



0074117

Department of Energy
Richland Operations Office
P.O. Box 550
Richland, Washington 99352

OCT 10 2007

08-SED-0001

Ms. Greta P. Davis
Nuclear Waste Program
State of Washington
Department of Ecology
3100 Port of Benton Blvd.
Richland, Washington 99354

RECEIVED
OCT 12 2007
EDMC

Dear Ms. Davis:

CLASS 1 MODIFICATIONS TO THE HANFORD FACILITY RESOURCE
CONSERVATION AND RECOVERY ACT PERMIT (QUARTER ENDING
SEPTEMBER 30, 2007)

In accordance with Hanford Facility Resource Conservation and Recovery Act Permit (Permit) Condition I.C.3, enclosed for your notification are the Class 1 modifications for the quarter ending September 30, 2007. These modifications update information in Part III, and Part V of the Permit. Part III Class 1 modifications pertain to the 305-B Storage Facility, 242-A Evaporator, and Waste Treatment and Immobilization Plant. The Part V Class 1 modifications pertain to the 300 Area Waste Acid Treatment System. The Class 1 modifications are being made to ensure that activities are conducted in compliance with the Permit. A record of these modifications is maintained in the Hanford Facility Operating Record.

If you have any questions, please contact Pete J. Garcia, Jr., Director, Safety and Engineering Division, on (509) 372-1909.

Sincerely,

Rob G. Hastings, Acting Assistant Manager
for Safety and Engineering

SED:ACM

Enclosures

cc: See page 2

Ms. Greta P. Davis
08-SED-0001

-2-

OCT 10 2007

cc w/encls:

T. Z. Smith, DOE-ORP *H-0-1*
Administrative Record, HF RCRA Permit, H6-08
Environmental Portal, LMSI
Ecology NWP Library
HF Operating Record (S. A. Thompson, FHI)

cc w/o encls:

F. W. Bond, Ecology
K. A. Conaway, Ecology
S. L. Dahl-Crumpler, Ecology
J. Hedges, Ecology
J. P. Henschel, BNI
M. N. Jaraysi, CH2M
J. L. Nuzum, FHI
J. B. Price, Ecology
E. J. Van Mason, Ecology
J. J. Wallace, Ecology

Hanford Facility RCRA Permit Modification Notification Forms

**Permit Attachment 4
DOE/RL-94-02, Hanford Emergency Management Plan**

Index

Page 2 of 5: Section 3.0, Table 3-1

Page 3 of 5: Section 3.0, Table 3-1

Page 4 of 5: Section 14.2.7

Page 5 of 5: Appendix C

Submitted by Co-Operator:



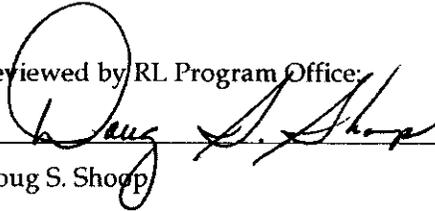
Anthony M. Umek



7/24/07

Date

Reviewed by RL Program Office:



Doug S. Shoop

8/2/07

Date

Hanford Facility RCRA Permit Modification Notification Form

Unit: Hanford Emergency Management Plan, DOE/RL-94-02	Permit Part & Chapter: Permit Attachment 4
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Description of Modification:
Remove and replace Section 3.0 with the attached Section 3.0.
Section 3.0, Table 3-1:

Table 3-1. Memorandums of Understanding

PARTIES	SERVICES/AREAS OF COOPERATION	POINTS OF CONTACT	CONSTRAINTS	DATE	EXPIRATION DATE	WHERE ON FILE
State of Washington	Document areas of cooperation between the parties in the planning for and response to emergencies at the Hanford Site.	Washington Emergency Management Division	None	01/08/04 06/20/07	Three years from actual date of signature 02/28/13 or until canceled by any party after 60 days written notice to the other parties.	RL SES
...						
Energy Northwest	Document areas of cooperation between the parties in the planning for and response to emergencies at the Hanford Site.	Energy Northwest Emergency Preparedness	The specific areas of assistance will be provided based upon availability, and are limited to those emergency actions necessary to protect onsite personnel, the public health and safety, and the environment in the event of a major emergency at the Hanford Site or Energy Northwest.	02/11/04 05/07/07	Continue until canceled by either of the parties upon 30 60 days written notice to the other party.	RL SES
...						
Our Lady of Lourdes Hospital Medical Center (OLOL Lourdes) Pasco, Washington	Significantly injured, contaminated persons will be admitted to facility for appropriate medical care.	OLOL Lourdes Administrator	The responsibilities of OLOL Lourdes will be limited to activities performed at the hospital.	08/17/98 05/07/07	Arrangements may be terminated by OLOL or by RL upon written notice to the other, which notice shall not become effective for at least 30 days after the date thereof. Continue until canceled by either of the parties upon 30 days written notice to the other party.	RL SES

WAC 173-303-830 Modification Class	Class 1	Class '1	Class 2	Class 3
Please mark the Modification Class:	X			

Enter relevant WAC 173-303-830, Appendix I Modification citation number: A.1
 Enter wording of WAC 173-303-830, Appendix I Modification citation:
 A.1. General Permit Provisions, Administrative and informational changes

Modification Approved: <input type="checkbox"/> Yes <input type="checkbox"/> No (state reason for denial)	Reviewed by Ecology:
Reason for denial:	
	G. P Davis Date

Hanford Facility RCRA Permit Modification Notification Form

Unit: Hanford Emergency Management Plan, DOE/RL-94-02	Permit Part & Chapter: Permit Attachment 4
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Description of Modification:
 Remove and replace Section 14 with the attached Section 14.
 Section 14.2.7:
14.3.7 Plan Locations
 Copies of this plan are maintained at:

- RL and ORP Emergency Preparedness program offices;
- each contractor Emergency Preparedness office and other locations as specified by the respective contractor;
- Hanford Fire Department (area fire stations);
- Occurrence Notification Center;
- DOE Hanford Emergency Operations Center (primary and alternate); and
- the Patrol Operations Center.

Copies of the plan are also maintained at the following offsite agencies (per their request) to meet the WAC 173-303-350(4) requirement:

- Pasco Police Department;
- Adams County Sheriff's Office;
- Pasco Fire Department;
- College Place Fire Department;
- Kadlec Medical Center;
- Our Lady of Lourdes Health Center;
- Kennewick General Hospital;
- Benton County Emergency Management Center;
- Franklin County Emergency Management Center; and
- Grant County Emergency Management Center.

Copies of location-specific documentation are provided to offsite agencies as requested. ~~Per agreement with Ecology, location specific documentation is offered to offsite agencies every two years.~~

WAC 173-303-830 Modification Class ^{1 2}	Class 1	Class '1	Class 2	Class 3
Please mark the Modification Class:	X			

Enter relevant WAC 173-303-830, Appendix I Modification citation number: A.1
 Enter wording of WAC 173-303-830, Appendix I Modification citation:
 A.1. General Permit Provisions, Administrative and informational changes

Modification Approved: <input type="checkbox"/> Yes <input type="checkbox"/> No (state reason for denial) Reason for denial:	Reviewed by Ecology:
	G. P Davis Date

Hanford Facility RCRA Permit Modification Notification Form

Unit:
Hanford Emergency Management Plan, DOE/RL-94-02

Permit Part & Chapter:
Permit Attachment 4

Description of Modification:

Remove and replace Appendix C with the attached Appendix C.
Appendix C:

APPENDIX C

HANFORD FIRE DEPARTMENT EQUIPMENT LIST

EQUIPMENT ¹	DESCRIPTION	NORMALLY LOCATED ²
...		
Mobile Air Vehicle 1 each	Examples of equipment contained on mobile air vehicle: <ul style="list-style-type: none"> • mobile air compressor, recharges self-contained breathing apparatus cylinders; and • tools and fittings for operation of vehicle and spare cylinders. 	Station 91
...		
Rescue Truck 1 each 2 each	Examples of equipment contained on rescue truck: <ul style="list-style-type: none"> • heavy and light rescue, water rescue, hi/lo angle rescue, and trench rescue; • mobile air compressor, recharges self-contained breathing apparatus cylinders; and • tools and fittings for operation of vehicle and spare cylinders. 	1 at Station 92 1 at Station 93

¹Emergency response vehicles identified in this table shall be serviced and maintained to keep them in safe operating condition and ready for response at all times. Should a unit be out of service for more than 30 days, written justification shall be provided to the Hanford Fire Department for review and approval. The written justification, when approved, will be maintained by the Hanford Fire Department until the equipment is returned to service.

²The Hanford Fire Department Chief has the authority to: 1) direct the placement of equipment as needed to control emergency events; and 2) take proactive action and assign different vehicle locations based on conditions such as fuel moisture content, area fire history, work in progress, or other conditions that could arise.

WAC 173-303-830 Modification Class ^{1 2} Please mark the Modification Class:	Class 1	Class 1	Class 2	Class 3
	X			

Enter relevant WAC 173-303-830, Appendix I Modification citation number: A.1.

Enter wording of WAC 173-303-830, Appendix I Modification citation:

A.1. General Permit Provisions, Administrative and informational changes

Modification Approved: Yes No (state reason for denial)

Reason for denial:

Reviewed by Ecology:

G. P Davis

Date

Hanford Facility RCRA Permit Modification Notification

Permit Attachment 4
DOE/RL-94-02, Hanford Emergency Management Plan

Replacement Index

DOE/RL-94-02, Section 3.0

DOE/RL-94-02, Section 14.0

DOE/RL-94-02, Appendix C

3.0 OFFSITE RESPONSE INTERFACES

3.1 OVERVIEW

Interfaces and coordination with offsite agencies are important in the planning, preparedness, response, and recovery elements of the Hanford emergency management program. As such, RL shall interface with Federal, tribal, state, local, and private organizations and/or agencies:

- that have a responsibility to protect the public and environment within the EPZs of the Hanford Site;
- with which RL supports as the Regional Coordinating Office for Region 8 (Oregon, Washington, and Alaska); and
- with which RL has entered into special agreements for assistance.

Where appropriate, RL shall develop and maintain agreements to formalize areas of understanding, cooperation, and support with offsite agencies.

3.1.1 Planning and Preparedness

The modes of interface for planning and preparedness activities, as is determined beneficial by the parties, may include:

- coordination of emergency plans and procedures;
- periodic meetings to share information and coordinate activities;
- training opportunities related to offsite responsibilities;
- development of agreements for support to and from offsite agencies;
- participation in annual exercises; and
- development of public information programs.

3.1.2 Response and Recovery

In the event of an emergency on or affecting the Hanford Site, RL shall interface with offsite agencies to ensure coordination and support of response and recovery activities. These interfaces include:

- notification and periodic updates to local jurisdictions within the plume EPZ, states that contain portions of the ingestion EPZ, and other agencies that may be requested to provide assistance (see respective subsections in section 5.0);

Offsite Response Interfaces

- communication and coordination with DOE-HQ;
- RL representation in appropriate offsite emergency centers;
- offsite representation in the Hanford EOC;
- PARs to offsite agencies; and
- event scene interface with offsite responders.

Communications with state and local EOCs are depicted on Figure 3-1.

3.2 FEDERAL AGENCIES

3.2.1 U.S. Department of Energy-Headquarters

The DOE-HQ Cognizant Secretarial Officers are responsible for ensuring implementation of policy and requirements for activities conducted under their respective areas of cognizance.

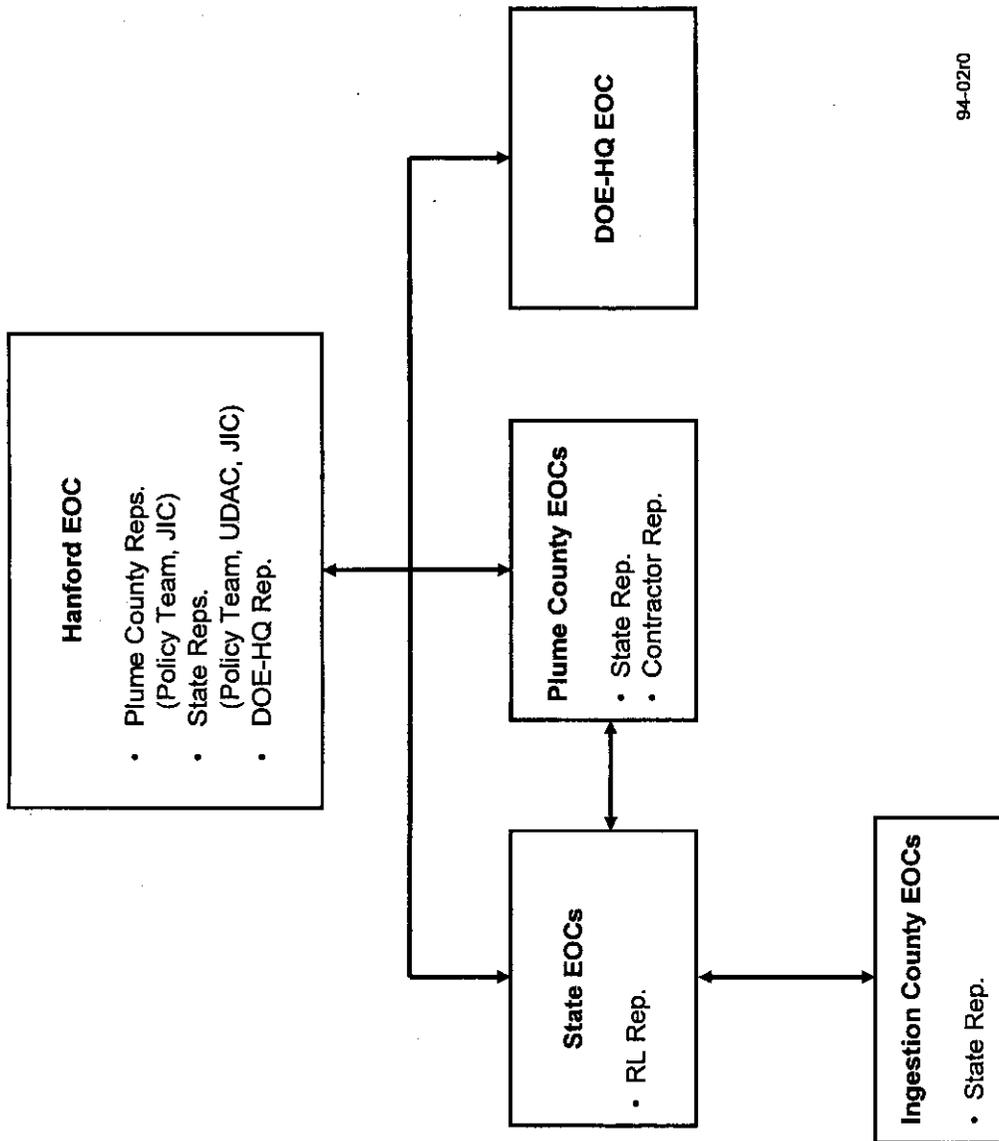
The DOE-HQ EOC serves as the point-of-contact for receipt of all emergency notifications and reports. Accordingly, the DOE-HQ EOC receives, coordinates, and disseminates emergency information to DOE-HQ elements and Program Office emergency points-of-contact, the White House Situation Room, and other Federal agencies. As such, emergency status reports shall be forwarded to the DOE-HQ EOC on a continuing basis until the emergency is terminated.

In the event of an emergency, a DOE-HQ Emergency Management Team is convened to:

- receive information on the facility, site, or area response;
- monitor the Operations/Field Office;
- provide appropriate support and assistance;
- assist with issue resolution; and
- coordinate interagency Congressional, and public information activities at the national level.

RL/ORP shall notify and provide information to the DOE-HQ EOC. Written reports shall be provided to the DOE-HQ EOC as soon as practical, but within 24 hours of emergency classification. A DOE-HQ Site Representative will respond to the Hanford EOC to provide liaison with the DOE-HQ EOC. Upon request from DOE-HQ, RL/ORP shall dispatch a liaison to support activation of the DOE-HQ EOC.

Figure 3-1. Lines of Communication Between Emergency Centers.



94-0270

DOE also has seven emergency response assets available to assist at events if conditions warrant. These assets include:

- Aerial Measuring System (AMS) – provides fixed-wing aircraft and/or helicopters for remote sensing to detect and measure for ground deposition or perform aerial photography and multi-spectral imaging;
- National Atmospheric Release Advisory Capability (NARAC) – develops predictive plots to provide near real-time assessments of the consequences of accidental or potential radiation releases;
- Accident Response Group (ARG) – provides equipment for assessment, recovery, and disposal of damaged nuclear weapons and components;
- Federal Radiological Monitoring and Assessment Center (FRMAC) – coordinates the Federal radiological monitoring, assessment, and evaluation of data during a radiological emergency;
- Nuclear Emergency Support Team (NEST) – provides search and identification of nuclear materials, diagnostics and assessment of suspected nuclear devices, packaging, and transportation;
- Radiological Assistance Program (RAP) – provides radiological assistance during all types of radiological accidents or emergencies (considered DOE's First Responder team); and
- Radiation Emergency Assistance Center/Training Site (REAC/TS) – provides health professionals and coordinators for consultation or direct medical care on health problems associated with radiation accidents.

Requesting emergency response asset assistance is delineated in subsection 5.1.1.2.3.

3.2.2 Federal Bureau of Investigation

The role of the FBI is to serve as the primary U.S. Law Enforcement Agency responsible for investigating alleged or suspected violations of the Atomic Energy Act of 1954, as amended, and other Federal statutes. As such, security events of national consequence occurring at the Hanford Site and within the jurisdiction of the U.S. Department of Justice (e.g., theft of special nuclear material, terrorist activity, weapons of mass destruction incidents) will be communicated to the FBI.

During these types of security events, the FBI becomes the Lead Federal Agency and acts as the On-scene Commander with responsibility for crisis management which may include intelligence, surveillance, tactical operations, behavioral assessments, negotiations, forensics, and investigation. The FBI will receive a complete briefing on the incident from Hanford EOC personnel and determine the need for additional regional and national FBI crisis management resources.

Offsite Response Interfaces

Command of FBI response activities, including plant security forces deployed at the event scene, will be the responsibility of the FBI Special-Agent-in-Charge when a declared security event has occurred. The FBI has the authority to assume command and control of all FBI and DOE on-scene crisis management resources, including plant security forces deployed at the event scene, when the FBI crisis management assets are in place and ready to assume their specific crisis management responsibilities. An RL Office of Security and Emergency Services (SES) representative will be assigned to provide direct support to the FBI as requested. RL will retain command and control of a security event until the FBI assumes this responsibility. Additionally, RL/ORP and site contractors will maintain operational control and authority over those site areas and resources not directly affected by the incident.

The DOE-HQ Office of Security and Emergency Operations maintains a memorandum of understanding (MOU) with the FBI Counterterrorism Division which provides mutual support guidelines concerning the contingency response planning, coordination of procedures, training and exercises, and operational cooperation required to effectively deal with actual or possible security related emergencies.

3.2.3 U.S. Coast Guard

The U.S. Coast Guard (USCG) (through the Thirteenth District Commander in Seattle, Washington and the Captain of the Port in Portland, Oregon) may regulate activities on navigable waters within the Hanford Site, when necessary, to prevent harm to persons, property, and the environment in or on those waters.

When notified of a Site Area or General Emergency, the USCG will close the appropriate portion of the Columbia River and make a broadcast to mariners.

In the event of an emergency, the ONC will make notifications and provide information to the USCG in Portland, Oregon.

3.2.4 U.S. Environmental Protection Agency

Under the provisions of the Federal Radiological Emergency Response Plan (FRERP), the EPA shall assume the LFA responsibility for coordinating the intermediate and long-term offsite radiation monitoring activities.

In the event of an emergency, the Hanford EOC shall notify and provide information to the EPA Region 10 in Seattle, Washington.

3.2.5 Federal Aviation Administration

The Federal Aviation Administration (FAA) may make flight restrictions for aircraft under their jurisdiction over the Hanford Site.

The ONC will notify and provide information to the FAA Seattle Center. At a Site Area or General Emergency the ONC may request the FAA to impose flight restrictions over the Hanford Site.

3.2.6 Federal Emergency Management Agency

The Federal Emergency Management Agency (FEMA) is responsible for coordinating Federal assistance (other than monitoring resources) to the states if requested. Under the provisions of the FRERP, FEMA coordinates the offsite (nontechnical) response.

At the time of a declaration of an emergency, the Hanford EOC notifies and provides information to the FEMA Region 10 office in Bothell, Washington.

3.3 STATE GOVERNMENT

States, along with local governments, share the responsibility for the protection of the public and the environment. The responsibilities and concept of operations for state agencies are described in the emergency response plans of each state.

RL shall work with the states of Washington and Oregon to assist in development of their program and response plans for an emergency at the Hanford Site. Periodic meetings will be conducted with the states to coordinate plans and share information. General descriptions of emergency responsibilities as well as areas of cooperation and understanding between RL and the states are delineated in memoranda of understanding (MOU). Copies of the MOUs are provided in Appendix B.

3.3.1 The State of Washington

The Governor of Washington is responsible for command and control of state resources to maintain and preserve life, property, and the environment in Washington. The lead agency for emergency planning and response activities is the Emergency Management Division of the Military Department. Other state agencies that participate in the planning process and have emergency response roles include the:

- Department of Health;
- Department of Agriculture;
- State Patrol;

Offsite Response Interfaces

- Department of Ecology; and
- Department of Transportation.

An emergency response plan is maintained by the Emergency Management Division that describes the concept of operations and roles and responsibilities of the state agencies. Emergency procedures are maintained by each state agency.

Responsibilities of the state of Washington include:

- providing a 24-hour single point of contact for the receipt of emergency notifications from RL/ORP;
- disseminating information to potentially affected counties within the plume and ingestion EPZs;
- coordinating ingestion protective action decisions and public information with the counties, the state of Oregon, and RL;
- providing assistance to counties as requested;
- evaluating offsite emergency PARs made to plume EPZ counties;
- making protective action decisions to protect public health from ingestion-related impacts, such as contamination of the food chain;
- performing field environmental radiological monitoring and dose assessments;
- providing guidance on emergency worker exposure and authorizing emergency workers to exceed protective action guides;
- implementing food, milk, and animal-feed control measures; and
- requesting Federal assistance as required.

3.3.2 The State of Oregon

The Governor of Oregon is responsible for directing and controlling state activities to protect the lives and property of Oregon citizens. The lead agency for Hanford Site emergency planning is the Oregon Office of Energy. Other state agencies that participate in the planning process and have emergency response roles include the:

- State Public Information Officer;
- Health Division;
- Emergency Management Division;
- Department of Agriculture;
- Oregon State University Radiation Center

Offsite Response Interfaces

- Military Department;
- State Police; and
- State Highway Division.

An emergency response plan is maintained by the Oregon Office of Energy that describes the concept of operations and roles and responsibilities of state agencies. Emergency procedures are maintained by each state agency.

Responsibilities of the state of Oregon include:

- providing a 24-hour single point of contact for the receipt of emergency notifications from RL/ORP;
- making protective action decisions for the state of Oregon;
- coordinating protective action decisions and public information with counties, the state of Washington, and RL;
- coordinating state and local emergency response within the state of Oregon;
- performing field environmental radiological monitoring and dose assessments;
- providing guidance on emergency worker exposure and authorizing emergency workers to exceed protective action guides;
- providing assistance to Oregon counties within the ingestion EPZ;
- implementing food, milk, and animal-feed control measures; and
- requesting Federal assistance as required.

3.4 LOCAL ORGANIZATIONS

Cities and counties are responsible for protecting the lives and property of their residents. The responsibilities and concept of operations for local governments are described in the emergency response plans of each jurisdiction.

RL shall work with local emergency response organizations through the county and state emergency management organizations. Generally, RL shall interface directly with emergency response and planning organizations providing service to those areas within a plume EPZ of a Hanford Site facility. Interface with those jurisdictions within the ingestion EPZ generally shall be accomplished through the state emergency management organization. To accomplish the necessary close coordination with local agencies, periodic meetings shall be conducted to share information and discuss concerns.

3.4.1 Plume Emergency Planning Zone Counties

Portions of Benton, Franklin, and Grant Counties are within plume EPZs of a Hanford Site facility. The Boards of County Commissioners are responsible for making emergency protective action decisions and implementing emergency response actions, as necessary, to protect their residents outside the Hanford Site boundary. The lead agency for emergency planning and coordination of emergency response is the county emergency management agency. County emergency response plans and procedures are developed by the emergency management agencies, working with county, city, and volunteer emergency response agencies, such as:

- law enforcement;
- fire and emergency medical;
- public works/road departments;
- hospitals; and
- American Red Cross.

The emergency responsibilities of the plume EPZ counties include:

- making and implementing protective action decisions to protect citizens who live within the plume EPZ;
- implementing protective action decisions, made by the state of Washington, for ingestion-related impacts to residents within the ingestion EPZ;
- disseminating alert and warnings to the public and providing emergency public information; and
- coordinating response actions and public information with neighboring counties, the state of Washington, and RL.

RL maintains agreements with Benton, Franklin, and Grant Counties that outline the areas of responsibility and cooperation (see Appendix B).

3.4.1.1 Law Enforcement. RL SES interfaces with local law enforcement agencies for support to the Hanford Site during emergencies. Via a contractual agreement, the Benton County Sheriff's Office provides law enforcement on the Hanford Site (i.e., traffic enforcement and criminal investigation), and assists in access control; and, as such, coordinates activities with RL SES and the Hanford Patrol.

RL SES maintains memorandums of understanding with the law enforcement agencies of Kennewick, Richland, West Richland, Benton County, Franklin County, and the state of Washington.

3.4.1.2 Fire and Emergency Medical. The Hanford Fire Department is signatory to the Tri-County Mutual Aid Agreement for fire agencies. The agreement, signed by 11 local fire agencies, provides mutual aid for fire or medical emergencies.

The Hanford Fire Department meets regularly with local fire agencies. The Hanford Fire Department and AMH representatives meet routinely with emergency medical service agencies to coordinate and share information.

3.4.1.3 Hospitals. RL maintains agreements with local hospitals, which provide for the care of injured, contaminated (chemical or radiological) Hanford Site personnel. These hospitals include:

- Our Lady of Lourdes Health Care Center;
- Kennewick General Hospital; and
- Kadlec Medical Center.

RL shall provide for training and exercise support, as needed, related to the services provided to the Hanford Site. AMH shall provide expertise on radiological decontamination or chemical exposure and treatment as requested.

3.4.2 Ingestion Emergency Planning Zone Counties

Counties within the ingestion EPZ of the Hanford Site are responsible to implement measures to protect their residents from potential ingestion related impacts. In the state of Washington, the counties of Adams, Benton, Franklin, Grant, Kittitas, Klickitat, Walla Walla, and Yakima are within the 50-mile (80-kilometer) ingestion EPZ. In the state of Oregon, the counties of Morrow and Umatilla are included. Ingestion EPZ counties have emergency response plans that describe their responsibilities in the event of an emergency at the Hanford Site.

RL shall coordinate emergency planning and preparedness for ingestion counties through the Washington State Emergency Management Division and the Oregon Office of Energy. Ingestion county responsibilities include:

- coordinating with the state and implementing decisions regarding protective measures for its residents within the ingestion EPZ; and
- consulting with the respective state EOC on the identification of access control points, food control areas, food control stations, and strategies for relocation, restoration, and recovery in contaminated areas.

3.5 TRIBAL ORGANIZATIONS

RL shall provide appropriate information to the impacted tribal organizations to coordinate planning for ingestion-related response actions of the tribe(s).

3.6 PRIVATE ORGANIZATIONS

The Hanford Site emergency management program shall address private facilities on or near the site. These facilities may be impacted by an emergency at the Hanford Site, or may impact Hanford Site facilities if they experience an emergency.

RL shall coordinate emergency planning and preparedness activities with onsite private facilities (namely Energy Northwest and US Ecology). In the event of an emergency at a Hanford Site facility, onsite private facilities will receive notifications and information from RL.

Where emergencies at facilities operated by private organizations may impact the Hanford Site, RL shall ensure that the emergency management program addresses actions that must be taken to protect site workers and facilities.

Areas of cooperation with private organizations shall be documented in memorandums of understanding.

3.7 MEMORANDA OF UNDERSTANDING

RL shall develop and implement mutual assistance agreements with offsite agencies to document areas of cooperation and assistance when appropriate and as identified in Federal, state, and local regulations (see Table 3-1).

RL SES is responsible for executing and maintaining MOUs related to security and emergency preparedness. The Hanford Fire Department shall execute and maintain MOUs within its area of responsibility. MOUs shall be reviewed annually and revised as needed.

Copies of MOUs shall be provided to the CSO through their inclusion in Appendix B of this plan.

Offsite Response Interfaces

Table 3-1. Memorandums of Understanding

PARTIES	SERVICES/AREAS OF COOPERATION	POINTS OF CONTACT	CONSTRAINTS	DATE	EXPIRATION DATE	WHERE ON FILE
State of Washington	Document areas of cooperation between the parties in the planning for and response to emergencies at the Hanford Site.	Washington Emergency Management Division	None	06/20/07	02/28/13 or until canceled by any party after 60 days written notice to the other parties.	RL SES
State of Oregon	Document areas of cooperation between the state of Oregon and RL in the planning for and providing notification and interface in the event of an incident on the Hanford Site.	Oregon Department of Energy	None	06/21/00	Continue until canceled by either party by written notice to the other Amendments or modifications to this Agreement may be made upon written agreement by both parties to the Amendment.	RL SES
Benton County	Document areas of cooperation between the parties in the planning for and response to emergencies at the Hanford Site.	Benton County Emergency Management	None	03/16/00	Continue until canceled by either party by written notice to the other.	RL SES
Franklin County	Document areas of cooperation between the parties in the planning for and response to emergencies at the Hanford Site.	Franklin County Emergency Management	None	01/20/00	Continue until canceled by either party by written notice to the other.	RL SES
Grant County	Document areas of cooperation between the parties in the planning for and response to emergencies at the Hanford Site.	Grant County Emergency Management	None	05/25/00	Continue until canceled by either party by written notice to the other.	RL SES
Energy Northwest	Document areas of cooperation between the parties in the planning for and response to emergencies at the Hanford Site.	Energy Northwest Emergency Preparedness	The specific areas of assistance will be provided based upon availability, and are limited to those emergency actions necessary to protect onsite personnel, the public health and safety, and the environment in the event of a major emergency at the Hanford Site or Energy Northwest.	05/07/07	Continue until canceled by either of the parties upon 60 days written notice to the other party.	RL SES
AREVA NP, Inc. (formerly Framatome ANP)	Establishes means by which RL can assist AREVA NP through use of RL facilities during an emergency at the AREVA NP plant in Richland, Washington	AREVA NP	Emergencies affecting the Hanford Site or Hanford facilities takes precedence over all other uses of the RL facilities.	11/21/05	Continue until canceled by either of the parties upon 30 days written notice to the other party.	RL SES

Offsite Response Interfaces

PARTIES	SERVICES/AREAS OF COOPERATION	POINTS OF CONTACT	CONSTRAINTS	DATE	EXPIRATION DATE	WHERE ON FILE
National Weather Service	Sharing Meteorological Information.	NWS Western Regional Headquarters.	None	10/05/94	Agreement may be terminated by either party upon 30 days written notice to the other party.	RL SES
Lourdes Medical Center (Lourdes) Pasco, Washington	Significantly injured, contaminated persons will be admitted to facility for appropriate medical care.	Lourdes Administrator	Lourdes will be limited to activities performed at the hospital.	05/07/07	Continue until canceled by either of the parties upon 30 days written notice to the other party.	RL SES
Kadlec Medical Center (KMC) Richland, Washington	Significantly injured, contaminated persons will be admitted to facility for appropriate medical care.	KMC Administrator	KMC will be limited to activities performed at the hospital.	05/07/07	Continue until canceled by either of the parties upon 30 days written notice to the other party.	RL SES
Kennewick General Hospital (KGH) Kennewick, Washington	Significantly injured, contaminated persons will be admitted to facility for appropriate medical care.	KGH Administrator	KGH will be limited to activities performed at the hospital.	05/07/07	Continue until canceled by either of the parties upon 30 days written notice to the other party.	RL SES
Tri-County Mutual Aid Agreement	Provide mutual aid to parties hereto desire to augment the fire and emergency medical protection available in their establishments, districts, agencies, and municipalities in the event of large fires or conflagrations or other disaster.	Hanford Fire Department	Assistance under the agreement is not mandatory.	02/05/98	Remain in full force and effect until canceled by mutual agreement of the parties hereto or by written notice by one party to the other party giving ten (10) days notice of said cancellation.	Hanford Fire Department
Richland Police Department	Mutual law enforcement assistance.	Richland Police Department	Assistance will be provided subject to the provision of the agreement and any other conditions as the parties may agree.	03/14/00	Indefinite duration.	RL SES
West Richland Police Department	Mutual law enforcement assistance.	West Richland Police Department	Assistance will be provided subject to the provision of the agreement and any other conditions as the parties may agree.	03/14/00	Indefinite duration.	RL SES
Kennewick Police Department	Mutual law enforcement assistance.	Kennewick Police Department	Assistance will be provided subject to the provision of the agreement and any other conditions as the parties may agree.	03/14/00	Indefinite duration.	RL SES
Benton County Sheriff	Mutual law enforcement assistance.	Benton County Sheriff	Assistance will be provided subject to the provision of the agreement and any other conditions as the parties may agree.	03/14/00	Indefinite duration.	RL SES

Offsite Response Interfaces

PARTIES	SERVICES/AREAS OF COOPERATION	POINTS OF CONTACT	CONSTRAINTS	DATE	EXPIRATION DATE	WHERE ON FILE
Franklin County Sheriff	Mutual law enforcement assistance.	Franklin County Sheriff	Assistance will be provided subject to the provision of the agreement and any other conditions as the parties may agree.	03/14/00	Indefinite duration.	RL SES
Washington State Patrol	Mutual law enforcement assistance.	Washington State Patrol	Assistance will be provided subject to the provision of the agreement and any other conditions as the parties may agree.	02/14/00	Indefinite duration.	RL SES
Adams County Sheriff	Mutual law enforcement assistance.	Adams County Sheriff	Assistance will be provided subject to the provision of the agreement and any other conditions as the parties may agree.	03/27/00	Indefinite duration.	RL SES
Grant County Sheriff	Mutual law enforcement assistance.	Grant County Sheriff	Assistance will be provided subject to the provision of the agreement and any other conditions as the parties may agree.	03/14/00	Indefinite duration.	RL SES
Pasco Police Department	Mutual law enforcement assistance.	Pasco Police Department	Assistance will be provided subject to the provision of the agreement and any other conditions as the parties may agree.	04/03/00	Indefinite duration.	RL SES

14.0 PROGRAM ADMINISTRATION

The basic purpose of program administration is to establish and maintain effective organizational management and control of the emergency management program. Even though the program is now available to ORP and its contractors, RL retains the primary responsibility to oversee, coordinate, and assess the emergency management programs of the Hanford Site contractors. RL will ensure the preparation and maintenance of plans and procedures necessary for RL/ORP to carry out its responsibilities during an emergency and will schedule through ORP any activities (i.e., drills, exercises, assessments) of ORP contractors.

14.1 EMERGENCY MANAGEMENT PROGRAM ADMINISTRATOR

The RL/ORP Managers have the responsibility for administering the overall emergency management program for the Hanford Site. The RL/ORP Managers have delegated the authority to develop, implement, and maintain the emergency management program to the RL SES director; however, key program decisions and/or policy changes will be coordinated with ORP prior to implementation. The RL Emergency Preparedness staff of RL SES carries out these responsibilities.

Each site contractor shall designate an individual to administer the site-level emergency management program and/or to administer/assess the facility-level emergency management program. This individual shall also assist, as necessary, in the development and maintenance of this plan and applicable implementing procedures; development of the Hanford Emergency Readiness Assurance Plan (ERAP) and annual updates; development and conduct of training and exercise programs; coordination of assessment activities; development of related documentation; and coordination of emergency resources.

Each building organization shall designate an individual (e.g., BED, BW, emergency preparedness coordinator) responsible to administer the emergency management program at the facility level.

14.1.1 Emergency Management Functions at the U.S. Department of Energy, Richland Operations Office

The RL/ORP Emergency Preparedness staff functions, as appropriate to the responsibilities described above, related to overseeing site contractor emergency preparedness programs include:

- ensuring that hazards assessments and hazards surveys for emergency planning are adequately performed and documented;

Program Administration

- reviewing and recommending approval of the annual Hanford ERAP developed by site contractors and RL/ORP, and submitting it to the CSO and the DOE-HQ Director of Emergency Management for inclusion in the annual report;
- assessing facility emergency preparedness programs to verify compliance with appropriate Federal and state directives and policy, and providing the results/conclusions to the CSO and the DOE-HQ Director of Emergency Management;
- submitting DOE Order requirement exemption requests, as necessary, for approval by the Under Secretary, which document the basis for each exemption, and establishes and justifies alternatives equivalent to or exceeding the Order;
- reviewing and approving the Hanford Site emergency exercise program, and reviewing exercise evaluation and quarterly corrective action status reports; and
- reviewing written reports of evaluations of declared events.

RL Emergency Preparedness staff functions to ensure that RL/ORP can carry out its responsibilities in an emergency include:

- ensuring that annual budgets and mission and function statements reflect implementation policies and decisions;
- assigning a senior emergency preparedness representative to the Emergency Management Advisory Committee;
- revising and updating this plan and the *Emergency Plan Implementing Procedures* (DOE-0223) in accordance with DOE O 151.1 and other appropriate Federal and state regulations, and ensuring integration within the overall emergency management program;
- interfacing with Federal, tribal, state, and local emergency management organizations;
- maintaining and negotiating agreements with state and county response agencies, Federal assistance agencies, and maintaining agreements with medical and fire support agencies;
- providing training to state and local emergency response personnel, as requested;
- recruiting and training staff for the DOE Hanford EOC;
- maintaining the DOE Hanford EOC facility and equipment; and
- maintaining the DOE Region 8 RAP.

Additional organizational responsibility, authority, and functions within RL for implementing requirements from DOE O 151.1 and other DOE Directives and Federal and state laws are delineated in the *Richland Operations Office Functions, Responsibilities and Authorities Manual*.

14.2 EMERGENCY READINESS ASSURANCE PROGRAM

14.2.1 Hanford Emergency Readiness Assurance Plan

Based upon the organization and management of the Hanford Site emergency management program, individual facility ERAPS are not provided. Rather, RL/ORP and site contractor Emergency Preparedness personnel participate in the preparation of a consolidated Hanford ERAP.

The Hanford ERAP shall be a planning tool to identify and develop needed resources and improvements. The Hanford ERAP shall highlight any significant changes in emergency management programs (i.e., planning bases, organizations, exemptions) from previous ERAPs, as well as comparing actual achievements to goals, milestones, and objectives. If applicable, the Hanford ERAP shall be reviewed for classified or controlled information prior to submittal.

Site contractor Emergency Preparedness personnel shall submit initial or updated emergency planning and preparedness activities information, as indicated above, to RL SES by September 30 each year for review and inclusion in the Hanford ERAP. The information shall cover a planning cycle of five years beginning the next October 1.

The RL Emergency Preparedness staff shall review and finalize the Hanford ERAP for approval by the RL SES director. The RL staff will obtain concurrence from ORP prior to ERAP approval by the RL SES director. The consolidated Hanford ERAP shall be submitted to the CSO and DOE-HQ Director of Emergency Management by November 30 each year.

14.2.2 Emergency Readiness Assurance Assessments/Appraisals

RL/ORP shall periodically review the ability of contractor-operated facilities to meet requirements of the DOE Emergency Management System. Appraisals and assessments shall be based on specific standards and criteria published by the DOE-HQ Director of Emergency Management. Appraisal findings shall be acknowledged by the appraised activity within 90 days of receipt of findings with a corresponding plan for correction. The RL/ORP appraising organization shall determine closure of open or unresolved appraisal findings.

Additionally, RL/ORP shall assess the emergency management program of each site contractor under its supervision. Each site contractor shall be assessed at least once every 3 years. RL/ORP shall notify the CSO of its assessment schedule.

Contractor-operated facilities shall conduct an annual internal readiness assurance assessment of their emergency management programs. Corrective actions shall be tracked and status reports provided to RL/ORP. In addition, site contractors shall assist external organizations (i.e., RL/ORP, DOE-HQ) in scheduling and conducting evaluations, appraisals, and assessments of their respective facilities; respond to external evaluation, appraisal, and assessment findings within 90 days of receipt of findings; and resolve all evaluation, appraisal, and assessment findings with the responsible organization or request approval for an exemption to the requirements.

RL/ORP and contractor assessment results shall be provided to the CSO and DOE-HQ Director of Emergency Management through documentation in the Hanford ERAP.

14.2.3 Lessons Learned

RL/ORP and each site contractor emergency management program shall include a system to track and identify correction of findings or lessons learned from training, drills, exercises, and actual responses.

14.2.4 Emergency Operations Metrics Data

RL/ORP and site contractors are required to report Emergency Operations metrics data quarterly. The metrics data is based on performance measures developed by the DOE-HQ Office of Security and Emergency Operations.

Site contractors shall submit applicable metrics data to RL SES within five working days after the last day of the previous fiscal year quarter for review and inclusion in the consolidated Hanford metrics data spreadsheet. Data may be projected as necessary in order to meet the submittal date.

RL SES shall review, collate, and finalize the metrics data and electronically disseminate the consolidated Hanford metrics data spreadsheet to the CSO and DOE-HQ Office of Emergency Operations within 15 days after the last day of the previous fiscal year quarter.

14.3 DOCUMENT CONTROL

This plan and RL/ORP and site contractor implementing procedures shall be controlled distribution documents. RL/ORP and site contractors shall use a document control system to ensure that controlled copies are up to date and available at locations where they may be needed in an emergency. RL/ORP and site contractors shall determine the internal and external controlled copy distribution of the emergency plan and respective implementing procedures.

14.3.1 Review and Update of the Hanford Emergency Management Plan and U.S. Department of Energy Richland Operations Office/Office of River Protection and Site Contractor Implementing Procedures

This plan and the *Emergency Plan Implementing Procedures* (DOE-0223) will be reviewed annually by the RL/ORP and the appropriate response organizations and agencies. RL SES is responsible for the coordination of this review and any resulting actions. RL SES will identify specific changes deemed necessary and will ensure implementation of the revisions.

Revising and updating of this plan and/or the *Emergency Plan Implementing Procedures* (DOE-0223) may be initiated at any time deemed necessary by RL SES. Changes and/or amendments shall be incorporated by RL SES, concurred upon by ORP and site contractors, and approved by the RL/ORP Manager or his designee.

A controlled copy of the approved plan and the *Emergency Plan Implementing Procedures* (DOE-0223) shall be submitted to the DOE-HQ Director of Emergency Management, the CSO, and to the DOE-HQ EOC.

Site contractor emergency plans (e.g., building emergency plans) and implementing procedures shall be reviewed at least annually.

14.3.1.1 Review and Update Based on WAC 173-303

Portions of this plan, together with Hanford Site location/activity-specific documentation established to meet contingency plan requirements, must be reviewed and immediately amended, if necessary, whenever:

- applicable regulations or the Hanford Facility RCRA Permit are revised;
- this plan or the location/activity-specific building emergency plan/procedure fails in an emergency;
- the Hanford Site facilities/activities change (e.g., design, operation, maintenance, etc.) in a way that materially increases the potential for fires, explosions, or releases of dangerous waste or dangerous waste constituents, or in a way that changes the response necessary in an emergency; or
- the list of emergency equipment changes.

14.3.2 Review of Agreements

Agreements with local, state, and Federal officials and agencies (as contained in Appendix B) are maintained by RL SES and are reviewed and/or updated at least annually. Updates may be initiated either by RL or by the agreement official or agency. Updates are documented by amendment marks on individual pages of the agreement unless comprehensive amendments are required. Agreements shall be reviewed annually and revised as necessary. RL SES shall maintain documentation of the annual review.

14.3.3 Classified Information

RL/ORP and site contractors shall ensure that emergency preparedness documents, such as plans, procedures, scenarios, and assessments, are reviewed, as necessary, for classified and Unclassified Controlled Nuclear Information (UCNI) by an authorized derivative classifier or UCNI reviewing official.

14.3.4 Supporting Documents

RL SES shall maintain copies of documents and records that support the emergency management program (i.e., technical data, hazards assessments, ERAPs, and plans and procedures). Records of training, drills, and exercises shall be maintained to document status of the program and provide direction for improvements.

Hanford Site contractors shall maintain records that will provide documentation of the facility emergency preparedness program and to support the preparation of the ERAP, work plans, etc.

14.3.5 Vital Records

A program shall be established to ensure that vital records, regardless of media, essential to continued functioning or reconstruction of an organization during and after an emergency, are maintained and available, per 36 CFR 1236.

The vital records program ensures the protection and availability of information critical to effective emergency response management, and the protection of the legal rights and interests of citizens, the Federal government and its employees, and DOE contractors and site personnel. The RL Office of Site Services is responsible to ensure that a vital records program for the Hanford Site is in place.

RL/ORP and site contractors shall annually review their respective records indicated on the vital records submittal listing and determine necessary additions to or deletions from the list. RL SES should ensure that the retrieval process for vital records is evaluated annually as part of a Hanford sitewide emergency exercise.

Each site contractor and RL/ORP shall provide designated storage locations for vital records, as appropriate. RL/ORP and site contractor documents identified as vital records, such as this plan, emergency procedures, and building emergency plans, shall be stored at the DOE Hanford EOC in paper form so they can be used without reliance on mechanical equipment. Other emergency operating records and rights and interests records designated as vital need not be kept at the DOE Hanford EOC.

14.3.6 Emergency Records

RL/ORP and site contractor emergency procedures shall provide for documentation of emergency records that contain information for review and reconstruction of major communications and actions taken during a declared emergency. These records include logs and documentation produced by the respective emergency response organizations (i.e., Incident Command Organization and the DOE Hanford EOC). RL SES shall maintain emergency records generated during the operation of the DOE Hanford EOC and may also request copies of emergency records generated at other emergency response locations.

In addition, provisions shall be in place for the control, monitoring, and maintenance of permanent records of onsite personnel exposures to internal/external radiological and nonradiological hazardous materials in response to emergency conditions. Exposure records shall be stored in accordance with existing site records retention requirements.

14.3.7 Plan Locations

Copies of this plan are maintained at:

- RL and ORP Emergency Preparedness program offices;
- each contractor Emergency Preparedness office and other locations as specified by the respective contractor;
- Hanford Fire Department (area fire stations);
- Occurrence Notification Center;
- Hanford Emergency Operations Center (primary and alternate); and
- the Patrol Operations Center.

Copies of the plan are also maintained at the following offsite agencies (per their request) to meet the WAC 173-303-350(4) requirement:

- Pasco Police Department;

Program Administration

- Adams County Sheriff's Office;
- Pasco Fire Department;
- College Place Fire Department;
- Kadlec Medical Center;
- Our Lady of Lourdes Health Center;
- Kennewick General Hospital;
- Benton County Emergency Management Center;
- Franklin County Emergency Management Center; and
- Grant County Emergency Management Center.

Copies of location-specific documentation are provided to offsite agencies as requested.

Hanford Fire Department Equipment List

APPENDIX C

HANFORD FIRE DEPARTMENT EQUIPMENT LIST

EQUIPMENT ¹	DESCRIPTION	NORMALLY LOCATED ²
Engines 4 pumpers 3 ladders 1 aerial ladder	Examples of equipment contained on engines: <ul style="list-style-type: none"> • 1,500-2,000 gal/min (5,678.1-7,570.8 L/min) pump; • 300-500 gal (1,135.6-1,892.7 L) water tank; • 1 – 85’ aerial ladder platform; • 3 – telescoping 65’-75’ ladder trucks with nozzle; and • Jaws of Life. 	1 pumper at Station 91, 92, 93, and 94 1 ladder at Station 91 1 ladder at Station 93 1 ladder at Station 94 Aerial at Station 92
Brush Fire Trucks 6 each	Examples of equipment contained on brush fire trucks: <ul style="list-style-type: none"> • 500 gal/min (1,892.7 L/min) pump; • 2,500 gal (9463.5 L) water tank; • 6x6 with 2,500 gal (9463.5 L) porti-tank; and • hose, nozzles, fittings, and tools. 	1 at Station 91 2 at Station 92 2 at Station 93 1 at Station 94
Water Tenders 1 each	Examples of equipment contained on water tenders: <ul style="list-style-type: none"> • 1000 gal/min (3785.4 L/min) pump; • 2 - 2,500 gal (9463.5 L) porti-tanks; • 4,500 gal (17,034.3 L) water tank; and • hose, nozzles, fittings, and tools. 	Station 92
Grass Fire Units 4 each	Examples of equipment contained on grass fire units: <ul style="list-style-type: none"> • 100 gal/min (378.5 L/min) pump; • 250 - 400 gal (946.3 – 1514.2 L) water tank; • 4-wheel drive; and • hose, nozzles, fittings, and tools. 	1 at each station
Ambulances 6 each	Examples of equipment contained on ambulances: <ul style="list-style-type: none"> • life support systems; and • medical and emergency response supplies. 	1 at Station 91 2 at Station 92 2 at Station 93 1 at Station 94
Command Vehicles 3 each	Contains communications equipment and protective equipment for commander.	Station 92

Hanford Fire Department Equipment List

EQUIPMENT ¹	DESCRIPTION	NORMALLY LOCATED ²
Mobile Incident Command Vehicle 1 each	Examples of equipment contained on mobile incident command vehicle: <ul style="list-style-type: none"> • communications equipment; • radio communications in Tri-County area; • cell phones (including satellite); • 10,000 watt generator; and • copier, fax. 	Station 92
Attack Vehicles 1 each	Examples of equipment contained on attack vehicles: <ul style="list-style-type: none"> • 450 lb (204.1 kg) of purple-K; • 300 gal (1,133.5 L) aqueous film-forming foam concentrate; • 300 gal (1,135.6 L) of aqueous film-forming foam pre-mix solution; and • hose, nozzles, fittings, and tools. 	Station 91
Hazardous Materials Vehicle 2 each	Examples of equipment contained on hazardous materials vehicle: <ul style="list-style-type: none"> • protective clothing for Hazardous Materials Response Team; • breathing apparatus for Hazardous Materials Response Team; • diking, plugging, and damming equipment; • detection instruments for Hazardous Materials Response Team; • tools for plugging and repairing leaking containers; • overpack containers for leaking containers; • command module with material safety data sheets, software, and portable meteorological station; and • tools and communications devices necessary to provide communications during emergency response activities. 	2 at Station 92
Metal Fire Response Vehicle 1 each	Examples of equipment contained on metal fire response vehicle: <ul style="list-style-type: none"> • equipment for response to special metals fire; • 500 lb (226.8 kg) of extinguishing powder; and • 1,000 lb (453.6 kg) of carbon microspheroids. 	Station 94
Rescue Truck 1 each	Examples of equipment contained on rescue truck: <ul style="list-style-type: none"> • heavy and light rescue, water rescue, hi/lo angle rescue, and trench rescue; • mobile air compressor, recharges self-contained breathing apparatus cylinders; and • tools and fittings for operation of vehicle and spare cylinders. 	1 at Station 93
<p>¹Emergency response vehicles identified in this table shall be serviced and maintained to keep them in safe operating condition and ready for response at all times. Should a unit be out of service for more than 30 days, written justification shall be provided to the Hanford Fire Department for review and approval. The written justification, when approved, will be maintained by the Hanford Fire Department until the equipment is returned to service.</p>		
<p>²The Hanford Fire Department Chief has the authority to: 1) direct the placement of equipment as needed to control emergency events; and 2) take proactive action and assign different vehicle locations based on conditions such as fuel moisture content, area fire history, work in progress, or other conditions that could arise.</p>		

Quarter Ending September 30, 2007

WA7 89000 8967, Part III, Operating Unit 1

Replacement Sections

305-B Storage Facility

Hanford Facility RCRA Permit Modification Notification Forms

Part III, Operating Unit 1

305-B Storage Facility

Remove and Replace the Following Sections:

Permit Part III, Operating Unit 1, Unit-Specific Conditions

Chapter 1.0, Part A Form, Closed 6/28/2007

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1 **PART III, OPERATING UNIT 1 UNIT-SPECIFIC CONDITIONS**
2 **305-B Storage Facility**
3 **Closed 6/28/2007**

4 The 305-B Storage Facility was a dangerous waste and mixed waste storage unit located in the 300 Area.
5 The 305-B Storage Facility was closed on June 28, 2007, in accordance with the approved Closure Plan
6 dated June 30, 2006, contained in Permit Revision 8B.

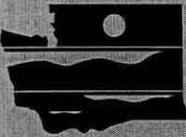
7 **OPERATING UNIT 1:**

8 Chapter 1.0 Part A Form, Revision 2, dated May 2005, Closed June 28, 2007

1
2
3
4
5

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1	Chapter 1.0	Part A
2	1.0 PART A FORM	1.ii

 WASHINGTON STATE DEPARTMENT OF E C O L O G Y		Dangerous Waste Permit Application Part A Form	
Date Received		Reviewed by: Jeff Ayres	Date: 0 7 1 7 2 0 0 6
Month	Day	Year	Approved by: <i>Marta P. Davis</i> Date: 0 7 1 9 2 0 0 6
0	7	1	0 2 0 0 6
Closed 6/28/2007			
I. This form is submitted to: (place an "X" in the appropriate box)			
<input checked="" type="checkbox"/>	Request modification to a final status permit (commonly called a "Part B" permit)		
<input type="checkbox"/>	Request a change under interim status		
<input type="checkbox"/>	Apply for a final status permit. This includes the application for the initial final status permit for a site or for a permit renewal (i.e., a new permit to replace an expiring permit).		
<input type="checkbox"/>	Establish interim status because of the wastes newly regulated on:	(Date)	
List waste codes:			
II. EPA/State ID Number			
W	A	7 8 9 0 0 0	8 9 6 7
III. Name of Facility			
US Department of Energy - Hanford Facility			
IV. Facility Location (Physical address not P.O. Box or Route Number)			
A. Street			
825 Jadwin			
City or Town		State	ZIP Code
Richland		WA	99352
County Code (if known)	County Name		
0 0 5	Benton		
B. Land Type	C. Geographic Location	D. Facility Existence Date	
	Latitude (degrees, mins, secs)	Longitude (degrees, mins, secs)	Month Day Year
F	S E E	T O P O	M A P 0 3 2 2 1 9 4 3
V. Facility Mailing Address			
Street or P.O. Box			
P.O. Box 550			
City or Town		State	ZIP Code
Richland		WA	99352

VI. Facility contact (Person to be contacted regarding waste activities at facility)												
Name (last)						(first)						
Klein						Keith						
Job Title						Phone Number (area code and number)						
Manager						(509) 376-7395						
Contact Address												
Street or P.O. Box												
P.O. Box 550												
City or Town						State		ZIP Code				
Richland						WA		99352				
VII. Facility Operator Information												
A. Name						Phone Number (area code and number)						
Department of Energy Owner/Operator Washington Closure Hanford, LLC** Co-Operator for 305-B Storage Facility						(509) 376-7395 (509) 372-9951**						
Street or P.O. Box												
P.O. Box 550 3070 George Washington Way **												
City or Town						State		ZIP Code				
Richland						WA		99352				
B. Operator Type		F										
C. Does the name in VII.A reflect a proposed change in operator?						<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No						
If yes, provide the scheduled date for the change:						Month		Day		Year		
D. Is the name listed in VII.A. also the owner? If yes, skip to Section VIII.C.						<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No						
VIII. Facility Owner Information												
A. Name						Phone Number (area code and number)						
Keith A. Klein, Operator/Facility-Property Owner						(509) 376-7395						
Street or P.O. Box												
P.O. Box 550												
City or Town						State		ZIP Code				
Richland						WA		99352				
B. Operator Type		F										
C. Does the name in VII.A reflect a proposed change in operator?						<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No						
If yes, provide the scheduled date for the change:						Month		Day		Year		
IX. NAICS Codes (5/6 digit codes)												
A. First						B. Second						
5	6	2	2	1		9	2	4	1	1	0	Administration of Air & Water Resource & Solid Waste Management Programs
Waste Treatment & Disposal												
C. Third						D. Fourth						
9	9	9	9	9	9	5	6	2	9	1	0	Remediation Services
Unclassified Establishments												

X. Other Environmental Permits (see instructions)													
A. Permit Type		B. Permit Number										C. Description	
E		A	I	R	0	2	-	1	2	0	2		WAC 246-247, Non radioactive Air, 40 CFR 61, Subpart H, NESHAPS
E		D	E	9	8	N	W	P	-	0	0	3	WAC 173-400, General Regulations for Air Pollution Sources WAC 173-460, Controls for New Sources of Toxic Air Pollutants

XI. Nature of Business (provide a brief description that includes both dangerous waste and non-dangerous waste areas and activities)

S01

The 305-B Storage Facility was a dangerous waste and mixed waste storage unit owned and operated by DOE and co-operated by PNNL. The unit was used for the collection, consolidation, packaging, storage, preparation for transport and disposal of both dangerous waste and mixed waste. It was an integral part of the Hanford Site's waste management system. Mixed waste was stored as received in storage cells in the basement of the facility. Other waste was stored in segregated cells in the high bay area. The waste stored at the 305-B Storage Facility consisted of listed waste, waste from nonspecific sources, characteristic waste, and state-only waste.

March 31, 2006, PNNL completed transferring out all waste stored at the 305-B Storage Facility. The majority of the waste stored at the 305-B Storage Facility was transferred to an offsite TSD facility, and the remainder was transferred to the 331-C Storage Unit. The 305-B Storage Facility was transferred to Washington Closure Hanford LLC (WCH) contractor (Co-Operator) in June 2006, for closure and demolition.

EXAMPLE FOR COMPLETING ITEMS XII and XIII (shown in lines numbered X-1, X-2, and X-3 below): A facility has two storage tanks that hold 1200 gallons and 400 gallons respectively. There is also treatment in tanks at 20 gallons/hr. Finally, a one-quarter acre area that is two meters deep will undergo *in situ* vitrification.

