Double-Shell Tank  
26 Farms. Categories include characteristic, listed, and state-only wastes, two of which are  
27 designated as extremely hazardous waste (WT01 and WP01). The following summarizes the  
28 dangerous waste numbers for the WTP.

29

### **Characteristic Waste Numbers**

D001	D002	D003	D004
D005	D006	D007	D008
D009	D010	D011	D018
D019	D022	D028	D029
D030	D033	D034	D035
D036	D038	D039	D040
D041	D043		

### **Listed Waste Numbers**

F001	F002	F003	F004
F005	F039 <sup>a</sup>		

**State-only Wastes<sup>b</sup>**

WT01	WT02	WP01	WP02
------	------	------	------

a Multi-source leachate (F039) is included as a waste derived from non-specific wastes F001 through F005.

b Washington State criteria

1

2 The WTP will use the following four types of permitted dangerous waste management units:

3

- 4 • Storage in containers
- 5 • Treatment and storage in tanks
- 6 • Treatment in miscellaneous units (e.g., the melters)
- 7 • Containment buildings

8

Solid Form

10 Radioactive, dangerous, and mixed wastes will be generated at the WTP during sampling,  
11 decontamination, and maintenance activities. This waste will be accumulated in a designated  
12 accumulation area(s) and transported to a permitted storage area.

13

Liquid Form

15 Highly radioactive mixed waste solutions and slurries will be processed at the WTP and stored in  
16 the pretreatment facility, HLW facility, and LAW facility for further treatment. Although these  
17 solutions and slurries will contain chemicals that are hazardous, the bounding consequence for  
18 spills or releases of this waste is usually based on the radiological components of the waste.

19

Gaseous Form

21 Airborne effluent streams will be produced through the following:

22

- 23 • Radiological control area Heating Ventilation Air Conditioning (HVAC) system – exhaust  
24 from radiological controlled areas.
- 25 • Vessel off-gas systems – vapors and gases from tanks and process equipment including the  
26 melters.

27

28 The off-gas systems will remove particulate, condensate NO<sub>x</sub> and organic vapors from the air  
29 stream before discharging them to the radiological controlled area HVAC system. The combined  
30 air stream will pass through HEPA filtration and will be monitored for radioactivity and  
31 chemicals.

32

**5.4 CRITICALITY**

34 Analyses have shown that there is no credible criticality event that can be postulated to occur at  
35 the WTP (BNI 2001b).

36

## **6.0 POTENTIAL EMERGENCY CONDITIONS**

Potential emergency conditions, under both WAC 173-303 and the DOE, may include one of three basic categories: 1) operations (process upsets, fires and explosions, loss of utilities, spills, and releases), 2) natural phenomena (e.g., earthquakes), and 3) security contingencies (bomb threat, hostage situation, etc.). The following are conditions that may lead to an emergency at the WTP. For a summary of responses to emergency conditions see Section 7.2.

The results of the WTP hazards assessment will be used to update the information presented in this section.

### **6.1 FACILITY OPERATIONS EMERGENCIES**

#### **6.1.1 Loss of Utilities**

##### **6.1.1.1 Loss of Electrical Power**

A loss of electrical power to the WTP is possible. The power will be provided to the WTP from two power transformers, supplied by two independent 230 kV transmission lines. The transformers will deliver a 13.8 kV secondary voltage for internal distribution at the plant. The plant loads will be divided into two load groups, normal, and alternate (Load Groups A and B).

##### **6.1.1.2 Loss of Water**

A loss of water, potable, raw or fire suppressant will not likely result in a plant emergency or evacuation of the WTP. Operations may be limited in order to minimize impact from the loss of water. A loss of water to the fire suppression system could result in a plant emergency, if a fire should develop.

##### **6.1.1.3 Loss of Ventilation**

A loss of ventilation could cause a change to plant operation and could require local evacuation of personnel if a loss of contamination control is suspected.

##### **6.1.1.4 Loss of Process Air or Instrument Air**

A loss of process air or instrument air could cause a change to plant systems but would not require implementation of personnel-protective actions.

#### **6.1.2 Major Process Disruption/Loss of Plant Control**

A major process disruption could be caused by a failure of the Process Control System (PCS). A loss of the PCS could cause plant abnormalities that would lead to increased radiological challenges to the WTP's protection systems.

#### **6.1.3 Pressure Release**

The WTP will have high-pressure steam and low-pressure compressed air and steam systems. Loss of the compressed air or steam system or systems could result in loss of plant control or a process disruption. Process disruption or loss of plant control could interrupt the treatment processes. However, it is not likely that this event would be classified as an emergency.

1  
2 Pressurized gases will be used throughout the WTP. Additionally, compressed gas cylinders will  
3 be stored in the compressed gas storage area. The inventory of gases includes flammable and  
4 nonflammable gases. These gases pose a hazard in the immediate storage area, or in the  
5 immediate area of the location being used. Failure of compressed gas bottles could cause flying  
6 debris hazards. This condition is addressed in Section 6.1.4.

7  
8 A process system pressure release is categorized as a condensate spray release. This condition is  
9 addressed in Section 6.1.5.

#### 10 11 **6.1.4 Fire and/or Explosion**

12 A fire or explosion could generate highly toxic or corrosive fumes, or release of radioactive  
13 material. Flying debris might result from explosions or compressed gas cylinder failure. Process  
14 system disruption, loss of plant control, and breach of process system boundaries could result  
15 from the flying debris. In addition, heavy smoke could disrupt the operation of the ventilation  
16 system.

#### 17 18 **6.1.5 Hazardous Material Spill**

19 Prior to the introduction of bulk quantities of hazardous chemicals into the WTP, this plan will  
20 be revised to include the types of hazardous materials that will be present, their locations,  
21 quantities, and characteristics. Additionally the potential effects from an accidental release of  
22 hazardous materials will be discussed.

#### 23 24 **6.1.6 Dangerous/Mixed Waste Spill**

25 Dangerous waste or mixed waste could spill, due to equipment failure or operator error. The  
26 severity of the event would be dependent on the nature and quantity of the spill.

#### 27 28 **6.1.7 Transportation and /or Packaging Incidents**

29 A transportation or packaging event involving hazardous chemicals, samples or radioactive  
30 material could result in personnel exposure to hazardous materials. Potential environmental  
31 damage could occur due to the release of hazardous or radioactive materials.

#### 32 33 **6.1.8 Radiological Waste Release**

34 The WTP processes include large quantities of radioactive liquids and slurries. Radioactive  
35 waste could accumulate in various treatment systems. The plant has the potential for  
36 concentrating radioactive waste; therefore, responses for abnormal radiation levels and  
37 radioactive waste releases are included in the scope of emergency planning. The release could  
38 come as a result of either failure of the ventilation system or a catastrophic leak of mixed waste.

39  
40 The ventilation system is designed to provide an air supply from areas of no contamination  
41 potential to areas of high contamination potential. Areas within the WTP are classified into one  
42 of three zones, C2, C3 and C5, according to their potential for radioactive contamination, with  
43 C5 having the highest potential for radioactive contamination. The C3 and C5 exhaust fans  
44 maintain a negative pressure in areas where radioactive contamination is most likely to occur.

