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DOE/RL 92-35

325/3100 Hazardous Waste Treatment Unit Dangerous Waste Permit Application

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U.S. Department of Energy
P.O. Box 550
Richland, Washington 99352

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STATE ENVIRONMENTAL POLICY ACT (SEPA)

CHECKLIST

FOR THE

325/3100 HAZARDOUS WASTE TREATMENT UNIT

PART B APPLICATION

JUNE 1992

WASHINGTON ADMINISTRATIVE CODE
ENVIRONMENTAL CHECKLIST FORMS
WAC 197-11-960

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A. BACKGROUND

1. Name of project, if applicable:

   Grant of a final (Part B) hazardous waste facility permit to the 325/3100 Hazardous Waste Treatment Unit (HWTU) located at the Hanford Site, Washington.

2. Name of applicants:

   U.S. Department of Energy, Richland Field Office (DOE-RL); owner and operator; and Pacific Northwest Laboratory (PNL), co-operator.

3. Address and Phone Number of Applicants and Contact Persons:

   U.S. Department of Energy
   Richland Field Office
   P.O. Box 550
   Richland, Washington 99352

   Pacific Northwest Laboratory
   Battelle Boulevard
   P.O. Box 999
   Richland, WA 99352

   Contact Persons:

   R. D. Izatt, Program Manager
   Office of Environmental Assurance,
   Permits and Policy
   (509) 376-5441

   J. L. McElroy, Manager
   Waste Technology Center
   Pacific Northwest Laboratory
   (509) 376-6253

4. Date checklist prepared:

   June 24, 1992

   Agency requesting the checklist:

   State of Washington
   Department of Ecology
   Mail Stop PV-11
   Olympia, Washington 98504-8711

6. Timing or schedule: (including phasing, if applicable):

   The HWTU is operating under interim status. The RCRA Part B application submission is a Hanford Facility Agreement and Consent Order milestone (M20-20)

7. Do you have any plans for future additions, expansions, or further activity related to or connected with this proposal? If yes, explain.

   The HWTU is divided into two sections. One section, the 3100 section, will handle dangerous waste, and the other, the 325 section, handles dangerous and mixed waste (MW). At this time the 3100 section is under design.

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8. List any environmental information you know about that has been prepared, or will be prepared, directly related to this project.

This SEPA checklist is being submitted to the Washington State Department of Ecology (Ecology) concurrently with the 325/3100 Hazardous Waste Treatment Unit Part B permit application.

In May 1988, RCRA Part A Permit application for the 325 section was submitted to the Washington Department of Ecology and amended to include the 3100 section in January 1992.

NEPA Environmental Assessments (EAs) will be submitted to the Washington Department of Ecology by DOE-HQ for review and copies of the final EAs will be provided.

Additional environmental information regarding the Hanford Site can be found in the following documents Hanford Site Dangerous Waste Permit Application:

Final Environmental Impact Statement--Waste Management Operations, Hanford Reservation, Richland Washington, ERDA-1538, Volumes 1 and 2, U.S. Energy Research and Development Administration, 1975. Richland, Washington.

Final Environmental Impact Statement--Disposal of Hanford Defense High-Level, Transurance and Tank Waste, Hanford Site, Volumes I through 5, December, 1987, Richland, Washington.

Hanford Site National Environmental Policy Act (NEPA) Characterization, PNL-6415, Rev. 3, UC-600, Pacific Northwest Laboratory, 1990, Richland, Washington.

9. Do you know whether applications are pending for government approvals of other proposals directly affecting property covered by your proposal?

The Hanford Facility Dangerous Waste Permit, under which the 325/3100 HWTU permit will be issued, is pending consideration of the permit application submitted by DOE-RL/WHC/PNL. No other applications are pending. However, this site lies within operable units 300-FF-3 and 300-FF-5, as designated in the Tri-Party Agreement, but this unit will not affect scheduled remediation. These operable units are scheduled to be remediated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) using the Remediation Investigation/ Feasibility Study (RI/FS) process.

10. List any government approvals or permits that will be needed for your project, if known.

Ecology is the lead agency authorized to approve or permit the unit under requirements authorized by the Resource Conservation and Recovery Act (RCRA), and Chapter 173-303 of the Washington Administration Code.

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The 3100 section must submit a Notice of Construction, in accordance with applicable air regulations.

11. Give a brief, complete description of the project, including the uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your project. You do not need to repeat those answers on this page.

The HWTU will be used for the treatment of hazardous wastes and mixed waste. The HWTU is an integral part of the Hanford site's overall waste management system.

The 325 section is a suite of laboratories located within an existing concrete and steel building, the 325 Building, constructed in the 1950s and located in the 300 Area of the Hanford Reservation. The rooms in this building to be used for this unit will be those specified in the Dangerous Waste Permit Application, Form 3, dated June 1992.

The 3100 section will be a single story building with approximately 10,500 square feet of floor space. The building is currently under design and will be located in the 300 Area of Hanford. The foundation structure will be poured-in-place reinforced concrete.

The 325 section will be used for the management of dangerous and mixed waste, and the 3100 section will be used for the management of dangerous waste.

Routine treatments which will be conducted in the 325 section will include stabilization and alkali metal treatments on small quantities of diverse dangerous and mixed waste generated from ongoing research and development activities.

Waste to be handled in the 325 section will include listed waste, waste from nonspecific sources, characteristic waste and state-only waste which are also regulated under the Atomic Energy Act of 1954 (as amended).

Routine treatment which will be conducted in the 3100 section will include ceramic melting/vitrification, grouting/stabilization, precipitation, neutralization, and liquid-liquid extraction. Several other processes that may be used in the future include: carbon adsorption, oxidation, reduction, deactivation, encapsulation, recovery of acids and bases, recovery of metals or inorganics, recovery of organics, controlled reaction with water, and photo catalytic destruction. The 3100 section will not handle MW.

Processes that may be used as appropriate in the 3100 section include electropolishing, electrodissolvers, other electrochemically-enhanced processes for decontaminating metals and oxidizing non-metals; ion-exchange for selective removal of contaminants from waste solutions; waste concentrators, waste dissolution, precipitation/filtration and solvent extraction systems for separation of contaminants from slurries

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and sludge; solids washing for separation of contaminants from sludges, waste retrieval from storage tanks, catalytic destruction methods, induced oxidation and decomposition, microwave treatment, sludge-to-oil conversion technology, biological treatment processes, distillation, alkali metal treatment, plasma arc pyrolysis, in situ heating of soils and sludges for removal of organics, metal melting for volume reduction and immobilization of contaminated metals, induced oxidation of organic chemicals, thermal treatment, in can melting of soil wastes and liquid slurries, and heating to dry and immobilize liquid and solid waste.

12. Give the location of the project. Give sufficient information for a person to understand the precise location of your project, including a street address, if any, and section, township, and range, if known. If the project occurs over a range of area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity map, and topographic map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any permit applications related to this checklist.

    The facility is located in T10N, R25E, Section 11, in the south portion of the 300 Area of Hanford. Maps and detailed plans are included in the Attachment to Chapter 2.0 of the RCRA Part B Permit Application submitted with the checklist. The unit is divided into two distinct parts. The portion in rooms 520, 522, 527, and 528 of the 325 Building will treat MW. The portion in the 3100 Building will treat dangerous waste.

B. ENVIRONMENTAL ELEMENTS

13. Earth

    a. General description of the site: Flat, rolling, hilly, steep slopes, mountainous, other.

       The HWTU is located in the 300 Area. The terrain is flat.

    b. What is the steepest slope on the site (approximate percent slope)?

       The slope is less than two percent.

    c. What general types of soils are found on the site? (for example, clay, sandy gravel, peat, muck)? If you know the classification of agricultural soils, specify them and note any prime farmland.

       Soils consist of alluvial sands and gravel. No farming is permitted on the Hanford site.

    d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe.

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There are no indications or history of unstable soils in the vicinity.

e. Describe the purpose, type, and approximate quantities of any filling or grading proposed. Indicate the source of the fill.

The 325 section is a suite of laboratories within an existing building and no filling or grading will be necessary.

The 3100 section will be approximately 125 feet by 95 feet when completed. The building will be located on a three acre lot in the 300 Area of Hanford. Minimal grading will be necessary as the building will be constructed on a slab above the ground.

f. Could erosion occur as a result of clearing, construction, or use? If so, describe.

Due to the low slope angle, and low rain intensity and duration, minimal erosion is anticipated to occur during construction activities. Use of the facility is not expected to contribute to erosion.

g. Approximately what percentage of the site is covered with impervious surfaces?

The 325 section is a suite of laboratories within the existing 325 Building. The 325 section is equipped with chemical resistant floors and sumps that will contain any accidental release of material.

The 3100 section will be located on approximately three acres within the 300 Area of the Hanford site. The 3100 Building houses the dangerous waste treatment processes and the administrative area for the unit. The building, sidewalks, access road, and parking areas will cover approximately 75 percent of the area.

h. Measures to reduce or control erosion, or other impacts to the earth, if there are any?

No erosion control measures are necessary.

14. Air

a. What types of emissions to the air result from the project (i.e., dust, automobile, odors, industrial wood smoke)? If any, generally describe and give approximate quantities if known.

When operational, the unit receives vehicle traffic of approximately 7-10 vehicles per day. Vehicles received are operated by unit staff, waste generators, or waste transporters.

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All operations will be conducted inside buildings. Several of the process area rooms will use laboratory hoods to control fumes from volatile liquids or to control particulates from hazardous solid wastes. The hoods in the 325 section are equipped with HEPA filters. The hoods in the 3100 section will be equipped with carbon absorbers and 85% American Society of Heating, Refrigeration, and Air Conditioning Engineers air filters. The only exception will be the grout room in the 3100 section. It will be HEPA filtered prior to being discharged.

Process areas and nonprocess areas in the 3100 section will be handled by separate ventilation equipment. The process area of the 325 section is handled by a separate exhaust system. An airborne release could occur as a result of upset conditions. A release inside the HWTU would not exceed immediately dangerous to life and health (IDLH) concentrations outside the immediate area of the spill/release because of the small quantity of material that is available for release (generally between one and five kilograms of process material).

All process exhaust is passed through a charcoal absorber and ducted to exhaust fans. This control measure will prevent the release of volatiles in the event of an upset condition.

b. Are there any off-site sources of emissions or odors that may affect your project? If so, generally describe.

No.

c. Measures to reduce or control emissions or other impacts to the air, if any?

Accumulations of toxic, explosive, or flammable fumes are prevented by frequent air changes throughout the unit. In case of volatilization of a spill/release, building heating, ventilation, and cooling provisions ensure that such an event would have only minor effects on facility personnel. Containers are closed when not in use. Operations are conducted in fume hoods.

15. Water

a. Surface

1) Is there any surface water body in or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into.

Yes. The closest body of surface water is the Columbia River, which is approximately one-third of a mile from the HWTU.

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2) Will the project require any work over, in, or adjacent to (within 200 feet of) the described waters? If yes, please describe and attach available plans.

No.

3) Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of the fill.

None.

4) Will the project require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities if known.

No. Water for the HWTU will be obtained from the existing 300 Area water supply system.

5) Does the project lie within a 100-year floodplain? If so, note location on the site plan.

No.

6) Does the project involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge.

No. Sewage from the HWTU will be routed to the 300 Area sanitary sewer system.

b. Ground

1) Will ground water be withdrawn, or will water be discharged to ground water? Give general description, purpose, and approximate quantities if known.

No.

2) Describe waste materials that will be discharged into the ground from septic waste tanks or other sources, if any (for example: Domestic sewage; industrial, containing the following chemicals; agricultural; etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve.

The HWTU is expected to be operational in 1995. The HWTU will be connected to the process sewer and the sanitary sewer. The HWTU is predicted to discharge less than 10 gallons per minute to the process sewer. A treatment

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facility for the process sewer system is scheduled for operation in 1994. This process sewer treatment facility will eliminate all trench discharge from the process sewer system. The sanitary sewer discharge from the HWTU is predicted to be nominal, serving only 2 restrooms and a lunchroom (nonserviced) sink. The 300 Area sanitary sewer system is scheduled to be connected to the City of Richland (a POTW) in 1994. This connection will eliminate all trench discharge from the 300 Area sanitary sewer system.

c. Water Run-off (including storm water)

1) Describe the source of run-off (including storm water) and methods of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other wastes? If so, describe.

Not Applicable. All operations at the 325 section and the 3100 section will be conducted inside buildings. No wastes will be exposed to stormwater at any time. Run-off from the 300 Area generally is absorbed or evaporated from paved areas.

2) Could waste materials enter ground or surface waters? If so, generally describe.

No. The HWTU is curbed and equipped with sumps to contain any spilled materials or wastes.

Water applied for fire suppression purposes will also be contained in the HWTU. The water will be analyzed and then managed per applicable regulations.

d. Measures to reduce or control surface, ground, and run-off water impacts, if any:

None.

16. Plants

a. Check the types of vegetation found onsite.

___ deciduous tree
___ evergreen tree
_x_ shrubs
_x_ grass
___ pasture
___ crop or gain
___ wet soil plants
___ water plants
___ other types of vegetation

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The only vegetation associated with this unit is used for landscaping.

b. What kinds and amount of vegetation are at the site?

Some irrigated vegetation will be used at the 3100 section for landscaping. The landscaping at the unit is similar to other buildings in the 300 Area.

c. List threatened or endangered species known to be on or near the site.

None. Additional information on the Hanford Site environment can be found in the environmental documents referred to in the answer to checklist A.8.

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any:

The 325 section is located in an existing building; no landscaping will be necessary. Some irrigated landscaping, including shrubs and grass, will be used at the 3100 Building. The landscaping will be similar to other buildings in the 300 Area.

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17. Animals

a. Identify any birds and animals which have been observed on or near the site or are known to be on or near the site:

Birds commonly seen in the 300 Area include sparrows and other small birds as well as sea gulls, crows, and pigeons. Mammals are generally limited to rabbits and squirrels. Fish are found in the Columbia River east of the unit.

b. List any threatened or endangered species known to be on or near the site.

The bald eagle and white pelican are sometimes seen near the Hanford Site but are not known to be in the 300 Area. The 300 Area is not known to be used by any threatened or endangered species.

c. Is the site part of a migration route? If so explain.

Yes. The Hanford Site is part of a migration route for some birds. The region bounding the Columbia River (adjacent the Hanford Site) is used as a resting place for Pacific flyway waterfowl and shore birds during the autumn and spring migrations.

d. Measures to preserve or enhance wildlife, if any:

None.

18. Energy and Natural Resources

a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc.

Energy to be used will consist of electrical power for the HWTU buildings and treatment systems.

b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe.

No.

c. What kinds of energy conservation features are included in the plans of this project? List other measures to reduce or control energy impacts, if any:

The 3100 Building will be insulated. The 3100 Building once-through HVAC system will be equipped with heat recovery. Tempered air will be recirculated in the Administrative Area of the 3100 Building.

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19. Environmental Health

a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste, that could occur as a result of this project? If so, describe.

Operation under Part B permit standards as shown in the application document is expected to reduce the risk of environmental health hazards.

1) Describe special emergency services that might be required.

Hanford security, fire response, and ambulance services are on call at all times in the event of an onsite emergency. A spill response team is also available on site. Mutual aid agreements and Memoranda of Understanding are in place between DOE-RL and many community agencies to provide backup services.

2) Proposed measures to reduce or control environmental health hazards, if any:

The Emergency Preparedness Program at PNL is conducted by the Emergency Preparedness office. Also, the 325 Building and the 3100 Building have a pre-fire plan. The applicable portions are included in the Part B Application.

b. Noise

1) What type of noise exists in the area which may affect your project (for example): traffic, equipment, operation, etc.)?

None.

2) What types and levels of noise would be created by or associated with the project on a short-term basis (for example: traffic, construction, operation, etc.)? Indicate what hours noise would come from the site.

Short-term noise will be produced during construction of the 3100 section. This noise will be created by vehicles and construction activities. The noise will be of short duration because of the simple slab-on-grade design of the 3100 section. It will be produced during the hours from 6 a.m. to 6 p.m.

During operations all noise levels are kept below 85 dB. The primary sources of noise are the unit ventilation system, the laboratory equipment used in processing the waste, and the vehicles used to gain access to the site.

3) Measures to reduce or control noise impacts, if any:

None.

20. Land and Shoreline Use

a. What is the current use of the site and adjacent properties?

The 325 Building is currently used for research and chemical analysis. The site of the 3100 section is currently undeveloped.

b. Has the site been used for agriculture? If so, describe.

No portion of the Hanford Site has been used for production of food crops since the U.S. Government acquired it in 1943.

c. Describe any structures on the site.

The 325 section is part of the 325 building. The 325 building is a steel and reinforced concrete structure 272′ X 285′ X 40′. The 325 building is in the 300 Area.

There are no existing structures in the three acre area of the 3100 section.

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d. Will any structures be demolished? If so, what?

No.

e. What is the current zoning classification of the site?

The Hanford Site, including the 300 Area, is zoned by Benton County as an Unclassified Use (U) district.

f. What is the current comprehensive plan designation of the site?

The 1985 Benton County Comprehensive Land Use Plan designated the Hanford Site as the "Hanford Reservation." Under this designation, land on the Site may be used for "activities nuclear in nature." Non-nuclear activities are authorized with DOE approval.

g. If applicable, what is the current master shoreline program designation of the site?

Not Applicable. The HWTU is not located within "shorelines of the state" or "wetlands" as defined in the Shoreline Management Act of 1971 (Revised Code of Washington [RCW] 90.58.030[2]).

h. Has any part of the site been classified as an "environmentally sensitive" area? If so, specify.

No.

i. Approximately how many people would reside or work in the completed project?

Approximately eight people will work in the completed project; others will assist as required. No one will reside in the project.

j. Approximately how many people would the completed project displace?

None.

k. Measures to avoid or reduce displacement impacts, if any:

None.

l. Measures to ensure the project is compatible with existing and projected land uses and plans, if any:

The project has been reviewed and approved by DOE-RL, owner and operator of the unit and the site. The project is fully compatible with other 300 Area operations, which have been active since 1943.

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21. Housing

a. Approximately how many units would be provided, if any? Indicate whether high-, middle-, or low-income housing.

None.

b. Approximately how many units, if any, would be eliminated? Indicate whether high-, middle-, or low-income housing.

None.

c. Measures to reduce or control housing impacts, if any:

Not Applicable.

22. Aesthetics

a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed?

The 325 section is located in an existing building. The existing structure will not be altered in any way. The 3100 section will be a single story structure with two roof heights. The nominal eave height of the administrative area will be 10 feet. The nominal eave height of the process areas will be 20 feet. Exterior walls will be a concrete veneer/metal channel panel supported by structural concrete walls, beams, and columns. The roof will be concrete planks and modified bitumen.

b. What views in the immediate vicinity would be altered or obstructed?

None.

c. Measures to reduce or control aesthetic impacts, if any:

Not Applicable.

23. Light and Glare

a. What type of light or glare does the project produce? What time of day does it mainly occur?

There will be lighting in the parking lot of the 3100 section.

b. Could light or glare from the finished project be a safety hazard or interfere with views?

No.

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c. What existing off-site sources of light or glare may affect your project?

None.

d. Measures to reduce or control light and glare impacts, if any:

Lighting will be directional to minimize glare.

24. Recreation

a. What designated and informal recreational opportunities are in the immediate vicinity?

None in the 300 Area; fishing and boating are conducted on the Columbia River.

b. Would the project displace any existing recreational uses? If so, describe.

No.

c. Measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any?

None.

25. Historic and Cultural Preservation

a. Are there any places or objects listed on, or proposed for, national, state, or local preservation registers known to be on or next to the site? If so, generally describe.

No places or objects listed on, or proposed for, national, state, or local preservation registers are known to be on or next to the 325 Building or in the area of the 3100 section.

b. Generally describe any landmarks or evidence of historic, archaeological, scientific, or cultural importance known to be on or next to the site.

There are no known archaeological, historical, or Native American religious sites in the 300 Area.

c. Measures to reduce or control impacts, if any:

None.

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26. Transportation

a. Identify public streets and highways serving the site, and describe proposed access to the existing street system. Show on site plans, if any.

The 300 Area, in general, is accessed from Stevens Drive or George Washington Way, which are maintained by the Federal Government but are publicly accessible. The nearest public transit stop is at the entrance to the 300 Area.

b. Is site currently served by public transit? If not, what is the approximate distance to the nearest transit stop?

The site is not publicly accessible and therefore is not served by public transit. The distance to the nearest public transit stop is approximately one mile.

c. How many parking spaces does the project have?

The 325 section has no parking spaces. The 3100 section will have 10 parking spaces.

d. Will the project require any new roads or streets, or improvements to existing roads or streets, not including driveways? If so, generally describe (indicate whether public or private).

No.

e. Will the project use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe.

No.

f. How many vehicular trips per day are generated by the completed project? If known, indicate when peak volumes occur.

An estimated 7 to 10 vehicles per day will be generated by staff or waste transport by the unit.

g. Measures to reduce or control transportation impacts, if any.

None.

27. Public Services

a. Would the project result in an increased need for public services (for example: fire protection, police protection, health care, schools, other)? If so, generally describe.

No. Existing services are adequate.

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b. Measures to reduce or control direct impacts on public services, if any:

None.

28. <u>Utilities</u>

a. List utilities currently available at the site: electricity, natural gas, water, refuse service, telephone, sanitary sewer, septic system, other:

Electricity, phone, sewer, water, and refuse collection are available at the HWTU.

b. Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity which might be needed.

All utilities for the 3100 section will be available at the unit boundary. These include water, sewer, electricity and telephone.

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SIGNATURES

The above answers are true and complete to the best of my knowledge. We understand that the lead agency is relying on them to make its decision.

James D Bauer for

R.D. Izatt, Program Manager
Office of Enviromental Assurance,
Permits and Policy
U.S. Department of Energy
Richland Field Office

6/24/92
Date

Jack McElroy, Manager
Waste Technology Center
Pacific Northwest Laboratory

6/5/92
Date

9313025.0088

325/3100 HAZARDOUS WASTE TREATMENT UNIT DANGEROUS WASTE PERMIT APPLICATION

FOREWORD

The Hanford Site is owned by the U.S. Government and operated by the U.S. Department of Energy, Richland Field Office (DOE-RL). The Hanford Site manages and produces dangerous waste and mixed waste (waste containing both radioactive and dangerous components). The dangerous waste is regulated in accordance with the Resource Conservation and Recovery Act of 1976 and the State of Washington Hazardous Waste Management Act of 1976 (as administrated through the Washington State Department of Ecology Dangerous Waste Regulations, Washington Administrative Code 173-303). The radioactive component of mixed waste is interpreted by the U.S. Department of Energy to be regulated under the Atomic Energy Act of 1954; the nonradioactive dangerous component of mixed waste is interpreted to be regulated under the Resource Conservation and Recovery Act of 1976 and Washington Administrative Code 173-303.

For purposes of the Resource Conservation and Recovery Act and Washington State Department of Ecology Dangerous Waste Regulations, the Hanford Site is considered to be a single facility. The single dangerous waste permit identification number issued to the Hanford Site by the U.S. Environmental Protection Agency and the Washington State Department of Ecology is U.S. Environmental Protection Agency/State Identification Number WA7890008967. This identification number encompasses over 60 treatment, storage, and/or disposal units within the Hanford Site, hereinafter referred to as the Hanford Facility when cited in the context of the Resource Conservation and Recovery Act and the Washington State Deparment of Ecology Dangerous Waste Regulations. All waste management activities carried out under the assigned identification number are considered to be "onsite."

Pursuant to the Hanford Federal Facility Agreement and Consent Order (Ecology et al. 1990), a single Resource Conservation and Recovery Act/Washington State Dangerous Waste Permit will be issued to cover the entire Hanford Facility. The consent order specifies that the U.S. Environmental Protection Agency and the Washington State Department of Ecology initially will issue the permit for less than the entire Hanford Facility because all of the treatment, storage, and/or disposal units cannot be permitted simultaneously.

At the time of submission of this portion of the Hanford Facility Dangerous Waste Permit Application covering the Hazardous Waste Treatment Facility, many issues identified in comments to the draft Hanford Facility Dangerous Waste Permit remain unresolved. This permit application reflects the positions taken by the U. S. Department of Energy, DOE Richland Field Office and Pacific Northwest Laboratories (PNL) on the draft Hanford Facility Dangerous Waste Permit and may not be read to conflict with those comments.

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The Hazardous Waste Treatment Unit (HWTU) will treat hazardous and mixed waste. It will be composed of two sections, the 325 section, that will treat mixed waste, and the 3100 section, that will treat hazardous waste only. The 325 section is contained in the 325 building, a preexisting building. The 3100 section will be new construction.

The Hazardous Waste Treatment Unit Permit Application consists of both a Part A and a Part B permit application. The Part A application for the HWTU was originally submitted on May 19, 1988, and revised on June 29, 1992, to incorporated TCLP waste codes and make other changes.

The Part B application consists of 15 chapters addressing the organization and content of the Part B Checklist prepared by Ecology (Ecology 1987). For ease of reference, the checklist section numbers, in brackets, follow chapter headings and subheadings.

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DOCUMENT CONTENT

FOREWARD

ACRONYMS AND ABBREVIATIONS

PART A APPLICATION

PART B APPLICATION

1.0 Introduction

2.0 Facility Description and General Provisions

3.0 Waste Characteristics

4.0 Process Information

5.0 Groundwater Monitoring

6.0 Procedures to Prevent Hazards

7.0 Contingency Plan

8.0 Personnel Training

9.0 Exposure Information Reports

10.0 Waste Minimization Plan

11.0 Closure/Post-Closure Requirements

12.0 Reporting and Recordkeeping

13.0 Other Relevant Laws

14.0 Certification

15.0 References

Appendices

2A Hanford Site and 300 Area Topograhic Map

2B Plan Drawings for 325 HWTU

2C Floor Plan of 3100 HWTU

4A Grouting/Stabilization Procedure

4B Design of the Ceramic Melter System

7A 325 BEP

7B 3100 BEP

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ACRONYMS & INITIALISMS

AA	Atomic Absorption
AED	Area Emergency Director
AIRS	Additional Information Request Sheet
ALE	Arid Lands Ecology
AMSL	Above Mean Sea Level
ANSI	American National Standards Institute
ASTM	American Society for Testing Materials
BED	Building Emergency Director
CFR	Code of Federal Regulations
COE	U.S. Army Corps of Engineers
COLIWASA	Containerized Liquid Waste Sampler
DOE	U.S. Department of Energy
DOE-RL	Department of Energy, Richland Field Office
DOS	Date of Shipment
DOT	U.S. Department of Transportation
EACT	Emergency Action Coordinating Team
EC	Environmental Compliance
ECC	Emergency Control Center
EHW	Extremely Hazardous Waste
EMC	Emergency Management Center
EPA	U.S. Environmental Protection Agency
FEMA	Federal Emergency Management Agency
FM	Factory Mutual
FM ST	Flammable Storage
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectroscopy
HEHF	Hanford Environmental Health Foundation
HEPA	High Efficiency Particulate Air (Filter)
HVAC	Heating, Ventilation, and Air Conditioning
HWTU	325/3100 Hazardous Waste Treatment Unit
ICP	Inductively Coupled Plasma (Spectroscopy)
IDLH	Immediately Dangerous to Life or Health
LDR	Land Disposal Restrictions
M&CSC	Materials and Chemical Sciences Center
MMI	Modified Mercall Intensity
MOU	Memorandum of Understanding
MSDS	Material Safety Data Sheet
NCRP	National Council on Radiation Protection and Measurements
NFPA	National Fire Protection Association

ACRONYMS & INITIALISMS (Cont'd)

ORM	Other Regulated Material
OSHA	Occupational Safety and Health Administration
OVA	Organic Vapor Analyzer
PCB	Polychlorinated Biphenyl
PNL	Pacific Northwest Laboratory
PPE	Personal Protective Equipment
PWC	Prohibited Waste Certification Form
RCW	Revised Code of Washington
RCRA	Resource Conservation and Recovery Act
RM	Richter Magnitude
RMW	Radioactive Mixed Waste
RSC	Representative Sample Certification Form
SCBA	Self-Contained Breathing Apparatus
TOC	Total Organic Carbon
TSCA	Toxic Substances Control Act
TSD	Treatment, Storage, or Disposal
TSS	Total Suspended Solids
UL	Underwriter Laboratory, Incorporated
USGS	United States Geological Survey
WAC	Washington Administrative Code
WHC	Westinghouse Hanford Company
WM	Waste Management Section, Laboratory Safety Department
WPPSS	Washington Public Power Supply System
WTC	Waste Technology Center
WTI	Waste Treatment Information (Form)
WVF	Waste Verification Form

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ABBREVIATIONS

°C	degrees Celsius
Ecology	Washington Department of Ecology
°F	degrees Fahrenheit
fpm	feet per minute
ft	feet
g	gram
gal	gallon
in.	inch
kg	kilogram
L	liter
lb	pound
lbs	pounds
yr	year

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PART A

The Part A permit application Forms 1 and 3 is included herein.

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IX. MAP

Attach to this application a topographic map of the area extending to at least one mile beyond property boundaries. The map must show th outline of the facility, the location of each of its existing and proposed intake and discharge structures, each of its hazardous waste treatmen storage, or disposal facilities, and each well where it injects fluids undergound. Include all springs, rivers and other surface water bodies in th map area. See instructions for precise requirements.

X. NATURE OF BUSINESS *(provide a brief description)*

- NATIONAL DEFENSE NUCLEAR MATERIAL PRODUCTION
- ENERGY RESEARCH AND TECHNOLOGY DEVELOPMENT
- DEFENSE NUCLEAR WASTE MANAGEMENT
- BYPRODUCT STEAM, SOLD FOR ELECTRIC POWER GENERATION
- AND SIC 15: BUILDING - GENERAL CONTRACTORS AND OPERATIVE BUILDERS

XI. CERTIFICATION *(see instructions)*

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attachments and that, based on my inquiry of those persons immediately responsible for obtaining the information contained in the application, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

A. NAME & OFFICIAL TITLE (type or print)	B. SIGNATURE	C. DATE SIGNED
SEE ATTACHMENT		

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WA7890008967

Form 1

DANGEROUS WASTE PERMIT GENERAL INFORMATION

XI. CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Michael J. Lawrence, Manager
Department of Energy
Richland Operations Office

5-19-88
Date

William R. Wiley, Director
Pacific Northwest Laboratory

5/19/88
Date

9813025.0100

FORM 1

State of Washington Department of Ecology

WASHINGTON STATE

DANGEROUS WASTE PERMIT GENERAL INFORMATION

(Read "Form 1 Instructions" before starting)

I. EPA/STATE ID. NUMBER: WA7890008967

II. NAME OF FACILITY: US DEPARTMENT OF ENERGY-HANFORD SITE

III. FACILITY CONTACT

A. NAME & TITLE (last, first, & title): LAWRENCE, MICHAEL J., MANAGER

B. PHONE (area code & no.): 509 376 7395

IV. FACILITY MAILING ADDRESS

A. STREET OR P.O. BOX: P.O. BOX 550

B. CITY OR TOWN: RICHLAND

C. STATE: WA

D. ZIP CODE: 99352

V. FACILITY LOCATION

A. STREET, ROUTE NO. OR OTHER SPECIFIC IDENTIFIER: HANFORD SITE

B. COUNTY NAME: BENTON

C. CITY OR TOWN: RICHLAND

D. STATE: WA

E. ZIP CODE: 99352

F. COUNTY CODE (if known): 005

VI. SIC CODES (4-digit, in order of priority)

A. FIRST: 9711 (specify) NATIONAL SECURITY

B. SECOND: 8922 (specify) NUCLEAR NONCOMMERCIAL DEVELOPMENT AND EDUCATION

C. THIRD: 9611 (specify) ADMINISTRATION AND GENERAL ECONOMICS PROGRAM

D. FOURTH: 4911 (specify) STEAM-ELECTRIC GENERATION

VII. OPERATOR INFORMATION

A. NAME: DEPARTMENT OF ENERGY-RICHLAND OPERATIONS (DOE-RL)
PACIFIC NORTHWEST LABORATORY

B. Is the name listed in Item VI-A also the owner? [X] YES ** [ ] NO

C. STATUS OF OPERATOR (Enter the appropriate letter into the answer box; if "Other", specify.)
F = FEDERAL; S = STATE; P = PRIVATE; M = PUBLIC (other than federal or state); O = OTHER (specify)
F (specify)

D. PHONE (area code & no.): 509 376 7395

E. STREET OR P.O. BOX: P.O. BOX 550/P.O. BOX 999

509 375 2201

F. CITY OR TOWN: RICHLAND

G. STATE: WA

H. ZIP CODE: 99352

VIII. INDIAN LAND: Is the facility located on Indian lands? [ ] YES [X] NO

**DOE-RL: Owner/Co-Operator; PNL: Co-Operator for certain units on the Hanford Site.

COMPLETE BACK PAGE

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Please print or type in the unshaded areas only
(Where shaded areas are spaced for dual type, i.e., 12 characters/inch)

FORM

DANGEROUS WASTE PERMIT APPLICATION

I. EPA/STATE I.D. NUMBER: W A 7 8 9 0 0 0 8 9 5 7

FOR OFFICIAL USE ONLY

APPLICATION APPROVED	DATE RECEIVED	COMMENTS

II. FIRST OR REVISED APPLICATION

Place an "X" in the appropriate box in A or B below (mark one box only) to indicate whether this is the first application you are submitting for your facility or a revised application. If this is your first application and you already know your facility's EPA/STATE I.D. Number, or if this is a revised application, enter your facility's EPA/STATE I.D. Number in Section I above.

A. FIRST APPLICATION (place an "X" below and provide the appropriate date)

☐ 1. EXISTING FACILITY (See instructions for definition of "existing" facility. Complete item below.)

FOR EXISTING FACILITIES, PROVIDE THE DATE (mo., day, & yr.) OPERATION BEGAN OR THE DATE CONSTRUCTION COMMENCED (use the boxes to the left)

☐ 2. NEW FACILITY (Complete item below.)

FOR NEW FACILITIES, PROVIDE THE DATE (mo., day, & yr.) OPERATION BEGAN OR IS EXPECTED TO BEGIN

B. REVISED APPLICATION (place an "X" below and complete Section I above)

☒ 1. FACILITY HAS AN INTERIM STATUS PERMIT

☐ 2. FACILITY HAS A FINAL PERMIT

III. PROCESSES — CODES AND DESIGN CAPACITIES

A. PROCESS CODE — Enter the code from the list of process codes below that best describes each process to be used at the facility. Ten lines are provided for entering codes. If more lines are needed, enter the code(s) in the space provided. If a process will be used that is not included in the list of codes below, then describe the process (including its design capacity) in the space provided on the (Section III-C).

B. PROCESS DESIGN CAPACITY — For each code entered in column A enter the capacity of the process.
1. AMOUNT — Enter the amount.
2. UNIT OF MEASURE — For each amount entered in column B(1), enter the code from the list of unit measure codes below that describes the unit of measure used. Only the units of measure that are listed below should be used.

PROCESS	PROCESS CODE	APPROPRIATE UNITS OF MEASURE FOR PROCESS DESIGN CAPACITY
Storage:		
CONTAINER (barrel, drum, etc.)	S01	GALLONS OR LITERS
TANK	S02	GALLONS OR LITERS
WASTE PILE	S03	CUBIC YARDS OR CUBIC METERS
SURFACE IMPOUNDMENT	S04	GALLONS OR LITERS
Disposal:		
INJECTION WELL	D80	GALLONS OR LITERS
LANDFILL	D81	ACRE-FEET (the volume that would cover one acre to a depth of one foot) OR HECTARE-METER
LAND APPLICATION	D82	ACRES OR HECTARES
OCEAN DISPOSAL	D83	GALLONS PER DAY OR LITERS PER DAY
SURFACE IMPOUNDMENT	D84	GALLONS OR LITERS

PROCESS	PROCESS CODE	APPROPRIATE UNITS OF MEASURE FOR PROCESS DESIGN CAPACITY
Treatment:		
TANK	T01	GALLONS PER DAY OR LITERS PER DAY
SURFACE IMPOUNDMENT	T02	GALLONS PER DAY OR LITERS PER DAY
INCINERATOR	T03	TONS PER HOUR OR METRIC TONS PER HOUR; GALLONS PER HOUR OR LITERS PER HOUR
OTHER (Use for physical, chemical, thermal or biological treatment processes not occurring in tanks, surface impoundments or incinerators. Describe the processes in the space provided; Section III-C.)	T04	GALLONS PER DAY OR LITERS PER DAY

UNIT OF MEASURE	UNIT OF MEASURE CODE
GALLONS	G
LITERS	L
CUBIC YARDS	Y
CUBIC METERS	C
GALLONS PER DAY	U
LITERS PER DAY	V
TONS PER HOUR	O
METRIC TONS PER HOUR	W
GALLONS PER HOUR	E
LITERS PER HOUR	H
ACRE-FEET	A
HECTARE-METER	F
ACRES	B
HECTARES	Q

EXAMPLE FOR COMPLETING SECTION III (shown in line numbers X-1 and X-2 below): A facility has two storage tanks, one tank can hold 200 gallons and the other can hold 400 gallons. The facility also has an incinerator that can burn up to 20 gallons per hour.

LINE NUMBER	A. PROCESS CODE (from list above)	B. PROCESS DESIGN CAPACITY 1. AMOUNT (specify)	B. PROCESS DESIGN CAPACITY 2. UNIT OF MEASURE (enter code)	FOR OFFICIAL USE ONLY	LINE NUMBER	A. PROCESS CODE (from list above)	B. PROCESS DESIGN CAPACITY 1. AMOUNT (specify)	B. PROCESS DESIGN CAPACITY 2. UNIT OF MEASURE (enter code)	FOR OFFICIAL USE ONLY
X-1	S02	600	G		5				
X-2	T03	20	E		6				
	T04	(annual average) 28	U		7				
2	S01	1000	G		8				
3					9				
4					10				

CONTINUE ON REVERSE

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III. PROCESSES (continued)

C. SPACE FOR ADDITIONAL PROCESS CODES OR FOR DESCRIBING OTHER PROCESS (code "T04"). FOR EACH PROCESS ENTERED HERE INCLUDE DESIGN CAPACITY.

The 325 Hazardous Waste Treatment Unit (325 HWTU) is located in rooms 520 and 528 of the 325 Building. Approximately 55 gallons of radioactive mixed waste can be treated per day in the 325 HWTU using grout and alkali metal treatments.

The 3100 Hazardous Waste Treatment Unit (3100 HWTU) will be a single story building with an area of approximately 10,500 square feet. Approximately 10,000 gallons of dangerous waste will be treated annually in this unit. Treatment will include carbon absorption, oxidation reduction, deactivation, vitrification, liquid-liquid extraction, encapsulation, neutralization, precipitation, recovery of acids and bases, recovery of organics, stabilization, controlled reaction with water, photo catalytic destruction, and ceramic melting.

Storage capacity in the 325 HWTU is 1,000 gallons and in the 3100 HWTU will be 5,000 gallons.

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IV. DESCRIPTION OF DANGEROUS WASTES

A. DANGEROUS WASTE NUMBER — Enter the four digit number from Chapter 173-303 WAC for each listed dangerous waste you will handle. If you handle dangerous wastes which are not listed in Chapter 173-303 WAC, enter the four digit number(s) that describes the characteristics and/or the toxic contaminants of those dangerous wastes.

B. ESTIMATED ANNUAL QUANTITY — For each listed waste entered in column A estimate the quantity of that waste that will be handled on an annual basis. For each characteristic or toxic contaminant entered in column A estimate the total annual quantity of all the non—listed waste(s) that will be handled which possess that characteristic or contaminant.

C. UNIT OF MEASURE — For each quantity entered in column B enter the unit of measure code. Units of measure which must be used and the appropriate codes are:

ENGLISH UNIT OF MEASURE	CODE	METRIC UNIT OF MEASURE	CODE
POUNDS	P	KILOGRAMS	K
TONS	T	METRIC TONS	M

If facility records use any other unit of measure for quantity, the units of measure must be converted into one of the required units of measure taking into account the appropriate density or specific gravity of the waste.

D. PROCESSES

1. PROCESS CODES:

For listed dangerous waste: For each listed dangerous waste entered in column A select the code(s) from the list of process codes contained in Section III to indicate how the waste will be stored, treated, and/or disposed of at the facility.

For non—listed dangerous wastes: For each characteristic or toxic contaminant entered in Column A, select the code(s) from the list of process codes contained in Section III to indicate all the processes that will be used to store, treat, and/or dispose of all the non—listed dangerous wastes that possess that characteristic or toxic contaminant.

Note: Four spaces are provided for entering process codes. If more are needed: (1) Enter the first three as described above; (2) Enter "000" in the extreme right box of Item IV-D(1); and (3) Enter in the space provided on page 4, the line number and the additional code(s).

2. PROCESS DESCRIPTION: If a code is not listed for a process that will be used, describe the process in the space provided on the form.

NOTE: DANGEROUS WASTES DESCRIBED BY MORE THAN ONE DANGEROUS WASTE NUMBER — Dangerous wastes that can be described by more than one Waste Number shall be described on the form as follows:

1. Select one of the Dangerous Waste Numbers and enter it in column A. On the same line complete columns B, C, and D by estimating the total annual quantity of the waste and describing all the processes to be used to treat, store, and/or dispose of the waste.
2. In column A of the next line enter the other Dangerous Waste Number that can be used to describe the waste. In column D(2) on that line enter "Included with above" and make no other entries on that line.
3. Repeat step 2 for each other Dangerous Waste Number that can be used to describe the dangerous waste.

EXAMPLE FOR COMPLETING SECTION IV *(shown in line numbers X-1, X-2, X-3, and X-4 below)* — A facility will treat and dispose of an estimated 900 pounds per year of chrome shavings from leather tanning and limshing operation. In addition, the facility will treat and dispose of three non—listed wastes. Two wastes are corrosive only and there will be an estimated 200 pounds per year of each waste. The other waste is corrosive and ignitable and there will be an estimated 100 pounds per year of that waste. Treatment will be in an incinerator and disposal will be in a landfill.

LINE NO.	A. DANGEROUS WASTE NO. (enter code)	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE (enter code)	D. PROCESSES 1. PROCESS CODES (enter)	D. PROCESSES 2. PROCESS DESCRIPTION (if a code is not entered in D(1))
X-1	K 0 5 4	900	P	T 0 3 D 8 0	
X-2	D 0 0 2	400	P	T 0 3 D 8 0	
X-3	D 0 0 1	100	P	T 0 3 D 8 0	
X-4	D 0 0 2			T 0 3 D 8 0	included with above

 CONTINUE ON PAGE 3

Continued from page 2

NOTE. Photocopy this page before completing if you have more than 26 wastes to list

I.D. NUMBER (enter from page 1)

WA789000897

IV. DESCRIPTION OF DANGEROUS WASTES (continued)

LINE NO.	A. DANGEROUS WASTE NO. (enter code)	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE (enter code)	D. PROCESSES 1. PROCESS CODES (enter)				D. PROCESSES 2. PROCESS DESCRIPTION (If a code is not entered in D(1))
1	D001	10,000	K	S01	T04			Treatment
2	D002	5,000	K	S01	T04			Treatment
3	D003	500	K	S01	T04			Treatment
4	D004	200	K	S01	T04			Treatment
5	D005	200	K	S01	T04			Treatment
6	D006	200	K	S01	T04			Treatment
7	D007	10,000	K	S01	T04			Treatment
8	D008	50,000	K	S01	T04			Treatment
9	D009	400	K	S01	T04			Treatment
10	D010	50	K	S01	T04			Treatment
11	D011	200	K	S01	T04			Treatment
12	D018	200	K	S01	T04			Treatment
13	D019	200	K	S01	T04			Treatment
14	D020	200	K	S01	T04			Treatment
15	D021	200	K	S01	T04			Treatment
16	D022	200	K	S01	T04			Treatment
17	D023	200	K	S01	T04			Treatment
18	D024	200	K	S01	T04			Treatment
19	D025	200	K	S01	T04			Treatment
20	D026	2,000	K	S01	T04			Treatment
21	D027	200	K	S01	T04			Treatment
22	D028	200	K	S01	T04			Treatment
23	D029	200	K	S01	T04			Treatment
24	D030	200	K	S01	T04			Treatment
25	D031	200	K	S01	T04			Treatment
26	D032	200	K	S01	T04			Treatment

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NOTE. Photocopy this page before completing if you have more than 26 wastes to list

I.D. NUMBER (enter from page 1): A789000896 7

IV. DESCRIPTION OF DANGEROUS WASTES (continued)

LINE NO.	A. DANGEROUS WASTE NO. (enter code)	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE (enter code)	D. PROCESSES 1. PROCESS CODES (enter)				D. PROCESSES 2. PROCESS DESCRIPTION (If a code is not entered in D(1))
1	D033	200	K	S01	T04			Treatment
2	D034	200	K	S01	T04			Treatment
3	D035	200	K	S01	T04			Treatment
4	D036	200	K	S01	T04			Treatment
5	D037	200	K	S01	T04			Treatment
6	D038	200	K	S01	T04			Treatment
7	D039	200	K	S01	T04			Treatment
8	D040	200	K	S01	T04			Treatment
9	D041	200	K	S01	T04			Treatment
10	D042	200	K	S01	T04			Treatment
11	D043	200	K	S01	T04			Treatment
12	WT01	20,000	K	S01	T04			Treatment
13	WT02	10,000	K	S01	T04			Treatment
14	WP01	5,000	K	S01	T04			Treatment
15	WP02	1,000	K	S01	T04			Treatment
16	WP03	1,000	K	S01	T04			Treatment
17	WC01	1,000	K	S01	T04			Treatment
18	WC02	1,000	K	S01	T04			Treatment
19	F001	2,000	K	S01	T04			Treatment
20	F002	2,000	K	S01	T04			Treatment
21	F003	3,000	K	S01	T04			Treatment
22	F004	1,000	K	S01	T04			Treatment
23	F005	2,000	K	S01	T04			Treatment
24	F027	200	K	S01	T04			Treatment
25	U001	200	K	S01	T04			Treatment
26	U002	200	K	S01	T04			Treatment

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Continued from page 2

NOTE: Photocopy this page before completing if you have more than 26 wastes to list

I.D. NUMBER (enter from page 1)

A 7 8 9 0 0 0 8 9 6 7

IV. DESCRIPTION OF DANGEROUS WASTES (continued)

LINE NO.	A. DANGEROUS WASTE NO. (enter code)	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE (enter code)	D. PROCESSES 1. PROCESS CODES (enter)				2. PROCESS DESCRIPTION (If a code is not entered in D(1))
1	U003	200	K	S01	T04			Treatment
2	U004	200	K	S01	T04			Treatment
3	U005	200	K	S01	T04			Treatment
4	U006	200	K	S01	T04			Treatment
5	U007	200	K	S01	T04			Treatment
6	U008	200	K	S01	T04			Treatment
7	U009	200	K	S01	T04			Treatment
8	U010	200	K	S01	T04			Treatment
9	U011	200	K	S01	T04			Treatment
10	U012	200	K	S01	T04			Treatment
11	U014	200	K	S01	T04			Treatment
12	U015	200	K	S01	T04			Treatment
13	U016	200	K	S01	T04			Treatment
14	U017	200	K	S01	T04			Treatment
15	U018	200	K	S01	T04			Treatment
16	U019	200	K	S01	T04			Treatment
17	U020	200	K	S01	T04			Treatment
18	U021	200	K	S01	T04			Treatment
19	U022	200	K	S01	T04			Treatment
20	U023	200	K	S01	T04			Treatment
21	U024	200	K	S01	T04			Treatment
22	U025	200	K	S01	T04			Treatment
23	U026	200	K	S01	T04			Treatment
24	U027	200	K	S01	T04			Treatment
25	U028	200	K	S01	T04			Treatment
26	U029	200	K	S01	T04			Treatment

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NOTE: Photocopy this page before completing if you have more than 26 wastes to list

I.D. NUMBER (enter from page 1)

A 7 8 9 0 0 0 8 9 6 7

IV. DESCRIPTION OF DANGEROUS WASTES (continued)

LINE	A. DANGEROUS WASTE NO. (enter code)	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE (enter code)	D. PROCESSES 1. PROCESS CODES (enter)				2. PROCESS DESCRIPTION (If a code is not entered in D(1))
1	U 0 3 0	200	K	S 0 1	T 0 4			Treatment
2	U 0 3 1	200	K	S 0 1	T 0 4			Treatment
3	U 0 3 2	200	K	S 0 1	T 0 4			Treatment
4	U 0 3 3	200	K	S 0 1	T 0 4			Treatment
5	U 0 3 4	200	K	S 0 1	T 0 4			Treatment
6	U 0 3 5	200	K	S 0 1	T 0 4			Treatment
7	U 0 3 6	200	K	S 0 1	T 0 4			Treatment
8	U 0 3 7	200	K	S 0 1	T 0 4			Treatment
9	U 0 3 8	200	K	S 0 1	T 0 4			Treatment
10	U 0 3 9	200	K	S 0 1	T 0 4			Treatment
11	U 0 4 1	200	K	S 0 1	T 0 4			Treatment
12	U 0 4 2	200	K	S 0 1	T 0 4			Treatment
13	U 0 4 3	200	K	S 0 1	T 0 4			Treatment
14	U 0 4 4	200	K	S 0 1	T 0 4			Treatment
15	U 0 4 5	200	K	S 0 1	T 0 4			Treatment
16	U 0 4 6	200	K	S 0 1	T 0 4			Treatment
17	U 0 4 7	200	K	S 0 1	T 0 4			Treatment
18	U 0 4 8	200	K	S 0 1	T 0 4			Treatment
19	U 0 4 9	200	K	S 0 1	T 0 4			Treatment
20	U 0 5 0	200	K	S 0 1	T 0 4			Treatment
21	U 0 5 1	200	K	S 0 1	T 0 4			Treatment
22	U 0 5 2	200	K	S 0 1	T 0 4			Treatment
23	U 0 5 3	200	K	S 0 1	T 0 4			Treatment
24	U 0 5 5	200	K	S 0 1	T 0 4			Treatment
25	U 0 5 6	200	K	S 0 1	T 0 4			Treatment
26	U 0 5 7	200	K	S 0 1	T 0 4			Treatment

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Continued from page 2

NOTE. Photocopy this page before completing if you have more than 26 wastes to list

ID NUMBER (enter from page 1)

A789000896 7

IV. DESCRIPTION OF DANGEROUS WASTES (continued)

LINE NO.	A. DANGEROUS WASTE NO. (enter code)	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE (enter code)	D. PROCESSES 1. PROCESS CODES (enter)				D. PROCESSES 2. PROCESS DESCRIPTION (If a code is not entered in D(1))
1	U058	200	K	S01	T04			Treatment
2	U059	200	K	S01	T04			Treatment
3	U060	200	K	S01	T04			Treatment
4	U061	200	K	S01	T04			Treatment
5	U062	200	K	S01	T04			Treatment
6	U063	200	K	S01	T04			Treatment
7	U064	200	K	S01	T04			Treatment
8	U066	200	K	S01	T04			Treatment
9	U067	200	K	S01	T04			Treatment
10	U068	200	K	S01	T04			Treatment
11	U069	200	K	S01	T04			Treatment
12	U070	200	K	S01	T04			Treatment
13	U071	200	K	S01	T04			Treatment
14	U072	200	K	S01	T04			Treatment
15	U073	200	K	S01	T04			Treatment
16	U074	200	K	S01	T04			Treatment
17	U075	200	K	S01	T04			Treatment
18	U076	200	K	S01	T04			Treatment
19	U077	200	K	S01	T04			Treatment
20	U078	200	K	S01	T04			Treatment
21	U079	200	K	S01	T04			Treatment
22	U080	200	K	S01	T04			Treatment
23	U081	200	K	S01	T04			Treatment
24	U082	200	K	S01	T04			Treatment
25	U083	200	K	S01	T04			Treatment
26	U084	200	K	S01	T04			Treatment

9313025.0108

Continued from page 2

NOTE: Photocopy this page before completing if you have more than 26 wastes to list

I.D. NUMBER (enter from page 1): A789000896 7

IV. DESCRIPTION OF DANGEROUS WASTES (continued)

LINE NO.	A. DANGEROUS WASTE NO. (enter code)	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE (enter code)	D. PROCESSES 1. PROCESS CODES (enter)	D. PROCESSES 2. PROCESS DESCRIPTION (If a code is not entered in D(1))
1	U085	200	K	S01 T04	Treatment
2	U086	200	K	S01 T04	Treatment
3	U087	200	K	S01 T04	Treatment
4	U088	200	K	S01 T04	Treatment
5	U089	200	K	S01 T04	Treatment
6	U090	200	K	S01 T04	Treatment
7	U091	200	K	S01 T04	Treatment
8	U092	200	K	S01 T04	Treatment
9	U093	200	K	S01 T04	Treatment
10	U094	200	K	S01 T04	Treatment
11	U095	200	K	S01 T04	Treatment
12	U096	200	K	S01 T04	Treatment
13	U097	200	K	S01 T04	Treatment
14	U098	200	K	S01 T04	Treatment
15	U099	200	K	S01 T04	Treatment
16	U101	200	K	S01 T04	Treatment
17	U102	200	K	S01 T04	Treatment
18	U103	200	K	S01 T04	Treatment
19	U105	200	K	S01 T04	Treatment
20	U106	200	K	S01 T04	Treatment
21	U107	200	K	S01 T04	Treatment
22	U108	200	K	S01 T04	Treatment
23	U109	200	K	S01 T04	Treatment
24	U110	200	K	S01 T04	Treatment
25	U111	200	K	S01 T04	Treatment
26	U112	200	K	S01 T04	Treatment

9313025.0109

Continued from page 2

NOTE: Photocopy this page before completing if you have more than 26 wastes to list

I.D. NUMBER (enter from page 1)

A 7 8 9 0 0 0 8 9 6 7

IV. DESCRIPTION OF DANGEROUS WASTES (continued)

LINE NO.	A. DANGEROUS WASTE NO. (enter code)	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE (enter code)	D. PROCESSES 1. PROCESS CODES (enter)				D. PROCESSES 2. PROCESS DESCRIPTION (If a code is not entered in D(1))
1	U 1 1 3	200	K	S 0 1	T 0 4			Treatment
2	U 1 1 4	200	K	S 0 1	T 0 4			Treatment
3	U 1 1 5	200	K	S 0 1	T 0 4			Treatment
4	U 1 1 6	200	K	S 0 1	T 0 4			Treatment
5	U 1 1 7	200	K	S 0 1	T 0 4			Treatment
6	U 1 1 8	200	K	S 0 1	T 0 4			Treatment
7	U 1 1 9	200	K	S 0 1	T 0 4			Treatment
8	U 1 2 0	200	K	S 0 1	T 0 4			Treatment
9	U 1 2 1	200	K	S 0 1	T 0 4			Treatment
10	U 1 2 2	200	K	S 0 1	T 0 4			Treatment
11	U 1 2 3	200	K	S 0 1	T 0 4			Treatment
12	U 1 2 4	200	K	S 0 1	T 0 4			Treatment
13	U 1 2 5	200	K	S 0 1	T 0 4			Treatment
14	U 1 2 6	200	K	S 0 1	T 0 4			Treatment
15	U 1 2 7	200	K	S 0 1	T 0 4			Treatment
16	U 1 2 8	200	K	S 0 1	T 0 4			Treatment
17	U 1 2 9	200	K	S 0 1	T 0 4			Treatment
18	U 1 3 0	200	K	S 0 1	T 0 4			Treatment
19	U 1 3 1	200	K	S 0 1	T 0 4			Treatment
20	U 1 3 2	200	K	S 0 1	T 0 4			Treatment
21	U 1 3 3	200	K	S 0 1	T 0 4			Treatment
22	U 1 3 4	200	K	S 0 1	T 0 4			Treatment
23	U 1 3 5	200	K	S 0 1	T 0 4			Treatment
24	U 1 3 6	200	K	S 0 1	T 0 4			Treatment
25	U 1 3 7	200	K	S 0 1	T 0 4			Treatment
26	U 1 3 8	200	K	S 0 1	T 0 4			Treatment

9313025.0110

Continued from page 2

NOTE: Photocopy this page before completing if you have more than 26 wastes to list

I.D. NUMBER (enter from page 1)

A 7 8 9 0 0 0 8 9 6 7

IV. DESCRIPTION OF DANGEROUS WASTES (continued)

LINE NO.	A. DANGEROUS WASTE NO. (enter code)	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE (enter code)	D. PROCESSES 1. PROCESS CODES (enter)				D. PROCESSES 2. PROCESS DESCRIPTION (If a code is not entered in D(1))
1	U140	200	K	S01	T04			Treatment
2	U141	200	K	S01	T04			Treatment
3	U142	200	K	S01	T04			Treatment
4	U143	200	K	S01	T04			Treatment
5	U144	200	K	S01	T04			Treatment
6	U145	200	K	S01	T04			Treatment
7	U146	200	K	S01	T04			Treatment
8	U147	200	K	S01	T04			Treatment
9	U148	200	K	S01	T04			Treatment
10	U149	200	K	S01	T04			Treatment
11	U150	200	K	S01	T04			Treatment
12	U151	200	K	S01	T04			Treatment
13	U152	200	K	S01	T04			Treatment
14	U153	200	K	S01	T04			Treatment
15	U154	200	K	S01	T04			Treatment
16	U155	200	K	S01	T04			Treatment
17	U156	200	K	S01	T04			Treatment
18	U157	200	K	S01	T04			Treatment
19	U158	200	K	S01	T04			Treatment
20	U159	200	K	S01	T04			Treatment
21	U160	200	K	S01	T04			Treatment
22	U161	200	K	S01	T04			Treatment
23	U162	200	K	S01	T04			Treatment
24	U163	200	K	S01	T04			Treatment
25	U164	200	K	S01	T04			Treatment
26	U165	200	K	S01	T04			Treatment

9313025.0111

Continued from page 2

NOTE: Photocopy this page before completing if you have more than 26 wastes to list

I.D. NUMBER (enter from page 1): A789000896 7

IV. DESCRIPTION OF DANGEROUS WASTES (continued)

LINE NO.	A. DANGEROUS WASTE NO. (enter code)	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE (enter code)	D. PROCESSES 1. PROCESS CODES (enter)				D. PROCESSES 2. PROCESS DESCRIPTION (If a code is not entered in D(1))
1	U166	200	K	S01	T04			Treatment
2	U167	200	K	S01	T04			Treatment
3	U168	200	K	S01	T04			Treatment
4	U169	200	K	S01	T04			Treatment
5	U170	200	K	S01	T04			Treatment
6	U171	200	K	S01	T04			Treatment
7	U172	200	K	S01	T04			Treatment
8	U173	200	K	S01	T04			Treatment
9	U174	200	K	S01	T04			Treatment
10	U176	200	K	S01	T04			Treatment
11	U177	200	K	S01	T04			Treatment
12	U178	200	K	S01	T04			Treatment
13	U179	200	K	S01	T04			Treatment
14	U180	200	K	S01	T04			Treatment
15	U181	200	K	S01	T04			Treatment
16	U182	200	K	S01	T04			Treatment
17	U183	200	K	S01	T04			Treatment
18	U184	200	K	S01	T04			Treatment
19	U185	200	K	S01	T04			Treatment
20	U186	200	K	S01	T04			Treatment
21	U187	200	K	S01	T04			Treatment
22	U188	200	K	S01	T04			Treatment
23	U189	200	K	S01	T04			Treatment
24	U190	200	K	S01	T04			Treatment
25	U191	200	K	S01	T04			Treatment
26	U192	200	K	S01	T04			Treatment

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Continued from page 2

NOTE: Photocopy this page before completing if you have more than 26 wastes to list

I.D. NUMBER (enter from page 1)

A 7 8 9 0 0 0 8 9 6 7

IV. DESCRIPTION OF DANGEROUS WASTES (continued)

LINE NO.	A. DANGEROUS WASTE NO. (enter code)	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE (enter code)	D. PROCESSES 1. PROCESS CODES (enter)	D. PROCESSES 2. PROCESS DESCRIPTION (If a code is not entered in D(1))
1	U193	200	K	S01 T04	Treatment
2	U194	200	K	S01 T04	Treatment
3	U196	200	K	S01 T04	Treatment
4	U197	200	K	S01 T04	Treatment
5	U200	200	K	S01 T04	Treatment
6	U201	200	K	S01 T04	Treatment
7	U202	200	K	S01 T04	Treatment
8	U203	200	K	S01 T04	Treatment
9	U204	200	K	S01 T04	Treatment
10	U205	200	K	S01 T04	Treatment
11	U206	200	K	S01 T04	Treatment
12	U207	200	K	S01 T04	Treatment
13	U208	200	K	S01 T04	Treatment
14	U209	200	K	S01 T04	Treatment
15	U210	200	K	S01 T04	Treatment
16	U211	200	K	S01 T04	Treatment
17	U213	200	K	S01 T04	Treatment
18	U214	200	K	S01 T04	Treatment
19	U215	200	K	S01 T04	Treatment
20	U216	200	K	S01 T04	Treatment
21	U217	200	K	S01 T04	Treatment
22	U218	200	K	S01 T04	Treatment
23	U219	200	K	S01 T04	Treatment
24	U220	200	K	S01 T04	Treatment
25	U221	200	K	S01 T04	Treatment
26	U222	200	K	S01 T04	Treatment

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Continued from page 2

NOTE: Photocopy this page before completing if you have more than 26 wastes to list

I.D. NUMBER (enter from page 1): 7 8 9 0 0 0 8 9 6 7

IV. DESCRIPTION OF DANGEROUS WASTES (continued)

LINE	A. DANGEROUS WASTE NO. (enter code)	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE (enter code)	D. PROCESSES 1. PROCESS CODES (enter)				D. PROCESSES 2. PROCESS DESCRIPTION (If a code is not entered in D(1))
1	U223	200	K	S01	T04			Treatment
2	U225	200	K	S01	T04			Treatment
3	U226	200	K	S01	T04			Treatment
4	U227	200	K	S01	T04			Treatment
5	U228	200	K	S01	T04			Treatment
6	U234	200	K	S01	T04			Treatment
7	U235	200	K	S01	T04			Treatment
8	U236	200	K	S01	T04			Treatment
9	U237	200	K	S01	T04			Treatment
10	U238	200	K	S01	T04			Treatment
	U239	200	K	S01	T04			Treatment
12	U240	200	K	S01	T04			Treatment
13	U243	200	K	S01	T04			Treatment
14	U244	200	K	S01	T04			Treatment
15	U246	200	K	S01	T04			Treatment
16	U247	200	K	S01	T04			Treatment
17	U248	200	K	S01	T04			Treatment
18	U249	200	K	S01	T04			Treatment
19	U328	200	K	S01	T04			Treatment
20	U353	200	K	S01	T04			Treatment
21	U359	200	K	S01	T04			Treatment
22	P001	200	K	S01	T04			Treatment
23	P002	200	K	S01	T04			Treatment
24	P003	200	K	S01	T04			Treatment
25	P004	200	K	S01	T04			Treatment
26	P005	200	K	S01	T04			Treatment

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Continued from page 2

NOTE: Photocopy this page before completing if you have more than 26 wastes to list

I.D. NUMBER (enter from page 1): A789000896 7

IV. DESCRIPTION OF DANGEROUS WASTES (continued)

LINE NO.	A. DANGEROUS WASTE NO. (enter code)	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE (enter code)	D. PROCESSES 1. PROCESS CODES (enter)	D. PROCESSES 2. PROCESS DESCRIPTION (if a code is not entered in D(1))
1	P006	200	K	S01 T04	Treatment
2	P007	200	K	S01 T04	Treatment
3	P008	200	K	S01 T04	Treatment
4	P009	200	K	S01 T04	Treatment
5	P010	200	K	S01 T04	Treatment
6	P011	200	K	S01 T04	Treatment
7	P012	200	K	S01 T04	Treatment
8	P013	200	K	S01 T04	Treatment
9	P014	200	K	S01 T04	Treatment
10	P015	200	K	S01 T04	Treatment
11	P016	200	K	S01 T04	Treatment
12	P017	200	K	S01 T04	Treatment
13	P018	200	K	S01 T04	Treatment
14	P019	200	K	S01 T04	Treatment
15	P020	200	K	S01 T04	Treatment
16	P021	200	K	S01 T04	Treatment
17	P022	200	K	S01 T04	Treatment
18	P023	200	K	S01 T04	Treatment
19	P024	200	K	S01 T04	Treatment
20	P026	200	K	S01 T04	Treatment
21	P027	200	K	S01 T04	Treatment
22	P028	200	K	S01 T04	Treatment
23	P029	200	K	S01 T04	Treatment
24	P030	200	K	S01 T04	Treatment
25	P031	200	K	S01 T04	Treatment
26	P033	200	K	S01 T04	Treatment

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Continued from page 2

NOTE Photocopy this page before completing if you have more than 26 wastes to list

I.D. NUMBER (enter from page 1)

A 7 8 9 0 0 0 8 9 6 7

IV. DESCRIPTION OF DANGEROUS WASTES (continued)

LINE NO.	A. DANGEROUS WASTE NO. (enter code)	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE (enter code)	D. PROCESSES 1. PROCESS CODES (enter)	D. PROCESSES 2. PROCESS DESCRIPTION (If a code is not entered in D(1))
1	P034	200	K	S01 T04	Treatment
2	P036	200	K	S01 T04	Treatment
3	P037	200	K	S01 T04	Treatment
4	P038	200	K	S01 T04	Treatment
5	P039	200	K	S01 T04	Treatment
6	P040	200	K	S01 T04	Treatment
7	P041	200	K	S01 T04	Treatment
8	P042	200	K	S01 T04	Treatment
9	P043	200	K	S01 T04	Treatment
10	P044	200	K	S01 T04	Treatment
11	P045	200	K	S01 T04	Treatment
12	P046	200	K	S01 T04	Treatment
13	P047	200	K	S01 T04	Treatment
14	P048	200	K	S01 T04	Treatment
15	P049	200	K	S01 T04	Treatment
16	P050	200	K	S01 T04	Treatment
17	P051	200	K	S01 T04	Treatment
18	P054	200	K	S01 T04	Treatment
19	P056	200	K	S01 T04	Treatment
20	P057	200	K	S01 T04	Treatment
21	P058	200	K	S01 T04	Treatment
22	P059	200	K	S01 T04	Treatment
23	P060	200	K	S01 T04	Treatment
24	P062	200	K	S01 T04	Treatment
25	P063	200	K	S01 T04	Treatment
26	P064	200	K	S01 T04	Treatment

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Continued from page 2

NOTE: Photocopy this page before completing if you have more than 26 wastes to list

I.D. NUMBER (enter from page 1)

A 7 8 9 0 0 0 8 9 6 7

IV. DESCRIPTION OF DANGEROUS WASTES (continued)

LINE NO.	A. DANGEROUS WASTE NO. (enter code)	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE (enter code)	D. PROCESSES 1. PROCESS CODES (enter)				D. PROCESSES 2. PROCESS DESCRIPTION (If a code is not entered in D(1))
1	P065	200	K	S01	T04			Treatment
2	P066	200	K	S01	T04			Treatment
3	P067	200	K	S01	T04			Treatment
4	P068	200	K	S01	T04			Treatment
5	P069	200	K	S01	T04			Treatment
6	P070	200	K	S01	T04			Treatment
7	P071	200	K	S01	T04			Treatment
8	P072	200	K	S01	T04			Treatment
9	P073	200	K	S01	T04			Treatment
10	P074	200	K	S01	T04			Treatment
11	P075	200	K	S01	T04			Treatment
12	P076	200	K	S01	T04			Treatment
13	P077	200	K	S01	T04			Treatment
14	P078	200	K	S01	T04			Treatment
15	P081	200	K	S01	T04			Treatment
16	P082	200	K	S01	T04			Treatment
17	P084	200	K	S01	T04			Treatment
18	P085	200	K	S01	T04			Treatment
19	P087	200	K	S01	T04			Treatment
20	P088	200	K	S01	T04			Treatment
21	P089	200	K	S01	T04			Treatment
22	P092	200	K	S01	T04			Treatment
23	P093	200	K	S01	T04			Treatment
24	P094	200	K	S01	T04			Treatment
25	P095	200	K	S01	T04			Treatment
26	P096	200	K	S01	T04			Treatment

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Continued from page 2

NOTE. Photocopy this page before completing if you have more than 26 wastes to list

ID NUMBER (enter from page 1)

A 7 8 9 0 0 0 8 9 6 7

IV. DESCRIPTION OF DANGEROUS WASTES (continued)

LINE NO.	A. DANGEROUS WASTE NO. (enter code)	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE (enter code)	D. PROCESSES 1. PROCESS CODES (enter)				2. PROCESS DESCRIPTION (If a code is not entered in D(1))
1	P097	200	K	S01	T04			Treatment
2	P098	200	K	S01	T04			Treatment
3	P099	200	K	S01	T04			Treatment
4	P101	200	K	S01	T04			Treatment
5	P102	200	K	S01	T04			Treatment
6	P103	200	K	S01	T04			Treatment
7	P104	200	K	S01	T04			Treatment
8	P105	200	K	S01	T04			Treatment
9	P106	200	K	S01	T04			Treatment
10	P107	200	K	S01	T04			Treatment
11	P108	200	K	S01	T04			Treatment
12	P109	200	K	S01	T04			Treatment
13	P110	200	K	S01	T04			Treatment
14	P111	200	K	S01	T04			Treatment
15	P112	200	K	S01	T04			Treatment
16	P113	200	K	S01	T04			Treatment
17	P114	200	K	S01	T04			Treatment
18	P115	200	K	S01	T04			Treatment
19	P116	200	K	S01	T04			Treatment
20	P118	200	K	S01	T04			Treatment
21	P119	200	K	S01	T04			Treatment
22	P120	200	K	S01	T04			Treatment
23	P121	200	K	S01	T04			Treatment
24	P122	200	K	S01	T04			Treatment
25	P123	200	K	S01	T04			Treatment
26								

9313025.0118

Continued from the front.