Section XII. Process Codes and Design Capacities							Section XIII. Other Process Codes							
Line Number	A. Process Codes (enter code)			B. Process Design Capacity		C. Process Total Number of Units	Line Number	A. Process Codes (enter code)			B. Process Design Capacity		C. Process Total Number of Units	D. Process Description
	1	2	3	1. Amount	2. Unit of Measure (enter code)			1	2	3	1. Amount	2. Unit of Measure (enter code)		
X 1	S	0	2	1,600	G	002	X 1	T	0	4	700	C	001	In situ vitrification
X 2	T	0	3	20	E	001								
X 3	T	0	4	700	C	001								
1	S	0	1	30,000	G	001	1							
2							2							
3							3							
4							4							
5							5							
6							6							
7							7							
8							8							
9							9							
1 0							1 0							
1 1							1 1							
1 2							1 2							
1 3							1 3							
1 4							1 4							
1 5							1 5							
1 6							1 6							
1 7							1 7							
1 8							1 8							
1 9							1 9							
2 0							2 0							
2 1							2 1							
2 2							2 2							
2 3							2 3							
2 4							2 4							
2 5							2 5							

XIV. Description of Dangerous Wastes

Example for completing this section: A facility will receive three non-listed wastes, then store and treat them on-site. Two wastes are corrosive only, with the facility receiving and storing the wastes in containers. There will be about 200 pounds per year of each of these two wastes, which will be neutralized in a tank. The other waste is corrosive and ignitable and will be neutralized then blended into hazardous waste fuel. There will be about 100 pounds per year of that waste, which will be received in bulk and put into tanks.

Line Number	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)]						
X 1	D 0 0 2	400	P	S	0	1	T	0	1						
X 2	D 0 0 1	100	P	S	0	2	T	0	1						
X 3	D 0 0 2														Included with above
	1 D 0 0 1	20,000	K	S	0	1									Includes Debris
	2 D 0 0 2	5,000	K	S	0	1									Includes Debris
	3 D 0 0 3	1000	K	S	0	1									Includes Debris
	4 D 0 0 4	1000	K	S	0	1									Includes Debris
	5 D 0 0 5	1000	K	S	0	1									Includes Debris
	6 D 0 0 6	1000	K	S	0	1									Includes Debris
	7 D 0 0 7	10,000	K	S	0	1									Includes Debris
	8 D 0 0 8	50,000	K	S	0	1									Includes Debris
	9 D 0 0 9	1000	K	S	0	1									Includes Debris
	1 0 D 0 1 0	1000	K	S	0	1									Includes Debris
	1 1 D 0 1 1	1000	K	S	0	1									Includes Debris
	1 2 D 0 1 2	220	K	S	0	1									Includes Debris
	1 3 D 0 1 3	220	K	S	0	1									Includes Debris
	1 4 D 0 1 4	220	K	S	0	1									Includes Debris
	1 5 D 0 1 5	220	K	S	0	1									Includes Debris
	1 6 D 0 1 6	220	K	S	0	1									Includes Debris
	1 7 D 0 1 7	220	K	S	0	1									Includes Debris
	1 8 D 0 1 8	2,000	K	S	0	1									Includes Debris
	1 9 D 0 1 9	2,000	K	S	0	1									Includes Debris
	2 0 D 0 2 0	220	K	S	0	1									Includes Debris
	2 1 D 0 2 1	220	K	S	0	1									Includes Debris
	2 2 D 0 2 2	2,000	K	S	0	1									Includes Debris
	2 3 D 0 2 3	2,000	K	S	0	1									Includes Debris
	2 4 D 0 2 4	2,000	K	S	0	1									Includes Debris
	2 5 D 0 2 5	2,000	K	S	0	1									Includes Debris

EPA/State ID Number	W	A	7	8	9	0	0	0	8	9	6	7
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Continuation of Section XIV. Description of Dangerous Waste

Line Number	A. Dangerous Waste No. (enter code)						B. Estimated Annual Quantity of Waste	C. Unit of Measure (enter code)	D. Process								
									(1) Process Codes (enter)						(2) Process Description [If a code is not entered in D (1)]		
2	6	D	0	2	6	2,000	K	S	0	1							Includes Debris
2	7	D	0	2	7	220	K	S	0	1							Includes Debris
2	8	D	0	2	8	220	K	S	0	1							Includes Debris
2	9	D	0	2	9	220	K	S	0	1							Includes Debris
3	0	D	0	3	0	220	K	S	0	1							Includes Debris
3	1	D	0	3	1	220	K	S	0	1							Includes Debris
3	2	D	0	3	2	220	K	S	0	1							Includes Debris
3	3	D	0	3	3	220	K	S	0	1							Includes Debris
3	4	D	0	3	4	220	K	S	0	1							Includes Debris
3	5	D	0	3	5	5,000	K	S	0	1							Includes Debris
3	6	D	0	3	6	220	K	S	0	1							Includes Debris
3	7	D	0	3	7	2,000	K	S	0	1							Includes Debris
3	8	D	0	3	8	2,000	K	S	0	1							Includes Debris
3	9	D	0	3	9	2,000	K	S	0	1							Includes Debris
4	0	D	0	4	0	2,000	K	S	0	1							Includes Debris
4	1	D	0	4	1	220	K	S	0	1							Includes Debris
4	2	D	0	4	2	220	K	S	0	1							Includes Debris
4	3	D	0	4	3	2,000	K	S	0	1							Includes Debris
4	4	F	0	0	1	2,000	K	S	0	1							Includes Debris
4	5	F	0	0	2	2,000	K	S	0	1							Includes Debris
4	6	F	0	0	3	5,000	K	S	0	1							Includes Debris
4	7	F	0	0	4	1,000	K	S	0	1							Includes Debris
4	8	F	0	0	5	5,000	K	S	0	1							Includes Debris
4	9	F	0	2	7	200	K	S	0	1							Includes Debris
5	0	P	0	0	1	200	K	S	0	1							Includes Debris
5	1	P	0	0	2	200	K	S	0	1							Includes Debris
5	2	P	0	0	3	200	K	S	0	1							Includes Debris
5	3	P	0	0	4	200	K	S	0	1							Includes Debris
5	4	P	0	0	5	200	K	S	0	1							Includes Debris
5	5	P	0	0	6	200	K	S	0	1							Includes Debris
5	6	P	0	0	7	200	K	S	0	1							Includes Debris
5	7	P	0	0	8	200	K	S	0	1							Includes Debris
5	8	P	0	0	9	200	K	S	0	1							Includes Debris
5	9	P	0	1	0	200	K	S	0	1							Includes Debris

EPA/State ID Number	W	A	7	8	9	0	0	0	8	9	6	7
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Continuation of Section XIV. Description of Dangerous Waste

Line Number	A. Dangerous Waste No. (enter code)			B. Estimated Annual Quantity of Waste	C. Unit of Measure (enter code)	D. Process								
						(1) Process Codes (enter)							(2) Process Description [If a code is not entered in D (1)]	
1	9	6	U 0 2 4	200	K	S	0	1						Includes Debris
1	9	7	U 0 2 5	200	K	S	0	1						Includes Debris
1	9	8	U 0 2 6	200	K	S	0	1						Includes Debris
1	9	9	U 0 2 7	200	K	S	0	1						Includes Debris
2	0	0	U 0 2 8	200	K	S	0	1						Includes Debris
2	0	1	U 0 2 9	200	K	S	0	1						Includes Debris
2	0	2	U 0 3 0	200	K	S	0	1						Includes Debris
2	0	3	U 0 3 1	200	K	S	0	1						Includes Debris
2	0	4	U 0 3 2	200	K	S	0	1						Includes Debris
2	0	5	U 0 3 3	200	K	S	0	1						Includes Debris
2	0	6	U 0 3 4	200	K	S	0	1						Includes Debris
2	0	7	U 0 3 5	200	K	S	0	1						Includes Debris
2	0	8	U 0 3 6	200	K	S	0	1						Includes Debris
2	0	9	U 0 3 7	200	K	S	0	1						Includes Debris
2	1	0	U 0 3 8	200	K	S	0	1						Includes Debris
2	1	1	U 0 3 9	200	K	S	0	1						Includes Debris
2	1	2	U 0 4 1	200	K	S	0	1						Includes Debris
2	1	3	U 0 4 2	200	K	S	0	1						Includes Debris
2	1	4	U 0 4 3	200	K	S	0	1						Includes Debris
2	1	5	U 0 4 4	200	K	S	0	1						Includes Debris
2	1	6	U 0 4 5	200	K	S	0	1						Includes Debris
2	1	7	U 0 4 6	200	K	S	0	1						Includes Debris
2	1	8	U 0 4 7	200	K	S	0	1						Includes Debris
2	1	9	U 0 4 8	200	K	S	0	1						Includes Debris
2	2	0	U 0 4 9	200	K	S	0	1						Includes Debris
2	2	1	U 0 5 0	200	K	S	0	1						Includes Debris
2	2	2	U 0 5 1	200	K	S	0	1						Includes Debris
2	2	3	U 0 5 2	200	K	S	0	1						Includes Debris
2	2	4	U 0 5 3	200	K	S	0	1						Includes Debris
2	2	5	U 0 5 5	200	K	S	0	1						Includes Debris
2	2	6	U 0 5 6	200	K	S	0	1						Includes Debris
2	2	7	U 0 5 7	200	K	S	0	1						Includes Debris
2	2	8	U 0 5 8	200	K	S	0	1						Includes Debris
2	2	9	U 0 5 9	200	K	S	0	1						Includes Debris

EPA/State ID Number	W	A	7	8	9	0	0	0	8	9	6	7
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Continuation of Section XIV. Description of Dangerous Waste

Line Number	A. Dangerous Waste No. (enter code)	B. Estimated Annual Quantity of Waste	C. Unit of Measure (enter code)	D. Process								
				(1) Process Codes (enter)					(2) Process Description [If a code is not entered in D (1)]			
2 6 4	U 0 9 6	200	K	S	0	1						Storage-Container
2 6 5	U 0 9 7	200	K	S	0	1						Includes Debris
2 6 6	U 0 9 8	200	K	S	0	1						Includes Debris
2 6 7	U 0 9 9	200	K	S	0	1						Includes Debris
2 6 8	U 1 0 1	200	K	S	0	1						Includes Debris
2 6 9	U 1 0 2	200	K	S	0	1						Includes Debris
2 7 0	U 1 0 3	200	K	S	0	1						Includes Debris
2 7 1	U 1 0 5	200	K	S	0	1						Includes Debris
2 7 2	U 1 0 6	200	K	S	0	1						Includes Debris
2 7 3	U 1 0 7	200	K	S	0	1						Includes Debris
2 7 4	U 1 0 8	200	K	S	0	1						Includes Debris
2 7 5	U 1 0 9	200	K	S	0	1						Includes Debris
2 7 6	U 1 1 0	200	K	S	0	1						Includes Debris
2 7 7	U 1 1 1	200	K	S	0	1						Includes Debris
2 7 8	U 1 1 2	200	K	S	0	1						Includes Debris
2 7 9	U 1 1 3	200	K	S	0	1						Includes Debris
2 8 0	U 1 1 4	200	K	S	0	1						Includes Debris
2 8 1	U 1 1 5	200	K	S	0	1						Includes Debris
2 8 2	U 1 1 6	200	K	S	0	1						Includes Debris
2 8 3	U 1 1 7	200	K	S	0	1						Includes Debris
2 8 4	U 1 1 8	200	K	S	0	1						Includes Debris
2 8 5	U 1 1 9	200	K	S	0	1						Includes Debris
2 8 6	U 1 2 0	200	K	S	0	1						Includes Debris
2 8 7	U 1 2 1	200	K	S	0	1						Includes Debris
2 8 8	U 1 2 2	200	K	S	0	1						Includes Debris
2 8 9	U 1 2 3	200	K	S	0	1						Includes Debris
2 9 0	U 1 2 4	200	K	S	0	1						Includes Debris
2 9 1	U 1 2 5	200	K	S	0	1						Includes Debris
2 9 2	U 1 2 6	200	K	S	0	1						Includes Debris
2 9 3	U 1 2 7	200	K	S	0	1						Includes Debris
2 9 4	U 1 2 8	200	K	S	0	1						Includes Debris
2 9 5	U 1 2 9	200	K	S	0	1						Includes Debris
2 9 6	U 1 3 0	200	K	S	0	1						Includes Debris
2 9 7	U 1 3 1	200	K	S	0	1						Includes Debris

EPA/State ID Number	W	A	7	8	9	0	0	0	8	9	6	7
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Continuation of Section XIV. Description of Dangerous Waste

Line Number	A. Dangerous Waste No. (enter code)	B. Estimated Annual Quantity of Waste	C. Unit of Measure (enter code)	D. Process								
				(1) Process Codes (enter)					(2) Process Description [If a code is not entered in D (1)]			
3 6 6	U 2 0 5	200	K	S	0	1						Includes Debris
3 6 7	U 2 0 6	200	K	S	0	1						Includes Debris
3 6 8	U 2 0 7	200	K	S	0	1						Includes Debris
3 6 9	U 2 0 8	200	K	S	0	1						Includes Debris
3 7 0	U 2 0 9	200	K	S	0	1						Includes Debris
3 7 1	U 2 1 0	200	K	S	0	1						Includes Debris
3 7 2	U 2 1 1	200	K	S	0	1						Includes Debris
3 7 3	U 2 1 3	200	K	S	0	1						Includes Debris
3 7 4	U 2 1 4	200	K	S	0	1						Includes Debris
3 7 5	U 2 1 5	200	K	S	0	1						Includes Debris
3 7 6	U 2 1 6	200	K	S	0	1						Includes Debris
3 7 7	U 2 1 7	200	K	S	0	1						Includes Debris
3 7 8	U 2 1 8	200	K	S	0	1						Includes Debris
3 7 9	U 2 1 9	200	K	S	0	1						Includes Debris
3 8 0	U 2 2 0	200	K	S	0	1						Includes Debris
3 8 1	U 2 2 1	200	K	S	0	1						Includes Debris
3 8 2	U 2 2 2	200	K	S	0	1						Includes Debris
3 8 3	U 2 2 3	200	K	S	0	1						Includes Debris
3 8 4	U 2 2 5	200	K	S	0	1						Includes Debris
3 8 5	U 2 2 6	200	K	S	0	1						Includes Debris
3 8 6	U 2 2 7	200	K	S	0	1						Includes Debris
3 8 7	U 2 2 8	200	K	S	0	1						Includes Debris
3 8 8	U 2 3 4	200	K	S	0	1						Includes Debris
3 8 9	U 2 3 5	200	K	S	0	1						Includes Debris
3 9 0	U 2 3 6	200	K	S	0	1						Includes Debris
3 9 1	U 2 3 7	200	K	S	0	1						Includes Debris
3 9 2	U 2 3 8	200	K	S	0	1						Includes Debris
3 9 3	U 2 3 9	200	K	S	0	1						Includes Debris
3 9 4	U 2 4 0	200	K	S	0	1						Includes Debris
3 9 5	U 2 4 3	200	K	S	0	1						Includes Debris
3 9 6	U 2 4 4	200	K	S	0	1						Includes Debris
3 9 7	U 2 4 6	200	K	S	0	1						Includes Debris
3 9 8	U 2 4 7	200	K	S	0	1						Includes Debris
3 9 9	U 2 4 8	200	K	S	0	1						Includes Debris

EPA/State ID Number	W	A	7	8	9	0	0	0	8	9	6	7
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Continuation of Section XIV. Description of Dangerous Waste

Line Number	A. Dangerous Waste No. (enter code)						B. Estimated Annual Quantity of Waste	C. Unit of Measure (enter code)	D. Process									
									(1) Process Codes (enter)						(2) Process Description [If a code is not entered in D (1)]			
4 0 0	U	2	4	9			200	K	S	0	1							Includes Debris
4 0 1	U	2	7	1			200	K	S	0	1							Includes Debris
4 0 2	U	2	7	8			200	K	S	0	1							Includes Debris
4 0 3	U	2	7	9			200	K	S	0	1							Includes Debris
4 0 4	U	2	8	0			200	K	S	0	1							Includes Debris
4 0 5	U	3	2	8			200	K	S	0	1							Includes Debris
4 0 6	U	3	5	3			200	K	S	0	1							Includes Debris
4 0 7	U	3	5	9			200	K	S	0	1							Includes Debris
4 0 8	U	3	6	4			200	K	S	0	1							Includes Debris
4 0 9	U	3	6	7			200	K	S	0	1							Includes Debris
4 1 0	U	3	7	2			200	K	S	0	1							Includes Debris
4 1 1	U	3	7	3			200	K	S	0	1							Includes Debris
4 1 2	U	3	8	7			200	K	S	0	1							Includes Debris
4 1 3	U	3	8	9			200	K	S	0	1							Includes Debris
4 1 4	U	3	9	4			200	K	S	0	1							Includes Debris
4 1 5	U	3	9	5			200	K	S	0	1							Includes Debris
4 1 6	U	4	0	4			200	K	S	0	1							Includes Debris
4 1 7	U	4	0	9			200	K	S	0	1							Includes Debris
4 1 8	U	4	1	0			200	K	S	0	1							Includes Debris
4 1 9	U	4	1	1			200	K	S	0	1							Includes Debris
4 2 0	W	P	C	B			5,000	K	S	0	1							Includes Debris
4 2 1	W	P	0	1			5,000	K	S	0	1							Includes Debris
4 2 2	W	P	0	2			1,000	K	S	0	1							Includes Debris
4 2 3	W	P	0	3			500	K	S	0	1							Includes Debris
4 2 4	W	T	0	1			30,000	K	S	0	1							Includes Debris
4 2 5	W	T	0	2			20,000	K	S	0	1							Includes Debris
4 2 6	W	S	C	2			5,000	K	S	0	1							Includes Debris
4 2 7	K	0	1	3			200	K	S	0	1							Includes Debris
4 2 8	K	0	4	4			200	K	S	0	1							Includes Debris

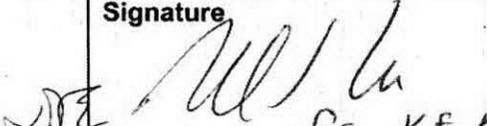
XV. Map
 Attach to this application a topographic map of the area extending to at least one (1) mile beyond property boundaries. The map must show the outline of the facility; the location of each of its existing and proposed intake and discharge structures; each of its dangerous waste treatment, storage, recycling, or disposal units; and each well where fluids are injected underground. Include all springs, rivers, and other surface water bodies in this map area, plus drinking water wells listed in public records or otherwise known to the applicant within ¼ mile of the facility property boundary. The instructions provide additional information on meeting these requirements.

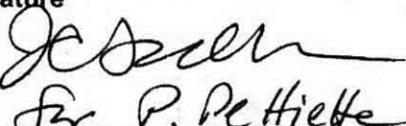
XVI. Facility Drawing
 All existing facilities must include a scale drawing of the facility (refer to Instructions for more detail).

XVII. Photographs
 All existing facilities must include photographs (aerial or ground-level) that clearly delineate all existing structures; existing storage, treatment, recycling, and disposal areas; and sites of future storage, treatment, recycling, or disposal areas (refer to Instructions for more detail).

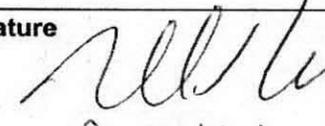
XVIII. Certifications

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 assure 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.

Operator Name and Official Title (type or print) Keith A. Klein, Manager U.S. Department of Energy Richland Operations Office	Signature  for KE Klein	Date Signed 7/1/06
--	---	------------------------------

Co-Operator** Name and Official Title (type or print) Patrick L. Pettiette Project Manager Washington Closure Hanford LLC	Signature  for P. Pettiette	Date Signed 6/18/06
--	--	-------------------------------

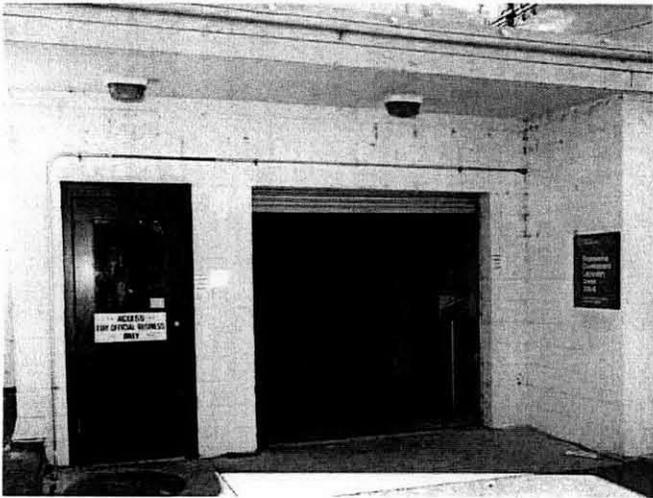
Co-Operator – Address and Telephone Number**
 3070 George Washington Way
 Richland, WA 99352
 (509) 372-9951

Facility-Property Owner Name and Official Title (type or print) Keith A. Klein, Manager U.S. Department of Energy Richland Operations Office	Signature  for K Klein	Date Signed 7/1/06
---	---	------------------------------

Comments

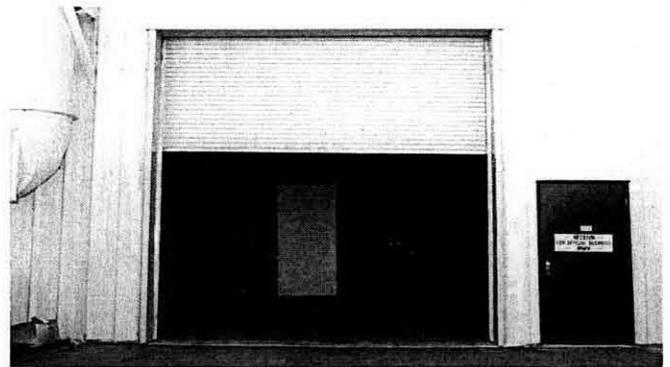
[Empty comment box]

305-B Storage Facility



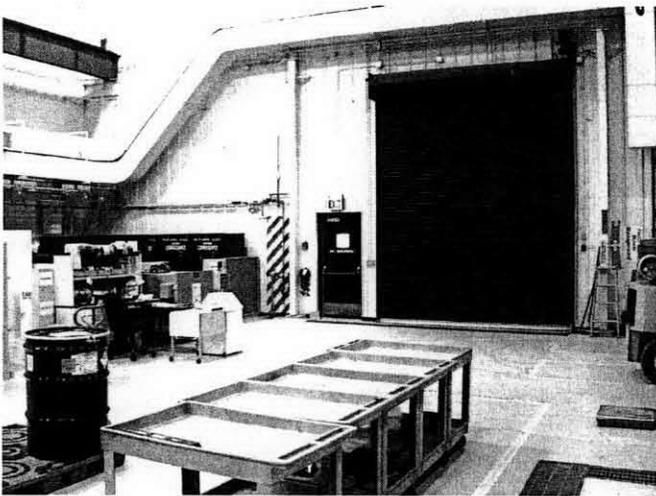
View Looking West

88A907-8CN
(PHOTO TAKEN 1988)



View Looking South

88A907-1CN
(PHOTO TAKEN 1988)



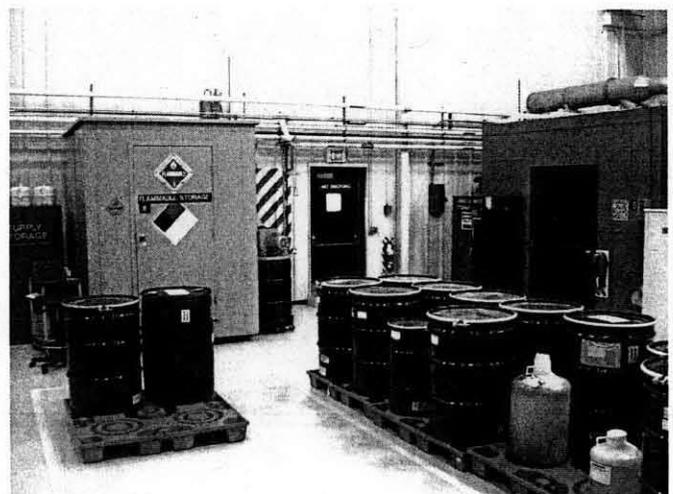
305-B High Bay, Loading Area



305-B Storage Cell

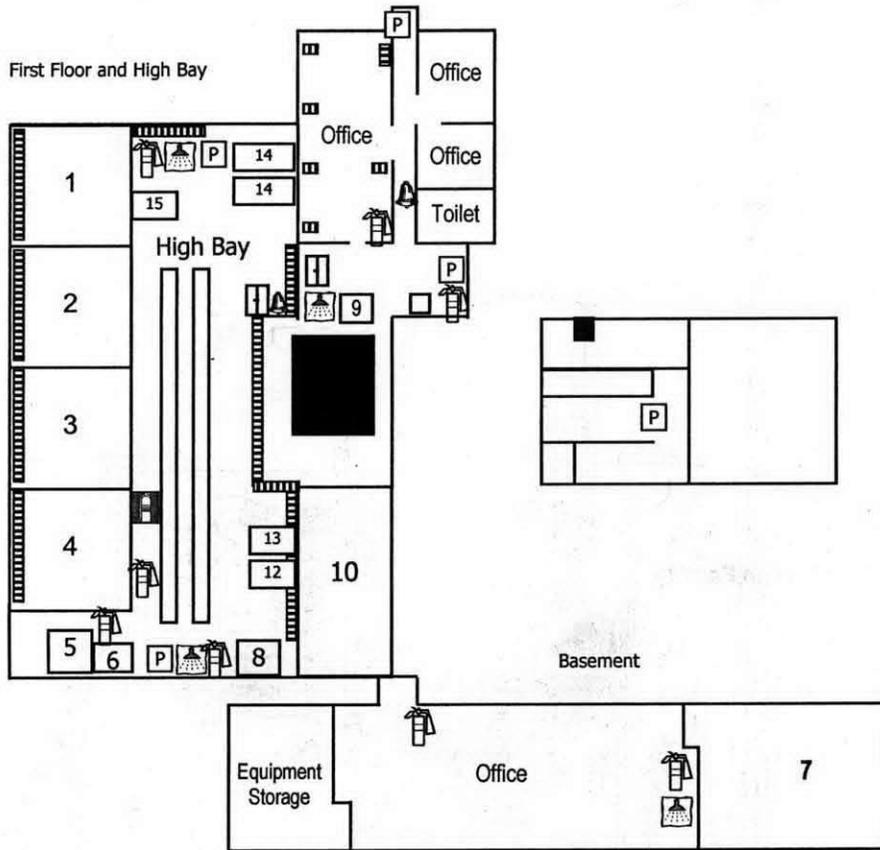


305-B Storage Cell and Bulking Module



305-B Bulking Module and Flammables Module

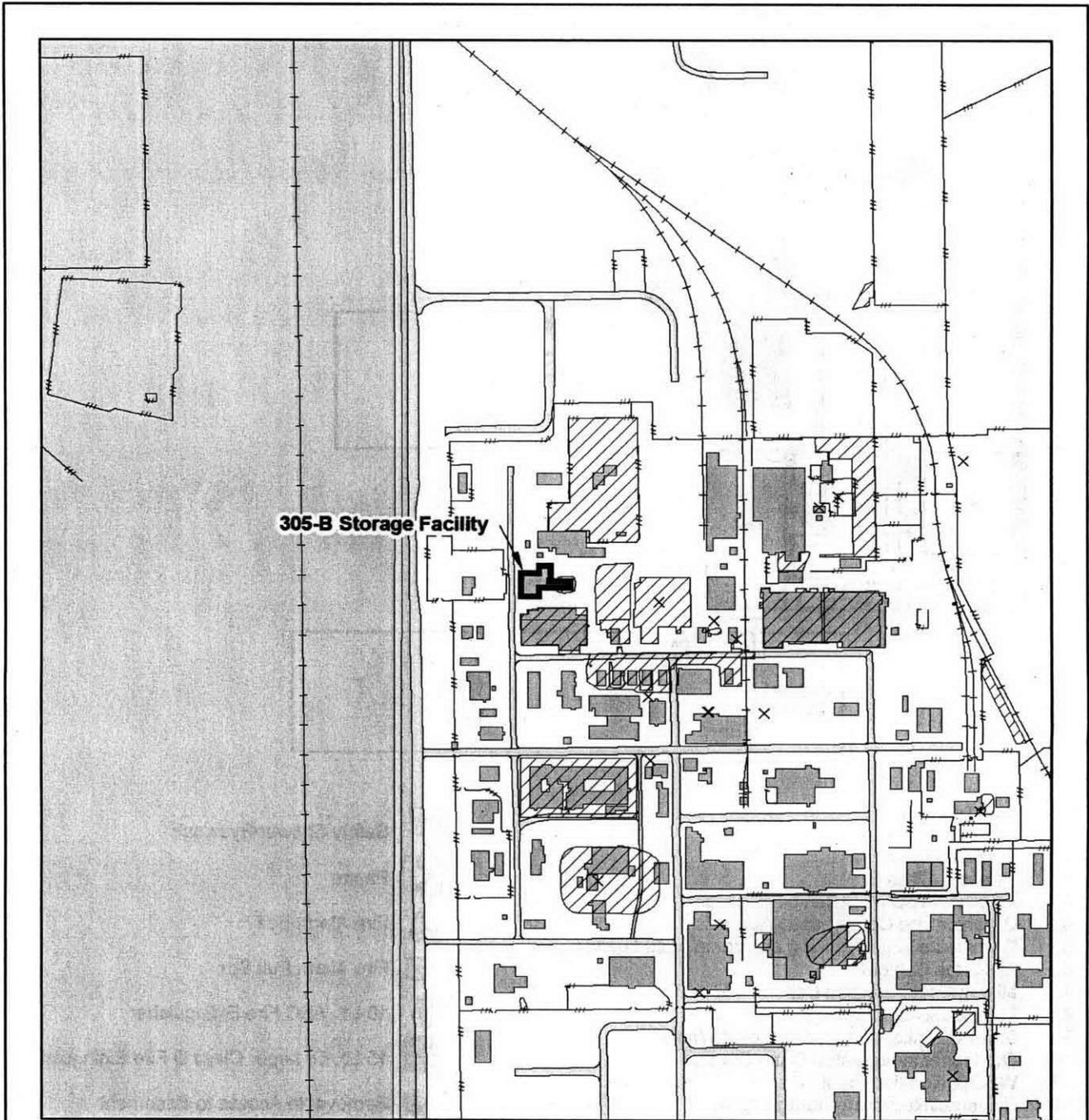
305-B Storage Facility



Legend

- 1. Acids, Oxidizers
- 2. Poisons, Class 9
- 3. Alkaline, WSDW, Organic Peroxides
- 4. Organics and Compressed Aerosols
- 5. Flammable Liquid Bulking and compressed gases
- 6. Asbestos Cabinet
- 7. Mixed Waste Storage Cell
- 8. Flammable Storage
- 9. Small Quantity Flammable Mixed Waste
- 10. Outdoor Non-regulated Drum Storage
- 11. WSDW Non-flammable Drums
- 12. Universal/Recycling Storage Area
- 13. Acid Drums
- 14. Alkaline Drums
- 15. Explosive Magazine

-  Safety Shower/Eyewash
-  Phone
-  Fire Alarm Bell
-  Fire Alarm Pull Box
-  10-Lb. ABC Fire Extinguisher
-  15 Lb. Or larger Class D Fire Extinguisher
-  Removable Access to Basement
-  Emergency Equipment Cabinet
-  Collection Sump



305-B Storage Facility

305-B Storage Facility

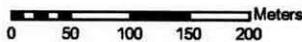
Prepared for:
US DEPARTMENT OF ENERGY
RICHLAND OPERATIONS OFFICE



Created and Published by: Central Mapping Services
Fluor Hanford, Richland, WA (509) 376-8759

INTENDED USE: REFERENCE ONLY

- | | |
|-------------------------------|-----------------------|
| TSD Unit Boundary | Buildings and Mobiles |
| DOE Operating Areas | Structures |
| Hanford Facility | Concrete |
| Waste Management Units | Major Roads |
| Linear Waste Management Units | Service Roads |
| Spot Waste Management Units | Railroads |
| | Fences |



O:\Projects\2004\RCRA_TSD\041102_Top10FacilityTopos2005_Bowman\Maps\050401_305BStorageFacility_LineDwg_85x11_Rev3.mxd - 6/5/2006 @ 12:28:53 PM

Hanford Facility RCRA Permit Modification Notification Forms

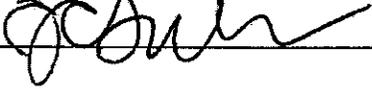
Part III, Operating Unit 4

242A Evaporator

Index

- Page 3 of 6: Chapter 3.0, §3.9.2
- Page 4 of 6: Chapter 8.0, Table of Contents
- Page 5 of 6: Chapter 8.0, §8.3

Submitted by Co-Operator:



8/13/07

Date

Reviewed by ORP Program Office:



8/15/07

Date

Hanford Facility RCRA Permit Modification Notification Form				
Unit: 242A Evaporator	Permit Part Part III Operating Unit 4			
<p><u>Description of Modification:</u> Hanford Facility RCRA Permit III.4:</p> <p style="text-align: center;">PART III, OPERATING UNITS OPERATING UNIT 4 UNIT-SPECIFIC CONDITIONS 242-A Evaporator</p> <p>The 242-A Evaporator is a mixed waste treatment and storage unit consisting of a conventional forced-circulation, vacuum evaporation system to concentrate mixed-waste solutions located in the 200 East Area.</p> <p>This document sets forth the operating conditions for the 242-A Evaporator.</p> <p>II.4.A. COMPLIANCE WITH PERMIT CONDITIONS</p> <p>The Permittees shall comply with all requirements set forth in the Hanford Facility RCRA Permit (Permit) as specified in Permit Attachment 3, Permit Applicability Matrix, including all approved modifications. All chapters, subsections, figures, tables, and appendices included in the following unit-specific Permit Conditions are enforceable in their entirety.</p> <p>In the event that the Part III-Unit-Specific Conditions for Operating Unit 4, 242-A Evaporator conflict with the Part I-Standard Conditions and/or Part II-General Facility Conditions of the Permit, the unit-specific conditions for Operating Unit 4, 242-A Evaporator prevail.</p> <p><u>OPERATING UNIT 4:</u></p> <p>Chapter 1.0 Part A Form, Revision 9, dated May 2005 Chapter 2.0 Unit Description, dated August 2004 Chapter 3.0 Waste Analysis Plan, dated December 31, 2005 September 30, 2007 Chapter 4.0 Process Information, dated December 31, 2005 Appendix 4B Tank Integrity Assessment, dated December 31, 2002 Chapter 5.0 Groundwater Monitoring, dated (not applicable) Chapter 6.0 Procedures to Prevent Hazards, dated January 2007 (also refer to Permit Attachment 33, §6.1, Security) Chapter 7.0 Contingency Plan, dated June 30, 2004 Chapter 8.0 Personnel Training, dated December 31, 2002 September 30, 2007 Chapter 11.0 Closure and Postclosure Requirements, dated December 31, 2005 Chapter 12.0 Reporting and Recordkeeping (refer to Permit Attachment 33, Table 12.1, Reports and Records)</p> <p>III.4.B UNIT-SPECIFIC CONDITIONS FOR 242-A EVAPORATOR</p> <p>Portions of Permit Attachment 4 (DOE/RL-94-02) that are not made enforceable by inclusion in the applicability matrix for that document are not made enforceable by reference in this document.</p>				
WAC 173-303-830 Modification Class	Class 1	Class 1 ¹	Class 2	Class 3
Please mark the Modification Class:	X			
Enter relevant WAC 173-303-830, Appendix I Modification citation number: A.1 Enter wording of WAC 173-303-830, Appendix I Modification citation: A.1 General Permit Provisions, Administrative and informational changes				
Modification Approved: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No (state reason for denial) Reason for denial: <i>RAC</i>	Reviewed by Ecology: <i>G. P. Davis 8/9/07</i> G. P. Davis Date			

Hanford Facility RCRA Permit Modification Notification Form

Unit:
242A Evaporator

Permit Part
Part III Operating Unit 4

Description of Modification:

Chapter 3.0 §3.9.2

3.9.2 Analytical Methods

The analytical methods that must be followed for RCRA sampling of the candidate feed tanks are included in Table 3.56. Performance-based specifications rather than procedure-based specifications are used for determining the appropriate analytical methods. This allows for necessary adjustments to the methods for Hanford Facility-specific issues; related to high radioactivity of the sample matrix, while ensuring acceptable data quality. Because of the high radioactivity, the analytical method will in some cases deviate from those in national standards such as *Test Methods For Evaluating Solid Waste*, SW-846 (EPA 1986) and *Standard Methods for the Examination of Water and Waste Water* (AWWA 1989).

WAC 173-303-830 Modification Class

Please mark the Modification Class:

Class 1

Class 1¹

Class 2

Class 3

X

Enter relevant WAC 173-303-830, Appendix I Modification citation number: A.1

Enter wording of WAC 173-303-830, Appendix I Modification citation:

A.1 General Permit Provisions, Administrative and informational changes

Modification Approved: Yes No (state reason for denial)

Reason for denial:

LC

Reviewed by Ecology:

G.P. Davis

8/9/07

G. P Davis

Date

Hanford Facility RCRA Permit Modification Notification Form

Unit: 242A Evaporator	Permit Part Part III Operating Unit 4
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Description of Modification:
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WAC 173-303-830 Modification Class Please mark the Modification Class:	Class 1	Class 1 ¹	Class 2	Class 3
	X			

Enter relevant WAC 173-303-830, Appendix I Modification citation number: A.1

Enter wording of WAC 173-303-830, Appendix I Modification citation:

A.1 General Permit Provisions, Administrative and informational changes

Modification Approved: Yes No (state reason for denial)
Reason for denial: *RAC*

Reviewed by Ecology:

G.P. Davis *8/9/07*
G. P Davis Date

Hanford Facility RCRA Permit Modification Notification Form

Unit:
242A Evaporator

Permit Part
Part III Operating Unit 4

Description of Modification:

Chapter 8.0 § 8.3

Table 8.1. ~~200 Area Liquid Waste Processing Facilities~~242-A Training Evaporator Training Matrix¹

Attachment 33 Chapter 8 Training Category		Training Category*					
		General Hanford Facility Training	Contingency Plan Training	Emergency Coordinator Training	Operations Training		
200 Area Liquid Waste Processing Facilities Operating Unit 4: 242A Evaporator Dangerous Waste Training Plan (TFC-PLN-07) implementing category		Orientation Program (Tank Farm and 242-A Evaporator)	Emergency Response (contingency plan) Emergency Hazards Check List	Emergency Coordinator Training	General Waste Management (handling, segregation and packaging)	Container Management	Tank System Management Surface Impoundment
Job title/position	Dangerous Waste Worker Categories*						
Nuclear Chemical (Operators) (NCOs)	Waste Workers	X	X	X	X	X	X
Shift Technical Advisor (STAs)	Waste Worker Supervisor/ Manager	X	X		X		
Shift Operations Manager (SOMs)	Waste Worker Supervisor/ Manager	X	X	X	X		
Operational Engineer (OEs)	Waste Worker Supervisor/ Manager	X	X	X	X		
Environmental Compliance Officer	Waste Worker Supervisor/ Manager	X	X	X	X		
Resident Waste Service Provider	Advanced Waste Workers	X	X	X	X	X	
Non-Resident Waste Service Provider	???	X		X			

* Dangerous Waste Worker categories are defined in the Tank Farm Contractor Dangerous waste Training Plan (TFC-PLN-07 current revision) Refer to the 200 Area Liquid Waste Processing Facilities Dangerous Waste Training Plan for a complete description of coursework in each training category. The 200 Area Liquid Waste Processing Facilities Dangerous Waste Training Plan address the 242-A Evaporator, the 200 Area Effluent Treatment Facility, and the Liquid Effluent Retention Facility.

¹ All training currently in table 8-1 is class-room instruction per WAC 173-3-3-330(1)

WAC 173-303-830 Modification Class	Class 1	Class 1 ¹	Class 2	Class 3
Please mark the Modification Class:	X			

Enter relevant WAC 173-303-830, Appendix I Modification citation number: B.5.B

Enter wording of WAC 173-303-830, Appendix I Modification citation:

B.5.B Changes to the training plan: Other changes

Modification Approved: Yes No (state reason for denial)

Reason for denial: **KAC**

Reviewed by Ecology:

G. P. Davis 8/19/07

G. P Davis

Date

Hanford Facility RCRA Permit Modification Notification Forms

Part III, Operating Unit 4

242A Evaporator

Remove and Replace the Following Sections:

Permit Part III, Operating Unit 4, Unit-Specific Conditions

Chapter 3.0, dated December 31, 2005 with Chapter 3.0, dated September 30, 2007

Chapter 8.0, dated December 31, 2002 with Chapter 8.0, dated September 30, 2007

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GLOSSARY

2	ASTM	American Society for Testing and Materials
3	AWWA	American Water Works Association
4	CFR	Code of Federal Regulations
5	C _T	total carbon
6	DOE	U. S. Department of Energy
7	DQO	data quality objective
8	DQO/DEFT	data quality objective/decision error feasibility trials
9	DSC	differential scanning calorimeter
10	DST	Double-Shell Tanks
11	Ecology	Washington State Department of Ecology
12	EPA	U.S. Environmental Protection Agency
13	ETF	200 Area Effluent Treatment Facility
14	GC	gas chromatography
15	HDPE	high-density polyethylene
16	HFFACO	Hanford Federal Facility Agreement and Consent Order
17	IC _T	total inorganic carbon
18	IR	infrared
19	LDR	land disposal restriction
20	LERF	Liquid Effluent Retention Facility
21	MS	mass spectrometry
22	N/A	not applicable
23	QA	quality assurance
24	QC	quality control
25	RCRA	<i>Resource Conservation and Recovery Act of 1976</i>
26	RPD	relative percent difference
27	TEDF	Treated Effluent Disposal Facility
28	TCLP	toxicity characteristic leaching procedure
29	TOC	total organic carbon
30	TSD	treatment, storage, and/or disposal
31	VOA	volatile organic analysis
32	WAC	Washington Administrative Code
33	WAP	waste analysis plan

1

METRIC CONVERSION CHART

Into metric units

Out of metric units

If you know	Multiply by	To get	If you know	Multiply by	To get
Length			Length		
inches	25.40	millimeters	millimeters	0.0393	inches
inches	2.54	centimeters	centimeters	0.393	inches
feet	0.3048	meters	meters	3.2808	feet
yards	0.914	meters	meters	1.09	yards
miles	1.609	kilometers	kilometers	0.62	miles
Area			Area		
square inches	6.4516	square centimeters	square centimeters	0.155	square inches
square feet	0.092	square meters	square meters	10.7639	square feet
square yards	0.836	square meters	square meters	1.20	square yards
square miles	2.59	square kilometers	square kilometers	0.39	square miles
acres	0.404	hectares	hectares	2.471	acres
Mass (weight)			Mass (weight)		
ounces	28.35	grams	grams	0.0352	ounces
pounds	0.453	kilograms	kilograms	2.2046	pounds
short ton	0.907	metric ton	metric ton	1.10	short ton
Volume			Volume		
fluid ounces	29.57	milliliters	milliliters	0.03	fluid ounces
quarts	0.95	liters	liters	1.057	quarts
gallons	3.79	liters	liters	0.26	gallons
cubic feet	0.03	cubic meters	cubic meters	35.3147	cubic feet
cubic yards	0.76456	cubic meters	cubic meters	1.308	cubic yards
Temperature			Temperature		
Fahrenheit	subtract 32 then multiply by 5/9ths	Celsius	Celsius	multiply by 9/5ths, then add 32	Fahrenheit
Force			Force		
pounds per square inch	6.895	kilopascals	kilopascals	0.14504	pounds per square inch

2 Source: *Engineering Unit Conversions*, M. R. Lindeburg, P.E., Second Ed., 1990, Professional
 3 Publications, Inc., Belmont, California.

4

1 **3.4 242-A EVAPORATOR PROCESS DESCRIPTION**

2 The 242-A Evaporator, located in the 200 East Area of the Hanford Site, separates the incoming waste
3 from the DST System into two aqueous streams as described in the following paragraph. Also associated
4 with the 242-A Evaporator are utility waste streams such as cooling water and steam condensate, which
5 are not dangerous waste. Description of the waste processed by the 242-A Evaporator is described in
6 Section 3.4.

7 The 242-A Evaporator process uses a conventional forced-circulation, vacuum evaporation system to
8 concentrate mixed waste solutions from the DST System tanks. The incoming stream is separated by
9 evaporation into two liquid streams: a concentrated slurry stream and a process condensate stream. The
10 slurry contains the majority of the radionuclides and inorganic constituents. After the slurry is
11 concentrated to the desired amount, the slurry stream is pumped back to the DST System and stored for
12 further treatment. Vapor from the evaporation process is condensed, producing process condensate,
13 which is primarily water with trace amounts of organic material and a greatly reduced concentration of
14 radionuclides. The process condensate is transferred to LERF for storage and treatment. Vacuum for the
15 evaporator vessel is provided by two steam jet ejectors, producing a gaseous vessel vent exhaust. The
16 242-A Evaporator vessel vent stream is filtered and discharged through an exhaust stack. Figure 3.1
17 shows a simplified schematic of the 242-A Evaporator process. A more detailed description of the
18 242-A Evaporator process is provided in Chapter 4.0.

19 **3.5 WASTE IDENTIFICATION**

20 All of the waste accepted by the 242-A Evaporator comes from DST System. The waste in the DST
21 System tanks is received from onsite generators, which characterize the waste before transfer to the DST
22 System. Waste characterization is based on analytical data and/or process knowledge. Based on this
23 information, the waste in certain DST System tanks are selected as 'candidates' for processing in the
24 242-A Evaporator. The contents of these candidate feed tanks are subjected to closer scrutiny and
25 evaluated against 242-A Evaporator waste acceptance criteria before the final tank selection is made. To
26 meet waste acceptance criteria, the contents of several tanks could be blended together in the feed tank
27 (241-AW-102) prior to processing.

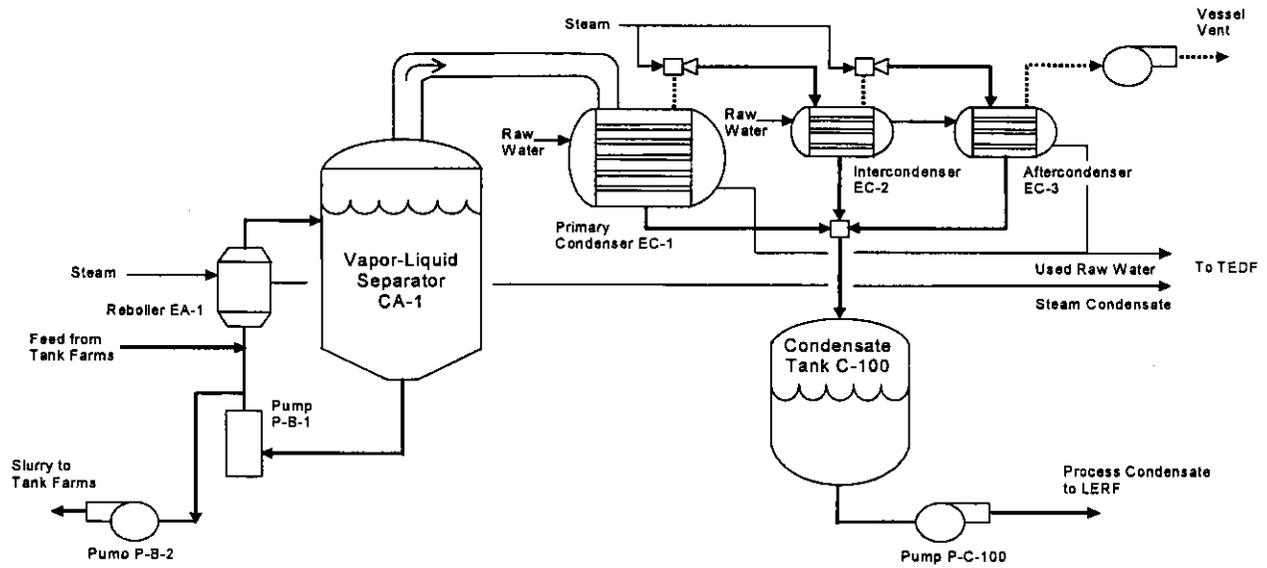
28 **3.5.1 General Constituent Description**

29 The only waste stream processed at the 242-A Evaporator is the DST System waste stream, which
30 consists of mixed waste received from various Hanford Site activities. The mixed waste is a radioactive
31 aqueous solution containing dissolved inorganic salts such as sodium, potassium, aluminum, hydroxides,
32 nitrates, and nitrites. The mixed waste in some tanks has detectable levels of heavy metals such as lead,
33 chromium, and cadmium. The radionuclide content includes fission products such as the Sr-90 and
34 Cs-137, and actinide series elements such as uranium and plutonium. Small quantities of ammonia and
35 organics, such as acetone, butanol, and tri-butyl phosphate, could also be present. Waste received in the
36 DST System has been chemically adjusted to ensure the waste is compatible with materials used for
37 construction of the waste tanks and the 242-A Evaporator. The consistency of the waste in the DST
38 System ranges from liquid supernate to thick sludge. Waste fed to the 242-A Evaporator is supernate
39 taken from the DST System; the sludge is not processed through the 242-A Evaporator.

40 The slurry is an aqueous solution containing the same components as the feed stream with increased
41 concentrations. Most of the volatile constituents are evaporated and transferred to the process condensate.
42 The process condensate is a dilute aqueous solution with ammonia, volatile organics, and trace quantities
43 of radionuclides and inorganic constituents.

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Figure 3.1. 242-A Evaporator Simplified Schematic



1 **3.5.2 Classification of Waste**

2 The waste processed at the 242-A Evaporator is classified as a mixed waste because it contains
3 radioactive components and is a dangerous waste. The concentrated slurry produced by the evaporation
4 process is also a mixed waste because it contains the same mixed waste constituents as the waste feed.
5 The process condensate is classified as a mixed waste because it contains radioactive components and is a
6 listed waste. The process condensate is a listed waste because it is derived from a listed waste.

7 Analysis of utility streams which do not contact mixed waste solutions, such as cooling water and steam
8 condensate, are conducted per the requirements of the 200 Area Treated Effluent Disposal Facility, which
9 receives these streams. These analyses are not discussed in this plan because these streams are not
10 dangerous waste under WAC 173-303.

11 **3.5.3 Dangerous Waste Numbers**

12 Waste transferred to the 242-A Evaporator could be assigned any of the dangerous waste numbers found
13 in Chapter 1.0, Part A, Form (latest Revision). These numbers are identical to the ones in the Part A,
14 Form (latest Revision) for the DST System. Process knowledge and historical data indicate that the slurry
15 stream returning to the DST System contains the same dangerous waste constituents as the waste feed, so
16 the same dangerous waste numbers are applicable to the feed and slurry.

17 Table 3.1 lists the dangerous waste numbers assigned to the process condensate. The process condensate
18 is designated with the dangerous waste numbers F001 to F005 because the process condensate is derived
19 from treatment of DST System waste assigned these numbers.

20 Table 3.1. Waste Designation for Process Condensate.

Waste number	Characteristic/Source	Basis for designation
F001	Spent halogenated solvents	Derived from F001 waste
F002	Spent halogenated solvents	Derived from F002 waste
F003	Spent nonhalogenated solvents	Derived from F003 waste
F004	Spent nonhalogenated solvents	Derived from F004 waste
F005	Spent nonhalogenated solvents	Derived from F005 waste
F039	Multi-source leachate from waste disposal operations	Future receipt of waste with the F039 number, derived from F001 through F005.

21 **3.6 WASTE ACCEPTANCE PROCESS**

22 This section describes the actions performed before every campaign to determine if the waste in the
23 DST System tanks is acceptable for treatment at the 242-A Evaporator. This section also describes the
24 procedures and processes for sampling the process condensate stream at the 242-A Evaporator, if required
25 by the waste acceptance criteria for treatment at the 200 Area Effluent Treatment Facility (ETF).

26 **3.6.1 Candidate Feed Waste Acceptance Process**

27 Candidate feed tank sampling performed for this WAP is done in the DST System before transfer of the
28 waste to the 242-A Evaporator. Certain DST System tanks are selected as 'candidates' for waste to be
29 processed in the 242-A Evaporator. This section describes the method for determining if the waste in a
30 candidate feed tank is acceptable for processing.

- 1 The following activities are performed to determine if candidate waste feed will meet the evaporator
2 waste acceptance criteria.
- 3 • Estimate concentrations of the eight Critical analytes to determine the minimum number of feed tank
4 samples needed for compliance with the waste acceptance criteria. The eight Critical analytes are
5 Ammonia, Nitrite, Nitrate, Hydroxide, Acetone, Pu-239/240, Cs-137, and Sr-90. The evaporator
6 DQO also specifies that a boil down study be performed to evaluate the impacts of solid formation.
 - 7 • Evaluate Potential for Energetics/Uncontrolled Chemical Reactions: The 242-A Evaporator Waste
8 Analysis Plan (WAP, Ecology 2003) requires that no exothermic reaction occur below 168°C and the
9 ratio of exotherm-to-endothrm energy be less than 1.
 - 10 • Evaluate Potential for Separable Organic Phase: Prior to operation of the evaporator, the absence of
11 separable organics in the feed must be verified.
 - 12 • Evaluate Feed Ammonia Concentration: The concentration of ammonia in the feed stream is limited
13 to 6800 mg/L and must be confirmed.
 - 14 • Calculate Process Condensate Ammonia and Organic Concentrations: Radionuclide, ammonia, and
15 volatile organic concentrations are needed for the LERF waste profile sheet (refer to the Permit, Part
16 III, LERF and 200 Area ETF, unit-specific conditions and Chapter 3.0, Waste Analysis Plan.)
 - 17 • Calculate Vessel Vent Ammonia Emissions: Ammonia monitoring is required by the Permit to
18 determine that the ammonia emissions do not exceed 100 lbs per 24 hours.

19 **3.6.1.1 Selecting Candidate Feed Tanks**

20 For each 242-A Evaporator campaign, DST System tanks are selected as candidate feed tanks based on
21 process knowledge of chemical properties with respect to waste acceptance criteria (Section 3.6.1). After
22 a candidate tank is selected, the waste in the tank is sampled and analyzed and the data evaluated to
23 confirm waste acceptability. Every candidate feed tank is sampled and analyzed to confirm waste
24 acceptability.

25 **3.6.1.2 Determining the Number of Candidate Feed Tank Samples**

26 The method for determining the number of feed tank samples is specified in the data quality objectives
27 (DQO) (Banning et al. 2005) and this WAP, and uses power analysis software supplied by the
28 U.S. Environmental Protection Agency (EPA) (EPA 2001). Estimated concentrations of eight critical
29 analytes (Section 3.6.1) are used to determine the minimum number of samples, accounting for the
30 desired confidence level and how close the estimated concentrations are to the waste acceptance limits a
31 random number generator is then used to determine the sample locations in the tank, using constraints
32 given in the WAP.

33 Figure 3.2 illustrates the decision logic used to determine the number of samples to be taken. Preliminary
34 concentrations of critical analytes are compared to the waste acceptability limits statistically to determine
35 the number of samples necessary to verify the composition of the waste. The statistical analysis accounts
36 for how close the concentrations of critical analytes are to the limits and the desired confidence level.
37 The closer the concentrations are to the limits, or the greater the desired confidence level, the more
38 samples must be taken. For regulatory compliance, acetone is used as the critical analyte because it is
39 often present at elevated levels. A 95% confidence level is specified for acetone. Critical analytes for
40 process control are also assessed. Acetone analysis is usually not available from preliminary data, so
41 process control analytes (such as nitrate and hydroxide) are often used. The statistical analysis includes
42 the generation of power curve calculations using *Data Quality Objectives Decision Error Feasibility*
43 *Trials* (EPA 2001 or current revision) software developed by the EPA. This software requires input of
44 minimum and maximum expected values, action levels, mean sample results, standard deviations of

1 sample results, and upper and lower confidence levels. The software outputs the minimum number of
2 samples required. In general, three samples are taken as a minimum because taking two samples would
3 require resampling if one sample should be lost or contaminated in the laboratory. A maximum of five
4 samples generally is applied to minimize exposure to sampling personnel.

5 **3.6.1.3 Assessing Candidate Feed Tank Analysis**

6 When results of the sample analysis are available (and before the waste is processed), a second statistical
7 analysis, similar to the first, is performed with the new analyte data to verify a sufficient number of
8 samples were taken (Figure 3.3).

9 Candidate feed tank sampling and analysis, in conjunction with the waste acceptance criteria in
10 Section 3.6.1, are used to assess whether established limits (limits are defined in the 242 Evaporator
11 DQO, Banning 2004 and Permit, Part III, LERF and 200 Area ETF, unit-specific conditions and Chapter
12 3.0, Waste Analysis Plan) would be exceeded. Based on the results, four possible options are
13 implemented:

- 14 • The waste is acceptable for processing at the 242-A Evaporator without further actions.
- 15 • The waste is unacceptable for processing as a single batch, but is acceptable if blended with other
16 waste to be processed.
- 17 • The waste is unacceptable for processing.
- 18 • Perform further evaluation to determine if action limit can be protected through mid-campaign
19 monitoring/sampling and/or process adjustments.

20 If the waste is suitable for evaporation, it will be transferred to the feed tank (241-AW-102) for
21 processing.

22 **3.6.2 Process Condensate Waste Sampling Process**

23 RCRA sampling of process condensate is completed per the Permit, Part III, LERF and 200 Area ETF
24 unit-specific conditions and Chapter 3.0, Waste Analysis Plan before treatment at the ETF. Depending on
25 programmatic needs, this sampling can be performed at the 242-A Evaporator during a campaign or at
26 LERF after the campaign is completed.

27 Before the start of a 242-A Evaporator campaign, the decision whether process condensate sampling will
28 be performed at the 242-A Evaporator or at LERF is documented in the operating record. Planning for
29 process condensate sampling at the 242-A Evaporator (i.e., number of samples, when samples are taken,
30 etc.) is completed before starting the campaign.

31 **3.6.2.1 Determining the Number of Process Condensate Samples**

32 The purpose of sampling the process condensate stream at the 242-A Evaporator is to confirm that the
33 stream is acceptable for treatment at the ETF. Before starting a 242-A Evaporator campaign where
34 sampling will be performed at the 242-A Evaporator instead of LERF, characterization of the process
35 condensate will be developed based on process knowledge. Process knowledge includes previous
36 documented process condensate analysis, estimated concentrations based on documented candidate feed
37 tank analysis, etc. RCRA sampling of the process condensate stream at the 242-A Evaporator is
38 performed during the campaign to confirm the characterization is correct. Sampling frequency is
39 determined using the following equation:

1 Number of process condensate = $N + 1$ samples required (per campaign). Where N is the number
2 of candidate feed tanks to be processed during the campaign.