1 Failure of the C3 or C5 exhaust fans could cause a reverse flow and cause a release of  
2 radioactive contamination.

### 4 **6.1.9 Criticality**

5 Analyses have shown that there is no credible criticality event that can be postulated to occur at  
6 the WTP (BNI 2001b).

## 8 **6.2 NATURAL PHENOMENA**

9 The WTP is designed such that it will not fail under a design basis event. Therefore, natural  
10 phenomena events are not expected to cause structural damage to the WTP, which would  
11 constitute an emergency, or cause a release to the environment. However, the following natural  
12 phenomena that have the potential to cause conditions which are beyond the facility design basis  
13 are discussed: a beyond design basis seismic event, high winds, volcanic eruption and ash fall, a  
14 flood, a range fire, and an aircraft crash.

### 16 **6.2.1 Seismic Event**

17 Depending on the magnitude of the beyond design basis event, severe structural damage can  
18 occur resulting in serious injuries or fatalities and the release of hazardous materials to the  
19 environment. Damaged electrical circuits and wiring could result in the initiation of fires.

### 21 **6.2.2 Volcanic Eruption/Ash fall**

22 Though not expected to cause structural damage, the ash resulting from a volcanic eruption could  
23 cause shorts in electrical equipment and plug ventilation system filters.

### 25 **6.2.3 High Winds/Tornadoes**

26 High winds that are defined as sustained winds above a threshold that would potentially or  
27 actually cause significant structural damage to the facility, are not expected to occur.  
28 (Significant structural damage is interpreted to mean a breach of facility  
29 containment/confinement systems sufficient to cause an actual or potential release of hazardous  
30 material to the environment). However, dirt and dust from windstorms could cause shorts in  
31 electrical equipment, or could plug ventilation system filters. Disruption of normal operations is  
32 possible.

### 34 **6.2.4 Flood**

35 The 200 Area is well above projected flood elevations for the Columbia and Yakima Rivers;  
36 therefore, a flood is not considered a credible natural event for the WTP. The grading and  
37 drainage features that are provided ensures that precipitation, even from a downpour, would  
38 infiltrate the ground or drain off toward the Columbia River without significant flooding. The  
39 WTP is not sited in a wetlands or coastal high-hazard area.

### 41 **6.2.5 Range Fire**

42 The hazards associated with a range fire are similar to those associated with a building fire plus  
43 potential site access restrictions and travel hazards such as poor visibility. Smoke and ash from a

1 range fire can also cause shorts in electrical equipment, or plug ventilation system filters.  
2 Disruption of normal operations is possible.

### 4 **6.2.6 Aircraft Crash**

5 In addition to the potential for serious injuries or fatalities, an aircraft crash could result in the  
6 direct release of hazardous materials to the environment or cause a fire that could lead to the  
7 release.

## 9 **6.3 SECURITY CONTINGENCIES**

10 Security contingencies are discussed in the following sections.

### 12 **6.3.1 Bomb Threat/Explosive Device**

13 A bomb threat may be received by anyone who answers the telephone or receives mail. The  
14 major effect on the WTP is that personnel will need to initiate emergency shutdown before  
15 evacuation. If an explosive device detonates, the effects are the same as those discussed under  
16 fire and explosion.

### 18 **6.3.2 Hostage Situation/Armed Intruder**

19 A hostage situation or the entry of an armed hostile intruder(s) can pose an emergency if either  
20 of these conditions has the potential to adversely affect facility operations. This could result in a  
21 loss of facility control or the coercion of an employee to take some malevolent action. The  
22 severity of the emergency would be based on actual or potential damage to the WTP or release of  
23 hazardous material or radioactive, dangerous, or mixed waste.

### 25 **6.3.3 Suspicious Object**

26 A suspicious object could result in an explosion. If a suspicious device were to detonate, the  
27 effects would be the same as those discussed under fire and explosion. The response to a  
28 suspicious device with the potential to contain a bomb would be the same as a bomb threat  
29 discussed in Section 6.3.1 above.

## 31 **7.0 INCIDENT RESPONSE**

32 The initial response to any emergency is to immediately protect the health and safety of persons  
33 in the affected area. Identification of released material is essential to determine appropriate  
34 protective actions. Containment, treatment, and disposal assessment are secondary responses.

35  
36 The following sections describe the process for implementing basic protective actions as well as  
37 descriptions of response actions for the events listed in Section 6.0 of this plan. *Hanford*  
38 *Emergency Management Plan* (DOE/RL-94-02), Section 1.3, provides concept of operations for  
39 emergency response on the Hanford Site. Site specific procedures are detailed in DOE-0223 and  
40 will be used as necessary. Facility specific actions will be denoted in WTP emergency response  
41 procedures. Procedure titles will be included in Appendix 7A-A when the documentation is  
42 revised prior to the introduction of bulk quantities of hazardous chemicals into the WTP.  
43

## 7.1 PROTECTIVE ACTION RESPONSES

Protective action responses are discussed in the following sections. The steps identified in the following description of actions do not have to be performed in sequence because of the unanticipated sequence of incident events.

### 7.1.1 Evacuation

The WTP may need to be evacuated when conditions warrant (such as fire, explosion, release of hazardous material, etc.). Evacuation will be initiated by automatic alarms or directed by the BED. The evacuation alarm is a steady siren signal. The BED will use WTP emergency response procedures, experience and training to determine when conditions warrant evacuation.

The BED may initiate the evacuation of a building(s) or the entire WTP site with a verbal announcement or by manually initiating an evacuation alarm. The evacuation alarm will be delivered by a combination of the WTP siren system and warning lights. Specific instructions can be provided to personnel via the WTP public address system. As conditions warrant, the 200 Area evacuation alarms will be activated by telephoning the POC, using either 911 (preferred) or 373-3800. The BED will determine if an alternate staging area should be used based on the location of the event, wind direction, and WTP emergency procedures.

The Hanford Site evacuation routes are shown in Figure 7A-B-1, Appendix 7A-B. Evacuation routes out of the buildings will be provided in a revision of this document before the introduction of bulk quantities of hazardous chemicals into the WTP. These routes will be based on providing simple egress. Employees are trained on evacuation routes and procedures. Routes will be clearly marked and maintained clear of all obstructions. The BED will determine the operating configuration of the WTP and identify any additional protective actions needed for limiting exposure of personnel to the hazard.

Staging areas will be designated when the site and building layouts have been finalized. The exterior staging areas will be based on prevailing wind direction (NW), gates, and roadways leading off the site. These locations will be based on historical wind data in the 200 East Area. Alternate staging areas will be available for use if the wind direction or other circumstances necessitate.

For an immediate evacuation, accountability will be performed at the staging area. Personnel Accountability Aides (PAAs) and Staging Area Managers (SAMs) will ensure evacuation actions are taken at all applicable WTP buildings. These positions are standing assignments. Implementing actions executed by the PAAs and SAMs will be directed by site or plant emergency response procedures. When evacuation actions are complete, the PAAs will report to the SAMs. The Staging Area Managers will report to the BED via radio communications or other means, as necessary. When personnel cannot be accounted for active searches will be conducted. ERO personnel, utilizing personal protective equipment appropriate for the conditions, will conduct these searches.