DESCRIPTION OF DANGEROUS WASTES *(continued)*

USE THIS SPACE TO LIST ADDITIONAL PROCESS CODES FROM SECTION D(1) ON PAGE 3.

Routine treatments which will be conducted in the 325 HWTU will include stabilization and alkali metal treatments on small quantities of diverse dangerous and radioactive mixed waste generated from ongoing research and development activities.

Waste to be handled in the 325 HWTU will include listed waste, waste from nonspecific sources, characteristic waste and state-only waste which are also regulated under the Atomic Energy Act of 1954 (as amended).

Routine treatment which will be conducted in the 3100 HWTU will include carbon absorption, oxidation, reduction, deactivation, vitrification, liquid-liquid extraction, encapsulation, neutralization, precipitation, recovery of acids and bases, recovery of metals or inorganics, recovery of organics, stabilization, controlled reaction with water, photo catalytic destruction and ceramic melting. The 3100 HWTU will not handle RMW.

Processes that are utilized as appropriate in the 3100 HWTU include electropolishing, electrodissolvers, other electrochemically-enhanced processes for decontaminating metals and oxidizing non-metals; ion-exchange for selective removal of contaminants from waste solutions; waste concentrators, waste dissolution, precipitation/filtration and solvent extraction systems for separation of contaminants from slurries and sludge; solids washing for separation of contaminants from sludges, waste retrieval from storage tanks,

9313025.0119

V. FACILITY DRAWING

All existing facilities must include in the space provided on page 5 a scale drawing of the facility *(see instructions for more detail)*.

VI. PHOTOGRAPHS * This information appears on the attached drawing and photographs.

All existing facilities must include photographs *(aerial or ground—level)* that clearly delineate all existing structures; existing storage, treatment and disposal areas; and sites of future storage, treatment or disposal areas *(see instructions for more detail)*.

VII. FACILITY GEOGRAPHIC LOCATION

LATITUDE *(degrees, minutes, & seconds)*	LONGITUDE *(degrees, minutes, & seconds)*

VIII. FACILITY OWNER

[X] A. If the facility owner is also the facility operator as listed in Section VII on Form 1, "General Information", place an "X" in the box to the left and skip to Section IX below.

B. If the facility owner is not the facility operator as listed in Section VII on Form 1, complete the following items:

1. NAME OF FACILITY'S LEGAL OWNER	2. PHONE NO. *(area code & no.)*

3. STREET OR P.O. BOX	4. CITY OR TOWN	5. ST.	6. ZIP CODE

IX. OWNER CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

NAME *(print or type)*	SIGNATURE	DATE SIGNED
John Wagoner, Manager U.S. DOE, Richland Field Office		

X. OPERATOR CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

NAME *(print or type)*	SIGNATURE	DATE SIGNED
SEE ATTACHMENT		

Continued from page 4

V. FACILITY DRAWING (see page 4)

catalytic destruction methods, induced oxidation and decomposition, microwave treatment, sludge-to-oil conversion technology, biological treatment processes, grouting, distillation, alkali metal treatment, plasma arc pyrolysis, in situ heating of soils and sludges for removal of organics, metal melting for volume reduction and immobilization of contaminated metals, induced oxidation of organic chemicals, thermal treatment, in can melting of soil waste, and waste vitrification.

0319025.0120

WA7890008967

Form 1

325/3100 HAZARDOUS WASTE TREATMENT UNIT

9313025.0121

XI. OPERATOR CERTIFICATION

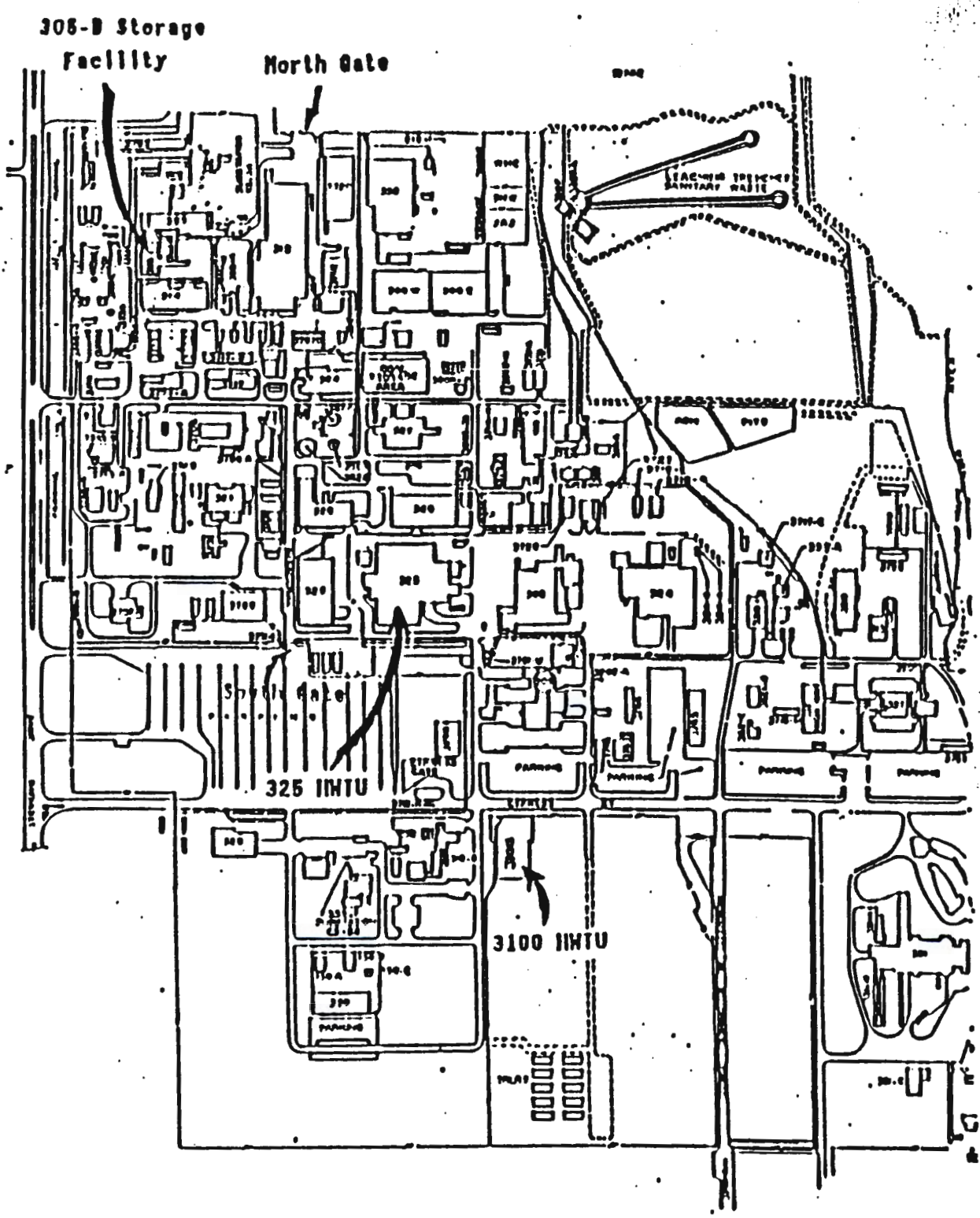
I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Owner/Operator
for John Wagoner
Department of Energy
Richland Field Office

6-24-92
Date

Co-Operator
William R. Wiley, Director
Pacific Northwest Laboratory

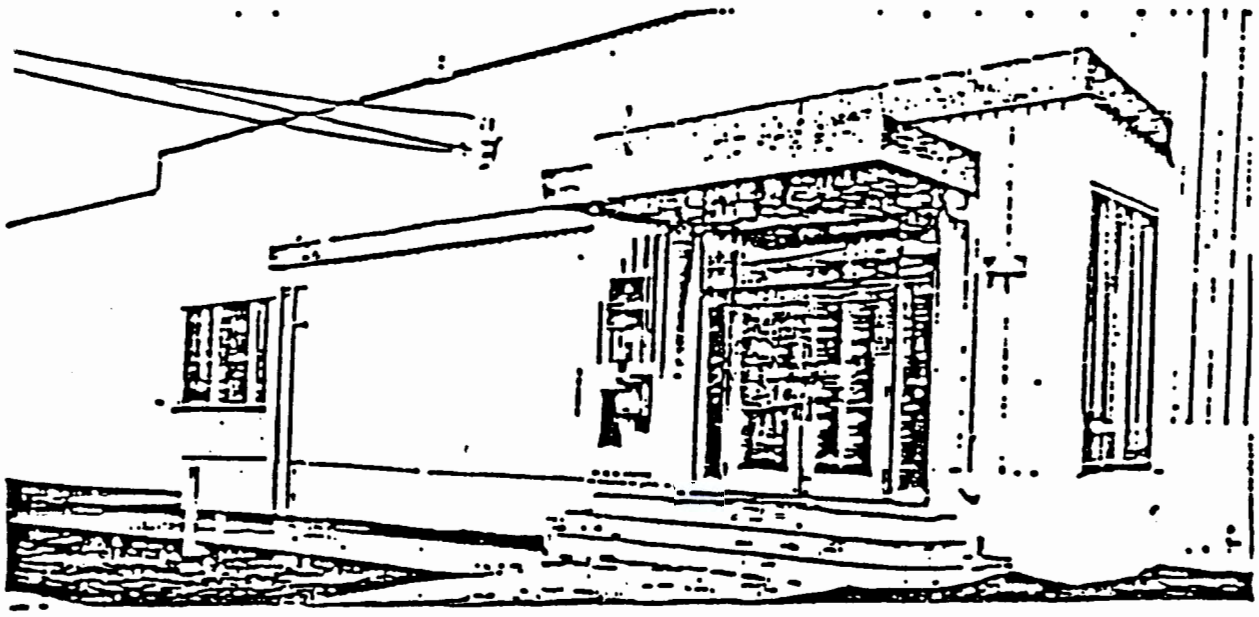
6-6-92
Date



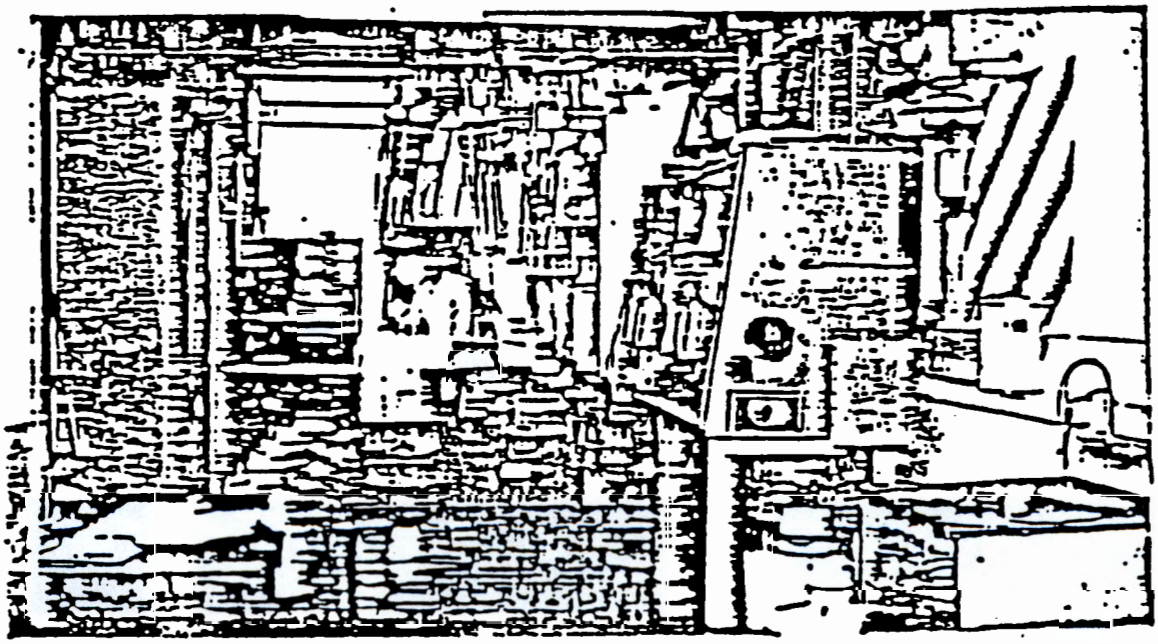
300 Area

9313025.0122

325 Hazardous Waste Treatment Unit



8901464-11CN
Photo Taken 1988



Longitude 119°19'34"
Latitude 46°22'31"

8901464-4CN
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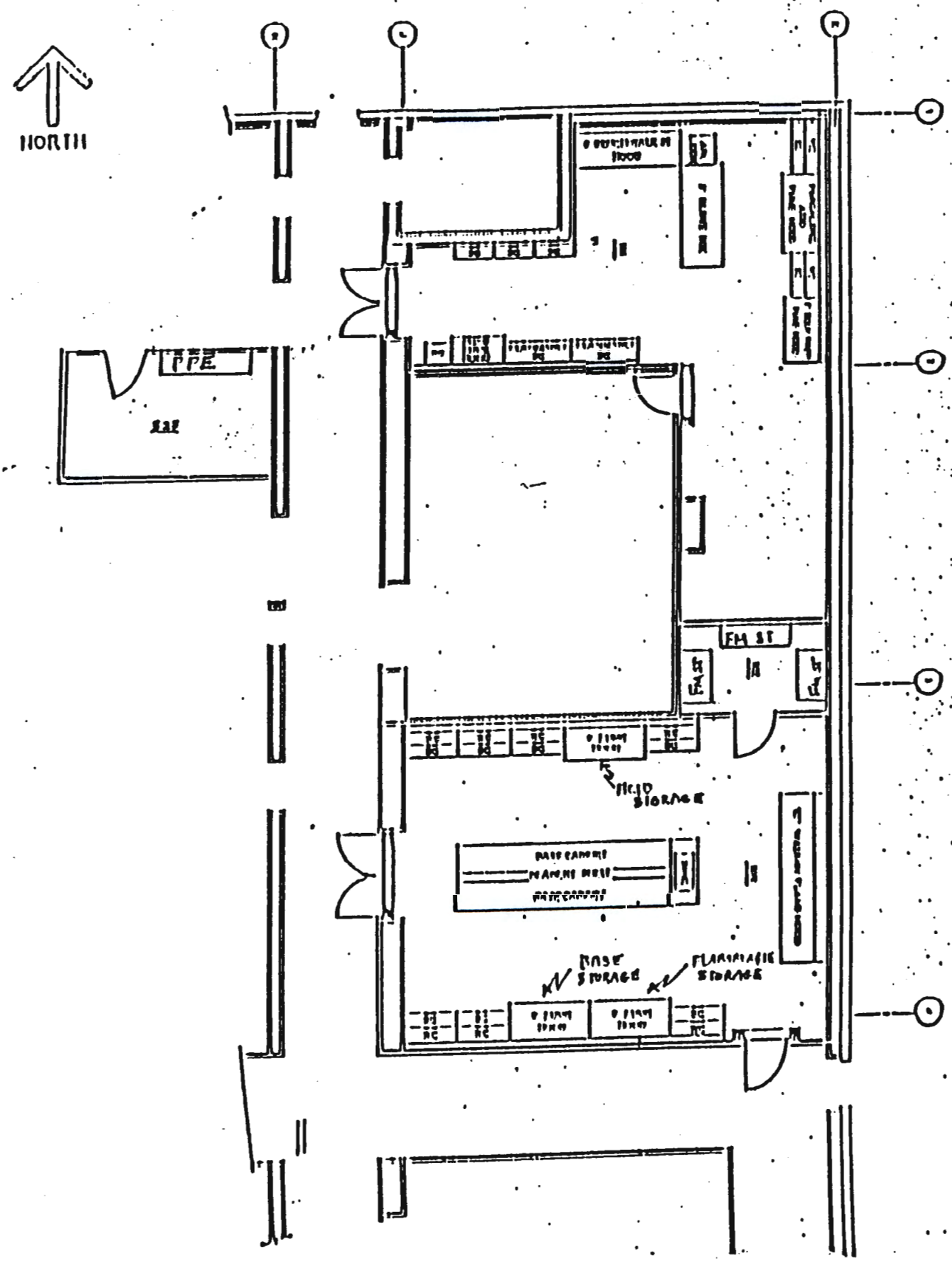

325 Hazardous Waste Treatment Unit

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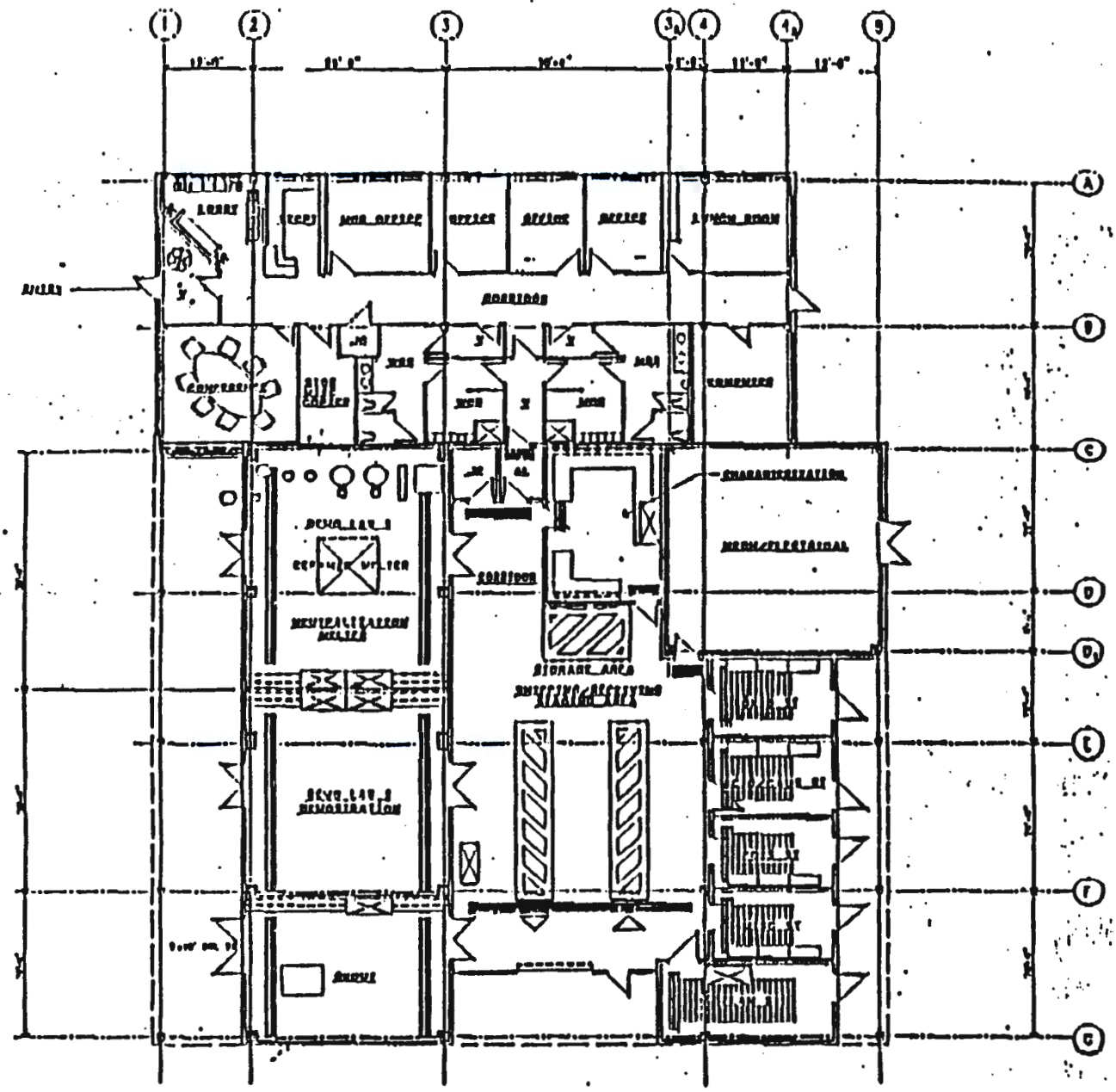

3100 Hazardous Waste Treatment Unit

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PART B

This Part B permit application for the 325/3100 Hazardous Waste Treatment Unit is comprised of 15 chapters and seven appendices.

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1.0 INTRODUCTION

This chapter briefly describes the permitting approach for the 325/3100 Hazardous Waste Treatment Unit (HWTU) and provides an overview of the contents of the HWTU Part B Permit Application. The Part B Permit Application consists of 15 chapters that address the Part B Checklist prepared by Ecology (Ecology 1987). For ease of reference, the Ecology Checklist numbers, in brackets, follow chapter headings and subheadings.

1.1 HAZARDOUS WASTE TREATMENT UNIT PERMITTING

The HWTU is used to receive, store, and treat small volumes of dangerous waste and mixed waste (MW) generated by Hanford Facility Programs and therefore is required to obtain a permit pursuant to WAC 173-303-800. In accordance with WAC 173-303-630, containers are managed using the procedure outlined in Chapter 4.

The HWTU is divided into two distinct physically separated sections (separate buildings). One section handles chemical wastes, and the other handles mixed wastes (MW). The Department of Energy, Richland Field Office (DOE-RL) submitted an Environmental Protection Agency (EPA) Resource Conservation and Recovery Act (RCRA)/Washington Department of Ecology (Ecology) Dangerous Waste Part A Permit Application as required by 40 CFR Part 265 and WAC 173-303-805 to qualify for interim status. The HWTU will be permitted under WAC 173-303-806 and references therein.

The 325 section is a self-contained waste processing facility located within the preexisting 325 building. The 325 building is a concrete and steel building constructed in the 1950s located in the 300 Area of the Hanford Site. The 325 section of the HWTU occupies a small portion (approximately 1700 square feet) of the first floor of this building and has been designed to be a stand-alone unit. Mixed wastes (MW) are treated in the 325 section. It will incorporate small-scale treatments for MW, including grouting and neutralization.

The 3100 section of the HWTU is currently being designed and will be located in the 300 Area of the Hanford Site. The 3100 section will be a single-story structure with a floor area of approximately 10,500 square feet. The administrative area of the 3100 section and the treatment processes for dangerous waste are located in this building. It will incorporate larger-scale treatments including grouting, neutralization and ceramic melting. Definitive design details for the 3100 section are not currently available. These details will be supplied to Ecology when available.

1.2 HAZARDOUS WASTE TREATMENT UNIT PART B PERMIT APPLICATION CONTENTS

The HWTU Part B Permit Application consists of the following chapters:

- Introduction (Chapter 1.0)
- Facility Description and General Provisions (Chapter 2.0)

- Waste Characteristics (Chapter 3.0)
- Process Information (Chapter 4.0)
- Groundwater Monitoring (Chapter 5.0)
- Procedures To Prevent Hazards (Chapter 6.0)
- Contingency Plan (Chapter 7.0)
- Personnel Training (Chapter 8.0)
- Exposure Information Reports (Chapter 9.0)
- Waste Minimization Plan (Chapter 10.0)
- Closure/Post-Closure Requirements (Chapter 11.0)
- Reporting and Recordkeeping (Chapter 12.0)
- Other Relevant Laws (Chapter 13.0)
- Certification (Chapter 14.0)
- References (Chapter 15.0)

A brief description of each chapter is provided in the following sections.

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1.2.1 Facility Description and General Provisions (Chapter 2.0)

This chapter provides a general description of the HWTU. A brief description and history of the Hanford Site and Hanford Facility are also provided.

1.2.2 Waste Characteristics (Chapter 3.0)

This chapter discusses waste types that will be received at the HWTU. Included are descriptions of the wastes to be accepted and their dangerous characteristics and methods for waste sampling and analysis.

1.2.3 Process Information (Chapter 4.0)

This chapter discusses the various treatment processes of the HWTU. Information is also provided concerning the management of containers which will be used at the HWTU for processing the waste.

1.2.4 Groundwater Monitoring (Chapter 5.0)

The HWTU will not be operated as a dangerous waste surface impoundment, waste pile, land treatment unit, or landfill; therefore, groundwater monitoring is not required.

1.2.5 Procedures To Prevent Hazards (Chapter 6.0)

This chapter discusses the security practices which will be used at the HWTU. Information is presented concerning inspection of property and equipment, and methods used to prevent undesired reactions of ignitable, reactive, and incompatible wastes.

1.2.6 Contingency Plan (Chapter 7.0)

This chapter describes the HWTU and Hanford Facility response to potentially dangerous incidents at the HWTU. It details emergency response procedures that will be used to lessen the potential impact on public health and the environment in the event of an incident at the HWTU.

1.2.7 Personnel Training (Chapter 8.0)

This chapter outlines the training program to be used and the records required for the personnel involved in the handling and processing of dangerous wastes received at the HWTU.

1.2.8 Exposure Information Reports (Chapter 9.0)

The HWTU will not be operated as a dangerous waste surface impoundment, waste pile, land treatment unit, or landfill; therefore, no exposure information report is required.

1.2.9 Waste Minimization Plan (Chapter 10.0)

This chapter discusses the program to minimize the volume or quantity and toxicity of waste generated and managed at the HWTU.

1.2.10 Closure/Post-Closure Requirements (Chapter 11.0)

This chapter describes how the HWTU will be decontaminated and closed. A closure schedule is provided, along with descriptions of specific closure activities. No post-closure plan is required because the HWTU is not to be closed as a dangerous waste disposal unit.

1.2.11 Reporting and Recordkeeping (Chapter 12.0)

This chapter summarizes the reports that will be submitted to Ecology and/or EPA and the records that will be maintained at the HWTU.

1.2.12 Other Relevant Laws (Chapter 13.0)

This chapter discusses compliance with other Federal and State laws that may impact the operation of the HWTU.

1.2.13 Certification (Chapter 14.0)

This chapter contains the required certification signed by officials of PNL and the Department of Energy, Richland Field Office (DOE-RL) that the information provided is true, accurate, and complete.

1.2.14 References (Chapter 15.0)

References used in this Part B Permit Application are listed in this chapter.

1.3 ACRONYMS AND ABBREVIATIONS

Acronyms and abbreviations used throughout this Part B permit application are located at the beginning of the document between the Foreword and the Part A permit application.

1.4 DEFINITIONS

Definitions specific to this permit application are provided in this section. Definitions of these terms are as follows:

Dangerous Waste--The term "Dangerous Waste" means those solid wastes designated in WAC 173-303-070 through WAC 173-303-103 as dangerous or extremely hazardous waste. As used in the permit, the words "dangerous waste" shall refer to the full universe of wastes regulated by Chapter 70.105 RCW and Chapter 173-303 WAC (including dangerous waste, hazardous waste, extremely hazardous waste, and mixed waste).

Days--The term "days" means calendar days unless specifically identified otherwise.

Ecology--The term "Ecology" means the Washington State Department of Ecology.

Facility--The term "facility," as used in this permit application, has several meanings based on context. In general, the term "facility" refers to the Hanford Site because the entire site has just one EPA identification number. However, due to the use of the term "facility" in various sections of the WAC referenced herein, and broad general usage, the term "facility" may also refer to an on-site treatment, storage and/or disposal (TSD) unit or an off-site TSD facility designated to receive shipments of dangerous waste, i.e., the destination of a shipment traveling under a dangerous waste manifest as described in WAC 173-303-180.

The term may also be used in connection with citations from the WAC or other regulations when noting requirements applicable to TSD facilities in general.

When the term "facility" does not refer to the Hanford Site, wording to clarify the meaning is used.

Generating Unit--The term "generating unit" as used in this permit application refers to the individual processes (laboratories, maintenance shops, etc.) which generate wastes requiring management under the regulation of WAC 173-303. The wastes are generated by DOE-RL or one of its contractors performing work authorized under their contracts with DOE-RL.

Generator--The term "generator" refers to DOE-RL and its contractors performing work authorized under their contracts with DOE-RL.

Hanford Site--The term "Hanford Site" refers to the approximately 560 contiguous square miles under the ownership and operational control of the United States Department of Energy, Richland Field Office (DOE-RL). DOE-RL has been issued a single EPA identification number for all regulated dangerous waste management activities (generation, transportation, recycling, treatment, storage, and disposal) occurring at the Hanford Site.

Offsite Shipment--Shipment not considered to be onsite shipments.

Onsite Shipment--Shipments (1) from waste generating units to waste management units operated by DOE-RL, or (2) between waste management units operated by DOE-RL.

Release--The term "release" means any spilling, leaking, pouring, emitting, emptying, discharging, injecting, pumping, escaping, leaching, dumping, or disposing of hazardous waste into the environment (including the abandonment or discarding of containers containing hazardous waste or hazardous constituents).

Reasonable Times--The term "reasonable times" means normal business hours, hours during which production, treatment, storage, construction, disposal or discharge occurs or times when Ecology or the U.S. Environmental Protection Agency suspects a violation requiring immediate inspection.

Unit--The term "unit" (or "waste management unit") is used throughout the application to refer to the physical location, buildings and equipment comprising the HWTU or, in selected instances, other onsite TSD units. It may be inferred to have the same meaning as the term "dangerous waste management unit" as defined in WAC 173-303-040.

HWTU, 325 Section, and 3100 Section--The term HWTU is used throughout to refer to the Hazardous Waste Treatment Unit. The HWTU is composed of two sections: the 325 section, located in the 325 building, and the 3100 section, which will be a stand-alone new building. Reference to the 325 section or the 3100 section refers to the respective sections of the HWTU.

1.5 PERMIT MODIFICATIONS

All modifications to the HWTU Dangerous Waste Permit will be made in accordance with the requirements identified in WAC 173-303-830, with the following exception. The notifications required by WAC 173-303-830(4)(a)(i)(A) and (B) for Class 1 changes will be submitted to the required regulatory agencies, appropriate units of state and local government, and individuals on the facility mailing list maintained by Ecology. These notifications will be submitted by March 1 of each year.

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2.0 FACILITY DESCRIPTION AND GENERAL PROVISIONS [B]

This chapter briefly describes the Hanford Site and the Hanford Facility. In addition, this chapter describes the HWTU location and operational information including the following:

- General Description
- Topography
- Location information
- Traffic information
- Performance standards
- Buffer monitoring zones
- Spills and discharges
- Manifest system.

2.1 GENERAL DESCRIPTION [B-1]

This section discusses the general Hanford Facility operating areas and provides an introduction to the HWTU. A brief description of the Hanford Facility is also provided. A more detailed discussion of the waste types and known characteristics of the waste that the HWTU treats is provided in Chapters 3.0 and 4.0.

2.1.1 The Hanford Site

The Hanford Site consists of approximately 560 square miles (1450 square km) of semiarid land that is owned by the U.S. Government and managed by DOE-RL. This site is located northwest of the City of Richland, Washington, along the Columbia River (Figure 2-1). The City of Richland adjoins the southernmost portion of the Hanford Site boundary and is the nearest population center. In early 1943, the U.S. Army Corps of Engineers selected the Hanford Site as the location for a reactor, chemical separation, and related facilities for the production and purification of special nuclear materials. The mission of the Hanford Site recently has focused on environmental remediation and restoration.

Activities are centralized in numerically designated areas on the Hanford Site. The reactor facilities (active and decommissioned) are located along the Columbia River in the 100 Areas. The reactor fuel processing and waste management facilities are located in the 200 Areas, situated on a plateau about 7 miles (11.2 km) from the river. The 300 Area, located north of Richland, contains mostly reactor fuel manufacturing facilities and research and development laboratories. The 400 Area, 5 miles (8 km) northwest of the 300 Area, contains the Fast Flux Test Facility. The 1100 Area, north of Richland, contains buildings associated with maintenance and transportation functions for the Hanford Site. Administrative buildings and other research and development laboratories are found in the 3000 Area, also north of Richland. Administrative buildings are also located in the 700 Area in downtown Richland. Figure 2-1 provides a general overview of the Hanford Site and contiguous area.

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2.1.2 The Hanford Facility

The Hanford Facility is defined as a single RCRA facility, identified by the EPA/State Identification Number WA7890008967, that consists of over 60 TSD units conducting dangerous waste management activities (Figure 2-1). These TSD units are included in the Hanford Facility Dangerous Waste Part A Permit Application (DOE-RL 1988b). The Hanford Facility consists of the contiguous portion of the Hanford Site that contains these TSD units and, for the purposes of RCRA, is owned and operated by the U.S. Department of Energy (excluding lands north and east of the Columbia River, river islands, state owned or leased lands, lands owned by the Bonneville Power Administration, lands leased to the Washington Public Power Supply System, and the Ashe Substation. The Hanford Facility is a single site for purposes of provisions regulating "offsite" or "onsite" waste handling.

2.1.3 The Hazardous Waste Treatment Unit

The HWTU is a dangerous and MW treatment unit owned and operated by DOE and co-operated by PNL. The unit will be used to treat dangerous waste and MW prior to disposal. It will also provide greater than 90 day storage of wastes scheduled for treatment.

The 325 section is contained within the 325 Building, a two-story metal and concrete building with basement. The 325 Building is located within the 300 Area, as shown in Figure 2-2, and is used for engineering research and development. A portion of the first floor of the 325 Building was recently upgraded to house the HWTU. The part of the 325 Building encompassed by this permit application includes only the rooms detailed in the referenced maps (rooms 500, 522, 527, and 528). Adjacent halls and loading docks are not part of this permit application. The plan drawings for the 325 section are provided in Appendix 2B. The treatment processes used in this section will be bench scale operations which are portable and can be conducted at various locations within the 325 section. Routine treatments that will be conducted in the 325 section are grout and alkali metal treatment. The 325 section is separated from adjacent activities in the 325 Building by halls and shares no adjacent wall with these activities. Activities in adjacent laboratories in the 325 Building will have no significant impact on the safe operation of the 325 section. Also, the 325 section will have no significant effect on the safety of the 325 Building because of safety controls on the 325 section. In the event of off-normal events, the 325 section is isolated by fire dampers (electronically activated by the fire suppression system) and net negative pressurization relative to the rest of the 325 Building (see Appendix 2B). A reference to the Functional Design Criteria for the 325 section is provided for information purposes only.

The 3100 section will be a single-story structure with approximately 10,500 square feet of floor area. The building will be located on three acres in the 300 Area of the Hanford Site, as shown in Figure 2-2. Appendix 2C shows the proposed floor plan of the 3100 section. The facility will be divided into two areas: an administrative area and a process area. Specific rooms have been designated in the process area to house the major treatment processes (e.g., ceramic melting and neutralization) to be used in the 3100 section, which are detailed in Section 4.8. The administrative area will be isolated from the process area by an air lock. The process area will have net negative

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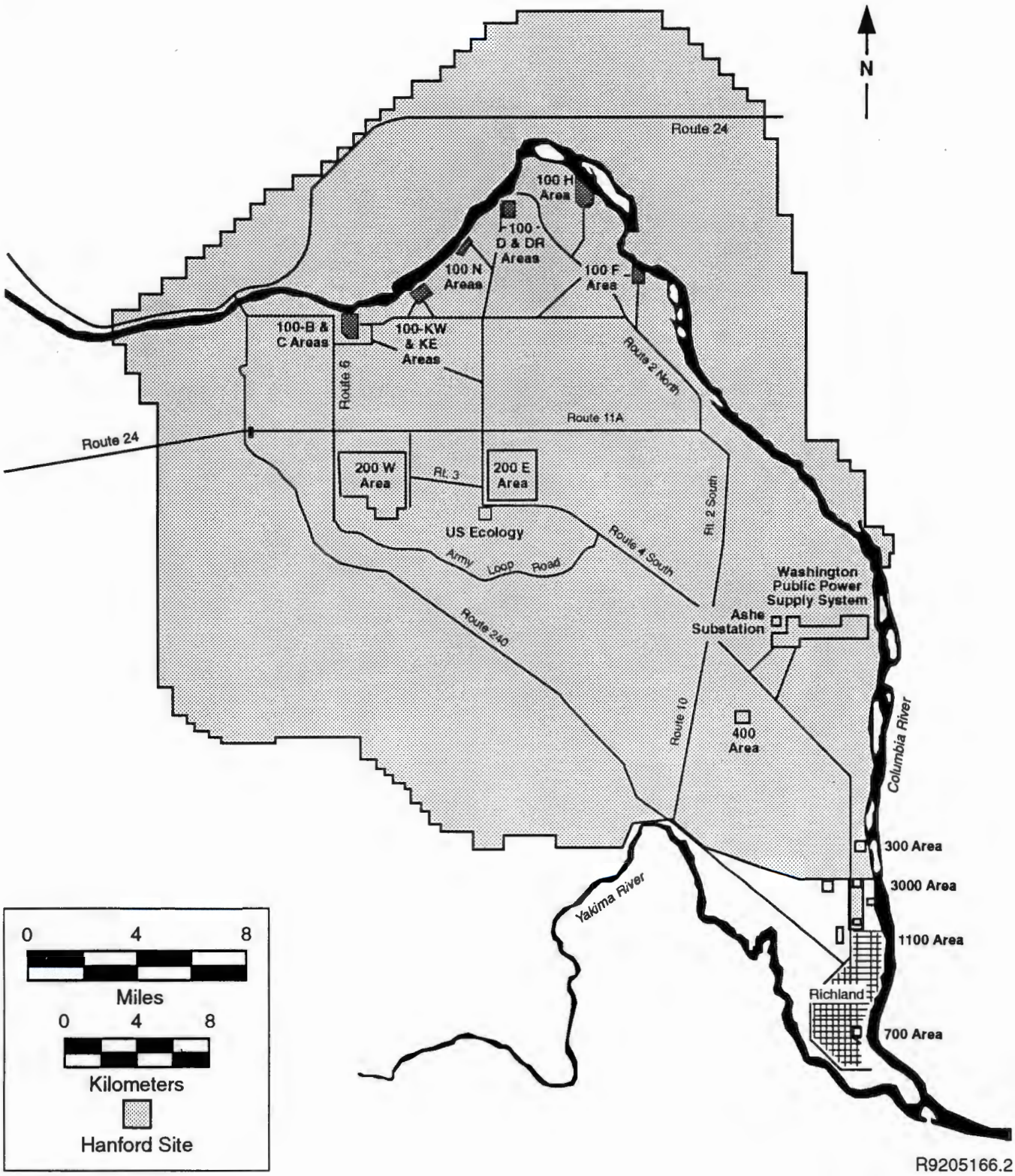
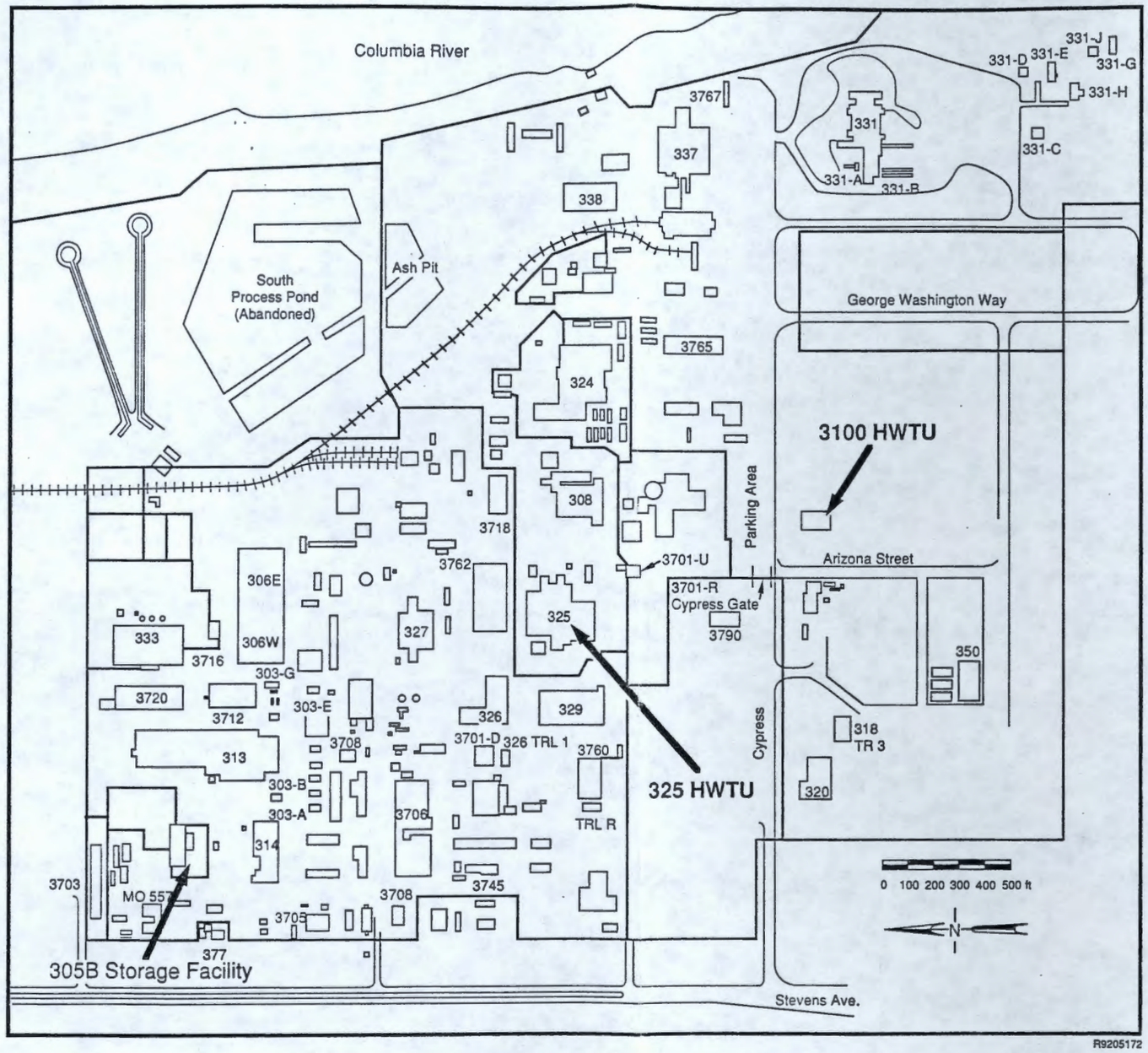


FIGURE 2-1. Hanford Site Map



300 Area

FIGURE 2-2. 325/3100 HWTU

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pressure relative to the administrative area and all ventilation air will be single pass through. There will be sumps at every entrance/exit from the process area, including the loading/unloading dock. These sumps will drain to a retention container. The loading/unloading dock will be designed such that trucks unloading will have their beds within the 3100 section containment system. An asphalt pad will surround the process area of the unit with bermed edges. A reference to the Functional Design Criteria for the 3100 section is provided for information purposes only. Design information on the 3100 section will be supplied when available.

Hundreds of types of chemical wastes and radioactive mixed wastes (historically averaging 1-10 pounds, or 1-5 kilograms, per waste stream) are generated from general research laboratory activities in the 300 area of the Hanford Facility. These wastes include listed and characteristic wastes in solid and liquid form. Mixed wastes amenable to treatment will be brought to the 325 section for treatment prior to disposal, and dangerous wastes will be brought to the 3100 section for treatment prior to disposal. Proposed treatments include neutralization, grouting/stabilization, and ceramic melting. The goal of these treatments is to render wastes non-toxic.

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2.2 TOPOGRAPHIC MAP [B-2]

Plate 2-1 in Appendix 2A is a topographical map, showing a distance of at least 1,000 feet (305 meters) around the HWTU. This map contains the following:

- Map scale
- Date
- The boundary of the Hanford Site
- Surrounding land use, including the Saddle Mountain National Wildlife Refuge and the State Game Reserve to the north, the City of Richland to the south, Rattlesnake Mountain Arid Lands Ecology (ALE) Reserve located to the west, and farmlands or game reserves to the east
- Contours sufficient to show surface water flow
- Locations of the various areas described in Section 2.1.1
- Fire control facilities located on the Hanford Site

- Locations of access roads, internal roads, railroads, and perimeter gates and barricades

- Latitudes and longitudes.

A topographic map of the 300 Area, divided into plates numbered one through twelve, is provided in Appendix 2A.

Plates 2 through 12 in Appendix 2A, in conjuction with Figure 2-2, provide a detailed representation of the area where the HWTU is located. These maps provide a detailed profile of the unit and a distance of 1,000 feet (305 meters) around it at a scale of 1 inch equals 40 feet (1 centimeter equals 4.8 meters). Contour intervals are shown at every foot and provide sufficient detail of surface waters and flow, access control, buildings, structures, fire control facilities, etc., to meet the requirements of WAC 173-303-806(4)(a)(xviii).

Figure 2-3 illustrates wind roses for various locations on the Hanford Site. Winds are predominantly from the west. The predominant wind direction for the Hanford Site is southwest and the average wind velocity is 14.7 fps (4.5 m/s).

2.3 LOCATION INFORMATION [B-3]

This section describes the locations of the HWTU in relation to seismic, floodplain, and shoreline considerations.

2.3.1 Seismic Consideration [B-3a]

The HWTU is located in Benton County, Washington, and is not within one of the political jurisdictions identified in Appendix VI of Title 40 Code of Federal Regulations (CFR) Part 264, nor is it covered in the requirements listed in WAC 173-303-806(4)(a)(xi). Therefore, no further demonstration of compliance with the seismic standard is required.

2.3.2 Floodplain Standard [B-3b]

The HWTU is located in the 300 Area, which is adjacent to the Columbia River, approximately at river mile 345. Floods of the Columbia River were considered for determining compliance with floodplain standards. Floods of other water bodies (i.e., the Yakima River and ephemeral streams on the Hanford Site) were not considered because of their great distance when compared to the distance to the Columbia River.

Large Columbia River floods have occurred in the past (DOE 1987), but the likelihood of recurrence of large-scale flooding has been reduced by the construction of several flood control/water storage dams upstream of the Site. Major floods on the Columbia River are typically the result of rapid melting of the winter snowpack over a wide area augmented by above-normal precipitation. The maximum historical flood on record occurred June 7, 1894, with a peak discharge at the Hanford Site of 21,000 m^3/s (742,000 cfs). The largest recent flood took place in 1948 with an observed peak discharge of 20,000 m^3/s (706,000 cfs) at the Hanford Site. The probability of flooding at the magnitude of the 1894 and 1948 floods has been greatly lowered because of upstream regulation by dams.

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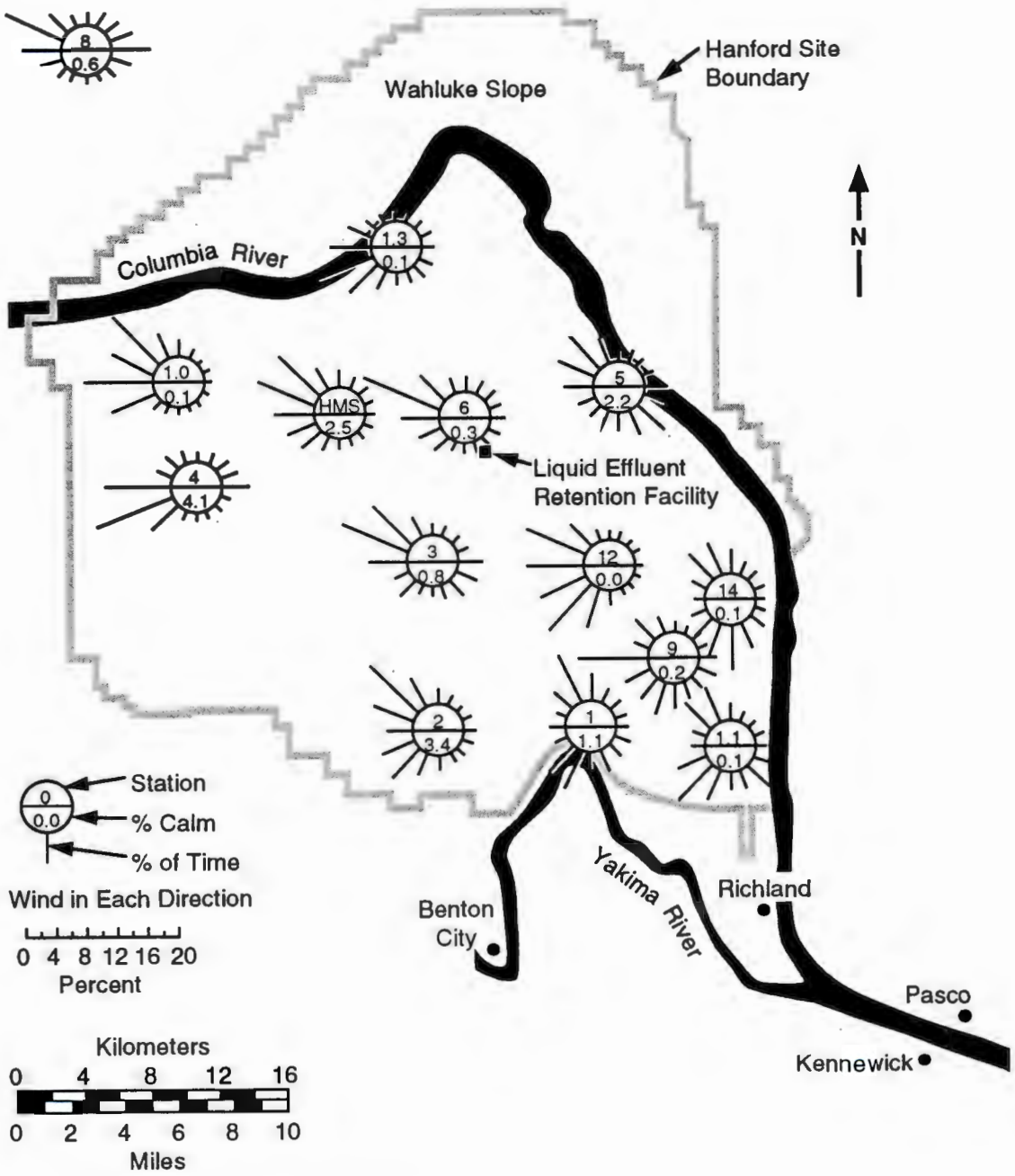

FIGURE 2-3. Wind Roses

One hundred-year floodplains are identified in flood insurance rate maps developed by the Federal Emergency Management Agency (FEMA). The FEMA maps for Benton County, Washington, do not include the Hanford Site. Determination of whether the HWTU is located in a 100-year floodplain, therefore, was made by comparing the land surface elevation at the HWTU with the nearest downstream 100-year flood base elevation identified on the FEMA maps for Benton County. The nearest 100-year floodplain identified on the Benton County FEMA maps is at Columbia Point, approximately nine miles downstream of the HWTU at river mile 336.

The FEMA map for this area (FEMA 1982) identifies a 100-year flood base elevation of 352 feet above mean sea level (AMSL). This elevation is significantly below the elevation of the 325 section and the 3100 section, which are 387 feet and 390 feet AMSL respectively.

The potential for the HWTU to be inundated during a flood was also evaluated using the probable maximum dam-regulated flood for the Columbia River, which is greater than the 100-year flood.

The Army Corps of Engineers (COE) has calculated the maximum probable dam-regulated flood for the Columbia River based on the upper limit of precipitation falling on a drainage area and other hydrologic factors such as antecedent moisture conditions, snowmelt, and tributary conditions that could lead to maximum runoff. The probable maximum flood for the Columbia River below Priest Rapids Dam has been calculated to be 1.4 million cubic feet per second (COE 1969). This flood would inundate the 100 Area adjacent to the Columbia River, but the central portion of the Hanford Site would be unaffected (DOE 1987). Figure 2-4 shows those portions of the 300 Area of the Hanford Site which would be affected by the probable maximum flood. According to COE projections, the probable maximum flood would result in flood elevations of 382 feet AMSL. The lowest location of the HWTU is at 387 feet AMSL. Because the facility is constructed on relatively flat topography, the 5-foot differential between the maximum flood level and the elevation of the unit corresponds to an areal separation of approximately 1,500 feet (to the east). Therefore, the HWTU is safe from flooding and thus meets the floodplain standard.

Because the location of the HWTU is not within the boundary of the 100-year floodplain, no demonstration of compliance is required.

2.3.2.1 Demonstration of Compliance [B-3b(1)]. Because the location of the HWTU is not within the 100-year floodplain, no demonstration of compliance is required.

2.3.2.1.1 Floodplain Proofing and Flood Protection Measures [b-3b(1)(a)]. Because the HWTU is not within the 100-year floodplain, no demonstration of compliance is required.

2.3.2.1.2 Flood Plan [B-3b(1)(b)]. Because the HWTU is not within the boundary of the 100-year floodplain, no demonstration of compliance is required.