3 For example, a campaign processing waste from only one candidate feed tank would require two samples,
4 while a campaign processing waste from three candidate feed tanks would require four samples. Sampling
5 is spread approximately evenly through the campaign, allowing for operational events such as unexpected
6 shutdowns and planned maintenance outages. This sample frequency represents a confirmation rate of
7 about one sample every 5 to 8 days of processing. This is reasonable based on the extensive database of
8 previous process condensate analysis. A minimum of two samples is taken to allow averaging of results.

9 **3.6.2.2 Assessing Process Condensate Analysis**

10 The process condensate sample results are assessed against the requirement in the Permit, Part III, LERF
11 and 200 Area ETF unit-specific conditions and Chapter 3.0, Waste Analysis Plan. The discussion of the
12 waste management decision process for process condensate sampling, including the reevaluation process,
13 is also included in the Permit, Part III, LERF and 200 Area ETF unit-specific conditions and Chapter 3.0,
14 Waste Analysis Plan.

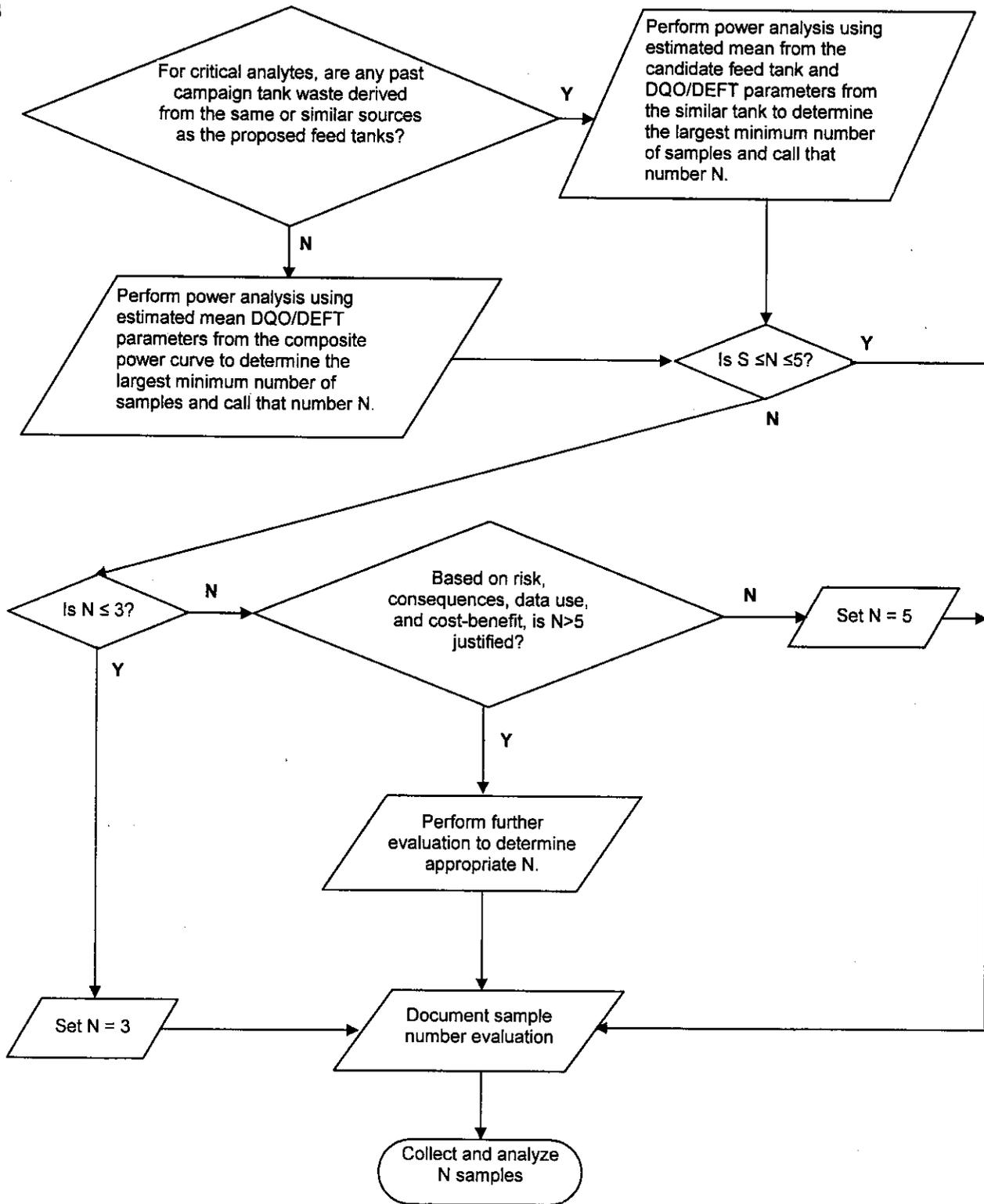
15 **3.7 242-A EVAPORATOR ACCEPTANCE CRITERIA**

16 Acceptance criteria for the 242-A Evaporator have been established from regulatory requirements,
17 operating experience, previous sample analyses, and engineering calculations. Processing criteria are
18 maximum and/or minimum values of a waste analyte that, if exceeded, alert the operator that management
19 of the waste requires further attention. The rationale for selecting a given analyte for inclusion in this
20 WAP, as required by WAC 173-303-300, is indicated in this section.

21 Additional analyses (such as specific gravity and radionuclide analysis) of the feed tanks, process
22 condensate, and other streams are performed to ensure that the facility is operating within established
23 parameters. This process control sampling and analysis is outside the scope of this plan because it is not
24 used to assess compatibility of the waste with other waste and with the 242-A Evaporator tank systems.

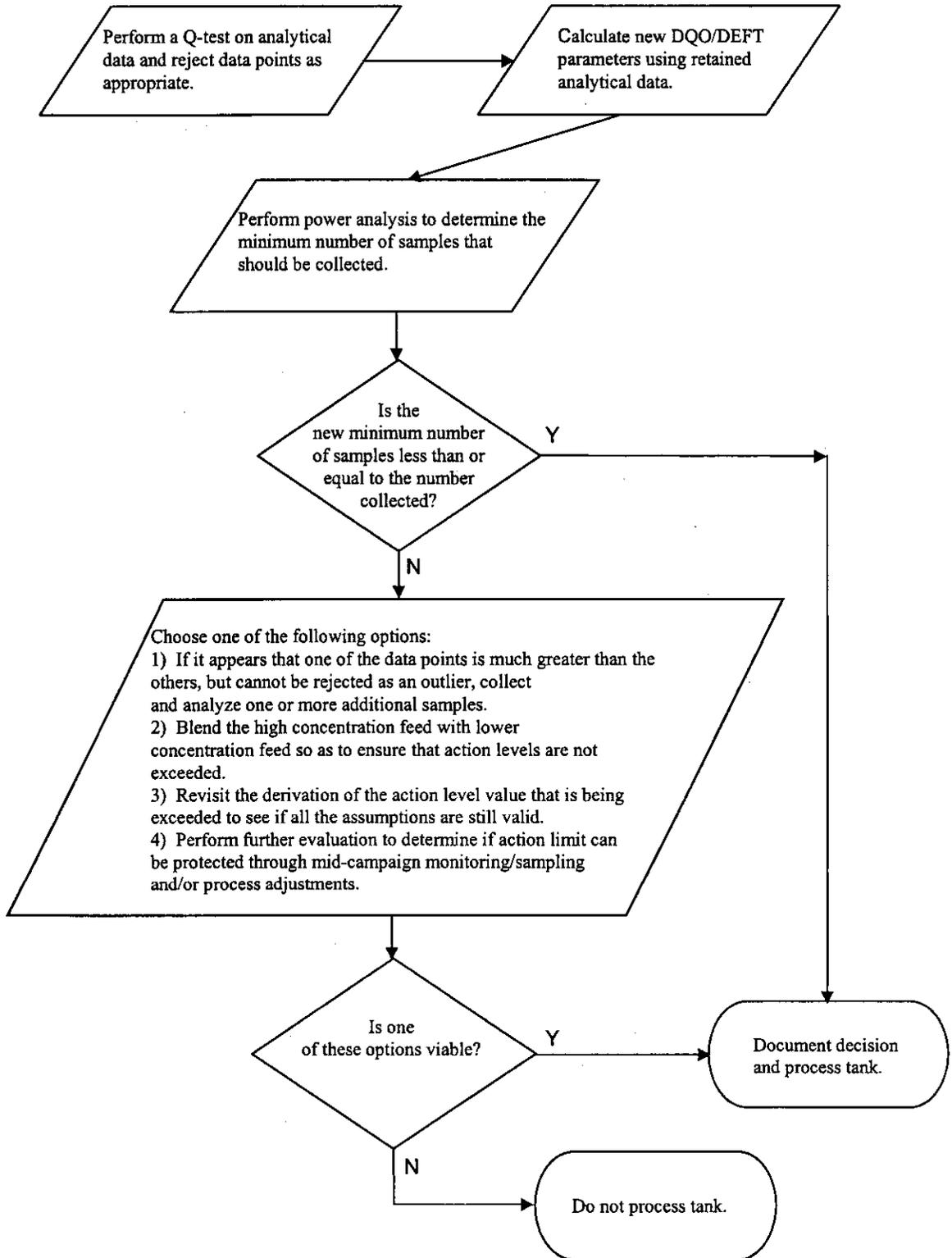
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Figure 3.2. Strategy for Determining the Number of Candidate Feed Tank Samples.



1

Figure 3.3. Strategy for Verifying the Number of Candidate Feed Tank Samples.



1 **3.7.1 Candidate Feed Tank Waste Acceptance Criteria**

2 The following sections discuss waste acceptance criteria for candidate feed tanks to be processed in the
3 242-A Evaporator.

4 **3.7.1.1 Exothermic Reactions**

5 WAC 173-303-395 requires waste handling be conducted to prevent an uncontrolled reaction that could
6 damage the tank system structural integrity or threaten human health or the environment. To evaluate the
7 possibility of an uncontrolled reaction at the elevated temperatures in the evaporator vessel, a differential
8 scanning calorimeter (DSC) test is performed on sample of all candidate waste to be processed. DSC
9 measures the amount of heat absorbed or released by a sample as the temperature is increased. Waste
10 exhibiting exotherms below 168EC, or with an absolute value of the exotherm-to-endotherm ratio greater
11 than one, will not be processed in the 242-A Evaporator without further technical evaluation.

12 **3.7.1.2 Compatibility**

13 WAC 173-303-395 requires waste handling be conducted to prevent an uncontrolled reaction that could
14 damage the tank system structural integrity or threaten human health or the environment. To verify there
15 will be no adverse affects because of mixing the contents of different waste tanks in the feed tank and
16 evaporator vessel, a compatibility evaluation is performed on waste in the candidate feed tanks. As
17 samples from each of the planned waste sources are mixed, observations are made to note any changes in
18 color, temperature, clarity, or any other visually determinable characteristic. This would indicate an
19 unexpected chemical reaction that might have an impact on 242-A Evaporator operations. If such visible
20 changes are observed when mixing samples, the waste would not be processed in the 242-A Evaporator
21 without further technical evaluation.

22 **Organic Constituents**

23 The 242-A Evaporator performs distillation of waste containing organic concentrations greater than
24 10 parts per million by weight; therefore, organic air emissions are subject to WAC 173-303-690 (which
25 incorporates 40 CFR 264, Subpart AA, by reference). Organic emissions from TSD units on the Hanford
26 Site subject to 40 CFR 264, Subpart AA are controlled to ensure emissions to do not exceed
27 1.4 kilograms per hour and 2,800 kilograms per year. To ensure these requirements are met, the levels of
28 volatile organics in the 242-A Evaporator feed must be limited to prevent excessive organic emissions
29 during processing. Engineering calculations were used to determine the feed limits given in Table 3.2.
30 The limits include a modifier "(R-1)/R", which adjusts the limits based on the campaign's planned boiloff
31 rate. R is the ratio of feed flow rate to slurry flow rate. Typically, R is between 1 to 2, making the range
32 of (R-1)/R 0 to 0.5.

33 In addition, analysis of the individual components in Table 3.2, total carbon (C_T) and total inorganic
34 carbon (IC_T) analysis are performed as a screening tool to account for other organic species that might be
35 present in the waste. The value of C_T minus IC_T represents the total organic concentration in the waste. If
36 the C_T minus IC_T limit is exceeded, additional volatile organic species might be present and a more
37 detailed evaluation will be conducted to determine organic emissions out of the vessel vent. The limit for
38 evaluation is 174.4 milligrams per liter, based on the conservative assumption that all organic species
39 present in the waste are as volatile as acetone. Acetone was chosen because of its relatively high
40 volatility and low percentage of carbon.

41 The level of volatile organics in the feed must also be limited to ensure organic constituents that transfer
42 to the process condensate are compatible with the LERF liner. The high density polyethylene (HDPE)
43 liner used at the LERF is exposed to process condensate that could contain trace quantities of chemicals
44 that could cause degradation of the liner material. Based on the liner manufacturer's compatibility data,

1 the concentration limits in Table 3.3 are imposed on those classes of constituents that could potentially
 2 degrade the liner. To ensure that these limits are not exceeded in the process condensate, the
 3 concentration limits are applied to the candidate feed tanks as well, with the modifier "(R-1)/R". A
 4 C_T minus IC_T analysis, similar to the one described previously, is also applied to the LERF liner limits.
 5 The strictest limit for organic species in Table 3.3 is 2,000 milligrams per liter. Assuming the organic is
 6 acetone (with its low percentage of carbon); this converts to a carbon value of 1,240 milligrams per liter.

7 The calculations in Tables 3.2 and 3.3 require use of the «sum of the fractions» technique. A calculation
 8 is performed where the analysis of each constituent is divided by its associated limit to produce a fraction
 9 of the limit. If the sum of these fractions is less than 1, the waste meets the requirements in the tables.

10 **3.7.2 Process Condensate Acceptance Criteria**

11 The waste acceptance criteria for process condensate sampling, including treatability, LERF liner
 12 compatibility, compatibility with other waste, etc., is given in the Permit, Part III, LERF and 200 Area
 13 ETF unit-specific conditions and Chapter 3.0, Waste Analysis Plan.

14 Table 3.2. Candidate Feed Tank Limits for Vessel Vent Organic Discharge^a.

Feed constituent	Limit (milligrams per liter) b, c
Acetone	174.4 ([R-1]/R)
1-Butanol	452 ([R-1]/R)
2-Butoxyethanol	190.4 ([R-1]/R)
2-Butanone	116 ([R-1]/R)
Tri-butyl phosphate	2.03E+4 ([R-1]/R)
Total carbon and Total inorganic carbon	(CT-ICT) < 174.4 ([R-1]/R) (as acetone)

15

^a Limits are based on a maximum continuous operating time equivalent to 6 months per year. If total operating time is expected to exceed 6 months per year, the limits must be re-evaluated.

$$\sum_{n=1}^i \left(\frac{\text{Conc}_n}{\text{LIMIT}_n} \right) \leq 1$$

^b The limits are applied using the sum of the fractions technique: where i is the number of organic constituents detected in analysis of the waste feed tank. Total carbon and total inorganic carbon analysis are not part of the summation.

^c R is the ratio of feed flow rate to slurry flow rate (typically R = between 1 and 2).

1

Table 3.3. Candidate Feed Tank Limits for LERF Liner Compatibility ^f

Chemical family/parameter ^a	Current target compounds	Limit (milligrams per liter) ^{b,c}
Alcohol/glycol	1-Butanol	500,000 ([R-1]/R)
Alkanone ^d	Sum of acetone, 2-butanone	200,000 ([R-1]/R)
Alkenone ^e	None targeted	2,000 ([R-1]/R)
Aromatic/cyclic hydrocarbon	None targeted	2,000 ([R-1]/R)
Halogenated hydrocarbon	None targeted	2,000 ([R-1]/R)
Aliphatic hydrocarbon	None targeted	500,000 ([R-1]/R)
Ether	2-Butoxyethanol	2,000 ([R-1]/R)
Other hydrocarbons	Tri-butyl phosphate	2,000 ([R-1]/R)
Oxidizers	None targeted	1,000 ([R-1]/R)
Acids, bases, and salts	Ammonia	100,000 ([R-1]/R)
Total carbon and total inorganic carbon	Not applicable	(C _T -IC _T) < 1,240 ([R-1]/R) (as acetone)

2

a If a chemical fits in more than one chemical family, the more restrictive limit applies.

b The limits are applied using the sum of the fractions technique: where i is the number of constituents detected in analysis of the waste feed tank. Total carbon and total inorganic carbon analysis are not part of the summation.

$$\sum_{n=1}^i \left(\frac{Conc_n}{LIMIT_n} \right) \leq 1$$

c R is the ratio of feed flow rate to slurry flow rate (typically R = between 1 and 2).

d Ketone containing only saturated alkyl group(s)

e Ketone containing unsaturated alkyl group(s)

This table is used to ensure process condensate generated from candidate feed tank treatment is within LERF liner compatibility limits

1 **3.8 SAMPLE COLLECTION AND ANALYSIS**

2 This section discusses sampling and analysis, including sampling procedures, sample collection points,
3 sample quality assurance/quality control (QA/QC), and selection of analytes.

4 **3.8.1 Sample Collection**

5 This section describes collection of candidate feed tank and process condensate samples for RCRA
6 analysis. Candidate feed tank waste is sampled and analyzed before the start of each 242-A Evaporator
7 campaign. Process condensate samples are taken at the 242-A Evaporator only if the decision is made
8 before the start of the campaign that sampling will be done at the 242-A Evaporator instead of LERF.

9 **3.8.1.1 Candidate Feed Tank Sample Collection**

10 Candidate feed tank samples are obtained by using a grab sampling method (e.g. "bottle on a string
11 method") specified in ASTM E300, *Standard Practices for Sampling Industrial Chemicals* (ASTM 1986).
12 The number of lateral sampling locations in candidate feed tanks is limited by the availability of tank
13 risers providing access into the tank. Generally, only a few risers in each tank are actually available for
14 sampling because the risers are dedicated to instrumentation or other uses. Sampling within a vertical
15 column is generally limited only by the depth of waste in the tank. The criteria in Table 3.4 are used
16 when determining the specific sampling locations.

17 Riser selection is made by numbering the available risers that are at least 4.6 meters from each other and
18 using a random number generator to select which risers will be used. Sample depths are determined by
19 dividing the tank level into 1-foot increments and using a random number generator to determine a depth,
20 which meets the criteria given in Table 3.4.

21 **3.8.1.2 Candidate Feed Tank Sampling Quality Assurance and Quality Control**

22 For each candidate feed tank sample, a sample solution is drawn from the sample riser using one or more
23 sample bottles. All sample bottles are precleaned, amber-colored glass bottles sealed with Teflon* caps
24 or septum caps and lined septums; however, the sample bottle for VOA must be sealed with septum cap
25 and lined septum.

26 For candidate feed tank sampling quality control, one field blank, consisting of one or more sample
27 bottles, is taken during the sample event. Field blanks are inserted at least 1-foot into the head space
28 through any one of the sample risers used during the sample event. One trip blank, also consisting of one
29 or more sample bottles, is taken during each sample event. Trip blanks are analyzed as independent
30 samples for VOA. Field and trip blanks use the same types of sample bottles as the actual samples and
31 are filled with reagent-grade water before shipment to the field.

32 Preservatives are not used with candidate feed tank samples because of concerns with high radiation
33 exposure that would result from additional handling of sample solutions. It is not practical to refrigerate
34 the bulky, shielded sample pigs and shipping containers. Biological activity, generally the largest
35 problem in environmental samples, is unlikely in candidate feed tank samples because of the high salt
36 content, pH, and radioactivity.

*Teflon is a trademark of E.I. DuPont de Nemours & Company

1 The chain of custody is documented on a data sheet that includes a unique sample number, date and time
2 sample was taken, custody seal number, and signature of the sampler. When possession of the sample is
3 transferred to other persons, such as the shipper or laboratory, the signature of the relinquisher and
4 receiver are recorded, along with date and time of the transfer. The receiver at the laboratory also
5 documents on the data sheet that the sample seal number is correct and the seal is intact. The chain-of-
6 custody data sheets are included in the operating record.

7 **3.8.1.3 Deviations from Specified Sampling Practices**

8 The WAP requires ASTM E 300 'bottle on a string procedure' for sampling (ASTM E300-86). Due to
9 high radiation fields, some deviations to the standard have been necessary to implement safely the
10 sampling practices in the field. These deviations are documented below.

- 11 • Requirement: The sampling apparatus be filled and allowed to drain before drawing the sample.

12 Deviation: Sampling personnel lowers the sampling apparatus to the specified level and collects the
13 sample. To pour the contents out and resample would encourage the spread of radiological
14 contamination and additional whole body and extremity radiation exposure.

- 15 • Requirement: Bottles and jars may be made of clear or brown glass or polyethylene with necks
16 shaped to receive glass stopper or a screw cap made of metal or plastic material.

17 Deviation: Sampling personnel uses clear or amber glass with necks shaped to receive rubber
18 stoppers. Glass stoppers were used at one time but resulted in broken sample bottles during the
19 removal of the glass stoppers from the glass bottles.

- 20 • Requirement: Stopper and label bottles immediately after taking the samples and deliver them to the
21 laboratory.

22 Deviation: Sampling personnel screws on the bottle cap after the sample has been collected. Because
23 of the alkalinity of the tank waste sample labels will not stay on bottles after samples are collected.
24 Therefore, sample bottles are etched with the sample numbers before the samples are collected. The
25 samples are shipped to the laboratory as soon as resources are available, within three days of sample
26 collection.

- 27 • Requirement: Select wiping cloths so that lint is not introduced, contaminating the samples.

28 Deviation: Sampling personnel uses damp cotton towels to wipe down sample bottles after the
29 sample bottles have been capped. The intent is to remove any waste that may have been deposited on
30 the bottle during the sampling event to minimize contamination and personnel exposure.

- 31 • Requirement: To prevent the loss of the liquid during shipment and to protect against moisture and
32 dust, cover the closure of the glass bottle with plastic caps, which have been swelled in water, wiped
33 dry, placed over the top of the stoppered bottle, and allowed to shrink tightly in place. Screw-top
34 bottles are recommended. The cap should be lined with material inert to the sample. The screw caps
35 should be secured by use of adhesive tape or similar material.

36 Deviation: Sampling personnel uses screw caps and 4-mil plastic bags. The cap is Teflon-lined
37 which is inert to the sample. The sample bottle is placed inside a plastic bag, which is placed inside a
38 steel pig (or sample pig). The steel pig is placed inside a shipping pig. The screw cap is not secured
39 with adhesive tape. Securing the sample bottle caps with tape would present the laboratory with
40 difficulty of removing the caps remotely (in the hot cell). If the sample leaks from the sample bottle,
41 it is trapped in the plastic bag. The custody seal is placed on the shipping pig per procedure.

- 1 • Requirement: All sampling apparatus and closures shall be clean, dry, free of contaminants, and
2 constructed of materials that are inert to the product to be sampled.

3 Deviation: The weldments are wiped down at the fabrication shop but are stored in open bins inside
4 the warehouse. The stoppers are received in bags and are inspected for dirt and wiped down. By
5 training, visual inspection is made of the sampling equipment to verify that the equipment does not
6 contain any gross contamination. If any is found, the equipment is either replaced or wiped down.
7 The bottles with screw caps are washed and certified and are not opened until at the time of the
8 sampling event. The bottles are opened when the last sample is completed so that only one bottle is
9 opened at the time of sampling to insert the rubber stopper from the sample holder. The weldments,
10 stopper, and bottles are constructed from materials that are inert to the product to be sampled.

11 **3.8.1.4 Process Condensate Sample Collection**

12 Process condensate samples, when performed at 242-A Evaporator instead of LERF, are taken from the
13 process condensate transfer line in the condenser room of the 242-A Building. Grab sampling is
14 performed during the campaign at the SAMP-RC3-2 sampler or other sample port. Samples of process
15 condensate are collected in a manner consistent with SW-846 procedures (EPA 1986) as documented in
16 sampling procedures, which are maintained and implemented by unit personnel.

17 **3.8.1.5 Process Condensate Sampling Quality Assurance and Quality Control**

18 For information on process condensate sample collection, including the number and types of sample
19 bottles, sampling QA/QC, etc., refer to the Permit, Part III, LERF and 200 Area ETF unit-specific
20 conditions and Chapter 3.0, Waste Analysis Plan.

21 **3.8.2 Analyte Selection and Rationale**

22 The DQO analysis for the 242-A Evaporator examined the data needs for sampling the candidate feed
23 tanks and determined that the analyses in Table 3.5 should be conducted to satisfy WAC 173-303-300
24 requirements. Table 3.5 also contains the rationale for these parameters being selected. Section 3.6
25 provides additional detail on the rationale.

26 For information on process condensate sample analyte selection and rationale, refer to the Permit, Part III,
27 LERF and 200 Area ETF unit-specific conditions and Chapter 3.0, Waste Analysis Plan.

1

Table 3.4. Candidate Feed Tank Sample Point Selection.

Number of samples	Location of sample points
Two samples	One sample taken from the upper half of the waste from one riser and the other sample taken from the lower half of the waste from another riser.
Three samples	Two Samples taken from one riser (one from the top half and the other from the bottom half of the waste) and one sample from another riser
Four samples	Two samples taken from each of two separate risers. One sample is to be taken from the top half of the waste and one from the bottom half of the waste from each of the selected risers.
Five samples	Same as for four samples except one sample from either the top or bottom half of the tank will be taken from a third riser

2

Table 3.5. Analytes for Candidate Feed Tanks

Parameter	Test technique	Analyte	Rationale
Exotherm	Differential scanning calorimeter	Temperature and energy	Verify the waste will not undergo an exothermic reaction (Section 3.6.1.2).
Compatibility test	Mixing and compatibility study	Visual physical changes	Verify the waste is chemically compatible (Section 3.6.1.3).
Organic compounds	Gas chromatograph/mass spectrometer	Acetone, 1-Butanol, 1-Butoxyethanol, 1-Butanone, Tri-butyl phosphate	Used in calculations to verify that vessel vent emissions will not exceed regulatory limits and to prevent compatibility problems with the LERF liner (Section 3.6.1.4).
	Carbon coulometric detector	Total carbon, Total inorganic carbon	Used in calculations to verify that vessel vent emissions will not exceed regulatory limits and to prevent compatibility problems with the LERF liner (Section 3.6.1.4).
Ammonia	Ion selective electrode	Ammonia	To prevent compatibility problems with the LERF liner (Section 3.6.1.45.1.3).

3

3.9 ANALYTICAL METHODS AND QUALITY ASSURANCE AND QUALITY CONTROL

4

This section provides information on the analytical methods and QA/QC for candidate feed tank samples, including discussions concerning laboratory selection and analytical methods. For information on process condensate analytical methods and QA/QC, refer to the Permit, Part III, LERF and 200 Area ETF unit-specific conditions and Chapter 3.0, Waste Analysis Plan.

5

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8

3.9.1 Laboratory Selection

9

Because of the samples, it is anticipated that candidate feed tank sample analyses will be conducted at the 222-S Laboratory Complex. Other laboratories at the Hanford Facility could be used provided they are equipped to handle such samples. Laboratory selection depends on availability, analytical needs, and the ability of the laboratory to meet Permit and quality assurance requirements.

10

11

12

1 **3.9.2 Analytical Methods**

2 The analytical methods that must be followed for RCRA sampling of the candidate feed tanks are
 3 included in Table 3.6. Performance-based specifications rather than procedure-based specifications are
 4 used for determining the appropriate analytical methods. This allows for necessary adjustments to the
 5 methods for Hanford Facility-specific issues; related to high radioactivity of the sample matrix, while
 6 ensuring acceptable data quality. Because of the high radioactivity, the analytical method will in some
 7 cases deviate from those in national standards such as *Test Methods For Evaluating Solid Waste, SW-846*
 8 (EPA 1986) and *Standard Methods for the Examination of Water and Waste Water (AWWA 1989)*.

9 **3.9.3 Laboratory Quality Assurance and Quality Control**

10 Candidate feed tank analytical and sampling methods conducted as part of this plan meet the data quality
 11 requirements contained in Table 3.7. Quality control check samples (i.e., calibration samples and/or
 12 laboratory control samples) generally are performed once per sample event (e.g., once for all samples
 13 from one candidate feed tank). Matrix spike and duplicate analysis are performed once per sample event
 14 for all methods except differential scanning calorimetry (DSC). A duplicate analysis is performed for
 15 DSC analysis to determine method precision. Accuracy for DSC is evaluated by using the laboratory
 16 control standard.

17 The QA/QC program for sampling and analysis related to this unit must, at a minimum, comply with the
 18 applicable Hanford Site standard requirements and the regulatory requirements. All analytical data will
 19 be defensible and will be traceable to specific, related quality control samples and calibrations.

20 **Table 3.6. Analytical Methods for Candidate Feed Tank Stream Analytes.**

Category	Analyte	Performance-based analytical methods	Basis for method	Equipment/Method
Organics	Acetone 2-Butanol 2-Butanone	Purge and trap and GC/MS (VOA)	SW-846 Method 8260	A diluted sample is purged with nitrogen or helium and organic vapors are trapped in an adsorbent column. The column is desorbed at 180° C into a 30-m long wide- or narrow-bore capillary column. The GC column is heated/desorbed into an MS for analysis.
	2-Butoxyethanol Tri-butyl Phosphate	Solvent extraction and GC/MS (semi-VOA)	SW-846 Method 3520B and 8270A	A diluted sample is adjusted to pH <2 (pH <6 in some cases) using sulfuric acid solution. The sample is placed in a continuous liquid-liquid extractor using methylene chloride as the extractant. The extractant is placed in an evaporator and volume is reduced. The extractant is injected into a GC/MS for analysis.
Inorganic	Ammonia	Ion selective electrode	AWWA Method 4500-NH3	The sample is preserved by the addition of hydrochloric acid solution to pH <2. For analysis, a diluted sample is made alkaline by sodium hydroxide solution. The ammonia is measured by an ammonia gas sensing electrode. A standard ammonium chloride solution is added and measured by the electrode in two stages. Based on the three readings, an ammonia concentration is calculated.
Other	Exotherm	Differential scanning calorimeter	N/A	A sample is placed in the DSC unit and heated to 500° C. The differential heat flow between the sample and a reference pan is monitored by thermocouples. A duplicate sample is run on the equipment.
	Mixing and compatibility study	Lab specific	N/A	Solution from each sample are mixed and visually checked for gas evolution, heat generation, precipitation, dissolution of solids, color change, clarity, and any other observable characteristics.

Category	Analyte	Performance-based analytical methods	Basis for method	Equipment/Method
	Total carbon	Combustion with IC _T /TOC coulometric detection OR Persulfate oxidation with IC _T /TOC coulometric detection	Combustion and persulfate treatment: AWWA Method 5310 Coulometry: ASTM D4129 (AWWA approval pending)	A diluted sample is injected into a furnace heated to 800° C while purged with oxygen. The furnace converts carbon to carbon dioxide, which is carried by the oxygen. The gas sample passes through adsorbent columns to remove acid vapors, sulfur oxides and nitrogen oxides. The carbon dioxide is absorbed in an organic solution and measured with a coulometric carbon analyzer. OR: A diluted sample is acidified with sulfuric acid, converting inorganic carbon to carbon dioxide. The sample purged with oxygen, stripping the carbon dioxide. Then, persulfate is added to the sample to oxidize the organic carbon. The sample is again acidified with sulfuric acid and purged with oxygen. The gas samples from both steps pass through an adsorbent column to remove acid vapors, sulfur oxides and nitrogen oxides. The carbon dioxide is absorbed in an organic solution and measured with a coulometric carbon analyzer.
	Total Inorganic Carbon	Acidification with IC _T /TOC coulometric detection	Acidification: AWWA Method 5310. Coulometry: ASTM D4129 (AWWA approval pending) GC/MS - gas chromatography/mass spectrometry VOA - volatile organic analysis IC _T - total inorganic carbon TOC - total organic carbon	A diluted sample is acidified with sulfuric acid/sulfamic acid, converting inorganic carbon to carbon dioxide. The sample purged with oxygen, stripping the carbon dioxide. The gas sample passes through scrubbers to remove acid vapors, sulfur oxides and nitrogen oxides. The carbon dioxide is absorbed in an organic solution and measured with a coulometric carbon analyzer.

1 **Table 3.7. Quality Assurance Requirements for Candidate Feed Tank Stream Analytes**

Category	Analyte	Estimated quantitation limit (matrix specific)	Precision (RPD between duplicates), %	Accuracy (recovery of matrix spike ¹), %	Action level ²
Organics	Acetone	28 mg/L	<25	40-110	> 87 mg/L ³
	1-Butanol	20 mg/L	<25	30-110	> 226 mg/L ³
	2-Butoxyethanol	30 mg/L	<25	30-110	> 95.2 mg/L ³
	2-Butanone (methyl ethyl ketone)	18 mg/L	<25	40-110	> 58 mg/L ³
	Tri-butyl phosphate	50 mg/L	<25	40-125	> 1.015E+4 mg/L ³
Inorganic	Ammonia	400 Φg/ml	<20	75-125	> 50,000 mg/L
Other	Exotherm	None	<20 ⁴	Not applicable ⁴	< 168 EC or absolute value of ratio of exotherm to endotherm > 1
	Mixing and compatibility study	Not applicable	Not Applicable	Not Applicable	Visual: unusual changes in color, temperature, clarity, etc.
	Total carbon	25 Φg/mL	<20	75-125	C _T -IC _T > 87 mg/L
	Total inorganic carbon	25 Φg/mL	<20	75-125	C _T -IC _T > 87 mg/L

Reserved.

In deriving the action levels, the ratio of feed flow rate to slurry flow rate (R) is assumed to be 2.

For organic species limits, sum of the fractions rule apply (refer Tables 3.2 and 3.3). Total carbon and total inorganic carbon are not included in the summation of organics.

Precision for this method is evaluated by the deviation between sample (unspiked) and sample replicate.

Accuracy for DSC is evaluated by using the laboratory control standard.

RPD - relative percent difference C_T - total carbon IC_T - total inorganic carbon

Mg/L - milligram per liter Φg/L - microgram per liter

2 **3.10 REFERENCES**

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1	Chapter 8.0	Personnel Training
2	8.0	PERSONNEL TRAINING 8.1
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8.0 PERSONNEL TRAINING

This chapter discusses personnel training requirements based on WAC 173-303 and the Hanford Facility RCRA Permit, WA7 89000 8967 (Permit). In accordance with WAC 173-303-806(4)(a)(xii), the Hanford Facility Dangerous Waste Part B permit application must contain two items: (1) an outline of both the introductory and continuing training programs by owners or operators to prepare persons to operate or maintain the TSD facility in a safe manner as required to demonstrate compliance with WAC 173-303-330, and (2) a brief description of how training will be designed to meet actual job tasks in accordance with the requirements in WAC 173-303-330(1)(d). Permit Condition II.C, Personnel Training contains training requirements applicable to Hanford Facility personnel and non-Facility personnel.

Compliance with these requirements at 242-A Evaporator is contained in Permit Attachment 33, Chapter 8.0 and this chapter. This chapter supplements Permit Attachment 33, Chapter 8.0.

8.1 OUTLINE OF INTRODUCTORY AND CONTINUING TRAINING PROGRAMS

The introductory and continuing training programs are designed to prepare personnel to manage and maintain the TSD unit in a safe, effective, and environmentally sound manner. In addition to preparing personnel to manage and maintain TSD units under normal conditions, the training programs ensure that personnel are prepared to respond in a prompt and effective manner should abnormal or emergency conditions occur. Emergency response training is consistent with the description of actions contained in Chapter 7.0, Contingency Plan. The introductory and continuing training programs contain the following objectives:

- Teach Hanford Facility personnel to perform their duties in a way that ensures the Hanford Facility's compliance with WAC 173-303
- Teach Hanford Facility personnel dangerous waste management procedures (including implementation of the contingency plan) relevant to the job titles/positions in which they are employed, and
- Ensure Hanford Facility personnel can respond effectively to emergencies.

8.1.1 Introductory Training

Introductory training includes general Hanford Facility training and TSD unit-specific training. General Hanford Facility training is described in Attachment 33, Chapter 8.0, Section 8.1, and is provided in accordance with the Permit Condition II.C.2. TSD unit-specific training is provided to Hanford Facility personnel, allowing those personnel to work unescorted, and in some cases is required for escorted access. Hanford Facility personnel cannot perform a task for which they are not properly trained, except to gain required experience while under the direct supervision of a supervisor or coworker who is properly trained. Hanford Facility personnel must be trained within 6 months after their employment at or assignment to the Hanford Facility, or to a new job title/position at the Hanford Facility, whichever is later.

General Hanford Facility training: Refer to description in Attachment 33, Chapter 8.0, Section 8.1.

Contingency Plan training: Hanford Facility personnel receive training on applicable portions of the *Hanford Emergency Management Plan* (Permit Attachment 4) in general Hanford Facility training. In addition, Hanford Facility personnel receive training on content of the description of actions contained in contingency plan documentation in Chapter 7.0 to be able to effectively respond to emergencies.

1 Emergency Coordinator training: Hanford Facility personnel who perform emergency coordinator duties
2 in WAC 173-303-360 (e.g., Building Emergency Director) in the Hanford Incident Command System
3 receive training on implementation of the contingency plan and fulfilling the position within the Hanford
4 Incident Command System. These Hanford Facility personnel must also become thoroughly familiar
5 with applicable contingency plan documentation, operations, activities, location, and properties of all
6 waste handled, location of all records, and the unit/building layout.

7 Operations training: Dangerous waste management operations training (e.g., waste designation training,
8 shippers training) is determined on a unit-by-unit basis and considers the type of waste management unit
9 (e.g., container management unit) and the type of activities performed at the waste management unit
10 (e.g., sampling). For example, training provided for management of dangerous waste in containers is
11 different than the training provided for management of dangerous waste in a tank system. Common
12 training required for compliance within similar waste management units can be provided in general
13 training and supplemented at the TSD unit. Training provided for TSD unit-specific operations is
14 identified in the training plan documentation based on: (1) whether a general training course exists,
15 (2) the training needs to ensure waste management unit compliance with WAC 173-303, and (3) training
16 commitments agreed to with Ecology.

17 **8.1.2 Continuing Training**

18 Continuing training meets the requirements for WAC 173-303-330(1)(b) and includes general Hanford
19 Facility training and TSD unit-specific training.

20 General Hanford Facility training: Annual refresher training is provided for general Hanford Facility
21 training. Refer to description in Attachment 33, Chapter 8.0, Section 8.1.

22 Contingency plan training: Annual refresher training is provided for contingency plan training. Refer to
23 description above in Section 8.1.1.

24 Emergency coordinator training: Annual refresher training is provided for emergency coordinator
25 training. Refer to description above in Section 8.1.1.

26 Operations training: Refresher training occurs on many frequencies (i.e., annual, every other year, every
27 3 years) for operations training. When justified, some training will not contain a refresher course and will
28 be identified as a one-time only training course. The TSD unit-specific training plan documentation will
29 specify the frequency for each training course. Refer to description above in Section 8.1.1.

30 **8.2 DESCRIPTION OF TRAINING DESIGN**

31 Proper design of a training program ensures personnel who perform duties on the Hanford Facility related
32 to WAC 173-303-330(1)(d) are trained to perform their duties in compliance with WAC 173-303. Actual
33 job tasks, referred to as duties, are used to determine training requirements. The first step taken to ensure
34 Hanford Facility personnel have received the proper training is to determine and document the waste
35 management duties by job title/position. The second step compares waste management duties to general
36 waste management unit training curriculum. If general waste management unit training curriculum does
37 not address the waste management duties, the training curriculum is supplemented and/or on-the-job
38 training is provided. The third step summarizes the content of a training course necessary to ensure that
39 the training provided to each job title/position addresses associated waste management duties. The last
40 step is to assign training curriculum to Hanford Facility personnel based on the previous evaluation. The
41 training plan documentation contains this process.

1 Waste management duties include those specified in Section 8.1 as well as those contained in
2 WAC 173-303-330(1)(d). Training elements of WAC 173-303-330(1)(d) applicable to the
3 242-A Evaporator operations include the following:

- 4 • Procedures for using, inspecting, repairing, and replacing emergency and monitoring equipment
- 5 • Key parameters for automatic waste feed cut-off systems
- 6 • Communications or alarm systems
- 7 • Response to fires or explosions
- 8 • Shutdown of operations.

9 Hanford Facility personnel who perform these duties receive training pertaining to their duties. The
10 training plan documentation described in Section 8.3 contains specific information regarding the types of
11 training Hanford Facility personnel receive based on the outline in Section 8.1.

12 8.3 DESCRIPTION OF TRAINING PLAN

13 In accordance with Permit Condition II.C.3, the unit-specific portion of the Hanford Facility Dangerous
14 Waste permit application must contain a description of the training plan. Training plan documentation is
15 maintained outside of the Hanford Facility Dangerous Waste Part B permit application and the Permit.
16 Therefore, changes made to the training plan documentation are not subject to the Permit modification
17 process. However, the training plan documentation is prepared to comply with WAC 173-303-330(2).

18 Documentation prepared to meet the training plan consists of hard copy and/or electronic media as
19 provided by Permit Condition II.C.1. The training plan documentation consists of one or more
20 documents and/or a training database with all the components identified in the core document.

21 A description of how training plan documentation meets the three items in WAC 173-303-330(2) is as
22 follows:

- 23 1. -330(2)(a): "The job title, job description, and name of the employee filling each job. The job
24 description must include requisite skills, education, other qualifications, and duties for each position."

25 Description: The specific Hanford Facility personnel job title/position is correlated to the waste
26 management duties. Waste management duties relating to WAC 173-303 are correlated to training
27 courses to ensure training properly is assigned.

28 Only names of Hanford Facility personnel who carry out job duties relating to TSD unit waste
29 management operations at the 242-A Evaporator are maintained. Names are maintained within the
30 training plan documentation. A list of Hanford Facility personnel assigned to the 242-A Evaporator
31 is available upon request.

32 Information on requisite skills, education, and other qualifications for job titles/positions are addressed by
33 providing a reference where this information is maintained (e.g., human resources). Specific information
34 concerning job title, requisite skills, education, and other qualifications for personnel can be provided
35 upon request.

- 36 2. -330(2)(b): "A written description of the type and amount of both introductory and continuing
37 training required for each position."

Description: In addition to the outline provided in Section 8.1, training courses developed to comply with the introductory and continuing training programs are identified and described in the training plan documentation. The type and amount of training is specified in the training plan documentation as shown in Table 8-1.

3. -330(2)(c): "Records documenting that personnel have received and completed the training required by this section. The Department may require, on a case-by-case basis, that training records include employee initials or signature to verify that training was received."

Description: Training records are maintained consistent with Attachment 33, Chapter 8.0, Section 8.4.

Table 8.1. 242-A Evaporator Training Matrix

Attachment 33 Chapter 8 Training Category		Training Category					
		General Hanford Facility Training	Contingency Plan Training	Emergency Coordinator Training	Operations Training		
Operating Unit 4: 242A Evaporator Dangerous Waste Training Plan (TFC-PLN-07) implementing category		Orientation Program (Tank Farm and 242-A Evaporator)	Emergency Hazards Check List	Emergency Coordinator Training	General Waste Management (handling, segregation, and packaging)	Container Management	Tank System Management
Job title/position	Dangerous Waste Worker Categories*						
Nuclear Chemical (Operators)	Waste Worker	X	X	X	X	X	X
Shift Technical Advisor (STAs)	Waste Worker Supervisor/ Manager	X	X		X		
Shift Manager (SMs)	Waste Worker Supervisor/ Manager	X	X	X	X		
Operational Engineer (OEs)	Waste Worker Supervisor/ Manager	X	X	X	X		
Environmental Compliance Officer	Waste Worker Supervisor/ Manager	X	X	X	X		
Waste Service Provider	Advanced Waste Worker	X	X	X	X	X	

* Dangerous Waste Worker categories are defined in the Tank Farm Contractor Dangerous waste Training Pan (TFC-PLN-07 current revision)

¹ All training currently in Table 8-1 is class-room instruction per WAC 173-3-3-330(1)

Hanford Facility RCRA Permit Modification Notification Forms

**Part III, Chapter 10 and Attachment 51
Waste Treatment and Immobilization Plant (WTP)**

Index

Ecology approved PCNs for quarter ending September 30, 2007:

<u>PCN</u>	<u>Date on Modification Form</u>
24590-HLW-PCN-ENV-06-021	2007-06-27 Denied
24590-PTF-PCN-ENV-06-016	2007-07-30 Approved
24590-PTF-PCN-ENV-06-018	2007-08-08 Approved
24590-HLW-PCN-ENV-06-025	2007-08-23 Approved
24590-PTF-PCN-ENV-07-005	2007-08-29 Approved
24594-LAW-PCN-ENV-06-004	2007-08-30 Approved
24590-HLW-PCN-ENV-07-001	2007-08-31 Approved
24590-LAW-PCN-ENV-06-014	2007-09-05 Approved
24590-LAW-PCN-ENV-07-001	2007-09-05 Approved
24590-LAW-PCN-ENV-07-002	2007-09-05 Approved
24590-LAW-PCN-ENV-07-003	2007-09-05 Approved
24590-LAW-PCN-ENV-06-007	2007-09-07 Approved
24590-LAW-PCN-ENV-06-012	2007-09-11 Approved
24590-LAW-PCN-ENV-07-005	2007-09-11 Approved

September 30, 2007

WA7890008967, Operating Unit 10, WTP

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Quarter Ending 06/30/07

24590-HLW-PCN-ENV-06-021

Hanford Facility RCRA Permit Modification Notification Form
Part III, Chapter 10 and Attachment 51
Waste Treatment and Immobilization Plant

Index

Page 2 of 2: Hanford Facility RCRA Permit, Part III, Chapter 10, and Attachment 51, Appendix 10.6
Update the HLW Facility Silver Mordenite Column Mechanical Systems Data Sheets 24590-HLW-MKD-HOP-P0014 and 24590-HLW-MKD-HOP-P0017, in Appendix 10.6 of the Dangerous Waste Permit.

Submitted by Co-Operator:

Reviewed by ORP Program Office:

D. A. Klein
D. A. Klein

5/3/07
Date

S. J. Olinger
S. J. Olinger

5/3/07
Date

Quarter Ending 06/30/07

24590-HLW-PCN-ENV-06-021

Hanford Facility RCRA Permit Modification Notification Form

Unit: Waste Treatment and Immobilization Plant	Permit Part & Chapter: Part III, Chapter 10 and Attachment 51																						
<u>Description of Modification:</u>																							
<p>This modification updates the HLW Facility Melter 1 and 2 Silver Mordenite Column Mechanical Systems Data Sheets (24590-HLW-MKD-HOP-P0014 and 24590-HLW-MKD-HOP-P0017) located in Appendix 10.6 of the Dangerous Waste Permit. The silver mordenite columns have been installed in the HLW facility in 2005; the purpose of this PCN is to update the mechanical data sheets to include design details provided by the vendor and other minor editorial changes.</p> <p>The changes are summarized as follows:</p> <ul style="list-style-type: none"> • Revised Seismic Base Moment from TBD to data provided by the vendor • Revised Support Type from TBD to data provided by the vendor • Revised Nozzles Sampling & Testing Connections from TBD to data provided by the vendor • Revised Note 1 by adding tolerances to the unit dimensions • Reinstated Note 4 deleted from the previous revision to the permit data sheets. Note 4 clarifies that the updated data sheet supercedes the information contained in the supplier deviation request. • Reinstated the reference to Process Data Sheet deleted from the previous revision to the permit data sheet. • Added the Safety Screening block and the E&NS signature column. <p>Please replace the following documents in Appendix 10.6 of the Dangerous Waste Permit:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="4" style="text-align: left;">Appendix 10.6</th> </tr> <tr> <td style="width: 15%;">Replace:</td> <td style="width: 35%;">24590-HLW-MKD-HOP-P0014, rev. 1</td> <td style="width: 15%;">With:</td> <td style="width: 35%;">24590-HLW-MKD-HOP-P0014, rev. 2</td> </tr> <tr> <td></td> <td>24590-HLW-MKD-HOP-P0017, rev. 0</td> <td></td> <td>24590-HLW-MKD-HOP-P0017, rev. 1</td> </tr> </table> <p>WAC 173-303-830 Modification Class: ^{1 2}</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 40%;">Please mark the Modification Class:</th> <th style="width: 15%;">Class 1</th> <th style="width: 15%;">Class '1</th> <th style="width: 15%;">Class 2</th> <th style="width: 15%;">Class 3</th> </tr> <tr> <td></td> <td></td> <td style="text-align: center;">X</td> <td></td> <td></td> </tr> </table> <p>Enter Relevant WAC 173-303-830, Appendix I Modification citation number: N/A</p> <p>Enter wording of WAC 173-303-830, Appendix I Modification citation: N/A</p> <p>In accordance with WAC 173-303-830(4)(d)(i), this modification notification is requested to be reviewed and approved as a Class 1 modification. WAC 173-303-830(4)(d)(ii)(A) states, "Class 1 modifications apply to minor changes that keep the permit current with routine changes to facility or its operation. These changes do not substantially alter the permit conditions or reduce the capacity of the facility to protect human health or the environment."</p>		Appendix 10.6				Replace:	24590-HLW-MKD-HOP-P0014, rev. 1	With:	24590-HLW-MKD-HOP-P0014, rev. 2		24590-HLW-MKD-HOP-P0017, rev. 0		24590-HLW-MKD-HOP-P0017, rev. 1	Please mark the Modification Class:	Class 1	Class '1	Class 2	Class 3			X		
Appendix 10.6																							
Replace:	24590-HLW-MKD-HOP-P0014, rev. 1	With:	24590-HLW-MKD-HOP-P0014, rev. 2																				
	24590-HLW-MKD-HOP-P0017, rev. 0		24590-HLW-MKD-HOP-P0017, rev. 1																				
Please mark the Modification Class:	Class 1	Class '1	Class 2	Class 3																			
		X																					
Modification Approved: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No (state reason for denial) <u>Reason for denial:</u> <i>errors on Mechanical Data Sheet</i>	Reviewed by Ecology:  S. Dahl Date 10/26/07																						

¹ Class 1 modifications requiring prior Agency approval.

² If the proposed modification does not match any modification listed in WAC 173-303-830 Appendix I, then the proposed modification should automatically be given a Class 3 status. This status may be maintained by the Department of Ecology, or down graded to a Class '1, if applicable.



R10771497

	MECHANICAL SYSTEMS DATA SHEET: VESSEL	PLANT ITEM No. 24590-HLW-MV-HOP-ABS-00002
--	--	---

ISSUED BY RPP-WTP-PDG	
Project: RPP-WTP	P&ID: 24590-HLW-M6-HOP-P0008
Project No: 24590	Process Data Sheet: 24590-HLW-MKD-HOP-00012 2
Project Site: Hanford	Vessel Drawing: 24590-HLW-3PS-MBT0-TP001 (Vendor Supplied Dwg's TBD)
Description: Melter 1 Silver Mordenite Column	

Reference Data

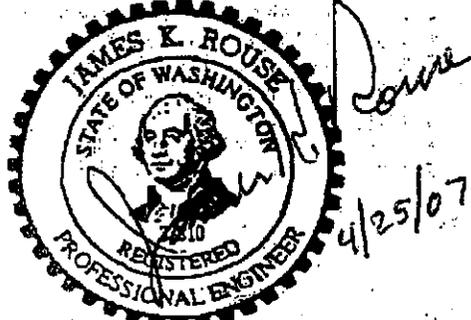
Charge Vessels (Tag Numbers)	None
Pulsejet Mixers / Agitators (Tag Numbers)	None
RFDs/Pumps (Tag Numbers)	None

Design Data

Quality Level	QL-2	Fabrication Specs	24590-HLW-3PS-MBT0-TP001		
Seismic Category	SC-III	Design Code	ASME AG-1/1a & ASME Section VIII, Div. 1		
Service/Contents	Filtered Radioactive Gas	Code Stamp	No		
Design Specific Gravity	0.588	NB Registration	No		
Maximum Operating Volume	gal NIA	Weights (lbs)	Empty	Operating	Test
Total Volume	gal NIA	Estimated	14,200	35,200	35,200
Environmental Qualification 2	None	Actual *	39,600	55,900	55,900

Inside Diameter	inch	NIA			Wind Design	Not Required	
Length/Height (TL-TL)	inch	See note 1			Snow Design	Not Required	
		Vessel Operations	Vessel Design	Coil/Jacket Design	Seismic Design	24590-WTP-3PS-FB01-TP001 & 24590-HLW-3PS-MBT0-TP001	
Internal Pressure	psig	0	3	NIA	Seismic Base Moment *	ft-k	0 2
External Pressure	psig	1.3 (see note 3)	3	NIA	Postweld Heat Treat	Not Required	
Temperature	*F	330	330	NIA	Corrosion Allowance	inch	0.04
Min. Design Metal Temp.	*F	59			Hydrostatic Test Pressure *	psig	See note 2
Max Operating Pressure Drop	in-WG	10					

Note: Please note that source, special nuclear and byproduct materials, as defined in the Atomic Energy Act of 1954 (AEA), are regulated at the U.S. Department of Energy (DOE) facilities exclusively by DOE acting pursuant to its AEA authority. DOE asserts, that pursuant to the source, special nuclear, and byproduct materials at DOE-owned nuclear facilities. Information contained herein on radionuclides is provided for process description purposes only.



EXPIRES: **3/5/2008**

This Bound Document contains a total of 3 Sheets.

2

Safety Screening / Evaluation Required? If yes, per 24590-WTP-GPP-SREG-002, signature is required.	Yes	No X
--	-----	-------------

2	4/16/07	Issued for Permitting Use	C. Thompson	A. Cutrona	G. Goolsby	N/A	
1	1/28/04	Issued for Permitting Use	K. Brightman	D. Pease	C. Morley	N/A	M. Hoffmann
0	10/29/02	Issued for Permitting Use	J. Jackson	C. Slater	N/A	N/A	S. Kirk
REV	DATE	REASON FOR REVISION	PREPARER	CHECKER	REVIEWER	E&NS	APPROVER



MECHANICAL SYSTEMS DATA SHEET: VESSEL

PLANT ITEM No.
24590-HLW-MV-HOP-ABS-00002

Materials of Construction

Component	Material	Minimum Thickness / Size	Containment
Top Head	NIA	NIA	NIA
Shell	316L	1/4" Plate	Primary
Bottom Head	NIA	NIA	NIA
Support	316L	1/4" 3 x 3 angle	NIA
Jacket/Coils/Half-Pipe Jacket	NIA	NIA	NIA
Internals	316L	1/4" Plate	NIA
Pipe	316L	SCH 40	NIA
Forgings/ Bar stock	NIA	NIA	NIA
Gaskets	Silicone HT	NIA	NIA
Bolting	Varies - See DWGs	NIA	NIA

Miscellaneous Data

Orientation	Horizontal	Support Type	20" x 2 7/16" x 1/4" Fabricated Flange 304L 2
Insulation Function	Personnel protection and process temperature control	Insulation Material	Calcium Silicate w/0.024" thk, 304 SST Jacket
Insulation Thickness (Inch)	6"	Internal Finish	NIA
		External Finish	NIA

Remarks

* To be determined by the Vendor.

Equipment Cyclic Data Sheet

Component Plant Item Number	24590-HLW-MV-HOP-ABS-00002
Component Description	Silver Mordenite Column containment housing
<i>The information below is provisional and envelopes operational duty for fatigue assessment. It is not to be used as operational data.</i>	
Materials of Construction	316L
Design Life	40 yr
Component Function and Life Cycle Description	Removal of Iodine-129 and other halogens

Load Type	Min	Max	Number of Cycles	Comment
Design Pressure (-ve/+ve) psig	-3	+3	1	Based on 3 yr melter life
Operating Pressure (-ve/+ve) psig	-1.3	+1.5	13	Based on 3 yr melter life
Operating Temperature °F	59	330	13	Based on 3 yr melter life
Contents Specific Gravity	0.588	0.588	NIA	
Contents Level inch	NIA	NIA	NIA	Gas service, flow through operation

Localized Features

Nozzles	Sampling & Testing Connections	3/4" - 150 lb WNF x3 2
Air Inlet	Flange	
Delivery	Flange	
Supports	*TBD	



MECHANICAL SYSTEMS DATA SHEET: VESSEL

PLANT ITEM No.

24590-HLW-MV-HOP-ABS-00002

Notes

1. Maximum outside dimensions: 19'-9 1/4" L (w/o insulation) x 15'-3 1/4" W (w/insulation) x 7'-0" H (bottom of column to top of column grating). Dimensions are $\pm 1/2"$.
2. Pneumatic Test of Housing Pressure Boundary per ASME Section VIII, Div 1. All other testing per ASME AG-1/1a & N509.
3. Normal operating pressure will be 1.3 psig External. The other pressures shown are design, off-normal conditions.
4. The information contained in revision 2 data sheet supercedes the information contained in SDDR 24590-WTP-SDDR-PROC-03-0003.
5. Contents of this document are Dangerous Waste Permit affecting.



MECHANICAL SYSTEMS DATA SHEET: VESSEL

PLANT ITEM No.
24590-HLW-MV-HOP-ABS-00003
 ISSUED BY
RPP/WTP/PBG

Project:	RPP-WTP	P&ID:	24590-HLW-M6-HOP-P20008
Project No:	24590	Process Data Sheet:	24590-HLW-MKD-HOP-00018 1
Project Site:	Hanford	Vessel Drawing:	24590-HLW-3PS-MBT0-TP001 (Vendor Supplied Dwg's TBD)
Description:	Melter 2 Silver Mordenite Column		

Reference Data

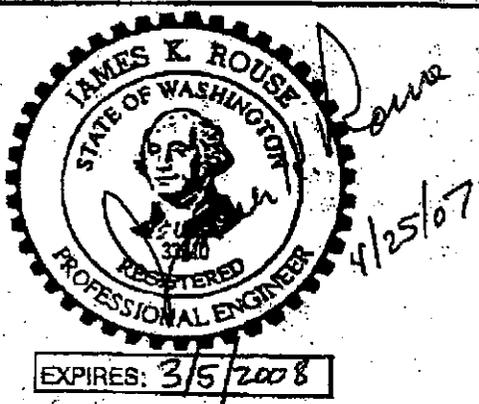
Charge Vessels (Tag Numbers)	None
Pulsejet Mixers / Agitators (Tag Numbers)	None
RFDs/Pumps (Tag Numbers)	None

Design Data

Quality Level	QL-2		Fabrication Specs	24590-HLW-3PS-MBT0-TP001		
Seismic Category	SC-III		Design Code	ASME AG-1/1a & ASME Section VIII, Div. 1		
Service/Contents	Filtered Radioactive Gas		Code Stamp	No		
Design Specific Gravity	0.588		NB Registration	No		
Maximum Operating Volume	gal	NIA	Weights (lbs)	Empty	Operating	Test
Total Volume	gal	NIA	Estimated	14,200	35,200	35,200
Environmental Qualification	1	None	Actual *	39,600	55,900	55,900

Inside Diameter	inch	NIA			Wind Design	Not Required	
Length/Height (TL-TL)	inch	See note 1			Snow Design	Not Required	
		Vessel Operating	Vessel Design	Coll/Jacket Design	Seismic Design	24590-WTP-3PS-FB01-T0001 & 24590-HLW-3PS-MBT0-TP001	
Internal Pressure	psig	0	3	NIA	Seismic Base Moment *	ft-lb	0 1
External Pressure	psig	1.3 (see note 3)	3	NIA	Postweld Heat Treat	Not Required	
Temperature	*F	330	330	NIA	Corrosion Allowance	inch	0.04
Min. Design Metal Temp.	*F	59			Hydrostatic Test Pressure *	psig	See note 2
Max Operating Pressure Drop	in-WG	10					

Note: Please note that source, special nuclear and byproduct materials, as defined in the Atomic Energy Act of 1954 (AEA), are regulated at the U.S. Department of Energy (DOE) facilities exclusively by DOE acting pursuant to its AEA authority. DOE asserts, that pursuant to the source, special nuclear, and byproduct materials at DOE-owned nuclear facilities. Information contained herein on radionuclides is provided for process description purposes only.