To evacuate from any WTP building, personnel will proceed to the nearest exit. Stairways, not elevators, will be used to ascend or descend to the main level (0 ft. elevation). From the

1 building, personnel will proceed to the primary staging areas unless otherwise instructed by the  
2 BED or other ERO personnel. Personnel in protective clothing when an evacuation alarm  
3 sounds will make every effort to follow normal exit procedures when exiting from radiological  
4 control areas, unless threatened by the emergency event. Personnel unable to remove protective  
5 clothing will remain separated from the others and report to the contaminated personnel staging  
6 sign (there will be a sign at each staging area). These personnel will notify staging area  
7 personnel that they need a radiation survey.

8  
9 Personnel will immediately evacuate the building and proceed to the primary staging area (unless  
10 directed otherwise by the BED or other ERO personnel), when a fire alarm is heard. The  
11 discoverer of the fire will contact the Central Control Room (CCR) via telephone or radio. The  
12 BED will make an announcement on the public address system, stating which building has  
13 initiated the fire alarm, and inform personnel to stand clear of the area.

14  
15 The BED may direct personnel to evacuate to an offsite location, if required. Personnel will  
16 remove and leave protective clothing in the parking lot and obtain a radiation survey prior to  
17 entering a vehicle. Personnel will use their privately owned vehicles. Personnel with their own  
18 vehicles will be asked to accommodate other personnel who are without transportation.  
19 Government vehicles may be available and may be obtained upon request from the  
20 RL Emergency Operations Center (RL-EOC).

### 21 22 **7.1.2 Take Cover**

23 The BED will initiate a local take cover notice for the WTP using the facility communications  
24 systems. Where area 200 could be affected, the BED will initiate the take cover alarm by  
25 telephoning the POC, using either 911 (preferred) or 509-373-3800. The take cover alarm is a  
26 wavering siren signal. Actions to complete a take cover order will be directed by WTP  
27 emergency response procedure. Determination of additional take cover actions will be based on  
28 operating configuration, weather conditions, type and duration of release, and other conditions,  
29 as applicable to the event and the associated hazard. The intent of this protective action is to  
30 minimize personnel exposure to hazardous materials and move personnel to locations where  
31 additional instructions can be provided.

32  
33 When the take cover alarm is activated, personnel will halt work, place equipment in a safe  
34 condition, and take cover in the nearest building capable of providing shelter from an airborne  
35 hazard. Exterior doors and windows will be closed; and heating, ventilation, and air  
36 conditioning (HVAC) systems will be secured. If possible, personnel will follow normal exit  
37 procedures from radiological controlled areas in preparation for evacuation. The PAAs have  
38 responsibility to ensure that take cover actions are taken. These positions are standing  
39 assignments. When take cover actions are complete, the PAAs will provide the BED with a  
40 status report via communications paths identified in WTP procedures.

## 41 42 **7.2 RESPONSE TO FACILITY OPERATIONS EMERGENCIES**

43 Depending on the severity of the event, the BED reviews the site-wide and WTP emergency  
44 response procedure(s) and, as required, categorizes and/or classifies the event. If necessary, the  
45 BED initiates area protective actions and Hanford Site Emergency Response Organization

1 activation. The steps identified in the following description of actions do not have to be  
2 performed in sequence because of the unanticipated sequence of incident events.

3  
4 The following emergency signals will be used to initiate emergency response:

- 5
- 6 • Evacuation - steady siren
- 7 • Take Cover - wavering siren
- 8 • Fire - Gong/Bell
- 9

## 10 **7.2.1 Loss of Utilities**

11 A case-by-case evaluation is required for each event to determine loss of utility impacts. When a  
12 BED determines a loss of utility impact, actions are taken to ensure dangerous and/or mixed  
13 waste is being properly managed, to the extent possible given event circumstances. As  
14 necessary, the BED will stop operations and take appropriate actions until the utility is restored.  
15

### 16 **7.2.1.1 Loss of Electrical Power**

17 Should there be a partial or total loss of electrical power to the WTP; automatic measures ensure  
18 the plant is in a safe operational configuration. (Safe operational configuration is defined as a  
19 shutdown to minimal operations that will prevent releases and prevent unnecessary damage to  
20 the equipment.)

21  
22 The emergency power system will consist of two diesel turbine- automatically controlled  
23 emergency diesel generators and one diesel engine standby generator. The automatic and standby  
24 generators are connected to three separate 4.16kV emergency switchgears. Upon loss of power  
25 the emergency diesel turbine generators will automatically start. The emergency diesel turbine  
26 generators are capable of starting, accelerating, and being loaded with the design load in a  
27 specified time limit. The standby diesel generator is started manually or automatically in the  
28 event of a prolonged loss of offsite power. The emergency power system will be connected to  
29 essential loads in order to ensure only a short-term power interruption for those loads designated  
30 as essential. Critical indications and controls are backed up by uninterruptible power supplies  
31 and batteries. The plant will remain in a safe condition during loss of electrical power.  
32

33 Egress lighting will consist of self-contained fixtures with battery packs and charging systems.  
34 These lighting systems will be located in stairways, exit routes and fire alarm stations and will  
35 come on automatically upon loss of normal power to the fixture. A selected part of the normal  
36 lighting will operate as essential lighting, and will provide a minimum level of illumination  
37 throughout the plant to aid in restoring the plant to normal operation. Essential lighting will be  
38 powered by the EPS and will be available after an offsite power loss, following a delay required  
39 to start the emergency power supply diesel generators and for the generators to pick up the  
40 essential loads.

41  
42 Selected instrumentation and controls will also be powered by an un-interruptible power  
43 supply (UPS) system and therefore will be unaffected by a loss of offsite power. UPS systems  
44 will be battery backed, and the battery chargers will be connected to the EPS. Radiation

1 monitors, such as Continuous Air Monitors (CAMs) and area radiation monitors, are also  
2 powered by the UPS systems and continue operating during power failure.

### 4 **7.2.1.2 Loss of Water**

5 Upon loss of the raw water system, operations will be restricted. Upon loss of potable water  
6 chemical operations will be terminated until safety showers and eyewash stations are available.  
7 Upon loss of the fire suppression system, the plant will be placed in a safe configuration, and  
8 corrective actions will be implemented.

### 10 **7.2.1.3 Loss of Ventilation**

11 A cascade ventilation system is used at the WTP in conjunction with physical building  
12 containment features to confine transferable radioactive contamination in the event of an  
13 accidental release, spill, or system failure. The ventilation system is designed to maintain  
14 building differential pressures so air will flow from areas of lesser contamination potential to  
15 areas of greater contamination potential through containment boundary penetrations such as  
16 engineered air gaps and air in-bleed ductwork.

17  
18 The WTP is divided into numbered zones with the higher number indicating the greater hazard  
19 potential and therefore the greater degree of control/restriction required. Radiation (R1 to R5)  
20 and contamination (C1 to C5) zones are classified independently in order to differentiate  
21 between the need for shielding or confinement.