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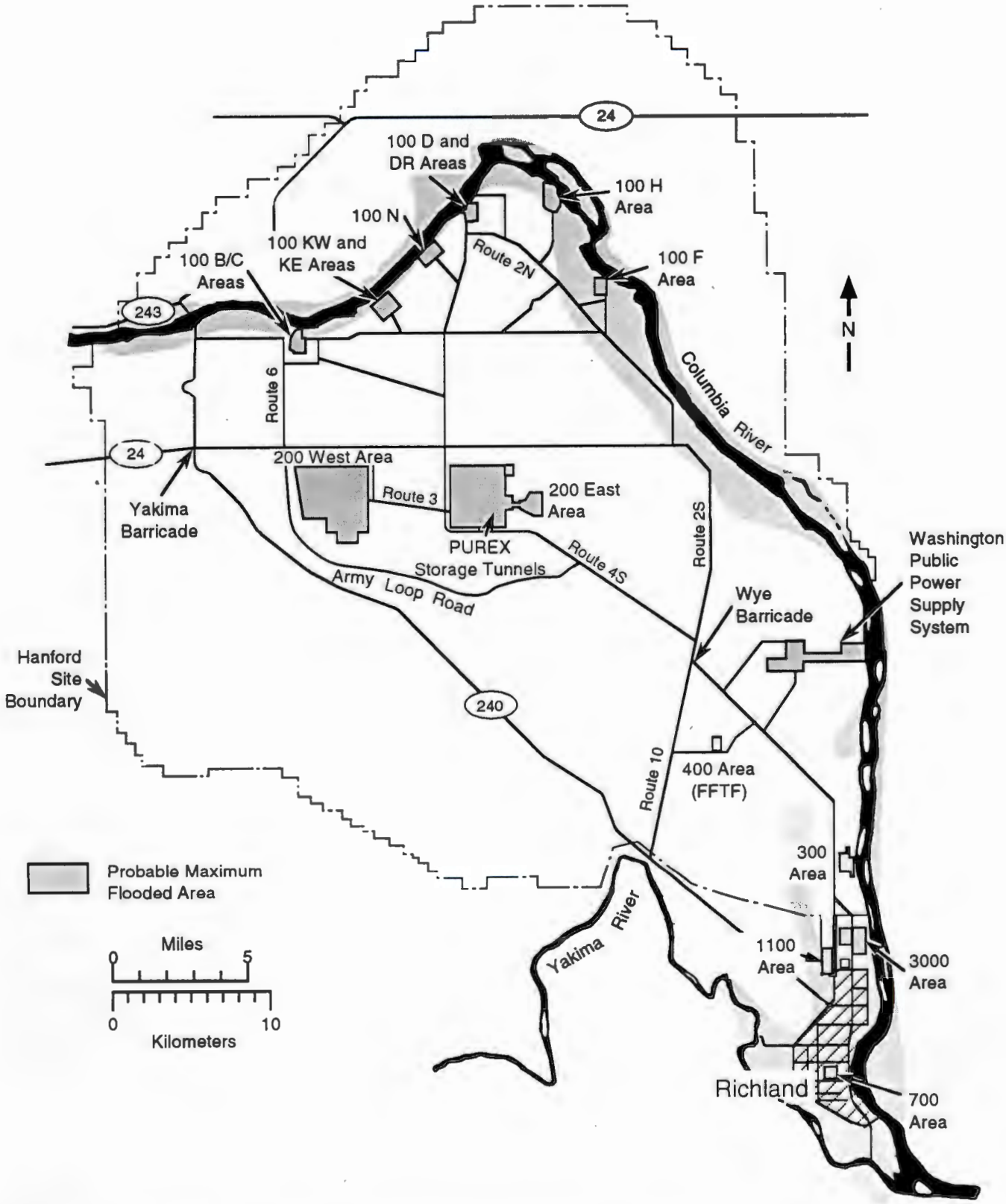

FIGURE 2-4. Areas Affected by the Probable Maximum Flood of the Columbia River

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2.3.2.2 Plan for Future Compliance with Floodplain Standard [B-3b(2)]. Because the location of the HWTU is not within the 100-year floodplain, no demonstration of compliance is required.

2.3.3 Shoreline Standard [B-3c]

The HWTU is not located within "shorelines of the state" or "wetlands" as defined in the Shoreline Management Act of 1971 (Revised Code of Washington [RCW], 90.58.030[2]). (The HWTU is located approximately 2,600 feet from the Columbia River, the nearest "shoreline of state-wide significance" as defined in the Shoreline Management Act.) The HWTU is not within a wetland area (i.e., within 200 feet of the high water mark).

The Hanford Site is owned by the U.S. Government and operated by DOE-RL. The Hanford Site has been used for production and test reactor operation and related activities since 1943. The Hanford Site is not classified as natural conservancy, rural, or residential.

2.3.4 Sole Source Aquifer Criteria [B-3d]

The HWTU is not located over a sole source aquifer as defined in Section 1424 (e) of the Safe Drinking Water Act of 1974. Therefore, no demonstration of compliance is required.

2.4 TRAFFIC INFORMATION [B-4]

The Hanford Site is traversed by numerous primary and secondary roads as shown by Figure 2-5. An enlarged view of the 300 Area indicating roads can be found in Figure 2-2. Roadways on the Hanford Facility, excluding State Highways 240 and 24, are restricted to authorized personnel. Other U. S. Department of Energy roads are subject to such restriction as the U. S. Department of Energy may determine appropriate. The majority of the site traffic consists of light-duty vehicles and buses used to transport employees to various sites within the Hanford boundary. Primary routes include Routes 4S, 10, 4N, 2N, 1, 6, and 11A, as well as various avenues within the site boundary. The primary routes are constructed of bituminous asphalt (usually 2 inches thick, but the thickness of the asphalt layer will vary with each road) with an underlying aggregate base in accordance with U.S. Department of Transportation (DOT) requirements. The secondary routes are constructed of layers of an oil and rock mixture with an underlying aggregate base. The aggregate base consists of various types and sizes of rock found on site.

Access to the 300 Area by vehicular traffic is by Stevens Drive and George Washington Way (see Figure 2-2). There is no traffic control regulating the entry to the 300 Area from Stevens (Route 4s) onto Cypress. Reentry to Stevens from Cypress is regulated by a stop sign. Traffic on Stevens Drive consists of personal vehicles, buses for the transport of personnel to and from work, and light or medium duty trucks for the transport of materials. Traffic on the capillary routes will be private vehicles destined for designated parking areas, buses for the transport of personnel to and from work, and light or medium duty trucks for the transport of materials.

Personnel will have pedestrian access only to the 325 section throughmanned security checkpoints. Parking will be in the designated general parking areas

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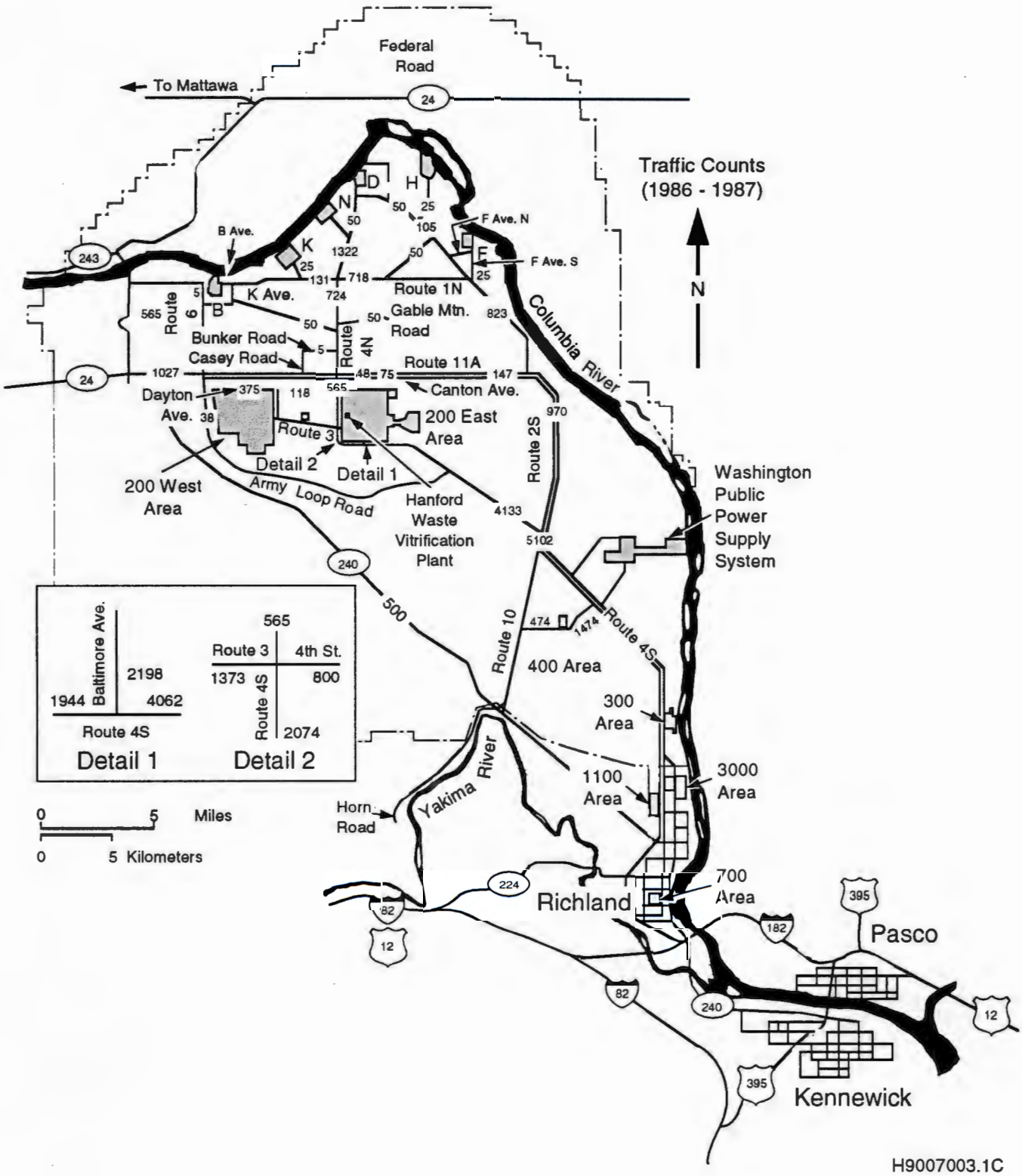

FIGURE 2-5. Estimated Traffic Volume (Vehicles/Day)

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in the south part of the 300 Area. New parking will be provided for 3100 section. Vehicular traffic to the 325 section is limited to DOE-owned vehicles only and will be through a single manned security checkpoint. No new routes will be needed. An estimated one or two shipments of waste per day will be delivered or removed from the 325 section. However, most of these shipments will consist of a few small containers of waste from nearby research laboratories. They will be received at the loading/unloading docks.

Personnel will have access to the parking area adjacent to the 3100 section via the Cypress Street gate and George Washington Way gate. This parking area, which will be located at the corner of Cypress Street and Arizona Street, will be new. The estimated increase in vehicular traffic on Cypress Street as a result of this new parking will be approximately 10 additional vehicles per day. Vehicular access for light and medium duty trucks to the 3100 section for the shipment of materials will be via Arizona Street. An estimated one or two shipments of waste per day will be delivered to or removed from the 3100 section.

Wastes transported to the HWTU over public roads will be accompanied by a manifest in accordance with Section 2.8.

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2.5 PERFORMANCE STANDARD [B-5]

The HWTU is designed to minimize exposure of personnel to hazardous and MW and to prevent waste from reaching the environment. In addition, measures are taken to ensure that the HWTU is maintained and operated in a manner that prevents the following:

- 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 HWTU
- 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 HWTU

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

2.5.1 Measures to Prevent Degradation of Groundwater Quality

Degradation of groundwater quality will be prevented by storing containers awaiting treatment inside the HWTU in enclosed storage areas which have sealed

concrete floors, curbing, and sumps. Containers will be opened in areas with spill containment. Unit design and administrative controls significantly reduce the possibility of loss of waste to the ground and/or contamination of the groundwater. Water used for fire suppression will be contained within the HWTU. For capacities for containment system see Section 4.1.1.6.

2.5.2 Measures to Prevent Degradation of Surface Water Quality

The potential for degradation of surface water quality will be extremely low due to the manner in which the unit is designed and will be operated. All waste-handling activities (e.g., container opening, waste transfer) presenting the opportunity for spills will be conducted inside the unit. All exits from the unit are equipped with spill containment systems to prevent spilled material from leaving the unit. For capacities for containment system see Section 4.1.1.6.

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

Open burning will not be conducted at the HWTU. Air from the 3100 section will be exhausted through carbon absorbers and 85% American Society of Heating, Refrigeration, and Air Conditioning Engineers air filters. The only exception is the process room used for grouting/stabilization. It will be HEPA filtered prior to being discharged. The hoods in the 325 section are equipped with HEPA filters. Stacks emitting exhausts from HEPA filtered areas will be equipped with continuous particulate monitoring in both the 325 section and the 3100 section.

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

The HWTU is located in the 325 Building and the 3100 Building in the 300 Area. The 300 Area is an industrial area; therefore, little if any natural flora and fauna exist. No waste treatment operations will be conducted outside the unit.

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.)

2.5.5 Measures to Prevent Excessive Noise

During normal operations at the HWTU, excessive noise will not be generated. The major sources of noise will be hoods, exhaust fans, and miscellaneous instruments.

2.5.6 Measures to Prevent Negative Aesthetic Impacts

The unit will treat waste using approved methods within the confines of the 325 Building and the 3100 Building. The appearances of these buildings are similar to neighboring buildings. For these reasons, the unit will present no negative aesthetic impacts.

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2.5.7 Measures to Prevent Unstable Hillsides or Soils

The area is flat with little to no potential for landslides. The soil consists of alluvial sands and gravels.

2.5.8 Measures to Prevent the Use of Processes that do not Treat, Detoxify, Recycle, Reclaim, and Recover Wastes to the Extent Economically Feasible

The HWTU will use the applicable processing technology to ensure that the methods selected will treat, detoxify, recycle, reclaim, or recover wastes. As research and development identify new methods of treatment, and as new methods are promulgated, these new methods may be incorporated as standard processing techniques.

After treatment at the HWTU, waste management options for dangerous wastes being shipped from the HWTU will be evaluated according to the following order of preference:

1. Recycling
2. Further Treatment
3. Land Disposal.

The HWTU operations staff endeavors to use this hierarchy without regard to minor variations in cost. For example, if recycling is slightly more expensive than land disposal, recycling is used. See Section 10.0, the Waste Minimization Plan, for a discussion of recycling and reuse options.

2.5.9 Measures to Prevent Endangerment to the Health of Employees or the Public Near the Facility

The HWTU is within the 300 Area, which abuts the corporate limits of the City of Richland. There is no public access to the 300 Area; therefore, members of the public cannot gain access to the HWTU. Exposure of members of the public or employees to dangerous and mixed waste constituents will be prevented through administrative controls over the designation, packaging, loading, transporting, and treatment of the wastes received at the HWTU. In addition, physical controls exist (i.e., spill containment systems) to prevent release of wastes or waste constituents in the event of a spill.

Employees will be properly trained before handling wastes (Chapter 8.0). The training will include dangerous waste handling, emergency response, and workplace safety. Protective equipment, emergency response equipment, safety data, and hazardous materials information will be supplied by operations management and will be readily available for employee use. Employees will be given yearly updates to ensure that proper safety techniques are used.

An aggressive inspection program will be implemented to uncover situations which could lead to personnel or environmental hazards (Chapter 6.0).

A contingency plan, including emergency response procedures, is in place and will be 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.

2.6 BUFFER MONITORING ZONES [B-6]

Requirements for buffer monitoring zones have been deleted from WAC 173-303-440. Therefore, no discussion of the checklist items under buffer monitoring zones [B-6] will be included in this permit application.

2.7 SPILLS AND DISCHARGES INTO THE ENVIRONMENT [B-7]

Chapter 7.0 discusses the procedures that will be followed to ensure immediate response to a spill or discharge of wastes or hazardous substances from the HWTU to the environment and the immediate notification of authorities. As a convenience, checklist items listed below are cross-referenced to the appropriate section or sections of Chapter 7.0.

2.7.1 Notification [B-7a]

Information regarding notifications made to authorities in the event of a nonpermitted spill or discharge of wastes or hazardous substances into the environment is included in Section 7.4.1.

2.7.2 Mitigation and Control [B-7b]

Actions taken to protect human health and the environment in the event of a spill or discharge are discussed in Sections 7.4.1 through 7.4.4. Additional information describing the responses to container spills or leaks is included in Section 7.4.9.

2.7.2.1 Cleanup of Released Wastes or Substances [B-7b(1)] Actions taken to clean up all released hazardous/dangerous wastes or hazardous substances and the criteria used to determine the extent of removal are described in Section 7.4.6.

2.7.2.2 Management of Contaminated Soil, Waters, or Other Materials [B-7b(2)] Storage and treatment of released materials are discussed in Section 7.4.6. All soil, waters, or other materials contaminated by a spill or discharge will be treated, stored, or disposed of in accordance with WAC 173-303. The wastes will be subject to the review process described in Chapter 3.0.

2.7.2.3 Restoration of Impacted Area [B-7b(3)] Due to the location of the HWTU within the 325 Building and the 3100 Building and due to the presence of spill containment systems, no spills or discharges are likely to occur on property which is not owned by the U.S. Government.

2.8 MANIFEST SYSTEM [B-8]

Some wastes must be transported to the HWTU on public highways or roads. Such wastes will be manifested as if they were from offsite sources. Similarly, if wastes are transported from the HWTU to other waste management units on the Hanford Site using public roads or to offsite treatment or

disposal facilities, these shipments must be accompanied by a Uniform Hazardous Waste Manifest. In addition to the Uniform Hazardous Waste Manifest, wastes subject to land disposal restrictions which are shipped from the HWTU to offsite treatment, storage, or disposal facilities are accompanied by the applicable notifications and certifications required under 40 CFR 268.

The Hanford Site has one EPA/State identification number as required by WAC 173-303-060, and all units on the Hanford Facility are part of a single dangerous waste facility; therefore, wastes generated within the Hanford Site which are not transported over public highways are not subject to manifest requirements under WAC 173-303. Such wastes will be tracked using the Hanford tracking system.

The following sections provide information on receiving shipments, response to manifesting discrepancies, and provisions for nonacceptance of shipments.

2.8.1 Procedures for Receiving Shipments [B-8a]

The following procedures will be used prior to transport of wastes to the HWTU. First the generator must submit a waste treatment information form (see Chapter 3.0 for details) to HWTU personnel. The HWTU operations staff will then review this form to determine the accuracy of the dangerous waste designation. The waste may then be inspected by the HWTU operations staff to verify the information contained on the request form and to verify that the waste is properly containerized. If a discrepancy is noted (i.e., the waste is not as described on the request form, the generator has insufficient supporting data to verify the waste characteristics, or subsequent analyses demonstrates a discrepancy as described in Section 3.3.3.) or if the waste is improperly packaged, it will not be accepted. In this case, deficiencies will be explained to the generator, who will then be responsible for correcting them. If transport will be over public roads, a Uniform Hazardous Waste Manifest will be prepared, identifying the HWTU as the receiving unit. The HWTU operations staff will sign and date each copy of the manifest to certify that the dangerous waste covered by the manifest was received. The transporter will be given at least one copy of the signed manifest. A copy of the manifest will be returned to the generator within 30 days of receipt at HWTU. A copy of the manifest will also be retained in the HWTU operating record.

2.8.2 Response to Significant Discrepancies [B-8b]

The procedures described in Section 2.8.1 are designed to prevent significant discrepancies. It is the responsibility of Waste Management (WM) or HWTU staff to inspect wastes prior to shipment to the HWTU to ensure that they are properly characterized, labeled, and packaged. This inspection serves to identify and correct discrepancies before wastes are shipped. For shipments transported on public roads, manifests will be prepared by WM staff. Significant discrepancies, as defined by WAC-173-303-370 (4), will be noted on the manifest and properly reported.

Manifested waste shipments received at the HWTU will be inspected to determine if there are any manifest discrepancies. Wastes will not be accepted unless the discrepancy or discrepancies can be resolved with the generating unit at

the time the shipment is received. Manifest discrepancies requiring such resolution include:

- Any inaccuracy in piece counts in containerized shipments (underages or overages);
- Type mismatches (i.e., the waste is not as described on the request form, obvious inaccuracies such as waste acid substituted for waste solvent).

Manifest information will also be considered incorrect if the written description of wastes does not agree with visual observations, or if observed weights or volumes differ by more than 10 percent from those described on the manifest.

If a discrepancy is noted, the generating unit will be contacted immediately. The waste will not be accepted until the discrepancy is resolved. Once the cause of the discrepancy is identified, and the generating unit and the HWTU have concurred as to resolution of the discrepancy, the manifest will be corrected. Corrections will be made by drawing a single line through the incorrect entry and entering the correct information. Corrected entries will be initialed and dated by the individual making the correction. Once the manifest has been corrected, the discrepancy will be considered resolved.

If the discrepancy cannot be resolved within 15 days of receipt of the shipment, the HWTU will file the report required by WAC 173-303-370(4)(b) as described in Section 12.4.1.1.

2.8.3 Provisions for Nonacceptance of Shipment [B-8c]

Provisions for nonacceptance of shipments are discussed in the following sections.

2.8.3.1 Nonacceptance of Undamaged Shipment [B-8c(1)] As described in Section 2.8.1, all wastes will be inspected by staff from WM or HWTU prior to shipment. This procedure is designed to prevent receipt of nonacceptable wastes. HWTU operations staff will reject wastes which are nonacceptable at the HWTU.

2.8.3.2 Activation of Contingency Plan for Damaged Shipment [B-8c(2)] Damaged containers will not be accepted from the generator. If a shipment of waste is damaged during transport and arrives in a condition which poses a hazard to public health or the environment, the unit contingency plan will be implemented as described in Chapter 7.0.

2.8.4 Unmanifested Waste

Waste generated within the Hanford Site is not transported over public highways and is not subject to manifest requirements under WAC 173-303. Such waste may be received at the HWTU without a manifest.

If transport is by public roadways or highways, a manifest must be used. Shipments requiring a manifest and not having one will be rejected, or, at the discretion of the unit operator, be accepted and an unmanifested waste report described in WAC 173-303-390(1) will be prepared.

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3.0 WASTE CHARACTERISTICS [C]

This chapter provides information on the chemical, biological, and physical characteristics of waste treated at the HWTU. A waste analysis plan is included to describe the methodology for determining the waste types.

3.1 CHEMICAL, BIOLOGICAL, AND PHYSICAL ANALYSIS [C-1]

The dangerous and mixed waste managed at the HWTU can be categorized as originating from five basic sources:

- Waste from nonspecific sources
- Discarded commercial chemical products
- Waste from research activities using radioactive isotopes
- Waste from chemicals synthesized or created in research laboratories
- Discarded commercial products exhibiting dangerous waste characteristics and/or criteria.

Each of these waste categories is discussed below, including waste descriptions, hazard characteristics, and bases for hazard designations. This information includes that which must be known to treat, store, or dispose of the wastes, as required under WAC 173-303-806(4)(a)(ii).

<u>Waste from Nonspecific Sources</u>. Waste from nonspecific sources consists of those listed wastes identified in WAC 173-303-9904. The Part A permit application for the HWTU identifies the following wastes from this category:

- F001 - Spent halogenated degreasing solvents and sludges
- F002 - Spent halogenated solvents and still bottoms
- F003 - Spent nonhalogenated solvents and still bottoms
- F004 - Spent nonhalogenated solvents and still bottoms
- F005 - Spent nonhalogenated solvents and still bottoms
- F027 - Discarded polychlorinated phenol formulations or compounds derived from these

These halogenated and nonhalogenated solvents are in the form of spent solvents; no still bottoms are generated. Degreasing solvents (F001), as well as spent halogenated solvents (F002), are used primarily in research although some commercial applications do exist (e.g., printing, duplicating). Spent nonhalogenated solvents (F003, F004, and F005) also come primarily from research laboratories. Manufacturing activities are not performed at Hanford; therefore, dangerous wastes from specific sources (WAC 173-303-9904 "K" Wastes) are not generated.

The F wastes are designated on the basis of the generator's knowledge(e.g., information from container labels or material safety data sheets), or by sampling. Sampling is performed if the generating unit does not have information to document the composition and characteristic of the waste. The

waste generator is responsible for specifying the characteristics of the waste on the basis of knowledge of the chemical products used (i.e., information supplied by the manufacturer) and the process generating the waste. These listed wastes are all designated as dangerous waste (DW) unless the generator determined through process knowledge (i.e., knowledge of materials used and concentrations used) that wastes F001 or F002 contain greater than 1% halogenated hydrocarbons. Wastes with greater than 1% halogenated hydrocarbons are designated as extremely hazardous waste (EHW).

Discarded Chemical Products. Discarded chemical products consist of those products listed in WAC 173-303-081. The Part A permit application identifies all of the discarded chemical products listed in WAC 173-303-9903 (P001 through P123 and U001 through U359, non inclusive) and specifies an estimated maximum annual management quantity. Only a few of these wastes are typically generated at any one time. The Part A application listed all of these wastes, however, because the wide variety of research activities conducted at Hanford presents the potential to generate any of these wastes.

Wastes in this category are designated on the basis of the generator's knowledge. As these wastes are usually in original containers, information on the container label is verified by generator knowledge (i.e., knowledge that material is in its original container) and is used to identify contents. Wastes in "as procured" containers (i.e., original container with intact label) are not sampled. These listed wastes contain those designated as DW as well as those designated as EHW.

Waste from Research Activities Using Radioactive Isotopes. Dangerous waste from research activities using radioactive isotopes are MW. These wastes are generated in laboratories performing chemical and physical research, and consist primarily of radiologically contaminated chemicals. These wastes are designated on the basis of the generator's knowledge or on the basis of sampling and analysis. The generator's knowledge is used if the generator has kept accurate records of the identities and concentrations of constituents present in the waste. For example, many generating units keep log sheets for accumulation containers in satellite areas to keep a record of waste constituents. If information available from the generator is inadequate for waste designation, the wastes are sampled (as described in Section 3.2) and the results of the analysis are used for designation. These wastes include those designated as dangerous waste mixtures under WAC 173-303-084 and also those designated as characteristic dangerous wastes under WAC 173-303-090. The Part A permit application includes all categories of toxic, persistent, and carcinogenic waste mixtures (i.e., both DW and EHW). While not all of these wastes are currently generated or have been generated, the wide variety of research activities conducted at Hanford presents the potential that these wastes could be generated and require subsequent management at the HWTU. Similarly, the Part A permit application includes the characteristic dangerous waste categories D001 through D043 (i.e., ignitable, corrosive, reactive, and TCLP toxic due to metals or organic content).

Wastes from Chemicals Synthesized or Created in Research Laboratories. Wastes from chemicals synthesized or created in research laboratories typically consist of organics in quantities of 3.5 ounces (100 grams) or less, received in small containers.

These wastes are designated on the basis of the generator's knowledge or on the basis of sampling and analysis. The generator's knowledge is used if the generating unit has kept accurate records of the identities and concentrations of constituents present in the waste (e.g., log sheets for accumulation containers). If information available from the generating unit is inadequate for waste designation, the wastes are sampled (as described in Section 3.2) and the results of the analysis are used for designation. These wastes include those designated as dangerous waste mixtures under WAC 173-303-084 and also those designated as characteristic dangerous waste under WAC 173-303-090. The Part A permit application includes all categories of toxic, persistent, and carcinogenic waste mixtures (i.e., both DW and EHW). While not all of these wastes are currently generated or have been generated, the wide variety of research activities conducted at Hanford presents the potential that these wastes could be generated and require subsequent management at the HWTU.

The waste in this category could include those designated as either DW or EHW.

<u>Discarded Commercial Products Exhibiting Dangerous Waste Characteristics and/or Criteria</u>. Many discarded chemical products handled in the HWTU are not listed in WAC 173-303-9903 and are still considered dangerous waste since they exhibit at least one dangerous waste characteristic and/or criterion (WAC 173-303-090 and WAC 173-303-084). These wastes are included with those listed in the Part A permit application under waste codes D001 through D043, WT01, WT02, WP01, WP02, WP03, WC01, and WC02. These wastes are typically received in the manufacturer's original container.

Wastes in this category are designated based on the generator's knowledge. As these wastes are usually in their original containers, information on the container label is verified by the generator's knowledge and is used to identify the contents. These wastes contain those designated as DW as well as those designated as EHW.

3.1.1 Containerized Waste [C-1a]

The container storage areas in the HWTU meets or exceeds the containment system requirements of WAC 173-303-630(7)(c). Testing or documentation that the dangerous wastes stored do not contain free liquids is not required at the unit.

3.1.2 Waste in Tank Systems [C-1b]

Operation of the HWTU does not involve the storage of dangerous waste in tank systems. Therefore, the requirements of WAC 173-303-640 are not applicable.

3.1.3 Waste in Piles [C-1c]

Operation of the HWTU does not involve the placement of dangerous waste in piles. Therefore, the requirements of WAC 173-303-660 are not applicable.

3.1.4 Landfilled Wastes [C-1d]

Operation of the HWTU does not involve the placement of dangerous wastes in landfills. Therefore, the requirements of WAC 173-303-665 are not applicable.

3.1.5 Wastes Incinerated and Wastes Used in Performance Tests [C-1e]

Operation of the HWTU does not involve the incineration of dangerous waste or the use of waste in performance tests. Therefore, the requirements of WAC 173-303-670 are not applicable.

3.1.6 Wastes to be Land Treated [C-1f]

Operation of the HWTU does not involve the land treatment of dangerous waste. Therefore, the requirements of WAC 173-303-655 are not applicable.

3.2 WASTE ANALYSIS PLAN [C-2]

This section describes the procedures used to obtain the information necessary to manage wastes in accordance with the requirements of WAC 173-303. A flowchart has been included to indicate flow of information used to manage wastes (Figure 3-1).

3.2.1 Parameters and Rationale [C-2a]

Waste testing parameters and the rationale for these parameters are summarized in Table 3-2. Most of the information necessary to manage wastes is obtained from generating units without the need to perform detailed chemical, physical, and biological analysis. This approach is used for the following reasons:

- Most of the wastes managed at the HWTU are generated on the Hanford Facility and/or by PNL research programs; effective administrative control can be maintained over individual waste generating units (i.e., the same organization generates the wastes and operates the unit);

- Most of the wastes managed at the HWTU are discarded chemical products for which knowledge of waste characteristics is available without further analysis; and

- Many of the wastes managed at the HWTU result from research activities which are carefully controlled and documented; this information includes information on chemical constituents.

The chemical and physical characteristics of waste accepted for treatment at the HWTU will be adequately identified by analytical and/or process knowledge provided by the generator. This information will be necessary to accept, store, treat, and dispose of the waste. Waste review decisions will be made by the HWTU Operator or designee.

To profile a waste for acceptance, the generator must, at a minimum, provide a waste treatment information form. If an analysis will be used to identify the wastes, the analysis characterizing the waste must also be submitted. Detailed inventories of waste accumulated, MSDSs, process descriptions, and instrumental or wet chemistry analysis will be used to determine if the waste is acceptable.

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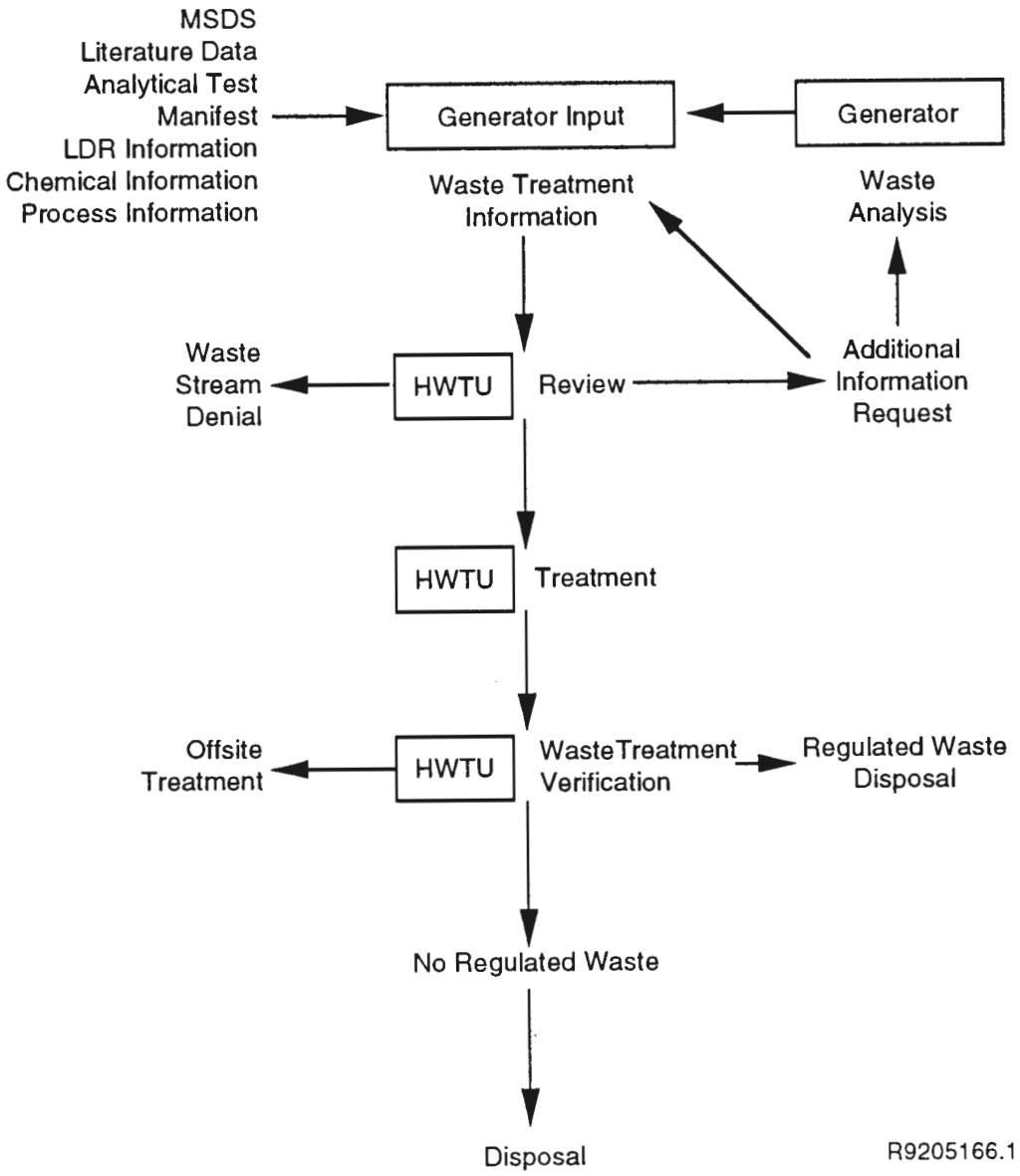

FIGURE 3-1. Flow Chart of Waste Management Information

TABLE 3-2. Summary of Test Parameters, Rationales, and Methods

Waste Type	Parameter	Rationale	Test Method
Spent halogenated solvent mixtures	Halogenated hydrocarbon content	Persistent dangerous waste per WAC 173-303-084(6)	WDOE persistence testing
	Flash point	Ignitable waste per WAC 173-303-090(5); Flammable waste storage limits	Pensky-Martens closed cup Setaflash closed cup
	Halogenated organic compounds	Land disposal restrictions for solvent and California List wastes	TCLP leachate Volatile organic compounds by GC/MS[1] Semivolatile organic compounds by GC/MS
	PCB content	Land disposal restrictions for California List wastes	TCLP leachate PCBs by GC[2]
Spent nonhalogenated solvent mixtures	Flash point	Ignitable waste per WAC 173-303-090(5); Flammable waste storage limits per UFC	Pensky-Martens closed up Setaflash closed up
	PCB content	Land disposal restrictions for California List wastes	TCLP Leachate PCBs by GC
Waste oils	Flash point	Ignitable waste per WAC 173-303-090(5); Flammable waste storage limits; Flammable waste oil subject to requirements under WAC 173-303-515 when burned for energy recovery	Pensky-Martens closed up Setaflash closed up

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TABLE 3-1. (Cont'd)

Waste Type	Parameter	Rationale	Test Method
Waste oils (continued)	PCB content	PCB contaminated wastes with less than 50 ppm PCB may be listed under WAC 173-303-9904; Waste oil with greater than 2 ppm PCB subject to requirements under WAC 173-303-515 when burned for energy recovery	PCBs by GC
	EP toxicity	EP toxic characteristic waste per WAC 173-303-090(8); Waste oil with elevated levels of As, Cd, Cr, Pb subject to requirements under WAC 173-303-515 when burned for energy recovery	EP metals by AA[3]
	Halogenated hydrocarbon content	Persistent dangerous waste per WAC 173-303-084(6); Waste oil with elevated halogens subject to WAC 173-303-510 or -515 when burned for energy recovery	WDOE persistence testing
Aqueous waste	Corrosivity	Corrosive characteristic waste per WAC 173-303-090(6), Land disposal restrictions for California List wastes	pH measurement; steel corrosion rate
	Reactivity	Reactive characteristic waste per WAC 173-303-090(7)	Sulfide - iodometric Cyanide - colorometric
	Toxicity Character-istic	Characteristic waste per WAC 173-303-090(8), Land disposal restrictions for California List wastes	TCLP Leachate EP metals by AA Pesticides by GC

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TABLE 3-1. (Cont'd)

Waste Type	Parameter	Rationale	Test Method
Aqueous Waste (continued)	Toxicity	Toxic waste mixtures per WAC 173-303-084(5)	Metals by ICP Volatile organic compounds by GC/MS Semivolatile organic compounds by GC/MS
Organic waste	Flash point	Ignitable waste per WAC 173-303-090(5); Flammable waste storage limits	Pensky-Martens closed up Setaflash closed up
	Toxicity	Toxic waste mixtures per WAC 173-303-084(5)	Volatile organic compounds by GC/MS Semivolatile organic compounds by GC/MS Toxicity tests
	Halogenated hydrocarbon	Persistent dangerous waste per WAC 273-303-084(6)	WDOE persistence testing
	Polycyclic aromatic hydrocarbon content	Persistent dangerous waste per WAC 173-303-084(6)	WDOE persistence testing

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TABLE 3-1. (Cont'd)

Waste Type	Parameter	Rationale	Test Method
Organic waste (continued)	PCB content	PCB contaminated wastes with less than 50 ppm PCB may be listed under WAC 173-303-9904	PCBs by GC
	Halogenated organic compounds	Land disposal restrictions for solvent and California List wastes	TCLP leachate Volatile organic compounds by GC/MS Semivolatile organic compounds by GC/MS
	Free liquids	Land disposal restrictions for liquid wastes	Paint filter test
Unknown solid	Corrosivity	Corrosive characteristic waste per WAC 173-303-090(6)	pH measurement
	Reactivity	Reactive characteristic waste per WAC 173-303-090(7)	Impact apparatus
	TCLP toxicity	TCLP toxic characteristic waste per WAC 173-303-090(8)	TCLP leachate EP metals by AA Pesticides by GC
	Toxicity	Toxic waste mixtures per WAC 173-303-084(5)	Metals by ICP Volatile organic compounds by GC/MS Semivolatile organic compounds by GC/MS Toxicity tests

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TABLE 3-1. (Cont'd)

Waste Type	Parameter	Rationale	Test Method
Unknown Solid Waste (continued)	PCB content	PCB contaminated wastes with less than 50 ppm PCB may be listed under WAC 173-303-9904	PCBs by GC
	Halogenated organic compounds	Land disposal restrictions for solvent and California List wastes	TCLP leachate Volatile organic compounds by GC/MS Semivolatile organic compounds by GC/MS
	Fee liquids	Land disposal restrictions for liquid wastes	Paint filter test

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Notes:

[1]GC/MS - Gas Chromatography/Mass Spectroscopy

[2]GC - Gas Chromatography

[3]AA - Atomic Absorption

[4]ICP - Inductively Coupled Plasma Emission Spectroscopy

All accompanying information is filed by a unique ("reference") number to be used for internal tracking. This information will also be stored in a PNL-maintained computer system. The HWTU will be equipped with a computer terminal for access to that system. A file will be maintained by HWTU operations staff so amendments and upkeep of the file will be accomplished in a timely manner. Active files are located in the record storage area in the 3100 section; the 325 section active files are accessible via the 3100 section record storage.

3.2.1.1 Technical Review Process Overview. This program is designed to obtain the waste information required pursuant to 40 CFR 265.13 and WAC 173-303-300. The technical review will use chemical information, analytical data, and information from the generator regarding the process generating the waste, together with literature reviews and the professional judgement of the reviewer, to determine if a waste will be accepted for storage, treatment and subsequent disposal.

The HWTU Operating Supervisor will administer the waste acceptance program. The review will be conducted by the Research/Waste Treatment Engineer using procedural guidelines and professional judgement. The reviewer, at his/her discretion, may request additional information or require additional analytical data before determining waste acceptability.

The technical review will be conducted with a thorough knowledge of applicable Federal and State regulations and facility operational permits and guidelines. The reviewer will base waste acceptance on that knowledge, as well as his/her own technical knowledge.

Technical review of the waste treatment information form is designed to accomplish three objectives: (1) determine if HWTU can accept the material, (2) identify special handling procedures necessary to safely store the material prior to treatment, and (3) identify treatment technologies that will meet waste minimization efforts and applicable regulatory restrictions (e.g., land disposal restrictions).

Waste minimization is central to the goal of reducing environmental risks and bringing about environmental compliance for continuing operations and for new units at the Hanford Facility. The HWTU waste minimization plan is included as Chapter 10.0.

The waste stream file will include any information submitted by the generator and any literature reviews, records of conversations, etc., completed by the reviewer.

- HWTU Operators will use copies of laboratory test results, specific information on the process which generated the waste, Material Safety Data Sheets, etc., to determine the components of the waste. If

  waste characterization and/or supporting analytical data do not adequately identify the wastes, the reviewer may be unable to correctly judge the waste's acceptability for treatment.

- All information on the form must be certified as true and correct by the generator. The waste description and handling certification on the waste treatment information form must be signed by the generator before a waste stream will be approved for treatment.
- When omissions or discrepancies on the waste treatment information form are found, a reviewer will telephone the contact individual noted on the waste treatment information form for additional information. A telephone note will be made with the individual's response to the questions. Unless otherwise noted, the technical contact listed by the generator will be the person contacted.

- After discussing the situation with the contact and/or requesting the necessary information in writing, an additional information form summarizing the conversation will be completed.

- If additional analytical testing will be necessary, the HWTU operations staff will notify the generator. If testing cannot be performed, the HWTU will not accept the waste.

3.2.1.2 Review Criteria. The waste treatment information form and accompanying documents and any required analyses must provide the information necessary to make decisions concerning waste acceptance or denial, storage requirements, treatments to be performed, legal/regulatory requirements, additional lab work required, potential hazards in safety and handling, and methods to verify that treatment is successful.

This section briefly describes the items that will be considered in the technical review conducted by the HWTU operations staff and the rationale for requesting the information:

Generator Information. The generator, the location of waste generation, and a contact person must be provided. The address used will be for the location of the actual waste generation.

Waste Name. The HWTU will require that a name be given which provides, at a minimum, a tradename, major constituents, or process name.

Process Generating Waste. The HWTU operators may need to know what kind of operation/process produces the waste to correctly classify the waste. Process knowledge provided by the generator will be considered a viable waste identification technique in most situations. Process knowledge for complex chemical processes may be accepted when the generator provides sufficient information indicating that his process knowledge is based upon process design, quality control, mass balance, or previous sampling and analysis.

This information must be as detailed as possible, especially if a laboratory analysis of the waste materials is not being provided.

U.S. EPA/Ecology Waste Code. This portion of the review process will require a thorough knowledge of the waste identification regulations. Using this knowledge and the information provided by the generator, the HWTU operations staff will determine the appropriateness of the generator's waste code selection. This section must specify the Ecology/EPA waste number(s);

indicate that the waste is nonhazardous pursuant to Ecology/EPA; or indicate that the waste is exempt per Ecology/EPA regulations. WM staff will assist in assigning this number if requested.

If the waste code number is one that is covered under the Land Disposal Restrictions (LDR), the proper certifications must accompany the waste treatment information form. If the waste will be manifested, the manifest must also have an LDR certification attached. A land disposal restriction form will be provided as a courtesy to generators to help them fulfill their certification requirements.

The waste treatment information form will arrive with the waste characterization designation in place. If the waste treatment information form reviewer does not feel the waste has been properly coded after examining the process knowledge, the lab analysis or inventories, or the process flow, he may reject the waste for acceptance based on improper codes. The HWTU personnel must be satisfied about all aspects of the waste before acceptance, including waste codes applied.

Analytical Information. Process knowledge provided by the generator during the review for treatment will be carefully evaluated. Unknown wastes, generic names or unsubstantiated information will be unacceptable. Process knowledge will be accepted only if the reviewer is satisfied that it is conclusive and sufficient. Analytical data may be required to identify wastes or to support the information on the waste treatment information form.

If provided, a laboratory report from an in-house or contract laboratory will be reviewed. If there are questions concerning the laboratory report, the certifying chemist will be contacted.

Analytical data provided to substantiate the waste treatment information form must contain the following information:

- Laboratory name and address
- Name of waste that has been analyzed
- Parameter which has been determined to be of interest
- Test method
- Detection limits of method/instrument
- Analytical result
- Signature of certifying chemist

General Information. For in-house information and planning purposes, the generator will be asked to provide waste quantities, shipment frequencies and handling instructions. The latter will provide the HWTU operators with direct generator input for safety concerns.

Certification Statement. The waste treatment information form will not be considered complete until it has been signed by an authorized representative from the generating unit order to provide assurances of data/information accuracy.

3.2.1.3 Additional Information Procurance. The information contained in the waste treatment information form will be the minimum that the HWTU will consider to evaluate waste acceptability. Depending upon the type and relative importance of additional information, such may be obtained by phone conversation or in writing.

When omissions or discrepancies on the waste treatment information form are found, a reviewer will telephone or write the contact individual noted on the waste treatment information form for additional information. After discussing the situation with the contact and/or requesting the necessary information in writing, an additional information request sheet summarizing the conversation will be completed. This sheet, once completed, contains answers to the noted questions and may contain any other information pertinent to the generator's waste. Unless otherwise noted, the technical contact listed by the generator will be the person contacted.

Information to be supplied in writing may arrive in the following forms to satisfy the requirements:

- The generator may mail or fax a letter providing the necessary information. The letter must be signed and dated by a generator representative.

- The information may be placed on the waste treatment information form and sent to the generator for a certifying signature and date.

- HWTU staff may summarize the information obtained by phone and send it to the generator in the form of a letter for confirmation. The letter will contain a certification statement. If the information is correct, the generator must sign and return the entire letter.

3.2.1.4 Characterization Verification. Research wastes generated at Hanford are generally not production by-products or produced as a continuous waste stream. Normally, quantities of waste generated from a specific laboratory total less than 100 pounds (45.4 kilograms) annually, and average less than 10 pounds (4.54 kilograms) per waste stream. In addition, nearly all hazardous waste generated at Hanford is comprised of commercially available chemical products; therefore, it is obtained and will usually be discarded as a well-defined entity (i.e., with original labels in place) or as an easily definable mixture of chemicals resulting from experimental studies. The final waste product will be classifiable to an extreme degree of assurance by the generator of the waste since rigid quality control is required during experimental procedures in research laboratories.

If it is determined that insufficient information is available regarding the waste, a verification analysis may have to be performed by the generator or an off-site laboratory prior to acceptance of waste materials for treatment. The generator will be required to supply a laboratory analysis for the waste materials to be treated. The analysis will be used to determine if the materials presented for treatment contain prohibited chemicals and generally to identify the waste. The overall intent is to protect against improper treatment.

For verification of the waste as provided, generator knowledge will be the most useful mechanism in most cases; however, if the waste is not adequately characterized or if the HWTU Operator has reason to question the waste inventory or believes the inventory may be incomplete, the waste will be subjected to chemical analysis.

Process knowledge will often suggest another line of analysis to be performed to gain sufficient detail to treat a particular waste. For example, F002 spent solvent waste will be detailed by generator knowledge, but the characteristics of the solvent may be unknown, as in paint-stripping operations. In such operations, the generator may know that he/she has rendered methyl ethyl ketone a spent solvent, but may not know that a particular metal was rendered leachable by the process, requiring additional coding and treatment.

If additional analyses are necessary to evaluate the waste, the reviewer will complete a waste analysis request form. The form will specify the additional analyses the generator must provide to completely profile the waste.

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Rationale for Analysis. Characterization verification analysis may be used to confirm that the constituents of the waste are the same as profiled. This will ensure that proper treatment is available for the hazardous constituents of the waste. The determination that waste is a listed waste is truly process-dependent. For example, the presence of methanol in a waste mixture will not automatically result in an F003 code. Rather, the methanol must exist in certain concentrations in a solution used for its solubilizing properties, become unusable, and then be designated for disposal. If the solution is not used in this manner it must only be evaluated for characteristics. Methanol that is technical grade or "off-spec" unused product will be U154, regardless of the concentration, which may be in percentages or in parts per million. The mere presence of a constituent says nothing about the proper identification of the waste; the concentration of constituents is crucial to acceptance and treatment decisions.

The generator may be required to analyze a representative sample from the initial waste shipment. The analyses to be performed may include radioactivity scan, pH, flashpoint, cyanide spot test, sulfide spot test, water reactivity, moisture content, water miscibility, and any other tests deemed necessary.

Parameter Selection Procedure. Testing parameters for each type of waste will be selected to obtain data sufficient to properly manage the wastes. If information on the source of the waste is available, all parameters may not be required. For example, if waste oil is known to be from an area where no PCBs are present, testing for PCB may not be performed.

Verification analysis may be requested to confirm the waste is as profiled and/or to confirm the absence of material believed not to be present. The analysis may be used to obtain additional information required to set treatment parameters or evaluate treatment capability. The verification analysis may be necessary to provide additional details required to fully and safely handle, store and treat the waste.

To prevent prohibited materials from being accepted, all information regarding the waste stream will be evaluated. Verification analysis may be used to confirm the absence of prohibited materials when generator knowledge is insufficient.

A third-party lab may be necessary to verify the primary hazardous constituents and the major waste components.

Parameter Interpretation. Examination of the verification analysis will provide a direct method for the HWTU to determine if the waste has conformed to the waste treatment information form description. The HWTU operations staff will verify the identity and acceptability of the waste materials.

The values the generator provided on the waste treatment information form will be compared to the values determined by verification analysis. The ranges of verification parameter analysis accepted are specified as follows:

PARAMETER	ACCEPTABLE RANGE
Liquid/Solid	As Specified
Color	As Specified
Unprofiled Debris	Absence
Radioactivity Scan	Yes/no, as specified
pH	± 1 unit
Flashpoint	± 25%
Cyanides	Yes/no, as specified
Sulfides	Yes/no, as specified
Water Reactivity	Yes/no, as specified
Miscibility With Water	Yes/no floats/no sinks, as specified
Water Content	± 20%
Chemical Constituent	± 20%

If the HWTU verification values fall outside the ranges indicated, the nonconformity will be resolved. Section 3.3.2 outlines nonconformity resolution procedures. If the waste has been missprofiled, the waste treatment information form may be amended. If the HWTU cannot identify a treatment process for the waste, the waste will not be accepted.

3.2.2 Test Methods [C-2b]

All methods are specified in WAC 173-303-110, and/or Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, EPA SW-846. In the case of MW, As Low as Reasonably Achievable (ALARA) considerations may need to be evaluated in sampling and analytical procedures.

3.2.3 Sampling Method [C-2c]

Representative sampling may be requested by unit staff to ensure proper waste identification. Sampling may be performed by unit personnel or the generating unit producing the waste.

In all instances, sampling methods will conform to the representative sample method referenced in WAC 173-303-110(2), i.e., ASTM standards for solids and

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SW-846 for liquids. The specific sampling methods and equipment used will vary with the chemical and physical nature of the waste material and the sampling circumstances.

Representative samples of liquid waste (vertical "core sections") will be obtained using a composite liquid waste sampler (COLIWASA) or tubing, as appropriate. The sampler will be long enough to reach the bottom of the container in order to provide a representative sample of all phases of the containerized liquid waste. If a liquid waste has more than one phase, each phase will be separated for individual testing as required.
Other waste types which may require sampling are sludges, powders, and granules. Nonviscous sludges will be sampled using a COLIWASA. Highly viscous sludges and cohesive solids will be sampled using a trier, as specified in SW-846. Dry powders and granules will be sampled using a thief, also as specified in SW-846.

Samplers will be constructed of material compatible with the wastes. In general, aqueous liquids will be sampled using polyethylene samplers, organic liquids using glass samplers, and solids using polyethylene samplers. Disposable samplers will be used whenever possible to eliminate the potential for cross-contamination. If nondisposable sampling equipment is used, it will be decontaminated between samples using the guidelines in the unit sampling procedures.

The number of samples collected will depend on the amount of waste present and on the heterogeneity of the waste as determined by observation. In most cases, there will be only one container of waste present. In such cases, only one vertical composite sample will be collected (e.g., COLIWASA). If more than one container is present, a random number of samples will be collected and analyzed statistically using the procedures specified in SW-846.

3.2.4 Frequency of Analyses [C-2d]

Dangerous wastes are sampled as specified in Section 3.2.1.4 on an individual container or batch basis before they are collected from the point of generation or prior to shipment offsite. After the dangerous constituents have been characterized, these waste streams will not be analyzed again until process or raw material changes occur.

3.2.5 Additional Requirements for Waste Generated Offsite [C-2e]

All wastes managed at the HWTU will be generated on the Hanford Facility and/or by PNL research programs; in fact, most of the wastes managed in the unit will be generated within the 300 Area. Additional requirements for waste generated outside the 300 Area include proper manifesting (if appropriate) and proper packaging for transport over public roadways. Although wastes generated outside of the 300 Area may be considered to be generated offsite since they are transported on roads accessible to the public, they are under the same administrative controls as wastes which are generated onsite (e.g., in the 300 Area). There are no additional requirements, therefore, for wastes generated offsite.

3.2.6 Additional Requirements for Ignitable, Reactive, or Incompatible Wastes [C-2f]

As described in Section 6.5.2, wastes managed at the HWTU are divided into DOT hazard classes and stored in separate locations to ensure compatibility using information obtained from generator or through a waste treatment information form.

3.3 DETERMINATION OF WASTE STATUS

Final approval will depend on: proper waste characterization, receipt of all required completed paperwork, and identification of a treatment to be performed.

Nonconformities identified during verification analyses must be resolved before waste will be accepted for treatment. If non-conformities are not resolved to the HWTU Operator's satisfaction, the waste will be rejected.

3.3.1 Waste Stream Approval

If the waste is acceptable, the HWTU operations staff will notify the generator accordingly. Unless otherwise noted, once a waste stream has been adequately reviewed and approved for treatment, the material may be authorized for a period of one year. Any time during this period, the waste treatment information form file may be reviewed again. A complete review may be conducted if additional information is presented by the waste generator or if the waste stream is suspected to have changed. In addition, waste generators will be required to notify HWTU staff in writing of changes in processes, including changes in raw materials, that could affect waste streams.

3.3.2 Waste Stream Denial

Denial will be for incompletely characterized waste, unknown constituents, incomplete paperwork, lack of response to technical questions, concern for handling requirements, incompatibility with other waste on hand, lack of capacity, unknown appropriate treatment, inability to perform specified treatments for RCRA-coded waste, prohibited wastes, improperly coded wastes, and any other reasons the technical reviewer may give.

Generators will be notified in writing of a denied status and given the reason(s) for the denial. This information will become part of the file and will be entered on the computer record. Waste streams in a denied status may be re-evaluated at any time provided the cause for the denial is resolved. When a file is re-opened, it may be subject to a complete review.

3.3.3 Waste Stream Renewal

As previously noted, HWTU approval may be issued for a one-year term. The generator may be notified prior to the expiration date that the waste is a candidate for renewal. The information received from the generator, whether it indicates any change from the original or not, must be resubmitted to the HWTU, and a complete technical review may be conducted.

3.4 DETERMINATION OF TREATMENT

WAC 173-303-140 encourages the best management practices for dangerous waste according to the priorities of RCW 70.105.150. In order of priority these practices are reduction; recycling; physical, chemical, and biological treatment; incineration; stabilization and solidification; and landfilling. The HWTU will observe these priorities whenever there is a management option.

Recycling will be performed whenever the waste may be used as reagent material in the treatment of other wastes received. Reduction of waste will be incorporated in the treatment processes so that the volume of residues will be reduced.

As stated previously, the HWTU will provide physical, chemical, and biological treatment to detoxify, neutralize, or otherwise process to remove or reduce harmful or listed properties or characteristics. Stabilization and solidification will be used to immobilize hazardous constituents prior to sending waste elsewhere for management. If the waste treatment residue has treatment technologies specified, these treatments will be performed as, at least, a final treatment train process. See Section 4.4 for a discussion of available treatment technologies.

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3.4.1 Waste Treatment Information Forms and Treatment

The treatment to be performed will be determined as part of the waste treatment information form approval process. For waste treatment information form approval purposes, each approved waste stream will be referenced with a treatment technology or treatment train to be performed. The HWTU operations staff will assign treatment codes prior to approval.

As specified in WAC 173-303-380 facilities that treat hazardous waste must keep certain records. The waste treatment information form approval sheet must detail the treatment that will be used since the waste will not be accepted unless the treatment technology chosen exists at the HWTU. Documented treatment decisions will use the codes as specified in the regulations (WAC 173-303-380 and 40 CFR 264, Appendix I) so that reporting will follow efficiently from the waste treatment information form.

A waste treatment information form review sheet will have a treatment section which must be completed by the waste treatment information form reviewer. As part of the waste treatment information form review process, a treatment will be specified before a waste stream may be approved. Approval will depend on whether an appropriate treatment is identified which is available in the HWTU and may be scheduled. The waste treatment information form reviewer will conduct literature searches to determine which technologies have been proven to successfully treat certain waste streams. The waste treatment information form reviewer will also use professional knowledge and judgement in selecting suitable processes.

Final disposition of the waste treatment residue will be specified on the waste treatment information form review sheet. All required certifications under the land disposal restrictions will be completed and attached to the waste treatment information form after the waste is treated.

3.4.2 Treatability Studies

Treatability samples may be accepted for study, research, and development of treatment methodologies. Samples of waste will be exempted from WAC 173-303 (except for WAC 173-303-050, 173-303-145, and 173-303-960) as provided in WAC 173-303-071 (3)(r) and (s).

WAC 173-303-071 (3)(r) and (s) provide for the handling of treatability study samples and the procedure for conducting these tests, including necessary notifications. All tests will be conducted in accordance with WAC 173-303-071 (3)(r) and WAC 173-303-071 (3)(s).

WAC 173-303-071 (3)(s)(x) will direct decisions concerning the final disposition of the treatability sample and residue.

3.5 EVALUATING TREATMENT PERFORMANCE

The approval of a waste for treatment or treatability study will involve identifying a treatment process which is appropriate and determining how treatment success will be verified.

This section outlines post-treatment decisions of concern and how the HWTU will address these concerns. Central to the post-treatment concerns will be the method of evaluating treatment performance. Waste coding processes will emphasize what constituents are of concern in a particular waste and what levels (either in a waste extract or a total constituent analysis) will be achieved by treatment to render the waste nonregulated.

Wastes that have particular constituent levels to be achieved can be easily evaluated for treatment success. The LDR requirement under 40 CFR 268.40 through 268.43 and WAC 173-303-140 will guide successful determination. Any waste treatment residue must also be evaluated for characteristics under 40 CFR 261.21-.24, WAC 173-303-090 (State-only wastes) and WAC 173-303-084. Waste treatment residues which exhibit a characteristic must then be treated for that characteristic.

Any residues resulting from treatment of LDR wastes will be managed in accordance with 40 CFR 268 and WAC 173-303-140.

3.5.1 Determining Parameters to be Tested

The regulated constituents of each listed and toxic characteristic waste are specified in the State and Federal regulations. The constituents for which a waste is listed and any applicable characteristics will be considered. State and Federal regulations list each waste code and the constituents of concern, and may be used as a tool for determining the parameters to be tested.

In some cases, tests for surrogate or chemically similar constituents will determine if target constituents have received treatment. Reliance on surrogate or chemically similar constituents will be specified and justified on the waste treatment information review sheet. Copies of scientific literature or regulatory language supporting these decisions will be attached as part of the waste treatment information form file.

The waste treatment information form file will document success of treatment based on residue analysis or on the proper operation of the treatment process.

3.5.2 Sampling

Residues will be sampled to verify treatment success as specified in the treatment standard for a particular waste. If no guidance for sampling is available, a representative sample of the residue will be used for verification of success.

3.5.3 Treatment Verification

Analyses for treatment verification will measure the level of amelioration or destruction of regulated constituents in a waste.

A waste treatment verification form will be used to certify the verification. If the waste is an LDR waste, an LDR certification will be included.

3.5.4 Certification of Treatment Success

Waste Rendered Nonhazardous. Non-LDR wastes, characteristic wastes, or State-only dangerous wastes, that have been treated to remove the characteristic or hazardous property may be disposed of as provided in WAC 173-303-140 (4) or 40 CFR 268.9(d). In that case, certification is made to the EPA or to Ecology.

Waste Treated to Meet Treatment Standards. For LDR wastes treated to meet treatment standards or treated using a specified technology, the certification is included in the waste treatment information form file.

Waste Treated, Fails to Meet Treatment Standards. It is possible that treated waste may fail to meet treatment standards. Additional treatment at the HWTU may be required, the wastes may receive a treatability variance under 40 CFR 268.44 and WAC 173-303-910, or the waste may be sent to an offsite facility for further treatment by the HWTU staff.

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4.0 PROCESS INFORMATION [D]

This chapter discussed the processes used to store waste prior to treatment and the treatment processes to be used and proposed for future use in the HWTU.

4.1 CONTAINERS [D-1]

The following sections describe the types of containers stored at the HWTU.

4.1.1 Containers with Free Liquids [D-1a]

Containers with free liquids are discussed below.

4.1.1.1 Description of Containers [D-1a(1)]. Containers of hazardous materials are inspected before being accepted. Generating units are responsible for placing the materials in adequate containers. Repackaged materials must be placed in containers that are new and compatible with the materials to be stored. Containers received in the HWTU will range in size from small sealed ampules up to 85 gallon (322 liter) salvage drums. Most of the waste will come in 5 gallon (19 liter) containers (or similar size) or 55 gallon (208 liter) drums.