This Bound Document Contains a total of 3 Sheets.

Safety Screening / Evaluation Required? If yes, per 24590-WTP-GPP-SREG-002, signature is required.	Yes	No <input checked="" type="checkbox"/>
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1	4/16/07	Issued for Permitting Use	<i>C. Thompson</i>	<i>A. Cutrona</i>	<i>G. Goolsby</i>	N/A	<i>J. Jelyk</i>
0	1/28/04	Issued for Permitting Use	K. Brightman	D. Pease	C. Morley	N/A	M. Hoffmann
REV	DATE	REASON FOR REVISION	PREPARER	CHECKER	REVIEWER	E&NS	APPROVER



MECHANICAL SYSTEMS DATA SHEET: VESSEL

PLANT ITEM No.
24590-HLW-MV-HOP-ABS-00003

Materials of Construction

Component	Material	Minimum Thickness / Size	Containment
Top Head	NIA	NIA	NIA
Shell	316L	1/4" Plate	Primary
Bottom Head	NIA	NIA	NIA
Support	316L	1/4" 3 x 3 angle	NIA
Jacket/Coils/Half-Pipe Jacket	NIA	NIA	NIA
Internals	316L	1/4" Plate	NIA
Pipe	316L	SCH 40	NIA
Forgings/ Bar stock	NIA	NIA	NIA
Gaskets	Silicone HT	NIA	NIA
Bolting	Varies - See DWGs	NIA	NIA

Miscellaneous Data

Orientation	Horizontal	Support Type	20" x 2 7/16" x 1/4" Fabricated Flange 304L
Insulation Function	Personnel protection and process temperature control	Insulation Material	Calcium Silicate w/0.024" thk, 304 SST Jacket
Insulation Thickness (Inch)	6"	Internal Finish	NIA
		External Finish	NIA

Remarks

* To be determined by the Vendor.

Equipment Cyclic Data Sheet

Component Plant Item Number:	24590-HLW-MV-HOP-ABS-00002
Component Description	Silver Mordenite Column containment housing

The information below is provisional and envelopes operational duty for fatigue assessment. It is not to be used as operational data.

Materials of Construction	316L
Design Life	40 yr
Component Function and Life Cycle Description	Removal of Iodine-129 and other halogens

Load Type	Min	Max	Number of Cycles	Comment
Design Pressure (-ve/+ve) psig	-3	+3	1	Based on 3 yr melter life
Operating Pressure (-ve/+ve) psig	-1.3	+1.5	13	Based on 3 yr melter life
Operating Temperature °F	59	330	13	Based on 3 yr melter life
Contents Specific Gravity	0.588	0.588	NIA	
Contents Level inch	NIA	NIA	NIA	Gas service, flow through operation

Localized Features

Nozzles	Sampling & Testing Connections	3/4" - 150 lb WNF x3	1
Air Inlet	Flange		
Delivery	Flange		
Supports	*TBD		



MECHANICAL SYSTEMS DATA SHEET: VESSEL

PLANT ITEM No.

24590-HLW-MV-HOP-ABS-00003

Notes

1. Maximum outside dimensions: 19'-9 1/4" L (w/o insulation) x 15'-3 1/4" W (w/insulation) x 7'-0" H (bottom of column to top of column grating). Dimensions are $\pm 1/2"$. 
2. Pneumatic Test of Housing Pressure Boundary per ASME Section VIII, Div 1. All other testing per ASME AG-1/1a & N509
3. Normal operating pressure will be 1.3 psig External. The other pressures shown are design, off-normal conditions.
4. The information contained in revision 1 data sheet supercedes the information contained in SDDR 24590-WTP-SDDR-PROC-03-0003. 
5. Contents of this document are Dangerous Waste Permit affecting.

Bechtel National, Inc. Certification

The following certification statement is provided consistent with Contract No. DE-AC27-01RV14136, Section H.26, Environmental Permits, paragraph (g) for the submittal of the Hanford Facility Resource Conservation and Recovery Act Permit Modification Notification Form 24590-HLW-PCN-ENV-06-021.

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 assure 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.


for W.S. ELKINS
W. S. Elkins
Project Director

5/8/07
Date

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Quarter Ending 09/30/07

24590-PTF-PCN-ENV-06-016

Hanford Facility RCRA Permit Modification Notification Form
Part III, Operating Unit 10
Waste Treatment and Immobilization Plant

Index

Page 2 of 2: Hanford Facility RCRA Permit, Operating Unit 10, Waste Treatment and Immobilization Plant
Update Engineering Specification for PTF Vessel Vent Caustic Scrubber (24590-PTF-3PS-MKAS-TP001) in
Appendix 8.7 of the Dangerous Waste Permit.

Submitted by Co-Operator:

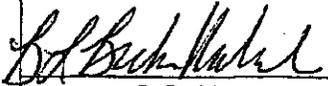
Reviewed by ORP Program Office:

D. A. Klein 6/18/07
D. A. Klein Date

T. Ray J. Smith for 7/11/07
S. J. Olinger Date

Quarter Ending September 30,
2007

24590-PTF-PCN-ENV-06-016

Hanford Facility RCRA Permit Modification Notification Form				
Unit: Waste Treatment and Immobilization Plant	Permit Part & Chapter: Part III, Operating Unit 10			
<u>Description of Modification:</u>				
<p>The purpose of this Class 1 modification is to update PTF Engineering Specification (24590-PTF-3PS-MKAS-TP001) for the PTF Vessel Vent Caustic Scrubber (PVP-SCB-00002) in Appendix 8.7 of the Dangerous Waste Permit. The following specification is submitted to replace the "permit" specification currently in Appendix 8.7.</p>				
Appendix 8.7				
Replace:	24590-PTF-3PS-MKAS-TP001, Rev. 0	With:	24590-PTF-3PS-MKAS-T0001, Rev. 1	
<p>This modification requests Ecology approval of the specific changes to this specification that are identified by revision triangles or revision bars. Revisions are the result of ongoing design (changes from vendor preliminary data to vendor detailed design). The following identifies the significant sections that have been revised on the attached data sheets.</p> <ul style="list-style-type: none"> • Revised Scope • Revised Acronyms, Abbreviations and Definitions • Revised Applicable Documents • Revised Design requirements, included new lateral restraint requirements • Revised Materials for lateral restraint • Revised Tests and Inspections, added requirements for Nondestructive Examination • Revised Documentation and Submittals <p>The following is a list of outstanding change documents that have not been incorporated into this modification:</p> <ul style="list-style-type: none"> • 24590-PTF-3PN-MKAS-00004 <p>Per WAC 173-303-830(4)(d)(ii), these changes do not substantially alter the permit conditions or reduce the capacity of the facility to protect human health or the environment.</p>				
WAC 173-303-830 Modification Class: ^{1 2}				
Please mark the Modification Class:				
	Class 1	Class ¹ 1	Class 2	Class 3
	X			
Enter Relevant WAC 173-303-830, Appendix I Modification citation number: A.1. and A.3. Enter wording of WAC 173-303-830, Appendix I Modification citation: A. General Permit Provisions 1. Administrative and informational changes 3. Equipment replacement or upgrading with functionally equivalent components (e.g., pipes, valves, pumps, conveyors, controls.)				
Modification Approved: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No (state reason for denial) Reason for denial:			Reviewed by Ecology:	
			 S. Dahl	
			7/30/07 Date	

¹ Class 1 modifications requiring prior Agency approval.

² If the proposed modification does not match any modification listed in WAC 173-303-830 Appendix I, then the proposed modification should automatically be given a Class 3 status. This status may be maintained by the Department of Ecology, or down graded to a Class '1, if applicable.



RIVER PROTECTION PROJECT – WASTE TREATMENT PLANT

ENGINEERING SPECIFICATION

FOR

PTF Vessel Vent Caustic Scrubber

ISSUED BY
RPP-WTP PDC

Content applicable to ALARA? Yes No

ADR No.
24590-PTF-ADR-M-02-057

Rev
1

Quality Level
Q
DOE Contract No. DE-AC27-01RV14136

NOTE: Contents of this document are Dangerous Waste Permit affecting.

REV	DATE	BY	CHECK	REVIEW	E&NS	QA	DPEM	
1	7/24/06	D Rickettson <i>D Rickettson</i>	L Donovan <i>L Donovan</i>	B Makadia <i>B Makadia</i>	J Hendricks <i>J Hendricks</i>	W Dey for <i>S. Ackerman</i>	J Julyk <i>J Julyk</i>	
0	07/24/03	Kar Wei Chin	N Sentanu	C Morley	N/A	G Warner	M Hoffman for G Duncan	
SPECIFICATION No.		24590-PTF-3PS-MKAS-T0001					Rev	1

Please note that source, special nuclear, and byproduct materials, as defined in the Atomic Energy Act of 1954 (AEA) are regulated at the U. S. Department of Energy (DOE) facilities exclusively by DOE acting pursuant to its AEA authority. DOE asserts that pursuant to AEA, it has sole and exclusive responsibility and authority to regulate source, special nuclear, and byproduct materials at DOE-owned nuclear facilities. Information contained herein on radionuclides is provided for process description purposes only.

Revision History

Revision	Reason for Revision
0	Issued for Purchase
1	Incorporated SCN's, 24590-PTF-3PN-MKAS-00001, 24590-PTF-3PN-MKAS-00002, & 24590-PTF-3PN-MKAS-00003. Added ANSI / AISC N690 NDE for ring beam, specifications for lateral restraint and Seismic Anchor Motions (SAM). Added Specification for Pressure Vessel Fatigue Analysis.

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1 Scope

1.1 Project Description and Location

The Hanford Tank Waste Treatment and Immobilization Plant (WTP) is a complex of waste treatment facilities where the US Department of Energy (DOE) Hanford Site tank waste will be pretreated and immobilized into a stable glass form via vitrification. The WTP contractor will design, build, and start up the WTP pretreatment and vitrification facilities for the DOE Office of River Protection (ORP).

The Hanford Site occupies an area of about 560 square miles along the Columbia River, north of Richland, WA in the USA. The WTP facilities will be constructed at the 200 East Area of the Hanford Site. The site elevation varies from 662 feet to 684 feet above mean sea level.

1.2 Equipment, Material, and Services Required

This specification establishes the minimum requirements for the performance, design, analysis, materials, fabrication, testing, inspection, quality assurance (QA), qualification, documentation, and preparation for shipment of the Vessel Vent Caustic Scrubber, plant item number 24590-PTF-MK-PVP-SCB-00002, for use in the WTP Pretreatment Facility (PTF).

The scope of work for the Seller includes all work specifically defined in this specification and its addenda and attachments. Work shall include, but shall not be limited to the following:

- 1.2.1 Provide design, materials, fabrication, testing, inspection, preparation for shipment, documentation, and submittals of a Vessel Vent Caustic Scrubber, plant item number 24590-PTF-MK-PVP-SCB-00002 in accordance with this specification, its addenda and attachments, material requisition # 24590-QL-MRA-MKAS-00002, and referenced codes, standards and Buyer documents.
- 1.2.2 Provide written (process, mechanical and hydraulic) guarantee that all equipment and components supplied by the Seller shall perform to the requirements of this specification, material requisition # 24590-QL-MRA-MKAS-00002, and referenced codes, standards and Buyer documents.
- 1.2.3 Perform the NDE for the ring beam as specified on the Mechanical Data Sheet, 24590-PTF-MKD-PVP-00002.
- 1.2.4 Provide design, materials, fabrication, testing, inspection, preparation for shipping, documentation, and submittals for the Vessel Vent Caustic Scrubber lateral restraint.
- 1.2.5 Provide Seismic Anchor Motion (SAM) for each vessel nozzle.

1.3 Work by Others

Any item not specifically listed as being supplied by the Buyer shall be provided by the Seller. The Buyer shall supply the following:

- 1.3.1 Shipping of the Vessel Vent Caustic Scrubber.
- 1.3.2 Unloading, storage and installation labor of all materials and equipment at the Buyer's job-site.
- 1.3.3 Supply and installation of instrumentation and controls.
- 1.3.4 **The Buyer is responsible for the design of the ring beam for the vessel support.**
- 1.3.5 **Embeds will be provided at elevation 41'-6" for the lateral restraint.**
- 1.3.6 **Field welding of the lateral restraint to the embed plates at elevation 41'-6".**

1.4 Acronyms, Abbreviations and Definitions

1.4.1 Acronyms and Abbreviations

APC	Additional Protection Class
ASME	American Society of Mechanical Engineers
DBE	Design Basis Earthquake
DF	Decontamination Factor
DOE	US Department of Energy
HEME	High Efficiency Mist Eliminator
ITS	Important to Safety
MDS	Mechanical Data Sheet
MR	Material Requisition
MSDS	Material Safety Data Sheet
NO _x	Nitrogen Oxides
ORP	Office of River Protection
PTF	Pretreatment Facility
PVP	Pretreatment Vessel Vent Process System
QA	Quality Assurance
QAP	Quality Assurance Program
QL	Quality Level
SC	Safety Class
SDC	Safety Design Class
SDS	Safety Design Significant
SS	Safety Significant
SSC	System, Structure, and Component
WG	Water Gauge
WTP	Hanford Tank Waste Treatment and Immobilization Plant

1.4.2 Quality Level (Q)

The quality level identifies the quality requirements to be applied to the equipment. The identified quality levels are Q, and CM (Commercial). Quality requirements are specifically defined on the associated mechanical data sheets (MDSs) and supplier quality assurance program (QAP) requirements data sheets.

1.4.3 Seismic Category (SC)

Specific requirements for each seismic category are defined in reference documents listed in section 2.3 of this specification.

1.4.4 Other Definitions

Black Cell (R5-C5): Is a sealed concrete structure containing very high radiation and contamination where human access is normally prohibited during the normal operating lifetime of the cell and maintenance is generally not performed in the cell.

C5: Contamination classification for plant areas that are considered high contamination areas. Access to C5 areas is not normally permitted.

Decontamination Factor (DF): Equals the ratio of the concentration of a component in the inlet gas versus the concentration of the same component in the outlet gas.

Design Basis Earthquake (DBE): A specification of the ground motion at the site. For the WTP site, the DBE is defined by horizontal and vertical acceleration response spectra; refer to section 2 of the MR for the attached In-Structure Acceleration Response Spectra.

Important to Safety (ITS): Systems, structures, and components (SSCs) that serve to provide reasonable assurance that the facility can be operated without undue risk to the health and safety of the workers and the public. ITS encompasses the broad class of facility features addressed (not necessarily explicitly) in the top-level radiological, nuclear, and process safety standards and principles that contribute to the safe operation and protection of workers and the public during all phases and aspects of facility operations (i.e., normal operation as well as accident mitigation). ITS includes SSCs designated as Safety Design Class (SDC) / Safety Class (SC), Safety Design Significant (SDS) / Safety Significant (SS), and Risk Reduction Class (RRC) / Additional Protection Class (APC).

MDS: Refers to the mechanical data sheet for the Vessel Vent Caustic Scrubber, Buyer document number 24590-PTF-MKD-PVP-00002.

MR: Refers to the material requisition for the Vessel Vent Caustic Scrubber, Buyer document number 24590-QL-MRA-MKAS-00002.

R5: Radiation classification for areas considered to be high or very high radiation areas.

Scrubber: Refers to the PTF Vessel Vent Caustic Scrubber, plant item number 24590-PTF-MK-PVP-SCB-00002.

1.5 Safety/Quality Classifications

Refer to the MDS for the quality level and seismic category designations of the Scrubber.

2 Applicable Documents

2.1 General

- 2.1.1 Work shall be done in accordance with the referenced codes, standards, and documents listed below, which are an integral part of this specification.
- 2.1.2 When specific chapters, sections, parts, or paragraphs are listed following a code, industry standard, or reference document, only those chapters, sections, parts, or paragraphs of the document are applicable and shall be applied. If a date or revision is not listed in section 2, the latest issue, including addenda, at the time of Request for Quote shall apply. The dates and revisions listed in section 2 shall apply to subsequent references to codes and standards within this specification. When more than one code, standard, or referenced document covers the same topic, the requirements for all must be met with the most stringent governing.

2.2 Codes and Standards

- 2.2.1 ASME Boiler and Pressure Vessel Code, Section VIII, Division 1, *Rules for Construction of Pressure Vessels*.
- 2.2.2 ASME AG-1-1997 Article AA, *Code on Nuclear Air and Gas Treatment*.
- 2.2.3 ASME-NQA-1-1989, *Quality Assurance Program Requirements for Nuclear Facilities*.
- 2.2.4 10 CFR 835, *Occupational Radiation Protection*.
- 2.2.5 ANSI/AISC N690-1994* *Specification for the Design, Fabrication, and Erection of Steel Safety-Related Structures for Nuclear Facilities*.
* This standard is tailored in Appendix C of the SRD (2.3.22). Engineering Specification is in accordance with the tailoring in Appendix C.

2.3 Reference Documents/Drawings

- 2.3.1 24590-PTF-MKD-PVP-00002, *Mechanical Data Sheet for the Vessel Vent Caustic Scrubber*.
- 2.3.2 24590-WTP-3PS-G000-T0001, *General Specification for Supplier Quality Assurance Program Requirements*.
- 2.3.3 24590-WTP-3PS-G000-T0002, *Engineering Specification for Positive Material Identification (PMI) for Shop Fabrication*.
- 2.3.4 24590-WTP-3PS-G000-T0003, *Engineering Specification for Packaging, Handling and Storage Requirements*.
- 2.3.5 24590-WTP-3PS-MV00-T0001, *Engineering Specification for Pressure Vessel Design and Fabrication*.

- 2.3.6 24590-WTP-3PS-MV00-T0002, *Engineering Specification for Seismic Qualification Criteria for Pressure Vessels.*
- 2.3.7 24590-WTP-3PS-MVB2-T0001, *Specification for Welding of Pressure Vessels, Heat Exchangers and Boilers.*
- 2.3.8 24590-WTP-3PS-SS00-T0002, *Specification for Welding of Structural Stainless Steel and Welding of Structural Carbon Steel to Structural Stainless Steel.*
- 2.3.9 24590-WTP-MV-M59T-00001, *Pressure Vessel Tolerances Standard Details.*
- 2.3.10 24590-WTP-MV-M59T-00007, *Thermowell Connection Standard Details.*
- 2.3.11 24590-WTP-MV-M59T-00009, *Lifting Lugs Standard Details.*
- 2.3.12 24590-WTP-MV-M59T-00010, *Tailing Lug Standard Details.*
- 2.3.13 24590-WTP-MV-M59T-00012, *Grounding Lug Standard Details.*
- 2.3.14 24590-WTP-MV-M59T-00016001, *Vessel Connections Standard Details Sheet 1 of 3.*
- 2.3.15 24590-WTP-MV-M59T-00016002, *Vessel Connections Standard Details Sheet 2 of 3.*
- 2.3.16 Deleted
- 2.3.17 24590-WTP-MV-M59T-00018, *Vessel Name Plate Standard Details.*
- 2.3.18 24590-WTP-PW-P30T-00001, *WTP End Prep Detail for Field Butt Welds.*
- 2.3.19 24590-WTP-3PS-SS90-T0001, **Engineering Specification for Seismic Qualification of Seismic Category I/ II Equipment and tanks.**
- 2.3.20 24590-WTP-DC-ST-01-001, **Structural Design Criteria.**
- 2.3.21 24590-WTP-DC-ST-04-001, **Seismic Analysis and Design Criteria.**
- 2.3.22 24590-WTP-SRD-ESH-01-001-02, **Safety Requirements Document, Volume II**
- 2.3.23 24590-WTP-3PS-MV00-T0003, *Engineering Specification for Pressure Vessel Fatigue Analysis.*

3 Design Requirements

3.1 General

- 3.1.1 As Low As Reasonably Achievable (ALARA) principles shall be applied to the design of the Scrubber per 10 CFR 835, *Occupational Radiation Protection.*
- 3.1.2 Seller shall design the Scrubber to the requirements of

- this specification
 - applicable codes, standards and documents in section 2 of this specification
 - Buyer document # 24590-WTP-3PS-MV00-T0001, *Engineering Specification for Pressure Vessel Design and Fabrication*
 - ASME AG-1-1997 Article AA-4000, *Code on Nuclear Air and Gas Treatment*
 - the MDS (mechanical data sheet # 24590-PTF-MKD-PVP-00002)
 - the MR (material requisition # 24590-QL-MRA-MKAS-00002)
- 3.1.3 The Scrubber, including the packed section and dry packing section, shall be designed to operate continuously for a minimum service life of 40 years without access for maintenance. Seller shall provide documentation, including but not limited to calculations and analyses, to support their design and performance of the equipment.
- 3.1.4 Seller shall provide a written performance guarantee for the Scrubber which shall include, but shall not be limited to, process and design calculations.
- 3.1.5 The main components of the Scrubber shall include, but shall not be limited to, the following:
- A ring beam for vessel support
 - A vertical cylindrical scrubber sump vessel with a vessel skirt and associated nozzles
 - A cylindrical column above the scrubber sump vessel. The column consists of the following:
 - A packed section (which may have one or more packed beds) filled with Raschig Rings, Intalox Saddles, or other similar packing, random or structured, for offgas scrubbing
 - A distribution system for the scrubbing solution above the packed section (irrigation and recirculation)
 - A dry packing section above the packed section for the removal of fine mists
 - Wash system for the dry packing and the packed section
 - Associated nozzles
 - Lateral Restraint
- 3.1.6 Deleted
- 3.1.7 Seller shall identify all interfaces and requirements for external connections supplied by the Buyer. The type and location of interfaces shall be reviewed and approved by the Buyer prior to fabrication.
- 3.1.8 Seller shall design the Scrubber and its internals, particularly the packed sections, to meet the requirements of testing, packaging, shipping (in the vertical and horizontal positions), handling, storage, installation, and operation of the Scrubber.
- 3.1.9 Corrosion allowance is specified in the MDS and shall be applied to all surfaces exposed to process vapor or liquid.
- 3.1.10 Deleted.

3.1.11 Seller shall provide a report containing equipment reliability figures for all major components and sub-components of the Scrubber. The report shall be submitted to the Buyer for review per Form G-321-E of the MR. The reliability figures shall include, as a minimum, the following:

- Failure rate, or mean time between failure (whichever is available).
- Estimated modes of failure (example, vessel failure, packing failure, nozzle failure, etc.). This may be delineated in a Failure Mode and Effect Analysis (FMEA). The method used to perform the FMEA (example, MIL-STD-1629) and the year shall be specified. All assumptions used to perform the FMEA shall be clearly stated.
- Recommended maintenance and frequency, as applicable.
- Estimated time to perform the recommended maintenance, as applicable.

The data above shall be based on the physical and environmental conditions delineated in this specification. Where possible, the Seller shall compare the figures for the equipment in this specification to similar equipment sold and serviced by the Seller. The source for all estimates and any underlying assumptions shall be stated. If software is used to perform the FMEA, the Seller shall specify the software and the version used (example software, Rellex, Isogen, Reliasoft, etc.).

3.2 Basic Description

The Scrubber treats the combined vent offgas collected from process vessels located in the PTF primarily to absorb Nitrogen Oxides (NO_x) gases and other acidic gases and removes large particulates from the feed gases.

The vent offgas flows up through the packed section of the Scrubber. The packed section shall be filled with either Raschig Rings, Intalox Saddles, or other similar random or structured packing, to provide efficient contact between the vent offgas and the alkaline scrubbing solution flowing down through the packed section. Part of the NO_x gases and other acidic gases, i.e. carbon dioxide, present in the vent offgas react with the alkaline scrubbing solution to form sodium salts. The scrubbing solution is collected in the scrubber sump vessel below the packed section. The pH level of the scrubbing solution shall be monitored and maintained within the operating pH limits by intermittent addition of fresh 5 molar caustic solution to the scrubber sump vessel.

The Scrubber shall remove some radioactive aerosols and reduce the radioactive particulate loading on the vessel vent High Efficiency Mist Eliminators (HEMEs) located downstream of the Scrubber. The Scrubber must achieve a decontamination factor (DF) of at least 1.8 for the removal of NO_x gases and a DF of at least 3.5 for the removal of large particulates for particulate sizes of 2 μm and larger.

The scrubber sump vessel batch volume shall be based on the sump vessel dimensions specified in the MDS and the total addition of caustic, the maximum condensate collected from contacting with the scrubber inlet offgases, and the runback volume of scrubbing solution in the event of stoppage of the vessel vent scrubber recirculation pumps. Total number of transfers per day, corresponding volume, and operating time shall be determined by Seller.

The vessel vent scrubber recirculation pumps, FVP-PMP-00001A/B (one operating, one standby), shall supply part of the scrubbing solution to the top of the packed section. The rest of the scrubber solution is recirculated back to the scrubber sump vessel to provide adequate mixing.

A heat exchanger designed and provided by the Buyer will maintain the temperature of the solution recirculated to the packed section at 70 degrees F. The Buyer will provide the pumps per the Seller's confirmation of scrubbing solution flow rates and supply pressure specified on the MDS.

Demineralized water shall be added intermittently to the Scrubber, via the wash system, either to clean and reduce the operating pressure drop across the packings, or to supply makeup requirements for maintaining liquid level in the scrubber sump vessel.

The vessel vent scrubber recirculation pumps also transfer scrubbing solution to the receipt vessel, PWD-VSL-00044. This is currently planned once a day (or upon a high level condition in the scrubber sump vessel) to maintain the liquid level of the scrubber sump vessel within the operating limits. An overflow line shall be provided to accommodate overflow of the scrubber sump vessel to the plant overflow vessel, PWD-VSL-00033.

Paragraph deleted.

Outlet offgases from the Scrubber flow to the vessel vent HEMEs. The Scrubber is located upstream of the HEMEs to saturate the offgas, thus avoiding any damage to the HEME elements from dry operation. The Scrubber shall provide for the removal of condensate and cool the offgas stream during the upset event of loss of chilled water supply.

3.3 Performance

- 3.3.1 Refer to the MDS for performance requirements and amount of NO₂ (Nitrogen Dioxide), NO (Nitric Oxide) and CO₂ (Carbon Dioxide) in the offgas inlet. Seller shall update the MDS per Form G-321-E of the MR with the required information for review by the Buyer.
- 3.3.2 Seller shall recommend additional operating parameters that must be monitored for the Scrubber to achieve the required performance.
- 3.3.3 Seller shall provide the optimum operating pH range for the scrubbing solution to achieve the required performance.
- 3.3.4 Seller shall provide the optimum operating and maximum rates of recirculation and delivery pressures of scrubbing solution for scrubbing and mixing purposes.
- 3.3.5 The Scrubber shall achieve a minimum DF of 1.8 for the removal of NO_x.
- 3.3.6 The Scrubber shall achieve a minimum DF of 3.5 for the removal of large particulates for particulate sizes of 2 μm and larger. Seller shall provide the DF for particle sizes of 1 μm and above as well as the DF for particle sizes of 0.5 μm and above.
- 3.3.7 Seller shall provide detailed operating instructions, in the form of a manual or similar, describing how to operate the Scrubber for all conditions (startup, normal, abnormal, shutdown) to achieve the required performance.
- 3.3.8 Seller shall provide the required flow rates and supply pressures of the demineralized water for wet packing and dry packing flushing.

3.3.9 Refer to the MDS for the maximum allowable pressure drop across the Scrubber,

3.4 Scrubber Design and Standard Details

3.4.1 Refer to the MDS for the dimensional constraints and design conditions of the Scrubber. Seller shall provide the outline dimensions, dry weight, test weight, and operating weight for the Scrubber in the form of a drawing or similar per Form G-321-E of the MR.

3.4.2 Ring beam design and fabrication shall comply with the ring beam detail in the MDS.

3.4.3 Nozzle design shall be in accordance with section 3.6 of Buyer document # 24590-WTP-3PS-MV00-T0001, *Engineering Specification for Pressure Vessel Design and Fabrication*.

3.4.4 Nozzle loading and reinforcement requirements shall be in accordance with sections 3.7 and 3.8 of Buyer document # 24590-WTP-3PS-MV00-T0001, *Engineering Specification for Pressure Vessel Design and Fabrication*.

3.4.5 Lifting lug design shall be in accordance with Buyer document # 24590-WTP-MV-M59T-00009, *Lifting Lugs Standard Details*.

3.4.6 Tailing lug design shall be in accordance with Buyer document # 24590-WTP-MV-M59T-00010, *Tailing Lug Standard Details*.

3.4.7 Grounding lug design shall be in accordance with Buyer document # 24590-WTP-MV-M59T-00012, *Grounding Lug Standard Details*.

3.4.8 Deleted

3.4.9 Seller shall provide a nameplate for the Scrubber in accordance with Buyer document # 24590-WTP-MV-M59T-00018, *Vessel Name Plate Standard Details*. General note 6 of 24590-WTP-MV-M59T-00018 does not apply.

3.4.10 Match mark the ring beam and the vessel skirt, using a line of welding bead, relative to north orientation after best fit.

3.5 Environmental Conditions

3.5.1 The Scrubber shall be stored outdoors prior to installation at ambient temperature ranging from -23°F to 113°F with relative humidity ranging from 5% to 100%.

3.5.2 The Scrubber will be located in room number P-0104, a Black Cell (R5-C5), at 0'-0" elevation of the pretreatment facility. The room will be maintained between 59°F dry bulb and 113°F dry bulb with an average relative humidity of 10.7%. The pressure in the room is between -1.0"WG and -1.4 "WG. Radiation dose rate is expected to be 100,000 mRad/hr.

3.5.3 Environment Qualification is not applicable to the PTF Vessel Vent Caustic Scrubber. The scrubber and scrubber internals are constructed from metal.

3.6 Loading

- 3.6.1 Seller shall design the Scrubber to be capable of handling the loads and stresses imposed on the Scrubber during testing, packaging, shipping (in the vertical and horizontal positions), handling, storage, installation, operation, and a Design Basis Earthquake (DBE).
- 3.6.2 Seller shall perform seismic analysis per the requirements of Buyer document # 24590-WTP-3PS-MV00-T0002, Engineering Specification for Seismic Qualification Criteria for Pressure Vessels and 24590-WTP-3PS-SS90-T0001, Engineering Specification for Seismic Qualification of Seismic Category I/II Equipment and Tanks. Refer to Section 2 of the MR for the attached In-Structure Acceleration Response Spectra.
- 3.6.3 Seller shall provide the dead weight, operating weight, and center of gravity for the column section, sump vessel, and the entire Scrubber per Form G-321-E of the MR.
- 3.6.4 Seller shall provide the base reaction (with seismic load combinations) of the Scrubber per Form G-321-E of the MR.

3.7 Instrumentation and Control Requirements

- 3.7.1 Seller shall recommend instrumentation and controls required for the Scrubber to achieve its required performance.
- 3.7.2 Seller shall provide functional test set points and recommended operating set points for the Scrubber.
- 3.7.3 Seller shall design, fabricate and install the necessary components for Buyer supplied and installed instrumentation. The components include, but are not limited to, thermowells, dip legs, dip pipes, and nozzles.
- 3.7.4 Thermowell design shall be in accordance with Buyer document # 24590-WTP-MV-M59T-00007, *Thermowell Connection Standard Details*.
- 3.7.5 Scrubber connection design shall be in accordance with Buyer document numbers 24590-WTP-MV-M59T-00016001, *Vessel Connections Standard Details Sheet 1 of 3*, and 24590-WTP-MV-M59T-00016002, *Vessel Connections Standard Details Sheet 2 of 3*.

3.8 Accessibility and Maintenance

- 3.8.1 The Scrubber will not be accessible for maintenance once it is put in operational service. Seller shall consider and recommend all necessary features to ensure the Scrubber does not fail for a minimum service life of 40 years.
- 3.8.2 Seller shall design and install a wash system to clean the dry packing and packed section as and when required. Seller shall recommend the frequency and period of cleaning as preventive maintenance for the given duty conditions. The wash system will be supplied with demineralized water.

3.9 Lateral Restraint for scrubber at elevation 41'-6"

- 3.9.1 The Buyer will provide embeds at 41'-6" elevation to support the use of a lateral restraint to reduce the bending moments in the upper column, to lower vessel junction and to reduce moments at the base. The seller shall design, fabricate, and inspect the lateral restraint.
- 3.9.2 The lateral restraint shall be designed in accordance with 24590-WTP-DC-ST-01-001, Structural Design Criteria and 24590-WTP-DC-ST-04-001, Seismic Analysis and Design Criteria.
- 3.9.3 This specification section takes precedence over section 1.3, "Analysis and design of equipment/ tank supports to be furnished by the Buyer", 24590-WTP-3PS-SS90-T0001, Seismic Qualification of Seismic Category I / II Equipment and Tanks.
- 3.9.4 The seller shall provide a calculation for the lateral restraint including: loads on the embed plate, size of field weld at the embed plate, and sizing of the lateral restraint support members.
- 3.9.5 The lateral restraint design shall take in to account the Relative Displacement values specified in attachment 5 of the Material Requisition.
- 3.9.6 The lateral restraint design shall include field trim or adjustability to account for the vessel elevation and wall construction tolerances.
- Vessel construction elevation tolerance is; plus 0 inches, minus 1/4 inches
 - Vessel location with respect to the black cell walls is; plus or minus 1 inch

Seismic Anchor Motion (SAM)

- 3.9.7 Provide the following information in the seismic report for the Vessel Vent Caustic Scrubber:
- For nozzles which are currently modeled in the finite element model the x, y and z displacements at the nozzle / shell / head intersection. The coordinates x, y and z are to be aligned with or referenced to the plant coordinate system identified on your fabrication drawings.
 - For nozzles not currently modeled in the finite element model the same information is required as above.
 - Stiffness coefficients for each nozzle currently modeled in the finite element model. Stiffness coefficients shall be reported as follows:
 - Cylindrical shell mounted nozzles
 - In plane shall be presented as longitudinal plane
 - Out plane shall be represented as circumferential plane
 - Torsional
 - Spherical shell (head) mounted nozzles
 - In plane shall be presented as meridional plane
 - Out plane shall be presented as latitudinal plane

- Torsional

4 Materials

4.1 General

- 4.1.1 All materials of construction for the Scrubber shall conform to the requirements of:
- this specification
 - Buyer document # 24590-WTP-3PS-MV00-T0001, *Engineering Specification for Pressure Vessel Design and Fabrication*
 - Buyer document # 24590-WTP-3PS-G000-T0002, *Specification for Positive Material Identification*
 - the MDS
 - the MR
 - ASME AG-1-1997 Article AA-3000, *Code on Nuclear Air and Gas Treatment*
- 4.1.2 Seller shall provide Material Safety Data Sheets (MSDSs) for all applicable materials used in the construction of the Scrubber.
- 4.1.3 All materials used in the construction of the Scrubber shall be resistant to the radiation dose rate indicated in section 3.5 of this specification.
- 4.1.4 The lateral restraint shall be stainless steel in accordance with section 7.1.2, 24590-WTP-DC-ST-01-001, *Structural Design Criteria*.

4.2 Prohibited Materials

- 4.2.1 Mercury and other low melting point metals, their alloys, or materials containing such metals as their basic constituents shall not be used in the construction of the Scrubber.
- 4.2.2 Sulfides and halides shall not be used in direct contact with stainless steel.
- 4.2.3 Asbestos shall not be included in any component of the Scrubber.
- 4.2.4 Carbon steel shall not be included in any component in contact with fluid and the vessel.
- 4.2.5 Halide containing materials shall not be used in any component of the Scrubber.

5 Fabrication

5.1 General

- 5.1.1 Fabrication of the Scrubber shall conform to the requirements of:
- this specification

- Buyer document # 24590-WTP-3PS-MV00-T0001, *Engineering Specification for Pressure Vessel Design and Fabrication*
- the MR
- ASME AG-1-1997 Article AA-6000, *Code on Nuclear Air and Gas Treatment*

5.1.2 Fabrication tolerances shall conform to the requirements of ASME Boiler and Pressure Vessel Code, Section VIII, Division 1, *Rules for Construction of Pressure Vessels*, and Buyer document # 24590-WTP-MV-M59T-00001, *Pressure Vessel Tolerances Standard Details*.

5.1.3 End preparations of field butt welds shall be in accordance with Buyer document # 24590-WTP-PW-P30T-00001, *WTP End Prep Detail for Field Butt Welds*.

5.2 Welding

5.2.1 Welding of the Scrubber shall conform to the requirements of the documents listed in section 5.1.1 of this specification and Buyer document # 24590-WTP-3PS-MVB2-T0001, *Specification for Welding of Pressure Vessels, Heat Exchangers and Boilers*.

5.2.2 Welding of structural steel shall conform to the requirements of Buyer document # 24590-WTP-3PS-SS00-T0002, *Specification for Welding of Structural Stainless Steel and Welding of Structural Carbon Steel to Structural Stainless Steel*.

6 Tests and Inspections

6.1 General

6.1.1 Seller shall conduct and be responsible for all testing and inspections of the Scrubber per the requirements of:

- this specification
- ASME Boiler and Pressure Vessel Code, Section VIII, Division 1, *Rules for Construction of Pressure Vessels*
- Buyer document # 24590-WTP-3PS-MV00-T0001, *Engineering Specification for Pressure Vessel Design and Fabrication*
- the MR
- ASME AG-1-1997 Article AA-5000, *Code on Nuclear Air and Gas Treatment*

6.1.2 Nondestructive Examination requirements shall be in accordance with sections 6.1, 6.2, and 7.2 of Buyer document # 24590-WTP-3PS-MV00-T0001, *Engineering Specification for Pressure Vessel Design and Fabrication*.

6.1.3 Seller shall develop and submit detailed test and inspection procedures for conducting all testing and inspections required per this specification, applicable codes, standards, and reference documents for review by the Buyer prior to fabrication of the Scrubber.

6.1.4 Seller shall complete and submit reports of all testing and inspections. Reports shall identify the component tested or inspected, date performed, applicable procedures,

acceptance criteria, person performing the test or inspection, results, and conclusions. Drawings of test setups shall be included. All testing and inspection results shall be certified.

- 6.1.5 Control and calibration of measuring and test equipment shall be in accordance with ASME AG-1-1997 Article AA-5130, *Code on Nuclear Air and Gas Treatment*.
- 6.1.6 **Nondestructive Examination for the ring beam shall meet the additional requirements of ANSI/AISC N690, section 11, 24590-WTP-3PS-SS00-T0002, Welding of Structural Stainless Steel and Welding of Structural Carbon Steel to Structural Stainless Steel. All ring beam welds are considered critical welds. Section 11 is mandatory even if the web to flange weld NDE is not indicated on a drawing.**
- 6.1.7 **Nondestructive Examination for the lateral restraint shall meet the additional requirements of ANSI/AISC N690, section 11, 24590-WTP-3PS-SS00-T0002, Welding of Structural Stainless Steel and Welding of Structural Carbon Steel to Structural Stainless Steel.**

7 Preparation for Shipment

7.1 General

- 7.1.1 The Scrubber shall be prepared for shipment in accordance with:
- Buyer document # 24590-WTP-3PS-MV00-T0001, *Engineering Specification for Pressure Vessel Design and Fabrication*
 - Buyer document # 24590-WTP-3PS-G000-T0003, *General Specification for Packaging, Shipping, Handling and Storage Requirements*
 - ASME AG-1-1997 Article AA-7000, *Code on Nuclear Air and Gas Treatment*
- 7.1.2 All results of shop tests and inspections for the Scrubber shall be reviewed by the Buyer prior to preparing and packaging it for shipment.
- 7.1.3 Seller shall verify, by calculation, that the Scrubber and its internals will withstand loads occurring during shipping, handling and installation.

7.2 Tagging

- 7.2.1 All packages shall be clearly and suitably tagged to at least show the Seller's name, Buyer's name, plant item number, purchase order number, package contents, parts list (for each package), and handling instructions.
- 7.2.2 The Scrubber shall be identified using a nameplate as specified in section 3.4.9 of this specification.

7.3 Shipping, Handling and Storage Instructions

Seller shall submit shipping weights as well as detailed shipping, handling, and storage instructions for the Scrubber prior to its shipment per Form G-321-E of the MR.

8 Quality Assurance

8.1 General Requirements

- 8.1.1 Seller's Quality Assurance Program (QAP) requirements are specified in Buyer document # 24590-WTP-3PS-G000-T0001, *General Specification for Supplier Quality Assurance Program Requirements*.
- 8.1.2 Seller's QAP manual shall be submitted to the Buyer for review in accordance with Buyer document # 24590-WTP-3PS-G000-T0001, *General Specification for Supplier Quality Assurance Program Requirements*.
- 8.1.3 Seller's QAP, as a minimum, shall contain the requirements detailed in the Supplier Quality Assurance Program Requirements data sheet listed in section 2 of the MR.

8.2 Quality Related Components

- 8.2.1 Seller shall have in place a QAP meeting the requirements of ASME-NQA-1-1989, marked as applicable in Supplier Quality Assurance Program Requirements Data Sheet attached to the MR, and Buyer document # 24590-WTP-3PS-G000-T0001, *General Specification for Supplier Quality Assurance Program Requirements*.
- 8.2.2 The successful bidder must pass a pre-award survey by the Buyer. Seller shall demonstrate that its quality program is in compliance with the procurement quality requirements listed in the Supplier Quality Assurance Program Requirements Data Sheet. Seller shall allow the Buyer, its agents, and DOE access to their facility and records pertaining to this purchase order for the purpose of QA audits and surveillance at mutually agreed times.
- 8.2.3 All items shall be manufactured in accordance with Seller's QAP that meets the requirements of ASME NQA-1-1989, and has been previously evaluated and accepted by the WTP Quality Assurance Organization.
- 8.2.4 Seller shall submit their QAP and work plan to the Buyer for review prior to commencement of work. The plan shall include documents and procedures to implement the work and include a matrix of essential QA elements cross referenced with the documents or procedures.

9 Configuration Management

- 9.1 The equipment covered by this specification is identified with the plant item number shown in the MDS. The equipment shall be identified in accordance with section 7.2, Tagging, of this specification.
- 9.2 Substitutions and deviations shall be in accordance with section 2.6 of the MR.

10 Documentation and Submittals

10.1 General

- 10.1.1 Seller shall submit to Buyer all detailed designs, documentation, procedures, instructions, calculations, analyses, manufacturer data, inspection reports, test reports, certifications, certificates, manuals, MSDSs, and drawings required per this specification, its addenda and attachments, the MR, and referenced codes, standards and Buyer documents.
- 10.1.2 Seller shall submit to Buyer the Engineering and Quality Verification documents in the forms, quantities, and timing shown in Form G-321-E, *Engineering Document Requirements*, and Form G-321-V, *Quality Verification Document Requirements*, in section 3 of the MR.
- 10.1.3 Section 2.6 of the MR applies for substitutions and deviations.
- 10.1.4 Each documentation transmittal package shall have a documentation inventory sheet attached listing all documents and the number of pages in each.
- 10.1.5 The seller shall submit to the buyer all detail designs, documentation, calculations, analysis, inspection reports, test reports, certifications, certificates, and shop detail drawings for the lateral restraint.

10.2 Calculations

All calculations to be provided to the Buyer shall be orderly, complete, and sufficiently clear to permit verification. The body of the calculations shall include:

- a concise statement of the purpose of the calculation
- input data, applicable criteria, and stated assumptions
- a list of references used, including drawings, codes, standards, and computer programs (indicate the version or issue date)
- a discussion of rationale used for design assumption basis
- equations used for all computations
- numerical calculations including identification of units used
- a concise statement addressing the calculation results and/or recommendations
- a table of contents for complex calculations

10.3 Schedules

10.3.1 A detailed schedule of engineering, document submittals, material purchases, fabrication, shop tests, and shipment shall be submitted using Form 15EX in section 3 of the MR.

10.3.2 Deleted

Bechtel National, Inc. Certification

The following certification statement is provided consistent with Contract No. DE-AC27-01RV14136, Section H.26, Environmental Permits, paragraph (g) for the submittal of the Hanford Facility Resource Conservation and Recovery Act Permit Modification Notification Form 24590-PTF-PCN-ENV-06-016.

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 assure 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.



W. S. Elkins
Project Director

20 JUNE 2007

Date

Quarter Ending June 30, 2007

24590-PTF-PCN-ENV-06-018

Hanford Facility RCRA Permit Modification Notification Form

Part III, Operating Unit 10

Waste Treatment and Immobilization Plant

Index

Page 2 of 3: Hanford Facility RCRA Permit, Operating Unit 10, Waste Treatment and Immobilization Plant
Update Mechanical Data Sheets for Pretreatment Facility Waste Feed Receipt Vessels (24590-PTF-MV-FRP-VSL-00002A/B/C/D) in Appendix 8.6 of the Dangerous Waste Permit.

Submitted by Co-Operator:

Reviewed by ORP Program Office:

D. A. Klein 6/27/07
D. A. Klein Date

S. J. Clinger 7/16/07
S. J. Clinger Date

Quarter Ending June 30, 2007

24590-PTF-PCN-ENV-06-018

Hanford Facility RCRA Permit Modification Notification Form	
Unit:	Permit Part & Chapter:
Waste Treatment and Immobilization Plant	Part III, Operating Unit 10
<p><u>Description of Modification:</u></p> <p>The purpose of the modification is to update four PTF mechanical data sheets for Waste Feed Receipt Vessels 24590-PTF-MV-FRP-VSL-00002A/B/C/D, identified as 24590-PTF-MVD-FRP-P0005/6/7/8 in Appendix 8.6 of the Dangerous Waste Permit (DWP). The following source mechanical data sheets are submitted to replace the permit data sheets currently in Appendix 8.6:</p> <ul style="list-style-type: none"> • Mechanical Data Sheet: Vessel (24590-PTF-MVD-FRP-00005, Rev 10) • Mechanical Data Sheet: Vessel (24590-PTF-MVD-FRP-00006, Rev 10) • Mechanical Data Sheet: Vessel (24590-PTF-MVD-FRP-00007, Rev 10) • Mechanical Data Sheet: Vessel (24590-PTF-MVD-FRP-00008, Rev 10) <p>The above mentioned mechanical data sheets include revisions as indicated by revision triangles shown on the documents. The revisions shown are the result of ongoing design. The significant changes are provided as follows:</p> <ul style="list-style-type: none"> • The following footnote (indicated by a double asterisk) was added to the actual weight and seismic based moment in the Design Data Section: "The actual weights and the seismic base moment shown herein are based on the original seismic data and these figures are subject to change, based on the new loads obtained from the seismic redesign." • Clarified the third paragraph in the Hydrodynamic Loading Section (which describes the plot) from: "Overblow loads vary as a function of the distance from the center of the overblowing pulse jet mixer nozzle and the elevation "H" above the overblowing pulse jet mixer nozzle as plotted" to: "Overblow loads vary as a function of the distance from the center of the overblowing pulse jet mixer nozzle and the elevation "H" above the overblowing pulse jet mixer nozzle up to the overflow level as plotted in the form of overblow pressures" The plot is not changing this is an informational change only. • Reworded the paragraph in the Hydrodynamic Loading Section below the plot from: "The overblow pressure shall only be applied to the projected area of the overblowing pulse jet mixer in the vertical, upward direction and to all surrounding components in the horizontal plane, radiating from the overblowing pulse jet mixer. Seller shall consider that any single pulse jet mixer may overblow 100 cycles." to: "For all vessel internal components other than the overblowing pulse jet mixer, the overblow forces shall be applied a) in the vertical direction, and b) in the horizontal direction, radiating from the centerline of the overblowing pulse jet mixer. For the overblowing pulse jet mixer, the force shall be applied in the vertical upward direction only. The overblow force on all components, including the structure and supports, shall be calculated by applying the overblow pressure at the location of the nearest surface of the components and to the projected area of the component, facing the appropriate direction. The normal force component, specified for the normal pulse jet mixer operation condition, is not applicable to the overblow condition. Any single pulse jet mixer may overblow 1000 cycles. Reference CCN 125541" 	

Quarter Ending June 30, 2007

24590-PTF-PCN-ENV-06-018

dated 7/27/05.*

This revision results in the vessel being functionally equivalent or upgraded due to accounting for vertical forces from PJM overblows on vessel internal components. Additionally, the vessel will now be designed for 1000 cycles from a single pulse jet mixer overblow instead of 100.

There are no outstanding change documents associated with these mechanical data sheets.

Please replace the following in Appendix 8.6 of the dangerous waste permit.

Appendix 8.6			
Replace:	24590-PTF-MVD-FRP-P0005, Rev. 3	With:	24590-PTF-MVD-FRP-00005, Rev. 10
	24590-PTF-MVD-FRP-P0006, Rev. 3		24590-PTF-MVD-FRP-00006, Rev. 10
	24590-PTF-MVD-FRP-P0007, Rev. 3		24590-PTF-MVD-FRP-00007, Rev. 10
	24590-PTF-MVD-FRP-P0008, Rev. 3		24590-PTF-MVD-FRP-00008, Rev. 10

WAC 173-303-830 Modification Class: ^{1 2}	Class 1	Class ¹ 1	Class 2	Class 3
Please mark the Modification Class:	X			

Enter Relevant WAC 173-303-830, Appendix I Modification citation number: A.1 and A.3
 Enter wording of WAC 173-303-830, Appendix I Modification citation:
 A.1. Administrative and informational changes
 A.3. Equipment replacement or upgrading with functionally equivalent components (e.g., pipes, valves, pumps, conveyors, controls)

Modification Approved: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No (state reason for denial) Reason for denial:	Reviewed by Ecology:  B. Becker-Khaleel	Date: 8/8/07
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¹ Class 1 modifications requiring prior Agency approval.
² If the proposed modification does not match any modification listed in WAC 173-303-830 Appendix I, then the proposed modification should automatically be given a Class 3 status. This status may be maintained by the Department of Ecology, or down graded to a Class '1, if applicable.



MECHANICAL DATA SHEET: VESSEL



R10637275

PLANT ITEM No.
24590-PTF-MV-FRP-VSL-00002A

Project:	RPP-WTP	P&ID:	24590-PTF-M6-FRP-00001
Project No:	24590	Calculations:	24590-PTF-MVC-FRP-00001, 24590-PTF-MTC-FRP-00001 △10
Project Site:	Hanford	Vessel Drawing	24590-PTF-M2-FRP-00001
Description:	Waste Feed Receipt Vessel		

ISSUED BY
RPP-WTP PDC

Reference Data

Charge Vessels (Tag Numbers)	
Pulsejet Mixers / Agitators (Tag Numbers)	FRP-PJM-00061, FRP-PJM-00062, FRP-PJM-00063, FRP-PJM-00064, FRP-PJM-00065, FRP-PJM-00066, FRP-PJM-00067, FRP-PJM-00068, FRP-PJM-00069, FRP-PJM-00070, FRP-PJM-00071, FRP-PJM-00072
RFDs/Pumps (Tag Numbers)	

Design Data

Quality Level	See Drawing	Fabrication Specs	24590-WTP-3PS-MV00-T0001		
Seismic Category	SC-1	Design Code	ASME VIII Div 1		
Service/Contents	Radioactive Liquid	Code Stamp	Yes		
Design Specific Gravity	1.46	NB Registration	Yes		
Maximum Design Volume	gal 406,800 (Note 6)	Weights (lbs)	Empty	Operating	Test
Total Volume	gal 474,000 (Note 6)	Estimated	592,900	5,550,000 (Note 3)	4,550,000
Viscosity	cP 1.58 min / 21 max	Actual **	589,800	5,370,000	4,540,000
Environmental Qualification	△10 NIA				

Inside Diameter	inch	564	Wind Design	Not Required	
Length/Height (TL-TL)	inch	322	Snow Design	Not Required	
			Seismic Design	24590-WTP-3PS-SS90-T0001 24590-WTP-3PS-MV00-T0002	
Internal Pressure	psig	ATM	15	NA	Seismic Base Moment ***
External Pressure	psig	0.123	2.5	NA	ft*lb 46,070,000
Temperature	°F	215	240	NA	Post weld Heat Treat
Min. Design Metal Temp.	°F	5			Not Required
					Corrosion Allowance
					inch 0.04 (Note 11)
					Hydrostatic Test Pressure *
					psig 19.5

Materials of Construction

Component	Material	Minimum Thickness / Size	Containment
Top Head	SA 240 316 (Note 2)	See Drawing	Auxiliary (Note 1)
Shell	SA 240 316 (Note 2)	See Drawing	Primary (Note 1)
Bottom Head	SA 240 316 (Note 2)	See Drawing	Primary (Note 1)
Support (Skirt)	SA 240 304 (Note 2)	See Drawing	NIA
Internals	SA 240 316 / SA 479 316 (Note 2)	See Drawing	Thermocouples Primary (Note 1)
Pipe	SA 312 TP316 Smls (Notes 2 & 7)	See Drawing	Note 1
Forgings/ Bar stock	SA 182 F316 (Note 2)	See Drawing	NIA

Miscellaneous Data

Orientation	Vertical	Support Type	Skirt
Insulation Function	Not Applicable	Insulation Material	Not Applicable
Insulation Thickness (inch)	Not Applicable	Internal Finish	Note 4
		External Finish	Welds Descaled as Laid

* As determined by the vendor △10

** The actual weights and the seismic base moment shown herein are based on the original seismic data and these figures are subject to change, based on the new loads obtained from the seismic redesign. △10



MECHANICAL DATA SHEET: VESSEL

PLANT ITEM NO.
24590-PTF-MV-FRP-VSL-00002A

Remarks

- Note 1: All welds forming part of the primary and auxiliary containments, including the nozzle attachment welds shall be subjected to 100% volumetric examination.
- Note 2: Maximum carbon content of 0.030% for all welded components.
- Note 3: Operating weight includes weight of liquid filled to top of overflow nozzle.
- Note 4: Descale all internal welds as laid, grind smooth and blend all start/stops, high spots, and cravices, finish welds as required for NDE purposes.
- Note 5: Revised PJM operating pressure and number of cycles per GCN 053810, specified contact viscosity.
- Note 6: Vessel volumes are approximate and do not account for manufacturing tolerances, nozzles, and displacement of internals.
- Note 7: Welded pipe may be used for 14" NPS PJM supports per 24590-WTP-SDDR-PROC-03-0154.
- Note 8: This vessel is located in a Black Cell.
- Note 9: Contents of this document are Dangerous Waste Permit affecting (internal use only).
- Note 10: Piping and piping support configurations shall be designed to preclude natural frequencies less than 7.0 Hz.
- Note 11: Seller shall ensure that an additional 0.044" is available for erosion in the spherical portion of the bottom head and shall report the minimum thickness required for all specified loading conditions, exclusive of erosion and corrosion allowance. ^{4 N D 128 S 41} _{8 19 15 15}
- Note 12: Revision 10 of this data sheet incorporates the GCN 129149. The GCN added the words "in the form of overflow presatble" to the notes shown above the overhead loads graph and further revised the note below the graph, as noted herein on sheet 3 of 5. Added calculation 24590-PTF-MTC-FRP-00001 and Environmental Qualification on Sheet 1. Added the note identified by "" on sheet 1.

10



MECHANICAL DATA SHEET: VESSEL

PLANT ITEM No.
24590-PTF-MV-FRP-VSL-00002A

Equipment Cyclic Data Sheet

Plant Item Number:	24590-PTF-MV-FRP-VSL-00002A
Description	Parent Vessel
<i>The information below is provisional and envelopes operational duty for fatigue assessment. It is not to be used as operational data.</i>	
Materials of Construction	SA 240 316 with maximum carbon content of 0.030%
Design Life	40 years
Component Function and Life Cycle Description	<i>This vessel receives and stores waste in a batch transfer from off-site tanks. It shall be designed to be filled to the maximum content level over a period of one day. Additionally, this vessel will be subjected to fluid dynamic forces from the operation of the pulse jet mixers during the process of suspending the solids in the waste feed. This vessel is washed down not more than once per year.</i>

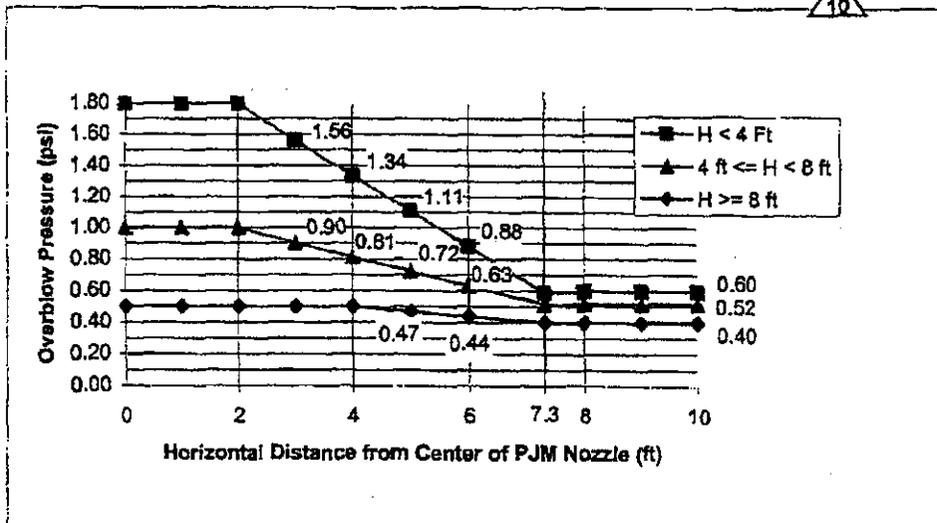
Load Type	Range	Number of Cycles	Comment
Design Pressure	psig -2.5 to 15	10	Nominal assumption for testing
Operating Pressure	psig -0.123 to 0	5100	
Operating Temperature	°F 50 to 215	5100	
Contents Specific Gravity	1.0 to 1.46	5100	
Contents Level	inch 32 to 402	5100	Liquid level measured from crown of bottom head
Localized Features			
Nozzles			
Supports	Same as vessel	Number of cycles same as vessel	

Hydrodynamic Loading

In normal operation, pulse jet mixers discharge liquid into the parent vessel imposing a cyclical hydrodynamic load on all internal components. Occasionally, an upset condition designated 'overflow' causes air to be discharged from any single pulse jet mixer. All internal components shall be designed for the combination of the normal operational hydrodynamic loads and overflow loads, and this load combination is also to be assumed to act concurrently with seismic loads.