22  
23 Supply air in C2 areas flows via C3 to the C5 areas, where it will be discharged by the C5  
24 exhaust fans. In some instances, the airflow will flow from the C2 areas to the C3 areas, where it  
25 will be discharged by the C3 exhaust fans. Some C2 air flow will be directly exhausted. Upon  
26 loss of the ventilation system, restoration of the C3 and C5 exhaust fans will be immediately  
27 attempted. If the C3 and C5 exhaust fans cannot be restored immediately, the C2 supply fans are  
28 automatically stopped, and personnel may be notified to evacuate C3 areas, as a precautionary  
29 measure.

30  
31 The BED and either the ERO or the IC will take the following actions:

- 32
- 33 • Locate the source of the problem, and take steps necessary to control the event
- 34 • Ensure appropriate areas have been evacuated
- 35 • Monitor contamination levels in the plant
- 36 • Restore ventilation system
- 37

### 38 **7.2.1.4 Loss of Process or Instrument Air**

39 The process air system will use redundant air compressors. One will be in operation and the  
40 other(s) will be in autostart mode. If the standby compressor fails to start on loss of the  
41 operating compressor, a backup compressor will be started locally.

### 1 **7.2.2 Major Process Disruption/Loss of Plant Control**

2 If there is a major process disruption, the BED will be notified while an attempt is made to return  
3 the system to service. The BED will compare the situation to criteria provided in the facility  
4 categorization/classification procedure to determine if an Operational Emergency is occurring. If  
5 it is determined that an Operational Emergency is in progress, the BED will make the appropriate  
6 categorization/classification, initiate protective actions, begin the notification process, and  
7 request that the ERO be activated. The system condition will be assessed, and  
8 mitigative/corrective actions will be implemented.  
9

### 10 **7.2.3 Pressure Release**

11 Pressure hazards in plant buildings associated with pressurized gases or compressed gas bottles  
12 could require changes to the plant operation and may require local evacuation. A fire or  
13 explosion caused by a release of pressurized gas will be responded to in accordance with Section  
14 7.2.4. If a mixed waste release occurs, actions identified in Section 7.2.5 will be performed.  
15

### 16 **7.2.4 Fire and/or Explosion**

17 In the event of a fire, the discoverer activates a fire alarm (pull box); calls 911 (509-373-3800 if  
18 using a cellular phone) or verifies that 911 has been called; and calls the CCR. Automatic  
19 initiation of a fire alarm (through the smoke detectors and sprinkler systems) is also possible.  
20 Activation of a fire alarm automatically signals the HFD and the Hanford POC and will be  
21 audible in the CCR.  
22

23 As soon as non-essential personnel are notified of a fire (verbally or by fire alarm activation),  
24 they will immediately exit the WTP area or building by the nearest safe exit, proceed to the  
25 nearest staging area upwind of the area/building, check-in with PAAs, and follow the  
26 instructions of responding personnel. If personnel are reported missing, and might be within the  
27 WTP area/building, the BED will be notified. A search will be made, if safe to do so. The BED  
28 will initiate emergency response procedures and will notify ERO members and the incident  
29 command structure.  
30

31 Initial actions to be taken by non-response personnel will consist of:

- 32
- 33 • Unless otherwise instructed, personnel will evacuate the area/building by the nearest safe exit  
34 and proceed to the designated staging area for accountability.
- 35 • On actuation of the fire alarm, ONLY if time permits, personnel should shut down  
36 equipment, and secure waste.  
37

38 Trained and certified operations personnel may initiate a plant shutdown depending on the  
39 location and severity of the fire, and the location and type of hazards in the affected area. The  
40 BED will interface with the appropriate agencies of the incident command structure and will  
41 perform the following:  
42

- 43 • Proceed directly to the ICP, obtain all necessary information pertaining to the incident, and  
44 send a representative to meet Hanford Fire Department.

- 1 • Provide a formal turnover to the IC, when the IC arrives at the ICP.
- 2 • Inform the Hanford Site Emergency Response Organization as to the extent of the emergency  
3 (including estimates of dangerous waste, mixed waste, or radioactive material quantities  
4 released to the environment).
- 5 • If operations are stopped in response to the fire, ensure that systems are monitored for leaks,  
6 pressure buildup, gas generation, and ruptures.

7  
8 The following is representative of the type of information that the BED may be called upon to  
9 provide to the incident command structure or other response agencies:

10

- 11 • Location and health of personnel, including missing personnel and possible locations for fire  
12 fighters to search for them
- 13 • Location and severity of fire, including character, exact source, and the amount, area, and  
14 extent of any released materials
- 15 • Known hazardous conditions (such as, radiological, non-radiological, electrical, thermal,  
16 flammable materials, pressurized cylinders, toxic gas, pressure systems, batteries, radiation  
17 areas)
- 18 • Plant operating status
- 19 • Utility systems status
- 20 • Support for WTP radiological control personnel (that is, monitoring, surveys, sampling,  
21 decontamination)
- 22 • WTP layout
- 23 • Support for firefighter activities as required
- 24 • Notifications as required in accordance with plant procedures and *Hanford Emergency*  
25 *Management Plan* (DOE/RL-94-02), Section 5.1.1

26

27 Following a fire and/or explosion, WAC 173-303-640(7) will be addressed for any WTP tank  
28 systems that may have been affected regarding fitness for use.

29

### 30 **7.2.5 Hazardous Material, Dangerous and/or Mixed Waste Spill**

31 The WTP has engineering controls to contain or minimize spills. These controls include  
32 containment berms, dedicated spill control sumps, remote leak detection systems, remote gauges  
33 and level indicators as well as shielding on chemical pipe flanges. WTP procedures provide  
34 alarm response and maintenance actions for leak detection equipment, surveillance of possible  
35 leak locations, and response actions for detected spills.

36

37 Spills can result from many sources including process leaks, container spills or leaks, damaged  
38 packages or shipments, or personnel error. Spills of mixed waste are complicated by the need to  
39 deal with the extra hazards posed by the presence of radioactive materials.