Containers in poor condition or inadequate/improper for storage are not accepted at the unit. "Container in poor condition or inadequate/improper for storage" means a container which is incompatible with the wastes stored or is not intact, undamaged or securely sealed to prevent leakage during storage, and transport. Examples of acceptable packaging include laboratory reagent bottles, DOT containers, spray cans, sealed ampules, paint cans, leaking containers which have been overpacked, etc. Unit operations personnel have the authority to determine whether a container is in poor condition or inadequate for storage, using the criteria of WAC 173-303-190 and professional judgement to determine whether the packaging may leak during handling and storage.

As with all wastes, repackaged containers of dangerous waste are marked and/or labeled to describe the contents of the container and the major hazards of the waste, as required under WAC 173-303. Containers are also marked with a unique identifying number assigned by the unit's computerized waste tracking system.

In the 325 section, all flammable liquid wastes and other compatible wastes are stored in compatible DOT-specified shipping containers and/or in Underwriter's Laboratory (UL)-listed and Factory Mutual (FM)-approved flammable storage cabinets. Solid chemicals and other materials not requiring storage in FM-approved cabinets are stored on shelving in specifically designated areas based on the DOT hazard classification. In the 3100 section, separate storage room will be provided for different types of waste, segregated using the criteria outlined in Section 6.5.2.

All containers used for offsite transport of dangerous wastes from the unit are selected according to the container selection criteria found in WAC 173-303-190(1).

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4.1.1.2 Container Management Practices [D-1a(2)]. Management practices and procedures for containers of dangerous waste ensure the safe receipt, handling, preparation for transport, and transportation of wastes. These practices and procedures are summarized below.

Inspection of Containers. Container areas will undergo daily, weekly, monthly, and yearly inspections to ensure container integrity, check for proper storage location, prevent capacity overrun, etc. These inspection procedures are detailed in Section 6.2.

Container Handling. All HWTU staff are instructed in proper container handling safeguards as part of their training (see Section 8.1.2 for further details). Containers are always kept closed except when adding or removing waste, in accordance with WAC 173-303-630(5)(a).

Containers are not opened, handled or stored in a manner which would cause the container to leak or rupture. Small containers (five gallons or less capacity) are stored on ventilated shelving or in approved flammable liquid storage lockers (if appropriate). Containers over 5 gallons (19 liter) capacity are stored on the floor of the appropriate storage cell. Unnecessary handling not required for preparation for treatment or transport is minimized. Drums are moved manually or by an electric drum lift. For manual movement, hand trucks specifically designed for drum handling are used.

Empty containers are destroyed or relabeled, if uncontaminated, after obliterating the old label.

4.1.1.3 Secondary Containment System Design and Operation [D-1a(3)] The container storage areas are designed to collect and hold spills and leaks. Detailed descriptions of the bases, liners, and drainage systems can be found below in sections 4.1.1.4 through 4.1.1.8.

The containment systems of the 3100 section will have bases (floors) underlying the containers which are free of cracks and gaps and are sufficiently impervious to contain spills and leaks until the collected material is detected and removed. The floors will be coated with a chemically resistant coating to prevent degradation and aid in cleanup. The bases will be six inches thick, reinforced, poured concrete slab sloped to drain liquids resulting from spills and leaks away from the containers so that they are protected from contact with accumulated liquids. Each area in the 3100 section will be equipped with sumps at all entrances/exits that drain to a retention container (the same container functions as the fire-flow containment). A chemical resistant floor coating will be also used to prevent degradation of the sump and facilitate cleanup. Each storage area will be equipped with a separate containment system which has sufficient capacity to contain ten percent of the volume of all containers or the volume of the largest container, whichever is greater, for those containers holding free liquids.

The 325 section is equipped with chemical resistant curbed (4 inches [10.2cm]) flooring that will facilitate cleanup. Wastes not in process will be stored in FM-approved storage cabinets. Spills are contained by the sloped construction of the floor and the sumps in front of each entrance/exit. Sumps drain to the Fire Flow Containment Tank located in the basement of the 325

Building. Section 6.4.3 contains additional information on the containment system. Containment is illustrated in Appendices 2B and 2C. The possibility of mixing of incompatable wastes in the containment system is minimized because the number of containers open at one time will be limited to those in process (wastes not in process will be stored in closed containers) and the very large volume of any fire flow will minimize the possibility of adverse reactions.

4.1.1.4 Requirement for Base or Liner to Contain Liquids [D-1a(4)]. The base of the facility in the 325 section consists of a six inches thick reinforced, poured concrete slab with no cracks or gaps. The concrete was mixed in accordance with ASTM 094, Section 5.3, Alternate 2, and all exposed surfaces are finished with a smooth trowelled surface. The base of the 3100 section is still under design.

The condition of the floor coating will be inspected weekly and repairs made as needed. Immediate repairs are indicated whenever the coating is observed to have been chipped, bubbled up, scraped, or otherwise damaged in a manner which would significantly impact the ability of the coating to contain spilled materials. Minor nicks and small chips resulting from normal operations that do not jeopardize the integrity of the containment will be repaired on a periodic basis.

4.1.1.5 Containment System Drainage [D-1a(5)]. All floor systems are sloped for removal and cleanup of any spilled material. The 325 section is equipped with an emergency Fire Flow Containment Tank in the basement of the 325 Building. This system is diagramed in Appendix 2B. The containment system for the 3100 section is still under design but will be designed to meet the requirements detailed in WAC 173-303-630. Design detail will be provided to Ecology when available.

4.1.1.6 Containment System Capacity [D-1a(6)]. The containment system in the 325 section as described in Section 4.1.1.3, is composed of two elements: curbed flooring and drains at doorways and individual storage cabinets which together provide sufficient capacity (6,000 gallons) to satisfy two criteria: contain a 20 minute fire suppressant system flow, and contain more than ten percent of the volume of all containers or contain the volume of the largest container, whichever is greater, for those containers holding free liquids. In the 325 section, as described in 4.1.1.3, separate FM-approved storage cabinets will be used and the containment for the room will provide adequate capacity to contain the contents of the cabinets. The capacity of the 325 section is determined by the UFC and UBC rating of the unit (Class B). The system for the 3100 section is still under design but will be designed to meet the requirements in WAC 173-303-630.

4.1.1.7 Control of Run-On [D-1a(7)]. The 325 section is contained within the 325 building and the possibility of run-off or run-on will be mitigated by that structure. The 3100 section is being designed to eliminate the likelihood of onsite, or offsite migration via run-on and run-off. The facility will be completely enclosed (i.e., complete roof and no open walls) and will be constructed upon a foundation so that precipitation cannot cause either run-on or run-off problems. Additional information can be found in Section 6.4.3.

4.1.1.8 Removal of Liquids from Containment System [D-1a(8)]. Liquid accumulation in the containment may contain hazardous components. After appropriate measures are taken (listed below) the liquid will be sampled and tested as described in Chapter 3.0.

Upon discovery of liquid accumulation in the containment resulting from a spill or other release, the Building Emergency Director (BED) must be contacted in accordance with the contingency plan (Chapter 7). The BED may determine that the contingency plan should be implemented. If the incident is minor, and the BED approves, removal of the liquids will commence immediately following a safety evaluation. Appropriate protective clothing and respiratory protection will be worn during removal activities; a PNL industrial hygienist may be contacted to determine appropriate personnel protection requirements and any other safety requirements, such as chemical testing or air monitoring. In addition, ventilation of the spill area may be performed if determined to be safe and if appropriate monitoring of the air discharge(s) is performed.

Spills are normally contained either within the storage cabinet, or within a secondary containment trench or berm. In any case, spilled material will be recovered to the extent possible by pumping recovered liquids with a pump made of nonreactive materials (either steel or PVC). Nonrecoverable liquids will be absorbed with an appropriate absorbent (after appropriate chemical reaction to neutralize reactivity in the case of reactive waste, or neutralization in the case of corrosive materials). The absorbent material will then be recovered and placed in an appropriate container. The floor, cabinets and any other impacted containers may be cleaned by dry rags, soap and water, or a compatible solvent if necessary to remove external contamination. Contaminated rags and other cleanup material will be disposed of in an appropriate manner.

4.1.2 Containers without Free Liquid that do not Exhibit Ignitability or Reactivity [D-1b]

This section is not applicable to the HWTU because the unit is used to manage containers both with and without free liquids. Therefore, the unit is subject to the full requirements for containment.

4.2. PROTECTION OF EXTREMELY HAZARDOUS WASTE IN CONTAINERS [D-2]

All wastes are stored in containers inside the HWTU. Storage locations are completely enclosed from weather; therefore, the HWTU complies with WAC 173-303-630(7)(d). Information of storage distances and aisle space is discussed in Section 6.3.2.

4.3 PREVENTION OF REACTION OF IGNITABLE, REACTIVE, AND INCOMPATIBLE WASTES IN CONTAINERS [D-3]

The following sections provide information on reactive waste containers.

4.3.1 Management of Ignitable or Reactive Wastes in Containers [D-3a]

Ignitable and reactive wastes are stored in compliance with Uniform Fire Code Division II regulations for Container and Portable Tank Storage Inside

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Buildings (International Conference of Building Officials 1988). Containers of ignitable and reactive waste are stored in individual flammable material storage cabinets within the storage cells.

4.3.2 Management of Incompatible Wastes in Containers [D-3b]

Containers of ignitable and reactive wastes are stored in individual flammable materials storage cabinets. Section 6.5.2 describes procedures used to determine the compatibility of dangerous waste so that incompatible wastes are not stored together. Incompatible wastes are never placed in the same container, or in unwashed containers that previously held incompatible waste. Operations are conducted such that extreme heat or pressure, fire or explosions, or violent reactions will not occur; uncontrolled toxic mists, fumes, dust, or gases in sufficient quantities to threaten human health or the environment will not be produced, uncontrolled flammable fumes or gases in sufficient quantities to pose a risk of fire or explosion will not be produced; and damage to the container will not occur.

Aisle space will be maintained according to Uniform Fire Code to separate incompatible wastes in the HWTU. The 3100 section has separate storage areas for the distinct waste classes. The possibility of adverse reaction is minimized (see Section 6.4 and 6.5 for procedures which are used to prevent sources of ignition and mixing of incompatible wastes).

4.3.3 Tank System [D-3c]

Operation of the HWTU does not involve the storage of dangerous waste in tank systems. Therefore, the requirements of WAC 173-303-640 are not applicable.

4.3.4 Waste Piles [D-3d]

Operation of the HWTU does not involve the placement of dangerous waste in piles. Therefore, the requirements of WAC 173-303-660 are not applicable.

4.3.5 Surface Impoundments [D-3e]

Operation of the HWTU does not involve the placement of dangerous waste in surface impoundments. Therefore, the requirements of WAC 173-303-650 are not applicable.

4.3.6 Incinerators [D-3f]

Operation of the HWTU does not involve the incineration of dangerous waste. Therefore, the requirements of WAC 173-303-670 are not applicable.

4.3.7 Landfills [D-3g]

Operation of the HWTU does not involve the placement of dangerous waste in landfills. Therefore, the requirements of WAC 173-303-665 are not applicable.

4.3.8 Land Treatment [D-3h]

Operation of the HWTU does not involve the land treatment of dangerous waste. Therefore, the requirements of WAC 173-303-655 are not applicable

4.4 DESCRIPTION OF TREATMENT PROCESSES

The following section describes treatment processes used for routine treatment in the HWTU. It also discusses processes that may be considered for future used in the HWTU.

4.4.1 Processes to be Used for Routine Treatment

The following treatment processes may be used in the HWTU. These processes may also be combined to form treatment trains. A treatment train is a series of steps or processes used to remove one or more hazardous characters or components from a waste.

The processes will be conducted on a small scale, usually within glassware. Operations will be performed under fume hoods when necessary. The HWTU operations staff will wear appropriate protective clothing during all procedures.

Wastes generated by treatment processes will be evaluated according to criteria outlined in Section 3.5. The sanitary sewer system is not accessible from the process area of the HWTU, therefore, no waste will be released into the sanitary sewer. Access to the process sewer is mediated by a retention container. Contents of retention containers will not be released to the process sewer unless they are determined to not contain dangerous waste. If the contents contain dangerous waste, they will be managed in the HWTU as a dangerous waste.

4.4.1.1 Stabilization. The following reagents may be used to reduce the leachability of metal or inorganic constituents: Portland cement and/or lime/pozzolans. Iron salts, silicates, and/or clays may also be added to enhance the set/cure time required. Appendix 4-B contains the Draft Procedures for the stabilization/grouting operations. These operations will be routinely be performed in the room designated as the Grout room in the 3100 section and on a lab bench in the 325 section. If volatile liquid are being used or there is a possibility of release from the mixing container, the operation will be performed under a fume hood.

4.4.1.2 Ceramic Melting. Volatile organic compounds, polymer compounds, aqueous solutions with nitrate salts, lead and lead compounds, and glass forming oxide materials left from vitrification testing programs may be subjected to ceramic melting. The process is conducted in a refractory-lined tank with electrodes that provide heat by passing current through a pool of molten glass. Temperatures range from 1000°C or higher depending upon the composition of the pool of molten glass. Combustible materials pyrolize and oxidize to benign materials, and noncombustible materials are converted to soluble glass oxides and incorporated into the molten pool. Combustion gases which exit the melter are treated by an off-gas system, which includes a scrubber for collection of aerosols and acid gases. Scrubber liquor from the off-gas system, sill be reintroduced into the melter. Appendix 4-A contains the Draft Design of the Melter System and the off-gas system.

The ceramic melter will be contained in the room designated in the 3100 section for ceramic melting. The proposed design includes a fume hood over the feed section of the melter for containment of volatile materials during

introduction into the melter. Wastes will only be introduced into the melter after the refractory has reached operating temperature. Ceramic melting will not be performed in the 325 section.

4.4.1.3 Liquid-Liquid Extraction (Solvent Extraction). In this technique, which is normally a part of a treatment train, organics are extracted from a liquid waste by an immiscible solvent. Due to the potentially volatile nature of many of the materials in this technique, liquid-liquid extraction will be routinely be performed under a fume hood.

4.4.1.4 Neutralization. Acids, bases, or water are used to neutralize wastes. The neutralized waste will have a pH greater than 2.0 but less than 12.5 as measured in the aqueous residuals. This procedure provides an excellent opportunity to use waste as reagents. Neutralization will routinely be performed under a fume hood. In the 325 section, some mixed waste may be neutralized in a glove box.

4.4.1.5 Precipitation. Precipitation is normally used as part of a treatment train to separate insoluble materials from waste. The following reagents (or wastes) are typically used alone or in combination to precipitate metals and other inorganics as insoluble precipitates of oxides, hydroxides, carbonates, sulfides, sulfates, chlorides, fluorides, or phosphates: line, caustic soda ash, sodium sulfide, ferric sulfate, ferric chloride, alum or sodium sulfate. Precipitation may be performed on the lab bench or under a fume hood.

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4.4.2 Processes to be Considered for Future Use in the HWTU

Several processes may be considered for future use as part of treatment trains in the HWTU. If any of these processes will be used for routine treatment, a permit modification will be sought as required.

Carbon Adsorption--Granulated or powdered carbon is used to absorb non-metallic inorganics, organo-metallics, and/or organic constituents.

Oxidation--Wastes are chemically or electrolytically oxidized using the following reagents (or wastes) or combination of reagents: hypochlorite, chlorine, chlorine dioxide, ozone or UV light, peroxides, persulfates, perchlorates, permanganates, or other oxidizers.

Reduction--Wastes are chemically reduced using the following reagents (or wastes) or combinations of reagents: sulfur dioxide; sodium, potassium, or alkali salts of sulfites, bisulfites, metabisulfites, and polyethylene glycols; sodium hydrosulfite; ferrous salts or other reducing agents.

Deactivation--Deactivation is used to remove the dangerous characteristics of ignitability, corrosivity, and/or reactivity.

Encapsulation--Encapsulation with surface coating materials such as polymeric organics (resins and plastics) or with a jacket of inert inorganic materials to substantially reduce surface exposure to potential leaching media. (Encapsulation does not include any material that would be classified as a tank or container.)

Recovery of Acids and Bases--Acids or bases may be recovered using distillation, ion exchange, resin or solid adsorption, reverse osmosis or physical techniques such as decantation, filtration, and centrifugation.

Recovery of Metals or Inorganics--The following techniques may be used to recover metals or inorganics: ion exchange, resin or solid adsorption, reverse osmosis, chelation/solvent extraction, freeze crystallization, and/or ultrafiltration.

Recovery of Organics--The following technologies may be used to recover organics: distillation, thin film evaporation, steam stripping, carbon adsorption, critical fluid extraction, liquid-liquid extraction, precipitation/crystallization, and/or chemical phase separation techniques.

Controlled Reaction with Water--Highly reactive inorganic or organic chemicals may be subjected to a controlled reaction with water.

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5.0 GROUNDWATER MONITORING

The HWTU is not operated as a dangerous waste surface impoundment, waste pile, land treatment unit, or landfill as defined in WAC 173-303-645(1)(a). Therefore, groundwater monitoring is not required.

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6.0 PROCEDURES TO PREVENT HAZARDS [F]

The HWTU will be operated to minimize exposure of the general public and operating personnel to dangerous and mixed wastes. Access to the HWTU will be restricted to authorized personnel and escorted visitors. The HWTU will be subjected to a rigorous inspection schedule to prevent any conditions which may cause or lead to threats to human health or the environment. Operating procedures have been developed for safe handling of wastes.

6.1 SECURITY [F-1]

Security for the HWTU is provided by a combination of the overall security system for the 300 Area and security systems for the 325 Building and the 3100 Building. There is also a specific security system for the 325 Section.

The HWTU is located within the 325 Building and the 3100 Building. These buildings are located within a fenced area inside the Hanford 300 Area. As part of the Hanford Site, the 300 Area is subject to a restricted access and personnel security system for the protection of Government property, classified information, and special nuclear materials. The 300 Area is a controlled access area with access limited to persons authorized to enter and having appropriate security clearances or escorts.

6.1.1 Security Procedures and Equipment [F-1a]

The following sections describe the 24-hour surveillance system, barriers, and warning signs used to provide security and control access to the HWTU.

6.1.1.1 24-Hour Surveillance System [F-1a(1)]. Access to that portion of the 300 Area in which the HWTU is located is through the 300 Area gates. The gates are controlled by Hanford Patrol guards on a 24-hour basis. The Hanford Patrol can be reached by phoning 375-2400, PNL Single-Point Contact. If 375-2400 is inoperative, the Hanford Patrol can be reached via their emergency number, 811 from on-site telephones.

To prevent unauthorized access, entrances to the HWTU will be locked whenever it is unoccupied.

6.1.1.2 Barriers and Means to Control Entry [F-1a(2)(a), (2)(b)]. The 300 Area is surrounded by an 8 foot chain link fence topped with three strands of barbed wire. The 325 Building and the 3100 Building are located within the fenced area and are kept locked at all times unless occupied. All mixed waste management activities will be conducted within the 325 Section, which is

located within the 325 Building. Dangerous waste management activities will be conducted within the 3100 Section, which is located within the 3100 Building. Only HWTU operations staff members and escorted official visitors are allowed in the HWTU.

Entry to the 300 Area is being controlled by Hanford Patrol guards through gates. To be admitted to the area by the Hanford Patrol guards, all persons must have a valid DOE security badge. Entry to the 3100 building and the 325 building is controlled through the used of locked entrances. The entrance to the 325 Section is also locked. Physical control of the keys and recordkeeping is maintained by PNL security. Distribution of keys is subject to approval by the 325 and 3100 Building Managers. A list of personnel assigned keys for the HWTU is kept in the operating record. Personnel in possession of keys admit only persons having official business. All visitors to the HWTU must be escorted by authorized personnel. Hanford Patrol monitor the entrance and exit of individuals from the 300 Area where the 325 and 3100 Buildings are located. All individuals and vehicles enter and leave the 300 area through guardhouses operated by Hanford Patrol. The guardhouses are occupied by armed guards 24 hours a day, 7 days a week.

Due to the locations of the 325 Building and the 3100 Building, the general public does not have access to the HWTU. The Hanford Patrol can be reached by telephoning 375-2400, which is the PNL Single Point of Contact. IF for any reason this number is inoperative, the Hanford Patrol can be reached by dialing 811.

6.1.1.3 Warning Signs [F-1a(3)]. The HWTU is posted with "DANGER - UNAUTHORIZED PERSONNEL KEEP OUT." These signs are posted at the entrances of the 3100 building and on the doors of the 325 Section. The signs are legible from at least 25 feet and are visible from any approach to each entrance of the HWTU.

6.2 INSPECTION SCHEDULE [F-2]

6.2.1 General Inspection Requirements [F-2a]

The purpose and intent of implementing inspection procedures at the HWTU are to prevent malfunctions, deterioration, operator error, and/or discharges which may cause or lead to the release of regulated waste to the environment or threats to human health. A system of daily, weekly, monthly, quarterly, and annual inspections involving various PNL departments and levels of management will be implemented at the HWTU.

The frequency of inspection will be based on specific regulatory requirements and on the rate of possible deterioration of equipment and probability of environmental or human health incidents.

Areas where dangerous and mixed waste will be actively handled will be considered as areas subject to spills. These areas will be given daily inspections when in use, as required by WAC 173-303-320(2)(c).

The containment system (i.e., floors and sumps) will be inspected weekly. This frequency is based on the need to perform timely corrective actions in the event that problems are noted.

Emergency and safety equipment and personal protective equipment will be inspected weekly. This frequency is based on consideration of the expected rate of use of this equipment. Use of emergency equipment should occur infrequently. Weekly inspections will ensure that this equipment is always functional and available in adequate supply.

The inspections performed at the HWTU are described in this section. Also described is maintenance of inspection records.

6.2.1.1 Daily Inspections. The HWTU will be inspected daily when waste management operations are being carried out as described in WAC 173-303-320(2)(c). Inspection efforts will focus on areas in which wastes are handled. Specific problems looked for in these inspections are damaged or leaky containers, mislabeled or open containers, improper storage designation, and disorderliness or uncleanliness. The daily inspections will be recorded in the daily operating record, which will be part of the permanent HWTU operating record.

6.2.1.2 Weekly Inspections. Operations personnel will conduct weekly safety and unit inspections in the HWTU. The items to be inspected will include container integrity, appropriate storage locations of hazardous waste materials/items (storage incident to treatment), container labeling form completeness and accuracy, and safety and emergency equipment function and supply. The inspection will normally be conducted by two individuals on the last workday of each week. The weekly inspection report/monthly management inspection checklist forms and the inspection logbook will be retained as part of the operating record for a minimum of five years.

The inspection checklist will be used to guide the inspection of particular items and to identify potential problem areas associated with the items inspected. A space is provided on the form for the inventory summary, hazard index, comments and indication of required remedial actions and assignments, as well as the date such action is accomplished. The inspectors will sign and print their names in addition to dating the inspection checklist after performing the inspection. A copy of the completed inspection form with any assigned action items will be distributed to the responsible operating personnel. All corrective action items identified in the unit inspections will be completed/corrected as soon as possible (i.e., within one week) unless

there is documentation and a valid reason for further delay. Repairs on items presenting a potential for personal health hazard or environmental release will be preformed immediately. When corrective action has been completed, the inspector will date and initial Section E of the Inspection Checklist.

Specific problems to be looked for during the weekly inspection are identified on the Weekly Inspection Checklist (Figure 6-1). The use of this form will enhance inspection effectiveness by providing a consistent and detailed listing of areas of concern and those safeguards in place to prevent problems.

6.2.1.3 Monthly Inspections. A unit monthly management oversight inspection will be conducted by the Waste Technology Center (WTC) operations manager or designee on or near the last workday of each month. The inspection will be conducted using the Monthly Management Inspection Checklist form (Figure 6-2).

Items listed for inspection are unit equipment functionality and condition, housekeeping, chemical inventory, weekly inspections and corrective action (if any), safety equipment operation, spill control and cleanup supplies and general packaging and material inventory. The inspection will be reported to the WTC Manager via an internal memorandum. Copies of the management inspection report will be provided to the operations personnel and maintained in the files of the HWTU. In addition, copies of the inspection will be retained in the operating record. Any corrective action noted on the management inspection checklist and deterioration or malfunctions in equipment discovered during the inspection will be assigned to a responsible individual in the operation group for followup and correction. Corrective actions identified in the monthly management inspection must be completed within two weeks unless there is documentation and reason for further delay. As previously stated, records of the management inspection will be retained in the operating record and kept for a minimum of five years.

6.2.1.4 Quarterly and Annual Inspections. In addition several layers of management inspections of the HWTU previously described, safety inspections are performed to ensure that the fire protection system and walk-in hood ventilation system are in proper working order. The 300 Area Hanford Fire Department will perform a quarterly inspection of fire suppressant and notification systems (i.e, sprinkler system and pull boxes). An annual inspection will be made of the sprinklers to ensure there is no blockage in the system. The alarm system will also be activated to ensure that pull boxes operate properly. A complete flow test is performed from the furthest valve to ensure flow through the whole system. Proper pressure and functions are also checked on all fire extinguishers. Those areas where ignitable or reactive wastes are stored will be performed annually in the presence of a professional person who is familiar with the Uniform Fire Code, or in the presence of the local, state or federal fire marshall in accordance with WAC 173-303-395(1)(d). PNL facilities support staff perform additional documented inspections of the emergency eye wash/shower units and hood air flow. Records of these inspections will be kept in the Building Manager's office for a minimum of five years.

Date_____

SECTION A: CONTAINER INSPECTION

	CABINET	SHELF	ROOM
LEAKING CONTAINERS?	_____	_____	_____
DETERIORATING CONTAINERS?	_____	_____	_____
BROKEN/CRACKED CONTAINERS?	_____	_____	_____
MISLABELED CONTAINERS?	_____	_____	_____
PROPER WASTE SEGREGATION?	_____	_____	_____
WASTE CONTAINERS CLOSED?	_____	_____	_____

COMMENTS: _____

_____

SECTION B: LABORATORY SAFETY/EMERGENCY EQUIPMENT

	(Y/N)	COMMENTS
SPILL CONTAINMENT SUMPS EMPTY AND DRY	_____	_____
EYEWASH	_____	_____
SPILL CONTROL EQUIPMENT	_____	_____
FIRE EXTINGUISHES	_____	_____
RADIATION MONITORING	_____	_____
EQUIPMENT (IF APPLICABLE)	_____	_____
MINIMUM 4-FT AISLE SPACE	_____	_____

	ADEQUATE SUPPLY	COMMENTS
RESPIRATORS (FULL FACE)	_____	_____
FACE SHIELDS	_____	_____
COVERALLS	_____	_____
EYE PROTECTION	_____	_____
GLOVES-RUBBER	_____	_____
GLOVES-LEATHER	_____	_____

SECTION C: GENERAL LABORATORY CONDITION

	COMMENTS
HOODS	_____
GLOVEBOXES	_____
LAB BENCHES	_____
STORAGE CABINETS	_____
FLOORS	_____

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FIGURE 6-1. HWTU Weekly Inspection Checklist

SECTION D: LABORATORY RECORDS

	COMMENTS
CURRENT LABORATORY INVENTORY	_____
CURRENT HAZARD INDEXES	_____
DAILY INVENTORY REPORTS CHECKED/FILED	_____
WEEKLY AMOUNT TREATED	_____
WEEKLY AMOUNT WASTE DESTROYED/DETOXIFIED	_____

[AMT REC'D - AMT SHIPPED + AMT IN FACILITY) = AMT WASTE DESTROYED/DETOXIFIED]

SECTION E: CORRECTIVE ACTION

	COMMENTS
CORRECTIVE ACTION EMPLOYEE ASSIGNED	_____

INSPECTOR (SIGNATURE)_____DATE_____TIME_____

INSPECTOR (PRINT NAME)_____

CO-INSPECTOR (SIGNATURE)_____DATE_____TIME_____

CO-INSPECTOR (PRINT NAME)_____

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FIGURE 6-1. HWTU Weekly Inspection Checklist (Cont.)

ROOM _____ DATE_____

INSPECTOR _____ TIME_____

SECTION A: GENERAL LABORATORY CONDITION

	SAT/UNSAT/COMMENTS*
LIGHTS (WORKING ORDER)	
HOODS (CLEAN, WORKING)	
SUMPS (CLEAN, DRY)	
EXITS CLEAR	
AISLES CLEAR	
FLOORS	
LAB BENCHES	
EXHAUST FAN	
GENERAL COMMENTS	

SECTION B: CHEMICAL STORAGE

	SAT/UNSAT/COMMENTS*
CHEMICAL STORAGE CABINETS	
SEGREGATED PROPERLY	
NOT OVERFILLED	
CLOSED	
CONTAINER LABELING	
CONTAINER CONDITION	
NOT LEAKING	
SEALS	
OPEN STORAGE	
SEGREGATED PROPERLY	
LOCATION	

SECTION C: SAFETY/EMERGENCY EQUIPMENT

	(Y/N)	COMMENTS*
SPILL CONTAINMENT EQUIPMENT		
EYEWASH/SHOWER		
RESPIRATORS		
EYE PROTECTION		
FACE SHIELDS		
COVERALLS		

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GLOVES-RUBBER _____ _____

FIGURE 6-2. Monthly Management Inspection Checklist

SECTION C: SAFETY/EMERGENCY EQUIPMENT (CONT.)

	(Y/N)	COMMENTS*
FIRE EXTINGUISHES	_____	_____
NEUTRALIZERS	_____	_____
MASKS/CARTRIDGES	_____	_____

SECTION D: LABORATORY RECORDS

	COMMENTS*
CURRENT LABORATORY INVENTORY	_____
CURRENT HAZARD INDEX	_____
DAILY INVENTORY REPORTS	_____
WEEKLY INVENTORY REPORTS	_____

SECTION E: CORRECTIVE ACTION

	COMMENTS*
CORRECTIVE ACTION/ EMPLOYEE ASSIGNED	_____

INSPECTOR (SIGNATURE)_____DATE_____TIME_____

INSPECTOR (PRINT NAME)_____

CO-INSPECTOR (SIGNATURE)_____DATE_____TIME_____

CO-INSPECTOR (PRINT NAME)_____DATE_____TIME_____

*CORRECTIVE ACTIONS REQUIRED WITHIN 2 WEEKS

FIGURE 6-2. Monthly Management Inspection Checklist (Cont.)

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6.2.2 Specific Process Inspection Requirements [F-2b]

The following sections detail the inspections to be performed at the HWTU.

6.2.2.1 Container Inspection [F-2b(1)]. Dangerous waste containers in storage at the HWTU will be inspected weekly for leakage; evidence of deterioration of structural integrity; obscured, improper or illegible labeling; and improper lid and bung closure. (Areas subject to spills will be inspected daily.) These containers will be inspected during the weekly general inspection.

6.2.2.2 Emergency Fire Flow Containment System Inspection [F-2b(2)]. There will be no tanks designated for use in dangerous waste service. However, each building has emergency containment designated to contain water discharged from the fire protection systems in the unlikely event of fire. These systems will be inspected quarterly for evidence of deterioration of structural integrity, improper or illegible labeling, and improper flange closure.

6.2.2.3 Waste Pile Inspection [F-2b(3)]. Operation of the HWTU does not involve the placement of dangerous waste in waste piles. Therefore, the requirements of WAC 173-303-660 are not applicable.

6.2.2.4 Surface Impoundment [F-2b(4)]. Operation of the HWTU does not involve the placement of dangerous waste in surface impoundments. Therefore, the requirements of WAC 173-303-650 are not applicable.

6.2.2.5 Incinerator Inspection [F-2b(5)]. Operation of the the HWTU does not involve incineration of dangerous waste. Therefore, the requirements of WAC 173-303-670 are not applicable.

6.2.2.6 Landfill Inspection [F-2b(6)]. Operation of the HWTU does not involve the placement of dangerous waste in landfills. Therefore, the requirements of WAC 173-303-665 are not applicable.

6.2.2.7 Land Treatment Facility Inspection [F-2b(7)]. Operation of the HWTU does not involve the land treatment of dangerous waste. Therefore, the requirements of WAC 173-303-655 are not applicable.

6.3 DOCUMENTATION OF PREPAREDNESS AND PREVENTION REQUIREMENTS [F-3]

The following describes the preparedness and prevention measures which will be taken at the HWTU and the emergency equipment which will be available at the HWTU.

6.3.1 Equipment Requirements [F-3a]

The following sections describe the internal and external communications and emergency equipment in use at the HWTU.

6.3.1.1 Internal Communications [F-3a(1)]

Internal communication systems will be used to provide immediate emergency instruction to personnel. Internal communications will address general emergencies which may occur in the 300 Area as well as specific emergencies which may occur in the HWTU.

Because of the activities which occur in the 300 Area, the potential exists for emergencies outside the HWTU which could impact HWTU operations and staff. Therefore, the general emergency signals for the 300 Area will apply at the HWTU. These signals are summarized in the following table:

EMERGENCY SIGNALS AND RESPONSES

Signal	Meaning	Response
Gong	Fire	Evacuate building. Move upwind. Keep clear of emergency vehicles.
Siren - Steady 3 to 5 minute blast	Area Evacuation	Proceed promptly to south parking lot staging area. Stand by to follow instructions from the emergency director.
Wavering Siren	Take Cover	Close up the HWTU, stay in the Building until notified that it is safe to leave.
Howler (Aa-oo-gah)	Criticality	Run immediately at least 100 yards away from the signal and take cover.

ALL EMERGENCY SIGNALS CAN BE REVIEWED BY PHONING 373-2345

Internal communications to provide emergency instructions in the event of an emergency in the HWTU are fire alarms and telephones.

The fire alarms in the HWTU will be used to provide notification for immediate evacuation of personnel in the HWTU. Fire alarm pull boxes are located at all exits of the unit such that operating personnel have immediate access to the one in all portions of the HWTU. A network of telephones also covers all areas in the HWTU.

6.3.1.2 External Communications [F-3a(2)]

Both a fire alarm system and telephone network system are in place at the HWTU.

The telephone system will be used to access PNL's Emergency Network directly at 375-2400 or by dialing the emergency number 811. The fire alarm system will summon direct response from the Hanford Fire Department's 300 Area Station.

6.3.1.3 Emergency Equipment [F-3a(3)]

Emergency equipment available for trained HWTU personnel includes spill containment sumps, eyewash and spill control equipment. Each building is also equipped with an automatic fire suppression system of galvanized steel, schedule 40 per ASTM A120 pipe and 150-pound malleable iron per ANSI B16.3 fittings. All components are UL-listed or FM-approved, and installation of the fire sprinkler system has been conducted in accordance with NFPA 13 for ordinary hazards. Spill cleanup supplies and equipment are maintained in the area. Emergency eyewash/showers are located in the hallway of the 325 Building and in the receiving areas of the 3100 Building for emergency personnel decontamination.

If needed, additional emergency equipment will be provided by the Hanford Fire Department as listed on Figure 6-3. Response time from the Hanford Fire Department to the HWTU is 3 minutes.

6.3.1.4 Water for Fire Control [F-3a(4)]

Adequate water volume and pressure are supplied by the sprinkler systems that services the HWTU. In addition, the Hanford Fire Department's 300 Area Station will be available to respond to any fire emergency.

6.3.2 Aisle Space [F-3b]

Radioactive mixed wastes awaiting treatment or off site disposal are stored in the 325 Section cabinets. Dangerous wastes awaiting treatment for off site disposal are stored in the 3100 Section. There is sufficient aisle space to allow unobstructed movement of personnel and spill control equipment in the event of an emergency. Aisle space in both sections will be adequate to satisfy requirements of WAC 173-303-340(3) and applicable Uniform Building Code and Life Safety Code requirements.

6.4 PREVENTIVE PROCEDURES, STRUCTURES AND EQUIPMENT [F-4]

The following sections describe preventive procedures, structures, and equipment.

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6.4.1 Unloading Operations [F-4a]

Procedures are in place to prevent hazards and minimize the potential for breakage, punctures, or the accidental opening of containers during waste unloading. All MW containers are required to used appropriate secondary containment as required by WAC 173-303-395(4). All wastes received at the 325 Section will be of such a size as to be hand carried into the unit through a doorway internal to the 325 Building.

The 3100 Section will be equipped with a loading/unloading bay area designed such that all loading/unloading activities take place inside the unit away from the elements. The unloading area has secondary containment. By unloading all wastes inside the fully contained facility, spills during unloading operations will be contained.

6.4.2 Water Supplies [F-4c]

The HWTU is designed and operated to safely contain wastes and prevent any contamination of water supplies. The nearest water supply is the 300 Area water intake.

6.4.3 Run-Off Prevention [F-4b]

The HWTU was designed to eliminate the likelihood of off-site migration via run-off. Because the unit is completely enclosed (i.e., complete roof and no open walls), run-off of precipitation will not be a factor. In addition, floors are bermed and sloped toward sumps to eliminate the possibility of spills interacting or migrating from the unit.

6.4.4 Equipment and Power Failure [F-4d]

All "critical systems" in the HWTU that depend on electrical power for operation ("critical systems" are those whose failure would result in a release of dangerous or mixed wastes to the environment) are attached to an automatically activated emergency backup system. The heating, ventilation, and air conditioning (HVAC) system need power to be operable. An emergency backup lighting system is in place and will be automatically activated if the electrical power is lost due to power outage. The 325 Section will operate in conjunction with the 300 Area emergency power system. The 3100 Section will have a dedicated automatically activated generator. If necessary, the contingency plan would be implemented in accordance with section 7.0.

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EMERGENCY EQUIPMENT
AVAILABLE FROM THE HANFORD FIRE DEPARTMENT

Below is a list of emergency response equipment maintained by the Hanford Fire Department. This equipment is available to respond to emergencies at the Hazardous Waste Treatment Unit if additional equipment beyond that maintained at the HWTU is required. This listing includes equipment contained in the Hanford Fire Department Hazardous Materials Response Vehicle and Hazardous Materials Response Trailer.

Equipment Inventory For Hazardous Materials Response Vehicle

1	Compass -- hand-held
1	Compass -- mounted
2	Hand lanterns - rechargeable
1	Micro scanner, heat detector
1	Polaroid camera
1	Weather Station
6	Self-Contained Breathing Apparatus (SCBA) With 1-hour bottles
4	30-Minute SCBA bottles
1	Earmark base station with 6 Earmark individual units
30	Plug N'Dike
6	Danger Spill Signs
3	Plug Rugs (S. M. L)
1	Tool Box -- assorted non-sparking tools
1	A-1 haz mat response kit
1	A-2 haz mat response kit
2	Dozen rubber gloves
4	Dozen canning gloves
1	Thermal tarp
2	Pair binoculars
4	Tank Sealing kits -- large
6	Haz mat suits -- encapsulated
3	Roll warning tape
2	Electrical tape, 3 duct and 6 masking
4	Packages gloves
1	Drager multi-gas detector with tubes
17	Dozen surgeon gloves
1	Portable Computer base

Equipment Inventory For Hazardous Materials Response Trailer

2	Electrical Cord Reels
2	5-Gallon Buckets Plug N'Dike
4	Brooks -- 2 large, 2 small
2	Proximity Suits
3	Ropes

FIGURE 6-3. Emergency Equipment - Available from the Hanford Fire Department

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3	Radiation Marking Ropes
3	Tarps
	Rubber Boots
	Leather Gloves
3	Shovels
1	Roll Screen
2	Roll Masking Tape
10	Metal Buckets, 4 large and 6 small
2	Five-gallon buckets Sodasorb
10	Rolls Visqueen 6 mil 20′ x 100′
2	Boxes 39" x 54" plastic bags
4	Boxes heavy weight rubber gloves
1	Box wooden blocks
2	Emergency reflectors
1	Saws-all
	Miscellaneous tools (drill, pipe wrenches, hammer, etc.)
5	Portable lights
8	Miscellaneous electrical adapters
2	Pair electrical gloves
1	Drill -- 5/8"
3	Plug Rug
4	Bags Absorbent -- Safstep
1	Generator/Electric Start
1	Portable Decontamination Shower

Reference Materials Available From The Hanford Fire Department

1	Haz Mat Information
1	Manufacturers Safety Data Sheet
1	Haz Mat Spill Control Handbook
1	Emergency Action Guides
1	Selection of Haz Mat Clothing
1	Merck Index
1	Industrial Fire Haz Mat Handbook
1	Chemical Dictionary
1	Fire Protection on Haz Mat
1	Emergency Response
1	Haz Mat Handbook
1	Haz Mat Injuries Handbook
1	Common Sense Approach to Hazardous Materials Handbook

FIGURE 6-3. Emergency Equipment - Available from the Hanford Fire Department (Cont.)

6.4.5 Personnel Protection Equipment [F-4e]

Protective clothing and equipment will be provided to safeguard employees during normal and emergency operations. Personnel protective equipment available will include:

- Air Purifying Respirators (Full Face)
- Self Contained Breathing Apparatus (SCBA)
- Face Shields
- Coveralls - Chemical Resistant
- Eye Protection
- Gloves - Chemical Resistant

This protective equipment will be stored in cabinets located in a readily accessible area at each section. The equipment will be periodically replaced as necessary, maintaining adequate inventory.

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6.5 PREVENTION OF REACTION OF IGNITABLE, REACTIVE, OR INCOMPATIBLE WASTES [F-5]

The following sections discribe prevention of reaction of ignitable, reactive, and incompatible waste.

6.5.1 Precautions to Prevent Ignition or Reaction of Ignitable or Reactive Waste [F-5a]

Precautions to prevent ignition of ignitable wastes will involve separation of wastes from sources of ignition and use of procedures which minimize the potential for accidental ignition. There will be no routine sources of ignition or open flame in the unit. Work with ignition or heat sources, if required, will be limited, controlled by management, and performed in compliance with health and safety procedures for elimination of ignition sources. These internal procedures will:

- Prohibit use of open flame equipment when working with flammable liquids
- Require electrical equipment used in flammable or explosive atmospheres to comply with the National Electrical Code, NFPA 70
- Require use of equipment with automatic, adjustable temperature controls and high-temperature limit switches to prevent overheating
- Prohibit placement of flammable liquids on hot surfaces
- Require all static electricity sources to be grounded in areas where ignitable vapors may be present

- Require bonding of conductive containers when transferring flammable liquids

- Required use of nonsparking tools near ignitable sources.

Any unit maintenance or modification that will require work with ignition sources must receive prior approval by a safety engineer. This approval will be documented in the Operating Record. Smoking will not be allowed in the HWTU at anytime and the interior and exterior of the 325 Building and the 3100 Building will be clearly posted with "No Smoking" signs. The 325 Building is heated by steam piped from a steam generator in the 300 Area. Air warmed by the steam lines is blown into the 325 Section so that there will be no radiant heat source associated with building heating. The 3100 Building has an HVAC system which is not a radiant heat source. All tools which will be used to open ignitable waste containers are constructed of nonsparking materials.

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6.5.2 General Precautions for Handling Ignitable or Reactive Waste and Mixing of Incompatible Waste [F-5b]

As described in Section 4.3., ignitable wastes will be managed in a manner which protects the wastes from sources of ignition or open flame. Ignitable waste containers will be maintained in good condition and inspected weekly to minimize the potential for releases that could result in fires. Containers of ignitable waste will be protected from high temperature to prevent the potential for pressurization and buildup of ignitable vapors. Containers of ignitable radioactive mixed waste will be stored in the 325 Section in flammable material storage cabinets. Dangerous waste exhibiting the characteristic of ignitability will be stored in the 3100 Section in the Flammable Storage area.

Because of the wide variety of wastes which may be accepted at the HWTU, waste segregation procedures will be used to prevent the mixing of incompatible wastes. Chemical wastes stored in the unit will be separated by compatibility and hazard class. Prior to accepting unfamiliar wastes from generators, waste management organization staff determine the Reactivity Group Number as per *A Method for Determining the Compatibility of Hazardous Wastes* (EPA 1980) for each waste so that wastes may be stored with compatible materials. The following general guidance is used to segregate and separate chemicals:

- Store acids on a low storage shelf or in acid storage cabinets

- Separate acids from bases and alkaline metals such as potassium or sodium

- Separate oxidizing acids from organic acids and flammable or combustible materials

- Store bases away from acids and store solutions of inorganic hydroxides in polyethylene containers

- Store oxidizers away from flammable or combustible materials and reducing agents such as zinc, alkaline metals, and formic acid

- Store peroxide-forming chemicals in airtight containers in a dark, cool, and dry place (inside of cabinets)

- Store flammable materials from oxidizing acids and oxidizers and keep them away from sources of ignition

- Clearly mark cabinets to identify the hazards associated with their contents.

The potential for waste ignition or reaction at HWTU is also minimized through storage restrictions on hazardous material quantities. The storage restrictions defined in the Uniform Building Code for Class B Occupancy apply to HWTU (International Conference of Building Officials 1988). The weekly inspection of HWTU includes checking to see if waste inventories are below these limits. These inspections are documented in the Operating Record.

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7.0 CONTINGENCY PLAN [G]

The information contained in this chapter is the unit Contingency Plan as required by WAC 173-303-806(4)(a)(vii). This plan has been developed to ensure that procedures are in place at the HWTU in the event an emergency arises.

This chapter also references the Building Emergency Plan (BEP), found in Appendices 7A and 7B, as required under DOE-RL Site Emergency Plan (revised 4/90) and PNL procedure PNL-MA-11. It supersedes all previous contingency plans and BEPs. It is maintained in the locations shown in Section 7.10 of this plan.

A BEP is required under the DOE-RL Emergency Plan for each building on the Hanford Site. This Contingency Plan, in conjunction with the included BEPs, has been designed to meet the requirements of the Emergency Plan as well as the Ecology requirements for a contingency plan for the HWTU. The Site Emergency Plan details the membership of the Emergency Action Coordinating Team (EACT) mentioned in Section 7.3 and the following sections, and the procedure for notifying and mobilizing the team.

The contingency plan is designed to minimize hazards to human health and the environment from fires, explosions, or any other unplanned sudden or non-sudden release of dangerous waste or dangerous waste constituents to air, soil, or surface water. The provisions of the plan will be carried out immediately whenever there is a fire, explosion, or release of dangerous waste or dangerous waste constituents which could threaten human health or the environment.

7.1 GENERAL INFORMATION [G-1]

The HWTU, a unit to treat dangerous waste, is located in the 300 Area of the Hanford Site north of Richland, Washington. The HWTU is owned by the U.S. Government and operated by DOE-RL. It is used for the treatment of dangerous waste and MW. This waste is generated from research and development laboratories and facility maintenance operations.

Copies of the HWTU Contingency plan will be maintained at the following locations:

- The 3100 section record storage room
- The 325 Section office
- The 325 Building Manager's Office
- The 300 Area Fire Station
- The 300 Area Emergency Control Center (ECC)

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- The DOE-RL/Emergency Action Coordinating Team (EACT) room, located in the Federal Building, Richland, Washington.

The HWTU is divided into two sections. The 3100 section and the 325 section. The 325 section is located inside the 325 Building, which has a Building Emergency Plan (BEP). Off-normal events in other areas of the 325 Building or the 300 Area may affect the 325 section. The 325 BEP is provided solely for informational purposes as Appendix 7A. The BEP for the 3100 section, Appendix 7B, is referenced for completeness. The 3100 section is currently under design. The BEP, which requires these design details, will be supplied when available.

7.2 EMERGENCY COORDINATORS [G-2]

The overall responsibility for implementing the Contingency Plan and protecting HWTU personnel and property lies with the Building Emergency Directors (BEDs, or Emergency Coordinators) or designated alternates. The BED has the functions of the Emergency Coordinator as described in WAC 173-303-360. This responsibility includes the direction of emergency response groups such as the Hanford Patrol, Hanford Fire Department, etc. At all times during normal operating hours, the BED or an alternate will be readily available. The BED and alternates are on call 24 hours a day, and in the event the contingency plan is initiated, the BED will have full authority to commit all necessary resources to implement the plan and carry it out until complete recovery from the contingency is achieved. The Contingency Plan Notification List contains all emergency response organizations and their telephone numbers. The list will be kept current at all times, and will be posted at all unit telephones for easy access.

7.3 IMPLEMENTATION OF THE CONTINGENCY PLAN [G-3]

Any person shall immediately notify the BED or alternate upon identifying any of the following:

- Fire
- Explosion
- Earthquake or any seismic activity
- Unplanned release of hazardous materials to the air, soil, surface water or groundwater which could threaten human health or the environment
- Injured or ill personnel requiring immediate medical assistance
- Intrusion of unescorted persons
- Any event not listed which presents an imminent hazard to personnel, facilities, or the environment.

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The following information will be conveyed to the BED or alternate:

- Caller's name
- Nature of incident (fire, explosion, etc.)
- Location of incident
- Material involved, if known.

Subsequent to notification, all personnel will function under the direction of the BED.

The decision by the BED or alternate to implement the Contingency Plan depends on whether an actual incident such as a fire, explosion, chemical spill, or release of dangerous waste threatens human health or the environment. Immediately after being notified of an emergency incident, the BED or alternate will proceed to the site and evaluate the situation to determine whether to implement the Contingency Plan.

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7.4 EMERGENCY RESPONSE PROCEDURES [G-4]

Emergency response procedures have been established for the HWTU and are described below.

7.4.1 Notification [G-4a]

The discovery of an emergency situation (fire, explosion, spill or release) may be made by personnel not employed at the HWTU. Two such examples are routine security inspections by the Hanford Patrol and activation of remote heat sensors at the 300 Area Fire Department. Personnel employed at the 300 Area have been trained to activate any appropriate alarms and report all other emergencies to either the PNL Single-Point Contact or the Hanford Patrol. In addition, a sign is posted on all HWTU telephones instructing persons observing an emergency at the unit to notify the PNL Single-Point Contact (375-2400). The PNL Single-Point Contact will initiate emergency notification procedures, including activation of alarms and communication systems and notification of the appropriate state or local agencies with designated response roles if their help is needed. (Section 7.6 describes coordination agreements which are in effect in case of emergencies.) The Single-Point Contact will request the person discovering the emergency to furnish all pertinent information about the emergency. The BED has full responsibility and authority for bringing the emergency under control within the unit. Emergency notifications are performed in accordance with internal PNL off-normal event reporting. This reporting will establish specific responsibilities for emergency notification. In emergencies involving dangerous waste, these responsibilities will include:

- Staff members will notify the PNL Single-Point Contact
- PNL Single-Point Contact will
  - Arrange for emergency services (e.g., fire, ambulance) as needed

- Contact the Building Emergency Director (Emergency Coordinator)
- As directed by the BED, notify the Emergency Management Center
- As directed by the BED, notify other response organizations.

. The Building Emergency Director will
- Notify the Single-Point Contact if the Emergency Management Center must be activated
- Notify appropriate PNL line management
- Notify the PNL Facilities and Operations Director if outside notifications are necessary (e.g., to Ecology, EPA)
- Upon approval of the PNL Facilities and Operations Director, coordinate notification by DOE-RL of outside notification requirements.

7.4.2 Identification of Hazardous/Dangerous Materials [G-4b]

The BED or alternate will immediately identify the character, exact source, amount, and extent of the release to the extent possible. The spilled waste can be identified by visual inspection, by sampling, by reference to unit inventory records or shipping manifests, and by consulting with operations personnel. The HWTU operating record includes information on the characteristics and treatment methods for all wastes to be processed at the unit. This information is referenced to container identification numbers and can be used in the event of spills and releases to identify dangerous constituents. Samples of spilled dangerous waste material can be analyzed by the Hanford Environmental Health Foundation (HEHF), located in Richland, Washington, adjacent to the Hanford Site, or by outside laboratories under contract to PNL. Spilled MW can be analyzed by PNL.

7.4.3 Hazard Assessment [G-4c]

Once the material(s) involved in the incident has been identified as described in Section 7.4.2, it should be possible to determine the extent of the danger posed by the incident. The Emergency Control Center (ECC) is available to provide assistance to the BED as needed. Possible aid may be in the form of determining the extent of an emergency, identifying the hazards associated with the materials spilled/released, assisting in handling the emergency, or coordinating incident needs (i.e., special equipment). If the individuals present who performed the identification are uncertain as to the associated dangers, additional assessment aid will be obtained.

If further consultation does not result in a positive assessment of the danger to human health or the environment presented by the incident, a worst case condition will be assumed and evacuation procedures will be initiated if deemed appropriate. The BED at the scene of the incident is responsible for initiating any evacuation.

Individuals performing a incident assessment will assess both the direct and indirect hazards posed by the incident.

7.4.3.1 Assessment of Incident (Fire/Explosion). Assessment will be made through observations for the following criteria:

1. The nature and extent of the incident

2. The intensity or magnitude of fire or explosion

3. The location of the incident

4. What materials are involved (the Emergency Control Center [ECC] may provide assistance to the BED)

5. The extent of material released to the air and surrounding area

6. Extent of injuries, if any

7. The potential for escalation through subsequent explosions or the spread of fire to other hazardous materials

8. Potential short- and long-term effects, with regard to human health and the environment

9. The potential that the fire or explosion could spread to nearby buildings

10. The need for outside assistance and/or evacuation

11. The proper extinguishing media for the fire will be established by the BED (i.e., foam, dry chemical, water, etc.).

7.4.3.2 Outside Assistance and Evacuation. Based on evaluation of the event, the BED or alternate will determine whether evacuation of the HWTU is required. If evacuation of buildings in the vicinity of the HWTU, or the entire 300 Area and/or neighboring areas (e.g., 3000 Area or 400 Area) is required, the PNL single point contact, with input from the BED or alternate will contact the Westinghouse Hanford Company (WHC) Emergency Management Center (EMC) and request activation alarm for the appropriate area(s). The decision to evacuate any outside areas will be made by the DOE Emergency Action Coordinating Team (EACT). The EACT will conduct any domestic evacuation required.

In the event that the Contingency Plan is activated, the BED will notify DOE-RL. DOE-RL will subsequently notify Ecology and the National Response Center.

Activation of the appropriate emergency response will be decided by the BED and the Office of Emergency Preparedness. As additional information on the event becomes available, they will revise the classification of the event and the response level accordingly if necessary.

7.4.4 Control Procedures [G-4d]

The initial response to any emergency will be to immediately protect human health and safety and then the environment. Identification, containment, treatment, and disposal assessment will be the secondary response. These secondary actions will be implemented after immediate protection of human health conditions has been met.

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The following is presented to define specific emergency actions for staff assigned to the HWTU for several emergency situations which could be encountered during operation of the unit.

7.4.4.1 **Area-Wide Evacuation.** In the event of an area-wide evacuation of the 300 Area, all staff will report to a designated accountability area. Zone wardens will account for all personnel.

7.4.4.2 **Take Cover.** In the event a take cover alarm is sounded, HWTU personnel will stay inside the HWTU, and close all doors to the outside. Personnel will contact the appropriate person in the building emergency organization with their whereabouts and request a call back for status.

7.4.4.3 **Response to Minor Spills.** (Signal: None) Unit personnel will generally perform immediate cleanup of minor spills or releases using unit equipment, sorbents and emergency equipment noted in Section 7.5. Personnel detecting such spills or releases shall contact the PNL Single Point Contact (375-2400) to notify of the detection of such release and arrange for notification of the BED. For spills or releases occurring within individual storage cells during routine handling and storage, see Section 4.1.1.8.

7.4.4.4 **Major Dangerous Waste and/or MW Spill or Material Release.** In the event of a major emergency involving a dangerous waste or MW, the following general procedures will be followed for safe and rapid response and control of the situation:

1. The discoverer of a spill will leave the immediate area and call the PNL Single-Point Contact (375-2400) and provide as much information as possible.

2. The Single-Point Contact will notify the BED.

3. The BED will go directly to the scene.

4. The BED will obtain all necessary information pertaining to the incident. If necessary, the Hanford Hazardous Material Response Team will be activated.

5. If building evacuation is necessary, the BED will sound the fire alarm.

6. If the BED determines that the emergency may affect more than one building, the 300 Area ECC will be activated.

7. If necessary, notification of the 300 Area ECC sets into motion the notification process for DOE, other Hanford contractors, and outside agencies.

8. If necessary, the Hanford Patrol will set up roadblocks within the 300 Area to route traffic away from the emergency scene.

9. If there are injured personnel, they will be removed to a safe location, first aid will be administered, and, if injuries warrant, they will be transported to Kadlec Medical Center.

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10. The unit operators/technicians, supervised by the BED, will ensure that the spilled material is properly collected and disposed. These personnel will be equipped with proper protective equipment and clothing.

11. The BED will take precautionary measures to ensure that any flammable liquid spills do not ignite. In the event fire does occur, the 300 Area Fire Department will control the fire using water, foam, or powders as necessary.

12. All emergency equipment will be cleaned and fit for its intended use immediately after cleanup procedures are complete.

7.4.4.5 Response to Fire. In the event of a fire and/or explosion involving hazardous materials, or if a fire threatens to involve hazardous materials anywhere within the unit, the following actions will take place:

1. The fire alarms (2 gongs/second) will be activated by the person who discovers the fire.

2. The alarm will provide a coded signal to the 300 Area Hanford Fire Station and to the 300 Area Hanford Patrol Headquarters.

3. If time permits, personnel will shut down equipment (e.g., transfer pumps and agitators).

4. The PNL Single-Point Contact (375-2400) will be called.

5. The BED will be notified by one of the means referred to in Section 7.3 or 7.4.1.

6. Personnel will leave the building by the nearest exit and go to the designated staging area.

7. Injured personnel will be immediately removed to a safe location, and medical treatment will be administered by qualified personnel.

8. The BED will contact the Occurrence Representative or the Area Emergency Director (AED) via 375-2400, depending on the severity of the event, and will advise regarding the extent of the emergency and if any immediate action is necessary to protect nearby personnel and buildings.

9. Activation of the 300 Area ECC will set into motion the notification process for DOE, other Hanford contractors, and outside agencies.

10. The Hanford Patrol will set up roadblocks within the 300 Area to route traffic away from the emergency scene.

11. When all personnel are accounted for, the BED will begin to assess the incident.

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7.4.4.6 Unusual, Irritating, or Strong Odors. If an unusual, irritating, or strong odor is detected by a HWTU staff member and the staff member has reason to believe that the odor may be from an uncontrolled release of a toxic or dangerous material, the staff member will:

- Immediately activate the building fire alarm system to evacuate the building, and

- Notify the PNL Single-Point Contact (375-2400), the building manager, and cognizant line management.

If the staff member knows the source and scope of the release and believes the release poses no immediate threat to other occupants of the 3100 section or the 325 section and/or the 325 Building, the release will immediately be reported to the building manager. Measures will be taken to contain the release and ventilate the area.

In the event an unusual odor is detected in the HWTU, and the source of the odor is unknown, the BED will determine whether the HWTU should be evacuated.

7.4.4.7 Discovery of a Bomb or Suspicious Object. If a bomb or suspicious object is discovered, staff will clear the immediate area. The PNL Single-Point Contact (375-2400) will be notified immediately. Staff will then take whatever steps are necessary to ensure that the object is not moved, opened, or otherwise disturbed. If practicable, staff will post warnings signs, place barricades, or stand guard in a sheltered location at the maximum possible distance.

7.4.4.8 "Off Shift" Conditions. If a staff member is working after or before hours and the need to evacuate the HWTU occurs, the following action will be taken:

- Ensure that all occupants leave the unit; provide assistance if necessary

- Follow the unit evacuation procedure

- In case of fire, activate an alarm (located at each HWTU exit) before exiting

- Remain available to inform the fire department of the location of fire, if fire was the cause of evacuation

- Notify the PNL Single-Point Contact at 375-2400.

7.4.5 Prevention of Recurrence or Spread of Fires, Explosions or Releases [G-4e]

The BED will be responsible for taking the steps necessary to ensure that a secondary release, fire, or explosion does not occur after the initial spill and/or incident. Precautions that will be implemented may include, but will not be limited to:

- Inspection of containment for leaks or cracks

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- Inspection for gas generation or pressure build-up in pipes and equipment

- Isolation of residual waste materials

- Reactivation of adjacent operations only after residual waste materials are cleaned up.

7.4.6 Storage and Treatment of Released Material [G-4f]

Treatment, storage, and disposal of released material will be part of restart and recovery activities. Restart of operations after activation of the contingency plan will be conducted in accordance with internal PNL practices for recovery from off-normal events. These practices call for cognizant PNL line management and PNL Laboratory Safety staff to determine the need for a recovery plan. A recovery plan will be needed following an event when further risk could be introduced to personnel, a unit, or the environment through recovery action and/or to maximize the preservation of evidence. If a recovery plan is required, it must be approved by PNL line management before restart. Restart of operations must be performed in accordance with the approved plan.

For emergencies not involving activation of the ECC, the BED will be responsible for ensuring that conditions are restored to normal before operations are resumed. If the ECC was activated and the emergency phase completed, a special recovery organization may be appointed at the discretion of the BED to restore conditions to normal. The makeup of this organization will depend on the extent of the damage and its effects. The recovery organization will be appointed by the Area Emergency Director (AED).

Immediately after an emergency, the BED or the recovery organization, if appointed, will make arrangements for the cleanup phase. Procedures for treatment, storage, or disposal of recovered wastes or any other material resulting from a release, fire, or explosion at the HWTU, will begin at this time.

Dangerous wastes will be contained in DOT-approved drums or other DOE-approved containers and transported to an appropriate storage area. The PNL Waste Management Organization will be contacted for support and guidance during this phase.

Cleanup may include any of the following actions:

- Small spills of acids or bases will be neutralized and other spilled liquids may be solidified with absorbent material. The material will be packed in drums for disposal.

- Leaking drums will be packed in overpack drums.

- All chemically contaminated soils and cleanup debris will be containerized for disposal.

- Throughout the cleanup efforts will always be made to segregate incompatible wastes.