Normal operation imposes a cyclical load ranging between -0.05 and 0.12 psi in the radial direction and -0.01 to 0.10 psi in the vertical direction for 8.0×10^6 cycles. The hydrodynamic pressure applies across the projected area of the component. Positive hydrodynamic forces act in the radial, outward direction and the vertical, upward direction. Seller shall apply the radial load simultaneously in the radial direction and normal to the radial direction in the horizontal plane.

Overflow loads vary as a function of the distance from the center of the overflowing pulse jet mixer nozzle and the elevation 'H' above the overflowing pulse jet mixer nozzle up to the overflow level, as plotted in the form of overflow pressures:



For all vessel internal components other than the overflowing pulse jet mixer, the overflow forces shall be applied a) in the vertical direction, and b) in the horizontal direction, radiating from the centerline of the overflowing pulse jet mixer. For the overflowing pulse jet mixer, the force shall be applied in the vertical upward direction only. The overflow force on all components, including the structures and supports, shall be calculated by applying the overflow pressure at the location of the nearest surface of the component and to the projected area of the component, facing the appropriate direction. The normal force component, specified for the normal pulse jet mixer operation condition, is not applicable to the overflow condition. Any single pulse jet mixer may overflow 1000 cycles. Reference CCN 125541 dated 07/27/05.



MECHANICAL DATA SHEET: VESSEL

PLANT ITEM No.
24590-PTF-MV-FRP-VSL-00002A

Notes

Cycle Increase: The Seller must increase the numbers of operational cycles given above by 10% to account for commissioning duty unless otherwise noted.

Remarks (Continued From Sheet 1)

Equipment Cyclic Data Sheet

Component Plant Item Number:	24590-PTF-MV-FRP-PJM-00061, 24590-PTF-MV-FRP-PJM-00062, 24590-PTF-MV-FRP-PJM-00063, 24590-PTF-MV-FRP-PJM-00064, 24590-PTF-MV-FRP-PJM-00065, 24590-PTF-MV-FRP-PJM-00066, 24590-PTF-MV-FRP-PJM-00067, 24590-PTF-MV-FRP-PJM-00068, 24590-PTF-MV-FRP-PJM-00069, 24590-PTF-MV-FRP-PJM-00070, 24590-PTF-FRP-MV-PJM-00071, 24590-PTF-MV-FRP-PJM-00072				
Component Description:	Pulse Jet Mixer Vessels (PJM)				
<i>The information below is provisional and envelopes operational duty for fatigue assessment. It is not to be used as operational data.</i>					
Materials of Construction	SA 240 316 with maximum carbon content of 0.030%				
Design Life	40 years				
Component Function and Life Cycle Description	<p>These PJMs are cyclically loaded using vacuum to fully fill the PJM with process liquid and compressed air to fully empty the PJM. The PJMs are contained within a parent vessel with varying liquid level. They shall be designed to cycle between the maximum pressure and the minimum pressure plus the external static head imposed by the parent vessel.</p> <p>The PJM supports shall be designed to cycle between the following loading conditions depending on the liquid level in the parent vessel:</p> <p>Fully Buoyant Parent vessel full and PJM empty</p> <ul style="list-style-type: none"> • Design for buoyancy + PJM thrust - PJM weight <p>PJM Weight Parent vessel full and PJM full or Parent vessel nearly empty and PJM empty</p> <ul style="list-style-type: none"> • Design for PJM weight <p>Fully Loaded Parent vessel nearly empty and PJM full</p> <ul style="list-style-type: none"> • Design for PJM weight + liquid weight 				
Load Type		Range		Number of Cycles	Comment
Design Pressure	psig	FV	80	10	Nominal assumption for testing
Operating Pressure	psig	FV	30	8.0 X 10 ⁶	Operating pressure = 22 psig + 8 psig design margin
Operating Temp	°F	50	215	<100	
Contents Specific Gravity		1.0	1.46	<1000	
Contents Level	inch	Empty	Flooded	8.0 X 10 ⁶	
PJM Thrust	lbf	0	330	8.0 X 10 ⁶	
Localized Features					
Supports	Fully Buoyant	PJM Weight		3.31 X 10 ⁶	The parent vessel is operating at greater than 75% capacity and the PJMs are cycling between empty and full for the indicated number of cycles.
	Fully Buoyant	Fully Loaded		1.38 X 10 ⁶	The parent vessel is operating at between 25 and 50% capacity and the PJMs are cycling between empty and full for the indicated number of cycles.
	PJM Weight	Fully Loaded		3.31 X 10 ⁶	The parent vessel is operating at less than 25% capacity and the PJMs are cycling between empty and full for the indicated number of cycles.

Notes

Cycle Increase: The Seller must increase the numbers of operational cycles given above by 10% to account for commissioning duty unless otherwise noted.



MECHANICAL DATA SHEET: VESSEL

PLANT ITEM No.
24590-PTF-MV-FRP-VSL-00002A

Approval

Rev	Description	System Engr	Vessel Engr	Checked	Approved	Date
0	Issue for Purchase	Y. Hovanski	R. Simmons	C. Slater/CEC	S. Kirk	4/18/02
1	Revised as Noted	Y. Hovanski	R. Simmons	C. Corriveau	S. Kirk	8/02/02
2	Revised Cyclical Data	Y. Hovanski	R. Simmons	C. Slater	S. Kirk	8/29/02
3	Revised as Noted, Deleted Charge Vessels	Y. Hovanski	R. Simmons	CS / JJ	M. Hoffmann	12/13/02
4	Revised per Note 5	Y. Hovanski	R. Simmons	CS / JJ	M. Hoffmann	5/16/03
5	Revised per Note 7	Y. Hovanski	R. Simmons	CS / JJ	M. Hoffmann	11/3/03
6	Added Black Cell Requirements	R. Rider	R. Simmons	YH/CS/JJ	M. Hoffmann	4/5/04
7	Added Material Specification for Internal Supports and Hydrodynamic Loads	R. Rider	R. Simmons	YH/RT/JJ D. Adler	M. Hoffmann	8/23/04
8	Revised Hydrodynamic Loading Criteria	R. Rider	R. Simmons	YH/CS/JJ	M. Hoffmann	7/13/04
9	Revised Hydrodynamic Loading Criteria	R. Rider	R. Simmons	CS/JJ	M. Hoffmann	7/20/04
10	Revised per Note 12 on sheet 2 of 5.	<i>RJR</i>	<i>RSP</i>	<i>HAS/RT/JJ</i>	<i>S. Kirk</i>	<i>10/23/05</i>

Please note that source, special nuclear, and byproduct materials, as defined in the Atomic Energy Act of 1954 (AEA) are regulated at the U. S. Department of Energy (DOE) facilities exclusively by DOE acting pursuant to its AEA authority. DOE asserts that pursuant to AEA, it has sole and exclusive responsibility and authority to regulate source, special nuclear, and byproduct materials at DOE-owned nuclear facilities. Information contained herein on radionuclides is provided for process description purposes only.



MECHANICAL DATA SHEET: VESSEL



PLANT ITEM No.
24590-PTF-MV-FRP-VSL-00002B

Project:	RPP-WTP	P&ID:	24590-PTF-M6-FRP-00001
Project No:	24590	Calculations:	24590-PTF-MVC-FRP-00001, 24590-PTF-MTC-FRP-00001 △10
Project Site:	Hanford	Vessel Drawing	24590-PTF-M2-FRP-00002 MVS
Description:	Waste Feed Receipt Vessel 10/28/05		

Reference Data

ISSUED BY
RPP-WTP PDC

Charge Vessels (Tag Numbers)	
Pulsejet Mixers / Agitators (Tag Numbers)	FRP-PJM-00017, FRP-PJM-00018, FRP-PJM-00019, FRP-PJM-00020, FRP-PJM-00021, FRP-PJM-00022, FRP-PJM-00023, FRP-PJM-00024, FRP-PJM-00025, FRP-PJM-00026, FRP-PJM-00027, FRP-PJM-00028
RFDs/Pumps (Tag Numbers)	

Design Data

Quality Level	See Drawing	Fabrication Specs	24590-WTP-3PS-MV00-T0001		
Seismic Category	SC-1	Design Code	ASME VIII Div 1		
Service/Contents	Radioactive Liquid	Code Stamp	Yes		
Design Specific Gravity	1.46	NB Registration	Yes		
Maximum Design Volume	gal 406,800 (Note 6)	Weights (lbs)	Empty	Operating	Test
Total Volume	gal 474,000 (Note 6)	Estimated	592,900	5,550,000 (Note 3)	4,550,000
Viscosity	cp 1.58 min 21 max	Actual **	589,800	5,370,000	4,540,000
Environmental Qualification	△10 NIA				

Inside Diameter	inch	564	Wind Design	Not Required	
Length/Height (TL-TL)	inch	322	Snow Design	Not Required	
		Vessel Operating	Vessel Design	Coil/Jacket Design	Seismic Design
					24590-WTP-3PS-SS90-T0001 24590-WTP-3PS-MV00-T0002
Internal Pressure	psig	ATM	15	NA	Seismic Base Moment ** △10 ft*lb 46,070,000
External Pressure	psig	0.123	2.5	NA	Postweld Heat Treat Not Required
Temperature	°F	215	240	NA	Corrosion Allowance Inch 0.04 (Note 11)
Min. Design Metal Temp.	°F	5			Hydrostatic Test Pressure * psig 19.5

Materials of Construction

Component	Material	Minimum Thickness / Size	Containment
Top Head	SA 240 316 (Note 2)	See Drawing	Auxiliary (Note 1)
Shell	SA 240 316 (Note 2)	See Drawing	Primary (Note 1)
Bottom Head	SA 240 316 (Note 2)	See Drawing	Primary (Note 1)
Support	SA 240 304 (Note 2)	See Drawing	NIA
Internals	SA 240 316 SA 479 316 (Note 2)	See Drawing	Thermocouples Primary (Note 1)
Pipe	SA 312 TP316 Smls (Notes 2 & 7)	See Drawing	Note 1
Forgings/ Bar stock	SA 182 F316 (Note 2)	See Drawing	NIA

Miscellaneous Data

Orientation	Vertical	Support Type	Skirt
Insulation Function	Not Applicable	Insulation Material	Not Applicable
Insulation Thickness (inch)	Not Applicable	Internal Finish	Note 4
		External Finish	Welds Descaled as Laid

* As determined by the vendor. △10

** The actual weights and seismic moment, shown herein are based on the original seismic data and these figures are subject to change, based on the new loads, obtained from the seismic redesign. △10



MECHANICAL DATA SHEET: VESSEL

PLANT ITEM No.
24590-PTF-MV-FRP-VSL-00002B

Remarks

- Note 1:** All welds forming part of the primary and auxiliary containments, including the nozzle attachment welds shall be subjected to 100% volumetric examination.
- Note 2:** Maximum carbon content of 0.030% for all welded components.
- Note 3:** Operating weight includes weight of liquid filled to top of overflow nozzle.
- Note 4:** Descale all internal welds as laid, grind smooth and blend all start/stops, high spots, and crevices, finish welds as required for NDE purposes.
- Note 5:** Revised PJM operating pressure and number of cycles per CCN 053810, specified content viscosity.
- Note 6:** Vessel volumes are approximate and do not account for manufacturing tolerances, nozzles, and displacement of internals.
- Note 7:** Welded pipe may be used for 14" NPS PJM supports per 24590-WTP-SDDR-PROC-03-0154.
- Note 8:** This vessel is located in a Black Cell.
- Note 9:** Contents of this document are Dangerous Waste Permit affecting (internal use only).
- Note 10:** Piping and piping support configurations shall be designed to preclude natural frequencies less than 7.0 Hz.
- Note 11:** Seller shall ensure that an additional 0.044" is available for erosion in the spherical portion of the bottom head and shall report the minimum thickness required for all specified loading conditions, exclusive of erosion and corrosion allowances. CCN 128549
08/18/2015
- Note 12:** Revision 10 of this data sheet incorporates the CCN 129149. The CCN added the words "in the form of overflow pressures", to the note shown above the overflow loads graph and further revised the note below the graph, as noted herein on sheet 3 of 3. Added calculation 24590-PTF-MTC-FRP-00001 and Environmental Qualification on Sheet 1. Added the note identified by ** on sheet 1.





MECHANICAL DATA SHEET: VESSEL

PLANT ITEM No.
24590-PTF-MV-FRP-VSL-00002B

Equipment Cyclic Data Sheet

Component Plant Item Number:	24590-PTF-MV-FRP-VSL-00002B
Component description	Parent Vessel
<i>The information below is provisional and envelopes operational duty for fatigue assessment. It is not to be used as operational data.</i>	
Materials of Construction	SA 240 316 with maximum carbon content of 0.030%
Design Life	40 years
Component Function and Life Cycle Description	This vessel receives and stores waste in a batch transfer from off-site tanks. It shall be designed to be filled to the maximum content level over a period of one day. Additionally, this vessel will be subjected to fluid dynamic forces from the operation of the pulse jet mixers during the process of suspending the solids in the waste feed. This vessel is washed down not more than once per year.

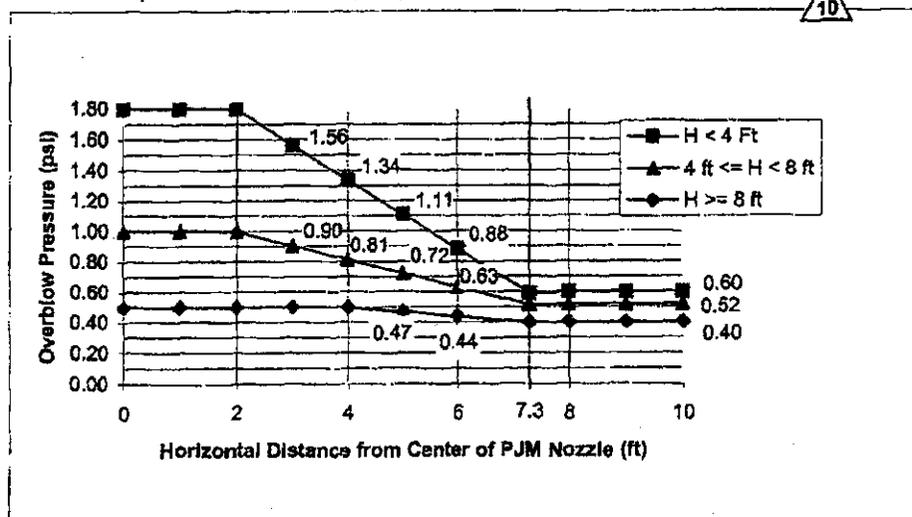
Load Type	Min	Max	Number of Cycles	Comment
Design Pressure psig	-2.5	15	10	Nominal assumption for testing
Operating Pressure psig	-0.123	0	5100	
Operating Temperature °F	50	215	5100	
Contents Specific Gravity	1.0	1.46	5100	
Contents Level inch	32	402	5100	Liquid level measured from crown of bottom head
Localized Features				
Nozzles				
Supports	Same as vessel		Number of cycles same as vessel	

Hydrodynamic Loading

In normal operation, pulse jet mixers discharge liquid into the parent vessel imposing a cyclical hydrodynamic load on all internal components. Occasionally, an upset condition designated 'overblow' causes air to be discharged from any single pulse jet mixer. All internal components shall be designed for the combination of the normal operational hydrodynamic loads and overblow loads, and this load combination is also to be assumed to act concurrently with seismic loads.

Normal operation imposes a cyclical load ranging between -0.05 and 0.12 psi in the radial direction and -0.01 to 0.10 psi in the vertical direction for 8.0×10^6 cycles. The hydrodynamic pressure applies across the projected area of the component. Positive hydrodynamic forces act in the radial, outward direction and the vertical, upward direction. Seller shall apply the radial load simultaneously in the radial direction and normal to the radial direction in the horizontal plane.

Overblow loads vary as a function of the distance from the center of the overblowing pulse jet mixer nozzle and the elevation 'H' above the overblowing pulse jet mixer nozzle up to the overflow level, as plotted in the form of overblow pressures:



For all vessel internal components other than the overblowing pulse jet mixer, the overblow forces shall be applied a) in the vertical direction, and b) in the horizontal direction, radiating from the centerline of the overblowing pulse jet mixer. For the overblowing pulse jet mixer, the force shall be applied in the vertical upward direction only. The overblow force on all components, including the structures and supports, shall be calculated by applying the overblow pressure at the location of the nearest surface of the component and to the projected area of the component, facing the appropriate direction. The normal force component, specified for the normal pulse jet mixer operation condition, is not applicable to the overblow condition. Any single pulse jet mixer may overblow 1000 cycles. Reference CCN 125541 dated 07/27/05.



MECHANICAL DATA SHEET: VESSEL

PLANT ITEM No.
24590-PTF-MV-FRP-VSL-00002B

Notes

Cycle increase: The Seller must increase the numbers of operational cycles given above by 10% to account for commissioning duty unless otherwise noted.

Equipment Cyclic Data Sheet

Component Plant Item Number:	24590-PTF-MV-FRP-PJM-00017, 24590-PTF-MV-FRP-PJM-00018, 24590-PTF-MV-FRP-PJM-00019, 24590-PTF-MV-FRP-PJM-00020, 24590-PTF-MV-FRP-PJM-00021, 24590-PTF-MV-FRP-PJM-00022, 24590-PTF-MV-FRP-PJM-00023, 24590-PTF-MV-FRP-PJM-00024, 24590-PTF-MV-FRP-PJM-00025, 24590-PTF-MV-FRP-PJM-00026, 24590-PTF-MV-FRP-PJM-00027, 24590-PTF-MV-FRP-PJM-00028
Component Description	Pulse Jet Mixers (PJM)

The information below is provisional and envelopes operational duty for fatigue assessment. It is not to be used as operational data.

Materials of Construction	SA 240 316 with maximum carbon content of 0.030%				
Design Life	40 years				
Component Function and Life Cycle Description	<p>These PJMs are cyclically loaded using vacuum to fully fill the PJM with process liquid and compressed air to fully empty the PJM. The PJMs are contained within a parent vessel with varying liquid level. They shall be designed to cycle between the maximum pressure and the minimum pressure plus the external static head imposed by the parent vessel.</p> <p>The PJM supports shall be designed to cycle between the following loading conditions depending on the liquid level in the parent vessel:</p> <p>Fully Buoyant Parent vessel full and PJM empty</p> <ul style="list-style-type: none"> Design for buoyancy + PJM thrust - PJM weight <p>PJM Weight Parent vessel full and PJM full or Parent vessel nearly empty and PJM empty</p> <ul style="list-style-type: none"> Design for PJM weight <p>Fully Loaded Parent vessel nearly empty and PJM full</p> <ul style="list-style-type: none"> Design for PJM weight + liquid weight 				
Load Type	Range		Number of Cycles	Comment	
Design Pressure	psig	FV	80	10	Nominal assumption for testing
Operating Pressure	psig	FV	30	8.0×10^4	Operating pressure = 22 psig + 8 psig design margin
Operating Temp	°F	50	215	<100	
Contents Specific Gravity		1.0	1.46	<1000	
Contents Level	inch	Empty	Flooded	8.0×10^4	
PJM Thrust	lbf	0	330	8.0×10^4	
Localized Features					
Supports	Fully Buoyant	PJM Weight	3.31×10^4	The parent vessel is operating at greater than 75% capacity and the PJMs are cycling between empty and full for the indicated number of cycles.	
	Fully Buoyant	Fully Loaded	1.38×10^4	The parent vessel is operating at between 25 and 50% capacity and the PJMs are cycling between empty and full for the indicated number of cycles.	
	PJM Weight	Fully Loaded	3.31×10^4	The parent vessel is operating at less than 25% capacity and the PJMs are cycling between empty and full for the indicated number of cycles.	

Notes

Cycle increase: The Seller must increase the numbers of operational cycles given above by 10% to account for commissioning duty unless otherwise noted.



MECHANICAL DATA SHEET: VESSEL

PLANT ITEM No.
24590-PTF-MV-FRP-VSL-00002B

Approval

Rev	Description	System Engr	Vessel Engr	Checked	Approved	Date
0	Issue for Purchase	Y. Hovanski	R. Simmons	C. Slater/CEC	S. Kirk	4/18/02
1	Revised as Noted	Y. Hovanski	R. Simmons	C. Corriveau	S. Kirk	6/02/02
2	Revised Cyclical Data	Y. Hovanski	R. Simmons	C. Slater	S. Kirk	8/28/02
3	Revised as Noted, Deleted Charge Vessels	Y. Hovanski	R. Simmons	CS / JJ	M. Hoffmann	12/13/02
4	Revised per Note 3	Y. Hovanski	R. Simmons	CS / JJ	M. Hoffmann	5/16/03
5	Revised per Note 7	Y. Hovanski	R. Simmons	CS / JJ	M. Hoffmann	11/3/03
6	Added Black Cell Requirements	R. Rider	R. Simmons	YH/CS/JJ	M. Hoffmann	4/8/04
7	Added Material Specification for Internal Supports and Hydrodynamic Loads	R. Rider	R. Simmons	YHRT/JJ D. Adler	M. Hoffmann	8/23/04
8	Revised Hydrodynamic Loading Criteria	R. Rider	R. Simmons	YH/CS/JJ	M. Hoffmann	7/13/04
9	Revised Hydrodynamic Loading Criteria	R. Rider	R. Simmons	CS/JJ	M. Hoffmann	7/20/04
10	Revised per Note 12 on sheet 2 of 5.	<i>[Signature]</i>	<i>[Signature]</i>	MASR <i>[Signature]</i>	<i>[Signature]</i>	10/28/05

Please note that source, special nuclear, and byproduct materials, as defined in the Atomic Energy Act of 1954 (AEA) are regulated at the U. S. Department of Energy (DOE) facilities exclusively by DOE acting pursuant to its AEA authority. DOE asserts that pursuant to AEA, it has sole and exclusive responsibility and authority to regulate source, special nuclear, and byproduct materials at DOE-owned nuclear facilities. Information contained herein on radionuclides is provided for process description purposes only.



MECHANICAL DATA SHEET: VESSEL

PLANT ITEM No. R10637277
24590-PTF-MV-FRP-VSL-00002C

Project:	RPP-WTP	P&ID:	24590-PTF-M6-FRP-00002
Project No.:	24590	Calculations:	24590-PTF-MVC-FRP-00001, 24590-PTF-MTC-FRP-00001
Project Site:	Hanford	Vessel Drawing	24590-PTF-M2-FRP-00003
Description:	Waste Feed Receipt Vessel		

Reference Data

ISSUED BY
RPP-WTP PDC

Charge Vessels (Tag Numbers)	
Pulsejet Mixers / Agitators (Tag Numbers)	FRP-PJM-00029, FRP-PJM-00030, FRP-PJM-00031, FRP-PJM-00032, FRP-PJM-00033, FRP-PJM-00034, FRP-PJM-00035, FRP-PJM-00036, FRP-PJM-00001, FRP-PJM-00002, FRP-PJM-00003, FRP-PJM-00004
RFDs/Pumps (Tag Numbers)	

Design Data

Quality Level	See Drawing		Fabrication Specs	24590-WTP-3PS-MV00-T0001		
Seismic Category	SC-I		Design Code	ASME VIII Div 1		
Service/Contents	Radioactive Liquid		Code Stamp	Yes		
Design Specific Gravity	1.46		NB Registration	Yes		
Maximum Design Volume	gal	406,800 (Note 6)	Weights (lbs)	Empty	Operating	Test
Total Volume	gal	474,000 (Note 6)	Estimated	592,900	5,550,000 (Note 3)	4,550,000
Viscosity	cP	1.58 min / 21 max	Actual **	589,800	5,370,000	4,540,000
Environmental Qualification	NIA					

Inside Diameter	inch	564			Wind Design	Not Required	
Length/Height (TL-TL)	inch	322			Snow Design	Not Required	
		Vessel Operating	Vessel Design	Coil/Jacket Design	Seismic Design	24590-WTP-3PS-SS90-T0001 24590-WTP-3PS-MV00-T0002	
Internal Pressure	psig	ATM	15	NA	Seismic Base Moment **	10	46,070,000
External Pressure	psig	0.123	2.5	NA	Postweld Heat Treat	Not Required	
Temperature	*F	215	240	NA	Corrosion Allowance	Inch	0.04 (Note 11)
Min. Design Metal Temp.	*F	5			Hydrostatic Test Pressure *	psig	19.5

Materials of Construction

Component	Material	Minimum Thickness / Size	Containment
Top Head	SA 240 316 (Note 2)	See Drawing	Auxiliary (Note 1)
Shell	SA 240 316 (Note 2)	See Drawing	Primary (Note 1)
Bottom Head	SA 240 316 (Note 2)	See Drawing	Primary (Note 1)
Support (Skirt)	SA 240 304 (Note 2)	See Drawing	NIA
Internals	SA 240 316 / SA 479 316 (Note 2)	See Drawing	Thermocouples Primary (Note 1)
Pipe	SA 312 TP316 Smls (Notes 2 & 7)	See Drawing	Note 1
Forgings/ Bar stock	SA 182 F316 (Note 2)	See Drawing	NIA

Miscellaneous Data

Orientation	Vertical	Support Type	Skirt
Insulation Function	Not Applicable	Insulation Material	Not Applicable
Insulation Thickness (inch)	Not Applicable	Internal Finish	Note 4
		External Finish	Welds Descaled as Laid

* As determined by the vendor.

** The actual weights and seismic moment, shown herein are based on the original seismic data and these figures are subject to change, based on the new loads, obtained from the seismic redesign.



MECHANICAL DATA SHEET: VESSEL

PLANT ITEM No.
24590-PTF-MV-FRP-VSL-00002C

Remarks

- Note 1:** All welds forming part of the primary and auxiliary containments, including the nozzle attachment welds shall be subjected to 100% volumetric examination.
- Note 2:** Maximum carbon content of 0.030% for all welded components.
- Note 3:** Operating weight includes weight of liquid filled to top of overflow nozzle.
- Note 4:** Descale all internal welds as laid, grind smooth and blend all starts/stops, high spots, and crevices, finish welds as required for NDE purposes.
- Note 5:** Revised PJM operating pressure and number of cycles per CCN 053810, specified content viscosity.
- Note 6:** Vessel volumes are approximate and do not account for manufacturing tolerances, nozzles, and displacement of internals.
- Note 7:** Welded pipe may be used for 14" NPS PJM supports per 24590-WTP-SDDR-PROC-03-0154.
- Note 8:** This vessel is located in a Black Cell.
- Note 9:** Contents of this document are Dangerous Waste Permit affecting (internal use only).
- Note 10:** Piping and piping support configurations shall be designed to preclude natural frequencies less than 7.0 Hz.
- Note 11:** Seller shall ensure that an additional 0.044" is available for erosion in the spherical portion of the bottom head and shall report the minimum thickness required for all specified loading conditions, exclusive of erosion and corrosion allowances. AND 128549
04-15/83/CS
- Note 12:** Revision 10 of this data sheet incorporates the CCN 129149. The CCN added the words "in the form of overflow pressures", to the note shown above the overflow loads graph and further revised the note below the graph, as noted herein on sheet 3 of 5.
- 10** Added calculation 24590-PTF-MTC-FRP-00001 and Environmental Qualification on Sheet 1. Added note identified by ** on sheet 1.



MECHANICAL DATA SHEET: VESSEL

PLANT ITEM No.
24590-PTF-MV-FRP-VSL-00002C

Equipment Cyclic Data Sheet

Component Plant Item Number:	24590-PTF-MV-FRP-VSL-00002-C
Component Description	Parent Vessel

The information below is provisional and envelopes operational duty for fatigue assessment. It is not to be used as operational data.

Materials of Construction	SA 240 316 with maximum carbon content of 0.030%
Design Life	40 years
Component Function and Life Cycle Description	This vessel receives and stores waste in a batch transfer from off-site tanks. It shall be designed to be filled to the maximum content level over a period of one day. Additionally, this vessel will be subjected to fluid dynamic forces from the operation of the pulse jet mixers during the process of suspending the solids in the waste feed. This vessel is washed down not more than once per year.

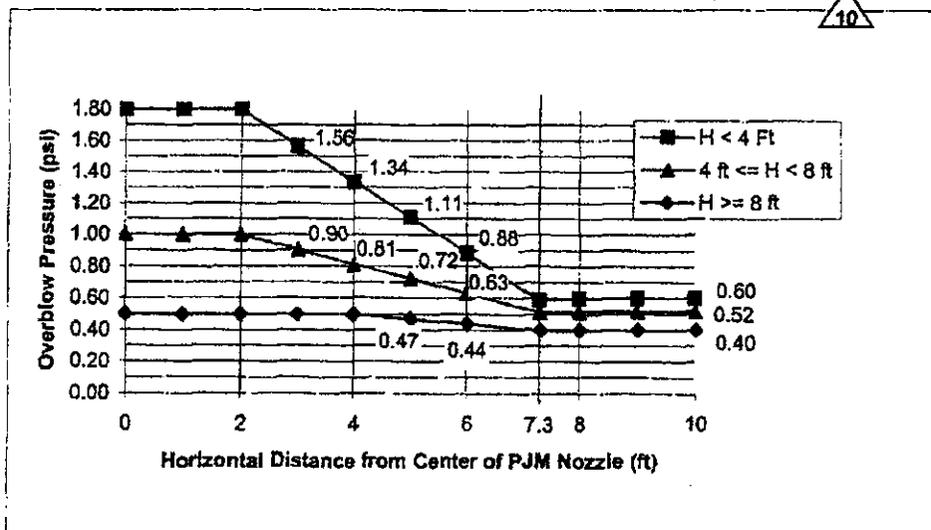
Load Type	Range	Number of Cycles	Comment
Design Pressure	psig -2.5 to 15	10	Nominal assumption for testing
Operating Pressure	psig -0.123 to 0	5100	
Operating Temperature	°F 50 to 215	5100	
Contents Specific Gravity	1.0 to 1.46	5100	
Contents Level	inch 32 to 402	5100	Liquid level measured from crown of bottom head
Localized Features			
Nozzles			
Supports	Same as vessel	Number of cycles same as vessel	

Hydrodynamic Loading

In normal operation, pulse jet mixers discharge liquid into the parent vessel imposing a cyclical hydrodynamic load on all internal components. Occasionally, an upset condition designated 'overblow' causes air to be discharged from any single pulse jet mixer. All internal components shall be designed for the combination of the normal operational hydrodynamic loads and overblow loads, and this load combination is also to be assumed to act concurrently with seismic loads.

Normal operation imposes a cyclical load ranging between -0.05 and 0.12 psi in the radial direction and -0.01 to 0.10 psi in the vertical direction for 8.0×10^6 cycles. The hydrodynamic pressure applies across the projected area of the component. Positive hydrodynamic forces act in the radial, outward direction and the vertical, upward direction. Seller shall apply the radial load simultaneously in the radial direction and normal to the radial direction in the horizontal plane.

Overblow loads vary as a function of the distance from the center of the overblowing pulse jet mixer nozzle and the elevation 'H' above the overblowing pulse jet mixer nozzle up to the overflow level as plotted in the form of overblow pressures:



For all vessel internal components other than the overblowing pulse jet mixer, the overblow forces shall be applied a) in the vertical direction, and b) in the horizontal direction, radiating from the centerline of the overblowing pulse jet mixer. For the overblowing pulse jet mixer, the force shall be applied in the vertical upward direction only. The overblow force on all components, including the structures and supports, shall be calculated by applying the overblow pressure at the location of the nearest surface of the component and to the projected area of the component, facing the appropriate direction. The normal force component, specified for the normal pulse jet mixer operation condition, is not applicable to the overblow condition. Any single pulse jet mixer may overblow 1000 cycles. Reference CCN 125541 dated 07/27/05.



MECHANICAL DATA SHEET: VESSEL

PLANT ITEM No.
24590-PTF-MV-FRP-VSL-00002C

Notes

Cycle Increase: The Seller must increase the numbers of operational cycles given above by 10% to account for commissioning duty unless otherwise noted.

Equipment Cyclic Data Sheet

Component Plant Item Number:	24590-PTF-MV-FRP-PJM-00001, 24590-PTF-MV-FRP-PJM-00002, 24590-PTF-MV-FRP-PJM-00003, 24590-PTF-MV-FRP-PJM-00004, 24590-PTF-MV-FRP-PJM-00028, 24590-PTF-MV-FRP-PJM-00030, 24590-PTF-MV-FRP-PJM-00031, 24590-PTF-MV-FRP-PJM-00032, 24590-PTF-MV-FRP-PJM-00033, 24590-PTF-MV-FRP-PJM-00034, 24590-PTF-MV-FRP-PJM-00035, 24590-PTF-MV-FRP-PJM-00036				
Component Description	Pulse Jet Mixers				
<i>The information below is provisional and envelopes operational duty for fatigue assessment. It is not to be used as operational data.</i>					
Materials of Construction	SA 240 316 with maximum carbon content of 0.030%				
Design Life	40 years				
Component Function and Life Cycle Description	<p>These PJMs are cyclically loaded using vacuum to fully fill the PJM with process liquid and compressed air to fully empty the PJM. The PJMs are contained within a parent vessel with varying liquid level. They shall be designed to cycle between the maximum pressure and the minimum pressure plus the external static head imposed by the parent vessel.</p> <p>The PJM supports shall be designed to cycle between the following loading conditions depending on the liquid level in the parent vessel:</p> <p style="margin-left: 40px;">Fully Buoyant Parent vessel full and PJM empty</p> <ul style="list-style-type: none"> • Design for buoyancy + PJM thrust - PJM weight <p style="margin-left: 40px;">PJM Weight Parent vessel full and PJM full or Parent vessel nearly empty and PJM empty</p> <ul style="list-style-type: none"> • Design for PJM weight <p style="margin-left: 40px;">Fully Loaded Parent vessel nearly empty and PJM full</p> <ul style="list-style-type: none"> • Design for PJM weight + liquid weight 				
Load Type		Range		Number of Cycles	Comment
Design Pressure	psig	FV	80	10	Nominal assumption for testing
Operating Pressure	psig	FV	30	8.0×10^6	Operating pressure = 22 psig + 8 psig design margin
Operating Temp	°F	50	215	<100	
Contents Specific Gravity		1.0	1.46	<1000	
Contents Level	inch	Empty	Flooded	8.0×10^6	
PJM Thrust	lbf	0	330	8.0×10^6	
Localized Features					
Supports	Fully Buoyant	PJM Weight		3.31×10^6	The parent vessel is operating at greater than 75% capacity and the PJMs are cycling between empty and full for the indicated number of cycles.
	Fully Buoyant	Fully Loaded		1.38×10^6	The parent vessel is operating at between 25 and 50% capacity and the PJMs are cycling between empty and full for the indicated number of cycles.
	PJM Weight	Fully Loaded		3.31×10^6	The parent vessel is operating at less than 25% capacity and the PJMs are cycling between empty and full for the indicated number of cycles.

Notes

Cycle Increase: The Seller must increase the numbers of operational cycles given above by 10% to account for commissioning duty unless otherwise noted.



MECHANICAL DATA SHEET: VESSEL

PLANT ITEM No.
24590-PTF-MV-FRP-VSL-00002C

Approval

Rev	Description	System Engr	Vessel Engr	Checked	Approved	Date
0	Issue for Purchase	Y. Hovanski	R. Simmons	C. Slater/CEC	S. Kirk	4/18/02
1	Revised as Noted	Y. Hovanski	R. Simmons	C. Corriveau	S. Kirk	6/02/02
2	Revised Cyclical Data	Y. Hovanski	R. Simmons	C. Slater	S. Kirk	8/29/02
3	Revised as Noted, Deleted Charge Vessels	Y. Hovanski	R. Simmons	CS / JJ	M. Hoffmann	12/13/02
4	Revised per Note 5	Y. Hovanski	R. Simmons	CS / JJ	M. Hoffmann	5/16/03
5	Revised per Note 7	Y. Hovanski	R. Simmons	CS / JJ	M. Hoffmann	11/3/03
6	Added Black Cell Requirements	R. Rider	R. Simmons	YH/CS/JJ	M. Hoffmann	4/8/04
7	Added Material Specification for Internal Supports and Hydrodynamic Loads	R. Rider	R. Simmons	YH/RT/JJ D. Adler	M. Hoffmann	6/23/04
8	Revised Hydrodynamic Loading Criteria	R. Rider	R. Simmons	YH/CS/JJ	M. Hoffmann	7/13/04
9	Revised Hydrodynamic Loading Criteria	R. Rider	R. Simmons	CS/JJ	M. Hoffmann	7/20/04
10	Revised per Note 12 on sheet 2 of 5.			WAS [Signature]	[Signature]	10/28/05

Please note that source, special nuclear, and byproduct materials, as defined in the Atomic Energy Act of 1954 (AEA) are regulated at the U. S. Department of Energy (DOE) facilities exclusively by DOE acting pursuant to its AEA authority. DOE asserts that pursuant to AEA, it has sole and exclusive responsibility and authority to regulate source, special nuclear, and byproduct materials at DOE-owned nuclear facilities. Information contained herein on radionuclides is provided for process description purposes only.



MECHANICAL DATA SHEET: VESSEL

PLANT ITEM No. R10637278
 24590-PTF-MV-FRP-VSL-00002D

Project:	RPP-WTP	P&ID:	24590-PTF-M6-FRP-00002
Project No:	24590	Calculations:	24590-PTF-MVC-FRP-00001, 24590-PTF-MTC-FRP-00001 △10
Project Site:	Hanford	Vessel Drawing	24590-PTF-M2-FRP-00004 N/A
Description:	Waste Feed Receipt Vessel ICP/ST/CS		

Reference Data

ISSUED BY
RPP-WTP-PDC

Charge Vessels (Tag Numbers)	
Pulsejet Mixers / Agitators (Tag Numbers)	FRP-PJM-00005, FRP-PJM-00006, FRP-PJM-00007, FRP-PJM-00008, FRP-PJM-00009, FRP-PJM-00010, FRP-PJM-00011, FRP-PJM-00012, FRP-PJM-00013, FRP-PJM-00014, FRP-PJM-00015, FRP-PJM-00016
RFDs/Pumps (Tag Numbers)	

Design Data

Quality Level	See Drawing		Fabrication Specs	24590-WTP-3PS-MV00-T0001		
Seismic Category	SC-I		Design Code	ASME VIII Div 1		
Service/Contents	Radioactive Liquid		Code Stamp	Yes		
Design Specific Gravity	1.46		NB Registration	Yes		
Maximum Design Volume	gal	406,800 (Note 6)	Weights (lbs)	Empty	Operating	Test
Total Volume	gal	474,000 (Note 6)	Estimated	592,900	5,550,000 (Note 3)	4,550,000
Viscosity	cP	1.58 min / 21 max	Actual **	589,800	5,370,800	4,540,000
Environmental Qualification	△10	NIA				

Inside Diameter	inch	564			Wind Design	Not Required	
Length/Height (TL-TL)	inch	322			Snow Design	Not Required	
		Vessel Operating	Vessel Design	Coil/Jacket Design	Seismic Design	24590-WTP-3PS-SS90-T0001 24590-WTP-3PS-MV00-T0002	
Internal Pressure	psig	ATM	15	NA	Seismic Base Moment **	△10	ft*lb 46,070,000
External Pressure	psig	0.123	2.5	NA	Postweld Heat Treat	Not Required	
Temperature	°F	215	240	NA	Corrosion Allowance	inch	0.04 (Note 11)
Min. Design Metal Temp.	°F	5			Hydrostatic Test Pressure *	psig	19.5

Materials of Construction

Component	Material	Minimum Thickness / Size	Containment
Top Head	SA 240 316 (Note 2)	See Drawing	Auxiliary (Note 1)
Shell	SA 240 316 (Note 2)	See Drawing	Primary (Note 1)
Bottom Head	SA 240 316 (Note 2)	See Drawing	Primary (Note 1)
Support	SA 240 304 (Note 2)	See Drawing	NIA
Internals	SA 240 316 / SA 479 316 (Note 2)	See Drawing	Thermocouples Primary (Note 1)
Pipe	SA 312 TP316 Smls (Notes 2 & 7)	See Drawing	Note 1
Forgings/ Bar stock	SA 182 F316 (Note 2)	See Drawing	NIA

Miscellaneous Data

Orientation	Vertical	Support Type	Skirt
Insulation Function	Not Applicable	Insulation Material	Not Applicable
Insulation Thickness (inch)	Not Applicable	Internal Finish	Note 4
		External Finish	Welds Descaled as Laid

* As determined by the vendor. △10

** The actual weights and seismic moment, shown herein are based on the original seismic data and these figures are subject to change, based on the new loads, obtained from the seismic redesign. △10



MECHANICAL DATA SHEET: VESSEL

PLANT ITEM No.
24590-PTF-MV-FRP-VSL-00002D

Remarks

- Note 1:** All welds forming part of the primary and auxiliary containments, including the nozzle attachment welds shall be subjected to 100% volumetric examination.
- Note 2:** Maximum carbon content of 0.030% for all welded components.
- Note 3:** Operating weight includes weight of liquid filled to top of overflow nozzle.
- Note 4:** Descale all internal welds as laid, grind smooth and blend all start/stops, high spots, and crevices, finish welds as required for NDE purposes.
- Note 5:** Revised PJM operating pressure and number of cycles per CCN 053810, specified content viscosity.
- Note 6:** Vessel volumes are approximate and do not account for manufacturing tolerances, nozzles, and displacement of internals.
- Note 7:** Welded pipe may be used for 14" NPS PJM supports per 24590-WTP-SDDR-PROC-03-0154.
- Note 8:** This vessel is located in a Black Cell.
- Note 9:** Contents of this document are Dangerous Waste Permit affecting (internal use only).
- Note 10:** Piping and piping support configurations shall be designed to preclude natural frequencies less than 7.0 Hz.
- Note 11:** Seller shall ensure that an additional 0.044" is available for erosion in the spherical portion of the bottom head and shall report the minimum thickness required for all specified loading conditions, exclusive of erosion and corrosion allowances. ^{and 128549}
- Note 12:** Revision 10 of this data sheet incorporates the CCN 129149. ^{10/28/02} The CCN added the words "in the form of overflow pressures", to the note shown above the overflow loads graph and further revised the note below the graph, as noted herein on sheet 3 of 5. Added calculation 24590-PTF-MTC-FRP-00001 and Environmental Qualification on Sheet 1. Added the note identified by ** on sheet 1.

10



MECHANICAL DATA SHEET: VESSEL

PLANT ITEM No.
24590-PTF-MV-FRP-VSL-00002D

Equipment Cyclic Data Sheet

Component Plant Item Number:	24590-PTF-MV-FRP-VSL-00002D
Component description	Parent Vessel
<i>The information below is provisional and envelopes operational duty for fatigue assessment. It is not to be used as operational data.</i>	
Materials of Construction	SA 240 316 with maximum carbon content of 0.030%
Design Life	40 years
Component Function and Life Cycle Description	This vessel receives and stores waste in a batch transfer from off-site tanks. It shall be designed to be filled to the maximum content level over a period of one day. Additionally, this vessel will be subjected to fluid dynamic forces from the operation of the pulse jet mixers during the process of suspending the solids in the waste feed. This vessel is washed down not more than once per year.

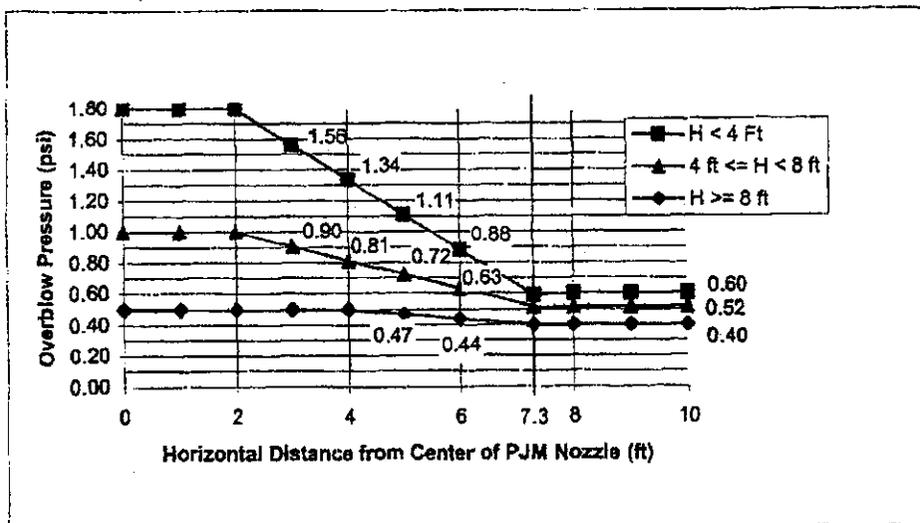
Load Type	Min	Max	Number of Cycles	Comment
Design Pressure psig	-2.5	15	10	Nominal assumption for testing
Operating Pressure psig	-0.123	0	5100	
Operating Temperature °F	50	215	5100	
Contents Specific Gravity	1.0	1.46	5100	
Contents Level inch	32	402	5100	Liquid level measured from crown of bottom head
Localized Features				
Nozzles				
Supports	Same as Vessel		Number of cycles same as vessel	

Hydrodynamic Loading

In normal operation, pulse jet mixers discharge liquid into the parent vessel imposing a cyclical hydrodynamic load on all internal components. Occasionally, an upset condition designated "overblow" causes air to be discharged from any single pulse jet mixer. All internal components shall be designed for the combination of the normal operational hydrodynamic loads and overblow loads, and this load combination is also to be assumed to act concurrently with seismic loads.

Normal operation imposes a cyclical load ranging between -0.05 and 0.12 psi in the radial direction and -0.01 to 0.10 psi in the vertical direction for 8.0×10^6 cycles. The hydrodynamic pressure applies across the projected area of the component. Positive hydrodynamic forces act in the radial, outward direction and the vertical, upward direction. Seller shall apply the radial load simultaneously in the radial direction and normal to the radial direction in the horizontal plane.

Overblow loads vary as a function of the distance from the center of the overblowing pulse jet mixer nozzle and the elevation "H" above the overblowing pulse jet mixer nozzle up to the overflow level, as plotted in the form of overblow pressures:



For all vessel internal components other than the overblowing pulse jet mixer, the overblow forces shall be applied a) in the vertical direction, and b) in the horizontal direction, radiating from the centerline of the overblowing pulse jet mixer. For the overblowing pulse jet mixer, the force shall be applied in the vertical upward direction only. The overblow force on all components, including the structures and supports, shall be calculated by applying the overblow pressure at the location of the nearest surface of the component and to the projected area of the component, facing the appropriate direction. The normal force component, specified for the normal pulse jet mixer operation condition, is not applicable to the overblow condition. Any single pulse jet mixer may overblow 1000 cycles. Reference CGN 125541 dated 07/27/05.



MECHANICAL DATA SHEET: VESSEL

PLANT ITEM No.
24590-PTF-MV-FRP-VSL-00002D

Notes

Cycle Increase: The Seller must increase the numbers of operational cycles given above by 10% to account for commissioning duty unless otherwise noted.

Equipment Cyclic Data Sheet

Component Plant Item Number:	24590-PTF-MV-FRP-PJM-00005, 24590-PTF-MV-FRP-PJM-00006, 24590-PTF-MV-FRP-PJM-00007, 24590-PTF-MV-FRP-PJM-00008, 24590-PTF-MV-FRP-PJM-00009, 24590-PTF-MV-FRP-PJM-00010, 24590-PTF-MV-FRP-PJM-00011, 24590-PTF-MV-FRP-PJM-00012, 24590-PTF-MV-FRP-PJM-00013, 24590-PTF-MV-FRP-PJM-00014, 24590-PTF-MV-FRP-PJM-00015, 24590-PTF-MV-FRP-PJM-00016
Component Description	Pulse Jet Mixers

The information below is provisional and envelopes operational duty for fatigue assessment. It is not to be used as operational data.

Materials of Construction	SA 240 316 with maximum carbon content of 0.030%				
Design Life	40 years				
Component Function and Life Cycle Description	<p>These PJMs are cyclically loaded using vacuum to fully fill the PJM with process liquid and compressed air to fully empty the PJM. The PJMs are contained within a parent vessel with varying liquid level. They shall be designed to cycle between the maximum pressure and the minimum pressure plus the external static head imposed by the parent vessel.</p> <p>The PJM supports shall be designed to cycle between the following loading conditions depending on the liquid level in the parent vessel:</p> <p>Fully Buoyant Parent vessel full and PJM empty</p> <ul style="list-style-type: none"> Design for buoyancy + PJM thrust - PJM weight <p>PJM Weight Parent vessel full and PJM full or Parent vessel nearly empty and PJM empty</p> <ul style="list-style-type: none"> Design for PJM weight <p>Fully Loaded Parent vessel nearly empty and PJM full</p> <ul style="list-style-type: none"> Design for PJM weight + liquid weight 				
Load Type		Range	Number of Cycles	Comment	
Design Pressure	psig	FV	80	10	Nominal assumption for testing
Operating Pressure	psig	FV	30	8.0 X 10 ⁶	Operating pressure = 22 psig + 8 psig design margin
Operating Temp	°F	50	215	<100	
Contents Specific Gravity		1.0	1.46	<1000	
Contents Level	inch	Empty	Flooded	8.0 X 10 ⁶	
PJM Thrust	lbf	0	330	8.0 X 10 ⁶	
Localized Features					
Supports	Fully Buoyant	PJM Weight		3.31 x 10 ⁶	The parent vessel is operating at greater than 75% capacity and the PJMs are cycling between empty and full for the indicated number of cycles.
	Fully Buoyant	Fully Loaded		1.38 x 10 ⁶	The parent vessel is operating at between 25 and 50% capacity and the PJMs are cycling between empty and full for the indicated number of cycles.
	PJM Weight	Fully Loaded		3.31 x 10 ⁶	The parent vessel is operating at less than 25% capacity and the PJMs are cycling between empty and full for the indicated number of cycles.

Notes

Cycle Increase: The Seller must increase the numbers of operational cycles given above by 10% to account for commissioning duty unless otherwise noted.



MECHANICAL DATA SHEET: VESSEL

PLANT ITEM No.
24590-PTF-MV-FRP-VSL-00002D

Approval

Rev	Description	System Engr	Vessel Engr	Checked	Approved	Date
0	Issue for Purchase	Y. Hovanaki	R. Simmons	C. Slater/CEC	S. Kirk	4/18/02
1	Revised as Noted	Y. Hovanaki	R. Simmons	C. Corriveau	S. Kirk	6/02/02
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4	Revised per Note 5	Y. Hovanaki	R. Simmons	CS / JJ	M. Hoffmann	5/18/03
5	Revised per Note 7	Y. Hovanaki	R. Simmons	CS / JJ	M. Hoffmann	11/3/03
6	Added Black Cell Requirements	R. Rider	R. Simmons	YH/CS/JJ	M. Hoffmann	4/5/04
7	Added Material Specification for Internal Supports and Hydrodynamic Loads	R. Rider	R. Simmons	YH/RT/JJ D. Adler	M. Hoffmann	6/23/04
8	Revised Hydrodynamic Loading Criteria	R. Rider	R. Simmons	YH/CS/JJ	M. Hoffmann	7/13/04
9	Revised Hydrodynamic Loading Criteria	R. Rider	R. Simmons	CS/JJ	M. Hoffmann	7/20/04
10	Revised per Note 12 on sheet 2 of 5.	<i>RJR</i>	<i>RS</i>	<i>WASR</i>	<i>M. Hoffmann</i>	<i>10/28/05</i>

Please note that source, special nuclear, and byproduct materials, as defined in the Atomic Energy Act of 1954 (AEA) are regulated at the U. S. Department of Energy (DOE) facilities exclusively by DOE acting pursuant to its AEA authority. DOE asserts that pursuant to AEA, it has sole and exclusive responsibility and authority to regulate source, special nuclear, and byproduct materials at DOE-owned nuclear facilities. Information contained herein on radionuclides is provided for process description purposes only.

Bechtel National, Inc. Certification

The following certification statement is provided consistent with Contract No. DE-AC27-01RV14136, Section H.26, Environmental Permits, paragraph (g) for the submittal of the Hanford Facility Resource Conservation and Recovery Act Permit Modification Notification Form 24590-PTF-PCN-ENV-06-018

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 assure 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.



W. S. Elkins
Project Director



6/28/07
Date

Quarter Ending 09/30/2007

24590-HLW-PCN-ENV-06-025

Hanford Facility RCRA Permit Modification Notification Form
Part III, Operating Unit 10
Waste Treatment and Immobilization Plant

Index

Page 2 of 2: Hanford Facility RCRA Permit, Operating Unit 10, Waste treatment and Immobilization Plant
Update HLW design proposal drawing 24590-HLW-M0-HSH-P0075, HLW Vitrification System HSH Melter
Cave 1 & 2 Design Proposal Drawing Decontamination Tank Process Flow Diagram, in Appendix 10.1 of the
Dangerous Waste Permit.

Submitted by Co-Operator:

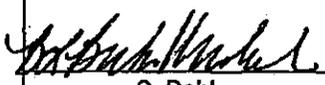
Reviewed by ORP Program Office:

D. A. Klein 6/18/07
D. A. Klein Date

S. J. Clinger 7/23/07
S. J. Clinger Date

Quarter Ending 09/30/2007

24590-HLW-PCN-ENV-06-025

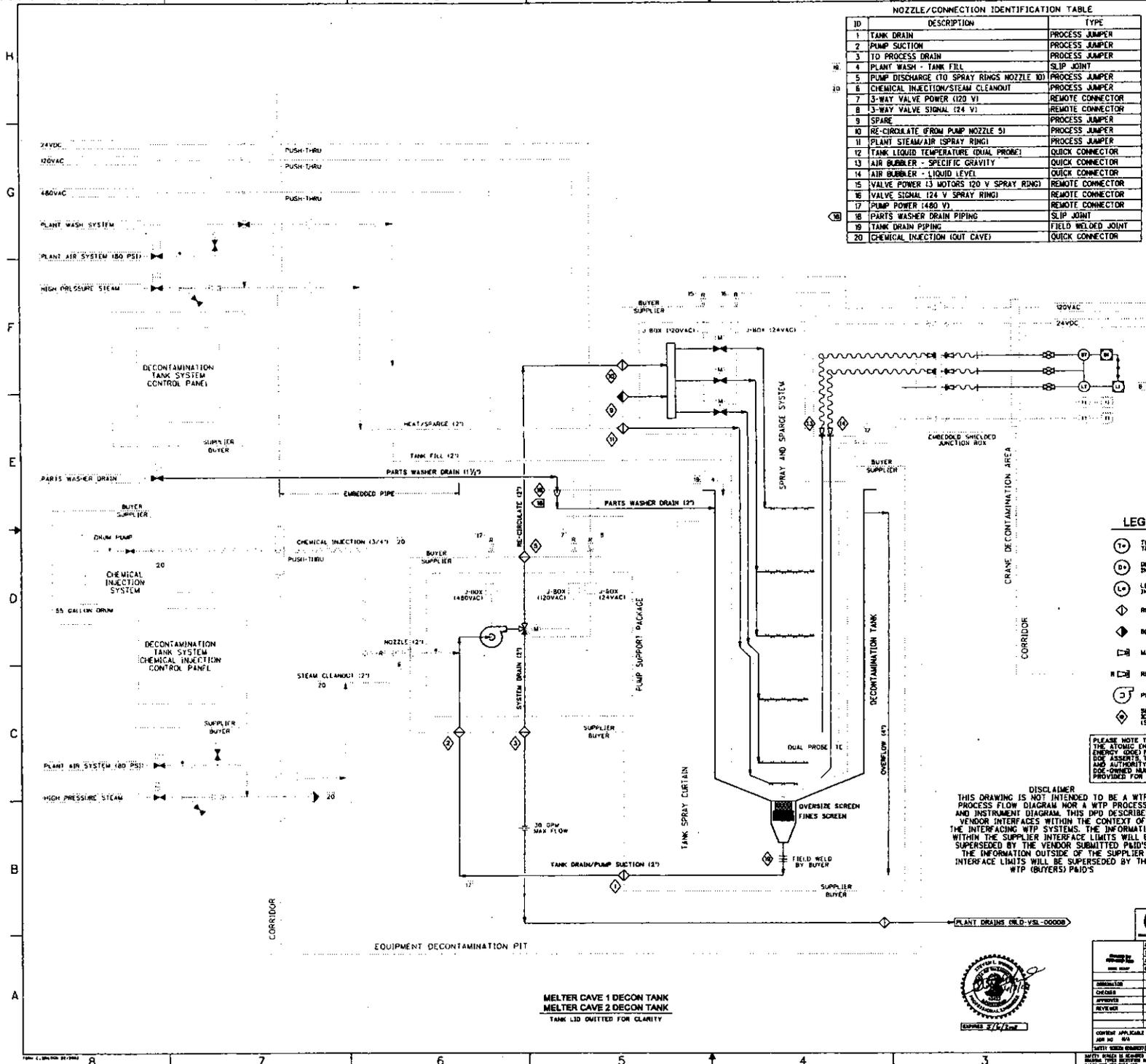
Hanford Facility RCRA Permit Modification Notification Form					
Unit: Waste Treatment and Immobilization Plant		Permit Part & Chapter: Part III, Operating Unit 10			
Description of Modification:					
The purpose of this Class 1 prime modification is to update the HLW Vitrification System HSH Melter Caves 1 & 2 Design Proposal Drawing Decontamination Tank Process Flow Diagram (24590-HLW-M0-HSH-P0075), located in Appendix 10.1 of the Dangerous Waste Permit (DWP).					
Please replace the following drawing in Appendix 10.1 of the Dangerous Waste Permit:					
Appendix 10.1					
Replace	24590-HLW-M0-HSH-P0075	Rev. 0	24590-HLW-M0-HSH-P0075 Rev. 1		
The referenced PFD is complete revision. It incorporates vendor design details and editorial changes as described in Note 21. This modification requests Ecology approval of the specific changes to this drawing that are identified in Note 21. The major changes are summarized below:					
<ul style="list-style-type: none"> • Updated symbols under Legend • Modified Note 1 to clarify operations of spray ring • Deleted Notes 3 through 6 and 10 through 15 • Added Notes 17 through 21 • Added callouts for room/corridor and Melter Cave • Added connections to electrical signal lines and junction boxes • Added drain line to the Decontamination Tank from the parts washer • Deleted jumper valves from the tank drain line • Revised nozzle ID numbers and added Nozzle/Connection Identification Table • Other editorial changes 					
There are no outstanding change documents associated with this drawing.					
WAC 173-303-830 Modification Class: ^{1,2}		Class 1	Class ¹ 1	Class 2	Class 3
Please mark the Modification Class:			X		
Enter Relevant WAC 173-303-830, Appendix I Modification citation number:		N/A			
Enter wording of WAC 173-303-830, Appendix I Modification citation:					
In accordance with WAC 173-303-830(4)(d)(i), this modification notification is requested to be reviewed and approved as a Class ¹ 1 modification. WAC 173-303-830(4)(d)(ii) states, "Class 1 modifications apply to minor changes that keep the permit current with routine changes to facility or its operation. These changes do not substantially alter the permit conditions or reduce the capacity of the facility to protect human health or the environment. In the case of Class 1 modifications, the director may require prior approval."					
Modification Approved: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No (state reason for denial)		Reviewed by Ecology:			
Reason for denial:		 S. Dahl			
		8/23/07 Date			

¹ Class 1 modifications requiring prior Agency approval.