40

41 The following actions will be taken in response to a spill or release of hazardous material,  
42 dangerous and/or mixed waste:

- 1
- 2 • The discoverer notifies the BED and initiates SWIMS response:
- 3
- 4     Stops work
- 5     Warns others in the vicinity
- 6     Isolates the area
- 7     Minimizes the spill if possible
- 8     Requests the BED Secure ventilation.
- 9
- 10 • The BED determines if emergency conditions exist requiring response from the Hanford Fire
- 11 Department based on classification of the spill and injured personnel, and evaluates need to
- 12 perform additional protective actions.
- 13 • If the Hanford Fire Department resources are not needed, the spill is mitigated with resources
- 14 identified in Section 9.0 of this plan and proper notifications are made.
- 15 • If the Hanford Fire Department resources are needed, the BED calls 911 (509-373-3800 if
- 16 using a cellular phone).
- 17 • The BED sends a representative to meet the Hanford Fire Department.
- 18 • The BED provides a formal turnover to the IC when the IC arrives at the ICP.
- 19 • The BED informs the Hanford Site Emergency Response Organization as to the extent of the
- 20 emergency (including estimates of dangerous waste, mixed waste, or radioactive material
- 21 quantities released to the environment).
- 22 • If operations are stopped in response to the spill, the BED ensures that systems are monitored
- 23 for leaks, pressure buildup, gas generation, and ruptures.
- 24 • Hanford Fire Department stabilizes the spill.
- 25
- 26 As necessary, the BED will also initiate or arrange for the following:
- 27
- 28 • Notify plant personnel of the spill or release by sounding the appropriate alarm, using the
- 29 public address system, or other available means.
- 30 • Establish a control point at a safe location, and coordinate further spill mitigation activities.
- 31 • Obtain all available information pertaining to the event, evaluate the need for event
- 32 categorization or classification, and begin ERO activation as necessary.
- 33 • Initiate use of plant and emergency response procedures.
- 34 • Arrange for care of any injured persons.
- 35 • Maintain access control at the event site by keeping unauthorized personnel and vehicles
- 36 away from the area. Security personnel can be used to assist in site control. In determining
- 37 which areas are to be controlled, the BED will consider environmental factors such as wind
- 38 velocity and direction.
- 39 • Arrange for proper remediation of the event after evaluation, and if required, incident
- 40 investigation processes have been initiated.
- 41 • Remain available for fire, patrol, and other authorities on the scene, and provide all required
- 42 information.

- 1 • Enlist the assistance of alternate BED(s) or ERO personnel, if response activities are  
2 projected to be long term.
- 3 • Ensure the use of proper protective equipment, remedial techniques, transfer procedures and  
4 decontamination procedures by all involved personnel, if remediation is performed by plant  
5 personnel.
- 6 • Remain at the scene to oversee activities and provide information, if remediation is  
7 performed by the HFD HAZMAT Team or other response teams.
- 8 • Ensure proper containerization, packaging, and labeling of recovered spill materials.
- 9 • Ensure decontamination (or restocking) and restoration of emergency equipment used in the  
10 spill remediation before resuming operations.
- 11 • Provide required reports after the event in accordance with plant procedures.

12

13 Additional actions to be taken in response to a leaking tank include:

14

- 15 • Removal of the leaking tank from service.
- 16 • Conduct an investigation to determine the cause of the event.
- 17 • Perform repairs or replacements before the tank is returned to service, with, as required, a  
18 final approval from an independent certified professional engineer.
- 19 • Following an emergency event involving a tank system, address all requirements of WAC  
20 173-303-640(7) regarding fitness for use.

21

### 22 **7.2.5.1 Damaged or Unacceptable Shipments**

23 No wastes will be received at the WTP from outside of the Hanford Site. Therefore, this section  
24 of the plan is not applicable to the WTP.

25

### 26 **7.2.6 Radiological Material Release**

#### 27 **7.2.6.1 C2, C3 or C5 Ventilation System Release**

28 If high radiation alarms indicate the occurrence of a radiological material release from the C2,  
29 C3 or C5 ventilation system the operating ventilation system can be immediately switched over  
30 to the standby HEPA filtration system. Near-contact radiation surveys and additional assessment  
31 making use of on-line instruments will be performed to determine the extent of the radiological  
32 material released. The actions described in Section 7.2.1.3 will be performed.

33

#### 34 **7.2.6.2 Release of Mixed Waste into the Plant**

35 If a catastrophic dumping of mixed waste occurs, affected plants or processes will be  
36 immediately shut down. The actions described in Section 7.2.5 will be performed.

37

38 If a catastrophic dumping causes a high radiation alarm on the C5 or C3 ventilation systems, the  
39 standby systems will be started, and actions described in Section 7.2.1.3 will be performed.

40

### 1 **7.2.7 Criticality**

2 Analyses have shown that there is no credible criticality event that can be postulated to occur at  
3 the WTP (BNI 2001b).

## 4 5 **7.3 PREVENTION OF RECURRENCE OR SPREAD OF FIRES, EXPLOSIONS, OR** 6 **RELEASES**

7 The BED, as part of the ICS, takes the steps necessary to ensure that a secondary release, fire, or  
8 explosion does not occur. The BED will take measures, where applicable, to stop processes and  
9 operations; collect and contain released wastes and remove or isolate containers. The BED will  
10 also monitor for leaks, pressure buildups, gas generation, or ruptures in valves, pipes, or other  
11 equipment, whenever this is appropriate.

## 12 13 **7.4 RESPONSE TO NATURAL PHENOMENA**

14 Depending on the severity of the event, the BED reviews site wide and WTP emergency  
15 response procedure(s) and, as required, categorizes and/or classifies the event. If necessary, the  
16 BED initiates area protective actions and Hanford Site Emergency Response Organization  
17 activation. The steps identified in the following description of actions do not have to be  
18 performed in sequence because of the unanticipated sequence of incident events.

### 19 20 **7.4.1 Seismic Event**

21 The Hanford Site Emergency Response Organization's primary role in a seismic event is  
22 coordinating the initial response to injuries, fires, and fire hazards and acting to contain or  
23 control radioactive and/or hazardous material releases.

24  
25 Individuals should remain calm and stay away from windows, steam lines, and hazardous  
26 material storage locations. Once the shaking has subsided, individuals should evacuate carefully  
27 and assist personnel needing help. The location of any trapped individuals should be reported to  
28 the BED or is reported to 911 (509-373-3800 if using a cell phone).

29  
30 The BED takes whatever actions are necessary to minimize damage and personnel injuries.  
31 Responsibilities include the following:

- 32
- 33 • Coordinating searches for personnel and potential hazardous conditions (fires, spills, etc.)
  - 34 • Conducting accountability.
  - 35 • Securing utilities and facility operations.
  - 36 • Arranging rescue efforts, and notifying 911 for assistance.
  - 37 • Determining if hazardous materials were released.
  - 38 • Determining current local meteorological conditions.
  - 39 • Warning other facilities and implementing protective actions if release of hazardous  
40 materials poses an immediate danger.
  - 41 • Providing personnel and resource assistance to other facilities, if required and possible.
- 42

#### 1 **7.4.2 Volcanic Eruption/Ash fall**

2 When notified of an impending ash fall, the BED will implement measures to minimize the  
3 impact of the ash fall. BED actions may include the following:

- 4
- 5 • Installing filter media over building ventilation intakes
- 6 • Installing filter media or protective coverings on outdoors equipment that may be adversely  
7 affected by the ash (diesel generators, equipment rooms etc.)
- 8 • Shutting down some or all operations and processes
- 9 • Sealing secondary use exterior doors

10

11 If other emergency conditions arise as a result of the ashfall (e.g., fires due to electrical shorts or  
12 lightning), response is as described in other sections of this plan.

13

#### 14 **7.4.3 High Winds/Tornadoes**

15 Upon notification of impending high winds, the BED takes steps necessary to secure all outdoor  
16 waste and hazardous material containers and storage locations.

17

18 All doors and windows are shut, and personnel are warned to use extreme caution when entering  
19 or exiting the building. Ventilation, utilities, and operations will be shut down as appropriate to  
20 lessen the severity of the impact.