- The BED or the recovery organization, if appointed, will make cleanup arrangements and will ensure that all response equipment is decontaminated and readied for service, or if not fit for further use, disposed of properly by salvaging or transport to an approved TSD.

- All liquids and other materials resulting from decontamination operations will be collected for disposal. Solid materials will be placed in DOT-approved 55-gallon drums or other DOE-approved containers, and liquids will be collected and contained for disposal or stabilization with suitable material.

7.4.7 Incompatible Wastes [G-4g]

After an emergency, the BED or the recovery organization, if appointed, will ensure that no waste which may be incompatible with released material is treated, stored, or disposed of until cleanup procedures are completed. Wastes from cleanup activities will be managed in the same manner as other dangerous wastes (see Section 4.4). The compatibility class of the wastes generated during cleanup will be determined as described in the waste review plan. Incompatible wastes will not be placed in the same container. Containers of waste will be placed in storage areas appropriate for their compatibility class.

7.4.8 Post-Emergency Equipment Maintenance [G-4h]

All equipment used during scene stabilization and cleanup operations will be decontaminated and readied for future use. All persons involved in the cleanup will shower and remove any contaminated clothing as necessary. Contaminated clothing will be cleaned or packaged for treatment, storage, or disposal, depending upon condition and level of contamination.

The BED will be responsible for ensuring that all equipment is cleaned and fit for its intended use before operations are resumed. Depleted stocks of neutralizing and absorbing materials will be replenished, SCBAs cleaned and refilled, protective clothing cleaned or readied for disposal, etc. Necessary local, state, and federal authorities will be notified by DOE-RL that cleanup procedures have been completed and all emergency equipment has been cleaned and is fit for use. This action will be completed before operations are resumed at the unit.

7.4.9 Response to Container Spills or Leaks [G-4i]

General procedures for the notification, identification, hazard assessment, and spill control are contained in Sections 7.4.1 through 7.4.4. In addition to these general procedures, the following procedures apply to response to container leaks and spills:

- If a container is leaking, its contents will be transferred to a sound container. Ignitable or reactive wastes will be transferred in accordance with internal PNL practices for fire safety (e.g., use of nonsparking tools, use of explosion-proof electrical equipment, grounding of containers).

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- If a container is not leaking but is of questionable integrity, it will be transferred to an overpack container. All void space in the overpacks will be filled with absorbent material (e.g., vermiculite).

- Any waste containers filled as a result of leak response (e.g., overpacks, cleanup residuals) will be labeled and managed in the same manner as other dangerous waste containers (see Section 3.1).

7.4.10 Response to Tank Spills or Leaks [G-4j]

Operation of the HWTU does not involve the storage of dangerous waste in tank systems. Therefore, the requirements of WAC 173-303-640 are not applicable.

7.4.11 Surface Impoundment Spills or Leaks [G-4k]

Operation of the HWTU does not involve the placement of dangerous waste in surface impoundments. Therefore, the requirements of WAC 173-303-650 are not applicable.

7.4.12 Waste Pile Spills or Leaks [G-4l]

Operation of the HWTU does not involve the placement of dangerous waste in waste piles. Therefore, the requirements of WAC 173-303-660 are not applicable.

7.4.13 Incineration Spills or Leaks [G-4m]

Operation of the HWTU does not involve incineration of dangerous waste. Therefore, the requirements of WAC 173-303-670 are not applicable.

7.4.14 Landfill Leakage [G-4n]

Operation of the HWTU does not involve the placement of dangerous waste in landfills. Therefore, the requirements of WAC 173-303-665 are not applicable.

7.4.15 Land Treatment Facility Spills or Leaks [G-4o]

Operation of the HWTU does not involve the land treatment of dangerous waste. Therefore, the requirements of WAC 173-303-655 are not applicable.

7.5 EMERGENCY EQUIPMENT [G-5]

The safety equipment for use during emergency situations at the HWTU and the Hanford Site 300 Area is discussed in the following sections.

7.5.1 Communication Equipment

The HWTU has an alarm system which is monitored by the 300 Area Hanford Fire Department. A manual fire alarm pull box is located near each exit door. In addition, staff members can use telephones or hand-held radios located at the HWTU to summon assistance. Communication equipment is also described in Section 6.4.

7.5.2 Fire Control Equipment

The HWTU is constructed of noncombustible materials and equipped with an automatic fire suppressant sprinkler system.

7.5.3 Other Emergency Equipment

Other emergency equipment at the HWTU includes approved fixed emergency shower and eye-wash units, absorbent pillows, industrial absorbent, neutralizing absorbent, and a adequate supply of protective clothing and equipment. The fixed 325 section emergency shower and eye-wash units are located just outside the HWTU near the north and south doors. The 3100 section emergency shower and eye-wash units are located in the receiving area. Ambulance response to either section of the HWTU from the 300 Area Fire Department is less than five minutes and provides emergency first aid if needed.

Supplies of absorbent pillows are located in the operating area. These pillows are nonspecific (for acids or bases), and each will absorb approximately one liter of waste. The work area is also provided with a large supply of diatomaceous earth, which is a standard industrial absorbent for cleaning up spills of oil, solvents, and aqueous materials. Neutralizing absorbent is available for absorbing acids or caustics. The supply of clean-up materials will be adequate to respond to emergencies involving the waste being treated or stored at the HWTU.

Protective clothing and equipment are provided to safeguard employees during normal and emergency operations. Protective eyewear, coveralls, and gloves are the minimum protective clothing to be worn. Personnel assigned to the HWTU are available to assist other trained personnel (e.g., fire fighters) in emergency situations or possible Immediately Dangerous to Life or Health (IDLH) spill cleanup situations.

The HWTU is equipped with primary and secondary power. In the event of a primary power loss, the secondary system is automatically activated. The 325 section is connected to the 300 Area emergency power grid. The 3100 section will have a dedicated emergency generator that will be automatically activated.

7.5.4 Hanford Site Emergency Equipment

The Hanford Site has fire and security personnel trained and equipped to respond to emergencies. Westinghouse Hanford Company (WHC) provides the fire and patrol services for the Hanford Site. The Hanford Fire Department's Hazardous Material Response Team is trained for mobilization and control of hazardous material emergencies. The Hanford Fire Department will take control of the event scene until the emergency incident is under control and personnel rescue is complete. A list of hazardous material equipment for hazardous material response available from the Hanford Fire Department is given in Figure 6-3.

The Hanford Patrol provides support to the Fire Department during an emergency incident.

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If an emergency threatens other buildings and/or there is a danger of release of dangerous material to the environment, the 300 Area ECC will be activated. The ECC will:

- Provide any assistance requested by the BED, who is responsible for the emergency at the event site and field control point until the Hanford Fire Department arrives

- Coordinate protective response actions and notifications

- Furnish technical assistance, if necessary.

7.6 COORDINATION AGREEMENTS [G-6]

This section describes the coordination agreements for emergency response of both on-site and off-site entities. DOE-RL and its contractors have established arrangements to coordinate response to site emergencies. The familiarity of the contractors with the Hanford Site will allow them to assist in an emergency with a minimum amount of direction.

The Memorandum of Understanding (MOU) among PNL, WHC, HEHF, and Kaiser Engineers Hanford defines the interfaces and notifications required for on-site contractors during an emergency. The DOE-RL has overall responsibility for emergency preparedness. Per the MOU, WHC has the responsibility for site-wide emergency preparedness. Each contractor has the responsibility for emergency preparedness at units they operate for DOE-RL.

Memoranda of Understanding have been established to reduce the impact to human health and the environment in the event that a Hanford Site emergency has off-site public health implications or if an on-site emergency warrants off-site assistance.

7.6.1 Local, State, and Federal Authorities

Various Memoranda of Understanding have been established among the DOE-RL and Benton County, Franklin County, Grant County, and the States of Washington and Oregon. These Memoranda of Understanding describe the cooperative agreements between DOE-RL and these state and local authorities for any on-site emergency that warrants off-site assistance. They describe the planning for, communication of, and response to emergencies at the Hanford Site that might have off-site consequences.

7.6.2 Hanford Fire Department

The Hanford Fire Department provides fire department services for the Hanford Site. Mutual aid agreements have been established with the local Tri-Cities (Richland, Kennewick, and Pasco) fire departments; Benton County Fire Districts 1, 2, and 4; Franklin County Fire District 3; and Walla Walla Fire District 5 for support to the Hanford Fire Department. In events where fire and/or smoke threatens more than one building, the area ECC is activated at a minimum.

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7.6.3 Medical and First Aid

Professional medical help is currently provided by HEHF for the entire Hanford Site. Doctors and/or nurses are available for emergency assistance at all times. The medical personnel are trained to work with personnel who have been exposed to dangerous and radioactive material. Emergency call lists ensure that professional medical care is available at all times. A nurse is on duty in the 300 Area at all times.

Hospital services are available at Kadlec Medical Center in Richland, Washington, with backup service at Kennewick General Hospital in Kennewick, Washington, and Our Lady of Lourdes Health Center in Pasco, Washington.

7.6.4 Ambulance Service

Ambulance service will be provided by the Hanford Fire Department, which has qualified emergency medical technicians as attendants. This service is available from the 300 area fire station on a 24-hour basis. Additional ambulances are available when needed from other fire stations and from other local fire departments under mutual aid agreements.

In addition, an MOU has been established with the City of Richland for providing backup ambulance service.

7.6.5 Unified Dose Assessment Center

The Unified Dose Assessment Center is the technical extension of the DOE-RL/Emergency Action Coordinating Team (EACT), providing services to both DOE-RL/EACT and the ECC. The primary mission of the Unified Dose Assessment Center is to provide recommendations for protective actions, dose calculations and projections, and consultation in the area of industrial hygiene (dangerous materials), biology, environmental monitoring, and meteorology to support the DOE-RL/EACT and the ECC.

Industrial hygiene and biological consultants at the Unified Dose Assessment Center advise and assist in proper response procedures for spills or releases of toxic, flammable, carcinogenic, and pathogenic materials. The Unified Dose Assessment Center staff are tasked with providing a central unified assessment of the dispersion and impact of atmospheric releases from the Hanford Site. Through communication with the ECC, the staff coordinates the assessment of impacts and assists in determination of actual and potential release source terms.

7.6.6 Hanford Patrol

The Hanford Patrol serves as the security and enforcement agency for the Hanford Site. In the event of an emergency, the Hanford Patrol provides services that may include activating the crash alarm systems and area sirens, coordinating the movement of emergency personnel through security gates, assisting evacuation activities, establishing barricades where needed, and making necessary notifications through the PNL point of contact. The Hanford Patrol has a large inventory of security response equipment. Various Memoranda of Understanding have been established with local Tri-Cities police departments to provide additional backup capabilities.

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7.6.7 River Evacuation

An MOU has been established among the DOE-RL, the Washington Public Power Supply System (WPPSS), Benton and Franklin Counties, and the Thirteenth Coast Guard District to ensure safety on the Columbia River during an emergency at the Hanford Site and to coordinate a river evacuation.

7.6.8 Meteorological Information

An agreement has been established between the DOE-RL and the National Weather Service, Washington Area, which defines the mutual responsibilities for providing meteorological information in an emergency situation.

7.6.9 Washington Public Power Supply System

An MOU has been established between the DOE-RL and WPPSS for providing mutual assistance as needed and available regarding use of buildings and equipment for personnel decontamination, first aid, evacuation and staging areas, respiratory protective equipment, protective clothing, radiological surveying equipment, resources for river evacuation, and radiological assistance response.

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7.7 EVACUATION PLAN [G-7]

All Hanford Site buildings have evacuation plans which include emergency signal identification, staging area location and, if required, plans for the use of the standby evacuation buses. Incidents in other buildings in the 300 Area or adjacent structures may necessitate evacuation of the HWTU. Incidents within the HWTU will require the HWTU personnel to evacuate the premises and report to their designated accountability areas.

Four warning signals are currently in use at the Hanford Site. These signals will warn personnel if incidents have occurred in a nearby building. First, a gong signal will be activated to inform personnel to evacuate the building and move upwind. Second, a steady siren will be activated to inform workers that an alert/evacuation is occurring. Personnel will be required to meet at their staging area(s) for instructions upon hearing the steady siren. Third, a wavering siren will require people to stay under cover. This siren may be used to protect personnel from radioactive fallout, dangerous material releases, adverse weather, etc. Fourth, activation of the howler "aa-oo-gah" will be used to signal personnel of a criticality. In the event this signal is activated, personnel inside the HWTU will immediately exit to the designated staging area.

7.8 REQUIRED REPORTS [G-8]

Within 2 hours after initiation of the contingency plan, PNL emergency management staff must classify the incident and notify DOE-RL per DOE-RL 5000.3A. Any spill will be reported in accordance with WAC 173-303-145 and 40 CFR 302.6. Within 24 hours after initiation of the Contingency Plan, the BED will record the time, date, and details of the incident. The BED or alternate will ensure that any event which requires implementation of the contingency plan is reported to Ecology through DOE-RL with a written report within 15 days after the incident. Any spill or release of hazardous material which

threatens the environment and requires implementation of the Contingency Plan must also be reported to the National Response Center through DOE-RL. These details will include:

1. Name, address and telephone number of the owner/operator of the TSD unit

2. Name, address, and telephone number of the TSD unit

3. Date and time of occurrence

4. Type of release, if any

5. Material(s) involved

6. Material released, if any, and volume

7. Immediate action taken

8. Follow-up action taken

9. Action taken to prevent future implementation of contingency plan

10. Modifications to the plan, if needed

11. Report of any injuries

12. Other agencies notified

13. Disposition of recovered material and quantity

14. Assessment of actual or potential hazards.

7.9 PLAN MODIFICATION

The Contingency Plan may be modified with concurrent approval by the Emergency Preparedness Office at PNL. The BED may modify the plan in emergency situations in order to more adequately protect human health or the environment. In addition, the Contingency Plan will be reviewed and immediately amended, if necessary, whenever:

- Applicable regulations or the HWTU permit are revised

- The plan fails in an emergency

- If improvements are recognized, during contingency drills, which would enhance effective response

- The list of emergency coordinators changes

- The list of emergency response equipment changes

- The list of response agencies changes

- The HWTU changes and new potential avenues for fires, explosions, or releases of hazardous materials are created

- Errors are found in the plan.

7.10 PLAN LOCATION

Copies of the contingency plan are maintained at the 325 section office, 325 Building Emergency Director's Office, the 3100 Building, the 300 Area Fire Station, the 300 Area ECC Offices, and DOE-RL/EACT command post, Federal Building, Richland.

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8.0 PERSONNEL TRAINING [H]

This section describes the basic requirements, as outlined in WAC 173-303-330, of the HWTU Safety and Operations Training Program. The program will provide new employees with the basic knowledge and skills required to effect a safe operation and provide experienced employees with progressive on-going training in hazardous waste management. In its entirety, the program will ensure continued compliance with WAC 173-303, and general RCRA, OSHA, and DOT training requirements as they pertain to the waste management operations conducted at the HWTU. All personnel training will be administered under the authority and direction of the PNL Training Coordinator. The training requirements for the HWTU operating personnel are depicted graphically in Figure 8.1.

8.1 OUTLINE OF TRAINING PROGRAM [H-1]

The training program for personnel at the HWTU is described in the following sections.

8.1.1 Job Titles and Job Descriptions [H-1a]

The Unit Operating Manager is responsible for the daily operation of the HWTU in compliance with regulations administered under RCRA, the State of Washington Dangerous Waste Regulations (WAC 173-303), and PNL operating procedures.

The Unit Operating Manager is ultimately responsible for assessing compliance, conducting inspections and overseeing any corrective actions which may result from them, ensuring waste handling and storing procedures are followed, and serving as BED in the 3100 section (and assistant to the 325 BED) to implement proper emergency procedures when necessary. In addition to the responsibilities mentioned above, it is the role of the Unit Operating Manager to direct new employees so that successful completion of introductory and on-the-job training will be accomplished in the first six months of employment.

The MW Waste Management Engineer is responsible for the mixed waste operation. This staff member must review all mixed waste disposal requests and ensure their accuracy and reliability. In addition, the MW Waste Management Engineer will dispatch a pickup team and oversee mixed waste pickup and transportation.

The Waste Management Engineers are responsible for evaluating unit compliance, managing the PNL PCB waste stream, managing the waste designation data base, and overseeing waste designations. This staff member must review all mixed waste disposal requests and ensure their accuracy and reliability. Waste Management Engineers also perform waste management operations such as pickup and lab packing of small containers. They also oversee offsite shipping of wastes and ensure compliance with DOT regulations.

Waste Management Technical Specialists and Technicians are responsible for the physical operations at the HWTU. The persons in these positions are responsible for packaging, labeling, and preparing waste for shipment to disposal facilities and will assist in any sampling activities and/or waste pickups.

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Training Course	STAFF POSITION OM	E	TS	S
Building Emergency Procedures	A	A	A	A
Security	A	A	A	A
Criticality Safety Training	B	A	A	A
Hazard Communication	I/A	I/A	I/A	I/A
Lab Fume Hood	B	B	B	B
Radiation Safety	I/B	I/B	I/B	I/B
Glove Box	B	B	B	B
Radioactive Materials Packaging	B	B	B	B
Dangerous and Radioactive Waste Management	A	A	A	A
TSD Operator 40-hr, 24-Hr & 8-Hr Courses	I/A	I/A	I/A	I/A
Hazardous Waste Operations Supervisor	I/A	N	N	N
Hazardous Waste Shipment Certification	I	I	I	I
Contingency Plan Review	I/A	I/A	I/A	I/A
Contamination Control & Decontamination	A	A	A	A
Basic First Aid	B	B	B	B
Permit Review	I/A	I/A	I/A	I/A
Procedures For Receipt, Inspection, Storage Handling, Processing and Disposal of Waste	A	A	A	A

Staff Position Key:
- OM - Unit Operating Manager
- E - Research/Waste Treatment Engineers (including MW)
- TS - Waste Treatment Technician
- S - Facility Operating Staff

Requirements Key:
- A - Annually, (includes updates and refreshers),
- B - Biennially, I - Initially
- N - Not Required

Figure 8-1. HWTU Training Requirements

Waste Management Clerks are responsible for recordkeeping and database maintenance. It is the role of the Waste Management Clerk to enter data and update the databases as required. Verification of waste inventories are also the Clerk's responsibility; other roles include reporting, preparation of labels, manifests and associated paperwork, and unit upkeep.

The Building Emergency Director (BED) for the 325 section is not a staff member of the HWTU. Therefore, his training will not be discussed in this permit application. The 325 Building BED has responsibility for directing emergency activities for the 325 building. To aid in this responsibility, he will receive appropriate training to respond to emergencies as well as specific training for the 325 section. He will also receive additional hazard information, in the event of an emergency, from the Unit Operating Manager.

8.1.2 Training Content, Frequency, and Techniques [H-1b]

Personnel training will consist of both classroom instruction and on-the-job training under the guidance and direction of a qualified "Hazardous Materials Handler." All new HWTU employees must complete their initial qualification training within six months from their date of hire. All current employees and new employees, upon completion of initial qualification phase, will receive on-going training relevant to the position for which they are employed. The continuing training received by each employee will be evaluated on an annual basis for relevance and completeness as part of the annual review process.

8.1.3 Training Coordinator [H-1c]

Training at PNL is provided by a number of specialists in their fields, including a Training Coordinator from the waste management organization who is responsible for coordinating dangerous waste training. The position of Training Coordinator is filled by an engineer or specialist having "hands-on" experience with handling chemical wastes. PNL also has a unit which tracks and monitors training for PNL employees. This coordinator includes a system for "flagging" affected employees when additional training and/or followup is warranted.

8.1.4 Relevance of Training to Job Position [H-1d]

At a minimum, all unit personnel will receive training commensurate with the level of knowledge necessary to ensure that each employee understands the general and specific aspects of their working environment. The training program can be divided into four general categories:

- Hazardous Materials Handler Trainee
- Hazardous Materials Handler
- Visitor Contractor Personnel
- Other Unit Personnel

8.1.5 Training for Emergency Response [H-1e]

Training is adequate to ensure that personnel are able to respond effectively to emergencies and are familiar with emergency procedures, emergency equipment, and emergency systems. Emergency response training includes, but is not limited to:

- Using, inspecting, repairing, and replacing unit emergency and monitoring equipment

- Activating and responding to communications and alarm systems

- Response to fires and explosions

- Shutdown of operations

Procedures for Using, Inspecting, Repairing, and Replacing Unit Emergency and Monitoring Equipment. Personnel operating the HWTU are adequately trained to ensure prompt and effective response to emergency situations that may arise during operation of the unit. The following required safety courses outline procedures for using, inspecting, repairing, and monitoring emergency equipment.

- Building Emergency Preparedness (contingency plan): conducted annually or when changes are made, whichever is more frequent, to familiarize the employee with the written contingency plan and specific responsibilities of emergency procedures.

- Hand-Held Radio Operator: conducted initially, this briefing makes the employee familiar with the operation of the hand-held and truck-mounted radio for both everyday and emergency operation. This briefing also includes a discussion on radio etiquette.

- Respiratory Protection: conducted annually, the course familiarizes the operating staff with the proper use of air purifying respirators and their limitations. It also makes the staff aware of potential respiratory hazards, how to recognize them, and what actions to take.

- Treatment, storage, and Disposal (TSD) Facility Operator Safety: consists of a 40 hour or 24 hour initial training and an 8 hour annual refresher. This course provides extensive instruction on the use of field survey instruments, such as combustible gas indicators, oxygen meters, detector tube systems, photo and flame ionization instruments, organic vapor analyzer (OVA) meters, and atmospheric sampling instruments. Other topics covered include heat-induced illness, OSHA's Emergency Response Standards, lists of personal protective equipment, hazardous materials classification systems, confined space work practices, liquid storage tanks, contamination control, toxicology, medical monitoring, and many others.

- SCBA: conducted annually, this course instructs the employee of the advantages and limitations of the SCBA equipment. Key items covered include equipment inspection, modes of operation, donning procedures, recognition and response to malfunctions, maintenance and repair, and practical demonstration.

- Fire extinguisher Use: conducted annually, this 30-minute course consists of a videocassette, lecture, and reading materials. Its intent is to familiarize all personnel with proper discharging, inspecting, and maintenance procedures for fire extinguishers to be used during an emergency.

Key Parameters for Automatic Waste Feed Cut-Off Systems. This section is not applicable to the HWTU because there are no automatic waste feed systems planned.

Communications or Alarm Systems. Personnel operating the HWTU are properly trained in both handling communication devices and alarm systems and recognizing alarm sirens as to their meaning. A Hand-Held Radio Operator training course (outlined above) is required to be part of all HWTU employee training. In addition, the Contingency Plan, also required reading for all operating staff at HWTU, details communication and alarm systems, as well as proper response to each system during an emergency.

Response to Fires. Personnel at HWTU are adequately trained in response to fires at the unit. All staff are trained annually in implementation of the contingency plan which outlines each person's immediate and sequential actions in case of a fire emergency. In addition, all staff receive training for proper handling, maintenance, and discharge of onsite fire extinguishers, and proper activation of alarm and fire suppressant systems.

Response to Groundwater Contamination Incidents. This section is not applicable because groundwater monitoring is not required at HWTU.

Shutdown Operations. Procedures for shutdown of operations at HWTU because of an emergency situation are outlined in the Contingency Plan. As mentioned previously, all staff are trained annually in implementation of the contingency plan. The person responsible for the decision to shut down is the BED or alternate.

8.2 IMPLEMENTATION OF TRAINING [H-2]

8.2.1 Hazardous Materials Handler Trainee [H-2a]

All personnel newly assigned to work in laboratory areas where waste is received, stored, handled or otherwise managed will receive initial qualification training as a "Hazardous Materials Handler Trainee." A Hazardous Materials Handler Training Record (Figure 8-2) will be initiated on the first day of employment. The new employee will complete this record within the first six months from date of hire. Until the time that all qualifications are complete, the employee will be considered a trainee and will be allowed to work in laboratory areas only under the direct supervision of a qualified "Hazardous Materials Handler."

- The HWTU Operating Manager will ensure that Hazardous Materials Handler Training Records are completed for all new HWTU employees who are to be classified as a Hazardous Materials Handlers.

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Name:_____ Employment Date:_____
Social Security No._____ Employee ID#:_____

THIS COMPLETED RECORD INDICATES THAT THE ABOVE NAMED INDIVIDUAL HAS RECEIVED THE REQUIRED INITIAL TRAINING TO ALLOW HIM/HER TO ASSUME THE DUTIES OF HIS/HER JOB POSITION.

A. The above named individual received the following safety equipment.

		Employee's Initials	Date
1.	Safety Glasses	_____	_____
2.	Hard Hat (if appl.)	_____	_____
3.	Work Uniform (if appl.)	_____	_____
4.	Other (Specify)	_____	_____

B. The above named individual received the following initial training and satisfactorily demonstrated an understanding of the subject material.

		Employee's Initials	Instructor's Initials	Date
1.	Respirator Fit Test	_____	_____	_____
2.	Respirator Training	_____	_____	_____
3.	Basic Safety Requirements	_____	_____	_____
4.	Unit Tour-Explanation of Operations	_____	_____	_____
5.	Emergency Contingency Plan			
	Location and Use of a. Emergency Communication Equipment	_____	_____	_____
	b. Various Contingencies (i.e., fire, spill, gas release) and the appropriate responses to each	_____	_____	_____

FIGURE 8-2 Hazardous Materials Handler Training Record

		Employee's Initials	Instructor's Initials	Date
	c. Agreements with off-site response agencies	_____	_____	_____
6.	Location and Use of Self Contained Breathing Apparatus (SCBA)	_____	_____	_____
7.	General Overview of License/ Permit	_____	_____	_____
8.	Fire Extinguisher Locations/ Uses/Limitations	_____	_____	_____
9.	Location and Use of Emergency Eye Wash/Shower	_____	_____	_____
10.	General Overview of EPA/DOT/ DOE Markings and Labeling	_____	_____	_____
11.	Hazard Communication	_____	_____	_____
12.	Personal Protective Equipment Locations/Uses/Limitations	_____	_____	_____
13.	Medical Surveillance Req.	_____	_____	_____
14.	Decontamination Procedures	_____	_____	_____
15.	Other	_____	_____	_____

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FIGURE 8-2 Hazardous Materials Handler Training Record (cont.)

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Name:_____ Employment Date:_____

Social Security No:_____ Employee ID#:_____

A. The above named individual has received the following training and has satisfactorily demonstrated an understanding of the subject material.

	Subject	Lesson Plan Code (If Applicable)	Instructor's Initials	Date
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13				
14.				
15.				
16.				
17.				
18.				
19.				

FIGURE 8-3 Hazardous Materials Handler Qualification Record

- No new HWTU employee will be allowed to work without direct supervision in the laboratory area until the Hazardous Materials Handler Training Record has been completed.

- Each new HWTU employee must receive a complete medical evaluation including clearance to wear appropriate respiratory equipment before being allowed to work in the active areas or to directly handle waste materials.

- Each new employee must be properly fitted with a respirator/SCBA being allowed into the laboratory area or to directly handle waste materials.

- The HWTU Operating Manager will initiate the Hazardous Materials Handler Training Record, beginning entries on this record the week the employee starts work.

8.2.2 Hazardous Materials Handler [H-2b]

Unit employees who work in laboratory areas where waste is received, stored, handled, treated, or otherwise managed will receive continual training to maintain their qualifications as Hazardous Materials Handlers. The Hazardous Materials Handler Qualification Record (Figure 8-3) will be completed annually, documenting all training the employees have received for the year. These documents will be reviewed at the end of each calendar year to ensure all required training has been given to each employee. Hazardous Materials Handler qualifications will vary in terms of subject and frequency, depending on the employee's job description. At a minimum all Hazardous Materials Handlers will receive training to include, but not be limited to the following areas:

- Building Emergency Procedures annual review
- Yearly security refresher
- Criticality safety training
- Hazard communication training
- Laboratory fume hood safety
- Respiratory protection including emergency use of respirators (SCBA training)
- Radiation safety
- Glove box operations
- Radioactive materials packaging
- Dangerous and radioactive waste management
- OSHA 29 CFR 1910.120 certification
- Hazardous waste shipment certification
- Review of HWTU Emergency Contingency Plan requirements and associated equipment necessary to carry out Contingency Plan response operations
- Contamination control and decontamination procedures (dangerous/radioactive)
- Basic first aid
- Review of permit requirements governing operations.
- Proper procedures for the receipt, inspection, storage, handling, processing, and disposal of waste material
- Personal protective equipment training.

8.2.3 Visitor and Contractor Personnel [H-2c]

All visitors and contractors who require occasional access to the unit will be accompanied by a qualified HWTU Operations Staff employee at all times while in the unit.

8.2.4 Other Facility Employee Training [H-2d]

Unit employees who do not work in laboratory areas (for example, anyone other than HWTU Operations Staff) will receive sufficient instruction to understand the posting of active areas, the general operations conducted in those areas, and the restrictions imposed on their entrance and access to such areas. They shall also be trained in the unit's Emergency Contingency Plan and shall demonstrate their ability to carry out their assigned duties if applicable.

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9.0 EXPOSURE INFORMATION REPORTS

The HWTU does not store, treat, or dispose of hazardous waste in a surface impoundment or a landfill as defined in 40 CFR 270.10 and RCRA, Section 3019. Therefore, exposure information is not required.

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10.0 WASTE MINIMIZATION PLAN

This chapter discusses the program to minimize the volume or quantity and toxicity of waste generated at the HWTU. The regulatory basis for, and objectives of, the waste minimization program are discussed. Waste generators are described and procedures for minimizing waste are discussed.

10.1 REGULATORY BASIS

The Hazardous and Solid Waste Amendments of 1984 to RCRA require that, whenever feasible, the generation of regulated hazardous waste be reduced or eliminated as expeditiously as possible. Section 3002(b) of RCRA requires certification of the following:

- The generator of the hazardous waste has in place a program to reduce the volume or quantity and toxicity of such waste to the degree determined by the generator to be economically practicable.

- The proposed method of treatment, storage, and/or disposal is that practicable method currently available to the generator that minimizes the present and future threat to human health and the environment.

This chapter provides the means to certify that a waste minimization program is in place for the HWTU.

10.2 HAZARDOUS WASTE TREATMENT UNIT WASTE MINIMIZATION OBJECTIVES

The HWTU waste minimization program is tied to the overall waste minimization program for the Hanford Facility. The HWTU waste minimization program includes all practices that reduce, avoid, or eliminate dangerous waste generation.

The HWTU waste minimization program objectives are as follows:

- Minimize the volume of dangerous waste generated.

- Segregate dangerous waste from nondangerous waste if practicable.

Annually, a certification as required by 40 CFR 264.73(b)(9) will be placed in the unit Operating Record stating that a waste minimization program is in place. Also, a Hanford Facility biennial report is made to the EPA and Ecology containing a description of efforts made to minimize waste and a certification that a waste minimization program is in place. The report will include information on the HWTU waste minimization program.

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10.3 WASTE GENERATION CONTROL

The HWTU waste minimization program is designed to avoid or reduce the amount or toxicity of dangerous waste generated. Waste generated at the HWTU is managed aggressively to minimize the total volume. Processes utilized for waste treatment in the HWTU will be designed and operated in such a manner to minimize the generation of secondary waste streams.

10.4 SPECIFIC WASTE MINIMIZATION PROCEDURES

As stated previously, the HWTU is a hazardous and mixed waste treatment unit. Waste generated at the HWTU is managed to ensure that the quantity and toxicity are minimized. Operating procedures require dangerous waste and mixed wastes be treated in separate portions of the unit to avoid inadvertent mixing which would result in the contamination of dangerous waste with radioactive components.

Section 3.0 discusses in detail the scope of waste to be accepted by the HWTU, the waste descriptions, hazard characteristics and the basis for hazard designations are also discussed. Whenever possible waste will be used as reagent for the purposes of treating another waste. A simple example is neutralization of a waste acid with a waste base. This type of waste reagent treatment will be considered whenever possible. Any applicable treatment standards for all of the wastes must be achieved.

Housekeeping and surveillance activities are performed daily to properly clean the unit to minimize the potential for dangerous waste generation. Floors in the operating area of the unit will be cleaned using only dry sweeping compounds and/or damp mops.

Unit personnel will be instructed not to dispose of nondangerous wastes (office trash, beverage containers, etc.) in dangerous waste containers. Dangerous waste containers are kept closed except while adding or removing waste, to help prevent inadvertent addition of ordinary refuse.

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11.0 CLOSURE/POST-CLOSURE REQUIREMENTS [I]

This chapter is submitted in accordance with the requirements of WAC 173-303-806(4)(a)(xiii) to demonstrate the DOE-RL has developed a plan to ensure safe closure of the HWTU. In accordance with WAC 173-303-610, copies of the closure plan and all revisions will be maintained at the HWTU until certification of the closure completeness has been submitted and accepted by Ecology. A post-closure plan is not required because HWTU is not a disposal unit and all dangerous wastes and dangerous waste residues will be removed at the time of closure.

11.1 CLOSURE PLAN [I-1]

This plan is written assuming closure of the HWTU at its maximum extent of operation. This plan contains the procedures for decontamination of the unit and all equipment as required by 40 CFR 264.112.

11.1.1 Closure Performance Standard [I-1a]

The HWTU will be closed in a manner which will minimize the need for further maintenance and eliminate post-closure release of dangerous waste or MW or constituents of dangerous wastes or MW. This standard will be met by removing all dangerous waste and MW and any residue of these wastes from the unit.

Closure activities will ensure that the unit is in a condition suitable for use in support of research and development activities. This use is consistent with other activities in the 300 Area.

If there is any evidence of spills or leaks from the unit into the environment, samples will be taken and analyzed to determine the extent of contamination in the soil, and if necessary, in groundwater. Evidence of spills or leaks will be obtained through sampling of unit structures accessible to the environment (e.g., floors) and through sampling of all barriers designed to prevent migration to the environment (e.g., sumps). If this sampling program indicates that contamination is present, the potential for migration and contamination to the environment will be evaluated. If potential migration appears likely, additional samples will be taken. In addition, if the inspections identify any potential contaminant migration routes (e.g., cracks in sumps), additional samples will be collected to determine whether migration has occurred.

Any contaminated soil will be excavated, removed, and disposed of as dangerous or mixed waste (determination of mixed waste status will be based on waste radioactivity). Soil will be decontaminated to the following levels, as required under WAC 173-303-610(2)(b):

- Background environmental levels for wastes which are listed under WAC 173-303-081 or WAC 173-303-082

- Background environmental levels for wastes which are characteristic dangerous wastes under WAC 173-303-090

- Designation limits for wastes which are designated under Wac 173-303-084, or WAC 173-303-101 through WAC 173-303-103.

Equipment and structural components will be decontaminated using the procedures described in Section 11.1.5. All residues resulting from decontamination will be sampled and analyzed as described in Section 11.1.6 to determine whether they are dangerous wastes. All residues will be removed from the unit and transferred for proper handling to a facility having the necessary permits. Residues having dangerous waste characteristics or exceeding dangerous waste designation limits will be disposed of as dangerous waste.

11.1.2 Partial and Final Closure Activities [I-1b]

This plan describes the steps necessary to perform final closure of the unit in order to meet the aforementioned closure performance standard. Closure activities involve removing dangerous waste and MW from the unit, then decontaminating the unit. These activities may be implemented at any point during the life of the unit.

Partial closure of the unit may be conducted. Partial closure will involve closing the 325 section or the 3100 section while the other section remains in operation.

11.1.3 Maximum Waste Inventory [I-1c]

The HWTU is used to treat a variety of different research and operations-related wastes. The maximum inventory of wastes at any time will be constrained by four factors:

- The total amount of mixed waste in the 325 section at any time will typically be less than 1000 gallons (3800 liters).

- The total amount of dangerous waste in the 3100 section at any time will typically be less than 5000 gallons (18950 liters).

- The total amount of any particular dangerous waste during any given year will not exceed the amounts given in the Part A permit application for the HWTU.

- The total amount of dangerous/mixed waste by hazard class at any one time will not exceed Uniform Building Code Class B Hazardous Waste Quantity Restrictions.

11.1.4 Inventory Removal, Disposal or Decontamination of Equipment, Structures and Soils [I-1d]

Closure or partial closure activities will be initiated by removal of the dangerous waste and/or MW inventory present at the HWTU at the time of closure or partial closure. Inventory removal procedures will be identical to the waste handling, packaging, and manifesting activities associated with normal operations. All dangerous wastes present will be placed into proper containers according to the currently accepted waste handling procedures; mixed wastes will be placed into containers and meet Hanford specifications

outlined in WHP-EP-0063, Hanford Radioactive Solid Waste Packaging, Storage, and Disposal Requirements. All containers of dangerous waste and/or MW will be transferred to another unit which is permitted to manage the waste, which will ensure proper handling and disposal.

Equipment and structures will be decontaminated at the time of closure or partial closure. Prior to decontamination, sampling and analysis will be performed to determine decontamination requirements. In most cases, minimal decontamination consisting of washing or wiping will be performed unless the sampling and analysis indicates the presence of high levels of contamination. To determine whether such contamination exists, a systematic sampling approach will be employed to locate "hot spots."

Decontamination of equipment and structures will take place as described below. The magnitude of each phase of the operation and estimated time for completion are included.

If partial closure of the 325 section occurs, the procedures in Section 11.1.4.1 will be followed. If partial closure of the 3100 section occurs, the procedures in Section 11.1.4.2 will be followed. If the entire unit is to be closed, the procedures in Sections 11.1.4.1 and 11.1.4.2 will be completed simultaneously.

11.1.4.1 Closure of the 325 Section. Decontamination of Waste Handling Equipment. All waste-handling equipment will be decontaminated first by washing followed by steam cleaning, or it will be disposed of as dangerous waste at an approved disposal facility. The decision to dispose or decontaminate equipment will be made at the time of closure. Whichever option is most environmentally and economically feasible will be chosen. If the equipment is not considered to be substantially contaminated, the washing may not be performed. In this case, the equipment will be cleaned by the steam cleaning technique only.

Equipment to be washed will be subjected to the wash deemed most effective for the removal of the suspected contamination. The equipment will then be subjected to a final washing and rinsing by a steam cleaning unit. All wastewater will be collected in sumps, pumped to polyethylene-lined, closed top drums, and transported and disposed of as dangerous waste.

The time required for decontamination of waste-handling equipment and the amount of wastewater generated by these procedures will depend on the amount of equipment to be decontaminated. At this time, minimal time and effort are anticipated. The decontaminated wastes are not anticipated to exceed 50 gallons (190 liters).

Decontamination of 325 Section. Wipe samples will be collected prior to decontamination on a regular grid with a spacing of 5 feet (1.5 meters) on the floor, walls, ceiling and exposed ventilation surfaces. The samples will be analyzed to determine if the surfaces have been contaminated. Using the results from the testing, appropriate decontamination procedures will be selected.

If no contamination is found on the wipe sample, decontamination procedures will consist of sweeping, dusting, vacuuming, and wiping with soap and water.

Brushing or sweeping is used to clean up coarse debris. Vacuuming will be performed using a commercial or industrial vacuum equipped with a high-efficiency particulate air (HEPA) filter. The vacuum cleaner bag containing captured particulates will be disposed of as a dangerous waste.

Dusting/wiping will be done with a damp cloth or wipe (soaked with water) to remove dust from surfaces not practically treatable with a vacuum. The cloth or wipe will also be disposed of as a dangerous waste.

Minimal time will be required for setup of the equipment. Labor requirements for the process should be moderate. Minimal time will also be required for packaging debris and dismantling and removing cleaning equipment. Small quantities of wastewater (only the contents of the buckets) will be generated by this procedure.

If contamination is found on the wipe samples, more sophisticated decontamination procedures must be implemented. The entire 325 section will be extensively treated via steam cleaning. The ceiling, walls, and floor will be treated by applying steam from a hand-held wand to remove all residues from the surfaces. The contaminated wastewater generated by this activity will be contained by the designed spill controls already in place for the areas. Pumps or vacuums will be used to empty the wastewater from the contaminated area into polyethylene-lined closed top drums. These containers will be transported for proper management at an approved dangerous waste or MW TSD facility.

Decontamination of Sumps. Collection sumps may be decontaminated by steam cleaning, if needed. Wastewaters collected in each sump from the cleaning process will be pumped into polyethylene-lined closed top drums and analyzed to determine whether or not they are designated as dangerous waste under WAC 173-303-070. If designated, they will be disposed of as dangerous waste. If they are not dangerous waste, the wastewater will be discharged to the 300 Area process sewer system. If steam cleaning is selected, the cleaning of all sumps should take minimal time and generate less than 100 gallons (380 liters) of wastewater. Additional decontamination techniques such as grit blasting or chipping will be used as necessary.

11.1.4.2 Closure of the 3100 Section

Decontamination of Waste Handling Equipment. All waste-handling equipment will be decontaminated first by washing followed by steam cleaning, or it will be disposed of as dangerous waste at an approved disposal facility. The decision to dispose or decontaminate equipment will be made at the time of closure. Whichever option is most environmentally and economically feasible will be chosen. If the equipment is not considered to be substantially contaminated, the washing may not be performed. In this case, the equipment will be cleaned by the steam cleaning technique only.

All equipment to be decontaminated will be subjected to the wash deemed most effective for the removal of the suspected contamination. The equipment will then be subjected to a final washing and rinsing by a steam cleaning unit. All wastewater will be collected in sumps, pumped to polyethylene-lined closed top drums, and transported and disposed of as dangerous waste.

The time required for decontamination of waste-handling equipment and the amount of wastewater generated by these procedures will depend on the amount of equipment to be decontaminated. At this time, minimal time and effort are anticipated. The decontaminated wastes are not anticipated to exceed 50 gallons (190 liters).

Decontamination of 3100 Section. Wipe samples will be collected prior to decontamination on a regular grid with a spacing of 5 feet(1.5 meters) on the floor, walls, ceiling and exposed ventilation surfaces. The samples will be analyzed to determine if the surfaces have been contaminated. Using the results from the testing, appropriate decontamination procedures will be selected.

If no contamination is found on the wipe sample, decontamination procedures will consist of sweeping, dusting, vacuuming, and wiping with soap and water. Brushing or sweeping is used to clean up coarse debris. Vacuuming will be performed using a commercial or industrial vacuum equipped with a high-efficiency particulate air (HEPA) filter. The vacuum cleaner bag containing captured particulates will be disposed of as a dangerous waste.

Dusting wiping will be done with a damp cloth or wipe (soaked with water) to remove dust from surfaces not practically treatable with a vacuum. The cloth or wipe will also be disposed of as a dangerous waste.

Minimal time will be required for setup of the equipment. Labor requirements for the process should be moderate. Minimal time will also be required for packaging debris and dismantling and removing cleaning equipment. Small quantities of wastewater (only the contents of the buckets) will be generated by this procedure.

If contamination is found on the wipe samples, more sophisticated decontamination procedures must be implemented. The entire 3100 section will be extensively treated via steam cleaning. The ceiling, walls, and floor will be treated by applying steam from a hand-held wand to remove all residues from the surfaces. The contaminated wastewater generated by this activity will be contained by the designed spill controls already in place for the areas. Pumps or vacuums will be used to empty the wastewater from the contaminated area into polyethylene-lined closed top drums. These containers will be transported for proper management at an approved dangerous waste TSD facility.

Although this procedure will require more time than the dusting, vacuuming, and wiping procedures outlined above, time requirements are still considered to be minimal for the steam cleaning approach. Wastewaters generated by this procedure are not anticipated to exceed 100 gallons (380 liters).

Decontamination of Sumps. Collection sumps may be decontaminated by steam cleaning, if needed. Wastewaters collected in each sump from the cleaning process will be pumped into polyethylene-lined closed top drums and analyzed to determine whether or not they are designated as dangerous waste under WAC 173-303-070. If designated, they will be disposed of as dangerous waste.

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If they are not dangerous waste, the wastewater will be disposed of in an appropriate manner. If steam cleaning is selected, the cleaning of all sumps should take minimal time and generate less than 100 gallons (380 liters) of wastewater.

11.1.4.3 Management of Decontamination Waste

Liquid decontamination wastes will be placed in drums and sampled to determine disposal requirements. Grab samples will be collected from drums using COLIWASA samplers. Grab samples from each drum will be analyzed for the following:

- Corrosivity using the methods described in EPA SW-846
- Flash point using the method described in EPA SW-846
- Toxicity characteristic using the toxicity characteristic leaching procedure described in 40 CFR 261 Appendix II (including analysis for metals, volatile organics, and semivolatile organics including chlorinated pesticides)
- Total radioactivity using gross alpha, gross beta, and gamma scan. (Applicable to the 325 section closure only.)

The results of sample analysis will be used to determine how to dispose of liquid decontamination wastes. (Background levels will be determined by analysis of the tap water used for makeup of the decontamination solutions.) The results of the ignitability, corrosivity, and toxicity characteristic analyses will be used to determine if liquid wastes are characteristic dangerous waste (WAC 173-303-090). Organic and inorganic analytical results will also be used to determine if liquid wastes are dangerous waste mixtures (WAC 173-303-084). The results of the radiological analyses will be used to determine whether any of the liquid wastes generated during the 325 section closure are low-level liquid radioactive wastes or mixed wastes. Depending on designation, liquid decontamination wastes will be disposed of as follows:

- Dangerous--Manifested and shipped to a permitted dangerous waste TSD facility
- Mixed--Manifested and shipped to a permitted mixed waste TSD facility
- Low-level Radioactive--Discharged to the 300 Area liquid radioactive waste system
- Nonregulated--Managed appropriately according to applicable regulations.

All non-liquid wastes generated during decontamination of dangerous wastes areas and equipment (e.g., personnel protective equipment and clothing) will be collected in 55-gallon (209 liter) open head drums and managed as dangerous wastes. All non-liquid wastes generated during decontamination of MW areas and equipment will be similarly collected and managed as MW.

11.1.4.4 Method for Sampling and Testing to Demonstrate Success of Decontamination

A series of wipe samples will be collected at various points along floors, walls, ceilings, exposed ventilation surfaces, and equipment of areas at which decontamination activities were conducted. These samples will be analyzed and used to verify whether decontamination procedures were effective. To verify decontamination, a systematic sampling approach to identify "hot spots" will be employed. Samples will be collected on a regular grid with a spacing of 5 feet (1.5 meters). If any "hot spots" are detected, a more thorough decontamination process will be utilized for all exposed surfaces.

Decontaminated "hot spots" will be sampled by collecting wipe samples at each "hot spot." If necessary, additional decontamination techniques such as grit blasting or chipping will be used with subsequent testing.

11.1.5 Closure of Containers [I-1d(1)]

At closure, all containers will be removed. All dangerous waste residue will be removed from the containment system components. Contaminated equipment, floors, walls, and loading areas will be decontaminated or removed. All decontamination equipment and rinsate will be containerized, tested, and properly disposed.

Sampling and analysis will be conducted to ensure that no contamination remains as discussed in Section 11.1.4.3.

11.1.6 Closure of Tanks (I-1d[2])

Operation of the HWTU does not involve the storage of dangerous waste in tanks. Therefore, the requirements of WAC 173-303-640 are not applicable.

11.1.7 Closure of Waste Piles (I-1d[3])

Operation of the HWTU does not involve the placement of dangerous waste in waste piles. Therefore, the requirements of WAC 173-303-660 are not applicable.

11.1.8 Closure of Surface Impoundments (I-1d[4])

Operation of the HWTU does not involve the placement of dangerous waste in surface impoundments. Therefore, the requirements of WAC 173-303-650 are not applicable.

11.1.9 Closure of Incinerator [I-1d[5])

Operation of the HWTU does not involve the incineration of dangerous waste. Therefore, the requirements of WAC 173-303-670 are not applicable.

11.1.10 Closure of Land Treatment Facilities [I-1d(6)]

Operation of the HWTU does not involve the land treatment of dangerous waste. Therefore, the requirements of WAC 173-303-655 are not applicable.

11.1.11 Closure of Disposal Facilities [I-1e through I-1e(8)]

The HWTU does not contain any waste piles, landfills. or surface impoundments. In addition, the waste or contaminated materials will not remain at the HWTU closure site. Therefore, this section is not applicable to the HWTU.

11.1.12 Closure Schedule [I-1f]

The inventory of dangerous and/or mixed waste will be removed within 90 days from receipt of the final volume of such waste. All closure activities will be completed within 180 days of receipt of the final volume of waste. The Director of the Washington Department of Ecology will be notified by DOE-RL at least 45 days before the final closure activities are begun. A detailed schedule of closure activities is provided in Figure 11-1.

11.1.13 Extension of Closure Time Frame [I-1g]

The inventory of dangerous and mixed waste will be removed within 90 days of receipt of the last volume of waste. The closure activities described in this plan will be completed within 180 days of receipt of final volume of waste. No extensions to the time frame for initiation and completion of closure are currently expected to be necessary. Extensions to the time frame for closure will be necessary only if unexpected conditions were encountered during closure of the unit. If it becomes apparent that all wastes cannot be removed within 90 days, Ecology will be so notified at least 30 days prior to expiration of the 90-day period. This notification will demonstrate why more than 90 days is required for removal of the wastes and will demonstrate that steps have been taken to prevent threats to human health and the environment and that the unit is in compliance with applicable permit standards.

If it becomes apparent that closure cannot be completed within 180 days after approval of this plan, Ecology will be so notified at least 30 days prior to expiration of the 180 day period. This notification will demonstrate why more than 180 days is required for closure and will demonstrate that steps have been taken to prevent threats to human health and the environment and that the unit is in compliance with applicable permit standards.

11.1.14 Amendments to Closure Plan

If changes are deemed necessary to the approved closure plan, DOE-RL will submit a written request to Ecology for authorizing a change to the approved plan. The written request will include a copy of the amended plan in accordance with WAC 173-303-610(3)(a).

11.2 CERTIFICATION OF CLOSURE

Within 60 days of completion of the final closure activities described in this plan, a certification of closure will be submitted to Ecology. This certification will indicate that closure has been conducted as described in this plan and that the closure performance standards given in Section 11.1.1 have been met. The certification will be submitted by registered mail or by equivalent service and will be signed by DOE-RL and an independent Professional Engineer registered in the State of Washington as described below.

The DOE-RL will self-certify with the following document or a document similar to it:

> I, (name), an authorized representative of the U.S. Department of Energy Richland Field Office located at the Federal Building, 825 Jadwin Avenue, Richland, Washington, hereby state and certify that the 325/3100 Hazardous Waste Treatment Unit (or applicable section of the unit), to the best of my knowledge and belief, has been closed in accordance with the attached approved closure plan and that the closure plan was completed on (date). (Signature and date)

The DOE-RL will engage an independent Professional Engineer registered in the State of Washington to inspect closure activities, verify that closure activities are being conducted according to this plan, and certify that closure has been performed in accordance with this plan.

The engineer will inspect at least weekly while closure activities are being performed. During these inspections the engineer will observe closure activities to determine whether they are being performed according to this plan. Inspections will include, but not be limited to:

- Inspection of dangerous and mixed waste containment structures and systems to determine whether releases of wastes to the environment has occurred

- Verification that the dangerous and mixed waste inventory has been removed within 90 days of receipt of the last waste shipment

- Inspection of manifests and operating record to verify that these wastes were disposed of in compliance with WAC 173-303

- Inspection of decontamination operations to verify that they are being performed using the procedures described in this plan

- Inspection of the operating record to verify that samples of liquid decontamination wastes were collected and analyzed using the procedures described in this plan

- Inspection of the operating record to verify that decontamination wastes were properly designated in compliance with WAC 173-303-070 and properly disposed of.

Inspections by the engineer will be documented in a bound notebook. Notations will include the date and time of the inspections, the areas inspected, the activities inspected, applicable closure plan requirements inspected, status of observed activities with respect to plan requirements inspected, corrective actions required, status of past corrective actions, and name and signature of inspector. This inspection notebook will be made available to Ecology upon request.

Action	Schedule	
Date of Receipt of Last Volume of Waste	Day	0
Inventory Removal	Day	90
Equipment Decontamination	Day	105
HWTU Decontamination	Day	120
Sump Decontamination	Day	135
Sampling and analysis to determine effectiveness of decontamination	Day	150
Further decontamination and sampling/analysis, if necessary	Day	180

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FIGURE 11-1. Closure Schedule

Upon completion of closure according to the plan, the DOE-RL will require the engineer to sign the following document or a document similar to it:

> I, (name), a certified Professional Engineer, hereby certify, to the best of my knowledge and belief, that I have made visual inspection(s) of the Hazardous Waste Treatment Unit (or applicable section of the unit) and that closure of the aforementioned has been performed in accordance with the attached approved closure plan. (Signature, date, state Professional Engineer license number, business address, and phone number).

11.3 POST-CLOSURE PLAN [I-2]

The HWTU is planned to be clean closed. Because waste will not be left in place following the operational period, the requirement for postclosure activities is not applicable to the HWTU.

11.4 NOTICE IN DEED [I-3]

The HWTU is planned to be clean closed. Because wastes will not be left in place following the operational period, the requirement for a notice in deed is not applicable to the HWTU.

11.5 CLOSURE COST ESTIMATE [I-4]

In accordance with 40 CFR 264.140(c) and WAC 173-303-620(1)(c), this estimate is not required for federal facilities. The Hanford Facility is a federally owned facility for which the federal government is the operator, and this estimate is therefore not applicable.

An annual report updating projections of anticipated closure and postclosure costs for the Hanford Facility TSD units having final status will be submitted to Ecology in accordance with WAC 173-303-390 by October 30 (beginning 1992).

11.6 FINANCIAL ASSURANCE MECHANISM FOR CLOSURE [I-5]

In accordance with 40 CFR 264.140(c) and WAC 173-303-620(1)(c), this section is not required for federal facilities. The Hanford Site is a Federally-owned facility for which the federal government is an operator and this section is therefore not applicable to the HWTU.

11.7 POST-CLOSURE COST ESTIMATE [I-6]

In accordance with 40 CFR 264.140(c) and WAC 173-303-620(1)(c), this estimate is not required for federal facilities. The Hanford Facility is a federally owned facility for which the federal government is the operator, and this estimate is therefore not applicable.

An annual report updating projections of anticipated closure and postclosure costs for the Hanford Facility TSD units having final status will be submitted to Ecology in accordance with WAC 173-303-390 by October 30 (beginning 1992).

11.8 FINANCIAL ASSURANCE MECHANISM FOR POST-CLOSURE CARE [I-7]

In accordance with 40 CFR 264.140(c) and WAC 173-303-620(1)(c), this estimate is not required for federal facilities. The Hanford Facility is a federally owned facility for which the federal government is the operator, and this estimate is therefore not applicable.

11.9 LIABILITY REQUIREMENTS [I-8]

In accordance with 40 CFR 264.140(c) and WAC 173-303-620(1)(c), this section is not required for federal facilities. The Hanford Site is a federally-owned facility for which the federal government is an operator and this section is therefore not applicable to the HWTU.

11.10 CLOSURE CONTACTS

The following office (or its successor) is the official contact for the HWTU:

Environmental Restoration Division
U.S. Department of Energy
Field Office, Richland
P.O. Box 550
Richland, Washington 99352
(509) 376-7277

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12.0 REPORTING AND RECORDKEEPING

This chapter summarizes the reporting and recordkeeping requirements for the HWTU. The reports are submitted to Ecology and/or EPA as required by applicable regulations, and required records are maintained at the HWTU. The general reporting requirements applicable to all dangerous waste management facilities (e.g., notification) are described, as well as reporting and recordkeeping requirements specific to generators, transporters, and treatment, storage, and/or disposal facilities. Reports and records applicable to the HWTU are summarized in Table 12-1.

12.1 NOTIFICATION OF HAZARDOUS WASTE ACTIVITIES

Generators generating or transporting dangerous wastes and the owners and operators of TSD facilities must have current EPA/Ecology Identification Numbers. The HWTU operates under EPA/Ecology Identification Number WA7890008967, issued to the Hanford Facility.

12.2 GENERATOR REQUIREMENTS

The HWTU generates only minor amounts of wastes since its overall purpose is to treat waste prior to its actual disposal (as required by the Land Disposal Restrictions [LDRs]). Hanford Facility waste generation records and required reports (e.g., annual reports) are compiled and issued as single records or reports for the entire Hanford Facility; information on waste generated by the HWTU is compiled and provided together with other Hanford Facility generator records and reports.

12.2.1 Recordkeeping

Generator records maintained by the Hanford Facility include the following:

- Records of waste generated onsite
- Records of waste packaged to be shipped offsite
- A copy of each annual report
- Land disposal restriction records.

Waste-generation records are retained as required by WAC 173-303-210 and 40 CFR 268.7. Unit records are retained in the 3100 section records room.

12.2.2 Reporting

Generator reports required by WAC 173-303-220 submitted by the Hanford Facility include the annual report, exception reports, and any required additional reports.

The Hanford Facility submits an annual report of waste generation activities to Ecology. The annual report is submitted on the "Generator Annual Dangerous Waste Report--Form 4." All dangerous waste generated at the HWTU is included in the annual report.

If waste is sent to an offsite TSD facility for management and a copy of the manifest is not returned with 35 days with the signature of the owner/operator of the permitted TSD facility designated to receive the waste, the HWTU staff will contact the initial transporter or TSD facility to determine the status of the waste shipment. If a copy of the manifest with the handwritten signature of the designated TSD facility owner/operator is not received by the HWTU within 45 days of the date the waste was offered to the initial transporter, an exception report will be submitted to Ecology. The report will include the following:

- A legible copy of the manifest for which delivery was not confirmed
- A cover letter explaining the efforts to locate the waste and the results of those efforts.

Copies of waste analysis reports or other documentation relating to the composition of dangerous waste shipped to and from the HWTU will be retained at the unit. All HWTU records will be kept in the 3100 section records room. Documents relating to land disposal restrictions are discussed in Section 12.4.2.2.

Any additional reports deemed necessary by Ecology or EPA are furnished by DOE-RL Site upon request.

12.3 TRANSPORTER REQUIREMENTS

The HWTU is not a transportation organization and transporter requirements are not applicable to its operation. All hazardous wastes resulting from HWTU operations to be shipped offsite to permittee facilities for further treatment, storage or disposal will be shipped using regulated transporters with their own EPA/Ecology identification numbers. Such shipments will be packages and manifested according to applicable regulations. Wastes are transported to the HWTU by PNL Waste Management Organization staff. Wastes transported to the HWTU on public roads are considered to be "offsite" shipments, and the generating unit complies with transporter recordkeeping and reporting requirements under WAC 173-303-260 and WAC 173-303-270 for these shipments.

12.4 TREATMENT, STORAGE, AND/OR DISPOSAL REQUIREMENTS

The HWTU reporting and recordkeeping requirements are discussed below.

12.4.1 Reports

This section discusses the reporting requirements of WAC 173-303 relating to aspects of dangerous wastes. The reporting requirements include the following:

- Waste manifest reports

- Annual reports
- Groundwater monitoring reports
- Contingency plan incident reports
- Spills, discharges, and leak reports
- Closure reports
- Post-closure reports.

12.4.1.1 Waste Manifest Reports. The waste manifest is the source of two possible reports, the waste manifest discrepancy report and the unmanifested waste report.

12.4.1.1.1 Manifest Discrepancy. Each dangerous or mixed waste transfer to the HWTU transported on public roads must have a Uniform Hazardous Waste Manifest for the transfer to be approved. The waste manifests received are checked to verify that they are properly filled out and the waste received is identical to the material described on the manifest. Every effort is made to resolve manifest discrepancies with the generator. If discrepancies are not resolved within 15 days, a report will be submitted to Ecology in accordance with WAC 173-303-370. This report describes the discrepancy and attempts to reconcile it. A copy of the manifest will be attached to the report.

12.4.1.1.2 Unmanifested Waste. The HWTU receives only dangerous and mixed wastes generated by Hanford Facility programs. Only wastes that are transported to the HWTU over public roads are subject to manifest requirements. As discussed in Section 3.8, measures are taken by the HWTU staff to prevent the possibility of waste arriving at the unit unmanifested.

If the unit accepts any dangerous waste from "offsite" sources without an accompanying manifest, and the waste is not excluded from the manifest requirement in WAC 173-303, the HWTU will submit an Unmanifested Dangerous Waste Report - Form 6 to Ecology within 15 days after receiving the waste in accordance with WAC 173-303-390.

The report must include at least the following information:

- The EPA/Ecology identification number, name, and address of the facility;
- The date the facility received the waste;
- The EPA/Ecology identification number, name and address of generator and the transporter, if available;
- A description and the quarterly report of each unmanifested dangerous waste the facility received;
- The method of management for each dangerous waste;

- The certification signed by the owner or operator of the facility or their authorized representative; and

- A brief explanation of why the waste was unmanifested, if known.

12.4.1.2 Annual Report. The State of Washington, pursuant to WAC 173-303-390, requires an annual overall report for each facility which holds an active EPA/Ecology Identification Number. The report is due to Ecology on March 1 of each year. A single report is prepared for the entire Hanford Facility and covers each dangerous waste treatment, storage, and/or disposal unit at Hanford, including the HWTU. The report contents for each unit include the following:

- EPA/Ecology Identification Number

- Name and address of the unit

- Calendar year covered by the report

- Sources of the waste received by the unit

- Description and quantity of the waste received by the unit

- Treatment, storage, and/or disposal methods

- Certification statement signed by an authorized representative.

The report form and instructions in the "Treatment, Storage, or Disposal Facility Annual Dangerous Waste Report--Form 5" are used for this report. The above information applicable to the HWTU is compiled by the operations staff and submitted to WHC. WHC is the organization responsible for preparing the Hanford Facility Annual Report.