² If the proposed modification does not match any modification listed in WAC 173-303-830 Appendix I, then the proposed modification should automatically be given a Class 3 status. This status may be maintained by the Department of Ecology, or down graded to a Class ¹1, if applicable.

ID	DESCRIPTION	TYPE
1	TANK DRAIN	PROCESS JUMPER
2	PUMP SUCTION	PROCESS JUMPER
3	TO PROCESS DRAIN	PROCESS JUMPER
4	PLANT WASH - TANK FILL	SLIP JOINT
5	PUMP DISCHARGE (TO SPRAY RINGS NOZZLE 10)	PROCESS JUMPER
6	CHEMICAL INJECTION/STEAM CLEANOUT	PROCESS JUMPER
7	3-WAY VALVE POWER (120 V)	REMOTE CONNECTOR
8	3-WAY VALVE SIGNAL (24 V)	REMOTE CONNECTOR
9	SPARE	PROCESS JUMPER
10	RE-CIRCULATE (FROM PUMP NOZZLE 5)	PROCESS JUMPER
11	PLANT STEAM/AIR (SPRAY RING)	PROCESS JUMPER
12	TANK LIQUID TEMPERATURE (DUAL PROBE)	QUICK CONNECTOR
13	AIR BUBBLER - SPECIFIC GRAVITY	QUICK CONNECTOR
14	AIR BUBBLER - LIQUID LEVEL	QUICK CONNECTOR
15	VALVE POWER (3 MOTORS (20 V SPRAY RING))	REMOTE CONNECTOR
16	VALVE SIGNAL (24 V SPRAY RING)	REMOTE CONNECTOR
17	PUMP POWER (480 V)	REMOTE CONNECTOR
18	PARTS WASHER DRAIN PIPING	SLIP JOINT
19	TANK DRAIN PIPING	FIELD WELDED JOINT
20	CHEMICAL INJECTION (OUT CAVE)	QUICK CONNECTOR

- NOTES:**
1. ONLY ONE SPRAY RING GROUP IS TO BE OPERATING AT ANY TIME.
 2. PLANT WASH SYSTEM TO PROVIDE DEMINERALIZED WATER OR DILUTED NITRIC ACID.
 3. DELETED
 4. DELETED
 5. DELETED
 6. DELETED
 7. STEAM HEAT SYSTEM SHALL BE SIZED TO HEAT UP A FULL DECON TANK FROM 50° F TO 200° F IN 4 HOURS.
 8. FOR INSTRUMENTATION REQUIREMENTS SEE SPECIFICATION 24590-WTP-SPS-3007-10001.
 9. FOR PUMP AND VALVE REQUIREMENTS SEE SPECIFICATION 24590-WTP-SPS-3007-10001.
 10. DELETED
 11. DELETED
 12. DELETED
 13. DELETED
 14. DELETED
 15. DELETED
 16. THIS DRAWING PROVIDED BASIC OUTLINES AND DESIGN OBJECTIVES TO CONTRACTED DESIGN OR FABRICATION SUPPLIERS AND SHALL BE USED BY USER TO COMPLY WITH THE DESIGN SYSTEM OR COMPONENT IDENTIFIED HEREIN. SEE VENDOR INFORMATION FOR FURTHER INFORMATION PROVIDED IN CONFORMANCE TO PURCHASE ORDER 24590-CM-POA-10YR-0001.
 17. FLOW REVERSES FROM HEAT SUPPORT PACKAGE TO URCON TANK WHEN PURGING LINE WITH STEAM OR AIR.
 18. REDUCER SIZE 1/2" TO 1" FACILITY (RING 1117) INSERTS INTO REDUCER TO ALLOW UNRESTRAINED TANK GROWTH DURING TANK HEATING OPERATIONS.
 19. JUMPER PUMP END INSERTS INTO OVERSIZED HOLE LOCATED IN TOP FLANGE OF SPRAY AND SPRAY SYSTEM (SPRAY RINGS).
 20. CHEMICAL INJECTION JUMPER AND BLANKED REMOTE JUMPER CONNECTOR (PLANT STEAM/AIR) TO BE REMOVED FOR TEMPORARY INSTALLATION OF STEAM CLEANOUT JUMPER.
 21. REVISION HISTORY:
 UPDATED TO REFLECT SUPPLIER'S DESIGN SUBMITTALS AND BUYER'S DEVELOPMENT FACILITY PAID. MODIFIED SUPPLIER EQUIPMENT TITLES TO MATCH OPI's. ADDED ROOM/CORRIDOR CALLOUTS TO MANUAL CONNECTOR TO POWER/SIGNAL LINES. MODIFIED PLANT WASH LINE. MODIFIED PLANT AIR AND HIGH PRESSURE AIR TO SPRAY AND SPRAY SYSTEM. ADDED PARTS WASHER LINE. MODIFIED PLANT STEAM TO TANK DRAIN CLEANOUT. ADDED AIR LINE TO TANK DRAIN CLEANOUT. MODIFIED CHEMICAL INJECTION LINE. DELETED SYSTEM DRAIN JUMPER VALVES. ADDED 1/2" BALL VALVE TO TANK DRAIN PIPING. REMOVED SELLER NOZZLE TO NUMBER 5 AND ADDED TANK REMOVED BUTTER NOZZLE TO NUMBER 5. UPDATED SYMBOL LEGEND. REVISED TITLE AND REF DWGS. ADDED MELTER CAVE 1 AND 2 CALLOUTS.
 22. CONTENTS OF THIS DOCUMENT ARE DANGEROUS WASTE PERMIT EFFECTIVE.
 23. ALL COMPONENTS SHOWN ON THIS DRAWING IN PHANTOM DO NOT REQUIRE INDEPENDENT QUALIFIED REGISTERED PROFESSIONAL ENGINEER ASSESSMENT OF DESIGN OR INSTALLATION. PHANTOMS AT A QUALIFIED INSTALLATION INSPECTOR IN ACCORDANCE WITH THE DWP AND/OR WASHINGTON ADMINISTRATIVE CODE REQUIREMENTS.



LEGEND

	TEMPERATURE ELEMENT/TRANSDUCER/INDICATOR		REDUCER
	DENSITY TRANSMITTER/INDICATOR		REDUCER USED AS SLIP JOINT
	LEVEL TRANSMITTER/INDICATOR		ORIFICE UNION
	REMOTE JUMPER CONNECTION		CHECK VALVE
	BLANKED REMOTE JUMPER CONNECTION		MANUAL ON/OFF VALVE (SHOWN NORMALLY CLOSED)
	MANUAL QUICK DISCONNECT		BALL VALVE (SHOWN NORMALLY CLOSED)
	REMOTE QUICK DISCONNECT		PNEUMATIC ACTUATED VALVE (SHOWN NORMALLY CLOSED)
	PUMP		MOTORIZED ON/OFF VALVE (SHOWN NORMALLY CLOSED)
	SELLER'S NOZZLE/CONNECTION IDENTIFICATION NUMBER (SEE TABLE)		MOTORIZED THREE-WAY VALVE

PLEASE NOTE THAT SOURCE, SPECIAL NUCLEAR AND BYPRODUCT MATERIALS, AS DEFINED IN THE ATOMIC ENERGY ACT OF 1954 (AEA) ARE REGULATED BY THE U.S. DEPARTMENT OF ENERGY (DOE) FACILITIES EXCLUSIVELY BY DOE ACTING PURSUANT TO ITS AEA AUTHORITY. DOE AEA AND AEA REGULATIONS AND DOE USES RESPONSIBILITY AND AUTHORITY TO REGULATE SOURCE, SPECIAL NUCLEAR AND BYPRODUCT MATERIALS AT DOE OWNED FACILITIES. INFORMATION CONTAINED HEREIN ON RADIOISOTOPES IS PROVIDED FOR PROCESS DESCRIPTION PURPOSES ONLY.

DISCLAIMER
 THIS DRAWING IS NOT INTENDED TO BE A WTP PROCESS FLOW DIAGRAM NOR A WTP PROCESS AND INSTRUMENT DIAGRAM. THIS DPD DESCRIBES VENDOR INTERFACES WITHIN THE CONTEXT OF THE INSTRUMENTING WTP SYSTEMS. THE INFORMATION WITHIN THE SUPPLIER INTERFACE LIMITS WILL BE SUPERSEDED BY THE VENDOR SUBMITTED PLI'S. THE INFORMATION OUTSIDE OF THE SUPPLIER INTERFACE LIMITS WILL BE SUPERSEDED BY THE WTP (BUYER'S) PAID'S.

REFERENCE DRAWINGS

NO.	REV.	DATE	TITLE
24590-WTP-SPS-3007-10001	1	10/1/01	NEW HSH WTP DECONTAMINATION LINE ASSEMBLY
24590-WTP-SPS-3007-10004	1	10/1/01	NEW HSH WTP DECON TANK CONTROL CIRCUITS
24590-WTP-SPS-3007-10002	1	10/1/01	NEW HSH WTP DECONTAMINATION TANK
24590-WTP-SPS-3007-10003	1	10/1/01	NEW HSH WTP DECON TANK SPRAY & SPRAY SYS
24590-WTP-SPS-3007-10004	1	10/1/01	NEW HSH WTP DECON TANK PUMP SUPPORT BNG
24590-WTP-SPS-3007-10005	1	10/1/01	NEW HSH WTP DECON TANK DISCHARGE FILTER
24590-WTP-SPS-3007-10006	1	10/1/01	NEW HSH WTP DECON TANK LID
24590-WTP-SPS-3007-10007	1	10/1/01	NEW HSH WTP DECON TANK LID
24590-WTP-SPS-3007-10008	1	10/1/01	NEW HSH WTP DECON TANK LID
24590-WTP-SPS-3007-10009	1	10/1/01	NEW HSH WTP DECON TANK LID

1	ISSUED FOR PERMITTING USE COMPLETE	AC	24	10/1/01
0	ISSUED FOR PERMITTING USE	AC	24	10/1/01
REV	DESCRIPTION	DATE	BY	DATE

CM

REVISION HISTORY

NO.	DATE	DESCRIPTION
1	10/1/01	ISSUED FOR PERMITTING USE COMPLETE

CONTRACTOR
 HLV VITRIFICATION SYSTEM HSH MELTER CAVES 1&2 DESIGN PROPOSAL DRAWING DECONTAMINATION TANK PROCESS FLOW DIAGRAM

CLIENT
 RIVER PROTECTION PROJECT
 WASTE TREATMENT PLANT
 2435 STEVENS CENTER PLACE
 RICHLAND, WA 99354

DATE
 10/1/01

SCALE
 NONE

PROJECT NO.
 24590-HLV-MO-HSH-P0075

REV
 1



MELTER CAVE 1 DECON TANK
 MELTER CAVE 2 DECON TANK
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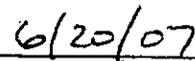
Bechtel National, Inc. Certification

The following certification statement is provided consistent with Contract No. DE-AC27-01RV14136, Section H.26, Environmental Permits, paragraph (g) for the submittal of the Hanford Facility Resource Conservation and Recovery Act Permit Modification Notification Form 24590-HLW-PCN-ENV-06-025.

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 assure 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.



W. S. Elkins
Project Director



Date

Quarter Ending September 30,
2007

24590-PTF-PCN-ENV-07-005

Hanford Facility RCRA Permit Modification Notification Form
Part III, Operating Unit 10
Waste Treatment and Immobilization Plant

Index

Page 2 of 3: Hanford Facility RCRA Permit, Part III, Operating Unit 10, Waste Treatment and Immobilization Plant
Update Pretreatment Facility General Arrangement Plan at the 77' elevation in Appendix 8.4 of the
Dangerous Waste Permit.

Submitted by Co-Operator:

Reviewed by ORP Program Office:

D. A. Klein 8/3/07
D. A. Klein Date

S. J. Olinger 8/20/07
S. J. Olinger Date

Quarter Ending September 30,
2007

24590-PTF-PCN-ENV-07-005

Hanford Facility RCRA Permit Modification Notification Form														
Unit: Waste Treatment and Immobilization Plant	Permit Part & Chapter: Part III, Operating Unit 10													
<u>Description of Modification:</u>														
The purpose of this Class 1 prime modification is to update Pretreatment Facility General Arrangement Plan at the 77' elevation in Appendix 8.4 of the Dangerous Waste Permit. The following General Arrangement Drawing is submitted to replace the permitted General Arrangement Drawing currently in Appendix 8.4.														
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td colspan="5" style="padding: 2px;">Appendix 8.4</td> </tr> <tr> <td style="width: 15%; padding: 2px;">Replace:</td> <td style="width: 35%; padding: 2px;">24590-PTF-P1-P01T-P0004, Rev. 0</td> <td style="width: 15%; padding: 2px;">With:</td> <td colspan="2" style="width: 35%; padding: 2px;">24590-PTF-P1-P01T-00004, Rev. 3</td> </tr> </table>					Appendix 8.4					Replace:	24590-PTF-P1-P01T-P0004, Rev. 0	With:	24590-PTF-P1-P01T-00004, Rev. 3	
Appendix 8.4														
Replace:	24590-PTF-P1-P01T-P0004, Rev. 0	With:	24590-PTF-P1-P01T-00004, Rev. 3											
This modification requests Ecology approval and incorporation into the permit the specific changes to the General Arrangement Drawing that are identified by the Revision 2 and 3 notes, clouds, and revision triangles shown on the General Arrangement Drawings that have been issued since the last revision of the permitted version. Revisions are the result of ongoing design. The following is a summary of the significant changes on the attached drawing:														
<ul style="list-style-type: none"> • Relocated equipment within and between rooms • Added new rooms and adjusted the boundaries of rooms • Added, adjusted, and relocated racks • Added and removed holds • Added component identification numbers for skids relative to equipment • Various changes to the depiction of equipment/structure • Identification of additional information as a result of going from permit drawing to the engineering design drawing 														
An updated Pretreatment Facility room and equipment list for the 77' elevation is also included.														
The following is a list of outstanding change documents that have not been incorporated into this modification: None														
WAC 173-303-830 Modification Class: ¹ ²														
Please mark the Modification Class:														
	Class 1	Class ¹ 1	Class 2	Class 3										
		X												
Enter Relevant WAC 173-303-830, Appendix I Modification citation number: N/A														
Enter wording of WAC 173-303-830, Appendix I Modification citation:														
In accordance with WAC 173-303-830(4)(d)(i), this modification notification is requested to be reviewed and approved as a Class ¹ 1 modification. WAC 173-303-830(4)(d)(ii)(A) states, "Class 1 modifications apply to minor changes that keep the permit current with routine changes to facility or its operation. These changes do not substantially alter the permit conditions or reduce the capacity of the facility to protect human health or the environment. In the case of Class 1 modifications, the director may require prior approval."														

¹ Class 1 modifications requiring prior Agency approval.

² If the proposed modification does not match any modification listed in WAC 173-303-830 Appendix I, then the proposed modification should automatically be given a Class 3 status. This status may be maintained by the Department of Ecology, or down graded to a Class '1, if applicable.

Quarter Ending September 30,
2007

24590-PTF-PCN-ENV-07-005

<p>Modification Approved: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No (state reason for denial) <u>Reason for denial:</u></p>	<p>Reviewed by Ecology:</p> <p><i>B. Becker-Khaleel</i> 8/29/07 B. Becker-Khaleel Date</p>
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**Pretreatment Facility
Room and Equipment List for El. 77'**

Room	Room Description	Equipment Number	Equipment Description
MISCELLANEOUS UNITS			
P-0418	Vessel Vent Exhaust Fan Room	PVV-FAN-00001A	PVV Exhaust Fan
		PVV-FAN-00001B	PVV Exhaust Fan
P-0430	CNP Evaporator Condenser Room	CNP-HX-00002	Cesium Evaporator Primary Condenser (located on CNP-SKID-00002)
		CNP-HX-00003	Cesium Evaporator Intercondenser (located on CNP-SKID-00002)
		CNP-HX-00004	Cesium Evaporator Aftercondenser (located on CNP-SKID-00002)
P-0431A	PJV Secondary HEPA Filter Room	PJV-HEPA-00002A	PJV Secondary Exhaust HEPA Filter
		PJV-HEPA-00002B	PJV Secondary Exhaust HEPA Filter
		PJV-HEPA-00002C	PJV Secondary Exhaust HEPA Filter
		PJV-HEPA-00002D	PJV Secondary Exhaust HEPA Filter
		PJV-HEPA-00002E	PJV Secondary Exhaust HEPA Filter
		PJV-HEPA-00002F	PJV Secondary Exhaust HEPA Filter
P-0433	PJV Fan Room	PJV-FAN-00001A	PJV Exhaust Fan
		PJV-FAN-00001B	PJV Exhaust Fan
		PJV-FAN-00001C	PJV Exhaust Fan

**Pretreatment Facility
Room and Equipment List for EL 77'**

Room	Room Description	Equipment Number	Equipment Description
TANK AND MISCELLANEOUS UNIT ANCILLARY EQUIPMENT			
P-0113	Reserved Space (TBD)	N/A	Does not contain any regulated tanks or MTUs, but does contain regulated ancillary equipment (valves, piping, etc.)
P-0335	Filter Cave	N/A	Does not contain any regulated tanks or MTUs, but does contain regulated ancillary equipment (valves, piping, etc.)
P-0402	Rack Room	N/A	Does not contain any regulated tanks or MTUs, but does contain regulated ancillary equipment (valves, piping, etc.)
P-0407	Process Area	N/A	Does not contain any regulated tanks or MTUs, but does contain regulated ancillary equipment (valves, piping, etc.)
P-0410	Rack Room	N/A	Does not contain any regulated tanks or MTUs, but does contain regulated ancillary equipment (valves, piping, etc.)
P-0411	Sub-Change Room	N/A	Does not contain any regulated tanks or MTUs, but does contain regulated ancillary equipment (valves, piping, etc.)
P-0415	Rack Room	N/A	Does not contain any regulated tanks or MTUs, but does contain regulated ancillary equipment (valves, piping, etc.)
P-0415A	Rack Room	N/A	Does not contain any regulated tanks or MTUs, but does contain regulated ancillary equipment (valves, piping, etc.)
P-0422A	Inbleed Room	N/A	Does not contain any regulated tanks or MTUs, but does contain regulated ancillary equipment (valves, piping, etc.)
P-0423	Rack Room	N/A	Does not contain any regulated tanks or MTUs, but does contain regulated ancillary equipment (valves, piping, etc.)
P-0426	Rack Room	N/A	Does not contain any regulated tanks or MTUs, but does contain regulated ancillary equipment (valves, piping, etc.)
P-0430	CNP Evaporator Condenser Room	CNP-EJCTR-00010A	2nd Stage Primary Vacuum Ejector (located on CNP-SKID-00002)
		CNP-EJCTR-00010B	2nd Stage Secondary Vacuum Ejector (located on CNP-SKID-00002)
		CNP-PMP-00002	Process Condensate Return Pump (located on CNP-SKID-00002)

**Pretreatment Facility
Room and Equipment List for EL. 77'**

Room	Room Description	Equipment Number	Equipment Description
CONTAINMENT BUILDINGS			
P-0431A	PJV Secondary HEPA Filter Room	N/A	Contains Permitted Equipment Identified Above

Bechtel National, Inc. Certification

The following certification statement is provided consistent with Contract No. DE-AC27-01RV14136, Section H.26, Environmental Permits, paragraph (g) for the submittal of the Hanford Facility Resource Conservation and Recovery Act Permit Modification Notification Form 24590-PTF-PCN-ENV-07-005.

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 assure 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.



W. S. Elkins
Project Director

6-AUG-2007

Date

Quarter Ending Sept. 30, 2007

24590-LAW-PCN-ENV-06-004

Hanford Facility RCRA Permit Modification Notification Form
Part III, Operating Unit 10
Waste Treatment and Immobilization Plant

Index

- Page 2 of 4: Hanford Facility RCRA Permit, Operating Unit 10, Waste Treatment and Immobilization Plant
- Update LAW Vitrification Building General Arrangement Plan at El. (-) 21'-0" (24590-LAW-P1-P01T-00001)
 - Update LAW Vitrification Building General Arrangement Plan at El. 3'-0" (24590-LAW-P1-P01T-00002)
 - Update LAW Vitrification Building General Arrangement Plan at El. 22'-0" (24590-LAW-P1-P01T-00003)
 - Update LAW Vitrification Building General Arrangement Plan at El. 28'-0" (24590-LAW-P1-P01T-00004)
 - Update LAW Vitrification Building General Arrangement Section A-A, B-B, C-C and S-S (24590-LAW-P1-P01T-00007)
 - Update LAW Vitrification Building General Arrangement Section D-D, E-E, F-F and T-T (24590-LAW-P1-P01T-00008)
 - Update LAW Vitrification Building General Arrangement Section G-G, H-H, and J-J (24590-LAW-P1-P01T-00009)
 - Update LAW Vitrification Building General Arrangement Section K-K, L-L, and M-M (24590-LAW-P1-P01T-00010)
 - Update LAW Vitrification Building General Arrangement Section N-N, P-P, R-R and U-U (24590-LAW-P1-P01T-00011)

Submitted by Co-Operator:

Reviewed by ORP Program Office:

D. A. Klein 6/26/07
D. A. Klein Date

S. J. Olinger 8/9/07
S. J. Olinger Date

Quarter Ending Sept. 30, 2007

24590-LAW-PCN-ENV-06-004

Hanford Facility RCRA Permit Modification Notification Form	
Unit: Waste Treatment and Immobilization Plant	Permit Part & Chapter: Part III, Operating Unit 10
<u>Description of Modification:</u> <p>The purpose of this modification is to update the general arrangement drawings currently located in Appendix 9.4 of the Dangerous Waste Permit (DWP). As discussed in "Proposed Transition Period for Implementing Revised Process for Permit Incorporation of Design Documents at the Waste Treatment and Immobilization Plant (WTP)" (CCN 141838), the following source General Arrangement drawings are submitted to replace the permit General Arrangement drawings currently in Appendix 9.4:</p> <ul style="list-style-type: none"> • LAW Vitrification Building General Arrangement Plan at El. (-) 21'-0" (24590-LAW-P1-P01T-00001, Rev. 2) • LAW Vitrification Building General Arrangement Plan at El. 3'-0" (24590-LAW-P1-P01T-00002, Rev. 5) • LAW Vitrification Building General Arrangement Plan at El. 22'-0" (24590-LAW-P1-P01T-00003, Rev. 4) • LAW Vitrification Building General Arrangement Plan at El. 28'-0" (24590-LAW-P1-P01T-00004, Rev. 3) • LAW Vitrification Building General Arrangement Section A-A, B-B, C-C and S-S (24590-LAW-P1-P01T-00007, Rev. 8) • LAW Vitrification Building General Arrangement Section D-D, E-E, F-F and T-T (24590-LAW-P1-P01T-00008, Rev. 7) • LAW Vitrification Building General Arrangement Section G-G, H-H, and J-J (24590-LAW-P1-P01T-00009, Rev. 8) • LAW Vitrification Building General Arrangement Section K-K, L-L, and M-M (24590-LAW-P1-P01T-00010, Rev. 8) • LAW Vitrification Building General Arrangement Section N-N, P-P, R-R and U-U (24590-LAW-P1-P01T-00011, Rev. 6) <p>The above mentioned general arrangement drawings include revisions as indicated by notes, clouds, and revision triangles shown on the document(s). The revisions shown are the result of ongoing design. Revisions of the above documents that are not associated with dangerous waste management (e.g. utility support systems) are described in the general revision notes in the above documents, but may not be discussed below. The following are the changes to the above mentioned general arrangement drawings that are potentially relevant to the management of dangerous waste and/or associated systems and equipment:</p> <ul style="list-style-type: none"> • LAW Vitrification Building General Arrangement Plan at El. (-) 21'-0" (24590-LAW-P1-P01T-00001) <ul style="list-style-type: none"> ○ Reconfiguration of doorways to rooms L-B012 and L-B014 to allow sufficient access for all required maintenance activities ○ Elimination of one LAW melter and equipment associated with the 2 + 2 melter configuration ○ Removed sumps associated with third LAW melter pour cave (dry area) ○ Removed two facility transformers in accordance with Electrical Design Criteria and Guide (24590-WTP-DC-E-01-001) (25% excess capacity requirement is still met with reduced number of transformers) ○ Approved Drawing Change Notices impacting this drawing: 24590-LAW-P1N-P01T-00025 and -00027 	

Quarter Ending Sept. 30, 2007

24590-LAW-PCN-ENV-06-004

- Approved Field Changes impacting this drawing:
 - 24590-WTP-FC-E-05-0034: Modified conduit spacing to eliminate potential air pockets in poured concrete
 - 24590-WTP-FC-E-06-0046: Designed new conduit support
 - 24590-WTP-FC-E-06-0096: Relocate enclosure PTJ-ENCL-00010 to prevent interference with pipe support
 - 24590-WTP-FC-E-06-0106: Moved UPE-PNL-20072 to the west wall of room L-B09 to eliminate piping interference and rename panel LVE-PNL-20070 to UPE-PNL-20072
- Removed room schedule
- LAW Vitrification Building General Arrangement Plan at El. 3'-0" (24590-LAW-P1-P01T-00002)
 - Revised melter assembly pad - added R1/C1 designation
 - Added callout for 2-inch plate cover over third melter bay (room L-0112)
 - Added callout for LMH-MHAN-00079 and SCW-TK-00006
 - Note 4 appended to indicate 24590-LAW-P1-P23T-01003 for equipment identification numbers
 - Revised configuration of MVE-XFMR-20603, MVE-XFMR-20604, MVE-XFMR-20605 and MVE-XFMR-20606, LVE-MCC-20104, LVE-SWDB-20101 and LVE-SWDB-20102 (release of hold 13)
 - Added C3V-FCU-00038 to room L-0101A
- LAW Vitrification Building General Arrangement Plan at El. 22'-0" (24590-LAW-P1-P01T-00003)
 - Reconfigured position of LOP-PMP-0003A/B and LOP-PMP-0006A/B
 - Updated fan coil units
 - Added callout to LSH-CRN-00001
- LAW Vitrification Building General Arrangement Plan at El. 28'-0" (24590-LAW-P1-P01T-00004)
 - Revised location and design of C2V-COND-00005/6 and LFH-HST-00001
 - Updated LEH-CRN-00003 to reflect vendor data
 - Added LOP-HTR-00001/2 in room LC0201
 - Added callouts for DOW-SHR-00011/12/13, LP0217, 20-CRN-00003, LEH-CRN-00005/6, C5V-HEPA-00040/41 and LP0217A
 - Added hold 14 (annex roof equipment pending final location)
- LAW Vitrification Building General Arrangement Section A-A, B-B, C-C and S-S (24590-LAW-P1-P01T-00007)
 - Updated LVP-SKID-00001/2 and LVP-SCB-00001 configuration (release of hold 5, Section B)
 - Updated C2V-HEPA-00004 and C3V-HEPA-00004 configuration (release of hold 12, Sections A and S)
 - Updated C3V-FAN-00005 configuration (release of hold 13, Sections A and S)
 - Relocated and modified electrical equipment in rooms L-0311 and L-0225 (Section B)
- LAW Vitrification Building General Arrangement Section D-D, E-E, F-F and T-T (24590-LAW-P1-P01T-00008)
 - Release of hold 13 on C2 workshop monorail and hoist (room L-0204)
 - Release of hold 14 on C2 MSM maintenance shop monorail and hoist (room L-0209)
 - Update of C5V-FAN-00010, C5V-HEPA40/41, and C5V-FLTH-00157/158 (release of hold 16)

On drawing 24590-LAW-P1-P01T-00008 it has been noted that rooms L-0209 and L-0211 were mistakenly labeled R-0209 and R-0211. WTP is in the process of developing a design change notice to address this issue and correct the mislabel in the next drawing revision.

Quarter Ending Sept. 30, 2007

24590-LAW-PCN-ENV-06-004

- LAW Vitrification Building General Arrangement Section G-G, H-H, and J-J (24590-LAW-P1-P01T-00009)
 - Updated configuration of LVP-SKID-00001, LOP-ENCL-00001, LMP-ENCL-00013/17 (release of hold 6)
 - Updated configuration of NaOH pump (associated with SHR-TK-00003) (release of hold 10)
 - Configuration of C5V-FAN-0009/10 and fan coil unit shown (release of hold 13)
 - LVP-HEPA-00002A/B equipment configuration shown in Section G
- LAW Vitrification Building General Arrangement Section K-K, L-L, and M-M (24590-LAW-P1-P01T-00010)
 - Updated LVE-MCC-20201/20202 to reflect vendor data
 - Updated configuration of C3V-HEPA-00004 (release of hold 9)
 - Release of hold 10 on the ASX system
- LAW Vitrification Building General Arrangement Section N-N, P-P, R-R and U-U (24590-LAW-P1-P01T-00011)
 - Update of LVP-EXHR-00001A/B/C and LVP-SKID-00001 (release of hold 8)
 - Release of hold 10 on C2V-HEPA-00004 and C3V-HEPA-00004
 - Added hold 12

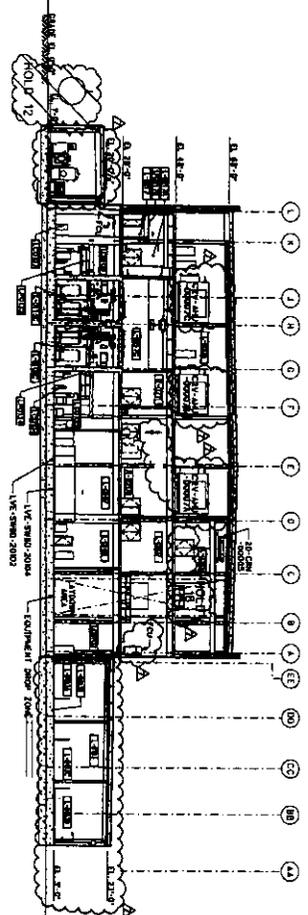
Per WAC 173-303-830(4)(d)(ii)(A), these changes do not substantially alter the permit conditions or reduce the capacity of the facility to protect human health or the environment.

Appendix 9.4			
Replace:		With:	
	24590-LAW-P1-P01T-P0001, Rev. 2		24590-LAW-P1-P01T-00001, Rev. 2
	24590-LAW-P1-P01T-P0002, Rev. 3		24590-LAW-P1-P01T-00002, Rev. 5
	24590-LAW-P1-P01T-P0003, Rev. 0		24590-LAW-P1-P01T-00003, Rev. 4
	24590-LAW-P1-P01T-P0004, Rev. 1		24590-LAW-P1-P01T-00004, Rev. 3
	24590-LAW-P1-P01T-P0007, Rev. 5		24590-LAW-P1-P01T-00007, Rev. 8
	24590-LAW-P1-P01T-P0008, Rev. 3		24590-LAW-P1-P01T-00008, Rev. 7
	24590-LAW-P1-P01T-P0009, Rev. 5		24590-LAW-P1-P01T-00009, Rev. 8
	24590-LAW-P1-P01T-P0010, Rev. 5		24590-LAW-P1-P01T-00010, Rev. 8
	24590-LAW-P1-P01T-P0011, Rev. 1		24590-LAW-P1-P01T-00011, Rev. 6

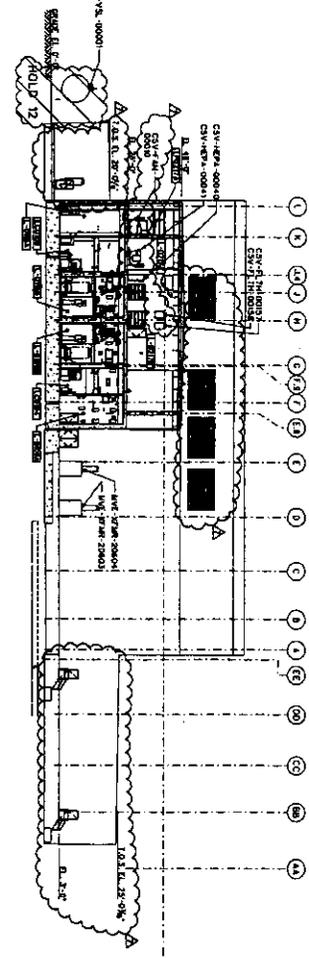
WAC 173-303-830 Modification Class: ^{1 2}	Class 1	Class 1 ¹	Class 2	Class 3
Please mark the Modification Class:	X			
Enter Relevant WAC 173-303-830, Appendix I Modification citation number: A.3				
Enter wording of WAC 173-303-830, Appendix I Modification citation: A.3 General Permit Provisions, Equipment replacement or upgrading with functionally equivalent components (e.g., pipes, valves, pumps, conveyors, controls)				
Modification Approved: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No (state reason for denial)	Reviewed by Ecology:			
Reason for denial:	 B. Becker-Khaleel		8/30/07 Date	

¹ Class 1 modifications requiring prior Agency approval.

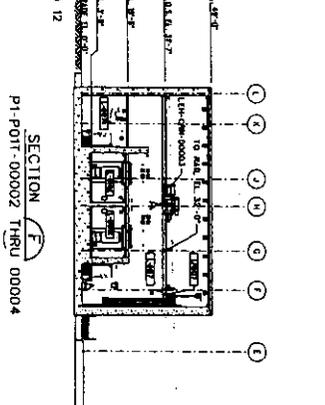
² If the proposed modification does not match any modification listed in WAC 173-303-830 Appendix I, then the proposed modification should automatically be given a Class 3 status. This status may be maintained by the Department of Ecology, or down graded to a Class '1, if applicable.



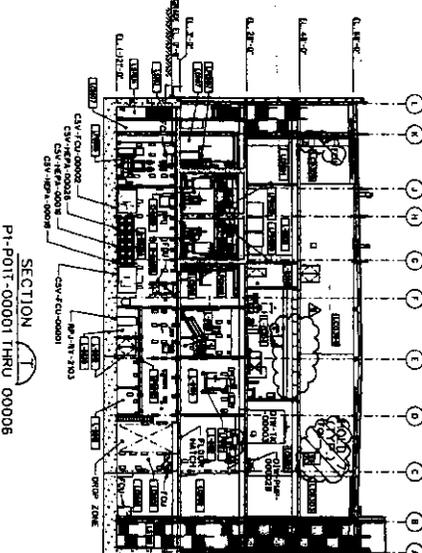
SECTION D
P1-P011-00002 THRU 00006



SECTION E
P1-P011-00002 THRU 00005



SECTION F
P1-P011-00002 THRU 00004



SECTION G
P1-P011-00001 THRU 00006

NOTES:

1. FOR GENERAL NOTES, SEE 24580-LAW-F1-P011-00008
2. FLOOR FINISHES: SEE 24580-LAW-F1-P011-00008
3. FLOOR FINISHES: SEE 24580-LAW-F1-P011-00008
4. FLOOR FINISHES: SEE 24580-LAW-F1-P011-00008
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24. FLOOR FINISHES: SEE 24580-LAW-F1-P011-00008

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LAW VITRIFICATION BUILDING
GENERAL ARRANGEMENT
SECTION D-D, E-E, F-F AND T-T

24580-LAW-F1-P011-00008

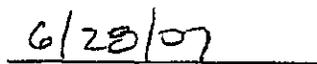
Bechtel National, Inc. Certification

The following certification statement is provided consistent with Contract No. DE-AC27-01RV14136, Section H.26, Environmental Permits, paragraph (g) for the submittal of the Hanford Facility Resource Conservation and Recovery Act Permit Modification Notification Form 24590-LAW-PCN-ENV-06-004.

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 assure 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.



W. S. Elkins
Project Director



Date

Quarter Ending September 30,
2007

24590-HLW-PCN-ENV-07-001

Hanford Facility RCRA Permit Modification Notification Form
Part III, Operating Unit 10
Waste Treatment and Immobilization Plant

Index

Page 2 of 4: Hanford Facility RCRA Permit, Operating Unit 10, Waste Treatment and Immobilization Plant
Update HLW Plant Item Mechanical Data Sheets for the High-Level Waste Facility Activated Carbon
Adsorbers (HOP-ADBR-00001A/B and HOP-ADBR-00002A/B) in Appendix 10.6 of the Dangerous Waste
Permit.

Submitted by Co-Operator:

Reviewed by ORP Program Office:

D. A. Klein

7/23/07

S. J. Olinger

8/17/07

D. A. Klein

Date

S. J. Olinger

Date

Quarter Ending September 30,
2007

24590-HLW-PCN-ENV-07-001

Hanford Facility RCRA Permit Modification Notification Form	
Unit: Waste Treatment and Immobilization Plant	Permit Part & Chapter: Part III, Operating Unit 10
<u>Description of Modification:</u>	
<p>The purpose of this modification is to update HLW Plant Item Mechanical Data Sheets for the High-Level Waste Facility Activated Carbon Adsorbers (HOP-ADBR-00001A/B and HOP-ADBR-00002A/B) in Appendix 10.6 of the Dangerous Waste Permit. The following source mechanical data sheets are submitted to replace the permit data sheets currently in Appendix 10.6:</p> <ul style="list-style-type: none"> • Mechanical Data Sheet Activated Carbon Adsorber (24590-HLW-MVD-HOP-00015, Rev 1) • Mechanical Data Sheet Activated Carbon Adsorber (24590-HLW-MVD-HOP-00016, Rev 1) <p>The above mentioned mechanical data sheets include revisions as indicated by revision triangles shown on the documents. The revisions shown are the result of ongoing design (changes from vendor preliminary data to vendor detailed design). The following are the sections affected by changes to the above mentioned mechanical data sheets:</p> <ul style="list-style-type: none"> • Incorporation of Environmental Qualification information (New Section) • Incorporation of Code 1 vendor submittal information <ul style="list-style-type: none"> ○ Thermal Information <ul style="list-style-type: none"> ▪ Revised maximum heat loss from 0.5 Kw (per unit) to 5 Kw (per unit) ○ Activated Carbon Data <ul style="list-style-type: none"> ▪ Revised the type of carbon for the guard bed from Desomix G-10 to Desomix ZA-37 ▪ Revised the activation element from sulfur to sulfur compounds for the primary bed and from powdered coke & hydrated lime to unimpregnated activated charcoal for the guard bed ▪ Revised the carbon media form from spheres to granular for the guard bed ▪ Bulk density is revised from 0.48 g/cc (30 lbs/ft³) to 0.57 g/cc (36 lbs/ft³) for the primary bed and from 0.85 g/cc to 0.57 g/cc (36 lbs/ft³) for the guard bed ▪ Residence time is revised from 2.9 to 6 (at design flow rate in SCFM) for the primary bed and from 1.45 to 3 (at design flow rate in SCFM) for the guard bed ▪ Total volume of carbon has been clarified to be per vessel and is revised from 200 ft³ to 220 ft³ for the primary bed and from 100 ft³ to 110 ft³ for the guard bed ▪ Total weight of carbon has been clarified to be per vessel and is revised from 6590 lbs to 7920 lbs for the primary bed and from 5600 lbs to 3960 lbs for the guard bed ▪ The face velocity through the carbon is revised from 34.5 fpm to 16.67 fpm (at design flow rate in SCFM) for both the primary bed and guard bed ○ House/Vessel <ul style="list-style-type: none"> ▪ Revised the material/thickness from 1/4 inch to 3/8 inch ▪ Vessel dimensions are revised from 132.5"x96.5"x156" to 138"x112"x156" ▪ Revised the total weight of the vessel from an estimated 15,000 lbs to an estimated 22,670 lbs per vessel ▪ Revised the weight of the vessel with carbon from 28,000 lbs to 34,550 lbs ▪ Design pressure is revised from -80 in-WG to -82 in-WG and added a positive design pressure of 126 in-WG ▪ Revised the operating pressure from -51 in-WG to -18.1 in-WG ▪ Design temperature is revised from 275 F to 250 F ▪ Revised the housing insulation material thickness from 4-6 inches to 7 inches on sides. 	

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- 1 inch over stiffeners
 - Revised the unloading on/off valve from 4 to 8 per vessel and from 4 inch to 8 inch size
- Discharge Filter
 - Filter material is revised from microglass fibers to microglass paper
 - Clarified filter frame material is type 316
 - Revised dimensions of filter from 24" x 24" x 4" to 23 3/8" x 23 3/8" x 3 3/4"
 - Revised the weight of the filter from 10 lbs to 15 lbs
 - Revised the maximum allowable temperature from 300 F to 250 F
- Connecting Pipe
 - Revised the material/thickness from 0.188 inches to 0.25 inches
 - The total length of piping is revised from 50 ft to 70 ft
 - The weight of the valve is revised from 150 lbs to 143 lbs
 - Revised the valve manufacturer from Ionex to Centerline Valves
 - Removed the option of using electric actuators
 - Revised actuator manufacturer from Rotech to Hi-Tork
 - The minimum actuator operating pressure changed from 100 to 80
 - Revised the opening time from less than 5 seconds to less than 10 seconds
 - The required instrument air supply is revised from less than 1 to 2 SCFM per actuator
 - The recommended piping insulation material thickness is revised from 4-6 inches to 1 inch
- Construction Data
 - Operating weight of the unit (2 vessels) is revised from 56,000 lbs to 69,100 lbs
 - Full water flood weight of unit (2 vessels) is revised from 89,000 lbs to 114,100 lbs
 - Shipping weight is revised from 56,000 lbs to 71,500 lbs

There are no outstanding change documents associated with these mechanical data sheets.

Appendix 10.6					
Replace:	24590-HLW-MVD-HOP-P0015, Rev. 0	With:	24590-HLW-MVD-HOP-00015, Rev. 1		
Replace:	24590-HLW-MVD-HOP-P0016, Rev. 0	With:	24590-HLW-MVD-HOP-00016, Rev. 1		
WAC 173-303-830 Modification Class: ^{1 2}		Class 1	Class ¹ 1	Class 2	Class 3
Please mark the Modification Class:			X		
Enter Relevant WAC 173-303-830, Appendix I Modification citation number:		N/A			
Enter wording of WAC 173-303-830, Appendix I Modification citation:					
In accordance with WAC 173-303-830(4)(d)(i), this modification notification is requested to be reviewed and approved as a Class ¹ 1 modification. WAC 173-303-830(4)(d)(ii)(A) states, "Class 1 modifications apply to minor changes that keep the permit current with routine changes to facility or its operation. These changes do not substantially alter the permit conditions or reduce the capacity of the facility to protect human health or the environment. In the case of Class 1 modifications, the director may require prior approval."					

¹ Class 1 modifications requiring prior Agency approval.

² If the proposed modification does not match any modification listed in WAC 173-303-830 Appendix I, then the proposed modification should automatically be given a Class 3 status. This status may be maintained by the Department of Ecology, or down graded to a Class '1, if applicable.

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2007

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Modification Approved: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No (state reason for denial)	Reviewed by Ecology:
<u>Reason for denial:</u>	 8/31/07
	B. Becker-Khaleel
	Date



River Protection Project
Waste Treatment Plant

MECHANICAL DATA SHEET ACTIVATED CARBON ADSORBER

ISSUED BY
RPP/WTP PDC



PLANT ITEM No. **24590-HLW-MV-HOP-ADBR-00001A/B**

Data Sheet No. **24590-HLW-MVD-HOP-00015** Rev. **1**

Project:	RPP-WTP	Description:	Activated Carbon Unit for Mercury Abatement
Project No:	24590	Mech. Drawing:*	
Site:	Hanford	P&ID:	24590-HLW-M6-HOP-00003
System:	HOP	Process Data:	24590-HLW-M6D-HOP-00001 and calculation 24590-HLW-M6C-HOP-00011
Process flow diagram:	24590-HLW-M5-V17T-00004	Specification:	24590-WTP-3PS-MWKD-T0001

General Data

Quality Level	QL-2	Design Life yrs	40 (See Process Note C for media design life requirement)
Seismic Category	SC-III		
Design Code	Note 2		
Code Stamp	N/A		
NB Registration	N/A		

Process Data

Inlet Offgas Conditions:				Gas Composition:					
		Conditions							
		Nominal	Max	Design	Nominal (%)	Max (%)			
Vol. Flow	ACFM	1559	1984	2000 SCFM @ 68 °F	N ₂	70.6	64.7	(By Volume)	
Mass Flow	lb/hr	5492	6347	N/A	O ₂	18.9	17.4	(By Volume)	
Temperature	°F	168	205	250	Ar	0.8	0.8	(By Volume)	
Pressure	in-WG	-10.4	-18.1	-82	CO ₂	0.4	0.6	(By Volume)	
Density	lb/ft ³	0.059	0.054	N/A	H ₂ O	9.2	16.4	(By Volume)	
Relative Humidity	%	23.2	18.3	N/A					
Allowable Pressure Drop	in-WG			12 (Note B)					
Process Notes: A. Carbon beds shall be operated in series during normal operation. B. Allowable pressure drop is for both carbon beds HOP-ADBR-00001A and B operating in series. (12 in-WG total) C. Design life of activated carbon media shall be for one year at nominal concentrations of Mercury with the beds operating in series. D. Equipment design pressure (Positive) shall be determined by Seller based on pressures generated during a carbon bed fire and activation of the fire suppression water.					Nominal		Maximum		
						(ppmv)	(mg/m ³)	(ppmv)	(mg/m ³)
					CO	40	34	65	50
					NO _x	614	606	2,700	2,600
					NH ₃	69	36	61	29
					SO ₂	0.047	0.093	0.032	0.056
					HCl	3.8E-03	4.3E-03	0.023	0.023
					HF	0.22	0.14	1.8	0.99
					I ₂	2.9E-09	2.3E-08	1.3E-04	8.9E-04
					SVOC	5.6	22	0.45	1.6
VOC	9.7E-08	2.3E-07	0.22	0.47					
Particulate	2.9E-10	2.2E-10	7.3E-10	7.9E-10					
Mercury Concentration:					Nominal		Design		
					(µg/dscm)		(µg/dscm)		
Hg	5100		42000						
Decontamination Factor (DF) for Hg					1000				
Min Carbon Change Out Frequency					months		12 (Note C) At nominal values		

Please note that source, special nuclear, and byproduct materials, as defined in the Atomic Energy Act of 1954 (AEA) are regulated at the U. S. Department of Energy (DOE) facilities exclusively by DOE acting pursuant to its AEA authority. DOE asserts that pursuant to AEA, it has sole and exclusive responsibility and authority to regulate source, special nuclear, and byproduct materials at DOE-owned nuclear facilities. Information contained herein on radionuclides is provided for process description purposes only.

1	Revised to comply with CODE I vendor Submittal (24590-QL-POA-MWKD-00001-09-00001), in accordance with CAR: 24590-WTP-CAR-QA-05-120. Added Environmental Qualification.					12/6/05
0	Issued for Purchase	J. Rouse	D. Pease	C. Morley	M. Hoffmann	9-20-04
Rev.	Reason for Revision	System Engineer / Process Engineer	Equipment Engineer	Checked	Approved	Date



River Protection Project
Waste Treatment Plant

MECHANICAL DATA SHEET ACTIVATED CARBON ADSORBER

PLANT ITEM No.

24590-HLW-MV-HOP-ADBR-00001A/B

Data Sheet No.

24590-HLW-MVD-HOP-00015

Rev.

1

Material Data:

Process Pipe and Housing Fabrication -			
Pipe Class	S11V	Valve Material	316/316L SS
Inlet Piping Size	14 inches	Valve Trim	TRIM 12, API 600
Outlet Piping Size	14 inches	Flange Material	316L SS
Housing	316L SS	Gasket Material	Spiral-Wound/Flat, Graphite
Activated Carbon Beds Screens	316L SS	Flange Rating	CL 150 RF B16.5
Pipe schedule	TBD	Housing Insulation / Jacket	Calcium Silicate ASTM C533, Type I / 0.024" thk. SST ASTM A240
Pipe Material	316L SS	Pipe Insulation / Jacket	Calcium Silicate ASTM C533, Type I / 0.024" thk. SST ASTM A240
Fire Protection Pipe -			
Pipe Class	TBD	Valve Trim	TBD
Inlet Piping Size	* 2 inches	Flange Material	TBD
Pipe schedule	TBD	Gasket Material	TBD
Pipe Material	TBD	Flange Rating	TBD
Valve Material	TBD		
Appurtenances and Other Items -			
Support Frames	Carbon Steel	Fire Suppression Drain Pipe Material	TBD
Pipe Supports	Carbon Steel	Fire Suppression Drain Pipe Sch.	TBD
Maintenance Platforms	Carbon Steel	Drain Line on/off valve	TBD
Flange Bolts / Nuts	ASTM F593 / ASTM F594	Drain Line Flange Material	TBD
		Drain Line Flange Rating	TBD

Bed Fire Suppression System:

Fluid Type		Water		Full Flood Fire Suppression:	
Activation Method:				Flowrate	* 22 gpm
Temperature Y/N	No			Pressure	* 50 psig
Smoke Y/N	No			Total Volume of Water	* 5400 gal
Instrument Signal Y/N	Yes			Total Time to Fill Vessel	* 240 minutes
Instrument Type	Differential CO Monitor			Drain Pipe Line Size	* 2 inches

Design Data:

Nozzle Loads at Buyer Interface -							
	F _x (lbs)	F _y (lbs)	F _z (lbs)	M _x (ft-lbs)	M _y (ft-lbs)	M _z (ft-lbs)	
Weight	200	1750	200	5250	2500	2500	
Thermal	2500	2500	3500	30000	30000	30000	
Seismic	5750	4500	8000	50000	50000	50000	
Total	8450	8750	11700	85250	82500	82500	

Thermal Information -

Room Temperature	83 °F	Maximum Heat Loss	5 Δ Kw (per unit)
Earth Temperature Beneath Slab	70 °F (Fixed)	Thermal Cycling Frequency:	For design purposes use a thermal cycle frequency of once every two (2) months for the life of the plant (40 years).
Concrete Slab Base Thickness	72 Inches		
Thermal Conductivity of Concrete Slab	1.8 W / m / K		

Environmental Qualification - Δ

Room #Δ	H-A123 Δ	Radiation (mrads/hr) Δ	2.5 Δ
Environmental Conditions Δ	Mild Δ	Flooding Δ	Water Spray Δ
Temperature: Δ		Chemical Spray Δ	No Δ
Normal (°F) Δ	59 - 95 Δ	Plant Induced Vibration Δ	No Δ
Accident (°F) Δ	130 Δ	Function post DBE Δ	No Δ
Pressure (atm) Δ	1.05 Δ	Operating time post DBE Δ	N/A Δ
Relative Humidity Δ	1 - 100% Δ		

Note: EQ requirement are applicable to electrical components pertaining to the carbon units. The carbon units are all metallic construction and not subject to EQ.



River Protection Project
Waste Treatment Plant

MECHANICAL DATA SHEET
ACTIVATED CARBON ADSORBER

PLANT ITEM No.
24590-HLW-MV-HOP-ADBR-00001A/B

Data Sheet No.	Rev.
24590-HLW-MVD-HOP-00015	1

Activated Carbon Data -	Primary Bed	Guard Bed (if included)
Manufacturer	* Donau Carbon	* Donau Carbon
Type of carbon (charcoal, coconut shell, etc.)	* Kombisorbon BAT-37	* Desomix ZA-37 Δ
Activation element (sulfur)	* Sulfur compounds Δ	* Unimpregnated activated charcoal Δ
Carbon media form (granular, pellet, etc.)	* Granular	* Granular Δ
Size of carbon media (mm)	* 3-5	* 3-5
Bulk density	* 0.57 g/cc (36 lb/ft ³) Δ	* 0.57 g/cc (36 lb/ft ³) Δ
Load efficiency	* 17%	* 17%
Number of beds per vessel	* two	* two
Arrangement	* Rectangular parallel beds	* Rectangular parallel beds
Residence time, sec	* 6 (at design flow rate in SCFM) Δ	* 3 (at design flow rate in SCFM) Δ
Thickness of bed, in	* 20	* 10
Total volume of carbon, ft ³ per vessel Δ	* 220 Δ	* 110 Δ
Total weight of carbon, lbs per vessel Δ	* 7920 Δ	* 3960 Δ
Spacing between beds, in	* 4	* 4 and 8
Face velocity thru carbon, fpm	* 16.67 (at design flowrate in SCFM) Δ	* 16.67 (at design flowrate in SCFM) Δ
Max. allowable temp, °F	* 284	* 284
Min. allowable temp, °F	* Ambient	* Ambient
House/vessel -		
Material/Thickness	* 3/8" stainless steel with external stiffeners Δ	
Vessel dimensions, (L x W x H)	* 138" x 112" x 156" Δ	
Total weight of vessel	* est. 22,670 lbs per vessel Δ	
Weight of vessel with carbon, lbs	* 34,550 lbs Δ	
Design pressure, in-WG	* -82 in-WG (Refer to Process Note D, positive design pressure 126 in-WG) Δ	
Operating pressure, in-WG	* -18.1 in-WG Δ	
Design temperature, °F	* 250 Δ	
Recommended housing insulation:	* Calcium silicate and/or foam glass	
Material/Thickness, in	* 7 inches on sides, 1 inch over stiffeners Δ	
Thermal Cond, Btu-in/hr ft ² °F	* 0.39	
Method of Attachment	* Mechanical support via outer jacket and/or straps	
Unloading on/off valve	* 8 each per vessel, each 8" size (4 ea. for Primary Bed) Δ	
Discharge Filter -		
Manufacturer	* American Air filter	
Type of filter	* Extended surface mini-pleat with metal sides	
Filter material	* microglass paper Δ	
Filter frame material	* stainless steel type 316 Δ	
Dimensions of filter, (L x W x H)	* 23-3/8" x 23-3/8" x 3-3/4" Δ	
Weight of filter, lbs	* 15 lbs Δ	
Number of filters per vessel	* 2	
Filter rating (efficiency, particle size)	* 99% on 5 micron particles	
Flowrate capacity, scfm	* 2000 per filter	
Max. allowable temp, °F	* 250 Δ	
Min. allowable temp, °F	* Ambient	



River Protection Project
Waste Treatment Plant

MECHANICAL DATA SHEET
ACTIVATED CARBON ADSORBER

PLANT ITEM No.
24590-HLW-MV-HOP-ADBR-00001A/B

Data Sheet No.	Rev.
24590-HLW-MVD-HOP-00015	1

Connecting Pipe -	
Pipe size, in	* 14
Material/Thickness, in	* 0.25 Δ
Total length of piping, ft	* 70 Δ
Valve type, (gate, butterfly, etc.)	* butterfly
Weight of valve, lbs	* 143 Δ
Valve manufacturer	* Centerline Valves Δ
Total number of valves	* 6
Actuators (air operated, rack and pinion, FC)	* Pneumatic, rack & pinion, Fail closed Δ
Actuator manufacture	* Hi-Tork Δ
Weight of actuator	* 50 lbs
Actuator operating pressure (min. and max.)	* 80-150Δ
Opening time, seconds	* less than 10 seconds Δ
Total number of Actuators	* 6 per ACA unit
Required instrument air supply, scfm	* 2 SCFM/actuator Δ
Recommended piping insulation:	* Calcium silicate or foam glass
Material/Thickness, in	* 1 inches Δ
Thermal Cond, Btu-in/hr ft ² °F	* 0.39
Method of Attachment	* straps

Pneumatic Loading Equipment -	
Manufacturer	* N/A
Blower size, horsepower	* N/A
Blower electrical load, watts	* N/A
Required voltage for blower	* N/A
Skid envelope size, (L x W x H)	* N/A
Skid weight, lbs	* N/A
Skid transportation/mobility	* N/A
Estimated time to load the vessel	* N/A

Note:
System designed to permit loading directly from bulk bags or drums into beds without the need for pneumatic loading devices.

Optional Electric Pre-Heater -	
Manufacturer	* N/A
Heater element electric load, watts	* N/A
Required voltage for heater elements, V	* N/A
Fan electric load, watts	* N/A
Required voltage for fan, V	* N/A
Fan size, horsepower	* N/A
Skid envelope size, (L x W x H)	* N/A
Skid weight, lbs	* N/A
Skid transportation/mobility	* N/A
Estimated time to preheat the carbon, hrs	* N/A
Total electric load for skid, watts	* N/A
Total required voltage	* N/A

Note:
Electrical Pre-Heater no longer proposed - considered unnecessary.

Construction Data: (To be determined by the supplier when not specified by the buyer)

Envelope Dimensions, (L x W x H) ft	(25 x 11 x 31)	Shipping Dimensions, (L x W x H) ft	* 3 trailers, each load (15 x 10 x 9) ft
Operating Weight of unit (two vessels), lbs	* 69,100 Δ	Shipping Weight lbs	* 71,500Δ
Full Water Flood Weight of unit (two vessels), lbs	* 114,100Δ		



River Protection Project
Waste Treatment Plant

MECHANICAL DATA SHEET
ACTIVATED CARBON ADSORBER

PLANT ITEM No.

24590-HLW-MV-HOP-ADBR-00001A/B

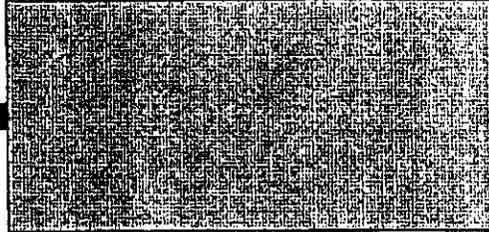
Data Sheet No.