21

#### 22 **7.4.4 Flood**

23 Since the 200 Area is well above projected flood elevations for the Columbia and Yakima  
24 Rivers, this section is not applicable.

25

#### 26 **7.4.5 Range Fire**

27 Responses to range fires are handled by preventive measures (i.e., keeping hazardous material  
28 and waste accumulation areas free of combustible materials such as weeds and brush). If a range  
29 fire breaches the WTP boundary, the response is as described in Section 7.2.4.

30

#### 31 **7.4.6 Aircraft Crash**

32 The response to an aircraft crash is the same as for a fire and/or explosion (Section 7.2.4).

33

### 34 **7.5 SECURITY CONTINGENCIES**

35 Depending on the severity of the event, the BED reviews sitewide and WTP emergency response  
36 procedure(s) and, as required, categorizes and/or classifies the event. If necessary, the BED  
37 initiates area protective actions and Hanford Site Emergency Response Organization activation.

38 The steps identified in the following description of actions do not have to be performed in  
39 sequence because of the unanticipated sequence of incident events.

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#### 41 **7.5.1 Bomb Threat/Explosive Device**

42 Response to a bomb threat/explosive device is discussed in the following sections.

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### **7.5.1.1 Telephone Threat**

Individuals receiving telephoned threats attempt to get as much information as possible from the caller (using the bomb threat checklist if available). Upon conclusion of the call, notify the BED and Hanford Patrol by calling 911 (do not use a cellular phone or hand-held radio for reporting a bomb threat/explosion unless beyond 300 feet from suspected object).

The BED evacuates the WTP and questions personnel at the staging area regarding any suspicious objects. When Hanford Patrol personnel arrive, their instructions will be followed.

### **7.5.1.2 Written Threat**

Receivers of written threats should handle the letter as little as possible. The BED and Hanford Patrol will be notified by calling 911 (do not use a cellular phone or hand-held radio for reporting a bomb threat/explosion unless beyond 300 feet from suspected object). Depending on the content of the letter, the BED might evacuate the affected locations. The letter is turned over to Hanford Patrol and their instructions are followed.

### **7.5.2 Hostage Situation/Armed Intruder**

The discoverer of a hostage situation or armed intruder reports the incident to 911 (509-373-3800 if using a cell phone) and to the BED if possible. The BED, after conferring with Hanford Patrol, might covertly evacuate areas not observable by the hostage taker(s)/intruder. No alarms will be sounded.

Hanford Patrol will determine the remaining response actions and will activate the Hostage Negotiating Team, if necessary.

### **7.5.3 Suspicious Object**

The discoverer of a suspicious object reports this object to the BED and to 911 (do not use a cellular phone or hand-held radio for reporting a bomb threat/explosive device unless beyond 300 feet from suspected object), if possible, and ensures that the object is not disturbed.

The BED will evacuate the WTP and (based on the description provided by the discoverer) attempt to determine the identity or owner of the object. Personnel will be questioned at the staging area to attempt to identify the owner of the object.

If the identity/ownership of the object cannot be determined, then Hanford Patrol will assume command of the incident. The canine unit will be used to determine if the package contains explosives. If there is a positive indication of explosives or it cannot be assured that there are no explosives, then an Explosive Ordnance Disposal Team will be dispatched to properly dispose of the object.

## **8.0 TERMINATION OF EVENT, INCIDENT RECOVERY, AND RESTART OF OPERATIONS**

*Hanford Emergency Management Plan* (DOE/RL-94-02), Section 9.0, describes actions for event termination, incident recovery, and restart of operations. The extent by which these actions are employed is based on the incident classification of each event. In addition, *Hanford Emergency Management Plan* (DOE/RL-94-02) also contains actions for the management of incompatible wastes that might apply.

### **8.1 TERMINATION OF EVENT**

For events where the Hanford Emergency Operations Center (Hanford-EOC) is activated, the RL/ORP Emergency Manager has the authority to declare event termination. This decision is based on input from the BED, IC, and other emergency response organization members. For events where the Hanford-EOC is not activated, the incident command system and staff will declare event termination.

### **8.2 INCIDENT RECOVERY AND RESTART OF OPERATIONS**

A recovery plan is developed when necessary in accordance with *Hanford Emergency Management Plan* (DOE/RL-94-02), Section 9.2. A recovery plan is needed following an event where further risk could be introduced to personnel, the WTP facilities, or the environment through recovery action and/or to maximize the preservation of evidence.

If the WTP ERP is implemented in accordance with Section 4.0 of this plan, Ecology will be notified before operations can resume. This notification is in addition to the required reports discussed in Section 5.1 of *Hanford Emergency Management Plan* (DOE/RL-94-02) and will include the following statements;

- There are no incompatibility issues with the waste and released materials from the incident.
- All the equipment has been cleaned, fit for its intended use, and placed back into service.

The notification required by WAC 173-303-360(2)(j) may be made via telephone conference. Additional information that Ecology requests regarding these restart conditions will be included in the required 15-day report identified in Section 11.0 of this plan.

For emergencies not involving activation of the Hanford-EOC, the BED ensures that conditions are restored to normal before operations are resumed. If the Hanford Site Emergency Response Organization was activated and the emergency phase is complete, a special recovery organization could be appointed at the discretion of RL to restore conditions to normal. This process is detailed in RL and contractor emergency procedures. The makeup of this organization depends on the extent of the damage and the effects. The onsite recovery organization will be appointed by the appropriate contractor's management.

### **8.3 INCOMPATIBLE WASTE**

After an event, the BED, or the onsite recovery organization ensures that no waste that might be incompatible with the released material is treated, stored, and/or disposed of until cleanup is

1 completed. Clean up actions are taken by WTP personnel or other assigned personnel. *Hanford*  
2 *Emergency Management Plan* (DOE/RL-94-02) Section 9.2.3, describes actions to be taken.

3  
4 Waste from cleanup activities is designated and managed as newly generated waste. A field  
5 check for compatibility is performed before storage, as necessary. Incompatible wastes are not  
6 placed in the same container. Containers of waste are placed in approved storage areas  
7 appropriate for their compatibility class.

8  
9 If incompatibility of waste was a factor in the incident, the BED or the onsite recovery  
10 organization ensures that the cause is corrected

#### 11 12 **8.4 POST EMERGENCY EQUIPMENT MAINTENANCE AND** 13 **DECONTAMINATION**

14 All equipment used during an incident is decontaminated (if practicable) or disposed of as spill  
15 debris. Decontaminated equipment is checked for proper operation before storage for  
16 subsequent use. Consumable and disposed materials are restocked. Fire extinguishers are  
17 replaced.

18  
19 The BED ensures that all equipment is cleaned and fit for its intended use before operations are  
20 resumed. Depleted stocks of neutralizing and absorbing materials are replenished, self-contained  
21 breathing apparatus are cleaned and refilled, protective clothing is cleaned or disposed of and  
22 restocked, etc.

### 23 24 **9.0 EMERGENCY EQUIPMENT**

25 Hanford Site emergency resources and equipment are described and listed in *Hanford*  
26 *Emergency Management Plan* (DOE/RL-94-02), Appendix C. Emergency resources and  
27 equipment for the WTP are presented in this section.