12.4.1.3 Biennial Report. The EPA requires, pursuant to 40 CFR 264.75, that an overall report describing each dangerous waste facility activity be submitted on March 1 of each even-numbered year. The biennial report is not required by Ecology. As with the annual report described above, a single report is prepared by WHC for the entire Hanford Facility covering all dangerous waste treatment, storage, and/or disposal units. The report contents for each unit include the following:

- EPA/Ecology Identification Number

- Name and address of the unit

- Calendar year covered by the report

- Sources of the waste received by the unit

- Description and quantity of the waste received by the unit

- Treatment, storage, and/or disposal methods

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- Waste minimization efforts
- Certification statement signed by an authorized representative.

This report covers activities for the previous calendar year and is submitted on EPA Form 8700-13B. The above information applicable to the HWTU is compiled by the operations staff and submitted to WHC. WHC is the organization responsible for preparing the Hanford Site biennial report.

12.4.1.4 Groundwater Monitoring Reports. The HWTU is not operated as a dangerous waste surface impoundment, waste pile, land treatment unit, or landfill as defined in WAC 173-303-645(1)(a). Therefore, no groundwater monitoring or reporting is required for this unit.

12.4.1.5 Contingency Plan Incident Reports. The BED and HWTU line management are responsible for making notifications of all emergency situations requiring contingency plan implementation as required by WAC 173-303-360.

All situations requiring contingency plan implementation are documented and completed within one working day of contingency plan implementation. A copy of the documentation is retained at the unit as part of the operating record.

If the unit stops operations in response to a fire, explosion, or release that may present a hazard to human health or the environment, the BED notifies DOE-RL, via line management, when the unit and emergency equipment cleanup is complete.

The DOE-RL is responsible for three types of notifications: an immediate notification; the incident assessment report; and the unit restart notification. Details of these notifications are provided below.

12.4.1.5.1 Immediate Notification. DOE-RL will immediately (within two hours) notify Ecology if the unit has had a fire, explosion, or release that could threaten human health or the environment. Spills will be reported in accordance with WAC 173-303-145. In addition, if a spill equals or exceeds the reportable quantities established by 40 CFR 302.4 and/or 40 CFR 355, DOE-RL will notify the National Response Center ([800] 424-8802) within 24 hours of the occurrence in accordance with 40 CFR 302.6.

The DOE-RL report will contain the following information:

- Name and telephone number of reporter
- Name and address of the unit
- Time and type of incident
- Name and quantity of material(s) involved to the extent known
- Extent of injuries, if any
- Possible hazards to human health or the environment outside the unit.

12.4.1.5.2 Incident Assessment Report. DOE-RL will provide a written report to Ecology within 15 days of any incident that requires implementation of the contingency plan. This report includes the following information:

- Name, address, and telephone number of the owner or operator
- Name, address, and telephone number of the unit
- Date, time, and type of incident
- Name and quantity of material(s) involved
- Extent of injuries, if any
- Assessment of actual or potential hazards to human health or the environment where this is applicable
- Estimated quantity and disposition of recovered material that resulted from the incident
- Cause of the incident
- Description of corrective action taken to prevent recurrence of the incident.

12.4.1.5.3 Unit Restart Notification. If the HWTU stops operations in response to a fire, explosion, or release that may present a hazard to human health or the environment, the DOE-RL will notify Ecology and the appropriate local authorities before normal operations are resumed in the affected area(s) of the unit. The notification will indicate that cleanup procedures are completed and that emergency equipment is cleaned and fit for its intended use.

12.4.1.6 Spills, Discharges, and Leak Reports. This section discusses the reports prepared as a result of unpermitted spills and discharges into the environment.

12.4.1.6.1 Spills and Discharges Reports. In the event of any unplanned release of dangerous materials, the Building Emergency Director will document the incident on an Occurrence Report. A copy of the Occupance Report will be retained at the unit. PNL line management will immediately notify the DOE-RL. The following information will be transmitted to the DOE-RL:

- Name and telephone number of reporter
- Name and address of the unit
- Time and type of incident
- Name and quantity of material(s) involved to the extent known
- Extent of injuries, if any
- Possible hazards to human health or the environment outside the unit.

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12.4.1.7 Closure and Post-Closure Reports. Reports regarding the closure of the HWTU will be made in accordance with the requirements of WAC 173-303-610(6) and (9).

12.4.1.7.1 Certification of Closure. Within 60 days of completion of closure of the HWTU, a certification signed by DOE-RL and an independent registered Professional Engineer will be submitted to Ecology. The certification will be sent by registered mail or equivalent delivery system. The certification will state that the unit was closed in accordance with the approved closure plan. Documentation supporting the independent registered engineer's certification will be supplied upon request of Ecology.

12.4.1.7.2 Survey Plat. The HWTU is not a disposal unit. This determination eliminates the requirement for producing a survey plat.

12.4.1.7.3 Post-Closure Reports. Post-closure reports required by WAC 173-303-610(9), (10), and (11) are not required because the HWTU is not a disposal unit.

12.4.2 Recordkeeping Requirements. The records kept by the HWTU include plans described in other portions of this permit application, operating records, miscellaneous support records, and records of reports made to Ecology and EPA. These records are described in the following sections.

12.4.2.1 Permit Application Plan. The plans described in other portions of this permit application and kept at the HWTU include the following:

- Waste analysis plan
- Contingency plan and amendments
- Training plan
- Closure plan
- Inspection plans.

Copies of the plans described above are included in this permit application. These plans are maintained at the HWTU during the life of the unit. Modifications or amendments required as a result of changing regulatory or operational requirements or data gathered with the monitoring and sampling programs will be submitted to Ecology and added to the plans maintained at the unit as required.

12.4.2.2 Operating Record. The operating record maintained at the HWTU includes the following:

12.4.2.2.1 Waste Description and Quantity. Each dangerous or mixed waste received at the HWTU is described by its common name and dangerous waste number(s). When a dangerous waste contains multiple dangerous waste constituents, the waste description includes all applicable dangerous waste numbers. For wastes that are not listed, the waste description includes the name of the process which generated the waste. The waste description includes the following information:

- Physical form (i.e., liquid, solid, sludge, or gas)

- Weight, volume, and density, using one of the units of measure in WAC 173-303-380(2)(c)

- Date and management method for each waste, including handling codes specified in WAC 173-303-380(2)(d).

12.4.2.2.2 Waste Location. The location of each dangerous or mixed waste container and the amount of waste in each container within the HWTU is documented and maintained. This record provides a cross-reference to associated manifest numbers.

12.4.2.2.3 Waste Analysis. As described in Section 3.0, most of the wastes received at the HWTU do not require analysis. Only those wastes which are unknown or for which the generating unit does not have documentation of contents require analysis. Waste sampling and analysis is performed by the generating unit. Waste analysis results are submitted to the HWTU Operator before the material will be accepted for treatment. Results of the waste analysis are kept at the HWTU and are cross-referenced to manifest numbers.

Chapter 3, Section 3.5 of the Part B permit application outlines the post-treatment performance evaluation.

12.4.2.2.4 Contingency Plan Implementation Report. Records documenting the details of any incidents requiring the implementation of the contingency plan, as described in Chapter 7.0 and Section 11.4.1.5, are maintained as part of the HWTU operating record as required by WAC 173-303-380.

12.4.2.2.5 Inspection Records. Records of the HWTU general inspections are maintained at the unit for at least five years from the inspection date. The records include the following:

- The date and time of inspection

- The inspector's name (printed and handwritten signature)

- Notations of observations

- The date and nature of any repairs or other remedial actions.

12.4.2.2.6 Waste Minimization Certification. Annually, a certification by DOE-RL that the HWTU has a program in place to reduce the volume and toxicity of hazardous waste is inserted into the HWTU operating record as required by 40 CFR 264.73(b)(9).

12.4.2.2.7 Land Disposal Restrictions Records. Records related to the treatment of waste subject to the land disposal prohibitions are maintained as required by 40 CFR 264.73(b)(10) and (16). Records potentially include the following:

- Records of waste placed in land disposal units under an extension to the effective date of any land disposal restriction granted pursuant to 40 CFR 268.5

- Records of waste placed in land disposal units under a petition granted pursuant to 40 CFR 268.5

- Records of the applicable notice and certification required by 40 CFR 268.7(a)

- Records of the demonstration and certification required by 40 CFR 268.8, if applicable, for waste subject to land disposal prohibitions or restriction.

Additional discussion of land disposal records is provided in the following sections.

12.4.2.2.8 Date Extension. The HWTU will not apply for an extension to the effective date of a land disposal restriction. The Hanford Facility generating unit or the permitted offsite disposal facility may apply for an extension, if required. If such an extension is approved by EPA, the generating unit or permitted offsite disposal facility, as appropriate, will provide a copy of the approval indicating the waste subject to the extension. Copies of these records as well as the quantities and the date of placement (information the permitted offsite disposal facility is requested to provide to HWTU) for each shipment of waste subject to the date of the extension will be maintained in the HWTU files.

12.4.2.2.9 Petition. The HWTU will not petition to allow land disposal of a waste subject to a land disposal restriction under 40 CFR 268, Subpart C. The permitted offsite disposal facility may petition to the regulatory authority for a variance to allow disposal of a restricted or prohibited waste if required. If such a petition is approved by EPA for waste shipped by the HWTU, the disposal facility will be requested to provide information related to the petition so that the HWTU may ensure that the waste shipped complies with the petition. Copies of the records of petition as well as the waste quantities and date of placement (information the permitted offsite disposal facility is requested to provide to the HWTU following disposal) for each waste shipment covered by the petition will be maintained in the HWTU files.

12.4.2.2.10 Notice and Certification. Each waste generating unit is required to provide the HWTU with adequate waste characterization data for the HWTU to determine whether or not the waste is subject to land disposal restrictions. The HWTU Operators will determine whether the waste is subject to LDR before accepting it for treatment. If wastes are determined to be subject to LDR, the required notices and certifications are included with shipments from the HWTU to offsite TSD facilities. Chapter 3.0, Section 3.6.4, pertains to the certification of treatment success.

Copies of notifications, certifications, demonstrations, and supporting documentation are maintained at the HWTU for each shipment of waste subject to a LDR or prohibition.

12.4.2.3 Miscellaneous Support Records. Miscellaneous support records include the following:

- Training records

- Liability coverage documentation

- Closure and post-closure cost estimates
- Report records.

12.4.2.3.1 Training Documentation. The name of each employee and the HWTU position held is maintained by the unit. Training records document that employees have received the training or job experience required for that position. The records are maintained at the HWTU on current employees until closure of the unit. Training records for former HWTU employees are kept for three years from the date the employee last worked at the unit. The only exception to this requirement is for employees who transfer from one to another hazardous waste management unit within the Hanford Facility. In this case, the employee's training records will also be transferred. Auditable copies of these records are maintained by the PNL Laboratory Training Coordinator.

12.4.2.3.2 Liability Coverage Documentation. Financial assurance and liability coverage mechanisms are not required for federal facilities. Therefore, this requirement is not applicable to the HWTU.

12.4.2.3.3 Closure and Post-Closure Cost Estimates. Financial assurance mechanisms for closure and post-closure costs are not required for federal facilities. Therefore, this requirement is not applicable to the HWTU.

12.4.2.3.4 Report Records. The reports described in Sections 12.1, 12.2.2, and 12.4.1 are contained in records maintained either by the HWTU or by other Hanford Facility organizations such as the TSD Record Retention Center as noted in Table 12-1. Copies of the reports will be made available upon the request of Ecology or EPA.

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TABLE 12-1

REPORTS AND RECORDS

Item	Storage	
	Retention Time	Location
Notification of dangerous waste activities	Life of facility	Hanford Facility
GENERATOR REPORTS AND RECORDS:		
Annual report	5 years after last waste shipment	Hanford Facility
Exception report	5 years after last waste shipment	Hanford Facility
Additional reports and records as required by Ecology/EPA	5 years after closure	Hanford Facility
Test and Waste Analysis Results:		
Waste generated onsite	5 years after last waste shipment	Hanford Facility
Waste packaged for offsite shipment	5 years after last waste shipment	Hanford Facility
Waste Manifest Reports and Records:		
Manifests	5 years after last waste shipment	HWTU
Manifest discrepancy	5 years after last waste shipment	HWTU
Unmanifested waste	Not required	HWTU
Land Disposal Restriction Records:		
Extension to an effective date	At least 5 years from date of shipment (DOS)	HWTU
Petition for a variance	At least 5 years from DOS	HWTU
Notice and certification of treatment standards	At least 5 years from DOS	HWTU

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TABLE 12-1

REPORTS AND RECORDS (Continued)

Item	Storage	
	Retention Time	Location
Demonstration and certification for a temporary extension to the effective date	At least 5 years DOS	HWTU
TRANSPORTER REPORTS AND RECORDS:		
None required	N/A	N/A
TREATMENT, STORAGE, AND/OR DISPOSAL REPORTS AND RECORDS:		
Permit Application Plans:		
Waste analysis	Life of unit	HWTU
Contingency	Life of unit	HWTU
Training	Life of unit	HWTU
Closure	Life of unit	HWTU
Post-Closure	Not required	N/A
Inspection	Life of unit	HWTU
Operating Reports and Records:		
Waste description and quantity	Life of unit	HWTU
Waste location	Until unit closure	HWTU
Waste analysis data	Life of unit	HWTU
Inspection records	Five years from inspection date	HWTU
Certification of waste minimization efforts	Life of unit	HWTU
Land Disposal Restriction Records:		
Extension to an effective date	At least 5 years from DOS	HWTU
Petition for a variance	At least 5 years from DOS	HWTU
Notice and certification of treatment standards	At least 5 years from DOS	HWTU

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TABLE 12-1

REPORTS AND RECORDS (Continued)

Item	Storage	
	Retention Time	Location
Demonstration and certification for a temporary extension to the effective date	At least 5 years from DOS	HWTU
Groundwater Monitoring Reports and Records:		
None required	N/A	N/A
Contingency Plan Incident Reports and Records:		
Immediate notification--Event Fact Sheet	Life of unit	HWTU
Assessment report	Life of unit	HWTU
Facility restart notification	Life of unit	HWTU
Spills, Discharges, and Leaks Reports and Records:		
Immediate notification	Life of unit	HWTU
Closure Reports and Records:		
Certification of closure	Life of unit	HWTU
Survey plat	Not required	N/A
Closure cost estimate	Not required	N/A
Post Closure Reports and Records:		
None required	N/A	N/A
Miscellaneous Support Reports and Records:		
Annual report	5 years from due date	Hanford Facility
Biennial report	Life of facility	Hanford Facility
Training documentation	Life of unit + 3 yrs	HWTU
Liability coverage documentation	Not required	N/A

DOS = Date of shipment
N/A = Not applicable

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CONTENTS

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13.1. CLEAN AIR ACT 13-1

13.2 CLEAN WATER ACT 13-1

13.3 THE COASTAL ZONE MANAGEMENT ACT OF 1972 13-2

13.4 THE ENDANGERED SPECIES ACT OF 1973 13-2

13.5 THE FISH AND WILDLIFE COORDINATION ACT OF 1934 13-2

13.6 THE NATIONAL HISTORIC PRESERVATION ACT OF 1966 13-2

13.7 THE WILD AND SCENIC RIVERS ACT OF 1968 13-2

13.8 TOXIC SUBSTANCES CONTROL ACTS 13-2

13.9 Other Requirements 13-2

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13.0 OTHER RELEVANT LAWS [J]

The HWTU will be operated in compliance with applicable laws and regulations. Relevant environmental laws and regulations have been reviewed, necessary notifications have been made, and approvals or permits obtained. No additional approvals or permits that would require action by either Ecology or EPA have been identified for the HWTU.

This chapter summarizes the regulatory review performed to assist Ecology in determining that the HWTU has met its obligation with respect to other Federal or State laws. The major environmental laws evaluated include the following:

- Clean Air Act
- Clean Water Act
- The Costal Zone Management Act of 1972
- The Endangered Species Act of 1973
- The Fish and Wildlife Coordination Act of 1934
- The National Historic Preservation Act of 1966 as amended
- The Wild and Scenic Rivers Act of 1968 as amended
- Toxic Substances Control Act of 1976.

In addition, a summary of other requirements that may apply is provided. Full references for each of these acts are included in Chapter 15.0

13.1. CLEAN AIR ACT

Since the 325 section is an existing unit within an existing facility permitting under the Clean Air Act does not apply to the unit. The unit has a responsibility to comply with any emissions generated which are regulated under the NESHAP program, including asbestos, benzene, and radionuclides. Except during a catastrophic incident, the potential to emit these materials from the 325 section is minimal. Catastrophic incidents are dealt with in the unit contingency plan in Chapter 7. At the Hanford Site, the Tri-Country Air Pollution Control Authority oversees site compliance with CAA regulations dealing with hazardous materials; the Washington Department of Health oversees compliance with radionuclide CAA regulations. The 3100 section must submit a notice of construction in accordance with the CAA.

13.2 CLEAN WATER ACT

Operation of the HWTU will not result in any point-source or nonpoint source discharge to surface waters. As such, National Pollutant Discharge Elimination System permits are not required. Spill reporting requirements of the CWA are covered in the unit contingency plan in Chapter 7.

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13.3 THE COASTAL ZONE MANAGEMENT ACT OF 1972

The HWTU is not located in a coastal zone or shoreline area as defined by this statute. Therefore, no permits or reviews pursuant to this statute are applicable.

13.4 THE ENDANGERED SPECIES ACT OF 1973

The HWTU is located in the 300 Area of the Hanford Site. (See Chapter 2.0 for site location information.) The site for the HWTU cannot be considered an undisturbed area or a major habitat for native plant and animal species. Also, this area constitutes a very small fraction of the Hanford Site and, hence, would not play a significant role in the ecology of the Site. No listed or proposed endangered or threatened species or their habitats are expected to be affected by the HWTU activities.

13.5 THE FISH AND WILDLIFE COORDINATION ACT OF 1934

The HWTU will not involve the impoundment, diversion, or other control or modification of any body of water. Therefore, no permits or reviews pursuant to this statute are applicable.

13.6 THE NATIONAL HISTORIC PRESERVATION ACT OF 1966

The HWTU affects no areas that are eligible for nomination to the National Register of Historic Places. All activities at Hanford involving excavation require review for the presence of archaeological resources in accordance with regulations issued pursuant to the National Historical Preservation Act of 1966; American Antiquities Preservation Act of 1906; the American Indian Religious Freedom Act of 1978; the Historic Sites, Buildings, and Antiquities Act of 1935; the Archaeological and Historic Preservation Act of 1960; and the Archaeological Resources Protection Act of 1979. No known cultural resource impacts have occurred from HWTU activities.

13.7 THE WILD AND SCENIC RIVERS ACT OF 1968

The HWTU does not affect any rivers presently designated under the Wild and Scenic Rivers Act of 1968.

13.8 TOXIC SUBSTANCES CONTROL ACT OF 1976

The HWTU will not manage PCBs or asbestos and thus will not be subject to the Toxic Substances Control Act, except as referenced below.

13.9 OTHER REQUIREMENTS

The application of insecticides and herbicides on or in the immediate vicinity of the HWTU will be conducted in compliance with the Federal Insecticide, Fungicide, and Rodenticide Act of 1975, TSCA, and the applicable provisions of the Washington State Water Quality Standards, WAC 173-201.

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14.0 CERTIFICATION [K] 14-1

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14.0 CERTIFICATION [K]

The following certification, required by Washington Administrative Code 173-303-810(13), for all applications and reports submitted to Ecology is hereby included:

> I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to ensure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

9313025.0287

Co-Operator
William R. Wiley, Director
Pacific Northwest Laboratory

6-6-92
Date

Owner/Operator
for John D. Wagoner, Manager
U.S. Department of Energy,
Richland Field Office

6-24-92
Date

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15.4 WASHINGTON ADMINISTRATIVE CODE 15-4

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15.0 REFERENCES

15.1 DOCUMENTS

COE, 1969, Lower Columbia River Standard Project Flood and Probable Maximum Flood, U.S. Army Corps of Engineers, North Pacific Division, Portland, Oregon.

DOE, 1990, Occurrence Reporting and Processing of Operations Information, DOE Order 5000.3A, U.S. Department of Energy, Washington D. C.

Ecology, 1983, Chemical Testing Methods for Complying with the State of Washington Dangerous Waste Regulations, WDOE-83-13, Washington State Department of Ecology, Olympia, Washington.

Ecology, 1987, State of Washington Part B Permit Application Requirements, Washington State Department of Ecology, Olympia, Washington.

Ecology, EPA and DOE, 1989, Hanford Federal Facility Agreement and Consent Order, Washington State Department of Ecology, U.S. Environmental Protection Agency, and U.S. Department of Energy, Olympia, Washington.

EPA, 1986, Test Methods For Evaluating Solid Waste, SW-846, 3rd Edition, U.S. Environmental Protection Agency, Washington, D.C.

FEMA, 1980, Flood Insurance Study: Benton County Washington, Federal Emergency Management Agency, Federal Insurance Administration, Washington, D.C.

Hazardous and Solid Waste Amendments of 1984, Public Law 98-616, 98 Stat.3221, 42USC 6912(a), 6921, 6922, 6924, 6925, 6926, 6930, 6935, 6937, 6939, 6991, and 6993.

NFPA, 1989, National Fire Protection Code, National Fire Protection Association, Quincy, Massachusetts.

Pacific Northwest Laboratory, 1989, Functional Design Criteria and Conceptual Design, Hazardous Waste Laboratory, 325 Building.

Pacific Northwest Laboratory, 1991, Functional Design Criteria, Revision 2 for Hazardous Waste Treatment Facility.

15.2 CODE OF FEDERAL REGULATIONS AND FEDERAL REGISTER

29 CFR 1910.120, "Hazardous Waste Operations and Emergency Response," Title 29, Code of Federal Regulations, Part 1910.120, Federal Register, FR 12792, March 28, 1989, Occupational Safety and Health Administration, Washington, D.C.

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40 CFR 261, Identification and Listing of Hazardous Waste, Title 40, Code of Federal Regulations, Part 261, U.S. Environmental Protection Agency, Washington, D.C.

40 CFR 262, Standard Applicable to Generators of Hazardous Waste, Title 40, Code of Federal Regulations, Part 262, U.S. Environmental Protection Agency, Washington, D.C.

40 CFR 263, Standards Applicable to Transporters of Hazardous Waste, Title 40, Code of Federal Regulations, Part 263, U. S. Environmental Protection Agency, Washington,D.C.

40 CFR 264, Standards of Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities, Title 40, Code of Federal Regulations, Part 264, U.S. Environmental Protection Agency, Washington, D.C.

40 CFR 268, Land Disposal Restrictions, Title 40, Code of Federal Regulations, Part 268, as amended, U.S. Environmental Protection Agency, Washington, D.C.

40 CFR 270, EPA Administered Permit Program: The Hazardous Waste Permit Program, Title 40, Code of Federal Regulations, Part 270, U.S. Environmental Protection Agency, Washington, D. C.

40 CFR 302, Designation, Reportable Quantities, and Notification, Title 40, Code of Federal Regulations, Part 302, U.S. Environmental Protection Agency, Washington, D. C.

40 CFR 355, Emergency Planning and Notification, Title 40, Code of Federal Regulations, Part 355, U. S. Environmental Protection Agency, Washington, D. C.

55 FR 61, Environmental Protection Agency Final Rule, Federal Register, Vol. 55, No. 61, pp. 11799-1187, March 29, 1990, U.S. Environmental Protection Agency, Washington, D.C.

55 FR 106, Land Disposal Restriction for Third-Third Scheduled Wastes: Final Rule, Federal Register, Vol. 55, No. 106, Sec. III.A.8.c.(2), p. 22627, June 1, 1990, U. S. Environmental Protection Agency, Washington, D. C.

15.3 FEDERAL AND STATE ACTS

American Antiquities Preservation Act, 1906, 16 USC 432.

American Indian Religious Freedom Act, 1978, Public Law 95-341, 92 Stat. 469, 42 USC 1996.

Archaeological and Historic Preservation Act, 1960, Public Law 86-523, 74 Stat. 220, Public Law 93-291, 88 Stat. 174, 16 USC 469.

Archaeological Resources Protection Act of 1979, Public Law 96-95, 93 Stat. 721, 16 USC 470aa.

Atomic Energy Act of 1954, as amended, Public Law 83-703, 66 Stat. 919, 42 USC 2011.

Clean Air Act of 1977, as amended, Public Law 95-95, 91 Stat. 685, 42 USC 7401.

Clean Water Act of 1977, as amended, Public Law 95-217, 92 Stat. 1566, 33 USC 1251.

Coastal Zone Management Act of 1972, as amended, Public Law 92-583, 86 Stat. 1280-, 16 USC 1451 et seq.

Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, Public Law 96-510, 94 Stat. 2767, 42 USC 9601 et seq.

Endangered Species Act of 1973, as amended, Public Law 93-205, 87 Stat. 884, 16 USC 1531, et seq.

Federal Insecticide, Fungicide, and Rodenticide Act, 1975, as amended, Public Law 92-516, 86 Stat. 973, 7 USC 136 et seq.

Fish and Wildlife Coordination Act of 1934, as amended, c.55 S1, 48 Stat. 401, 16 USC 661.

Historic Sites, Buildings and Antiquities Act, 1935, 49 Stat. 666, 16 USC 461-467.

National Environmental Policy Act of 1969, Public Law 91-190, 83 Stat. 852, 422 USC 4321 et seq.

National Historic Preservation Act of 1966, as amended, Public Law 89-665, 80 Stat. 915-919, 16 USC 470 et seq,

Resource Conservation and Recovery Act of 1976, as amended, Public Law 94-580, 90 Stat, 2795, 42 USC 6901 et seq.

Safe Drinking Water Act of 1974, Public Law 93-523, as amended, 42 USC 300f.

Shoreline Management Act of 1971, Revised Code of Washington 90.68.010 et seq. Olympia, Washington.

State of Washington Hazardous Waste Management Act, 1976, as amended, Revised Code of Washington 70.105, Olympia, Washington.

Toxic Substance Control Act of 1976, Public Law 94-469, 90 Stat. 2003, 15 USC 2601 et seq.

Washington Clean Air Act of 1967, RCW 70.94, Revised Code of Washington, Olympia, Washington.

Wild and Scenic Rivers Act of 1968, as amended, Public Law 90-542, 82 Stat. 906, 16 USC 1271.

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15.4 WASHINGTON ADMINISTRATIVE CODE

WAC 173-201, Water Quality Standards for Waters of the State of Washington, Washington State Department of Ecology, Olympia, Washington.

WAC 173-303, Dangerous Waste Regulations, Washington State Department of Ecology, Olympia, Washington.

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APPENDICES

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2B. Plan Drawings for 325 HWTU . . . . . APP 2B-i

2C. Floor Plan of 3100 HWTU . . . . . APP 2C-i

4A. Grouting/Stabilization Procedure . . . . . APP 4A-i

4B. Design of the Ceramic Melter System . . . . . APP 4B-i

7A. 325 BEP . . . . . APP 7A-i

7B. 3100 BEP . . . . . APP 7B-i

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APPENDIX 2A

HANFORD SITE AND 300 AREA TOPOGRAPHIC MAP

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Please see supplementary binder.

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APPENDIX 2B

PLAN DRAWINGS FOR 325 HWTU

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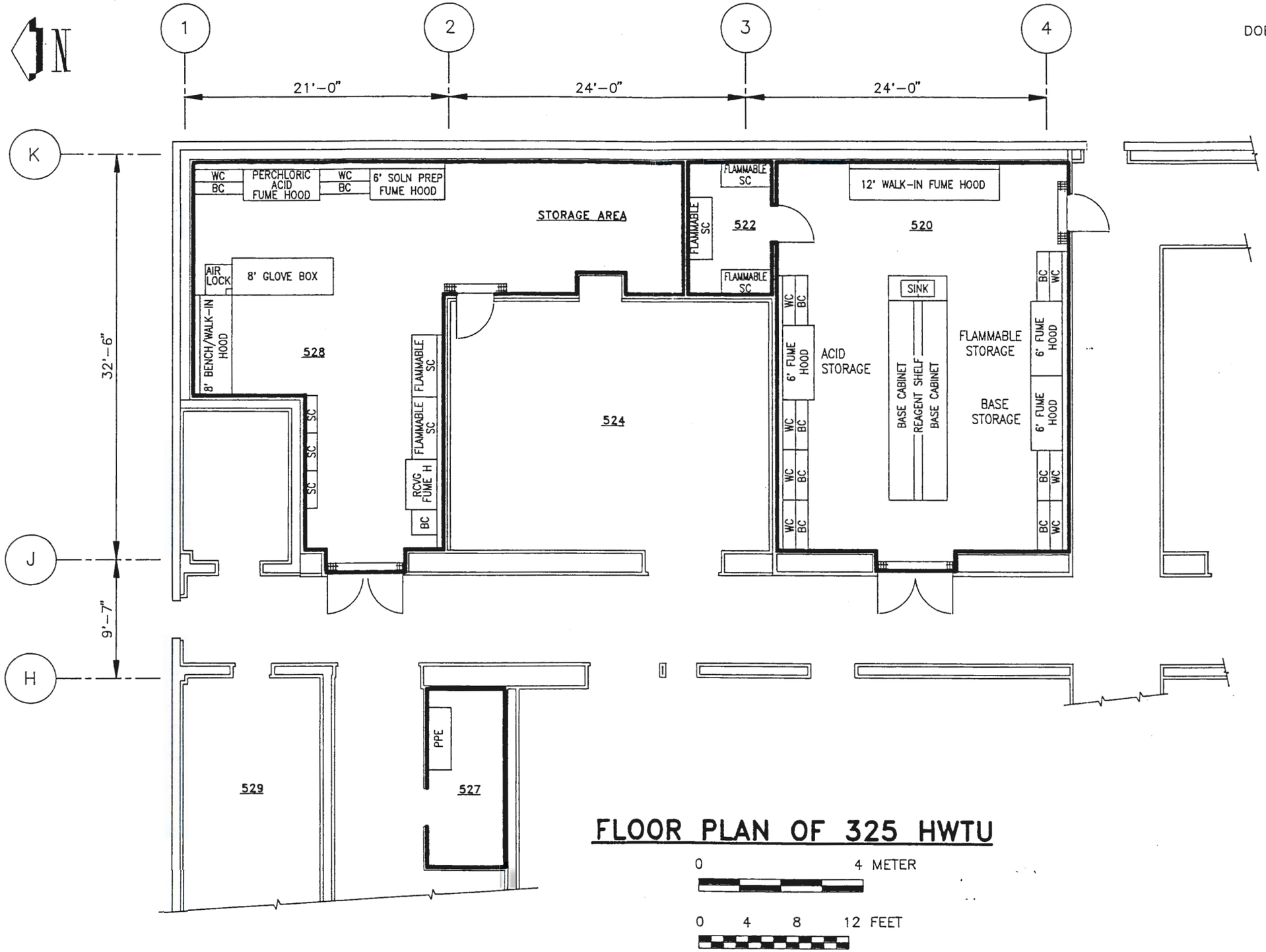

FLOOR PLAN OF 325 HWTU

0 4 METER

0 4 8 12 FEET

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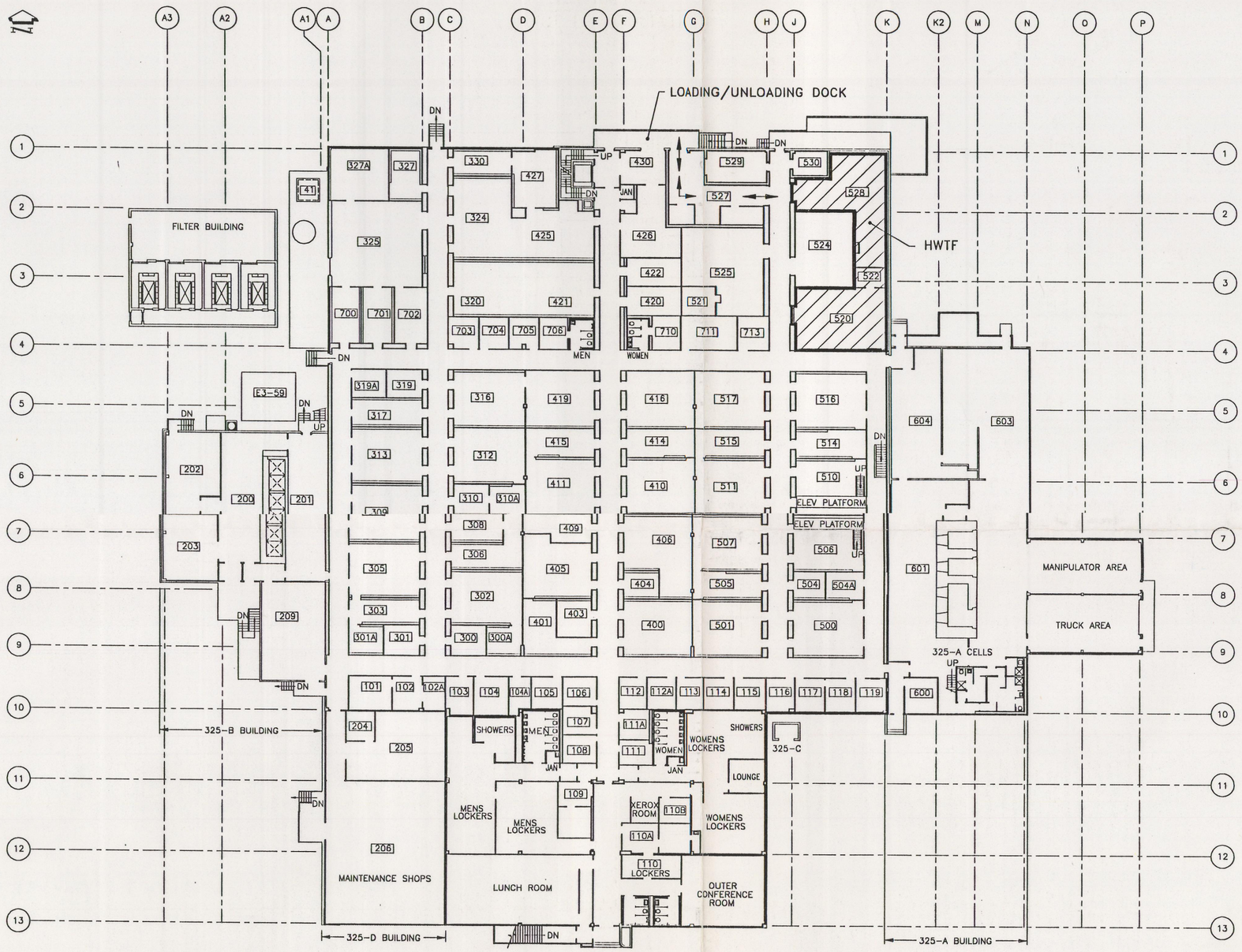

FIRST FLOOR PLAN

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NEXT USED ON		

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EDP # N/A

U. S. DEPARTMENT OF ENERGY
RICHLAND OPERATIONS OFFICE

PACIFIC NORTHWEST LABORATORY
OPERATED BY BATTELLE MEMORIAL INSTITUTE

SIMPLIFIED 325 BUILDING LAYOUT

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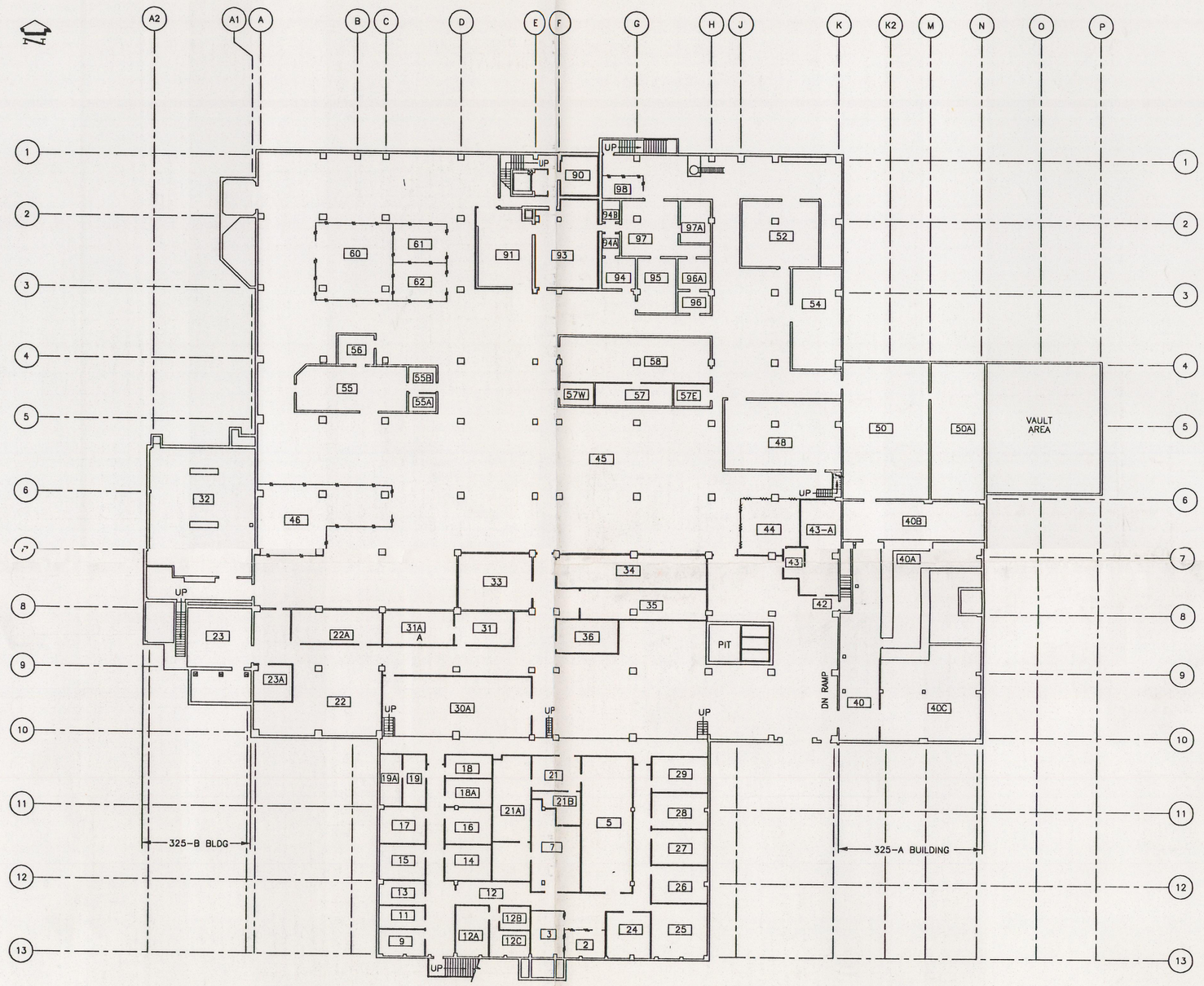

BASEMENT PLAN

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APVD		
OTHER		
QA		
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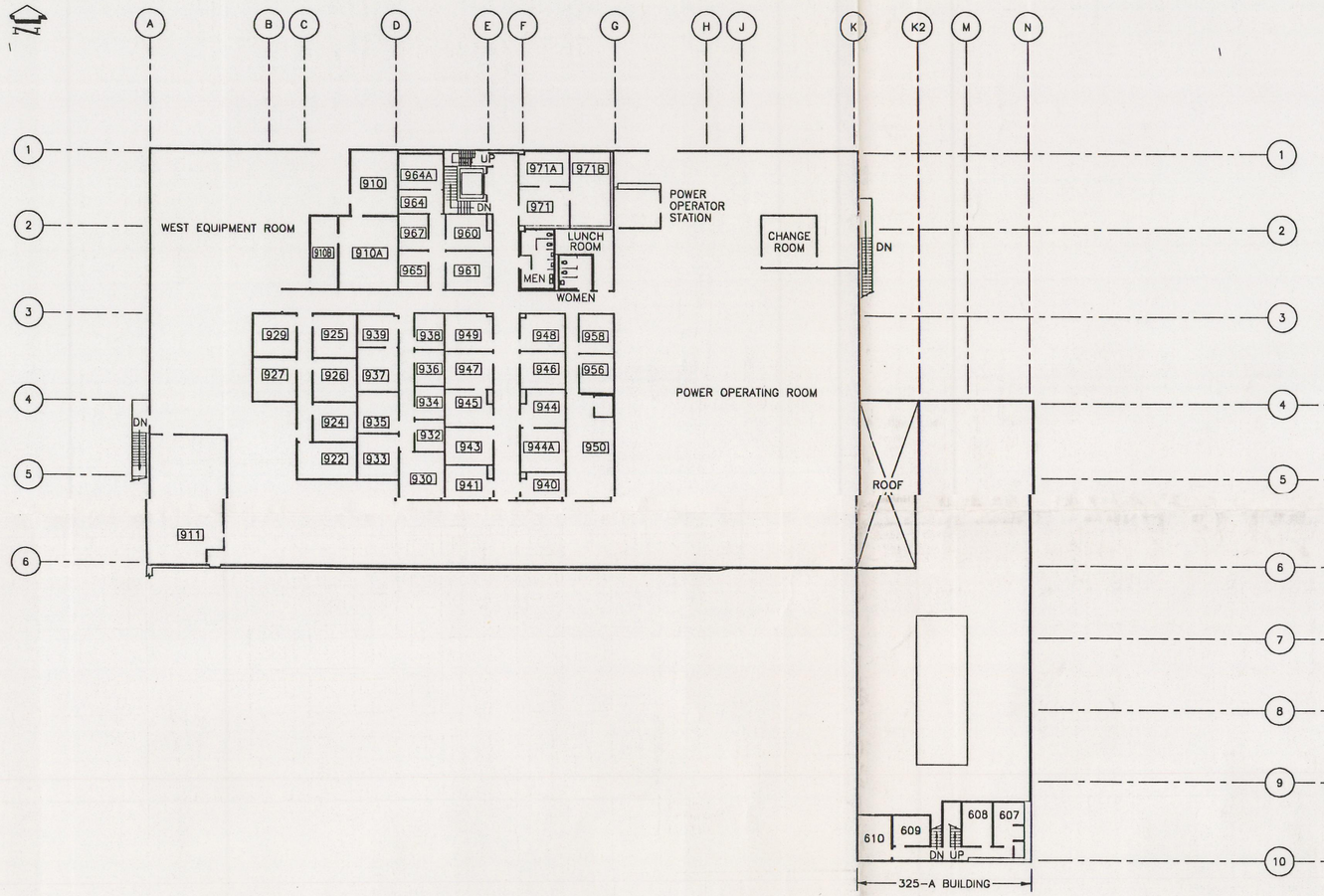

2ND FLOOR PLAN

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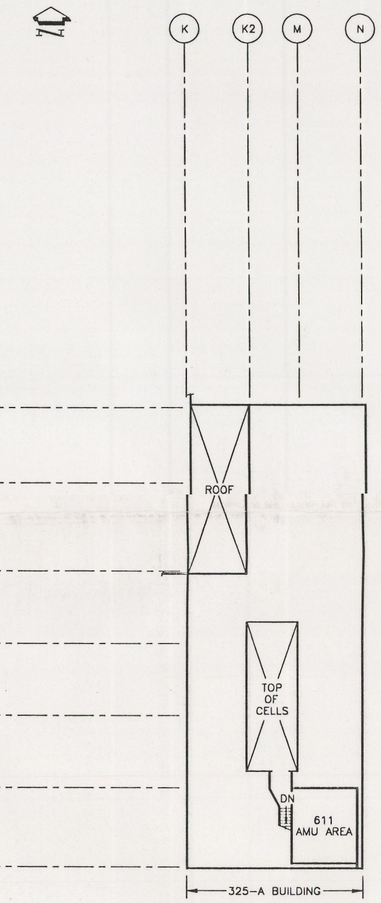

3RD FLOOR PLAN

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REVISIONS							

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CHECKED		
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ENGR		
APVD		
OTHER		
QA		

APPROVED FOR IMPLEMENTATION
BY _____
TITLE DATE

EDP # N/A

U. S. DEPARTMENT OF ENERGY
RICHLAND OPERATIONS OFFICE
PACIFIC NORTHWEST LABORATORY
OPERATED BY BATTELLE MEMORIAL INSTITUTE

SIMPLIFIED 325 BUILDING LAYOUT

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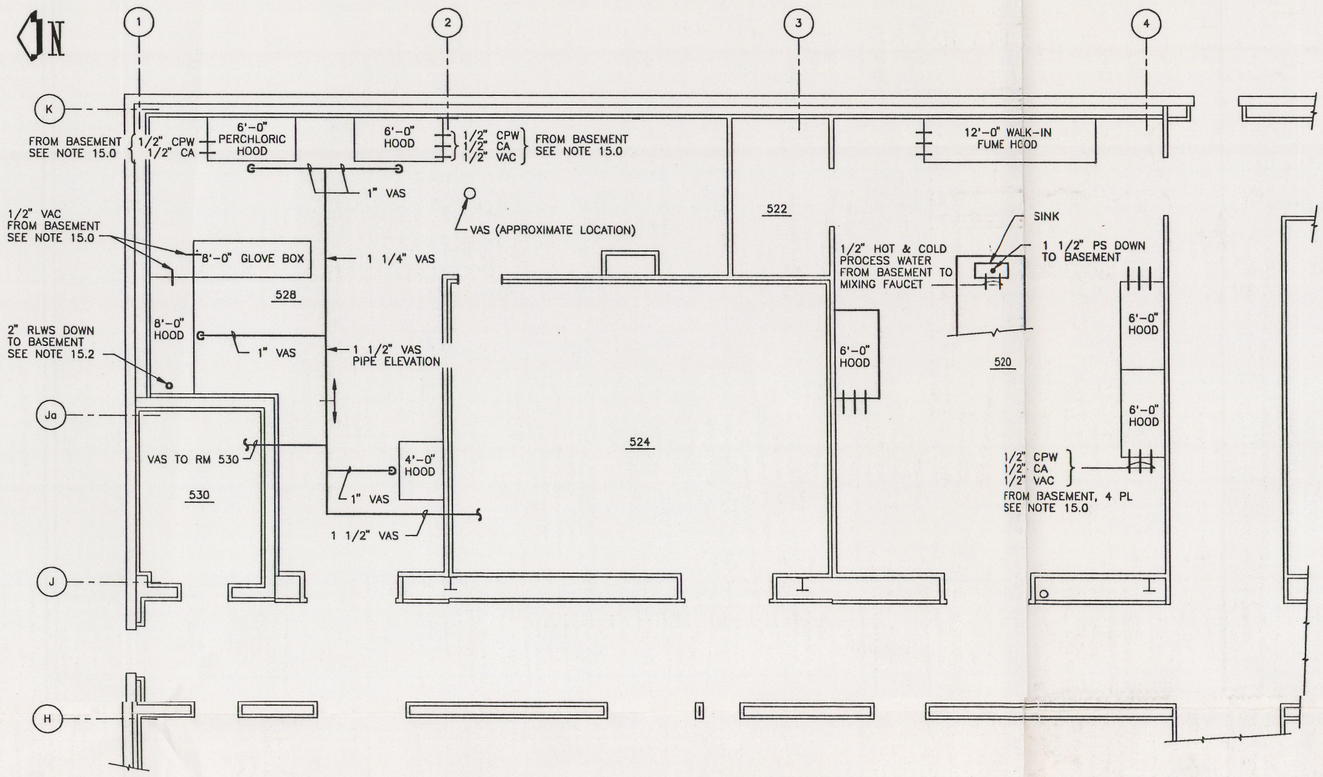

PARTIAL FIRST FLOOR PIPING PLAN

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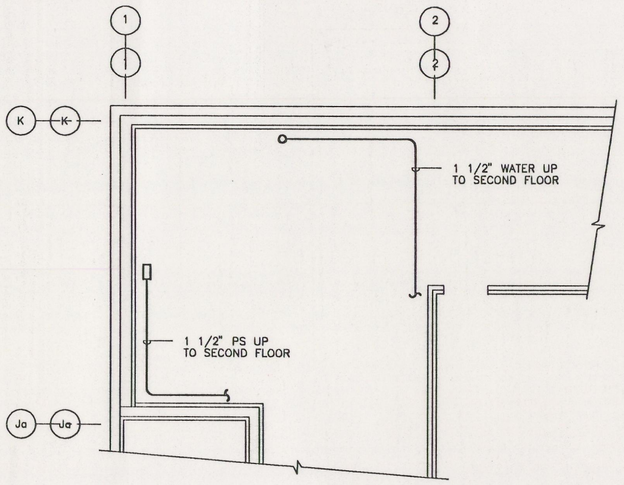

PARTIAL FIRST FLOOR PLAN

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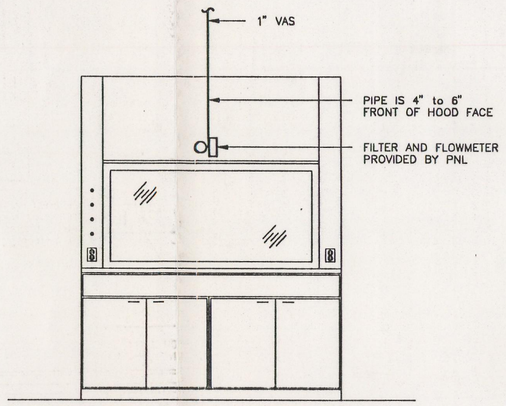


TYP VAS DROP AT HOOD

SCALE: NONE

GENERAL NOTES

(UNLESS OTHERWISE SPECIFIED)

1.0 ALL PARTS AND MATERIALS ARE AS SPECIFIED OR APPROVED EQUAL.

2.0 ALL DIMENSIONS FIELD VERIFIED.

3.0 INSTALLATION OF ALL EQUIPMENT IS PER MANUFACTURER'S WRITTEN INSTRUCTIONS.

4.0 ALL EXISTING SURFACES DAMAGED DURING CONSTRUCTION ARE REPAIRED TO MATCH EXISTING.

5.0 PIPING AS DEPICTED ON DRAWINGS IS DIAGRAMMATIC IN NATURE AND DOES NOT NECESSARILY SHOW ACTUAL ROUTING AND/OR ALL REQUIRED FITTINGS. ALL OBSTRUCTIONS MAY NOT BE SHOWN ON THE DRAWINGS. OFFSETS MADE TO AVOID OBSTRUCTIONS AND MINIMIZE PHYSICAL LENGTH OF PIPING.

6.0 INSTALLATION OF ALL PIPING IS IN ACCORDANCE WITH ANSI B31.9.

7.0 VACUUM AIR SAMPLING (VAS).

7.1 PIPE: BLACK STEEL PER ASTM A53, TYPE E OR S, OR A106, GRADE B. WALL THICKNESS: SCHEDULE 40.

7.2 FITTINGS: WROUGHT STEEL BUTT-WELDING TYPE PER ASTM A234, CLASS WPB AND ANSI B16.9, WALL THICKNESS TO MATCH PIPE.

7.3 SUPPORT: SUPPORT PIPING FROM BUILDING STRUCTURE AT MAXIMUM INTERVALS OF NOT MORE THAN 8 FEET (1" PIPE) AND 12 FEET (1 1/4" AND LARGER). SECONDARY STEEL SUPPORTS WHERE REQUIRED TO SUPPORT PIPING.

8.0 HOT AND COLD PROCESS WATER (HPW AND CPW).

8.1 PIPE: COPPER WATER TUBE PER ASTM B88, TYPE L.

8.2 FITTINGS: WROUGHT SOLDER JOINT TYPE PER ANSI B16.22. SILVER BASED SOLDER USED. DIELECTRIC TYPE CONNECTIONS AT TIE-IN POINTS TO DISSIMILAR METALS.

8.3 VALVES: BRONZE BODY, THREADED BALL VALVES, 125-LB RATING.

8.4 SUPPORT: SUPPORT PIPING FROM BUILDING STRUCTURE AT INTERVALS OF NOT MORE THAN 6 FEET. SECONDARY STEEL SUPPORTS WHERE REQUIRED TO SUPPORT PIPING. NOTE: COPPER PIPE IS ISOLATED FROM ANY STEEL SUPPORTS.

9.0 COMPRESSED AIR (CA).

9.1 PIPE: BLACK STEEL PER ASTM A53, TYPE E OR S OR A106, GRADE B. WALL THICKNESS: SCHEDULE 40.

9.2 FITTINGS: THREADED, 150-LB MALLEABLE IRON PER ANSI B16.3.

9.3 VALVES: BRONZE BODY, THREADED GATE VALVES, 125-LB RATING.

9.4 SUPPORT: PIPING IS SUPPORTED FROM BUILDING STRUCTURE AT INTERVALS OF NOT MORE THAN 6 FEET. SECONDARY STEEL SUPPORTS WHERE REQUIRED TO SUPPORT PIPING.

10.0 FIRE WATER CONTAINMENT TANK: MODUTANK INC. MODEL CH304 CHEMSTOR, 6000 GALLON CAPACITY, FREE STANDING.

10.1 CONSTRUCTION: EPOXY COATED CARBON STEEL, MODULAR TYPE CONSTRUCTION.

10.2 LINER: SEAMAN CORPORATION STYLE-8430, CHEMICAL RESISTANT (FURNISHED WITH TANK).

10.3 TANK IS SECURED TO CONCRETE FLOOR WITH 1/2" HILTI KWIK BOLTS AT 6 FEET INTERVALS. (BOLT THROUGH BOTTOM FLANGE OF TANK).

10.4 DRAIN PIPE CONNECTIONS TO TANK ARE FIELD LOCATED. SEE TYP CONNECTION TO TANK DETAIL ON SHEET 2.

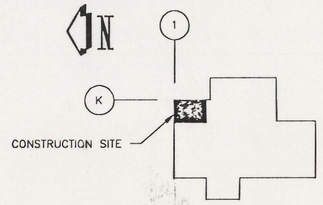
10.5 DRAIN VALVE: 2" GATE VALVE, THREADED, BRONZE BODY, 125-LB RATED. USE A FLANGE AT TANK TO VALVE CONNECTION. VALVE TO BE FIELD LOCATED AT APPROXIMATE POSITION SHOWN ON DRAWING. VALVE ELEVATION SHALL BE AS LOW AS POSSIBLE.

10.6 TANK LEVEL INDICATOR: ERNST GAGE CO. FIGURE L-150E, CATALOG NO 2160 BRONZE WATER GAGE VALVE OR SIMILIAR. (18" CENTER, 3/4" MPT CONNECTION). WELD HALF COUPLINGS ON TANK WALL FOR GAGE VALVE CONNECTIONS. LOCATE ON TANK AT APPROXIMATE LOCATION SHOWN ON DRAWING. ELEVATION OF GAGE VALVE TO BE AS LOW AS POSSIBLE.

11.0 FIRE WATER DRAIN SYSTEM.

11.1 PIPE: BLACK STEEL PER ASTM A53, TYPE E OR S OR A106, GRADE B. WALL THICKNESS: SCHEDULE 40. OPTIONAL PIPE: ELECTRIC-FUSION WELDED STEEL PER ASTM A139, STRAIGHT SEAM ONLY, WALL THICKNESS: SCHEDULE 10. 6" DIA. PIPE MAY BE A-53 GRADE A OR A-135 GRADE A OR B, SCH. 10 PLAIN END.

FOR CONTINUATION SEE SHEET 2



KEY PLAN

SCALE: NONE

FORMERLY DWG SK-3-28249 SH1 REV 0

EDP # 88-092

H-4-50052	13	FIRST FLOOR SERVICE PLAN
DRAWING NO	REV NO	DRAWING TITLE
REFERENCE DRAWINGS		
NEXT USED ON		

MF	QA / DATE	APVD BY / DATE	CHK BY / DATE	REV BY / DATE	DESCRIPTION	REV NO
	AGC 12-5 1990	DMB 11-26 1990	AGC 11-28 1990	RHC 7-11-90	AS BUILT PER MP D3007 DWG SK-3-28249 SH1 ECN 89-153-007 b)FORMERLY a)MODIFIED NOTE 11.1 PER	1

REVISIONS

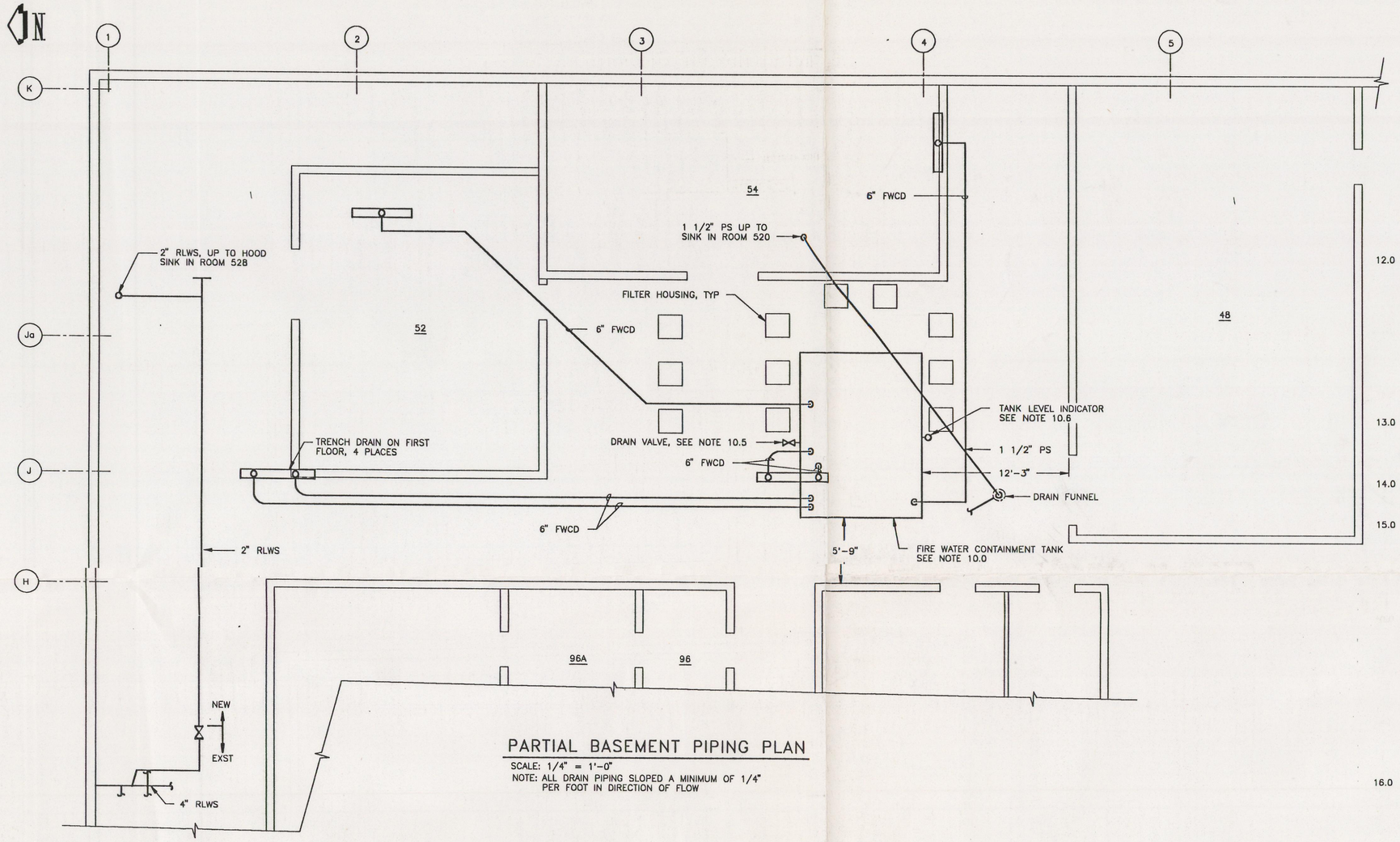
CAD CODE 3D:IBM:ACD2:10.0:SS CAD FILE C056498A

DRAWN	I.J. SILVER	9/1/89
CHECKED	B.G. SMITH	11/8/89
DFTG APVD	B.G. SMITH	11/8/89
ENGR	D.M. BROWN DMB	11/8/89
APVD	E.R. GERK	11/8/89
OTHER		
QA	C.W. CABLE	11/8/89
APPROVED FOR IMPLEMENTATION BY ____ FOR ____ DATE		

U. S. DEPARTMENT OF ENERGY
RICHLAND OPERATIONS OFFICE
PACIFIC NORTHWEST LABORATORY
OPERATED BY BATTELLE MEMORIAL INSTITUTE

PIPING MODS RMS 520, 522, 528

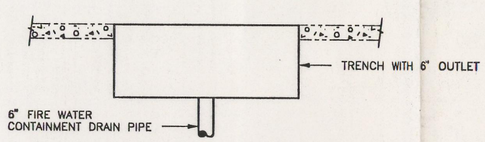
SIZE	INDEX NO	BLDG NO	DWG NO	REV NO
F	8505 8510	325	H-3-56498	1
SCALE SHOWN			SHEET 1 OF 2	



PARTIAL BASEMENT PIPING PLAN

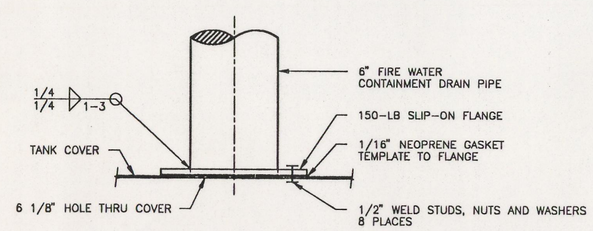
SCALE: 1/4" = 1'-0"

NOTE: ALL DRAIN PIPING SLOPED A MINIMUM OF 1/4" PER FOOT IN DIRECTION OF FLOW



TYP CONNECTION TO TRENCH DETAIL

SCALE: 1/2" = 1'-0"



TYP CONNECTION TO TANK DETAIL

SCALE: NONE

GENERAL NOTES CONTINUED FROM SHEET 1

11.2 FITTINGS: VICTAULIC PLAIN END FITTINGS OR SIMILAR, DUCTILE OR MALLEABLE IRON CONSTRUCTION. FITTINGS MAY BE 6" DIA., BW, 234-WPB WALL THICKNESS .219 FOR THE 90° ELBOWS AND 45° ELBOWS.