24590-HLW-MVD-HOP-00015

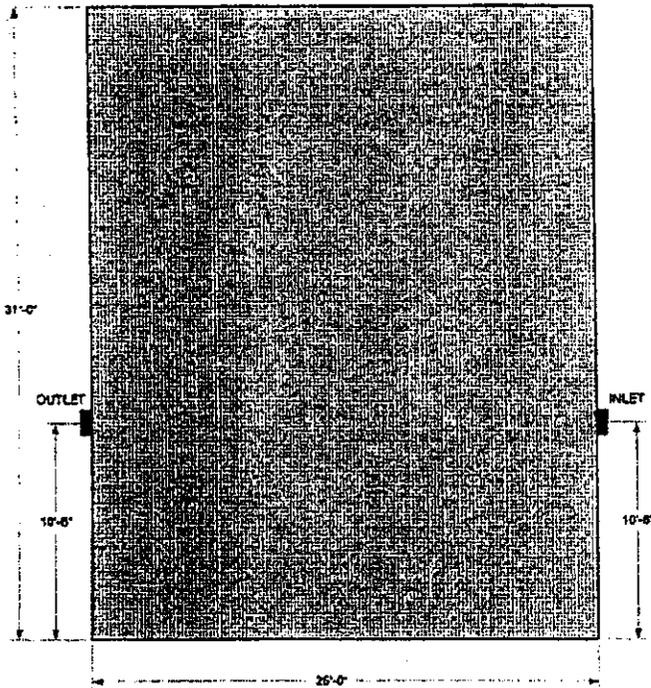
Rev.

1

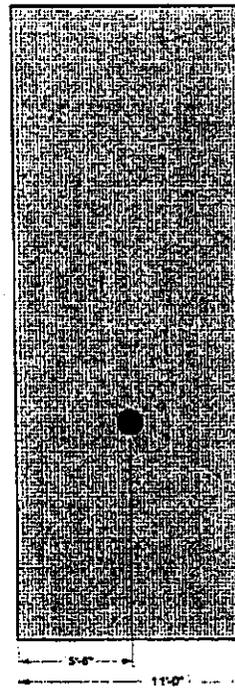
TOP VIEW



FRONT VIEW



END VIEW



Layout Notes:

- Process Inlet and Outlet nozzles are shown for clarity. Other nozzle locations will be per Seller.
- Carbon bed, piping, support frame, and maintenance platform layout shall be per Seller meeting the requirements of engineering specification 24590-WTP-3PS-MWK0-T0001.
- Pneumatic loading system shall be located per Seller's design.

General Notes

1. Data marked with an asterisk to be provided by Vendor.
2. The adsorber housing pressure boundary is designed and fabricated to ASME BPVC, Sec VIII, Div 1, the adsorbers and fire protection system are designed and fabricated to applicable ASME AG-1 requirements and the interconnect piping and valves are designed and fabricated to ASME B31.3 - 1996. The packaged unit is tested to ASME AG-1 with ASME AG-1a-2000 Addenda, and the pressure boundary pneumatically tested per ASME BPVC, Sec VIII, Div 1.
3. Contents of this document are Dangerous Waste Permit affecting.



River Protection Project
Waste Treatment Plant

MECHANICAL DATA SHEET ACTIVATED CARBON ADSORBER



PLANT ITEM No. **R10593034**
24590-HLW-MV-HOP-ADBR-00002A/B

ISSUED BY
RPPWTP PDC

Data Sheet No. **24590-HLW-MVD-HOP-00016**
Rev. **1**

Project:	RPP-WTP	Description:	Activated Carbon Unit for Mercury Abatement
Project No:	24590	Mech. Drawing:	
Site:	Hanford	P&ID:	24590-HLW-M6-HOP-20003
System:	HOP	Process Data:	24590-HLW-M6D-HOP-00001 and calculation 24590-HLW-M6C-HOP-00011
Process flow diagram:	24590-HLW-M5-V17T-20004	Specification:	24590-WTP-3PS-MWK0-T0001

General Data

Quality Level	QL-2	Design Life yrs	40 (See Process Note C for media design life requirement)
Seismic Category	SC-III		
Design Code	Note 2		
Code Stamp	N/A		
NB Registration	N/A		

Process Data

Inlet Offgas Conditions:				Gas Composition:					
		Conditions							
		Nominal	Max	Design	Nominal (%)	Max (%)			
Vol. Flow	ACFM	1559	1984	2000 SCFM @ 68 °F	N ₂	70.6	64.7	(By Volume)	
Mass Flow	lb/hr	5492	6347	N/A	O ₂	18.9	17.4	(By Volume)	
Temperature	°F	168	205	250	Ar	0.8	0.8	(By Volume)	
Pressure	in-WG	-10.4	-18.1	-82	CO ₂	0.4	0.6	(By Volume)	
Density	lb/ft ³	0.058	0.054	N/A	H ₂ O	9.2	16.4	(By Volume)	
Relative Humidity	%	23.2	18.3	N/A					
Allowable Pressure Drop	in-WG			12 (Note B)					
Process Notes: A. Carbon beds shall be operated in series during normal operation. B. Allowable pressure drop is for both carbon beds HOP-ADBR-00001A and B operating in series. (12 in-WG total) C. Design life of activated carbon media shall be for one year at nominal concentrations of Mercury with the beds operating in series. D. Equipment design pressure (Positive) shall be determined by Seller based on pressures generated during a carbon bed fire and activation of the fire suppression water.					Nominal		Maximum		
						(ppmv)	(mg/m ³)	(ppmv)	(mg/m ³)
					CO	40	34	65	50
					NO _x	614	606	2,700	2,600
					NH ₃	69	36	81	29
					SO ₂	0.047	0.093	0.032	0.056
					HCl	3.8E-03	4.3E-03	0.023	0.023
					HF	0.22	0.14	1.8	0.99
					I ₂	2.9E-09	2.3E-08	1.3E-04	8.9E-04
					SVOC	5.6	22	0.45	1.6
VOC	9.7E-08	2.3E-07	0.22	0.47					
Particulate	2.9E-10	2.2E-10	7.3E-10	7.9E-10					
Mercury Concentration:					Nominal		Design		
					(µg/dscm)		(µg/dscm)		
Hg	5100		42000						
Decontamination Factor (DF) for Hg <u>1000</u>									
Min Carbon Change Out Frequency months <u>12 (Note C)</u> At nominal values									

Please note that source, special nuclear, and byproduct materials, as defined in the Atomic Energy Act of 1954 (AEA) are regulated at the U. S. Department of Energy (DOE) facilities exclusively by DOE acting pursuant to its AEA authority. DOE asserts that pursuant to AEA, it has sole and exclusive responsibility and authority to regulate source, special nuclear, and byproduct materials at DOE-owned nuclear facilities. Information contained herein on radionuclides is provided for process description purposes only.

1	Revised to comply with CODE 1 vendor Submittal (24590-QL-POA-MWK0-00001-09-00001), in accordance with CAR: 24590-WTP-CAR-QA-05-120. Added Environmental Qualification.					9-20-04
0	Issued for Purchase	J. Rouse	D. Pease	C. Morley	M. Hoffmann	9-20-04
Rev.	Reason for Revision	System Engineer / Process Engineer	Equipment Engineer	Checked	Approved	Date



River Protection Project
Waste Treatment Plant

MECHANICAL DATA SHEET
ACTIVATED CARBON ADSORBER

PLANT ITEM No.

24590-HLW-MV-HOP-ADBR-00002A/B

Data Sheet No.

24590-HLW-MVD-HOP-00016

Rev.

1

Material Data:

Process Pipe and Housing Fabrication -

Pipe Class	S11V	Valve Material	316/316L SS
Inlet Piping Size	14 inches	Valve Trim	TRIM 12, API 600
Outlet Piping Size	14 inches	Flange Material	316L SS
Housing	316L SS	Gasket Material	Spiral-Wound/Flat, Graphite
Activated Carbon Beds Screens	316L SS	Flange Rating	CL 150 RF B16.5
Pipe schedule	TBD	Housing Insulation / Jacket	Calcium Silicate ASTM C533, Type I / 0.024" thk. SST ASTM A240
Pipe Material	316L SS	Pipe Insulation / Jacket	Calcium Silicate ASTM C533, Type I / 0.024" thk. SST ASTM A240

Fire Protection Pipe -

Pipe Class	TBD	Valve Trim	TBD
Inlet Piping Size	* 2 inches	Flange Material	TBD
Pipe schedule	TBD	Gasket Material	TBD
Pipe Material	TBD	Flange Rating	TBD
Valve Material	TBD		

Appurtenances and Other Items -

Support Frames	Carbon Steel	Fire Suppression Drain Pipe Material	TBD
Pipe Supports	Carbon Steel	Fire Suppression Drain Pipe Sch.	TBD
Maintenance Platforms	Carbon Steel	Drain Line on/off valve	TBD
Flange Bolts / Nuts	ASTM F593 / ASTM F594	Drain Line Flange Material	TBD
		Drain Line Flange Rating	TBD

Bed Fire Suppression System:

Fluid Type	Water	Full Flood Fire Suppression:		
Activation Method:		Flowrate	* 22	gpm
Temperature Y/N	No	Pressure	* 50	psig
Smoke Y/N	No	Total Volume of Water	* 5400	gal
Instrument Signal Y/N	Yes	Total Time to Fill Vessel	* 240	minutes
Instrument Type	Differential CO Monitor	Drain Pipe Line Size	* 2 inches	

Design Data:

Nozzle Loads at Buyer Interface -

	F _x (lbs)	F _y (lbs)	F _z (lbs)	M _x (ft-lbs)	M _y (ft-lbs)	M _z (ft-lbs)
Weight	200	1750	200	5250	2500	2500
Thermal	2500	2500	3500	30000	30000	30000
Seismic	5750	4500	8000	50000	50000	50000
Total	8450	8750	11700	85250	82500	82500

Thermal Information -

Room Temperature	83	°F	Maximum Heat Loss	5 Δ Kw (per unit)
Earth Temperature Beneath Slab	70	°F (Fixed)	Thermal Cycling Frequency:	For design purposes use a thermal cycle frequency of once every two (2) months for the life of the plant (40 years).
Concrete Slab Base Thickness	72	Inches		
Thermal Conductivity of Concrete Slab	1.8	W / m / K		

Environmental Qualification - Δ

Room # Δ	H-A123 Δ	Radiation (mrads/hr) Δ	2.5 Δ
Environmental Conditions Δ	Mild Δ	Flooding Δ	Water Spray Δ
Temperature: Δ		Chemical Spray Δ	No Δ
Normal (°F) Δ	59 - 95 Δ	Plant Induced Vibration Δ	No Δ
Accident (°F) Δ	130 Δ	Function post DBE Δ	No Δ
Pressure (atm) Δ	1.05 Δ	Operating time post DBE Δ	N/A Δ
Relative Humidity Δ	1 - 100% Δ		

Note: EQ requirements are applicable to electrical components pertaining to the carbon units. The carbon units are all metallic construction and not subject to EQ.



River Protection Project
Waste Treatment Plant

MECHANICAL DATA SHEET
ACTIVATED CARBON ADSORBER

PLANT ITEM No.
24590-HLW-MV-HOP-ADBR-00002A/B

Data Sheet No.
24590-HLW-MVD-HOP-00016

Rev.
1

Activated Carbon Data -	Primary Bed	Guard Bed (if included)
Manufacturer	* Donau Carbon	* Donau Carbon
Type of carbon (charcoal, coconut shell, etc.)	* Kombisorbon BAT-37	* Desomix ZA-37 Δ
Activation element (sulfur)	* Sulfur compounds Δ	* Unimpregnated activated charcoal Δ
Carbon media form (granular, pellet, etc.)	* Granular	* Granular Δ
Size of carbon media (mm)	* 3-5	* 3-5
Bulk density	* 0.57 g/cc (36 lb/ft ³) Δ	* 0.57 g/cc (36 lb/ft ³) Δ
Load efficiency	* 17%	* 17%
Number of beds per vessel	* two	* two
Arrangement	* Rectangular parallel beds	* Rectangular parallel beds
Residence time, sec	* 6 (at design flow rate in SCFM) Δ	* 3 (at design flow rate in SCFM) Δ
Thickness of bed, in	* 20	* 10
Total volume of carbon, ft ³ per vessel Δ	* 220 Δ	* 110 Δ
Total weight of carbon, lbs per vessel Δ	* 7920 Δ	* 3960 Δ
Spacing between beds, in	* 4	* 4 and 8
Face velocity thru carbon, fpm	* 16.67 (at design flowrate in SCFM) Δ	* 16.67 (at design flowrate in SCFM) Δ
Max. allowable temp, °F	* 284	* 284
Min. allowable temp, °F	* Ambient	* Ambient
House/vessel -		
Material/Thickness	* 3/8" stainless steel with external stiffeners Δ	
Vessel dimensions, (L x W x H)	* 138" x 112" x 156" Δ	
Total weight of vessel	* est. 22,670 lbs per vessel Δ	
Weight of vessel with carbon, lbs	* 34,550 lbs Δ	
Design pressure, in-WG	* -82 in-WG (Refer to Process Note D, positive design pressure 126 in-WG) Δ	
Operating pressure, in-WG	* -18.1 in-WG Δ	
Design temperature, °F	* 250 Δ	
Recommended housing insulation:	* Calcium silicate and/or foam glass	
Material/Thickness, in	* 7 inches on sides, 1 inch over stiffeners Δ	
Thermal Cond, Btu-in/hr ft ² °F	* 0.39	
Method of Attachment	* Mechanical support via outer jacket and/or straps	
Unloading on/off valve	* 8 each per vessel, each 8" size (4 ea. for Primary Bed) Δ	
Discharge Filter -		
Manufacturer	* American Air filter	
Type of filter	* Extended surface mini-pleat with metal sides	
Filter material	* microglass paper Δ	
Filter frame material	* stainless steel type 316 Δ	
Dimensions of filter, (L x W x H)	* 23-3/8" x 23-3/8" x 3-3/4" Δ	
Weight of filter, lbs	* 15 lbs Δ	
Number of filters per vessel	* 2	
Filter rating (efficiency, particle size)	* 99% on 5 micron particles	
Flowrate capacity, scfm	* 2000 per filter	
Max. allowable temp, °F	* 250 Δ	
Min. allowable temp, °F	* Ambient	



River Protection Project
Waste Treatment Plant

MECHANICAL DATA SHEET
ACTIVATED CARBON ADSORBER

PLANT ITEM No.
24590-HLW-MV-HOP-ADBR-00002A/B

Data Sheet No.	Rev.
24590-HLW-MVD-HOP-00018	1

Connecting Pipe -	
Pipe size, in	* 14
Material/Thickness, in	* 0.25 Δ
Total length of piping, ft	* 70 Δ
Valve type, (gate, butterfly, etc.)	* butterfly
Weight of valve, lbs	* 143 Δ
Valve manufacturer	* Centerline Valves Δ
Total number of valves	* 6
Actuators (air operated, rack and pinion, FC)	* Pneumatic, rack & pinion, Fail closed Δ
Actuator manufacture	* Hi-Tork Δ
Weight of actuator	* 50 lbs
Actuator operating pressure (min. and max.)	* 80-150Δ
Opening time, seconds	* less than 10 seconds Δ
Total number of Actuators	* 6 per ACA unit
Required instrument air supply, scfm	* 2 SCFM/actuator Δ
Recommended piping insulation:	* Calcium silicate or foam glass
Material/Thickness, in	* 1 inches Δ
Thermal Cond, Btu-in/hr ft ² °F	* 0.39
Method of Attachment	* straps
Pneumatic Loading Equipment -	
Manufacturer	* N/A
Blower size, horsepower	* N/A
Blower electrical load, watts	* N/A
Required voltage for blower	* N/A
Skid envelope size, (L x W x H)	* N/A
Skid weight, lbs	* N/A
Skid transportation/mobility	* N/A
Estimated time to load the vessel	* N/A
<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: auto;"> Note: System designed to permit loading directly from bulk bags or drums into beds without the need for pneumatic loading devices. </div>	
Optional Electric Pre-Heater -	
Manufacturer	* N/A
Heater element electric load, watts	* N/A
Required voltage for heater elements, V	* N/A
Fan electric load, watts	* N/A
Required voltage for fan, V	* N/A
Fan size, horsepower	* N/A
Skid envelope size, (L x W x H)	* N/A
Skid weight, lbs	* N/A
Skid transportation/mobility	* N/A
Estimated time to preheat the carbon, hrs	* N/A
Total electric load for skid, watts	* N/A
Total required voltage	* N/A
<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: auto;"> Note: Electrical Pre-Heater no longer proposed - considered unnecessary. </div>	

Construction Data: (To be determined by the supplier when not specified by the buyer)

Envelope Dimensions, (L x W x H) ft	(25 x 11 x 31)	Shipping Dimensions, (L x W x H) ft	* 3 trailers, each load (15 x 10 x 9) ft
Operating Weight of unit (two vessels), lbs	* 69,100 Δ	Shipping Weight lbs	* 71,500Δ
Full Water Flood Weight of unit (two vessels), lbs	* 114,100 Δ		



River Protection Project
Waste Treatment Plant

MECHANICAL DATA SHEET ACTIVATED CARBON ADSORBER

PLANT ITEM No.

24590-HLW-MV-HOP-ADBR-00002A/B

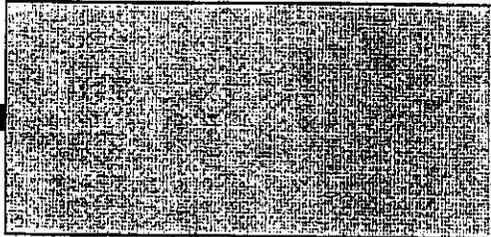
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24590-HLW-MVD-HOP-00016

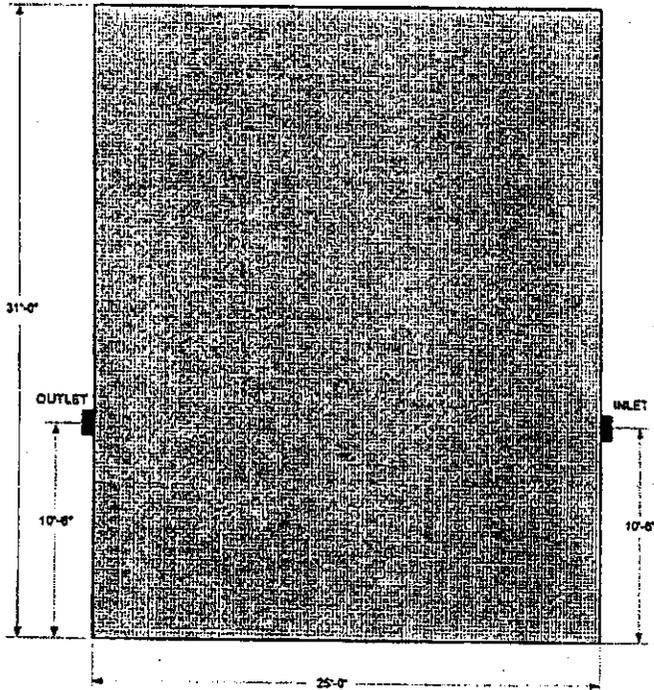
Rev.

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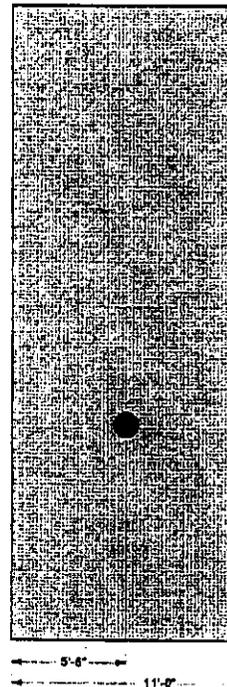
TOP VIEW



FRONT VIEW



END VIEW



Layout Notes:

- Process Inlet and Outlet nozzles are shown for clarity. Other nozzle locations will be per Seller.
- Carbon bed, piping, support frame, and maintenance platform layout shall be per Seller meeting the requirements of engineering specification 24590-WTP-3PS-MWK0-T0001.
- Pneumatic loading system shall be located per Seller's design.

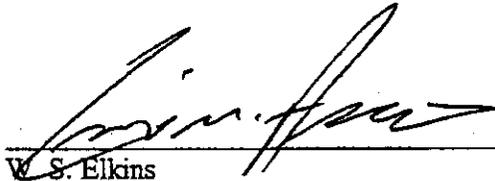
General Notes

1. Data marked with an asterisk to be provided by Vendor.
2. The adsorber housing pressure boundary is designed and fabricated to ASME BPVC, Sec VIII, Div 1, the adsorbers and fire protection system are designed and fabricated to applicable ASME AG-1 requirements and the interconnect piping and valves are designed and fabricated to ASME B31.3 - 1996. The packaged unit is tested to ASME AG-1 with ASME AG-1a-2000 Addenda, and the pressure boundary pneumatically tested per ASME BPVC, Sec VIII, Div 1.
3. Contents of this document are Dangerous Waste Permit affecting.

Bechtel National, Inc. Certification

The following certification statement is provided consistent with Contract No. DE-AC27-01RV14136, Section H.26, Environmental Permits, paragraph (g) for the submittal of the Hanford Facility Resource Conservation and Recovery Act Permit Modification Notification Form 24590-HLW-PCN-ENV-07-001

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 assure 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.



W. S. Elkins

for Project Director



Date

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Quarter Ending September 30,
2007

24590-LAW-PCN-ENV-06-014

Hanford Facility RCRA Permit Modification Notification Form
Part III, Operating Unit 10
Waste Treatment and Immobilization Plant

Index

Page 2 of 3: Hanford Facility RCRA Permit, Operating Unit 10, Waste Treatment and Immobilization Plant
Update LAW Vitrification Building Process Flow Diagram (PFD) for LAW Vit Secondary Offgas Treatment
(24590-LAW-M5-V17T-P0011) in Appendix 9.1 of the Dangerous Waste Permit.

Submitted by Co-Operator:

Reviewed by ORP Program Office:

D. A. Klein
D. A. Klein

7/30/07
Date

S. J. Olinger
S. J. Olinger

8/7/07
Date

Quarter Ending September 30,
2007

24590-LAW-PCN-ENV-06-014

Hanford Facility RCRA Permit Modification Notification Form	
Unit: Waste Treatment and Immobilization Plant	Permit Part & Chapter: Part III, Operating Unit 10
<u>Description of Modification:</u>	
<p>The purpose of the modification is to update a LAW process flow diagram (PFD) for the LAW vitrification secondary offgas treatment system, identified as 24590-LAW-M5-V17T-P0011, Rev. 0, located in Appendix 9.1 of the Dangerous Waste Permit (DWP).</p> <p>Ecology is requested to approve the following changes to the subject PFD:</p> <ol style="list-style-type: none"> 1. Note 12 is changed from: "Vessels must have the capability to be washed and to transfer the wash effluent or off-specification material to RLD-VSL-00003." To: "Vessels must have the capability to be washed and to transfer the wash effluent or off-specification material to RLD-VSL-00003 (via floor drain LVP-FD-00001)." 2. Note 13 revised from: "Controlled by differential NH3 and NOX across LVP-SKID-00002 or inlet temperature." To: "Controlled by differential NOX across LVP-SKID-00002 or inlet temperature." 3. Added Note 17 "This revision incorporated DCNs associated with the source drawing. LVP-SKID-00003 added per vendor design. Added "floor drain" to Note 12 for clarification. Changed offsheet connector from "LAW-P0016" to "LAW-00016". A permit version of 24590-LAW-M5-V17T-00016 will not be issued." 4. Corrected document number in Reference 2. Revise from: "24590-PTF-M5-V17T-P0001, "Process Flow Diagram Legends & Symbols" To: "24590-WTP-M5-V17T-P0001, "Process Flow Diagram Legends & Symbols" 5. Added Reference "11. (Deleted)", as Reference 11 was added to the source drawing, but is not applicable to the permit version. 6. Revised the valve for plant service water additions to LVP-TK-00001 from being normally open to being normally closed. 7. The portion of the transfer line shown in LVP-TK-00001, which goes to LVP-PMP-00002 A/B, was shown incorrectly and is being deleted. This does not affect the design of the system. 8. A reference to Note 12 is being added to the "Overflow to Berm" for LVP-TK-00001. 9. The plant item number for LVP-PMP-00001 A/B is changing to "LVP-PMP-00003 A/B" as a result of a pump flowrate change from 60 gpm to 200 gpm per vendor recommendation. 10. Revised non-permit affecting offsheet connector label for the 5M caustic solution from SHR-TK-00003 from: "LAW-P0016" to "LAW-00016". A permit version of the source will not be issued as the source drawing contains only systems associated with cold chemical product. 11. Revised non-permit affecting offsheet connector label from "Ammonia Vapor from AMR-VSL-00001/2" to "Ammonia Vapor from AMR-VSL-00003/4." The vessels are renumbered because they are being transferred to BOF. 12. Added a NOx indicator to waste stream LVP08 prior to entry into LVP-SKID-00001. 13. Revised the instrumentation on waste stream LVP26 prior to entering LVP-SKID-00002 Revised from the following indicators: NOx, VOC, temperature, and NH3. To indicators for the following: HF, temperature, and HCL. The NOx indicator is being moved to the carbon adsorber inlet as identified in Change #12. The VOC and NH3 indicators are being replaced with HF and HCL indicators to reflect the vendor design. 14. Added a NOx indicator to waste stream LVP23 prior to the temperature indicator in LVP-SKID-00002. 15. The plant item number for LVP-BLWR-00001 A/B is being corrected to "LVP-FAN-00001/2" 	

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24590-LAW-PCN-ENV-06-014

consistent with the tag names in the vendor package.

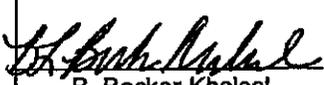
- 16. LVP-FAN-00001/2 and associated air piping along with ammonia vapor from AMR-VSL-00003/4 is being split from LVP-SKID-00002 and is now its own (new) skid, LVP-SKID-00003. LVP-SKID-00003 is also added to the plant item number and descriptions at the top of the drawing.
- 17. Added a HEPA filter to LVP-SKID-00003 dilution air prior to LVP-FAN-00001/2 to depict the vendor design.
- 18. The bypass associated with LVP-HX-00001 has been reconfigured to indicate the vendor design.
- 19. The symbol for LVP-FAN-00001/2 is corrected from a centrifugal pump symbol to a fan symbol.
- 20. Bolded notes and reworded Note 16 to read: "The components shown on this drawing in phantom do not require Independent Qualified Registered Professional Engineer assessments of design or installation inspections by a qualified installation inspector in accordance with the DWP and/or Washington Administrative Code requirements."

Please replace the following in Appendix 9.1 of the Dangerous Waste Permit.

Appendix 9.1			
Replace:	24590-LAW-M5-V17T-P0011, Rev. 0	With:	24590-LAW-M5-V17T-P0011, Rev. 1

WAC 173-303-830 Modification Class: ^{1 2}	Class 1	Class ¹	Class 2	Class 3
Please mark the Modification Class:	X			

Enter Relevant WAC 173-303-830, Appendix I Modification citation number: A.1 and A.3
 Enter wording of WAC 173-303-830, Appendix I Modification citation:
 A.1. Administrative and informational changes
 A.3. Equipment replacement or upgrading with functionally equivalent components (e.g., pipes, valves, pumps, conveyors, controls)

Modification Approved: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No (state reason for denial)	Reviewed by Ecology:
Reason for denial:	 9/5/07 B. Becker-Khaleel Date

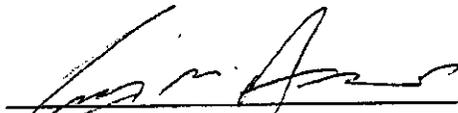
¹ Class 1 modifications requiring prior Agency approval.

² If the proposed modification does not match any modification listed in WAC 173-303-830 Appendix I, then the proposed modification should automatically be given a Class 3 status. This status may be maintained by the Department of Ecology, or down graded to a Class 1, if applicable.

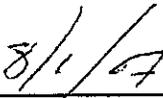
Bechtel National, Inc. Certification

The following certification statement is provided consistent with Contract No. DE-AC27-01RV14136, Section H.26, Environmental Permits, paragraph (g) for the submittal of the Hanford Facility Resource Conservation and Recovery Act Permit Modification Notification Form 24590-LAW-PCN-ENV-06-014.

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 assure 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.

for 

W. S. Elkins
Project Director



Date

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2007

24590-HLW-PCN-ENV-07-001

Hanford Facility RCRA Permit Modification Notification Form
Part III, Operating Unit 10
Waste Treatment and Immobilization Plant

Index

Page 2 of 4: Hanford Facility RCRA Permit, Operating Unit 10, Waste Treatment and Immobilization Plant
Update HLW Plant Item Mechanical Data Sheets for the High-Level Waste Facility Activated Carbon
Adsorbers (HOP-ADBR-00001A/B and HOP-ADBR-00002A/B) in Appendix 10.6 of the Dangerous Waste
Permit.

Submitted by Co-Operator:

Reviewed by ORP Program Office:

D. A. Klein 7/23/07
D. A. Klein Date

S. J. Olinger 8/17/07
S. J. Olinger Date

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2007

24590-HLW-PCN-ENV-07-001

Hanford Facility RCRA Permit Modification Notification Form	
Unit: Waste Treatment and Immobilization Plant	Permit Part & Chapter: Part III, Operating Unit 10
<u>Description of Modification:</u>	
<p>The purpose of this modification is to update HLW Plant Item Mechanical Data Sheets for the High-Level Waste Facility Activated Carbon Adsorbers (HOP-ADBR-00001A/B and HOP-ADBR-00002A/B) in Appendix 10.6 of the Dangerous Waste Permit. The following source mechanical data sheets are submitted to replace the permit data sheets currently in Appendix 10.6:</p> <ul style="list-style-type: none"> • Mechanical Data Sheet Activated Carbon Adsorber (24590-HLW-MVD-HOP-00015, Rev 1) • Mechanical Data Sheet Activated Carbon Adsorber (24590-HLW-MVD-HOP-00016, Rev 1) <p>The above mentioned mechanical data sheets include revisions as indicated by revision triangles shown on the documents. The revisions shown are the result of ongoing design (changes from vendor preliminary data to vendor detailed design). The following are the sections affected by changes to the above mentioned mechanical data sheets:</p> <ul style="list-style-type: none"> • Incorporation of Environmental Qualification information (New Section) • Incorporation of Code 1 vendor submittal information <ul style="list-style-type: none"> ○ Thermal Information <ul style="list-style-type: none"> ▪ Revised maximum heat loss from 0.5 Kw (per unit) to 5 Kw (per unit) ○ Activated Carbon Data <ul style="list-style-type: none"> ▪ Revised the type of carbon for the guard bed from Desomix G-10 to Desomix ZA-37 ▪ Revised the activation element from sulfur to sulfur compounds for the primary bed and from powdered coke & hydrated lime to unimpregnated activated charcoal for the guard bed ▪ Revised the carbon media form from spheres to granular for the guard bed ▪ Bulk density is revised from 0.48 g/cc (30 lbs/ft³) to 0.57 g/cc (36 lbs/ft³) for the primary bed and from 0.85 g/cc to 0.57 g/cc (36 lbs/ft³) for the guard bed ▪ Residence time is revised from 2.9 to 6 (at design flow rate in SCFM) for the primary bed and from 1.45 to 3 (at design flow rate in SCFM) for the guard bed ▪ Total volume of carbon has been clarified to be per vessel and is revised from 200 ft³ to 220 ft³ for the primary bed and from 100 ft³ to 110 ft³ for the guard bed ▪ Total weight of carbon has been clarified to be per vessel and is revised from 6590 lbs to 7920 lbs for the primary bed and from 5600 lbs to 3960 lbs for the guard bed ▪ The face velocity through the carbon is revised from 34.5 fpm to 16.67 fpm (at design flow rate in SCFM) for both the primary bed and guard bed ○ House/Vessel <ul style="list-style-type: none"> ▪ Revised the material/thickness from 1/4 inch to 3/8 inch ▪ Vessel dimensions are revised from 132.5"x96.5"x156" to 138"x112"x156" ▪ Revised the total weight of the vessel from an estimated 15,000 lbs to an estimated 22,670 lbs per vessel ▪ Revised the weight of the vessel with carbon from 28,000 lbs to 34,550 lbs ▪ Design pressure is revised from -80 in-WG to -82 in-WG and added a positive design pressure of 126 in-WG ▪ Revised the operating pressure from -51 in-WG to -18.1 in-WG ▪ Design temperature is revised from 275 F to 250 F ▪ Revised the housing insulation material thickness from 4-6 inches to 7 inches on sides. 	

Quarter Ending September 30,
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24590-HLW-PCN-ENV-07-001

- 1 inch over stiffeners
 - Revised the unloading on/off valve from 4 to 8 per vessel and from 4 inch to 8 inch size
- Discharge Filter
 - Filter material is revised from microglass fibers to microglass paper
 - Clarified filter frame material is type 316
 - Revised dimensions of filter from 24" x 24" x 4" to 23 3/8" x 23 3/8" x 3 3/4"
 - Revised the weight of the filter from 10 lbs to 15 lbs
 - Revised the maximum allowable temperature from 300 F to 250 F
- Connecting Pipe
 - Revised the material/thickness from 0.188 inches to 0.25 inches
 - The total length of piping is revised from 50 ft to 70 ft
 - The weight of the valve is revised from 150 lbs to 143 lbs
 - Revised the valve manufacturer from Ionex to Centerline Valves
 - Removed the option of using electric actuators
 - Revised actuator manufacturer from Rotech to Hi-Tork
 - The minimum actuator operating pressure changed from 100 to 80
 - Revised the opening time from less than 5 seconds to less than 10 seconds
 - The required instrument air supply is revised from less than 1 to 2 SCFM per actuator
 - The recommended piping insulation material thickness is revised from 4-6 inches to 1 inch
- Construction Data
 - Operating weight of the unit (2 vessels) is revised from 56,000 lbs to 69,100 lbs
 - Full water flood weight of unit (2 vessels) is revised from 89,000 lbs to 114,100 lbs
 - Shipping weight is revised from 56,000 lbs to 71,500 lbs

There are no outstanding change documents associated with these mechanical data sheets.

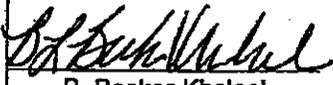
Appendix 10.6					
Replace:	24590-HLW-MVD-HOP-P0015, Rev. 0	With:	24590-HLW-MVD-HOP-00015, Rev. 1		
Replace:	24590-HLW-MVD-HOP-P0016, Rev. 0	With:	24590-HLW-MVD-HOP-00016, Rev. 1		
WAC 173-303-830 Modification Class: ^{1 2}		Class 1	Class ¹ 1	Class 2	Class 3
Please mark the Modification Class:			X		
Enter Relevant WAC 173-303-830, Appendix I Modification citation number:		N/A			
Enter wording of WAC 173-303-830, Appendix I Modification citation:					
In accordance with WAC 173-303-830(4)(d)(i), this modification notification is requested to be reviewed and approved as a Class ¹ 1 modification. WAC 173-303-830(4)(d)(ii)(A) states, "Class 1 modifications apply to minor changes that keep the permit current with routine changes to facility or its operation. These changes do not substantially alter the permit conditions or reduce the capacity of the facility to protect human health or the environment. In the case of Class 1 modifications, the director may require prior approval."					

¹ Class 1 modifications requiring prior Agency approval.

² If the proposed modification does not match any modification listed in WAC 173-303-830 Appendix I, then the proposed modification should automatically be given a Class 3 status. This status may be maintained by the Department of Ecology, or down graded to a Class ¹1, if applicable.

Quarter Ending September 30,
2007

24590-HLW-PCN-ENV-07-001

Modification Approved: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No (state reason for denial)	Reviewed by Ecology:
<u>Reason for denial:</u>	 8/31/07 B. Becker-Khaleel Date



River Protection Project
Waste Treatment Plant

MECHANICAL DATA SHEET ACTIVATED CARBON ADSORBER

ISSUED BY
RPP/WTP PDC



R10593033

PLANT ITEM No.
24590-HLW-MV-HOP-ADBR-00001A/B

Data Sheet No. 24590-HLW-MVD-HOP-00015
Rev. 1

Project:	RPP-WTP	Description:	Activated Carbon Unit for Mercury Abatement
Project No:	24590	Mech. Drawing:*	
Site:	Hanford	P&ID:	24590-HLW-M6-HOP-00003
System:	HOP	Process Data:	24590-HLW-M6D-HOP-00001 and calculation 24590-HLW-M6C-HOP-00011
Process flow diagram:	24590-HLW-M5-V17T-00004	Specification:	24590-WTP-3PS-MWK0-T0001

General Data

Quality Level	QL-2	Design Life yrs	40 (See Process Note C for media design life requirement)
Seismic Category	SC-III		
Design Code	Note 2		
Code Stamp	N/A		
NB Registration	N/A		

Process Data

Inlet Offgas Conditions:					Gas Composition:					
		Conditions								
		Nominal	Max	Design			Nominal (%)	Max (%)		
Vol. Flow	ACFM	1559	1984	2000 SCFM @ 68 °F	N ₂		70.6	64.7	(By Volume)	
Mass Flow	lb/hr	5492	6347	N/A	O ₂		18.9	17.4	(By Volume)	
Temperature	°F	168	205	250	Ar		0.8	0.8	(By Volume)	
Pressure	in-WG	-10.4	-18.1	-82	CO ₂		0.4	0.6	(By Volume)	
Density	lb/ft ³	0.059	0.054	N/A	H ₂ O		9.2	16.4	(By Volume)	
Relative Humidity	%	23.2	18.3	N/A						
Allowable Pressure Drop	in-WG	12 (Note B)					Nominal		Maximum	
							(ppmv)	(mg/m ³)	(ppmv)	(mg/m ³)
Process Notes: A. Carbon beds shall be operated in series during normal operation. B. Allowable pressure drop is for both carbon beds HOP-ADBR-00001A and B operating in series. (12 in-WG total) C. Design life of activated carbon media shall be for one year at nominal concentrations of Mercury with the beds operating in series. D. Equipment design pressure (Positive) shall be determined by Selter based on pressures generated during a carbon bed fire and activation of the fire suppression water.					CO	40	34	65	50	
					NO _x	614	606	2,700	2,600	
					NH ₃	69	36	61	29	
					SO ₂	0.047	0.093	0.032	0.056	
					HCl	3.8E-03	4.3E-03	0.023	0.023	
					HF	0.22	0.14	1.8	0.99	
					I ₂	2.9E-09	2.3E-08	1.3E-04	8.9E-04	
					SVOC	5.6	22	0.45	1.6	
					VOC	9.7E-08	2.3E-07	0.22	0.47	
					Particulate	2.9E-10	2.2E-10	7.3E-10	7.9E-10	
					Mercury Concentration:					
					Nominal		Design			
					(µg/dscm)		(µg/dscm)			
Hg					5100		42000			
					Decontamination Factor (DF) for Hg <u>1000</u>					
					Min Carbon Change Out Frequency months <u>12 (Note C)</u> At nominal values					

Please note that source, special nuclear, and byproduct materials, as defined in the Atomic Energy Act of 1954 (AEA) are regulated at the U. S. Department of Energy (DOE) facilities exclusively by DOE acting pursuant to its AEA authority. DOE asserts that pursuant to AEA, it has sole and exclusive responsibility and authority to regulate source, special nuclear, and byproduct materials at DOE-owned nuclear facilities. Information contained herein on radionuclides is provided for process description purposes only.

1	Revised to comply with CODE 1 vendor Submittal (24590-QL-POA-MWK0-00001-09-00001), in accordance with CAR: 24590-WTP-CAR-QA-05-120. Added Environmental Qualification.	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	12/6/05
0	Issued for Purchase	J. Rouse	D. Pease	C. Morley	M. Hoffmann	9-20-04
Rev.	Reason for Revision	System Engineer / Process Engineer	Equipment Engineer	Checked	Approved	Date



River Protection Project
Waste Treatment Plant

MECHANICAL DATA SHEET ACTIVATED CARBON ADSORBER

PLANT ITEM No.
24590-HLW-MV-HOP-ADBR-00001A/B

Data Sheet No.	Rev.
24590-HLW-MVD-HOP-00015	1

Material Data:

Process Pipe and Housing Fabrication -

Pipe Class	S11V	Valve Material	316/316L SS
Inlet Piping Size	14 inches	Valve Trim	TRIM 12, API 600
Outlet Piping Size	14 inches	Flange Material	316L SS
Housing	316L SS	Gasket Material	Spiral-Wound/Flat, Graphite
Activated Carbon Beds Screens	316L SS	Flange Rating	CL 150 RF B16.5
Pipe schedule	TBD	Housing Insulation / Jacket	Calcium Silicate ASTM C533, Type I / 0.024" thk. SST ASTM A240
Pipe Material	316L SS	Pipe Insulation / Jacket	Calcium Silicate ASTM C533, Type I / 0.024" thk. SST ASTM A240

Fire Protection Pipe -

Pipe Class	TBD	Valve Trim	TBD
Inlet Piping Size	* 2 inches	Flange Material	TBD
Pipe schedule	TBD	Gasket Material	TBD
Pipe Material	TBD	Flange Rating	TBD
Valve Material	TBD		

Appurtenances and Other Items -

Support Frames	Carbon Steel	Fire Suppression Drain Pipe Material	TBD
Pipe Supports	Carbon Steel	Fire Suppression Drain Pipe Sch.	TBD
Maintenance Platforms	Carbon Steel	Drain Line on/off valve	TBD
Flange Bolts / Nuts	ASTM F593 / ASTM F594	Drain Line Flange Material	TBD
		Drain Line Flange Rating	TBD

Bed Fire Suppression System:

Fluid Type	Water		Full Flood Fire Suppression:	
Activation Method:			Flowrate	* 22 gpm
Temperature Y/N	No		Pressure	* 50 psig
Smoke Y/N	No		Total Volume of Water	* 5400 gal
Instrument Signal Y/N	Yes		Total Time to Fill Vessel	* 240 minutes
Instrument Type	Differential CO Monitor		Drain Pipe Line Size	* 2 inches

Design Data:

Nozzle Loads at Buyer Interface -

	F _x (lbs)	F _y (lbs)	F _z (lbs)	M _x (ft-lbs)	M _y (ft-lbs)	M _z (ft-lbs)
Weight	200	1750	200	5250	2500	2500
Thermal	2500	2500	3500	30000	30000	30000
Seismic	5750	4500	8000	50000	50000	50000
Total	8450	8750	11700	85250	82500	82500

Thermal Information -

Room Temperature	83 °F	Maximum Heat Loss	5 Δ Kw (per unit)
Earth Temperature Beneath Slab	70 °F (Fixed)	Thermal Cycling Frequency:	For design purposes use a thermal cycle frequency of once every two (2) months for the life of the plant (40 years).
Concrete Slab Base Thickness	72 inches		
Thermal Conductivity of Concrete Slab	1.8 W / m / K		

Environmental Qualification - Δ

Room #Δ	H-A123 Δ	Radiation (mrads/hr) Δ	2.5 Δ
Environmental Conditions Δ	Mild Δ	Flooding Δ	Water Spray Δ
Temperature: Δ		Chemical Spray Δ	No Δ
Normal (°F) Δ	59 - 95 Δ	Plant Induced Vibration Δ	No Δ
Accident (°F) Δ	130 Δ	Function post DBE Δ	No Δ
Pressure (atm) Δ	1.05 Δ	Operating time post DBE Δ	N/A Δ
Relative Humidity Δ	1 - 100% Δ		

Note: EQ requirements are applicable to electrical components pertaining to the carbon units. The carbon units are all metallic construction and not subject to EQ.



River Protection Project
Waste Treatment Plant

MECHANICAL DATA SHEET
ACTIVATED CARBON ADSORBER

PLANT ITEM No.
24590-HLW-MV-HOP-ADBR-00001A/B

Data Sheet No.	Rev.
24590-HLW-MVD-HOP-00015	1

Activated Carbon Data -	Primary Bed	Guard Bed (if included)
Manufacturer	* Donau Carbon	* Donau Carbon
Type of carbon (charcoal, coconut shell, etc.)	* Kombisorbon BAT-37	* Desomix ZA-37 Δ
Activation element (sulfur)	* Sulfur compounds Δ	* Unimpregnated activated charcoalΔ
Carbon media form (granular, pellet, etc.)	* Granular	* Granular Δ
Size of carbon media (mm)	* 3-5	* 3-5
Bulk density	* 0.57 g/cc (36 lb/ft ³) Δ	* 0.57 g/cc (36 lb/ft ³) Δ
Load efficiency	* 17%	* 17%
Number of beds per vessel	* two	* two
Arrangement	* Rectangular parallel beds	* Rectangular parallel beds
Residence time, sec	* 6 (at design flow rate in SCFM) Δ	* 3 (at design flow rate in SCFM) Δ
Thickness of bed, in	* 20	* 10
Total volume of carbon, ft ³ per vessel Δ	* 220 Δ	* 110 Δ
Total weight of carbon, lbs per vessel Δ	* 7920 Δ	* 3960 Δ
Spacing between beds, in	* 4	* 4 and 8
Face velocity thru carbon, fpm	* 16.67 (at design flowrate in SCFM) Δ	* 16.67 (at design flowrate in SCFM) Δ
Max. allowable temp, °F	* 284	* 284
Min. allowable temp, °F	* Ambient	* Ambient
House/vessel -		
Material/Thickness	* 3/8" stainless steel with external stiffeners Δ	
Vessel dimensions, (L x W x H)	* 138" x 112" x 156" Δ	
Total weight of vessel	* est. 22,670 lbs per vessel Δ	
Weight of vessel with carbon, lbs	* 34,550 lbs Δ	
Design pressure, in-WG	* -82 in-WG (Refer to Process Note D, positive design pressure 126 in-WG) Δ	
Operating pressure, in-WG	* -18.1 in-WG Δ	
Design temperature, °F	* 250 Δ	
Recommended housing insulation:	* Calcium silicate and/or foam glass	
Material/Thickness, in	* 7 inches on sides, 1 inch over stiffeners Δ	
Thermal Cond, Btu-in/hr ft ² °F	* 0.39	
Method of Attachment	* Mechanical support via outer jacket and/or straps	
Unloading on/off valve	* 8 each per vessel, each 8" size (4 ea. for Primary Bed) Δ	
Discharge Filter -		
Manufacturer	* American Air filter	
Type of filter	* Extended surface mini-pleat with metal sides	
Filter material	* microglass paper Δ	
Filter frame material	* stainless steel type 316 Δ	
Dimensions of filter, (L x W x H)	* 23-3/8" x 23-3/8" x 3-3/4" Δ	
Weight of filter, lbs	* 15 lbs Δ	
Number of filters per vessel	* 2	
Filter rating (efficiency, particle size)	* 99% on 5 micron particles	
Flowrate capacity, scfm	* 2000 per filter	
Max. allowable temp, °F	* 250 Δ	
Min. allowable temp, °F	* Ambient	



River Protection Project
Waste Treatment Plant

MECHANICAL DATA SHEET ACTIVATED CARBON ADSORBER

PLANT ITEM No.

24590-HLW-MV-HOP-ADBR-00001A/B

Data Sheet No.

24590-HLW-MVD-HOP-00015

Rev.

1

Connecting Pipe -

Pipe size, in	* 14
Material/Thickness, in	* 0.25 Δ
Total length of piping, ft	* 70 Δ
Valve type, (gate, butterfly, etc.)	* butterfly
Weight of valve, lbs	* 143 Δ
Valve manufacturer	* Centerline Valves Δ
Total number of valves	* 6
Actuators (air operated, rack and pinion, FC)	* Pneumatic, rack & pinion, Fail closed Δ
Actuator manufacture	* Hi-Tork Δ
Weight of actuator	* 50 lbs
Actuator operating pressure (min. and max.)	* 80-150Δ
Opening time, seconds	* less than 10 seconds Δ
Total number of Actuators	* 6 per ACA unit
Required instrument air supply, scfm	* 2 SCFM/actuator Δ
Recommended piping insulation:	* Calcium silicate or foam glass
Material/Thickness, in	* 1 inches Δ
Thermal Cond, Btu-in/hr ft ² °F	* 0.39
Method of Attachment	* straps

Pneumatic Loading Equipment -

Manufacturer	* N/A
Blower size, horsepower	* N/A
Blower electrical load, watts	* N/A
Required voltage for blower	* N/A
Skid envelope size, (L x W x H)	* N/A
Skid weight, lbs	* N/A
Skid transportation/mobility	* N/A
Estimated time to load the vessel	* N/A

Note:
System designed to permit loading directly from bulk bags or drums into beds without the need for pneumatic loading devices.

Optional Electric Pre-Heater -

Manufacturer	* N/A
Heater element electric load, watts	* N/A
Required voltage for heater elements, V	* N/A
Fan electric load, watts	* N/A
Required voltage for fan, V	* N/A
Fan size, horsepower	* N/A
Skid envelope size, (L x W x H)	* N/A
Skid weight, lbs	* N/A
Skid transportation/mobility	* N/A
Estimated time to preheat the carbon, hrs	* N/A
Total electric load for skid, watts	* N/A
Total required voltage	* N/A

Note:
Electrical Pre-Heater no longer proposed - considered unnecessary.

Construction Data: (To be determined by the supplier when not specified by the buyer)

Envelope Dimensions, (L x W x H) ft	(25 x 11 x 31)	Shipping Dimensions, (L x W x H) ft	* 3 trailers, each load (15 x 10 x 9) ft
Operating Weight of unit (two vessels), lbs	* 69,100 Δ	Shipping Weight lbs	* 71,500Δ
Full Water Flood Weight of unit (two vessels), lbs	* 114,100Δ		



River Protection Project
Waste Treatment Plant

MECHANICAL DATA SHEET ACTIVATED CARBON ADSORBER

PLANT ITEM No.

24590-HLW-MV-HOP-ADBR-00001A/B

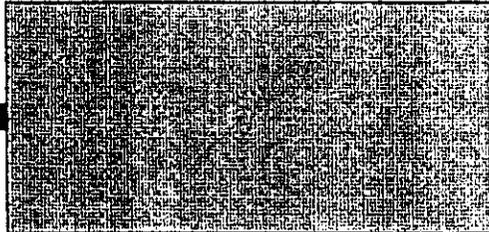
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24590-HLW-MVD-HOP-00015

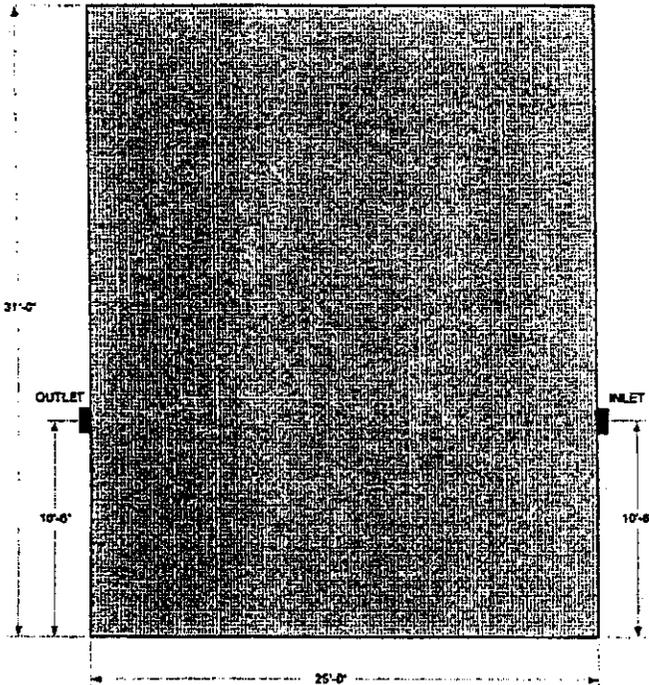
Rev.

1

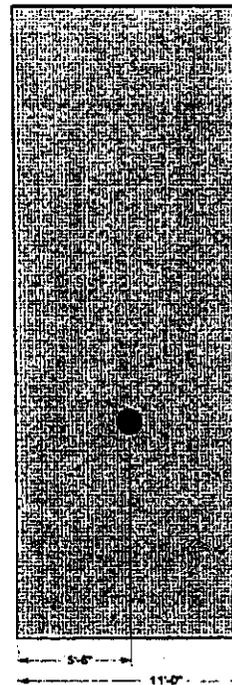
TOP VIEW



FRONT VIEW



END VIEW



Layout Notes:

- Process Inlet and Outlet nozzles are shown for clarity. Other nozzle locations will be per Seller.
- Carbon bed, piping, support frame, and maintenance platform layout shall be per Seller meeting the requirements of engineering specification 24590-WTP-3PS-MWK0-T0001.
- Pneumatic loading system shall be located per Seller's design.

General Notes

1. Data marked with an asterisk to be provided by Vendor.
2. The adsorber housing pressure boundary is designed and fabricated to ASME BPVC, Sec VIII, Div 1, the adsorbers and fire protection system are designed and fabricated to applicable ASME AG-1 requirements and the interconnect piping and valves are designed and fabricated to ASME B31.3 - 1996. The packaged unit is tested to ASME AG-1 with ASME AG-1a-2000 Addenda, and the pressure boundary pneumatically tested per ASME BPVC, Sec VIII, Div 1.
3. Contents of this document are Dangerous Waste Permit affecting.



River Protection Project
Waste Treatment Plant

MECHANICAL DATA SHEET ACTIVATED CARBON ADSORBER



PLANT ITEM No. R10593034
24590-HLW-MV-HOP-ADBR-00002A/B

ISSUED BY
RPPWTP PDC

Data Sheet No. 24590-HLW-MVD-HOP-00016
Rev. 1

Project:	RPP-WTP	Description:	Activated Carbon Unit for Mercury Abatement
Project No:	24590	Mech. Drawing:*	
Site:	Hanford	P&ID:	24590-HLW-M6-HOP-20003
System:	HOP	Process Data:	24590-HLW-M6D-HOP-00001 and calculation 24590-HLW-M6C-HOP-00011
Process flow diagram:	24590-HLW-M5-V17T-20004	Specification:	24590-WTP-3PS-MWK0-T0001

General Data

Quality Level	QL-2	Design Life yrs	40 (See Process Note C for media design life requirement)
Seismic Category	SC-III		
Design Code	Note 2		
Code Stamp	N/A		
NB Registration	N/A		

Process Data

Inlet Offgas Conditions:				Gas Composition:					
		Conditions							
		Nominal	Max	Design					
					Nominal (%)	Max (%)			
Vol. Flow	ACFM	1559	1984	2000 SCFM @ 68 °F	N ₂	70.6	64.7	(By Volume)	
Mass Flow	lb/hr	5492	6347	N/A	O ₂	18.9	17.4	(By Volume)	
Temperature	°F	168	205	250	Ar	0.8	0.8	(By Volume)	
Pressure	in-WG	-10.4	-18.1	-82	CO ₂	0.4	0.6	(By Volume)	
Density	lb/ft ³	0.059	0.054	N/A	H ₂ O	9.2	16.4	(By Volume)	
Relative Humidity %		23.2	18.3	N/A					
Allowable Pressure Drop	in-WG			12 (Note B)					
Process Notes: A. Carbon beds shall be operated in series during normal operation. B. Allowable pressure drop is for both carbon beds HOP-ADBR-00001A and B operating in series. (12 in-WG total) C. Design life of activated carbon media shall be for one year at nominal concentrations of Mercury with the beds operating in series. D. Equipment design pressure (Positive) shall be determined by Seller based on pressures generated during a carbon bed fire and activation of the fire suppression water.					Nominal		Maximum		
						(ppmv)	(mg/m ³)	(ppmv)	(mg/m ³)
					CO	40	34	65	50
					NO _x	614	606	2,700	2,600
					NH ₃	69	36	61	29
					SO ₂	0.047	0.093	0.032	0.056
					HCl	3.8E-03	4.3E-03	0.023	0.023
					HF	0.22	0.14	1.8	0.99
					I ₂	2.9E-09	2.3E-08	1.3E-04	8.9E-04
					SVOC	5.6	22	0.45	1.6
VOC	9.7E-08	2.3E-07	0.22	0.47					
Particulate	2.9E-10	2.2E-10	7.3E-10	7.9E-10					
Mercury Concentration:					Nominal		Design		
					(µg/dscm)		(µg/dscm)		
Hg	5100		42000						
Decontamination Factor (DF) for Hg					1000				
Min Carbon Change Out Frequency					months	12 (Note C)	At nominal values		

Please note that source, special nuclear, and byproduct materials, as defined in the Atomic Energy Act of 1954 (AEA) are regulated at the U. S. Department of Energy (DOE) facilities exclusively by DOE acting pursuant to its AEA authority. DOE asserts that pursuant to AEA, it has sole and exclusive responsibility and authority to regulate source, special nuclear, and byproduct materials at DOE-owned nuclear facilities. Information contained herein on radionuclides is provided for process description purposes only.