#### 28 29 **9.1 FIXED EMERGENCY EQUIPMENT**

30 The following table lists the fixed emergency equipment available at the WTP.  
31

**Table 7A-2 Fixed Emergency Equipment**

Type	Location	Capability
Safety shower/eye wash station	Throughout the WTP in locations designated by facility procedures.	Assist in flushing chemicals/materials from body or eyes and face.
Automatic sprinkler system	Throughout the WTP.	Assist in the control of fire.
Fire alarm pull boxes	Throughout the WTP.	Activates the building fire alarm and notifies fire department, as developed by Coordination Agreements.
Emergency diesel generators	East of the LAW Facility.	Provide emergency power.

**Table 7A-2 Fixed Emergency Equipment**

Type	Location	Capability
Fire hose connections	Throughout the WTP in locations designated by facility procedures.	Allow for connection of fire hoses to site water system for manual fire suppression.
Personnel decontamination rooms	TBD	Personnel decontamination.

Note: TBD = To be determined

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5

## 9.2 PORTABLE EMERGENCY EQUIPMENT

The following table lists available portable emergency equipment.

**Table 7A-3 Portable Emergency Equipment**

Type	Location	Capability
General purpose fire extinguishers	Throughout the WTP.	Fire suppression for class A, B, and C fires.
CO <sub>2</sub> or clean-agent fire extinguishers	Throughout the WTP.	Suppress electrical fires.
Miscellaneous emergency equipment	Throughout the facility located in emergency equipment cabinets as designated by facility procedures.	Safety harnesses, blankets, first aid kits, stretchers, emergency lights, and emergency tools.

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10

## 9.3 COMMUNICATIONS EQUIPMENT/WARNING SYSTEMS

The following table lists all communications and warning systems.

**Table 7A-4 Communications Equipment**

Type	Location	Capability
<b><u>Siren System</u></b> Evacuation STEADY SIREN Take Cover WAVERING SIREN Fire GONG/BELL	Throughout the WTP.	Alert facility personnel of emergency conditions.
PA System	Throughout the WTP.	Provides for information dissemination to facility personnel.
Fire alarm pull boxes	Throughout the WTP.	Summon aid in the event of a fire.

**Table 7A-4 Communications Equipment**

<b>Type</b>	<b>Location</b>	<b>Capability</b>
<u><b>Siren System</b></u> Evacuation STEADY SIREN Take Cover WAVERING SIREN Fire GONG/BELL	Throughout the WTP.	Alert facility personnel of emergency conditions.
Telephone system	WTP CCR, office areas, and other plant locations.	Internal and external communications.
Portable two-way radios	Throughout the WTP.	Communications to the CCR.
Pagers	Assigned to key personnel.	To alert key personnel to respond, either individually or by group alert.

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#### **9.4 PERSONAL PROTECTIVE EQUIPMENT**

The following table lists types of protective equipment available.

**Table 7A-5 Personal Protective Equipment**

<b>Type</b>	<b>Location</b>	<b>Capability</b>
Waterproof coveralls, Leather protective wear, Respirators, Filtered masks, Oxygen supplies, Escape Paks, SCBAs.	Throughout the facility in or near emergency equipment cabinets as designated by facility procedure.	Protection from various hazards (e.g., smoke, fumes, oxygen deficient atmosphere, chemicals, high airborne radioactivity concentrations, radiological contamination)

6  
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10

#### **9.5 SPILL CONTROL AND CONTAINMENT SUPPLIES**

The following table lists the locations of spill kits and includes a basic listing of contents.

**Table 7A-6 Spill Kits and Spill Control Equipment**

<b>Type</b>	<b>Location</b>	<b>Capability</b>
-------------	-----------------	-------------------

Absorbent materials 55-gal drums Overpack drums Bags Step-off pads Protective clothing Chemical resistant coveralls Surgical and chemical gloves Acid Goggles/Face shields Sodium-bicarbonate Barrier Tape Rags Scissors Flashlight Batteries pH paper Mop handles Mop heads Mop bucket with wringer Hazardous material labels Non-sparking shovel Hazardous absorbent booms Ear plugs Portable barriers	Throughout the facility in or near spill kit cabinets as designated by facility procedures.	Control and mitigation of radioactive and chemical spills.
---	---	--

1

2 **9.6 INCIDENT COMMAND POST**

3 The WTP primary ICP is located in the administration building. Alternate locations will be  
4 determined at the time of the emergency, if necessary. The location may be inside a building or  
5 outside, and may change depending on the weather, wind direction, and location and severity of  
6 the event. The IC could also activate the Hanford Fire Department Mobile Command Unit if  
7 necessary.

8

9 The ICP will contain the following:

10

- 11 • Telephone communications, (including speakerphones and headsets) including the Hanford
- 12 Site Emergency Alerting System (HSEAS)
- 13 • Radio communications
- 14 • Access to the public address system
- 15 • Access to plant operations data
- 16 • Access to plant systems information
- 17 • Access to accountability and building access control information

- 1 • Access to the Hanford Local Area Network (HLAN) as necessary  
2

### 3 **10.0 COORDINATION AGREEMENTS**

4 RL has established a number of coordination agreements, or memoranda of understanding  
5 (MOU) with various agencies to ensure proper response resource availability for incidents  
6 involving the Hanford Site. A description of the agreements is contained in *Hanford Emergency*  
7 *Management Plan* (DOE/RL-94-02), Section 3.0, Table 3-1.  
8

### 9 **11.0 REQUIRED REPORTS**

10 Post incident written reports are required for certain incidents on the Hanford Site. The reports  
11 are described in *Hanford Emergency Management Plan* (DOE/RL-94-02), Section 5.1.  
12

13 Facility management will note in the WTP operating record, the time, date, and details of any  
14 incident that requires implementation of the contingency plan (refer to Section 4.0 of this plan).  
15 Within fifteen (15) days after the incident, a written report on the incident will be submitted to  
16 Ecology. The report will include all items specified in WAC 173-303-360(2)(k).  
17

18 If a release from a tank system occurs that requires notification according to  
19 WAC 173-303-640(7), notification as described in WTP procedures will be followed.  
20

### 21 **12.0 PLAN LOCATION AND AMENDMENTS**

22 Copies of this plan are maintained at the following locations:  
23

- 24 • WTP CCR
- 25 • RL-EOC
- 26 • POC
- 27 • HFD

28  
29 Portions of the plan will be reviewed and immediately amended if necessary, when conditions  
30 described in *Hanford Emergency Management Plan* (DOE/RL-94-02), Section 14.3.1.1 occur.  
31 In addition, the plan will be revised prior to the introduction of bulk quantities of hazardous  
32 chemicals into the WTP. This will include information that is not currently available.  
33 Subsequently, the plan will be reviewed and updated annually.  
34

### 35 **13.0 FACILITY EMERGENCY RESPONSE ORGANIZATION**

36 The following table lists the Building Emergency Directors (BED) by job title.  
37

#### 38 **Building Emergency Director**

39 **Table 7A-7 WTP BEDs**

Title	Location	Phone
Shift Operations Manager (SOM),	Central Control Room, Pretreatment	TBD

Pretreatment Facility	Facility	
SOM, LAW Facility	Control Room, LAW Facility	TBD
SOM, HLW Facility	Control Room, HLW Facility	TBD

1  
2 Names and home telephone numbers of the BEDs will be available from the POC (509-373-  
3 3800) in accordance with Hanford Facility Dangerous Waste Permit, General Condition II.A.3.  
4 This list will be available prior to the introduction of bulk quantities of hazardous chemicals into  
5 the WTP.