11.3 COUPLINGS: VICTAULIC STYLE 90 OR SIMILAR, DUCTILE OR MALLEABLE IRON CONSTRUCTION, EPDM GASKET.

11.4 SUPPORTS: PIPING SUPPORTED FROM BUILDING STRUCTURE AT INTERVALS OF NOT MORE THAN 15 FEET. SECONDARY STEEL SUPPORTS WHERE REQUIRED TO SUPPORT PIPING. AT DRAIN PIPE TO CONTAINMENT TANK CONNECTION, ADDITIONAL SUPPORTS SUCH THAT CONTAINMENT TANK COVER DOES NOT SUPPORT WEIGHT OF DRAIN PIPING.

11.5 3M "INTERIM", 1 HOUR FIRE PROTECTIVE COATING WAS APPLIED TO THE FIRE WATER DRAIN PIPING, PIPE HANGERS, PIPE HANGER SECONDARY STEEL SUPPORTS, AND DRAINAGE TRENCHES. INSTALLATION OF THE COATING IS IN ACCORDANCE WITH THE MANUFACTURE'S RECOMMENDATIONS, PNL PROVIDED GUIDANCE FOR PORTIONS OF THE INSTALLATION THAT DO NOT FIT INTO ONE OF THE STANDARD INSTALLATION DETAILS. PNL ALSO PERFORMED A FINAL ACCEPTANCE WALK-THROUGH OF THE INSTALLATION PRIOR TO FINAL TURNOVER BY CONSTRUCTION FORCES.

12.0 RADIOACTIVE LIQUID WASTE SYSTEM (RLWS), PROCESS SEWER (PS), AND LABORATORY VACUUM (VAC).

12.1 PIPE: STAINLESS STEEL PER ASTM A312, GRADE 304L, (SEAMLESS OR WELDED), WALL THICKNESS: SCHEDULE 40S.

12.2 FITTINGS: STAINLESS STEEL BUTT WELDING TYPE PER ASTM A403, CLASS WP304L AND ANSI B16.9. WALL THICKNESS TO MATCH PIPE. NOTE: FOR LAB VACUUM ONLY, BACKWELDED THREADED STAINLESS STEEL FITTINGS ARE OPTIONAL.

12.3 SUPPORTS: PIPING SUPPORTED FROM BUILDING STRUCTURE AT MAXIMUM INTERVALS OF 8 FEET. SECONDARY STEEL SUPPORTS WHERE REQUIRED TO SUPPORT PIPING.

12.4 WELDING: ALL WELDING OF RLWS, PS AND VAC PIPING IS IN ACCORDANCE WITH ANSI B31.1.

13.0 TESTING AND EXAMINATION (RLWS DRAIN).

13.1 PERFORMED WAS A PNEUMATIC PRESSURE TEST OF THE DRAIN LINE IN ACCORDANCE WITH PARAGRAPH 137.5 OF ANSI B31.1. TEST PRESSURE WAS 25 PSIG. TEST WAS WITNESSED BY OPERATING CONTRACTOR.

14.0 TESTING (REMAINDER OF PIPING).

14.1 PERFORMED WAS AN "IN-SERVICE" TEST OF ALL OTHER PIPING.

15.0 SERVICES TO FUME HOODS (CPW, VAC, CA)

15.1 THE SERVICES LISTED BELOW WERE CONNECTED TO THE NEW FUME HOODS. UTILIZE THE SERVICE VALVES PROVIDED WITH THE FUME HOODS UNLESS OTHERWISE NOTED. BUILDING TIE-IN POINTS ARE LOCATED IN THE BASEMENT AND WILL BE IDENTIFIED BY THE OPERATING CONTRACTOR PRIOR TO INSTALLATION.

ROOM NUMBER	HOODS	SERVICES
520	ALL	CPW (COLD PROCESS WATER) VAC (LAB VACUUM) CA (90# COMPRESSED AIR)
528	8-FOOT	VAC
528	6-FOOT (PERCHLORIC)	CPW CA
528	6-FOOT	CPW VAC CA
528	GLOVE BOX	VAC
528	4-FOOT	NO SERVICES

15.2 2" RLWS WAS CONNECTED TO CUP DRAIN IN 8 FOOT HOOD. NOTE: CUP DRAIN IS 1 1/2" NPT. USE A CONCENTRIC TYPE REDUCER.

16.0 ALL PIPING WITH FLUID CONVEYED AND DIRECTION OF FLOW WAS IDENTIFIED PER HPS-111-M.

ABBREVIATIONS

FWCD	FIRE WATER CONTAINMENT DRAIN
PS	PROCESS SEWER
RLWS	RADIOACTIVE LIQUID WASTE STREAM
VAC	LABORATORY VACUUM
VAS	VACUUM AIR SAMPLING
CA	90# COMPRESSED AIR
CPW	COLD PROCESS WATER
HPW	HOT PROCESS WATER

FORMERLY DWG SK-3-28249 SH2 REV 0

DRAWING NO	REV NO	DRAWING TITLE
REFERENCE DRAWINGS		
NEXT USED ON		

REV NO	DESCRIPTION	REV BY	CHK BY	APVD BY	QA
1	AS BUILT PER MP D3007 SH2 d)FORMERLY DWG SK-3-28249 c)MODIFIED PIPING IN BASEMENT ECN 89-153-011 b)ADDED NOTE 11.5 PER a)ADDED TO NOTE 11.2	PMC 7-17-90	LBH 11-28 1990	DMB 11-26 1990	AGC 12-5 1990

REVISIONS

CAD CODE 3D:IBM:ACD2:10.0:SS CAD FILE C056498B

		DATE
DRAWN	I.J. SILVER	9/1/89
CHECKED	B.G. SMITH	11/8/89
DFTG APVD	B.G. SMITH	11/8/89
ENGR	D.M. BROWN DMB	11/8/89
APVD	E.R. GERK	11/9/89
OTHER		
QA	C.W. CABLE	11/8/89

APPROVED FOR IMPLEMENTATION

BY _____

FOR DATE

U. S. DEPARTMENT OF ENERGY
RICHLAND OPERATIONS OFFICE

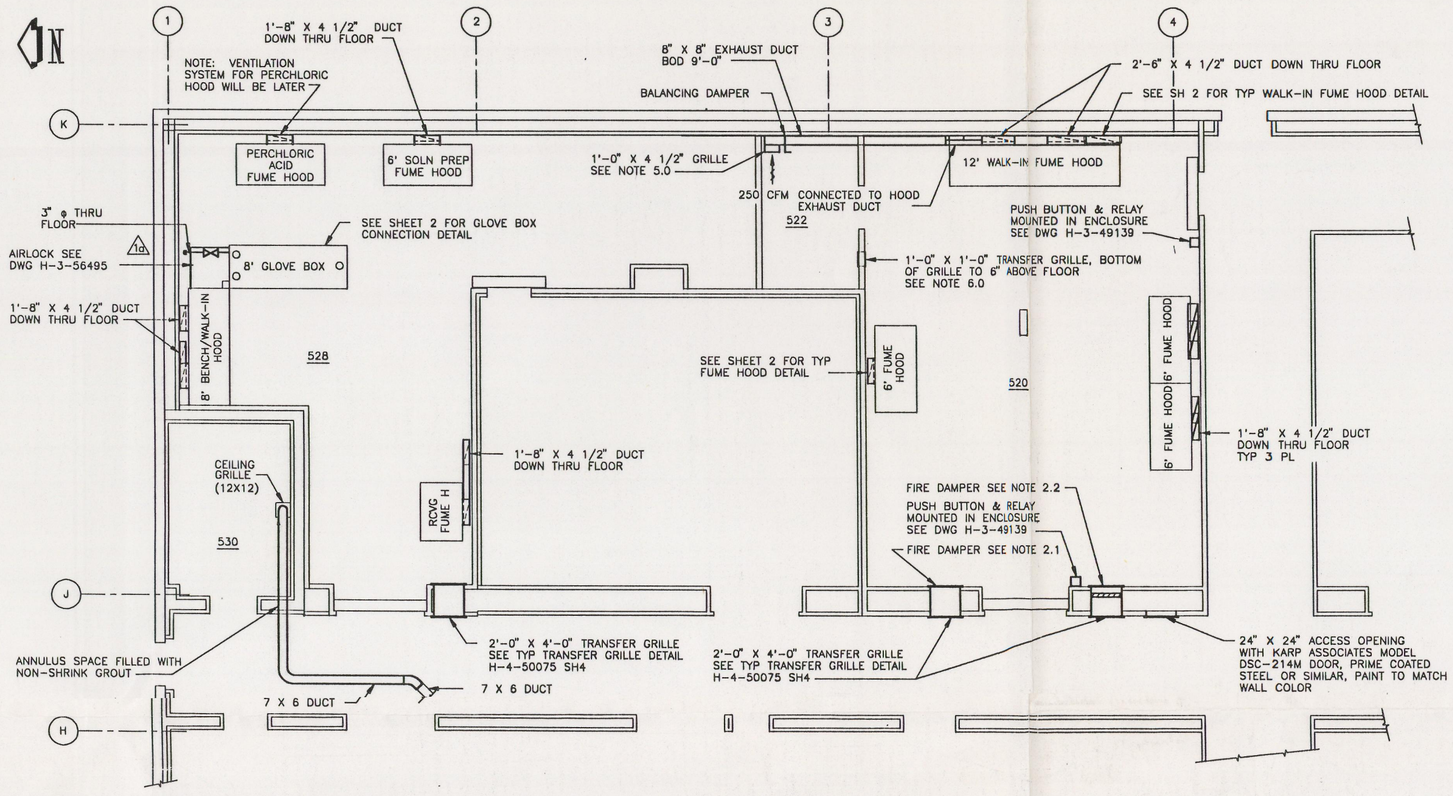
PACIFIC NORTHWEST LABORATORY
OPERATED BY BATTELLE MEMORIAL INSTITUTE

PIPING MODS BASEMENT

EDP # 88-092

SIZE	INDEX NO	BLDG NO	DWG NO	REV NO
F	8505 8510	325	H-3-56498	1

SCALE SHOWN SHEET 2 OF 2



PARTIAL FIRST FLOOR PLAN

SCALE: 1/4" = 1'-0"

GENERAL NOTES

(UNLESS OTHERWISE SPECIFIED)

1.0 EXHAUST DUCT

1.1 MATERIAL: STAINLESS STEEL PER ASTM A240, TYPE 304 OR 304L. THICKNESS: 18 GAGE MINIMUM FOR ALL ROUND DUCT AND 16 GAGE MINIMUM FOR ALL RECTANGULAR OR SQUARE DUCT UNLESS NOTED OTHERWISE. THE EXHAUST DUCT CONNECTED TO THE WALK-IN FUME HOOD SHALL ALSO HAVE TRANSVERSE REINFORCEMENT EVERY 8 FEET. THE REINFORCEMENT IS TO CONSIST OF 1 X 1 X 16 GAGE FORMED ANGLES WELDED TO THE DUCT.

1.2 CONSTRUCTION: ALL WELDED IN ACCORDANCE WITH AWS D9.1. USED WERE FLANGED JOINTS AT ALL DUCT-TO-EQUIPMENT JOINTS UNLESS OTHERWISE NOTED. FLANGED JOINTS WERE PERMITTED AT LOCATIONS WHERE REQUIRED TO FACILITATE INSTALLATION OF DUCT.

1.3 SUPPORT: SUPPORT DUCT FROM BUILDING STRUCTURE. PROVIDED AS SECONDARY STEEL SUPPORTS REQUIRED. SUPPORT SPACING DID NOT EXCEED 15 FEET FOR ALL DUCT SIZES.

1.4 DAMPERS: ALL DAMPERS ARE SEALED SHAFT TYPE PER DRAWING H-3-39777.

1.5 FLANGE GASKETS: NEOPRENE, 30-40 DUROMETER.

2.0 FIRE DAMPER

2.1 DAMPER SHALL BE PREFCO STYLE 5500-SF (1-1/2 HOUR RATING, UL LISTED), WITH MCGABE #E5720 DAMPER LINK. DAMPER SIZE IS 48 INCHES HIGH BY 24 INCHES WIDE.

2.2 DAMPER SHALL BE SAFE-AIR MODEL 710, SIZE 48" HIGH BY 24" WIDE, GALVANIZED STEEL CONSTRUCTION, (1 1/2 HR RATED, UL LISTED) PROVIDE WITH SAFE-AIR MARK V DAMPER OPERATOR (UL LISTED).

3.0 WALL TRANSFER GRILLES: PAINTED STEEL CONSTRUCTION, CARNES STURDICORE (40 DEGREE DEFLECTION). SIZE: 48 INCHES HIGH BY 24 INCHES WIDE. NOTE: THE GRILLE BLADES ARE PARALLEL WITH THE 24 INCH DIMENSION.

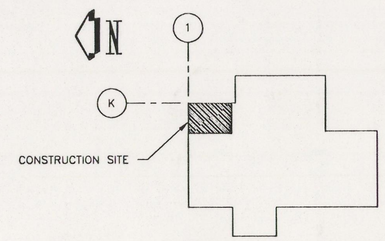
4.0 THE 18 INCH DUCT IS REMOVED BACK TO A POINT TO ALLOW INSTALLATION OF THE NEW DUCTWORK. THE REMAINING DUCT IS CAPPED.

5.0 ROOM 522 EXHAUST GRILLE WAS PAINTED STEEL CONSTRUCTION, CARNES SERIES RSAA OR SIMILAR.

6.0 ROOM 522 TRANSFER GRILLE ASSEMBLY IS SIMILAR TO DETAIL SHOWN ON DWG H-4-50075 SH 4 EXCEPT NO FIRE DAMPER IS REQUIRED AND GRILLE SIZE IS 12 INCHES HIGH BY 12 INCHES WIDE.

7.0 INSTALL HOOD AIRFLOW INDICATRORS AT EACH FUME HOOD. INDICATORS TO BE DWYER MODEL 2000-00AV (0-.25" H_2O, 300-2000 FPM). INSTALL INDICATORS ON FUME HOOD FRONT PANEL. ADDITIONAL DIRECTION REGARDING LOCATION WILL BE PROVIDED BY PNL AT TIME OF INSTALLATION. CONNECT PILOT TUBE TO AIRFLOW INDICATORS WITH STAINLESS STEEL OR PLENUM GRADE POLYETHELENE TUBING. FIELD ROUTE AND SUPPORT TUBIING.

NOTE: SEE DRAWING H-3-56495 FOR FUME HOOD INSTALLATION



KEY PLAN

SCALE: NONE

REVISION 2 AS-BUILDING IN PROGRESS

FORMERLY DWG SK-3-28248 SH 1 REV 0

DRAWING NO	REV NO	DRAWING TITLE
H-3-56495	1	CASEWORK MODS. RM 520, 522 & 52828
H-4-50075	0	HVAC MODS RM 520,522 & 528 SH 4
H-4-50079	7	ARRANGEMENT & DETS OF SPRAY BOOTH STACK & AIR SUPP DUCTS TO BASEMENT
H-3-39777	1	DUCT DAMPER

REFERENCE DRAWINGS

NEXT USED ON

QA	APVD BY / DATE	CHK BY / DATE	REV BY / DATE	DESCRIPTION	REV NO
			LLY 4-13-92	ECN B9-153-017 AND RELAY PER ACCESS OPENING, PUSHBOTTON ADDED NOTE 2.2, FIRE DAMPER,	2
MF	AGC 12-5 1990	DMB 11-26 1990	LBH 11-28 1990	PMC 7-17-90 c)AS BUILT PER MP D3007 S(1) b)FORMERLY DWG SK-3-28248 Z F-12 PER ECN 89-153-010 a)GLOVEBOX VENTILATION MOD	1

REVISIONS

CAD CODE 3D:IBM:ACD2:10.0:SS CAD FILE C056499A

EDP # 88-092

		DATE
DRAWN	I.J. SILVER	9/1/89
CHECKED	B.G. SMITH	11/8/89
DFTG APVD	B.G. SMITH	11/8/89
ENGR	D.M. BROWN DMB	11/8/89
APVD	E.R. GERK	11/8/89
OTHER		
QA	C.W. CABLE	11/8/89

APPROVED FOR IMPLEMENTATION

BY _____ DATE _____

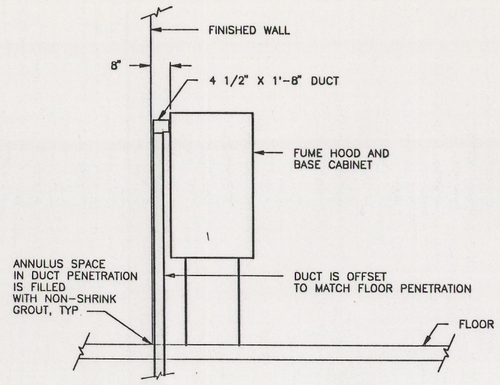
U. S. DEPARTMENT OF ENERGY
RICHLAND OPERATIONS OFFICE

PACIFIC NORTHWEST LABORATORY
OPERATED BY BATTELLE MEMORIAL INSTITUTE

HVAC MODS
RM 520, 522 & 528

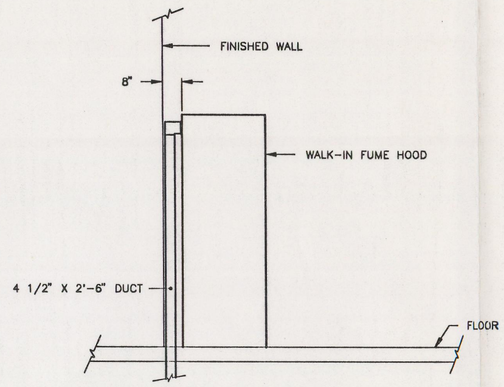
SIZE	INDEX NO	BLDG NO	DWG NO	REV NO
F	B900	325	H-3-56499	2

SCALE SHOWN SHEET 1 OF 2



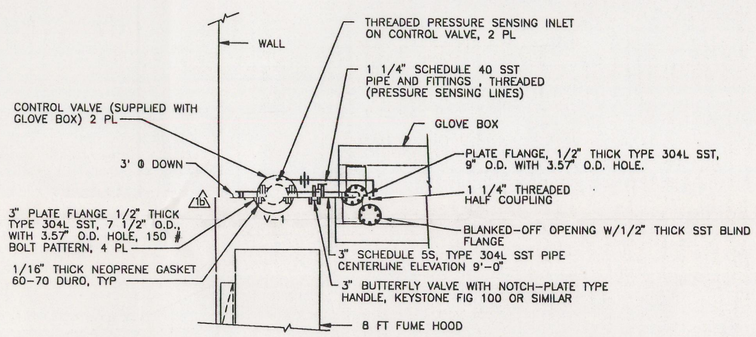
TYP FUME HOOD SECTION

SCALE: 1/2" = 1'-0"



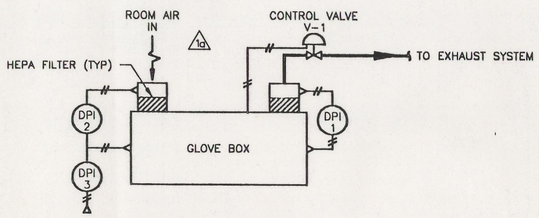
TYP WALK-IN FUME HOOD SECTION

SCALE: 1/2" = 1'-0"



GLOVE BOX CONNECTION DETAIL

SCALE: 1/2" = 1'-0"



CONTROL SEQUENCE

AUTOMATIC CONTROL VALVE V-1 WILL MAINTAIN THE GLOVE BOX AT (-)0.75" W.G. IN THE EVENT OF A GLOVE RUPTURE, V-1 WILL OPEN COMPLETELY TO MAINTAIN AIR FLOW INTO THE GLOVE BOX.
DIFFERENTIAL PRESSURE INDICATORS DPI-1 & 2 INDICATE PRESSURE DROP ACROSS THE HEPA FILTERS WHILE DPI-3 INDICATES NEGATIVE PRESSURE IN GLOVEBOX RELATIVE TO ROOM.

GLOVE BOX CONTROL DIAGRAM

SCALE: NONE
NOTE: DPI-1, 2 & 3 ARE INSTALLED ON GLOVEBOX.

FORMERLY DWG SK-3-28248 SH4 REV 0

REV NO	DESCRIPTION	MF	QA DATE	APVD BY DATE	CHK BY DATE	REV BY DATE
1	SH 4 AS BUILT PER MP D3007 c)FORMERLY DWG SK-3-28248 89-153-010 VENTILATION Z 02 PER ECN V-2 Z C-12 b)MODIFIED a)DELETED CONTROL VALVE		AGC 12-5 1990	DMB 11-28 1990	LBH 11-28 1990	PHC 7-16-90

REVISIONS

DRAWING NO	REV NO	DRAWING TITLE

REFERENCE DRAWINGS

NEXT USED ON

CAD CODE 3D:IBM:ACD2:10.0:SS CAD FILE C056499B

EDP # 88-092

DRAWN	I.J. SILVER	9/1/89
CHECKED	B.G. SMITH	11/6/89
DFTG APVD	B.G. SMITH	11/6/89
ENGR	D.M. BROWN DMB	11/7/89
APVD	E.R. GERK	11/9/89
OTHER		
QA	C.W. CABLE	11/7/89

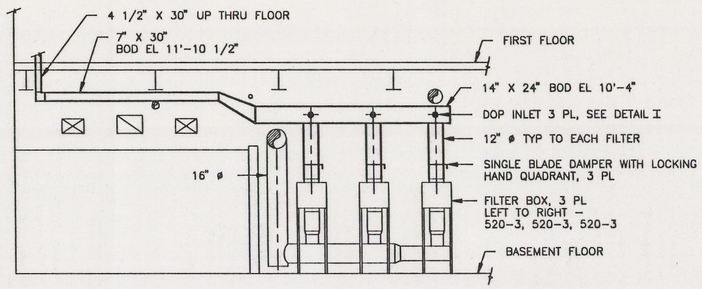
APPROVED FOR IMPLEMENTATION
BY _____
FOR DATE

U. S. DEPARTMENT OF ENERGY
RICHLAND OPERATIONS OFFICE
PACIFIC NORTHWEST LABORATORY
OPERATED BY BATTELLE MEMORIAL INSTITUTE

HVAC MODS
RM 520, 522 & 528

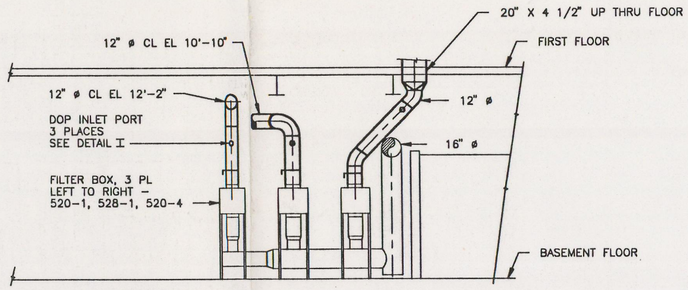
SIZE	INDEX NO	BLDG NO	DWG NO	REV NO
F	8900	325	H-3-56499	1

SCALE SHOWN SHEET 2 OF 2



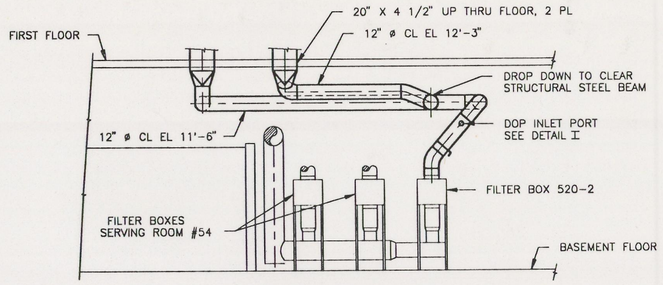
ELEVATION A–A

SCALE: 1/4" = 1'-0"
NOTE: SOME DUCTWORK NOT SHOWN FOR CLARITY



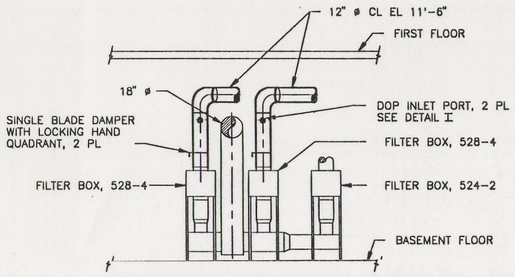
ELEVATION B–B

SCALE: 1/4" = 1'-0"
NOTE: SOME DUCTWORK NOT SHOWN FOR CLARITY



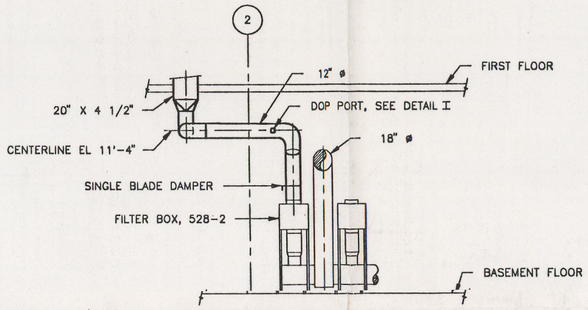
ELEVATION C–C

SCALE: 1/4" = 1'-0"
NOTE: SOME DUCTWORK NOT SHOWN FOR CLARITY



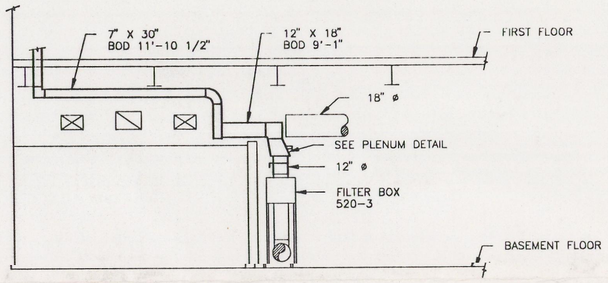
ELEVATION D–D

SCALE: 1/4" = 1'-0"



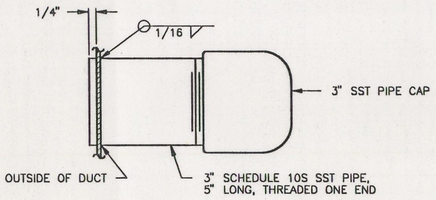
ELEVATION E–E

SCALE: 1/4" = 1'-0"



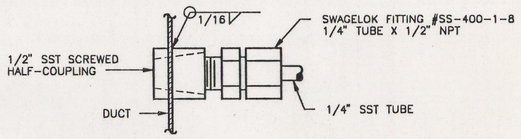
ELEVATION F–F

SCALE: 1/4" = 1'-0"



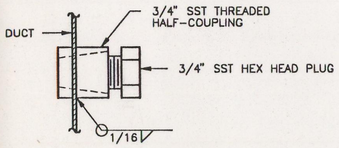
DETAIL I

SCALE: NONE
(DOP INLET PORT)



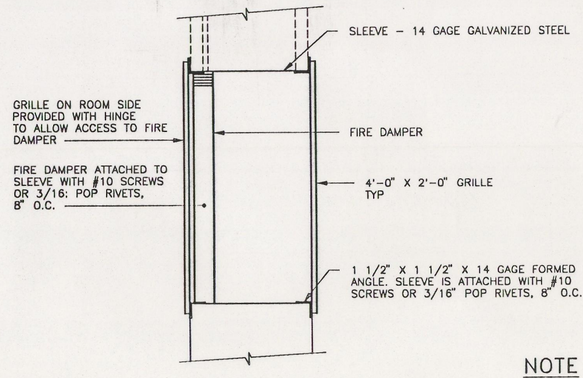
DETAIL II

SCALE: NONE
(DIFFERENTIAL PRESSURE PORT)



DETAIL III

SCALE: NONE
(DOP SAMPLE PORT)

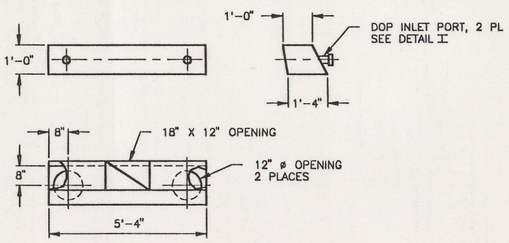


TYP TRANSFER GRILLE DETAIL

SCALE: 1" = 1'-0"

NOTE

DOP–DISPERSION OF DIOCTYL PHTHALATE



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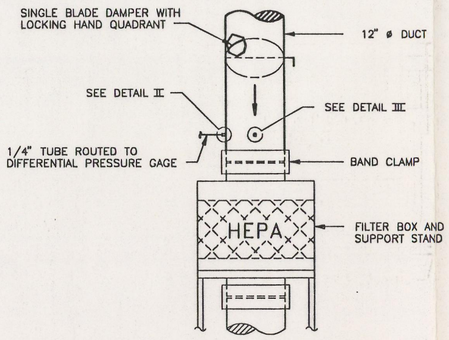

TYP FILTER BOX CONNECTION DETAIL

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FORMERLY DWG SK-3-28248 SH 3 REV 0

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NEXT USED ON		

REV NO	DESCRIPTION	MF	QA DATE	APVD BY DATE	CHK BY DATE	REV BY DATE
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REVISIONS

CAD CODE 3D:IBM:ACD2:10.0:SS CAD FILE D0500750

		DATE
DRAWN	I.J. SILVER	9/1/89
CHECKED	B.G. SMITH	11/6/89
DFTG APVD	B.G. SMITH	11/6/89
ENGR	D.M. BROWN DMB	11/7/89
APVD	E.R. GERK	11/9/89
OTHER		
QA	C.W. CABLE	11/7/89
APPROVED FOR IMPLEMENTATION		
BY		
FOR		DATE

EDP # 88-092

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HVAC MODS
RM 520, 522 & 528

SIZE	INDEX NO	BLDG NO	DWG NO	REV NO
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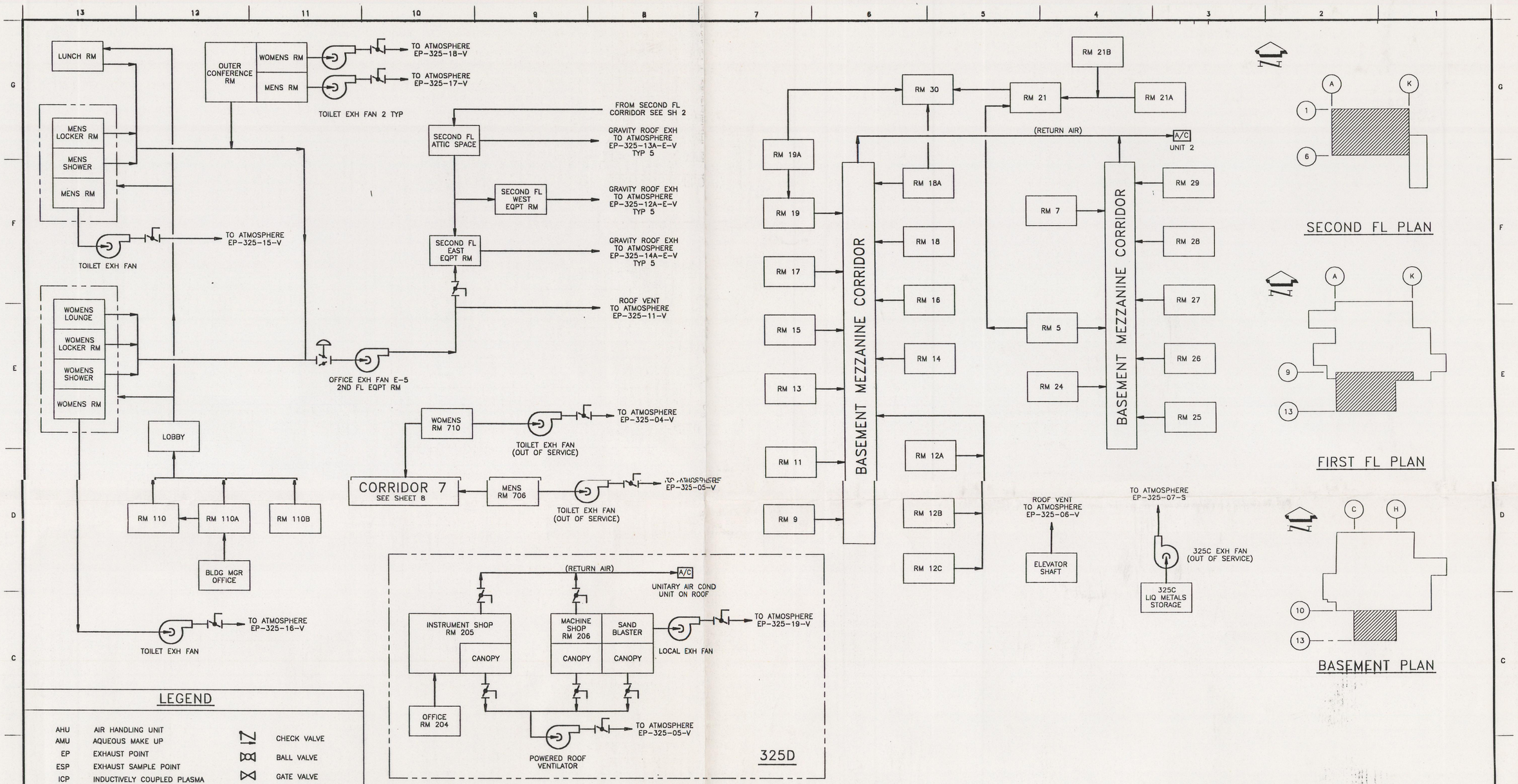
SCALE SHOWN SHEET 4 OF 4



EXHAUST FLOW DIAGRAM

LEGEND

AHU	AIR HANDLING UNIT
AMU	AQUEOUS MAKE UP
EP	EXHAUST POINT
ESP	EXHAUST SAMPLE POINT
ICP	INDUCTIVELY COUPLED PLASMA
LTH	LIQUID TRANSFER HOOD
LTS	LIQUID TRANSFER STATION
PT	PROCESS TANK
SEM	SCANNING ELECTRON MICROSCOPE
WT	WASTE TANK
R	AIR RECEIVER
S	FUME HOOD SCRUBBER
	AIR SAMPLER
	HEPA FILTER
	NONTESTABLE HEPA FILTER
C	CHARCOAL FILTER
	CHECK VALVE
	BALL VALVE
	GATE VALVE
	ACTUATED REGULATING VALVE
	VACUUM PUMP
	EXHAUST FAN
A/C	AIR CONDITIONER
	BUTTERFLY VALVE
	BACKDRAFT DAMPER
	BUTTERFLY DAMPER
	ACTUATED BUTTERFLY DAMPER
	ACTUATED DAMPER

DRAWING NO	REV NO	DRAWING TITLE	DRAWING NO	REV NO	DRAWING TITLE	DRAWING NO	REV NO	DRAWING TITLE
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SK-3-28297	0	HVAC MODS	H-3-43397	3	HVAC MEZZ A AND B	H-3-22612	2	HVAC AIR FLOW DIAGRAM
H-3-57504	0	FLTR BOX REPL DETAILS	H-3-43396	3	HVAC PLAN & SECT 1ST FL	H-3-22599	2	HVAC 2ND FL PLAN & SECT
H-3-57503	0	FLTR BOX REPL PLAN	H-3-43395	2	HVAC AIRFLOW & CONT DIAG	H-3-22598	1	HVAC 1ST & 2ND FL PLAN
H-3-57234	1	GLOVE BOX INSTL RM 500	H-3-43043	0	HEPA INSTL RM 40B,50,50A	H-3-22597	1	HVAC FLOW & CONT DIAG
H-3-57217	0	SAM SHIELDING INSTL	H-3-40620	0	HOOD & GLOVE BOX MODS	H-3-22582	1	HVAC BSMT PLAN & DETAILS
H-3-54116	1	SEM VENT SYSTEM DETAILS	H-3-40036	1	HVAC & PIPING FOIL CELL	H-3-22580	1	HVAC BSMT PLAN & DETAILS
H-3-52474	0	HVAC PLAN & SECT 1ST FL	H-3-39057	0	HVAC FLTR BOX REPL	H-3-22579	2	HVAC PLAN & DETAILS
H-4-50078	8	AIR DUCTS IN AIR COND AREA	H-3-39052	1	TANK VAULT VENT MODS	H-3-22509	1	HVAC PLANS & DETAILS
H-4-50075	1B	EXH DUCTWORK BSMT PLAN	H-3-37737	2	HVAC PLANS, SECT & DETS	H-3-12932	4	HEATING & VENT EL & DETS
H-4-50073	4	EXH SYS PLAN, SECT & DETS	H-3-32842	4	EXH FLTR & DUCT REPL	H-3-12931	2	SPLY & EXH H RAD FACIL
H-4-50016	9	2ND FL PLAN & DETAILS	H-3-29057	2	VENT DETS CHEM LAB ADD	H-3-12930	4	HVAC EXH HIGH RAD FACIL
H-4-50015	6	ROOF PLAN & DETAILS	H-3-22663	1	HVAC PLAN SECT & DETS	H-3-12929	2	HVAC SPLY HIGH RAD FACIL
H-3-47101	3	FLTR BOX REPLACEMENT	H-3-22662	1	HVAC DIAGS & EQUIP SCHED	H-3-9335	1	HVAC CERIUM RCVY FACIL
H-3-43476	0	HVAC PLAN AND SECTIONS	H-3-22618	1	HVAC PLAN SECT & DETS	H-3-9334	1	HVAC CERIUM RCVY FACIL
H-3-43401	1	C CELL FLTR PLENUM ADD	H-3-22615	1	HVAC FAN SECTIONS & DETS	H-3-9333	1	HVAC CERIUM RCVY FACIL
H-3-43400	1	A CELL FLTR PLENUM ADD	H-3-22614	1	HVAC FILTER SECTIONS	H-3-9316	1	PIPING PLAN VAULT AREA
REFERENCE DRAWINGS			REFERENCE DRAWINGS			REFERENCE DRAWINGS		
NEXT USED ON			NEXT USED ON			NEXT USED ON		

RR	MF	QA DATE	APVD BY DATE	CHK BY DATE	REV BY DATE	DESCRIPTION	REV NO

REVISIONS

CADCODE 3D:IBM:ACD2:11.0:SS CADFILE C070230A

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EDP # 90-163

DRAWN JE SANDBERG	DATE 2/1/91	U. S. DEPARTMENT OF ENERGY RICHLAND OPERATIONS OFFICE
CHECKED IJ SILVER LBH	10/2/91	PACIFIC NORTHWEST LABORATORY OPERATED BY BATTELLE MEMORIAL INSTITUTE
DFTG APVD R SCOTT SPENCER	10/2/91	EXHAUST FLOW DIAGRAM NON RAD AREAS
ENGR JW LEEPER JWL JW LEEPER	10/2/91	EFFLUENT SYSTEM DIAGRAMS
APVD ER GERK	10/3/91	
OTHER		
QA AG COUCH	10/2/91	
APPROVED FOR IMPLEMENTATION BY JW LEEPER		

SIZE	INDEX NO	BLDG NO	DWG NO	REV NO
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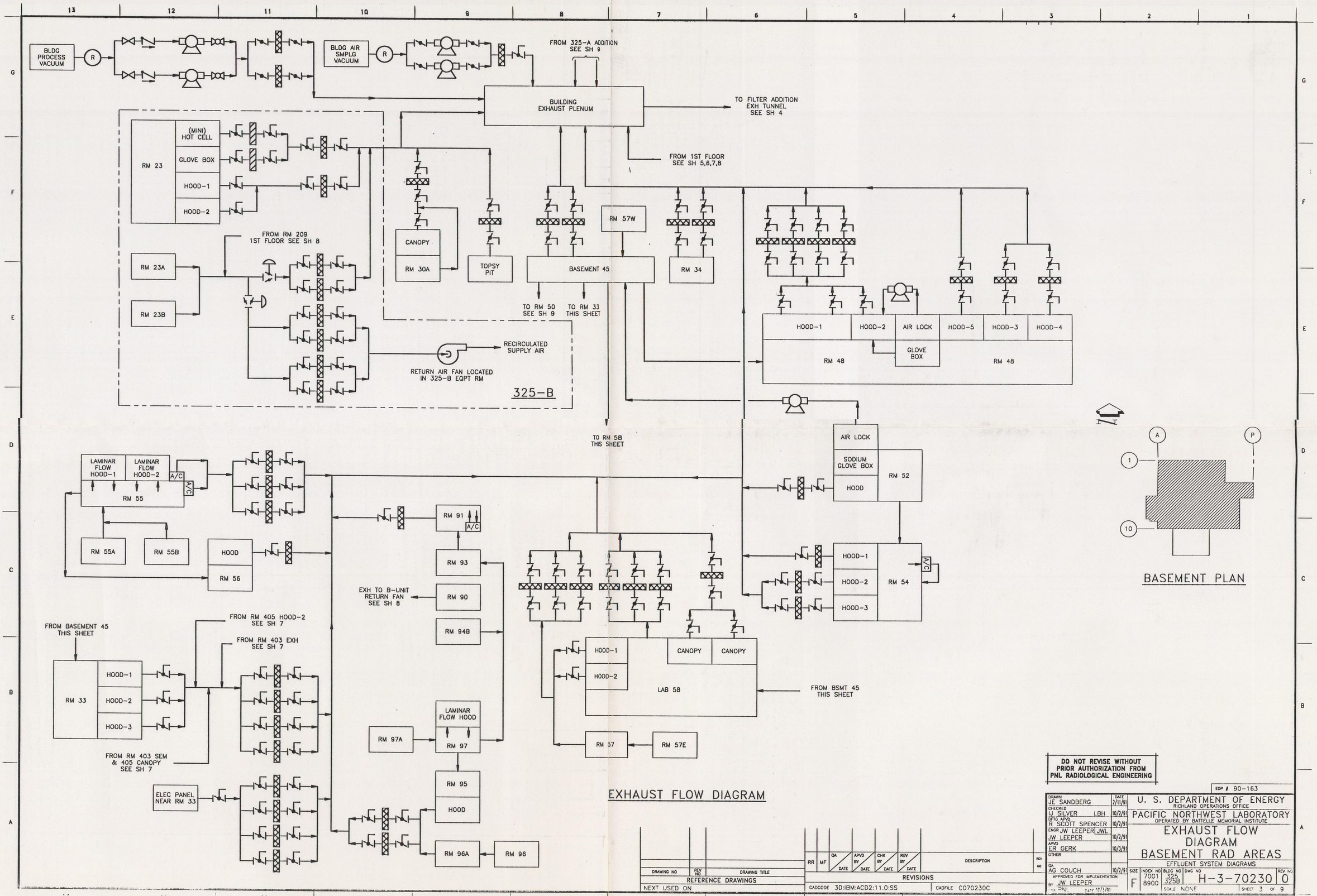

EXHAUST FLOW DIAGRAM

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EDP # 90-163

DRAWN	DATE
JE SANDBERG	2/11/91
CHECKED IJ SILVER LBH	10/2/91
DFTG APVD R SCOTT SPENCER	10/2/91
ENGR JW LEEPER JWL	10/2/91
JW LEEPER	
APVD ER GERK	10/3/91
OTHER	
QA AG COUCH	10/2/91
APPROVED FOR IMPLEMENTATION BY JW LEEPER	
PNL DATE 10/3/91	

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RICHLAND OPERATIONS OFFICE

PACIFIC NORTHWEST LABORATORY
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EXHAUST FLOW DIAGRAM BASEMENT RAD AREAS

EFFLUENT SYSTEM DIAGRAMS

SIZE	INDEX NO	BLDG NO	DWG NO	REV NO
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SCALE NONE — SHEET 3 OF 9

DRAWING NO	REV NO	DRAWING TITLE
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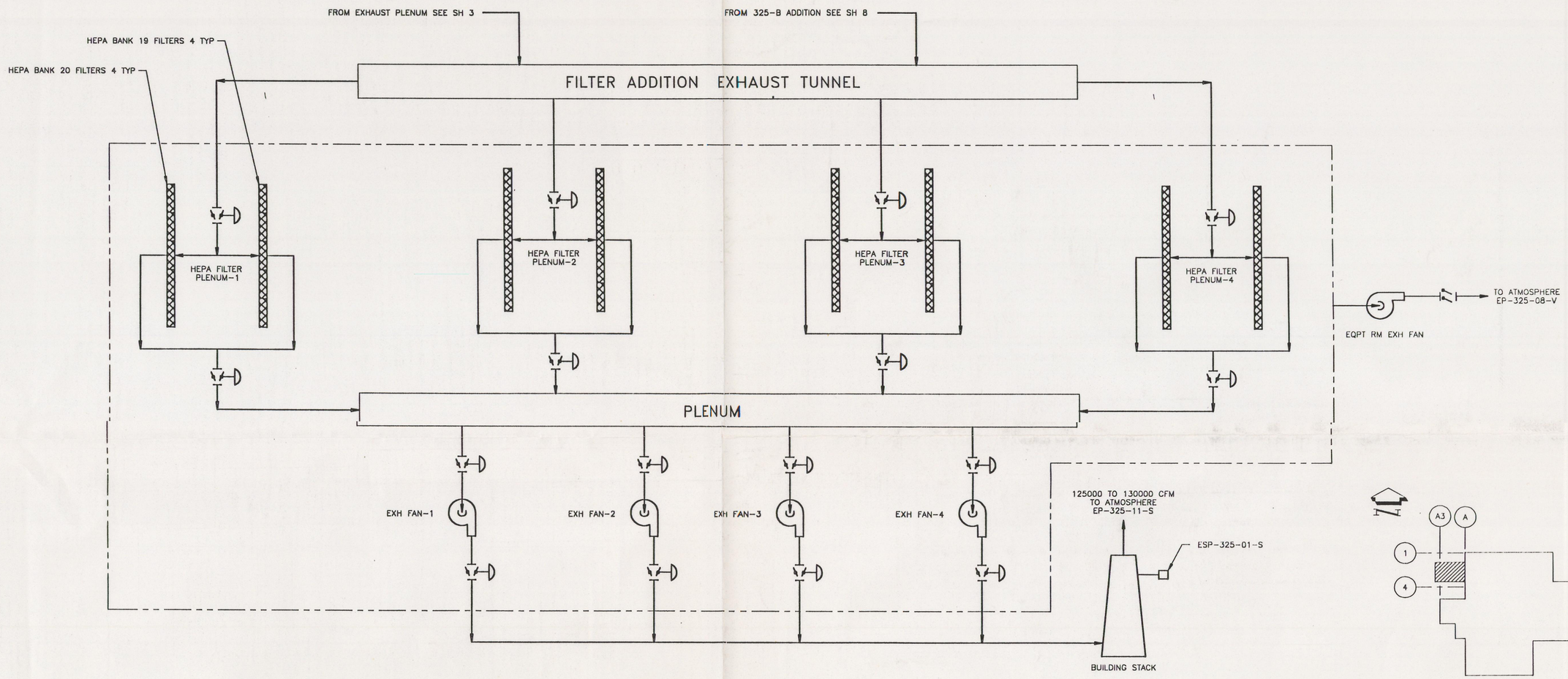
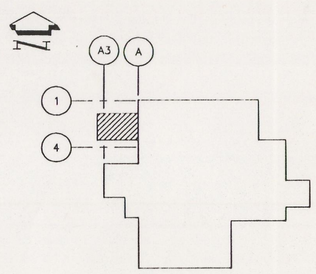


EXHAUST FLOW DIAGRAM



FIRST FL PLAN

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EDP # 90-163

DRAWN JE SANDBERG		DATE 2/14/91
CHECKED IJ SILVER	LBH	10/2/91
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JW LEEPER		10/2/91
APVD ER GERK		10/3/91
OTHER		
QA AG COUCH		10/2/91
APPROVED FOR IMPLEMENTATION BY JW LEEPER		
PNL	DATE 10/3/91	

U. S. DEPARTMENT OF ENERGY
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PACIFIC NORTHWEST LABORATORY
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EXHAUST FLOW DIAGRAM FILTER ADDITION

EFFLUENT SYSTEM DIAGRAMS

SIZE	INDEX NO	BLDG NO	DWG NO	REV NO
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SCALE NONE SHEET 4 OF 9

DRAWING NO	REV NO	DRAWING TITLE
REFERENCE DRAWINGS		
NEXT USED ON		

RR	MF	QA / DATE	APVD BY / DATE	CHK BY / DATE	REV BY / DATE	DESCRIPTION	REV NO
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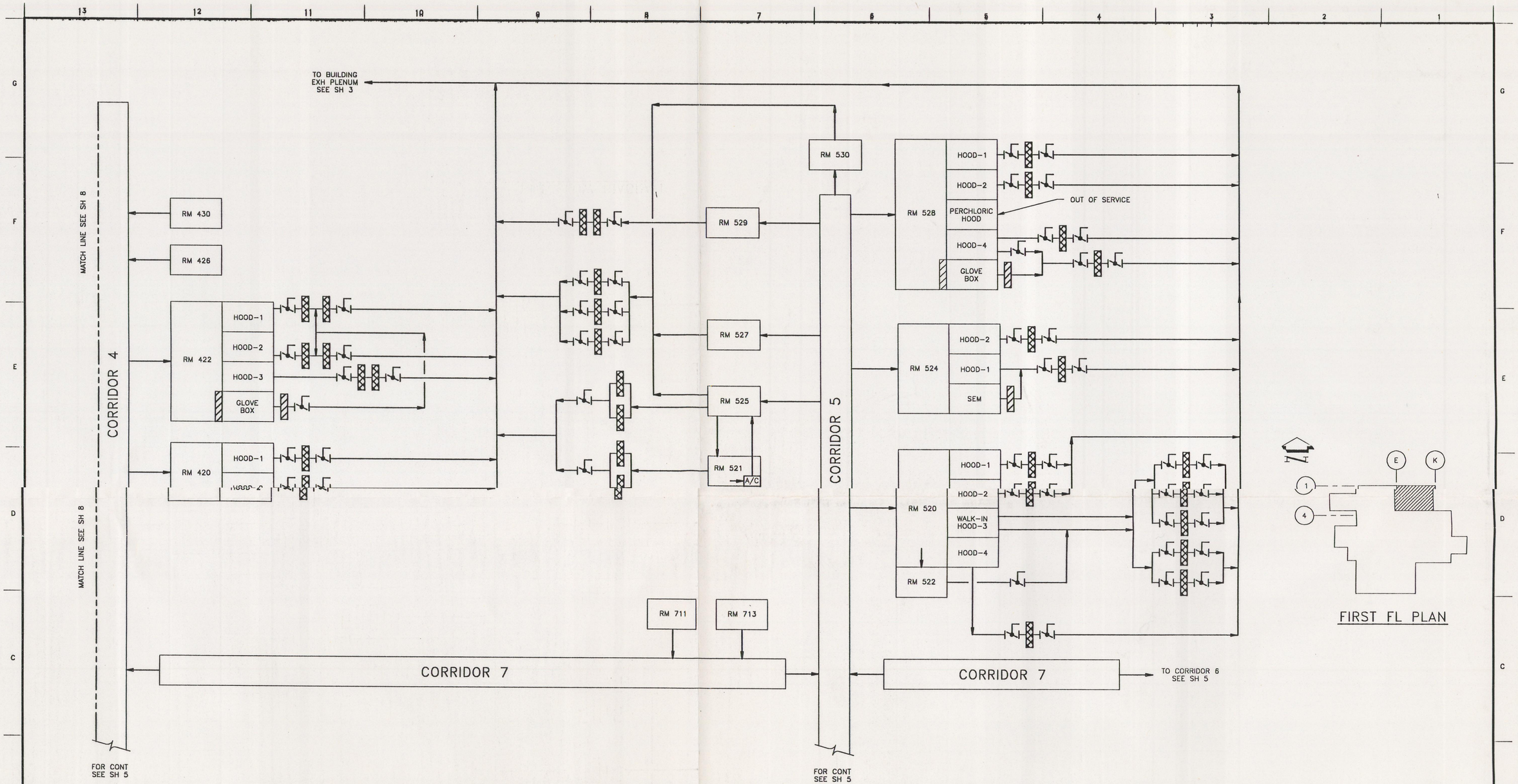

EXHAUST FLOW DIAGRAM

DO NOT REVISE WITHOUT PRIOR AUTHORIZATION FROM PNL RADIOLOGICAL ENGINEERING

EDP # 90-163

DRAWING NO	REV NO	DRAWING TITLE

REFERENCE DRAWINGS

NEXT USED ON

RR	MF	QA / DATE	APV'D BY / DATE	CHK BY / DATE	REV BY / DATE	DESCRIPTION	REV NO

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	JW LEEPER	10/2/91
APV'D	ER GERK	10/3/91
OTHER		
QA	AG COUCH	10/2/91
APPROVED FOR IMPLEMENTATION BY	JW LEEPER	
FOR PNL	DATE 10/3/91	

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EXHAUST FLOW DIAGRAM FIRST FLOOR NORTH EAST

EFFLUENT SYSTEM DIAGRAMS

SIZE	INDEX NO	BLDG NO	DWG NO	REV NO
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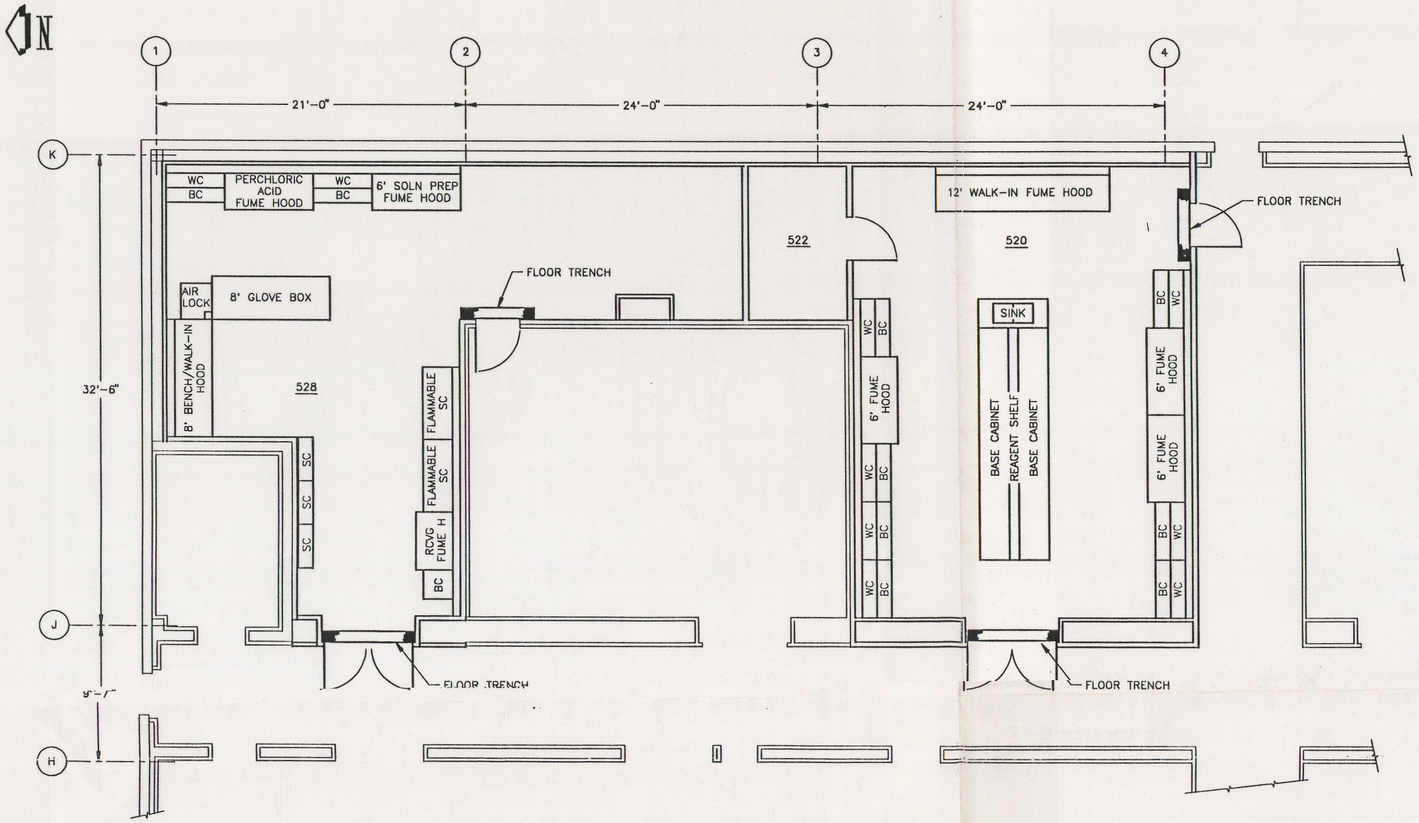
SCALE NONE SHEET 6 OF 9

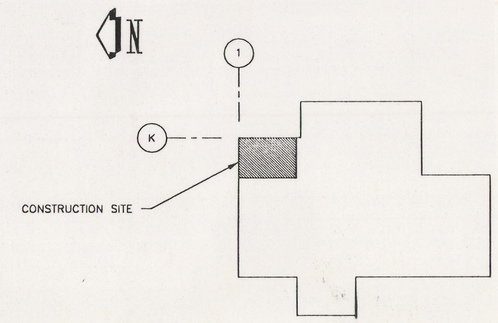


PARTIAL PLAN

SCALE: 1/4" = 1'-0"

LEGEND:

WC	WALL CABINET
BC	BASE CABINET
SC	STORAGE CABINET



KEY PLAN

SCALE: NONE

DRAWING NO	REV NO	DRAWING TITLE
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NEXT USED ON		

MF	QA / DATE	APVD BY / DATE	CHK BY / DATE	REV BY / DATE	DESCRIPTION	REV NO
REVISIONS						

CAD CODE 3D:IBM:ACD2:10.0:SS CAD FILE 325A

		DATE
DRAWN		
CHECKED		
DITG APVD		
ENGR		
APVD		
OTHER		
QA		

APPROVED FOR IMPLEMENTATION
BY
FOR DATE

EDP #

U. S. DEPARTMENT OF ENERGY
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PACIFIC NORTHWEST LABORATORY
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CASEWORK MODS
RM 520, 522 & 528

SIZE	INDEX NO	BLDG NO	DWG NO	REV NO
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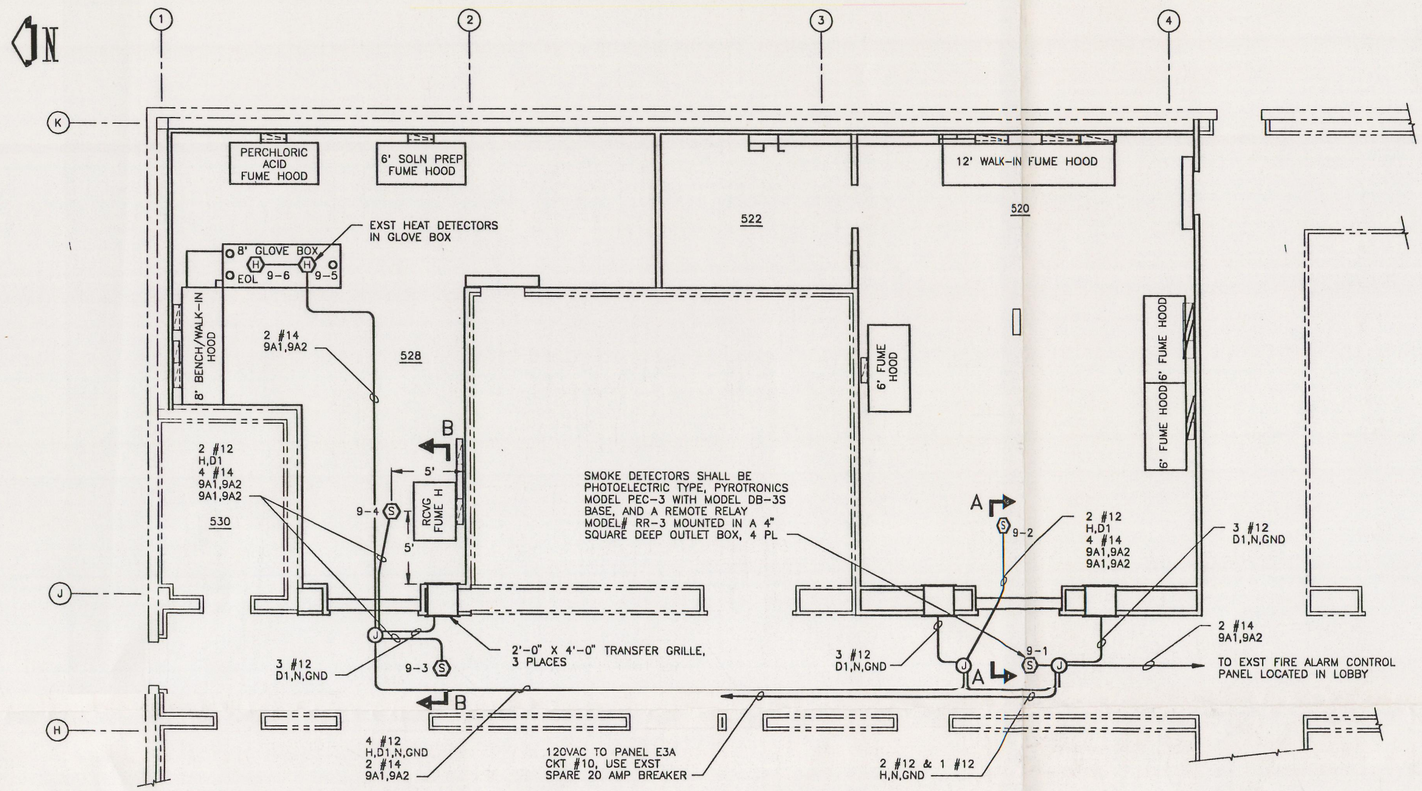
		SCALE SHOWN	SHEET 1 OF 1	

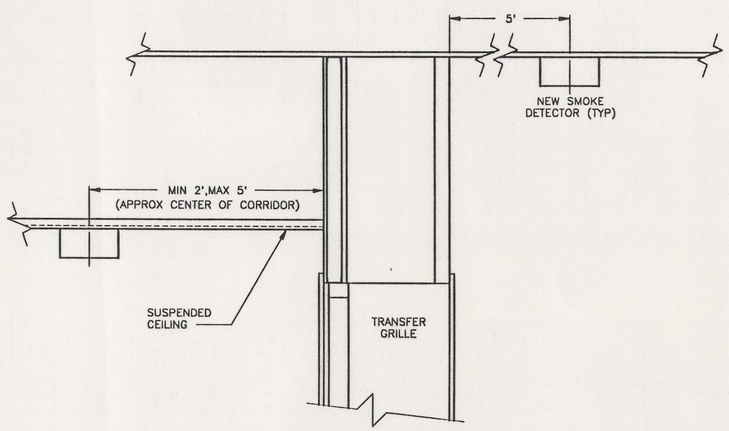


PARTIAL FIRST FLOOR PLAN

SCALE: 1/4" = 1'-0"

LEGEND

S	SMOKE DETECTOR
J	JUNCTION BOX
H	HEAT DETECTORS
R	FIRE ALARM RADIO TRANSMITTER
S	FIRE ALARM CONTROL PANEL (FACP)



SECTION B-B

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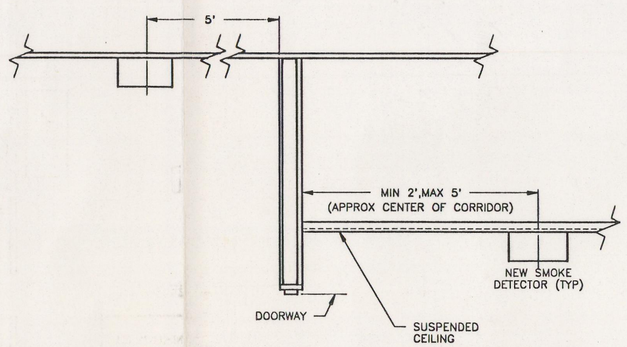

SECTION A-A

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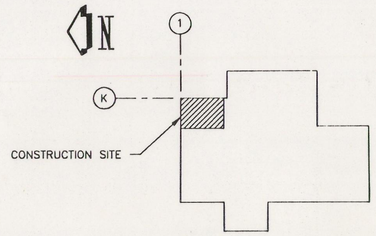

KEY PLAN

SCALE: NONE

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H-3-53361	1	FIRE ALARM 1ST FLOOR
H-3-49139	1	FIRE ALARM WIRING DIAGRAM

REFERENCE DRAWINGS

NEXT USED ON

REV NO	DESCRIPTION	REV BY / DATE	CHK BY / DATE	APVD BY / DATE	QA / DATE
					MF

REVISIONS

CAD CODE 3D:IBM:ACD2:10.0:SS CAD FILE W028292A

		DATE
DRAWN	JS OSBORN	10-23-89
CHECKED	BS SMITH	11/29/89
DFTG APVD	AG COUCH	11/29/89
ENGR	JE BURRIS	11/29/89
APVD	LF HIGGINSON	11/29/89
OTHER	SS ALLEN	11/30/89
QA	CW CABLE	11/29/89

APPROVED FOR IMPLEMENTATION

BY _____ DATE _____

IMPACT LEVEL II EDP # 88-092

U. S. DEPARTMENT OF ENERGY
RICHLAND OPERATIONS OFFICE
PACIFIC NORTHWEST LABORATORY
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ELECTRICAL FIRE ALARM SYSTEM PLAN AND SECTIONS

SIZE	INDEX NO	BLDG NO	DWG NO	REV NO
F	7701	325	SK-3-28292	0

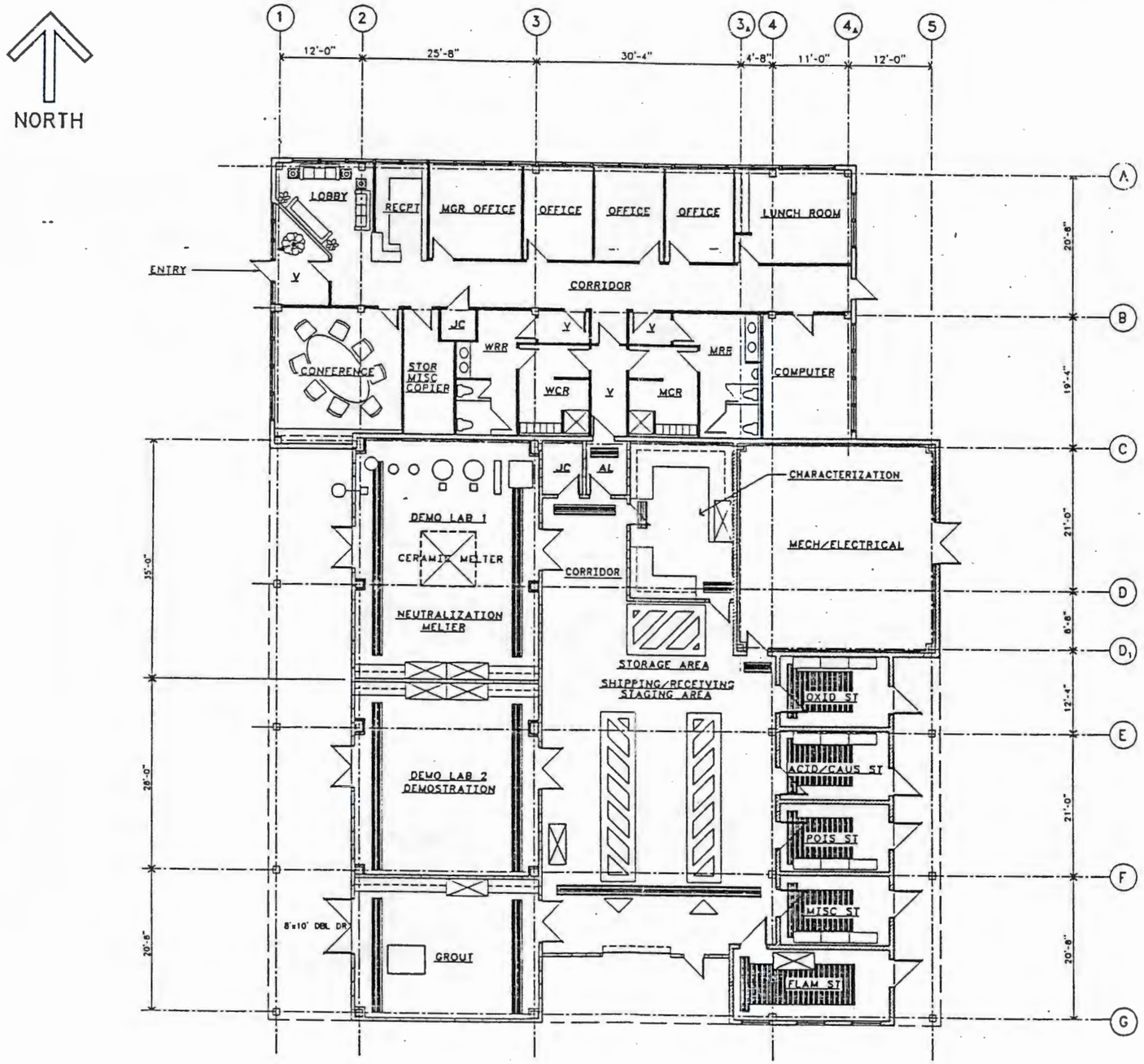
SCALE SHOWN SHEET 1 OF 2

APPENDIX 2C

FLOOR PLAN OF 3100 HWTU

9313025.0312

9313025.0313



Floor Plan of 3100 HWTU

APPENDIX 4A

GROUTING/STABILIZATION PROCEDURE

9313025.0314

APPENDIX 4A

GROUTING/STABILIZATION PROCEDURE

1.0 INTRODUCTION

Within the Hazardous Waste Treatment Facility (HWTF) grout will be used to immobilize hazardous waste. The grouting is accomplished by mixing a blend of dry cementitious solids with an aqueous waste solution. The waste solution will be accumulated until sufficient material exists to begin grouting. The mixing will be accomplished using a small, commercially available agitator in a 55 gallon drum. The aqueous waste solution will be added to the mixing vessel and the agitator started to suspend any non-dissolved material in the waste. A blend of dry cementitious solids will be added in appropriate proportion to create a uniform slurry. The agitator will then be removed and the top placed on the drum. The slurry will harden, with the majority of reaction taking place in the first few days. After 28 days the drum will be opened and if any separated liquid exists, it will be removed. At this point any required sampling would be performed.