6

7

#### **14.0 REFERENCES**

- 8 BNFL Inc. 1999b. *Draft Work Plan for Screening Level Risk Assessment for the RPP-WTP*,  
9 RPT-W375-EN00001, Revision D, 15 November 1999. BNFL Inc., Richland, Washington,  
10 USA.
- 11 BNI 2001a. *River Protection Project – Waste Treatment Plant Dangerous Waste Training Plan*,  
12 Revision 1, August 2001. Bechtel National Incorporated, Richland, Washington, USA.
- 13 BNI 2001b. *Criticality Safety Evaluation Report for RPP-WTP*, 24590-WTP-RPT-NS-01-001,  
14 Revision 0, Sept 4, 2001. Bechtel National Incorporated, Richland, Washington, USA.
- 15 DOE Order 232.1, *Occurrence Reporting and Processing of Operations Information*, United  
16 States Department of Energy, Washington D.C.
- 17 DOE/RL-94-02, *Hanford Emergency Management Plan*, as amended
- 18 WAC 173-303, *Washington State Dangerous Waste Regulations, Washington Administrative*  
19 *Code*, Washington State Department of Ecology, Olympia, Washington, as amended
- 20 Ecology, 1994, *Dangerous Waste Portion of the Hanford Facility Resource Conservation and*  
21 *Recovery Act Permit for the Treatment, Storage, and Disposal of Dangerous Waste, Permit*  
22 *Number WA7890008967*, Washington State Department of Ecology, Olympia, Washington, as  
23 amended

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1 **Appendix 7A-A**

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3 **List of Emergency Response Procedures**  
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5 DOE-0223, *Emergency Plan Implementing Procedures*: RLEP 3.4, "Emergency Termination,  
6 Reentry, and Recovery"

7 DOE-0223, *Emergency Plan Implementing Procedures*: RLEP 1.1, "Hanford Incident  
8 Command System and Event Recognition and Classification"

9 DOE-0223, *Emergency Plan Implementing Procedures*: RLEP 1.0, "Recognizing and  
10 Classifying Emergencies," Appendix 1-X.X.

11 Facility specific procedures will be available prior to the introduction of bulk quantities of  
12 hazardous chemicals into the WTP.

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1 **Appendix 7A-B**

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3 **Evacuation Routes**

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6 This Appendix will contain figures of:

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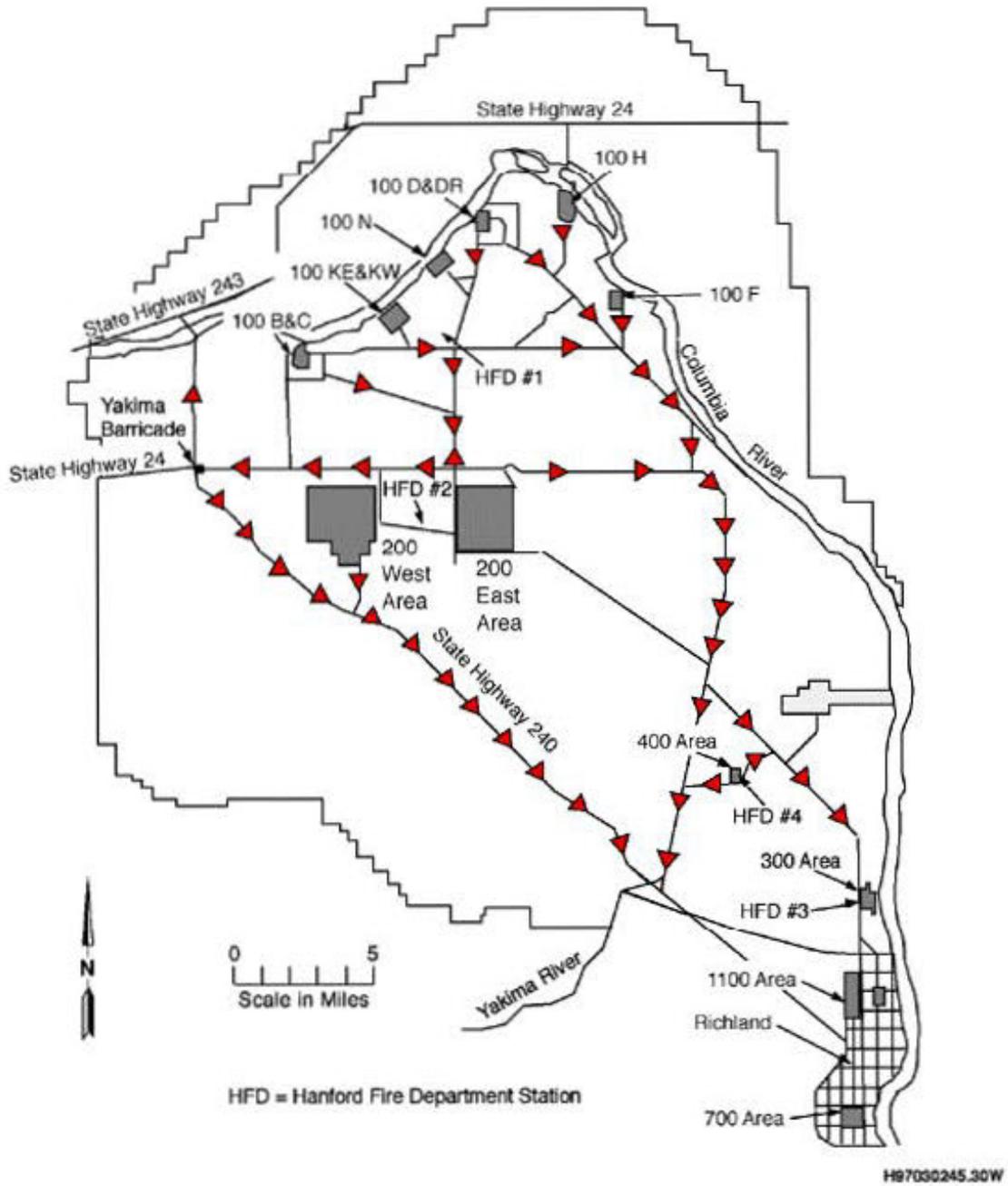
- 8 • The site plot plan showing the position of the staging areas.
- 9 • Floor plans for each WTP Facility showing evacuation routes.

10

11 These figures will be provided prior to the introduction of bulk quantities of hazardous chemicals  
12 into the WTP.

13

1 **Figure 7A-B-1 Hanford Site Evacuation Routes**  
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