A brief description of the proposed materials and grouting process are provided below.

2.0 MATERIALS

2.1 Dry Materials

The dry materials used in the grouting process may include materials such as portland cement, class F fly ash, blast furnace slag, and attapulgite clay. In addition, special materials may be added to the grout to decrease the mobility of a specific contaminant within the waste. For example, Indian Red pottery clay may be added to reduce the mobility of Cesium within the grout.

The dry materials to be used for a specific waste will be selected based on the waste to be grouted. The dry materials may be added to the waste solution in proportions of 7 to 15 lb of dry solids/ gallon of aqueous waste. The specific mix ratio used will be dependent on the properties of waste and selected dry materials. In most cases, it is expected that the mix ratio can be determined from past experience with grouting. Where there is uncertainty, a test mix of the grout will be performed using approximately 1 liter of waste to confirm the mix ratio is appropriate.

2.2 Waste Solution Properties

It is anticipated that grouting will be used for immobilization of primarily inorganic waste solutions. Grouting will not be used for solutions containing greater than 1 wt% organic unless there is data available which indicate that the organic compound in question does not interfere with the grouting process.

The waste solution to be grouted must have a pH greater than 7.0 prior to addition of the cementitious solids. There is no limit on the maximum pH for grouting. If the waste solution is acidic, the pH will be adjusted by the

addition of NaOH (and/or CaOH or CaO). The adjustment may be performed in the holding tank just prior to grouting if the temperature constraint below is not violated.

The temperature of the waste solution to be grouted will be within the range of 10 - 40 C at the start of the addition of the dry cementitious solids. The lower limit is to avoid excessive separated liquid due to a delayed set of the grout slurry. The upper limit of 40 C is imposed to prevent a flash set which could interfere with obtaining a uniform slurry and to limit the maximum temperature obtained during curing. The temperature of the grouted mix should not exceed 90 C during the curing process. Exceeding this temperature may adversely affect the leach resistance of the final cured grout.

Generally, the concentration of waste will range from dilute wastes to solution containing up to 6 molar sodium. It is expected that waste solution specific gravity may vary between 1.0 to 1.4. The waste solutions are anticipated to contain less than 50 wt% insoluble solids. Grouting of waste outside these ranges will not be performed unless data is available to demonstrate that the solution is appropriate for grouting. Blending of selected wastes may be performed if it is anticipated that the blended waste will result in superior properties for the resulting grout.

3.0 GROUTING PROCESS

3.1 Waste Preparation

Waste will be introduced into an agitated tank with a usable volume of approximately 600 gallons. Waste from a number of different sources will be combined to create a single homogeneous solution for grouting. If the waste to be grouted is a soluble solid, the material may be dissolved in the holding tank by adding an appropriate quantity of water to the tank and then adding the solid to the tank while agitating.

3.2 Dry Blend Preparation

The dry cementitious materials will blended by weighing the appropriate amount of material and then mixing in a cement truck. Smaller quantities of dry materials may be blended using a drum tumbler. The dry blend will then be place in a bin and stored until it is needed. It is possible that more than one dry blend may be stored at any time depending on the anticipated wastes to be grouted. The storage of the dry blend will protect it from moisture. Dry blend will be stored for a maximum of 1 year after blending.

3.3 Mixing

The mixing of the grout will be accomplished in a batch mode using a small, commercially available agitator in a 55 gallon drum. The drum will be placed on a platform scale and weighed. The aqueous waste solution will then be pumped into the drum leaving sufficient space to allow for the increase in volume when the dry materials are added. The appropriate weight of dry solids will then be added while agitating to create a uniform slurry. The agitator will then be removed and the top placed on the drum. The drum will be removed from the platform scale and placed in a storage area to allow the grout to harden into a solid mass.

9313025.0316

3.4 Sampling

After the slurry is placed in the drum but prior to placing the lid on the drum a small tube sampler will be placed in some drums to allow a sample to be removed after curing is complete. After 28 days, the drums will be opened and if any separated liquid exists it will be removed. The samplers will be removed from drums which contain them and the samples subjected to the appropriate tests. It is expected that compressive strength, TCLP and corrosivity will be performed in duplicate for each holding tank of material grouted with a particular dry blend. The drums to be sampled will be selected at random. If the results between duplicate samples differ significantly, additional sampling may be performed. Other testing may be performed as appropriate depending on the waste being grouted.

4.0 GROUTING PHYSICAL PRINCIPLES UNDERLYING THE GROUT SOLIDIFICATION PROCESS

The grout solidification process stabilizes and immobilizes the radioactive and dangerous constituents present in waste, thereby greatly reducing the potential for release of these constituents into the environment. This immobilization is accomplished by the formation of a physical barrier to soluble waste constituent migration and chemical immobilization of some other waste constituents. The effectiveness of these mechanisms in immobilizing the waste constituents is measured by leach testing of the solidified material.

In the Hazardous Waste Treatment Facility (HWTF), dry cementitious materials will be mixed with liquid waste to form a grout slurry. The slurry is then allowed to solidify.

The waste material is incorporated within the structure of the solidified grout. This forms a physical barrier that inhibits release of the waste constituents into the environment. The high pH (>12) of the liquids within the grout during curing will convert most multivalent cations into insoluble hydroxides or carbonates, resulting in reduced mobility for these species. Certain metal ions are also incorporated into the structure of the hydration products formed during the curing process. The precipitation and matrix incorporation of heavy metals and other multivalent cations into the cement matrix ensures the retention of these toxic materials in the grout product.

The mechanisms that control the release of material from the grout matrix generally are well understood but their specific application to individual waste constituents is difficult because of the complex chemistry of the waste-grout reactions. This complex chemistry does not allow a precise calculation of treatment effectiveness with the current state of knowledge. The current body of knowledge allows general statements to be made regarding the effectiveness for broad classes of waste constituents as stated previously, but testing is required to verify effectiveness on a case-by-case basis. The effectiveness of the grouted material in retaining waste constituents is measured by leach testing of the material using standardized, nationally approved procedures.

4.1 General Physical Principles

4.1.1 Generalized Grout Chemistry

This subsection provides background information on the dry materials used in grout production, the chemical reactions that occur during hydration, the effects of various DST waste constituents on the reactions, and a brief comparison of typical grout properties and typical concrete properties.

4.1.2 Portland Cement

Normal Portland cements are manufactured from a mixture of calcareous materials, such as limestone or chalk, and from alumina and silica found in clay or shale. In one process of cement manufacture, the appropriate proportions of raw materials are ground to a fine powder, formed into small (~1/2") balls, and fed into a rotary kiln that has been heated to sintering temperatures of 1300°C to 1500°C. The product exiting the kiln is called cement clinker and consists of fused pellets. The pellets are then cooled and ground in ball mills with small amounts of gypsum into the fine powder that is known as Portland cement.

During the clinkering process, the individual oxides combine through solid-state diffusion and melting to produce four major crystalline phases. These include tricalcium silicate, dicalcium silicate, tricalcium aluminate, and tetracalcium aluminoferrite. In addition, the clinker contains voids ('pores') and usually some free (uncombined) lime, CaO. More rarely, MgO (as periclase) is present. Typical concentrations and abbreviations of the four phases in Portland cement are as follows.

Chemical name	Chemical formula	Abbreviation	wt%
Tricalcium silicate	$3CaO \cdot SiO_2$	C_3S	55
Dicalcium silicate	$2CaO \cdot SiO_2$	C_2S	23
Tricalcium aluminate	$3CaO \cdot Al_2O_3$	C_3A	1
Tetracalcium aluminoferrite	$4CaO \cdot Al_2O_3 \cdot Fe_2O_3$	C_4AF	15

4.1.3 Hydration of Cement (Setting, Hardening, and Strength

Hydration is a process in which water is combined with the reacting substance. The hydration of cement is accompanied by solidification. The process of solidification comprises two stages: setting and hardening. On setting, the cement paste stiffens into a solid, but it has negligible strength. In the stage of hardening, the paste gradually develops considerable strength. There is no sharp division between setting and hardening; the transition is gradual.

In the hydration and solidification of cement, a number of different processes take place simultaneously and/or successively. These processes are described as follows:

1. Chemical reactions: especially hydration and hydrolysis reactions

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2. Dissolution and crystallization processes: gel-like and crystallized newly formed substances containing water (hydrate phases) are formed from supersaturated solutions and in topochemical processes

3. Interfacial process: surface-attractive forces (adhesion) produce bonding of the constituents of the cement paste.

The hydration reactions are exothermic; i.e., heat is evolved. The rate of heat evolution of cement hardening under adiabatic test conditions attains a maximum after 1 to 3 d and proceeds at a diminishing rate. The heat given off, in terms of quantity and in relation to time, depends on the type of cement (more particularly its constituents phases), its fineness, and the presence of additives such as blast furnace slag or pozzolana.

The overall result of the cement hydration reactions is a hardened product possessing high compressive strength. The strength of the hardened cement paste is primarily a result of its internal structure, which in turn is determined by the shape and size of hydration products and their spatial arrangement and packing density (porosity). Some of the water that is added to the cement to achieve hydration is combined chemically as hydration water. The theoretically required amount of water is not more than about 25% of the weight of the cement. In addition to this chemically combined water, a certain amount of water is physically bound on the very large surface areas of the hydrated phases. The remaining water is contained in capillary pores. Higher capillary water content increases the permeability of grout to water and, thus, the leachability of dangerous components.

The calcium silicate hydrates that are formed during hydration vary in shape (film-, roll-, and fiber-like) and in their composition, depending on the conditions of formation (water/cement ratio, temperature, etc.). They are, however, always very fine grained and are the principal strength-producing constituents of the hardened cement paste. Because the specific surface of the hardened paste is extremely high, on the order of 3,000,000cm^2/g (as compared with only 3,000cm^2/g for cement), its strength is attributed to the powerful adhesion forces (electrostatic forces of attraction acting between the exceedingly small hydrate phases) developed by the hydration products, and the mechanical stabilization of the mass by interlacing of the newly formed compounds.

4.1.4 Blast Furnace Slag

Blast furnace slag is a byproduct material obtained from the manufacture of pig iron in the blast furnace and is formed by the combination of the earthy constituents of the iron ore with a limestone flux. Although proportions differ, the essential components of slag are the same oxides that are present in portland cement (e.g., lime, silica, and aluminum).

Blast furnace slag is a latent hydraulic material; i.e., it needs an activator to enable it to harden hydraulically. In common practice, the calcium hydroxide produced during Portland cement hydration, sulfates, and alkalies act as activators. The slag must be in the glassy form produced by rapid cooling. This is achieved by quenching the molten slag in water, which yields

a granulated product. The granulated slag is then ground to a fineness similar to Portland cement. The hydraulic properties of blast furnace slag are determined by its chemical composition and glass content. The glass content is normally above 90%.

4.1.5 Fly Ash

Fly ash or pulverized fuel ash is a pozzolanic material that is obtained in the dust collection equipment of furnaces fired with pulverized coal, especially those of electricity-generating plants. Fly ash is composed of spherically shaped glass-like particles consisting mainly of SiO_2, Al_2O_3, and Fe_2O_3 with varying amounts of CaO, Na_2O, MgO, and TiO_2. Fly ash reacts with calcium hydroxide to produce calcium silicate hydrates, much like the hydration of Portland cement.

4.1.6 Hydration of Cements Containing Slag and Fly Ash

Blast furnace slag and fly ash generally cannot undergo hydration without other reactants. Blast furnace slag will hydrate in the presence of an activator such as calcium hydroxide, sulfates, and/or alkalis. The activators change the surface characteristics of the slag to allow dissolution and the subsequent formation of hydration products very similar to those of Portland cements. Fly ash must have a source of calcium to form hydration products. Calcium hydroxide from the hydration of Portland cements reacts with the silica from the fly ash to produce additional calcium silicate hydrates. This reaction results in additional filling of capillary pores with fine materials at the expense of the larger calcium hydroxide particles which results in a finer, less permeable microstructure.

4.1.7 Comparison Between Concrete and Waste Grouts

Succinct definitions to distinguish the meaning of Portland cement from grout and concrete are as follows:

1. Cement: A hydraulic powder produced by pulverizing Portland cement clinker consisting essentially of hydraulic calcium silicates and aluminates.

2. Grout: A mixture of cementitious materials and water, with or without fine aggregate, proportioned to produce a pourable consistency.

   Waste grouts are a mixture of cementitious and possibly other inert solids and wastes formulated to meet certain regulatory and process criteria.

3. Concrete: A composite material that consists essentially of a binding medium within which are embedded particles of aggregate. In portland cement concrete, the binder is a mixture of portland cement and water.

The hydration reactions described above for Portland cement and for mixtures of cement, slag and fly ash are applicable for hydration in relatively pure water. The hydration reactions of these mixtures with wastes may be much

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different because of the presence of a large quantity of hydroxide ions and soluble inorganic and organic salts in the wastes. Simple salts have been used in Portland cement concrete for accelerating or retarding the hydration reactions. Wastes may contain several of the salts used for these purposes, and in larger concentrations than normally used. The presence of the salts and organic complexants, coupled with a relatively high water content, may result in a relatively long set time, from 1 to 2 days, as determined by calorimetry curves.

The following table illustrates some of the differences between a waste grout and concrete. The table compares various parameters of a grout planned for use in immobilization of Double-Shell Tank Waste at Hanford to those for normal concrete.

	DST Grout[a]	Concrete[b]
Liquid Density	1.29 g/cm^3	1.00 g/cm^3
Total Water Content	37 wt%	6.7 wt%
Cementitious Solids Content	27 wt%	14 wt%
Water-to-Cement (W/C)[c]	1.36	0.48
Set time	24 to 48 hr	2 to 4 hr
Bulk Density	1.76 g/cm^3	2.39 g/cm^3
Percent of Original Water Required for 100% Hydration	18 wt%	52 wt%
Residual Water Left in Pores	30 wt%	3.2 wt%

(a) Typical DST grout prepared at 9 lb/gal with a 40% limestone blend
(b) Typical 5000 psi Portland cement concrete
(c) W/C is weight ratio of water to cementitious solids (i.e., cement, slag, fly ash)

The water content of the DST grouts is over five times that found in concrete and the cementitious solids content is twice as high. Only 18% of the original water present in DST wastes would be required for complete hydration of the cementitious solids in the grout, whereas greater than half of the original water in concrete is used for hydration. The final water content of the grout is ~30 wt%, which corresponds to a liquid-filled porosity of >50 vol%. The properties for any particular grout will be determined by the type and concentration of the waste and the dry blend used. However, grouts used for waste immobilization in the HWTF are expected to be more similar to the parameters for DST grout than that of concrete.

Another major difference between waste grouts and normal concrete is the curing conditions. Waste grouts may begin to cure at higher temperatures due to residual heat from agitation or neutralization, where as concretes are

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normally poured at ambient temperatures, typically less than 30 C. High curing temperatures can lead to larger pores resulting from the more rapid hydration reactions. This leads to a more permeable microstructure. This is the reason for setting a maximum waste temperature of 40 C prior to mixing the grout.

4.1.8 Microscopic Structure of Set Portland Cement

Set portland cement can be examined microscopically by powdering the material or preparing thin sections or polished surfaces, but identification of the hydrated materials present is difficult.

In thin sections, only three main constituents can normally be observed: unhydrated grains, calcium hydroxide crystals, and the gel groundmass of hydrated products. The gel occupies most of the space, apart from the calcium hydroxide, between the original cement grains. The amount of space between the grains corresponds to the original water/cement ratio, indicating that its porosity must vary correspondingly.

4.1.9 Phase Separation

It is a common observation that after grout has been placed in position, bleed water appears on the surface (phase separation or drainable liquid). This is essentially a sedimentation phenomenon caused by solids settling. Phase separation is influenced by plasticity of the mix, amount of entrained air, and motion or vibration of the mix during placement.

The grouts in the HWTF will be formulated to minimize phase separation. After mixing, the drum lid will be placed on the drum to prevent drying of the upper surface. Phase separation is not harmful to the quality of the grout. However if it does occur, it must be removed from the drums prior to disposal.

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APPENDIX 4B

DESIGN OF THE CERAMIC MELTER SYSTEM

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APPENDIX 4B

DESIGN OF THE CERAMIC MELTER SYSTEM

1.0 INTRODUCTION

The Pacific Northwest Laboratory (PNL) is designing a Hazardous Waste Treatment Unit (HWTU) for treatment of waste materials generated by the Hanford Site. The unit will include a ceramic melter for treatment of waste materials. The melter process is shown in Figure 1 and consists of a feed system, a joule heated melter and staged off gas cleaning equipment. Cleaned off-gas will exit as air to a building stack. Glass from the melter will be cast in steel drums which will qualify for disposal at a landfill. Alkali or alkaline earth salts from acid gas scrubbing can also be shipped off-site for disposal.

2.0 WASTE DESCRIPTION

Based on inventoried waste from previous years, the melter feedstock may contain volatile organic compounds, polymer compounds, aqueous solutions with nitrate salts, lead and lead compounds, and glass forming oxide materials left over from vitrification testing programs. The amount fed to the melter is expected to range from 10,000 to 60,000 kg/yr. Table 1 provides a breakdown of constituents fed to the melter assuming a 16,700 kg/yr throughput. The constituents shown are oxides and combustion products from hypothetical vitrification of wastes listed in PNL's 1990 inventory of hazardous materials that were shipped off-site for treatment and/or disposal. Excluded from consideration were non-regulated resource materials such as scrap metals and recyclable shop solvents and oils.

3.0 CERAMIC MELTER

The ceramic melter is a refractory-lined tank with electrodes that provide heat by passing current through a pool of molten glass (Figures 2 and 3). The joule-heated melter for waste treatment is an extension of commercial electric glass making technology. Waste will enter the ceramic melter through a feed port on the lid. Combustible materials will pyrolize and oxidize to benign materials. Oxidation air will be injected into the melter to accomplish combustion. Combustion products and other exhaust gases exit the melter and are treated by an off-gas system. Combustion residue and other inorganic materials will be converted to soluble glass oxides and incorporated into the molten pool. Accumulated glass will overflow from the melter through a discharge section and into steel drums where it will cool and solidify to form monoliths.

The melter is expected to operate at temperatures ranging from 1000C to about 1300C, depending on the composition of the molten pool of glass. The melter power requirement will be between 200 kW and 300 kW, depending on process conditions and desired feed rate. Its vessel size is 8 feet diameter by 8 feet high. Electrodes and feed equipment on top of the melter bring its overall height to about 13 feet.

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4.0 FEED SYSTEM

The melter will have three feeding modes: liquid feeding using a pump, container feeder using slide gate valves and solids feeding with a star feeder and hopper. These components are shown schematically in Figure 4.

Liquid is drawn into the feed line via a self-priming diaphragm pump at rates of 1 - 20 L/hr, depending on the nature of the feed material.

Another method of feeding waste would be to drop containers or vials filled with waste directly onto the melt surface (see "container feeding" in Figure 4). This is accomplished by placing a set of containers on a tray with a sliding bottom door. The tray is loaded on double slide gate assembly. The door and upper slide gate valve are opened together. The containers fall to the lower slide gate which is kept cool with a water spray to prevent melting of poly vials and premature heating of waste material. The upper slide gate then closes thus isolating the feed chamber from the environment. The lower gate opens to admit the containers to the melter. If containers ruptures in the feed chamber, any escaping volatiles would be drawn into the melter plenum through a vent line. The lower slide gate would be pitched at an angle to assure drainage of spilled liquids into the melter.

The final mode for feeding the melter is through a hopper with a solids "star" feeder. A star feeder is a rotating baffled shaft that transfers solids at a metered rate. Glass forming chemicals (such as sand, soda ash, and borax) and waste solids would be pre-loaded into a drum with a closable feed attachment secured to the top of the drum. The drum and attachment would be evaluated to the feeder and inverted. A slide gate on the drum attachment would then be opened and the contents would fall into the star feeder.

5.0 OFF GAS SYSTEM

The off-gas system will consist of an afterburner, quencher, scrubbers and blower. The afterburner will expose exhaust gases to 1800F temperature for a minimum of 1 second to assure complete combustion. The quencher uses water to cool gas to about 200F. The scrubber captures aerosols through high velocity impact with impinging water droplets. For acid gas removal, a scrubber with water treated with sodium hydroxide or calcium hydroxide is used. These components will occupy a space of about 4 feet wide by 8 feet long by 8 feet high. The off gas from this cleaning system will discharge to a building stack.

6.0 PROCESS OCCURING IN THE MELTER

Combustible liquids entering the melter burn from the high temperature and oxygen in the plenum. Air is to be injected into the melter plenum to accomplish this oxidation. Hydrocarbons break down into water and CO_2 gas. Chlorinated hydrocarbons additionally form HCl. The HCl is removed by the off gas scrubbers. Organic compounds containing sulfur or nitrogen also yield NO_x or SO_x. Sulfur oxides are readily removed in the acid gas scrubber; however, NO_x is expected to be released to the environment, unless facility licensing or permitting requires a specific NOx abatement device. Aqueous liquids boil on the surface of the molten glass in the melter. Non-volatile compounds in aqueous liquids form oxides (calcination). For example, sodium nitrate

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converts to volatile NO_x and glass-soluble Na_2O. Residues from combustion of organic materials and from calcination of inorganic compounds become incorporated into the glass melt. Examples of reactions that could occur in the melter are as follows:

Thermal breakdown of nitric acid solution:

$$2HNO_3(l) \text{----}> H_2O(g) + 2NO_2(g) + 1/2O_2(g)$$

Combustion of benzene

$$C_6H_6(l) + 7.5O_2(g) \text{-----}> 6CO_2(g) + 3H_2O(g)$$

Combustion of dichlorobenzene:

$$C_6H_4Cl_2 + 6.5O_2 \text{----}> 2HCl(g) + 6CO_2(g) + H_2O(g)$$

Calcination/vitrification of aqueous iron hydroxide solution:

$$2Fe(OH)_3(aq) \text{----}> \underset{\text{glass constituent}}{2FeO(s)} + 3H_2O(g) + 1/2O_2(g)$$

Combustion/calcination/vitrification of aqueous lead acetate solution:

$$Pb(C_2H_3O_2)_2(aq) + 4O_2(g) \text{---}> \underset{\text{glass constituent}}{PbO(s)} + 3H_2O(g) + 4CO_2(g)$$

Laboratory vials and bottles made from glass or polymers that contain waste liquids or solids containers can be fed to the melter intact. Experiments at PNL have indicated that these types of containers can be safely introduced to a melter. Glass containers immediately rupture from thermal shock and do not pressurize. Polymer containers melt and burn on the molten glass surface and also do not pressurize. The contents escape and then either burn (organic materials) or evaporate (aqueous solutions). It is not intended to add steel containers or other types of metal containers to the melter due to the potential for pressurization and a energetic rupture.

A blower at the end of the off-gas train maintains a constant negative pressure on the melter plenum and in all of the off-gas vessels. This assures that there is no escape of gases or aerosols into the environment from flanges and other fittings in the melter system.

7.0 MELTER OPERATION

The nominal processing rate for the melter will be 10 to 20 kg/h. At a nominal annual throughput of 16,700 kg, the on line time for the melter is approximately 1500 hours per year. This would likely be spread over 3 campaigns per year, each lasting about 3 weeks. Increases in capacity would be accommodated by increasing the number of campaigns accordingly.

Melter operation will follow protocols to assure worker safety, environmental protection, and protection of the equipment and facilities. These protocols would be based on the following requirements:

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1. Chemicals and other materials will be labeled by the originator with a description of the contents.

2. Incompatible materials will not be fed to the melter simultaneously. For example, organic solvents will not be processed with nitrate or perchlorate compounds.

3. The following materials will not be processed in the melter:

   - Explosives
   - Metal containers
   - Hazardous waste gases
   - Bulk materials designated for recycling
   - Materials contaminated with mercury or mercury compounds
   - Any other materials incompatible with the procedures.

8.0 GENERAL PROCEDURES

8.1 Melter System Start-up

The system blower will be started along with off gas cleaning equipment. Routine system checks will be made to assure proper functioning of the equipment.

The melter will be filled with a low melting frit (silica sand with 15 - 20 wt% soda as soda ash). Heat is applied in the melter plenum using a propane-fired burner mounted in the lid. The frit will begin to melt and a voltage applied across the electrodes. As soon as enough frit has melted, a conducting path will be established between electrodes and joule-heating will ensure.

8.2 Waste Processing

1. The feeding mode will be selected: a) liquid, b) container or c) bulk solids or some combination of these. The type and sequence of materials to be processed will be defined in a waste processing campaign plan to be prepared prior to feeding the melter.

2. For processing non-flammable liquids, the feed rate will be adjusted to achieve no more than 50% coverage of the melt surface with boiling liquid. Other controls will be to assure that the vacuum in the plenum space is at least -5 inches of water column (w.c.). If the vacuum declines due to excessive feed rate, then the feed rate will be reduced.

3. For flammable liquids that are pumped in, the feed rate will be coordinated with the air injection rate. The operating strategy will be to run the melter with excess air to completely oxidize organic compounds. The temperature and carbon monoxide concentration at the melter exit will be monitored. If the temperature dropped below 600C and the CO began to increase unacceptably, then this would signify insufficient air injection. Either the feed rate would be reduced or the air flow increased as

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counter measures. A propane-fired afterburner will be installed in the melter exhaust to assure complete destruction of organic compounds. This stage would operate such that combustion gases are held at 980C (1800 F) for at least 1 second.

4. The feed rate for flammable materials entering the melter through the container feeder would be monitored in the same fashion as in item 3 above. The cycle time for dropping in batches would be adjusted to achieve required temperatures and CO concentration limits.

5. Inorganic solids such as contaminated soils would be fed through the star feeder mechanism at rates of approximately 20 kg/h. This mode of melter operation would be similar to glass making. Electrode power would be regulated to sustain temperatures of 1100 - 1300 C in the pool of molten glass. Air injection would be minimized in this case, unless the solids being fed contained significant levels of combustible material.

6. When the level of molten glass in the melter has risen sufficiently, it will be discharged through an overflow trough into a steel drum. If necessary, a propane burner located in the overflow section will be used to initiate glass flow.

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8.3 Off-Normal Conditions

Failures in the off-gas system or in other system components typically would be countered by terminating the melter feed. An interlocking control system would also terminate the injection of air in the event of off-gas system failure. Once the melter feed and air injection has been terminated, the potential for releases to the environment or other uncontrolled events is virtually eliminated.

8.4 Melter Idling Shutdown

During periods when waste is not being processed, the melter would be placed in an idling condition. Melter idling is accomplished by terminating feed and air injection and adjusting electrode power to meet a minimum glass tank temperature. The off gas system blower remains active to provide a draft, although the air flow through the melter would be minimal. To minimize refractory corrosion, the idling temperature would be set at the lowest temperature practical to sustain joule-heating. Shutdown would occur if major repairs on the melter are needed, or if there are no further waste processing campaigns envisioned. In this case, the power to the electrodes would be shut off. The electrodes could either be left submerged in the glass or they could be withdrawn. The off-gas system blower could be shut-off during melter down time.

APPENDIX 7A

325 BED

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BUILDING EMERGENCY PROCEDURE

DOE BUILDING

325
Building

R. J. Kathen
Building Emergency Director

11-7-91
Date

November, 1992
Scheduled Revision Date

Approved:

R. J. Koford
PNL Emergency Preparedness Office

11/7/91
Date

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INTRODUCTION

It is the policy of the Pacific Northwest Laboratory (PNL) to provide for the safety of its employees, other contractors' personnel, visitors, and members of the general public in the event of an emergency incident. The PNL line management has the responsibility to execute this policy and ensure that all employees understand this plan, their responsibilities, and know the action to be taken in an emergency. Each employee is responsible for performing his job in accordance with safety instructions and procedures and to remain alert to unsafe conditions or acts. The purpose of the Building Emergency Procedure is to provide building occupants with the information necessary to react to emergency situations that may occur in order to:

- maximize personnel safety.
- ensure continuity of leadership in emergency situations.
- minimize the effects of an accident.
- minimize property damage.
- ensure prompt communications/notifications.
- ensure an appropriate response.

It shall be the responsibility of the Building Emergency Director (BED) to review and update the Building Emergency Procedure annually.

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B. Emergency Telephone Numbers

ANY EMERGENCY

PNL SINGLE-POINT CONTACT 9-375-2400

If 375-2400 is inoperative, call:

- Hanford Fire..... 811
- Hanford Ambulance..... 811
- Building Emergency Director..... 376-5746
  - Alternate 376-9370
  - Alternate 376-6880
- Exposure Evaluator 376-2222
- PNL Duty Officer(s) 9-375-2154
  (e.g. Safety - Security)
- Other Contractor Single-Point Contacts
  - WHC - 300 Area 376-5000
  - KEH 376-7297
  - HEHF 376-6414
- Kadlec Hospital 9-946-4611
- 300 Area ECC 376-4712
- PNL 3000 Area ECC 9-375-6900
- Off-Normal Events 9-375-2154

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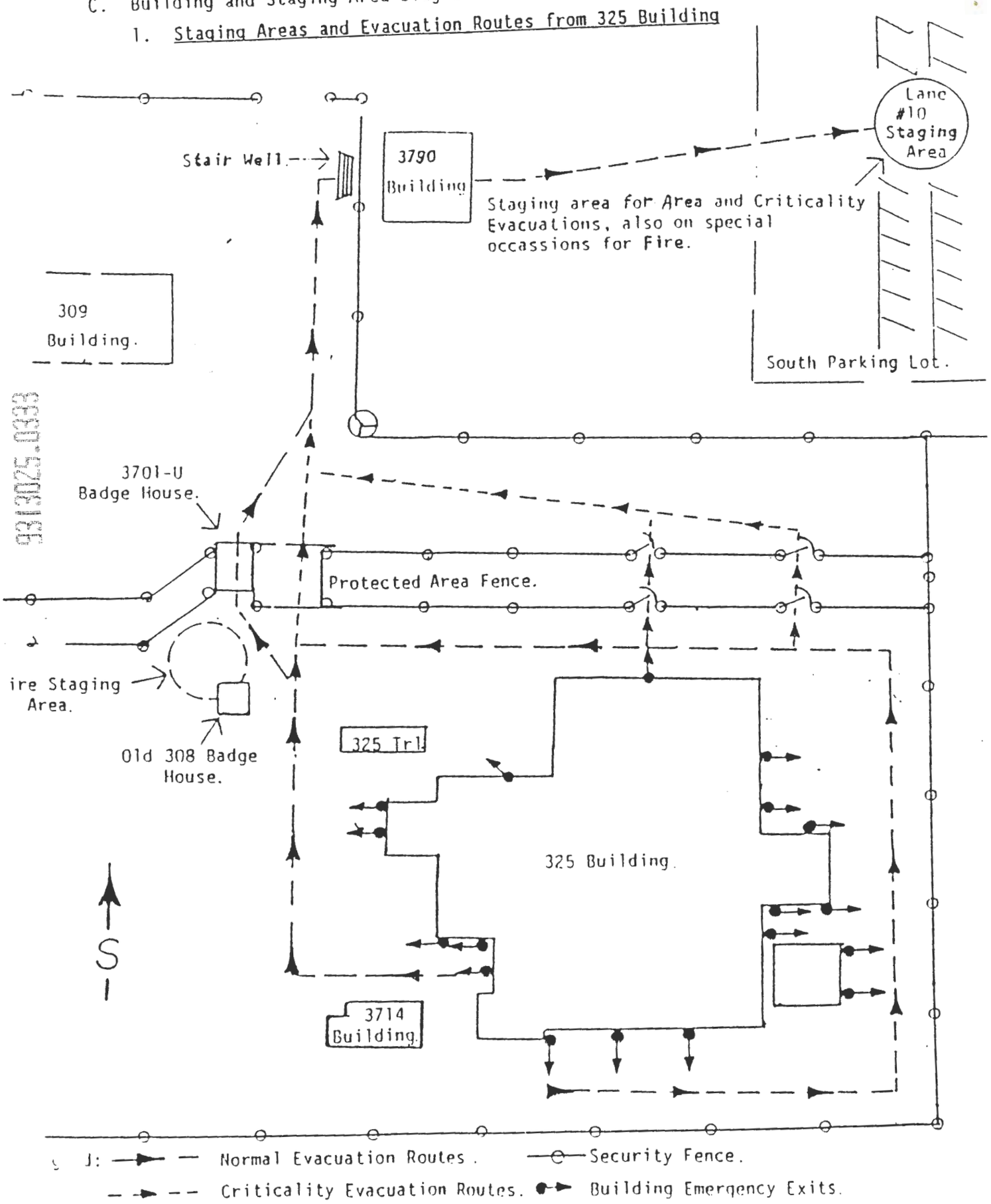
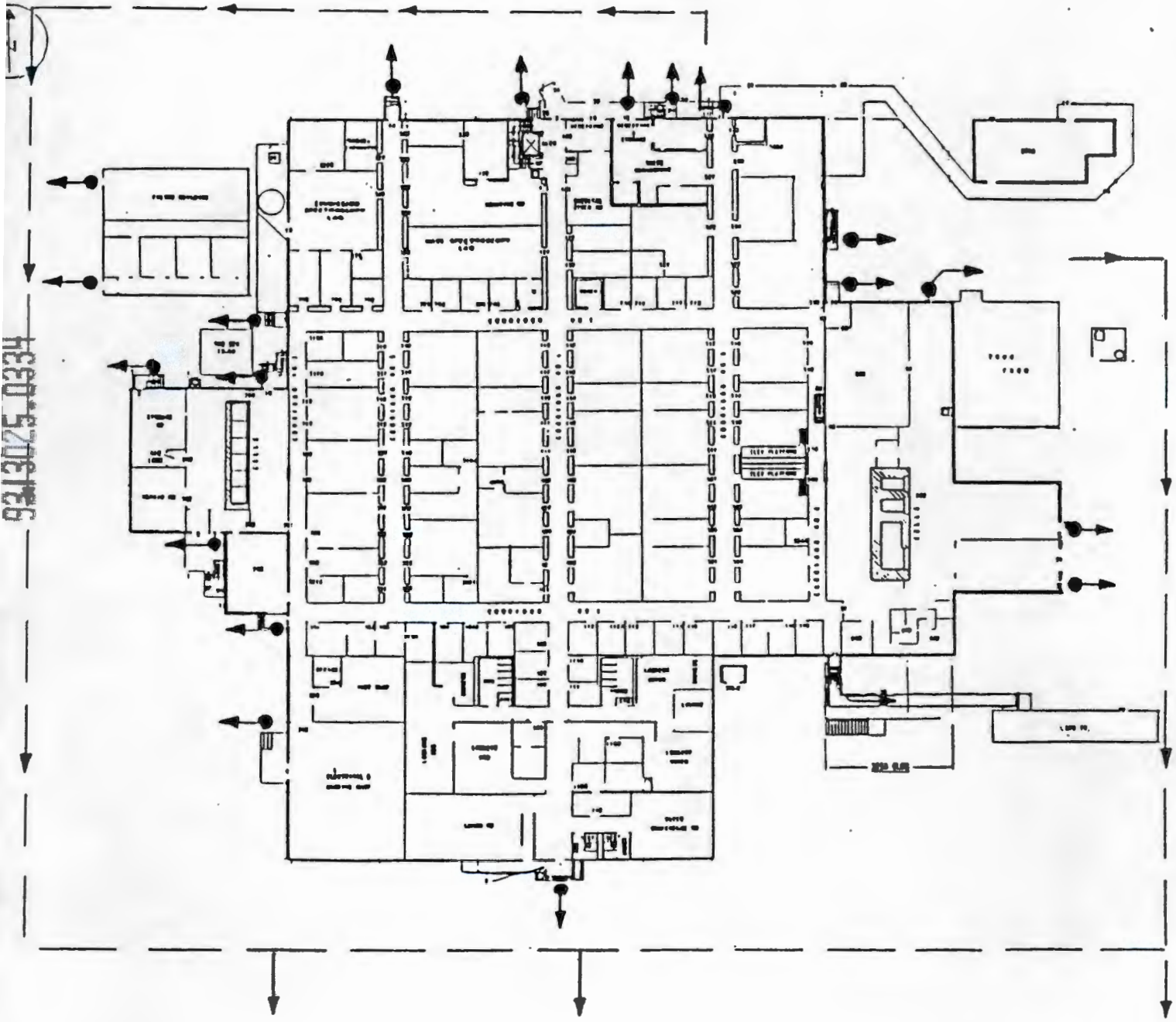
C. Building and Staging Area Diagrams

1. Staging Areas and Evacuation Routes from 325 Building

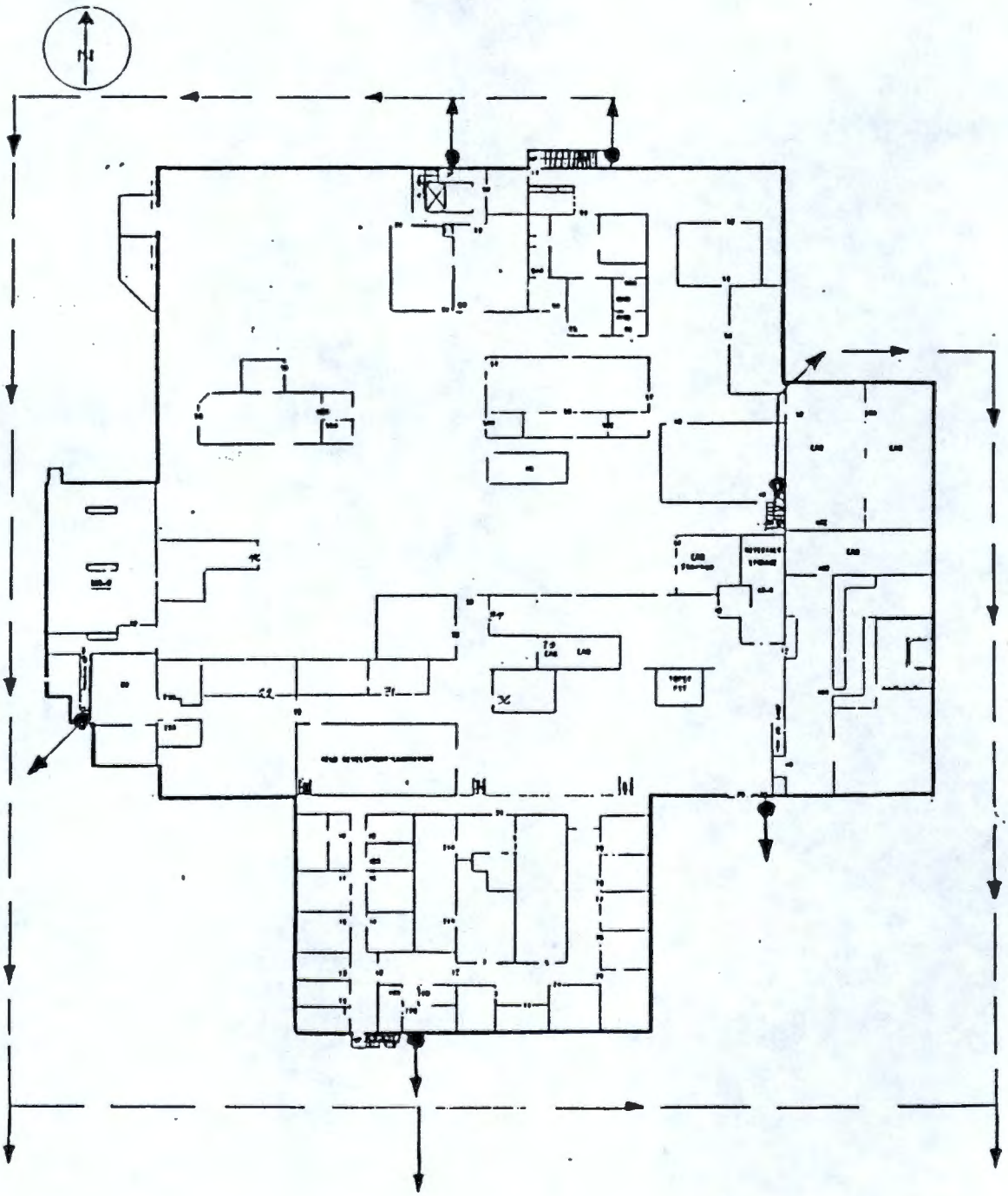


2. Evacuation Routes - First Floor



First Floor Plan
325 Building

3. Evacuation Routes - Basement Plan



Basement Plan
325 Building

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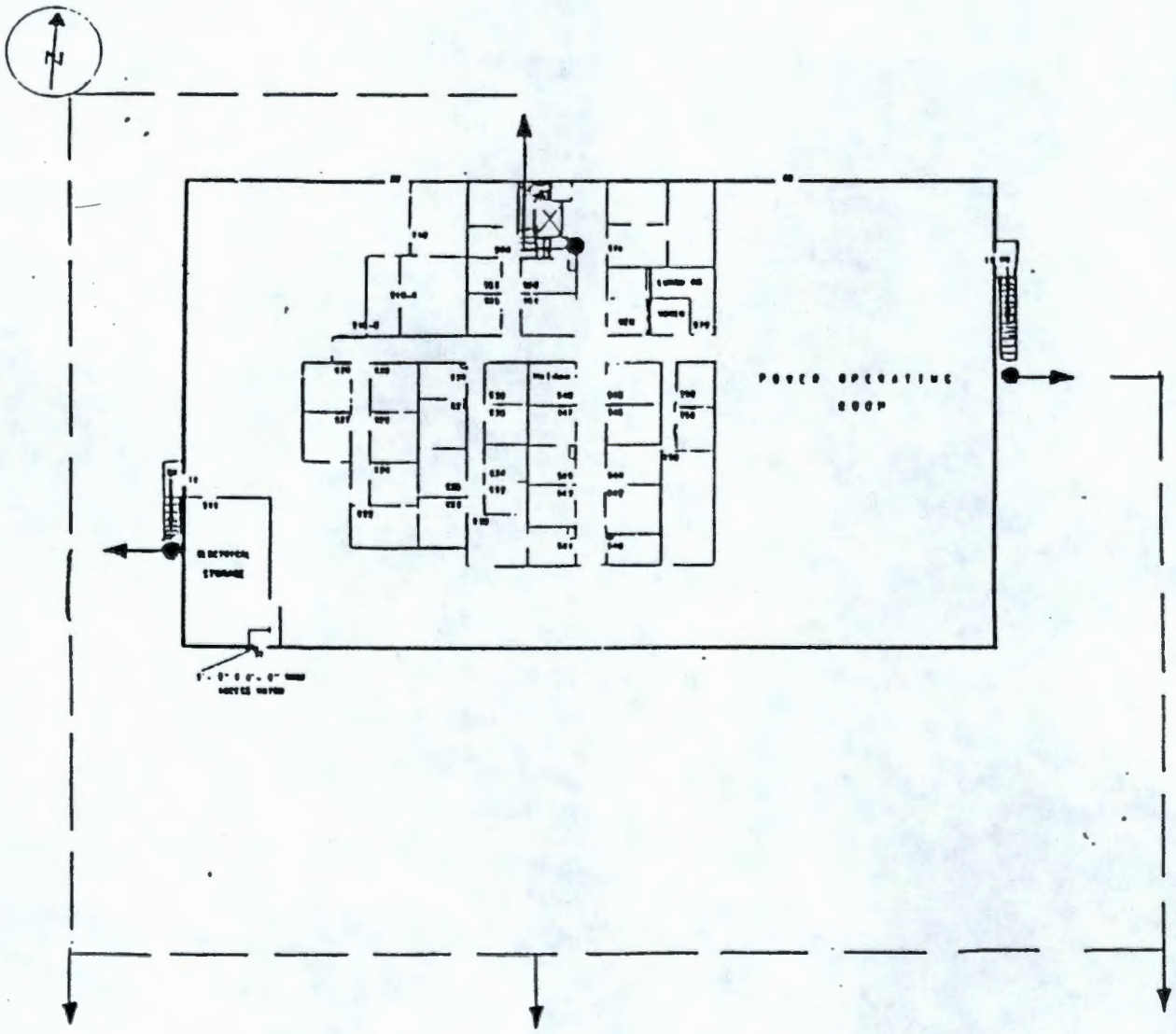
4. Evacuation Routes - Second Floor



Second Floor Plan
325 Building

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I. EMERGENCY REFERENCE DATA

A. Hanford Site Emergency Signals[a]

Emergency Signals	Meaning	Response
Gong (2 strokes per per second	Fire	Vacate building by nearest exit. Move upwind. Keep driveway clear.
Siren (steady for for 3 to 5 minutes	Evacuation	Get your car keys and proceed promptly to designated area. Listen for emergency information. Follow instructions.
Siren (wavering)	Take protective shelter	Stay inside. If outside, go inside closest building. Remain there until directed to do otherwise.
Continuously ringing of phone	Area or plant emergency	Answer crash alarm telephone relay message exactly as received to the Building Emergency Director. Telephones are identified with a white label on the handle.
Howler (AH-OO-GAH)	Criticality	Go! Now! Run away from alarm sound/ building. Proceed to staging area. Await instructions.

[a] Some signals may not be applicable in the building; however, they may be heard in other parts of the Hanford Site.

Note: Call 373-2345 to hear the sound of the signals and a recorded message.

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II AUXILIARY INFORMATION

A. Building Emergency Organization

1. Building Emergency Director

The BED has the responsibility for the welfare and safety of the building personnel and for directing efforts to control and terminate the event if his building is the site of the event.

	NAME	WORK PHONE
Building Emergency Director	P.J. Gaither	376-5746
1st Alternate	L.E. Maples	376-9370
2nd Alternate	R.L. McDowell	376-6880

2. Zone Warden

Zone Wardens are responsible for determining if all personnel have left their zone, reporting the occupancy status to the Staging Area Supervisor, and determining if aid and/or rescue is required. The Zone Warden is to assist anyone requiring help in evacuating the building.

	NAME	WORK PHONE
Zone #1		
Primary	R.T. Steele	376-3089
Secondary	C.O. Harvey	376-2699
Zone #2		
Primary	G.H. Bryan	376-0962
Secondary	R.J. Elovich	376-3554
Zone #3		
Primary	T.K. Andrews	376-3128
Secondary	G.M. Richardson	376-3171
Zone #4		
Primary	R.C. Britton	376-8470
Secondary	D.A. Cochran	376-3510
Zone #5		
Primary	T.E. Jones	376-3263
Secondary	B.M. Gillespie	376-5802

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A. Building Emergency Organization continued

Zone #6

Primary	L.R. Greenwood	376-6918
Secondary	S.W. Thompson	376-6529

3. Staging Area Supervisor

The Staging Area supervisor shall direct all activities at the Building Staging Area and is responsible for notifying the Building Emergency Director if all personnel are accounted for or if help is needed.

	NAME	WORK PHONE
Staging Area Supervisor	P.J. Gaither	376-5746
1st Alternate	C.J. Nichols	376-4439
2nd Alternate	M.C. Burt	376-3762

4. Facility Expertise

In the event of an emergency, specific detailed facility information may be needed. Knowledge of the building, utilities, and radiation hazards can be obtained from the following:

- Building Manager 376-5746
- Building Ventilation and Power Operation ..... 376-3526 or 376-5612
- Radiation Protection .....376-3001 or 376-8502
- Safety ..... 376-1187 or 376-1634
- Security 9-375-2400
- Crafts..... 376-2654

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5. Unique Program Laboratory Expertise

The technical knowledge of a specific program/laboratory activity is usually known by the laboratory occupant or program manager. If applicable, the following staff may be contacted in regards to emergencies or off-normal events in their laboratories:

G.H. Bryan	376-0548	Lab's: 23, 410, 500 thru 517, 604
T.K. Andrews	376-3128	Lab's: 600 thru 612
R.L. McDowell	376-6880	Lab's: 527, 528, 529
L.R. Greenwood	376-6918	Lab's 55, 317, 411, 425
M.W. Urie	376-9454	Lab's 52, 312, 316, 406, 414, 416
R.T. Steele	376-3089	Labs: 200 through 203
D.A. Cochran	376-3510	Laboratory 520
R.D. Bell	376-8470	Labs: 48, 54

NOTE: Posted at entry to all laboratories is an Emergency Notification Form listing: Laboratory Monitor, Alternate, and Manager.

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6. Staff Members

Give the appropriate alarm if an off-normal or emergency condition is observed. Respond as required in Section I.A.

A. Specific Emergency Actions

For any off-normal event or emergency condition not specifically addressed, call the PNL Single-Point of Contact on 9-375-2400. The Building Emergency Director will determine what response is appropriate.

1. Fire

a. Signal: Gong (Hanford Site)

b. Response/Action

- Sound alarm.
- If you are notified of a fire If time permits:

  - Shut down equipment
  - Close doors and windows
  - Lock up (secure) nuclear materials
  - Lock up (secure) classified documents or carry them them you.

- Evacuate building through nearest normal exit if you can SAFELY do so.

1. Fire Continued

- Discard SWP clothing outside exterior doors, if possible.
- Assemble upwind from the building and report your presence to the BED or delegate.
- If wearing SWPs, separate yourself from other building occupants and await survey by Radiation Monitoring.
- If you discover a fire, the following steps are to be performed.

  - Sound the alarm
  - Notify Single-Point-Contact (SPC) 375-2400 or 9-375-2400 if at a 373 or 376 exchange.
  - Fight the fire, if able to do so safely.
  - Initiate the same response as listed for the situation in which you are notified of a fire.

2. Criticality

Criticality is an event which is limited to a few specific facilities. This information is presented to provide consistent training to all staff.

a. Signal: Howler (ah-OO-gah)

b. Response/Action

- Leave the building immediately.
- Run.
- Assemble at the Building Staging Area.
- Report your presence to the designated accountability person.
- If wearing SWPs, isolate yourself from other building occupants.
- Notify 9-375-2400.

3. Area Evacuation

a. Signal: Steady Siren (3 to 5 minutes)

b. Response/Action

- Follow instructions; evacuate through normal exits.
- Shut down equipment if time permits.

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3. Area Evacuation Continued

- Secure nuclear material(s).
- Secure classified documents or carry them with you.
- Report to your Building Staging Area and accountability person.
- If wearing SWPs, isolate yourself from other building occupants.

4. Area Take Cover

a. Signal: Wavering Siren

b. Response/Action

- Stay inside building.
- Notify 9-375-2400.
- If outside, take cover inside nearest building.
- Secure nuclear material(s).
- Secure classified documents.
- Follow the instructions of the Building Emergency Director.

5. Criminal Activity (e.g. suspicious objects, threats, sabotage)

a. Signal: None

b. Response/Action

- When condition is observed, notify 9-375-2400.
- If necessary, clear the area of personnel.
- Do not move any suspicious objects.
- Post warnings if applicable.
- Furnish emergency responders with appropriate information.
- Follow the instructions of the Building Emergency Director/ and/or Security.

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6. Loss of Electrical Power

a. Signal: None

b. Response/Action

- Notify 9-375-2400.
- Close hoods (if applicable).
- Shut down all equipment.
- Secure nuclear material(s).
- Secure classified documents.
- If emergency power fails, evacuate to Building Staging Area.
- Evacuate to the 325 Building Lunch Room/Conference Room areas.
- Follow the instructions of the Building Emergency Director.

7. Leaks or Spills (radioactive, nonradioactive, [a] toxic, or hazardous material)

a. Signal: None

b. Response/Action

- Get away from substance.
- Notify 9-375-2400.
- Prevent personnel exposure (e.g., set up barricade(s)).
- Take steps to contain if possible.
- Spill cleanup material is located at spill station cabinets mounted on walls in corridors 100, 300, 400, and 500. Other materials may be found in Room #426.
- Follow the instructions of the Building Emergency Director.

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[a] The "PNL Waste Management Contingency Plan," PNL-MA-824.

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8. Unusual, Irritating or Strong Odors

a. Signal: None

b. Response/Action

If you believe the odor may be the result of an uncontrolled release of a toxic or hazardous material, respond the following way:

- Activate building fire alarm.
- Evacuate building to Building Staging Area.
- Notify 9-375-2400.

If the occupant has knowledge of the source and scope of the release and believes the release poses no damage,

- Notify the Building Manager.
- Notify your management.

If an unusual odor is detected and the source is unknown, the Building Emergency Director will determine if the building should be evacuated.

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C. Utility Disconnects

Utility disconnect may be necessary under extreme emergency conditions. The Building Emergency Director will determine if utility disconnects are necessary. Location of the utility disconnects or valves are described below:

1. Electrical: Switch Gear Control Center, is located along the West wall in the basement.

2. Water: The Internal Valves, are located in the South West corner of the basement. The external PIV is located South West of the building.

3. Gas Supplies: N/A.

4. Steam: The Steam Supply Valve, is located on the East side of the basement's North wall.

5. Air: The Compressed Air Supply Valve, is located on the East side of the basement's North wall.

6. Ventilation: Exhaust/Supply Fan Control Center, is located in the North West portion of the 2'nd Floor East Equipment Room.

APPENDIX 7B

3100 BED

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