1	Revised to comply with CODE 1 vendor Submittal (24590-QL-POA-MWK0-00001-09-00001), in accordance with CAR: 24590-WTP-CAR-QA-05-120. Added Environmental Qualification.						2/6/05
0	Issued for Purchase	J. Rouse	D. Pease	C. Morley	M. Hoffmann		9-20-04
Rev.	Reason for Revision	System Engineer / Process Engineer	Equipment Engineer	Checked	Approved		Date



River Protection Project
Waste Treatment Plant

MECHANICAL DATA SHEET
ACTIVATED CARBON ADSORBER

PLANT ITEM No.
24590-HLW-MV-HOP-ADBR-00002A/B

Data Sheet No.	Rev.
24590-HLW-MVD-HOP-00016	1

Material Data:

Process Pipe and Housing Fabrication -			
Pipe Class	S11V	Valve Material	316/316L SS
Inlet Piping Size	14 inches	Valve Trim	TRIM 12, API 600
Outlet Piping Size	14 inches	Flange Material	316L SS
Housing	316L SS	Gasket Material	Spiral-Wound/Flat, Graphite
Activated Carbon Beds Screens	316L SS	Flange Rating	CL 150 RF B16.5
Pipe schedule	TBD	Housing Insulation / Jacket	Calcium Silicate ASTM C533, Type I / 0.024" thk. SST ASTM A240
Pipe Material	316L SS	Pipe Insulation / Jacket	Calcium Silicate ASTM C533, Type I / 0.024" thk. SST ASTM A240
Fire Protection Pipe -			
Pipe Class	TBD	Valve Trim	TBD
Inlet Piping Size	* 2 inches	Flange Material	TBD
Pipe schedule	TBD	Gasket Material	TBD
Pipe Material	TBD	Flange Rating	TBD
Valve Material	TBD		
Appurtenances and Other Items -			
Support Frames	Carbon Steel	Fire Suppression Drain Pipe Material	TBD
Pipe Supports	Carbon Steel	Fire Suppression Drain Pipe Sch.	TBD
Maintenance Platforms	Carbon Steel	Drain Line on/off valve	TBD
Flange Bolts / Nuts	ASTM F593 / ASTM F594	Drain Line Flange Material	TBD
		Drain Line Flange Rating	TBD

Bed Fire Suppression System:

Fluid Type		Water		Full Flood Fire Suppression:		
Activation Method:				Flowrate	* 22	gpm
Temperature	Y/N No			Pressure	* 50	psig
Smoke	Y/N No			Total Volume of Water	* 5400	gal
Instrument Signal	Y/N Yes			Total Time to Fill Vessel	* 240	minutes
Instrument Type	Differential CO Monitor			Drain Pipe Line Size	* 2 Inches	

Design Data:

Nozzle Loads at Buyer Interface -							
	F _x (lbs)	F _y (lbs)	F _z (lbs)	M _x (ft-lbs)	M _y (ft-lbs)	M _z (ft-lbs)	
Weight	200	1750	200	5250	2500	2500	
Thermal	2500	2500	3500	30000	30000	30000	
Seismic	5750	4500	8000	50000	50000	50000	
Total	8450	8750	11700	85250	82500	82500	

Thermal Information -

Room Temperature	83	°F	Maximum Heat Loss	5	Kw (per unit)
Earth Temperature Beneath Slab	70	°F (Fixed)	Thermal Cycling Frequency:	For design purposes use a thermal cycle frequency of once every two (2) months for the life of the plant (40 years).	
Concrete Slab Base Thickness	72	inches			
Thermal Conductivity of Concrete Slab	1.8	W / m / K			

Environmental Qualification - Δ

Room #Δ	H-A123 Δ	Radiation (mrads/hr) Δ	2.5 Δ
Environmental Conditions Δ	Mild Δ	Flooding Δ	Water Spray Δ
Temperature: Δ		Chemical Spray Δ	No Δ
Normal (°F) Δ	59 - 95 Δ	Plant Induced Vibration Δ	No Δ
Accident (°F) Δ	130 Δ	Function post DBE Δ	No Δ
Pressure (atm) Δ	1.05 Δ	Operating time post DBE Δ	N/A Δ
Relative Humidity Δ	1 - 100%		

Note: EQ requirements are applicable to electrical components pertaining to the carbon units. The carbon units are all metallic construction and not subject to EQ.



River Protection Project
Waste Treatment Plant

MECHANICAL DATA SHEET ACTIVATED CARBON ADSORBER

PLANT ITEM No.
24590-HLW-MV-HOP-ADBR-00002A/B

Data Sheet No.	Rev.
24590-HLW-MVD-HOP-00016	1

Activated Carbon Data -	Primary Bed	Guard Bed (if included)
Manufacturer	* Donau Carbon	* Donau Carbon
Type of carbon (charcoal, coconut shell, etc.)	* Kombisorbon BAT-37	* Desomix ZA-37 Δ
Activation element (sulfur)	* Sulfur compounds Δ	* Unimpregnated activated charcoal Δ
Carbon media form (granular, pellet, etc.)	* Granular	* Granular Δ
Size of carbon media (mm)	* 3-5	* 3-5
Bulk density	* 0.57 g/cc (36 lb/ft ³) Δ	* 0.57 g/cc (36 lb/ft ³) Δ
Load efficiency	* 17%	* 17%
Number of beds per vessel	* two	* two
Arrangement	* Rectangular parallel beds	* Rectangular parallel beds
Residence time, sec	* 6 (at design flow rate in SCFM) Δ	* 3 (at design flow rate in SCFM) Δ
Thickness of bed, in	* 20	* 10
Total volume of carbon, ft ³ per vessel Δ	* 220 Δ	* 110 Δ
Total weight of carbon, lbs per vessel Δ	* 7920 Δ	* 3960 Δ
Spacing between beds, in	* 4	* 4 and 8
Face velocity thru carbon, fpm	* 16.67 (at design flowrate in SCFM) Δ	* 16.67 (at design flowrate in SCFM) Δ
Max. allowable temp, °F	* 284	* 284
Min. allowable temp, °F	* Ambient	* Ambient
House/vessel -		
Material/Thickness	* 3/8" stainless steel with external stiffeners Δ	
Vessel dimensions, (L x W x H)	* 138" x 112" x 156" Δ	
Total weight of vessel	* est. 22,670 lbs per vessel Δ	
Weight of vessel with carbon, lbs	* 34,550 lbs Δ	
Design pressure, in-WG	* -82 in-WG (Refer to Process Note D, positive design pressure 126 in-WG) Δ	
Operating pressure, in-WG	* -18.1 in-WG Δ	
Design temperature, °F	* 250 Δ	
Recommended housing insulation:	* Calcium silicate and/or foam glass	
Material/Thickness, in	* 7 inches on sides, 1 inch over stiffeners Δ	
Thermal Cond, Btu-in/hr ft ² °F	* 0.39	
Method of Attachment	* Mechanical support via outer jacket and/or straps	
Unloading on/off valve	* 8 each per vessel, each 8" size (4 ea. for Primary Bed) Δ	
Discharge Filter -		
Manufacturer	* American Air filter	
Type of filter	* Extended surface mini-pleat with metal sides	
Filter material	* microglass paper Δ	
Filter frame material	* stainless steel type 316 Δ	
Dimensions of filter, (L x W x H)	* 23-3/8" x 23-3/8" x 3-3/4" Δ	
Weight of filter, lbs	* 15 lbs Δ	
Number of filters per vessel	* 2	
Filter rating (efficiency, particle size)	* 99% on 5 micron particles	
Flowrate capacity, scfm	* 2000 per filter	
Max. allowable temp, °F	* 250 Δ	
Min. allowable temp, °F	* Ambient	



River Protection Project
Waste Treatment Plant

MECHANICAL DATA SHEET ACTIVATED CARBON ADSORBER

PLANT ITEM No.

24590-HLW-MV-HOP-ADBR-00002A/B

Data Sheet No.

24590-HLW-MVD-HOP-00016

Rev.

1

Connecting Pipe -	
Pipe size, in	* 14
Material/Thickness, in	* 0.25 Δ
Total length of piping, ft	* 70 Δ
Valve type, (gate, butterfly, etc.)	* butterfly
Weight of valve, lbs	* 143 Δ
Valve manufacturer	* Centerline Valves Δ
Total number of valves	* 6
Actuators (air operated, rack and pinion, FC)	* Pneumatic, rack & pinion, Fail closed Δ
Actuator manufacture	* Hi-Tork Δ
Weight of actuator	* 50 lbs
Actuator operating pressure (min. and max.)	* 80-150 Δ
Opening time, seconds	* less than 10 seconds Δ
Total number of Actuators	* 6 per ACA unit
Required instrument air supply, scfm	* 2 SCFM/actuator Δ
Recommended piping insulation:	* Calcium silicate or foam glass
Material/Thickness, in	* 1 inches Δ
Thermal Cond, Btu-in/hr ft ² °F	* 0.39
Method of Attachment	* straps
Pneumatic Loading Equipment -	
Manufacturer	* N/A
Blower size, horsepower	* N/A
Blower electrical load, watts	* N/A
Required voltage for blower	* N/A
Skid envelope size, (L x W x H)	* N/A
Skid weight, lbs	* N/A
Skid transportation/mobility	* N/A
Estimated time to load the vessel	* N/A
<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: auto;"> Note: System designed to permit loading directly from bulk bags or drums into beds without the need for pneumatic loading devices. </div>	
Optional Electric Pre-Heater -	
Manufacturer	* N/A
Heater element electric load, watts	* N/A
Required voltage for heater elements, V	* N/A
Fan electric load, watts	* N/A
Required voltage for fan, V	* N/A
Fan size, horsepower	* N/A
Skid envelope size, (L x W x H)	* N/A
Skid weight, lbs	* N/A
Skid transportation/mobility	* N/A
Estimated time to preheat the carbon, hrs	* N/A
Total electric load for skid, watts	* N/A
Total required voltage	* N/A
<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: auto;"> Note: Electrical Pre-Heater no longer proposed - considered unnecessary. </div>	

Construction Data: (To be determined by the supplier when not specified by the buyer)

Envelope Dimensions, (L x W x H) ft	(25 x 11 x 31)	Shipping Dimensions, (L x W x H) ft	* 3 trailers, each load (15 x 10 x 9) ft
Operating Weight of unit (two vessels), lbs	* 69,100 Δ	Shipping Weight lbs	* 71,500 Δ
Full Water Flood Weight of unit (two vessels), lbs	* 114,100 Δ		



River Protection Project
Waste Treatment Plant

MECHANICAL DATA SHEET ACTIVATED CARBON ADSORBER

PLANT ITEM No.

24590-HLW-MV-HOP-ADBR-00002A/B

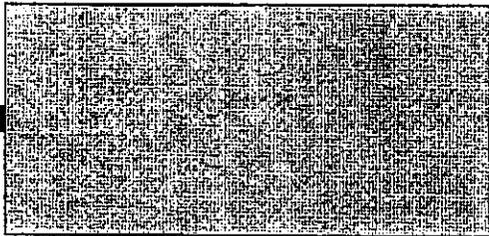
Data Sheet No.

24590-HLW-MVD-HOP-00016

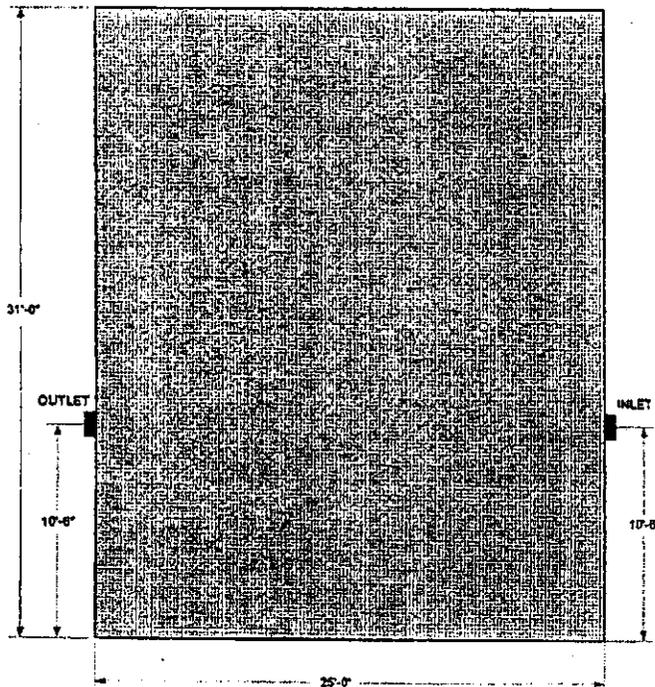
Rev.

1

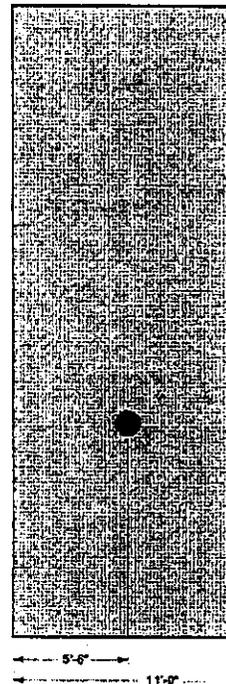
TOP VIEW



FRONT VIEW



END VIEW



Layout Notes:

- Process Inlet and Outlet nozzles are shown for clarity. Other nozzle locations will be per Seller.
- Carbon bed, piping, support frame, and maintenance platform layout shall be per Seller meeting the requirements of engineering specification 24590-WTP-3PS-MWK0-T0001.
- Pneumatic loading system shall be located per Seller's design.

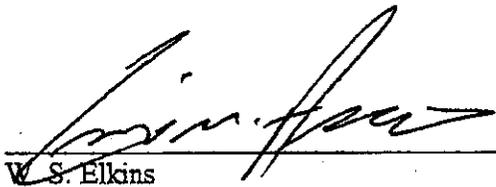
General Notes

- Data marked with an asterisk to be provided by Vendor.
- The adsorber housing pressure boundary is designed and fabricated to ASME BPVC, Sec VIII, Div 1, the adsorbers and fire protection system are designed and fabricated to applicable ASME AG-1 requirements and the interconnect piping and valves are designed and fabricated to ASME B31.3 - 1996. The packaged unit is tested to ASME AG-1 with ASME AG-1a-2000 Addenda, and the pressure boundary pneumatically tested per ASME BPVC, Sec VIII, Div 1.
- Contents of this document are Dangerous Waste Permit affecting.

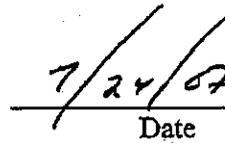
Bechtel National, Inc. Certification

The following certification statement is provided consistent with Contract No. DE-AC27-01RV14136, Section H.26, Environmental Permits, paragraph (g) for the submittal of the Hanford Facility Resource Conservation and Recovery Act Permit Modification Notification Form 24590-HLW-PCN-ENV-07-001

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 assure 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.



for W. S. Elkins
Project Director



Date

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Quarter Ending September 30,
2007

24590-LAW-PCN-ENV-07-002

Hanford Facility RCRA Permit Modification Notification Form
Part III, Operating Unit 10
Waste Treatment and Immobilization Plant

Index

Page 2 of 3: Hanford Facility RCRA Permit, Operating Unit 10, Waste Treatment and Immobilization Plant Update LAW Vitrification Building Piping and Instrumentation Diagrams (P&IDs) for the LAW Concentrate Receipt Process System Concentrate Receipt Vessel LCP-VSL-00001, LAW Concentrate Receipt Process System Concentrate Receipt Vessel LCP-VSL-00002, in Appendix 9.2 of the Dangerous Waste Permit.

Submitted by Co-Operator:

Reviewed by ORP Program Office:

D.A. Klein 7/24/07
D. A. Klein Date

S.J. Olinger 8/17/07
S. J. Olinger Date

¹ Class 1 modifications requiring prior Agency approval.

² If the proposed modification does not match any modification listed in WAC 173-303-830 Appendix I, then the proposed modification should automatically be given a Class 3 status. This status may be maintained by the Department of Ecology, or down graded to a Class '1, if applicable.

Quarter Ending September 30,
2007

24590-LAW-PCN-ENV-07-002

Hanford Facility RCRA Permit Modification Notification Form

Unit: Waste Treatment and Immobilization Plant	Permit Part & Chapter: Part III, Operating Unit 10
--	--

Description of Modification:

The purpose of this Class 1 prime modification is to update the following Piping and Instrumentation Diagrams (P&IDs) for the LAW Concentrate Receipt Process System Concentrate Receipt Vessel LCP-VSL-00001, LAW Concentrate Receipt Process System Concentrate Receipt Vessel LCP-VSL-00002. The following permit P&IDs are submitted to replace those currently in Appendix 9.2.

Appendix 9.2			
Replace:	24590-LAW-M6-LCP-P0001, Rev. 2	With:	24590-LAW-M6-LCP-P0001, Rev. 3
	24590-LAW-M6-LCP-P0002, Rev. 1		24590-LAW-M6-LCP-P0002, Rev. 2

The referenced P&IDs are complete revisions. They incorporate changes provided in applicable document change forms (e.g., DCN, SCN, SDDR, FCN, FCR, etc.) and changes associated with the resolution to comments on change documents since the issuance of the last revision of the permit drawing. This modification requests Ecology approval and incorporation into the permit. Revisions are the result of ongoing design changes. The following identifies the significant types of changes on the attached drawings.

LAW Vitrification Facility - Piping and Instrumentation Diagram P&ID 24590-LAW-M6-LCP-P0001 (Rev. 3)

The DCNs associated with changes to P&ID 24590-LAW-M6-LCP-P0001 are provided in drawing Note 43.

- Revised physical layout of LCP-VSL-00005
- Added overflow line from LFP-VSL-00002
- Changed Quality Designator from CM to Q
- Added and/or revised notes 1, 28 through 33 and Note 40 and their callouts such as symbols and legends, slopes, valve locations, and system designators
- Added slope notation to numerous lines
- Added magnetic flow meter and associated instrumentation to pump discharge lines
- Corrected off-sheet coordinates
- Added ISA lines to bulges
- Added seismic category and quality flag designators
- Added nozzle size to vessel nozzles
- Incorporated various editorial comments

LAW Vitrification Facility - Piping and Instrumentation Diagram P&ID 24590-LAW-M6-LCP-P0002 (Rev. 2)

The DCNs associated with changes to P&ID 24590-LAW-M6-LCP-P0002 are provided in drawing Note 39.

- Revised Notes 1, 11 & 30 such as symbols and legends, slopes, system and vendor designations
- Revised physical layout of LCP-VSL-00006
- Changed Quality Designator from CM to Q
- Added overflow line from LFP-VSL-00004
- Added slope notation to numerous lines
- Modified depiction of vessel vent lines to show lines going into vessel
- Added magnetic flow meter and associated instrumentation to pump discharge lines

¹ Class 1 modifications requiring prior Agency approval.

² If the proposed modification does not match any modification listed in WAC 173-303-830 Appendix I, then the proposed modification should automatically be given a Class 3 status. This status may be maintained by the Department of Ecology, or down graded to a Class '1, if applicable.

Quarter Ending September 30,
2007

24590-LAW-PCN-ENV-07-002

- Corrected off-sheet coordinates
- Added ISA lines to bulges
- Added seismic category and quality flag designators
- Added nozzle size to vessel nozzles and deleted N21, N22, and N23 and added N18
- Added label for LCP-BULGE-00001
- Re-routed sample supply and return lines to ASX-SAMPLER-00012 from ASX-SAMPLER-00013
- Incorporated various editorial comments

The following is a list of outstanding change documents that have not been incorporated into this modification:
None

WAC 173-303-830 Modification Class: ^{1 2}	Class 1	Class ¹ 1	Class 2	Class 3
Please mark the Modification Class:		X		

Enter Relevant WAC 173-303-830, Appendix I Modification citation number: N/A

Enter wording of WAC 173-303-830, Appendix I Modification citation:
In accordance with WAC 173-303-830(4)(d)(i), this modification notification is requested to be reviewed and approved as a Class ¹ modification. WAC 173-303-830(4)(d)(ii)(A) states, "Class 1 modifications apply to minor changes that keep the permit current with routine changes to facility or its operation. These changes do not substantially alter the permit conditions or reduce the capacity of the facility to protect human health or the environment. In the case of Class 1 modifications, the director may require prior approval."

Modification Approved: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No (state reason for denial)	Reviewed by Ecology:
Reason for denial:	<i>B. Becker-Khaleel</i> 9/5/07 B. Becker-Khaleel Date

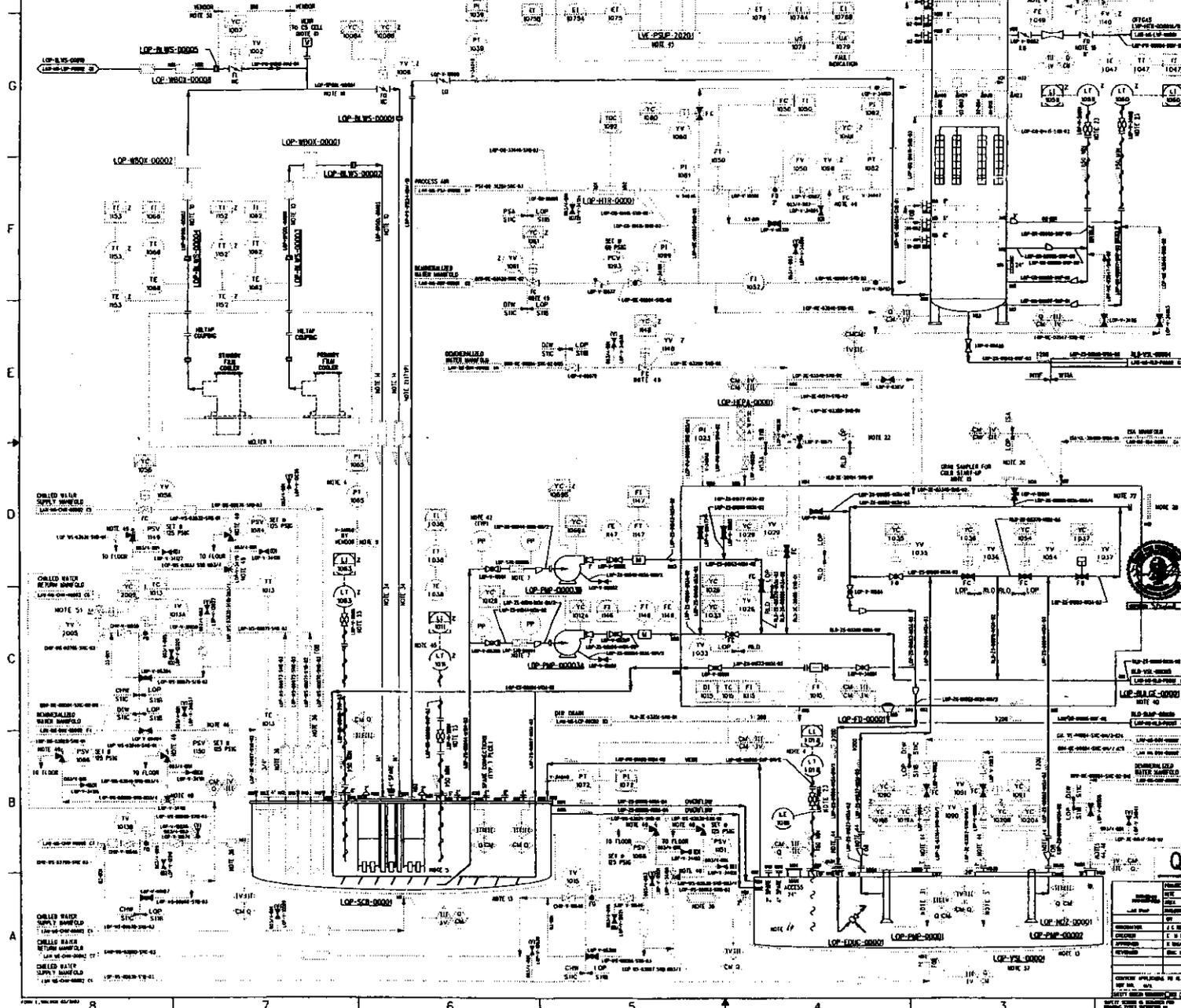
- REFERENCES:**
1. FOR PERMISSIVES AND INTERLOCKS TO IMPORTANT TO SAFETY UTILITY SYSTEMS REFER TO 24500-LAW-SP-PT-T0001, T0004.
 2. THE REQUIRED BATCH SEQUENCES, PERMISSIVES, INTERLOCKS, ALARMS AND OPERATOR INTERFACE POINTS ARE FULLY DESCRIBED IN THE SOFTWARE FUNCTIONAL SPECIFICATION, FOR LOP-LAS PRIMARY OF GAS PROCESS SYSTEM, 24500-LAW-SP-LOP-T0001.
 3. 24500-LAW-MS-VIT-P0004, PROCESS FLOW DIAGRAM LAW VITRIFICATION MELTER 1 SYSTEM LOP & LOP1.

HOLD/OPEN ITEMS:

1-7, DELETED.

NOTES:

1. SEE DRAWINGS 24500-WTP-MS-NO-P000 THROUGH 24500-WTP-MS-NO-P004 FOR GENERAL WATER SYMBOLS AND LEGEND, AND GENERAL SLOPE REQUIREMENTS.
- 2-3 DELETED.
4. INSTRUMENTS ARE QUALITY LEVEL CM UNLESS DESIGNATED BY OTHER AND ARE PERMIT AFFECTING. INSTRUMENT STOP VALVE AND PURGING QUALITY LEVEL, AND THE SAME AS THE CONNECTING PROCESS PIPE UNLESS NOTED OTHERWISE.
5. DISTRIBUTION HEADS MUST BE SERVICED AND SCRUBBED AS PROVIDED BY VESSEL VENDOR.
6. DELETED.
7. PROVIDE REMOVABLE PIPING SPOOL FOR STARTUP STRAINER. STRAINER WILL BE REMOVED PRIOR TO STARTUP.
8. SPECIAL RELIEF DEVICE VENTS AT 4 INCHES W.C.
9. LOCATE TAP FOR PI-1005 AS CLOSE TO LOP-FCB-00005 AS POSSIBLE. PI-1005 HAS AN INSTRUMENT AIR PURGE (NOT SHOWN).
10. SPECIALLY ENGINEERED PIPING SPOOL, WITH MILAP COUPLING.
- 11-12 DELETED.
13. HALF PIPE JACKET.
14. INSULATION BY VENDOR.
15. TO BE SEALED AFTER COLD STARTUP.
- 16-18 DELETED.
19. BUTTERFLY VALVE TO BE SUPPLIED WITH A MANUAL STOP TO PREVENT VALVE PV-140 FROM CLOSING MORE THAN 70% FROM THE OPEN POSITION TO MAINTAIN CONTINUITY OF FLOW.
20. ACCESS PANEL ON EXTERIOR OF BLADE.
21. WHERE SLOPING IS DESIGNATED ON PIPING, SLOPE 150 MM FROM HIGH POINT UNLESS OTHERWISE NOTED.
22. LINES INSIDE THE BLADE OF AND INSIDE DASHED LINES EXTENDING OUTSIDE THE BLADE ARE PROVIDED BY VENDOR.
23. SNAKE CHAIN LINE TO BE ROUTED TO TRANSMITTER LOCATED ON THE FLOOR ABOVE. A FILL PORT BALL VALVE IS REQUIRED FOR ISOLATION PURPOSES AT TRANSMITTER END OF GUIDE TUBE.
- 24-26 DELETED.
27. CONTENTS OF THIS DOCUMENT ARE DANGEROUS WASTE PERMIT AFFECTING.
28. DELETED.
29. VESSEL INTERNAL PUMP PRIMING AND DISCHARGE PIPING SUPPLIED WITH PUMP BY VENDOR.
30. POU-1003 IS A CALCULATED VALUE DERIVED FROM WESP DUCT PRESSURE PI-1009 AND WESP OUTLET PRESSURE PI-1004.
31. DELETED.
32. SEE DRAWING 24500-LAW-MS-P217-00002 AND 00005 FOR DIMENSIONAL DETAILS.
33. DELETED.
34. CHILLED WATER RETURN LINES WILL HAVE ANTI-DRIP/HEAT INSULATION (AS IN THE CELL AND COLD SERVICE INSULATION) COOL OUTSIDE THE CELL.
35. SPARE NOZZLES 1/2", 3/4", 1", 1 1/2" AND 2" ON LOP-VTL-00001 ARE NOT SHOWN ON THIS DRAWING FOR CLARITY.
- 36-38 DELETED.
39. SLOPE PIPING INSIDE BLADE TOWARDS THE OUTLET.
40. DELETED.
41. FILTER PLATES WILL BE REPLACED WITH REGULAR PLUGS AT STARTUP.
42. DELETED.
43. DELETED.
44. REMOVABLE PIPING SPOOL TO FACILITATE PUMP, MIXING EXHAUST OR SPRAY NOZZLE REMOVAL.
45. PERFORMS AN AIR PERMIT FUNCTION.
46. NOT TO BE INSTALLED WHEN MELTERS ARE PROCESSING WASTE.
47. EQUIPMENT COMPONENTS INSIDE LOP-VTL-00001 ARE QUALITY LEVEL CM AND SERVICE CATEGORY SC III UNLESS OTHERWISE NOTED. SERVICE CATEGORY SC III QUALITY LEVEL 0 AND SERVICE CATEGORY SC II QUALITY LEVEL 0 TO ASSURE OPEN PATH TO PSV.
48. VALVE MEETS QUALITY LEVEL D AND SERVICE CATEGORY SC III REQUIREMENTS.
49. DELETED.
50. DELETED.
51. VALVE IS APC.
52. FOR VENDOR COMPONENT DETAILS SEE 24500-LAW-MS-P217-00001, 00002.
53. THE COMPONENTS SHOWN ON THIS DRAWING IN PHANTOM DO NOT REQUIRE INDEPENDENT PROFESSIONAL ENGINEER REVIEW OR INSPECTION. THE QUALIFIED INSTALLATION INSPECTOR IN ACCORDANCE WITH THE TSP AND/OR WASHINGTON ADMINISTRATIVE CODE REQUIREMENTS.
54. THE DOCUMENT HAS COMPLETELY REVIEWED AND IDENTIFICATION OF REVISED ITEMS REVISIONS:
 - REVISION 1: REVISED LOP-FCB-00005, LOP-FCB-00006, LOP-FCB-00007, LOP-FCB-00008, LOP-FCB-00009, LOP-FCB-00010, LOP-FCB-00011, LOP-FCB-00012, LOP-FCB-00013, LOP-FCB-00014, LOP-FCB-00015, LOP-FCB-00016, LOP-FCB-00017, LOP-FCB-00018, LOP-FCB-00019, LOP-FCB-00020, LOP-FCB-00021, LOP-FCB-00022, LOP-FCB-00023, LOP-FCB-00024, LOP-FCB-00025, LOP-FCB-00026, LOP-FCB-00027, LOP-FCB-00028, LOP-FCB-00029, LOP-FCB-00030, LOP-FCB-00031, LOP-FCB-00032, LOP-FCB-00033, LOP-FCB-00034, LOP-FCB-00035, LOP-FCB-00036, LOP-FCB-00037, LOP-FCB-00038, LOP-FCB-00039, LOP-FCB-00040, LOP-FCB-00041, LOP-FCB-00042, LOP-FCB-00043, LOP-FCB-00044, LOP-FCB-00045, LOP-FCB-00046, LOP-FCB-00047, LOP-FCB-00048, LOP-FCB-00049, LOP-FCB-00050, LOP-FCB-00051, LOP-FCB-00052, LOP-FCB-00053, LOP-FCB-00054, LOP-FCB-00055, LOP-FCB-00056, LOP-FCB-00057, LOP-FCB-00058, LOP-FCB-00059, LOP-FCB-00060, LOP-FCB-00061, LOP-FCB-00062, LOP-FCB-00063, LOP-FCB-00064, LOP-FCB-00065, LOP-FCB-00066, LOP-FCB-00067, LOP-FCB-00068, LOP-FCB-00069, LOP-FCB-00070, LOP-FCB-00071, LOP-FCB-00072, LOP-FCB-00073, LOP-FCB-00074, LOP-FCB-00075, LOP-FCB-00076, LOP-FCB-00077, LOP-FCB-00078, LOP-FCB-00079, LOP-FCB-00080, LOP-FCB-00081, LOP-FCB-00082, LOP-FCB-00083, LOP-FCB-00084, LOP-FCB-00085, LOP-FCB-00086, LOP-FCB-00087, LOP-FCB-00088, LOP-FCB-00089, LOP-FCB-00090, LOP-FCB-00091, LOP-FCB-00092, LOP-FCB-00093, LOP-FCB-00094, LOP-FCB-00095, LOP-FCB-00096, LOP-FCB-00097, LOP-FCB-00098, LOP-FCB-00099, LOP-FCB-00100.



1	CHANGING PERMISSIVES	DATE	BY
2	CHANGING PERMISSIVES	DATE	BY
3	CHANGING PERMISSIVES	DATE	BY

REVISION HISTORY	
NO.	DESCRIPTION
1	ISSUED FOR PERMITTING
2	ISSUED FOR PERMITTING
3	ISSUED FOR PERMITTING

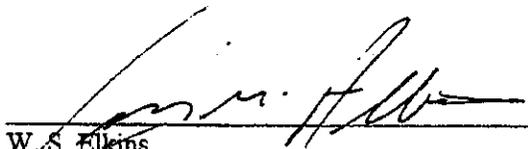
**P&ID-LAW
PRIMARY OFFGAS
PROCESS SYSTEM
MELTER 1**

24500-LAW-MS-LOP-P0001

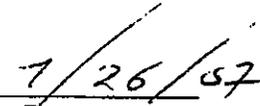
Bechtel National, Inc. Certification

The following certification statement is provided consistent with Contract No. DE-AC27-01RV14136, Section H.26, Environmental Permits, paragraph (g) for the submittal of the Hanford Facility Resource Conservation and Recovery Act Permit Modification Notification Form 24590-LAW-PCN-ENV-07-003.

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 assure 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.



For W. S. Elkins
Project Director



Date

Quarter Ending September 30,
2007

24590-LAW-PCN-ENV-07-003

Hanford Facility RCRA Permit Modification Notification Form
Part III, Operating Unit 10
Waste Treatment and Immobilization Plant

Index

Page 2 of 3: Hanford Facility RCRA Permit, Operating Unit 10, Waste Treatment and Immobilization Plant
Update LAW Vitrification Building Piping and Instrumentation Diagrams (P&IDs) for the LAW
Primary Offgas Process System Melter 1, LAW Primary Offgas Process System Melter 2, in
Appendix 9.2 of the Dangerous Waste Permit.

Submitted by Co-Operator:

Reviewed by ORP Program Office:

D. A. Klein
D. A. Klein

7/24/07
Date

S. J. Olinger
S. J. Olinger

8/9/07
Date

¹ Class 1 modifications requiring prior Agency approval.

² If the proposed modification does not match any modification listed in WAC 173-303-830 Appendix 1, then the proposed modification should automatically be given a Class 3 status. This status may be maintained by the Department of Ecology, or down graded to a Class '1, if applicable.

Quarter Ending September 30,
2007

24590-LAW-PCN-ENV-07-003

Hanford Facility RCRA Permit Modification Notification Form			
Unit:		Permit Part & Chapter:	
Waste Treatment and Immobilization Plant		Part III, Operating Unit 10	
<u>Description of Modification:</u>			
<p>The purpose of this Class 1 prime modification is to update the following Piping and Instrumentation Diagrams (P&IDs) for the LAW Primary Offgas Process System Melter 1, LAW Primary Offgas Process System Melter 2. The following permit P&IDs are submitted to replace those currently in Appendix 9.2.</p>			
<u>Appendix 9.2</u>			
Replace:	24590-LAW-M6-LOP-P0001, Rev. 1	With:	24590-LAW-M6-LOP-P0001, Rev. 2
	24590-LAW-M6-LOP-P0002, Rev. 1		24590-LAW-M6-LOP-P0002, Rev. 2
<p>The referenced P&IDs are complete revisions. They incorporate changes provided in applicable document change forms (e.g., DCN, SCN, SDDR, FCN, FCR, etc.) and changes associated with the resolution to comments on change documents since the issuance of the last revision of the permit drawing. This modification requests Ecology approval and incorporation into the permit. Revisions are the result of ongoing design changes. The following identifies the significant types of changes on the attached drawings.</p>			
LAW Vitrification Facility - Piping and Instrumentation Diagram P&ID 24590-LAW-M6-LOP-P0001 (Rev. 2)			
<p>The DCNs associated with changes to P&ID 24590-LAW-M6-LCP-P0001 are provided in drawing Note 54.</p>			
<ul style="list-style-type: none"> • Added and revised various notes as symbols and legends, slopes, reducers, valve locations, and system designators • Added slope notation to numerous lines including bulge piping • Corrected numerous off-sheet coordinates • Added Seismic Category flags and incorporated various editorial comments • Added reducers and nozzles to WESP purge heaters • Deleted pressure control valves and added orifice plates, nozzle numbers, and reducers to LOP-HTR-00001 • Added reducers to show 8" LOP-FV-1140 on 10" line between offgas LVP HTR-00001A/B and LOP-WESP-00001 • Added instrument service air from ISA manifold to bulge LOP-BULGE-00001 • Incorporated various editorial comments 			
LAW Vitrification Facility - Piping and Instrumentation Diagram P&ID 24590-LAW-M6-LOP-P0002 (Rev. 2)			
<p>The DCNs associated with changes to P&ID 24590-LAW-M6-LCP-P0002 are provided in drawing Note 53.</p>			
<ul style="list-style-type: none"> • Added and revised various notes as symbols and legends, slopes, reducers, valve locations, and system designators • Added slope notation to numerous lines including bulge piping • Corrected numerous off-sheet coordinates • Added Seismic Category flags and incorporated various editorial comments • Added reducers and nozzles to WESP purge heaters • Deleted pressure control valves and added orifice plates to LOP-HTR-00002 • Added reducers to show 8" LOP-FV-2140 on 10" line between offgas LVP HTR-00001A/B and LOP- 			

¹ Class 1 modifications requiring prior Agency approval.

² If the proposed modification does not match any modification listed in WAC 173-303-830 Appendix I, then the proposed modification should automatically be given a Class 3 status. This status may be maintained by the Department of Ecology, or down graded to a Class '1, if applicable.

Quarter Ending September 30,
2007

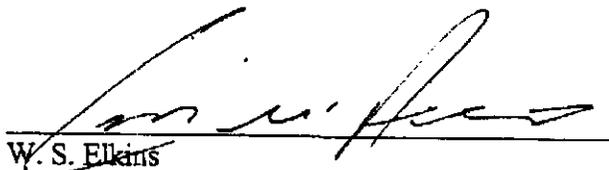
24590-LAW-PCN-ENV-07-003

WESP-00002 <ul style="list-style-type: none"> Added instrument service air from ISA manifold to bulge LOP-BULGE-00002 Incorporated various editorial comments The following is a list of outstanding change documents that have not been incorporated into this modification: 24590-LAW-M6N-LOP-00051				
WAC 173-303-830 Modification Class: ^{1 2}	Class 1	Class ¹ 1	Class 2	Class 3
Please mark the Modification Class:		X		
Enter Relevant WAC 173-303-830, Appendix I Modification citation number:		N/A		
Enter wording of WAC 173-303-830, Appendix I Modification citation:				
In accordance with WAC 173-303-830(4)(d)(i), this modification notification is requested to be reviewed and approved as a Class ¹ 1 modification. WAC 173-303-830(4)(d)(ii)(A) states, "Class 1 modifications apply to minor changes that keep the permit current with routine changes to facility or its operation. These changes do not substantially alter the permit conditions or reduce the capacity of the facility to protect human health or the environment. In the case of Class 1 modifications, the director may require prior approval."				
Modification Approved: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No (state reason for denial) Reason for denial:		Reviewed by Ecology:  B. Becker-Khaleel		
		9/5/07 Date		

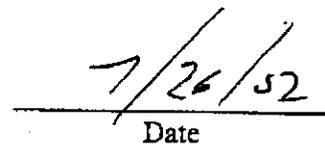
Bechtel National, Inc. Certification

The following certification statement is provided consistent with Contract No. DE-AC27-01RV14136, Section H.26, Environmental Permits, paragraph (g) for the submittal of the Hanford Facility Resource Conservation and Recovery Act Permit Modification Notification Form 24590-LAW-PCN-ENV-07-002.

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 assure 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.



W. S. Elkins
For Project Director



Date

Quarter Ending June 30, 2007

24590-LAW-PCN-ENV-06-007

Hanford Facility RCRA Permit Modification Notification Form
Part III, Operating Unit 10
Waste Treatment and Immobilization Plant

Index

Page 2 of 2: Hanford Facility RCRA Permit, Operating Unit 10, Waste treatment and Immobilization Plant
Update LAW Vitrification Offgas System Bypass Analysis in Appendix 9.18 of the Dangerous Waste Permit.

Submitted by Co-Operator:

Reviewed by ORP Program Office:

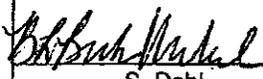
D. A. Klein 6/11/07
D. A. Klein Date

S. J. Olinger 7/30/07
S. J. Olinger Date

¹ Class 1 modifications requiring prior Agency approval.
² If the proposed modification does not match any modification listed in WAC 173-303-830 Appendix I, then the proposed modification should automatically be given a Class 3 status. This status may be maintained by the Department of Ecology, or down graded to a Class '1, if applicable.

Quarter Ending June 30, 2007

24590-LAW-PCN-ENV-06-007

Hanford Facility RCRA Permit Modification Notification Form								
Unit: Waste Treatment and Immobilization Plant		Permit Part & Chapter: Part III, Operating Unit 10						
Description of Modification:								
<p>The purpose of this Class 1 prime modification is to update the LAW Vitrification Offgas System Bypass Analysis. The following permit document is submitted to replace the document currently in Appendix 9.18.</p> <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td colspan="2" style="text-align: center;">Appendix 9.18</td> </tr> <tr> <td style="width: 50%;">Replace: 24590-LAW-PER-PR-03-001, Rev 0</td> <td style="width: 50%;">With: 24590-LAW-PER-PR-03-001, Rev. 2</td> </tr> </table>					Appendix 9.18		Replace: 24590-LAW-PER-PR-03-001, Rev 0	With: 24590-LAW-PER-PR-03-001, Rev. 2
Appendix 9.18								
Replace: 24590-LAW-PER-PR-03-001, Rev 0	With: 24590-LAW-PER-PR-03-001, Rev. 2							
<p>This modification requests Ecology approval of the specific changes to the document that are identified by revision bars. Revisions are the result of ongoing design. The following identifies the significant types of changes on the attached document.</p> <ul style="list-style-type: none"> • Updated discussion of LAW offgas treatment system • Enhanced the discussion of automatic bypass events • Added language concerning interlocks • Added language concerning the bypass of the catalytic oxidizer/reducer skid or caustic scrubber. • Added a new section on the actions that would be taken in the event of loss of power. • Removed descriptions for Primary Melter Offgas System Component Functions and Secondary Offgas System Component Functions • Added Section 4.7, Loss of LAW Facility Power • Revised Figure 1, Melter Offgas System 								
WAC 173-303-830 Modification Class: ^{1 2}		Class 1	Class ¹ 1	Class 2	Class 3			
Please mark the Modification Class:			X					
Enter Relevant WAC 173-303-830, Appendix I Modification citation number:		N/A						
Enter wording of WAC 173-303-830, Appendix I Modification citation:								
<p>In accordance with WAC 173-303-830(4)(d)(i), this modification notification is requested to be reviewed and approved as a Class ¹1 modification. WAC 173-303-830(4)(d)(ii)(A) states, "Class 1 modifications apply to minor changes that keep the permit current with routine changes to facility or its operation. These changes do not substantially alter the permit conditions or reduce the capacity of the facility to protect human health or the environment. In the case of Class 1 modifications, the director may require prior approval."</p>								
Modification Approved: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No (state reason for denial)		Reviewed by Ecology:						
Reason for denial:		 S. Dahl						
		9/7/07 Date						

¹ Class 1 modifications requiring prior Agency approval.

² If the proposed modification does not match any modification listed in WAC 173-303-830 Appendix I, then the proposed modification should automatically be given a Class 3 status. This status may be maintained by the Department of Ecology, or down graded to a Class '1, if applicable.



ISSUED BY
RPP-WTP PDC

R10773900

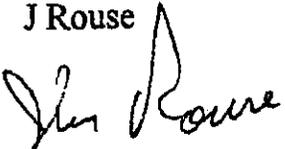
Document title: **LAW Vitrification Offgas
System Bypass Analysis**

Contract number: DE-AC27-01RV14136
Department: Process Engineering
Author(s): R Hanson

Principal author
signature: 

Document number: 24590-LAW-PER-PR-03-001, Rev 2

Checked by: J Rouse

Checker signature: 

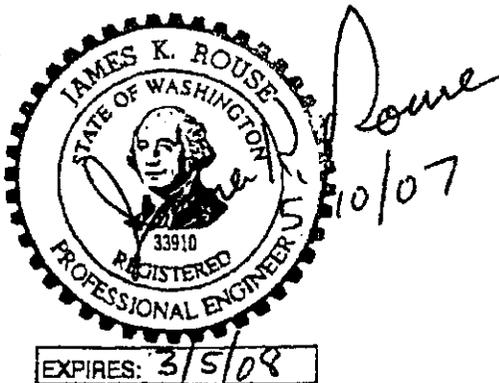
Date of issue: 9 May 2007

Issue status: Issued for Permitting Use

Approved by: B Voke

Approver's position: Mechanical & Process Engineering Discipline Supervisor

Approver signature: 



This bound document contains a total of 13 sheets

Notice

Please note that source, special nuclear, and byproduct materials, as defined in the *Atomic Energy Act of 1954* (AEA), are regulated at the US Department of Energy (DOE) facilities exclusively by DOE acting pursuant to its AEA authority. DOE asserts, that pursuant to the AEA, it has sole and exclusive responsibility and authority to regulate source, special nuclear, and byproduct materials at DOE-owned nuclear facilities. Information contained herein on radionuclides is provided for process description purposes only.

History Sheet

Rev	Date	Reason for revision	Revised by
0	28 January 2004	Issued for Permitting Use	T Anderson
1	7 February 2005	Updated and Issue for Permitting Use	R Hanson
2	9 May 2007	Updated section 4.5, 4.6 and Figure 1	R Hanson

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Acronyms and Abbreviations

AEA	<i>Atomic Energy Act of 1954</i>
CO _x	Carbon Dioxide / Carbon Monoxide
DOE	US Department of Energy
HEPA	high-efficiency particulate air
LAW	low-activity waste
NO _x	nitrogen oxides
SBS	submerged bed scrubber
SCR	selective catalytic reduction
VOC	volatile organic compound
WESP	wet electrostatic precipitator

1 Introduction

The two low-activity waste (LAW) melters process mixed waste in a joule-heated ceramic melter to reduce volume and immobilize radionuclides. The resulting offgas is treated in a manner that protects human health and the environment using a variety of unit operations that may, under specified circumstances, be bypassed. A bypass is defined as the intentional omission of one or more offgas treatment steps either as an automated part of system responses or manually. Bypasses are designed into the LAW vitrification offgas system to:

- Allow maintenance of treatment equipment without stopping melter ventilation
- Maintain a ventilation path to the facility stack
- Prevent and/or minimize melter pressurization

This document describes the LAW vitrification offgas system and potential bypass events in accordance with Dangerous Waste Permit Condition III.10.H.5.c.ix (WA7890008967).

2 Applicable Documents

Process flow diagrams associated with the LAW melter offgas system are as follows:

- 24590-LAW-M5-V17T-P0004, *Process Flow Diagram - LAW Vitrification Melter 1 (System LMP & LOP)*
- 24590-LAW-M5-V17T-P0005, *Process Flow Diagram - LAW Vitrification Melter 2 (System LMP and LOP)*
- 24590-LAW-M5-V17T-P0007, *Process Flow Diagram - Melter 1 Primary Offgas Treatment System (System LOP)*
- 24590-LAW-M5-V17T-P0008, *Process Flow Diagram - Melter 2 Primary Offgas Treatment System (System LOP)*
- 24590-LAW-M5-V17T-P0010, *Process Flow Diagram - LAW Vitrification Ammonia & Secondary Offgas (System AMR & LVP)*
- 24590-LAW-M5-V17T-P0011, *Process Flow Diagram - LAW Vit Secondary Offgas Treatment (System LVP)*

Other Documents

- WA7890008967, *Dangerous Waste Portion of the Hanford Facility Resource Conservation and Recovery Act Permit for the Treatment, Storage, and Disposal of Dangerous Waste, Chapter 10, and Attachment 51, "Waste Treatment and Immobilization Plant."*

3 System Summary

The offgas treatment system is designed to accommodate a LAW melter glass production rate of 15 metric tons per day per melter based on the concentrated LAW feed received from the pretreatment facility. Figure 1 schematically depicts the melter offgas system.

The primary offgas treatment system is designed to control the melter pressure, remove heat from the melter offgas, and remove particulates. The system, in conjunction with the exhausters, is designed to accommodate intermittent offgas increases up to seven times the normal steam and three times the normal noncondensable gas generation flow from the melter feed.

The vessel vent header receives offgas from the LAW concentrate receipt vessels (LCP-VSL-00001/2), the melter feed preparation vessels (LFP-VSL-00001/3), the melter feed vessels (LFP-VSL-00002/4), the plant wash vessel (RLD-VSL-00003), the submerged bed scrubber (SBS) condensate collection vessel (RLD-VSL-00005), and the C3/C5 drains/sump collection vessel (RLD-VSL-00004). The offgas received through the vessel vent system consists primarily of air, water vapor, and minor amounts of aerosols generated by the agitation or transfer of vessel contents.

Offgas from the vessel vent header is combined with offgas from the primary systems and routed to the secondary offgas system where the combined offgas is treated to destroy or remove hazardous contaminants. The system also removes potential catalyst poisons that could impair effectiveness of the catalyst treatment unit. After treatment, the offgas is released through a stack.

The primary offgas system consists of the following:

- Primary offgas line with film cooler (LOP-FCLR-00001/3)
- Melter control air
- Submerged bed scrubber (LOP-SCB-00001/2)
- SBS condensate vessel (LOP-VSL-00001/2)
- Offgas piping, valves, pumps, and instrumentation
- Wet electrostatic precipitator (WESP) (LOP-WESP-00001/2)
- Standby line (from the melter to its associated SBS) with
 - Film cooler (LOP-FCLR-00002/4)
 - Butterfly valve
 - Special relief device

This system cools the offgas and removes particulates. A separate primary offgas system is provided for each melter. Changes in gas generation rates affect the melter vacuum, which is controlled by adjusting the flow of control air introduced through the film cooler. The standby line is provided in the event that flow through the primary line is not sufficient to maintain the melter at the desired vacuum. This standby line includes a film cooler and has a butterfly valve as the isolation device. A special relief device between the melter and the butterfly valve in the wet process cell relieves melter pressure at about +10 in. water gauge.

The secondary offgas system consists of the following:

- Melters offgas HEPA preheaters (LVP-HTR-00001A/B)
- Melter offgas HEPA filters (LVP-HEPA-00001A/B, 2A/B and 3A)
- Melter offgas exhausters (LVP-EXHR-00001A/B/C)
- Mercury mitigation equipment skid (LVP-SKID-00001) consisting of the following:
 - Offgas mercury adsorbers (LVP-ADBR-00001A/B)
- LAW catalytic oxidizer/reducer skid (LVP-SKID-00002) consisting of the following:
 - Melters secondary offgas cat. oxidizer heat recovery exchanger (LVP-HX-00001)
 - Melters offgas cat. oxidizer electric heater (LVP-HTR-00002)
 - Melters offgas cat. oxidizer VOC catalyst (LVP-SCO-00001)
 - Melters offgas cat. oxidizer SCR catalyst (LVP-SCR-00001)
- Ammonia/air dilution skid (LVP-SKID-00003)
- Melters offgas caustic scrubber and caustic collection tank (LVP-SCB-00001 and LVP-TK-00001)
- Piping, valves, pumps, and instrumentation

This equipment removes most of the remaining particulates and removes or destroys chemical contaminants.

The vessel vent system consists of a header with lines to process vessels to maintain a slight vacuum that controls emissions both during normal operation and during maintenance.

4 Description of Bypass Events

The following six unit operations perform destruction or removal functions:

1. Submerged bed scrubber
2. Wet electrostatic precipitator
3. HEPA filters
4. Mercury mitigation equipment
5. Catalytic oxidizer/reducer skid
6. Caustic scrubber

With the exception of the HEPA filters, each unit operation can be intentionally bypassed for maintenance. The mercury mitigation equipment, catalytic oxidizer/reducer skid and the caustic scrubber may be bypassed automatically if high differential pressure across the unit is detected. The mercury mitigation equipment may be bypassed automatically if there is an indication of a carbon bed fire. In the event of melter pressurization, the butterfly valve in the line from the standby film cooler is interlocked to open to provide an alternate path.

The melter is enclosed in a shielding box that is separately ventilated via the C5 ventilation system. The C5 system ventilates areas known to be contaminated. If the melter pressurizes with respect to the annulus, offgas leaking from the melter plenum to the annulus bypasses treatment steps except for C5 HEPA filtration. The special relief device in the wet process cell can also act as a bypass since venting to

the wet process cell bypasses treatment steps except for C5 HEPA filtration. There are a total of six bypass events as described below.

All bypass events are preceded by, or followed by, the termination of melter feeds. In the case of a manually initiated bypass, the melter feed is terminated, the cold cap dissipated, and emissions allowed to decline to acceptable levels before the bypass is activated. In the event of melter pressurization, special relief device operation, or interlocked bed bypass, the melter feed would terminate and the cold cap would dissipate as a result of the event.

Each bypass is numbered in Figure 1 to correspond with the sections below.

4.1 Submerged Bed Scrubber/Wet Electrostatic Precipitator Maintenance Bypass

This maintenance bypass connects the standby offgas lines for both melters. It would be used if maintenance needs to be performed on a SBS or a WESP. This is an unlikely event because no routine maintenance is planned, and it is anticipated that the SBS and WESP will be inspected and refurbished, if required, during melter changeout. To use this bypass, both melters are idled, the bypass is opened, the butterfly valve in the offgas train that is not to undergo maintenance is opened, and the isolation valve downstream of the WESP on the system to undergo maintenance is closed. No treatment steps are bypassed for offgas from either melter. This bypass is not expected to result in increases in the environmental discharge of dangerous constituents to the environment.

4.2 Mercury Mitigation Equipment Bypass

This bypass is primarily intended to operate if a fire is detected in the mercury mitigation equipment. Detection of a fire (i.e., increase in CO_x concentration) or potential fire initiator (i.e., high inlet temperature) would automatically open the bypass to prevent blocking the offgas flow path and close the inlet valves to reduce oxygen to the fire. Feed to the melters would be interlocked to stop at this point. Additionally, if high differential pressure across the unit indicates plugging, this bypass would be activated to avoid melter pressurization and release of offgas into the C5 area of the building. Again, feed to the melters would be interlocked to stop at this point. The bypass could be used when changing out adsorption media, but this would not be necessary because a valving arrangement is provided to allow using just one of the two beds while the other is undergoing maintenance. The melter is normally idled before the unit undergoes maintenance. The automated bypass event would result in slight increases in the discharge of acid gases and mercury until the dissipation of the cold caps is complete.

4.3 Catalytic Oxidizer/Reducer Skid Bypass

This bypass is intended to operate if high differential pressure across the unit indicates plugging. This bypass would be activated to avoid melter pressurization and release of offgas into the C5 area of the building. Again, feed to the melters would be interlocked to stop at this point. This bypass will also be used to change out catalyst. In preparation for this, the melters would be idled and offgas generation allowed to abate. The bypass might also be used for maintenance on the heat recovery exchanger or the electric heater. The automated bypass event would result in slight increases in the discharge of VOCs and NO_x until the dissipation of the cold caps is complete.

4.4 Caustic Scrubber Bypass

This bypass is intended to operate if high differential pressure across the unit indicates plugging. This bypass would be activated to avoid melter pressurization and release of offgas into the C5 area of the

building. Again, feed to the melters would be interlocked to stop at this point. Use of this bypass is not expected to be routine because this unit has no routine maintenance associated with it that would require bypassing. In the unlikely event that the packing needs to be cleaned or replaced, the bypass will be used after idling the melters. The automated bypass event would result in slight increases in the discharge of acid gases until the dissipation of the cold caps is complete.

4.5 Melter Pressurization

The standby offgas line supplements control of the melter plenum pressure under high offgas surge situations or if there is a blockage in the main offgas line to the submerged bed scrubber. The melter plenum pressure is controlled at a sufficient vacuum set point relative to the melter cave to avoid contamination release to the melter cave, prevent inadvertent glass pour, and prevent damage from occurring to the primary treatment system. This is accomplished by providing an alternate path by way of the standby offgas line for melter offgas. The standby offgas line is identical in size to the primary offgas line and runs for the same length from the melter to the submerged bed scrubber.

The standby line will normally be isolated from the SBS via a valve. At a low vacuum set point, this valve will automatically open, providing an additional or alternative (if the primary is restricted) path for the melter offgas to flow. The standby offgas pipe extends to the bottom of the submerged bed scrubber packed bed, identical to the primary pipe. Thus, during melter surges the cross-sectional area available for offgas flow effectively doubles, decreasing the pressure drop between the melter and the submerged bed scrubber and helping to reestablish normal melter vacuum. In case of a plug or restriction in the primary offgas pipe between the melter and the submerged bed scrubber, the standby line and valve would activate, allowing melter pressure control to be maintained. Once the cause of the standby valve being activated is rectified, the valve would be closed by operator initiation returning all of the melter offgas to the primary offgas film cooler and offgas pipe. An air purge will be used to keep the standby offgas line clean and prevent blocking.

The standby offgas jumper is automatically activated based on the melter plenum vacuum via a pressure controls interlock. Activation of the standby jumper is most likely to occur under melter feeding conditions and during an upset condition (i.e., melter surge). No loss of offgas abatement occurs upon activation of the standby jumper since the offgas is routed to the same destination (i.e., the SBS) as the primary offgas jumper.

In the unlikely event that an offgas surge exceeds the capacity of the melter offgas pressure control system, and the melter pressurizes with respect to the annulus, outleakage from the melter will bypass treatment steps except for the C5 HEPA filters (4.5a on figure 1). These events / surges are smaller than those that would open the special relief device discussed below. Feed to the melter is interlocked to stop before the melter pressurizes. Air and water to the film coolers are also interlocked to stop and the standby line is interlocked to open before melter pressurization occurs. This bypass event will result in melter offgas being discharged with only HEPA filtration during the period the melter is pressurized. This automated bypass event would result in slight increases in the discharge of acid gases, VOCs, NOx and mercury until the dissipation of the cold caps is complete.

4.6 Special Relief Device Operation

An even more unlikely event is one where an offgas surge exceeds the capacity of the melter offgas pressure control system to a pressure higher than the situation described above. In this situation the special relief device would open. If the special relief device on the standby line in the wet process cell opens, vented gas bypasses treatment steps except for C5 HEPA filtration. Note that the special relief

device is intended to limit melter pressurization. Feed to the melter is interlocked to stop before the melter pressurizes. Air and water to the film coolers are also interlocked to stop and the standby line is interlocked to open before melter pressurization occurs. This bypass event will result in melter offgas being discharged with only HEPA filtration during the period the melter is pressurized. The special relief device closes when the line pressure drops below the set point.

4.7 Loss of LAW Facility Power

If power to the LAW facility is lost, the melter could pressurize if the following automatic actions are not completed. Feed to the melter is interlocked to stop on loss of power. Air and water to the film coolers are also interlocked to stop and the standby line is interlocked to open before melter pressurization occurs. This bypass event will result in melter offgas being discharged with only HEPA filtration during the loss of power event until the cold cap is dissipated. Additionally, the mercury mitigation equipment, catalytic oxidizer/reducer skid and caustic scrubber bypasses open to avoid/reduce the release of offgas into the C5 areas of the building. This is a safety requirement to direct NOx gasses out of building to avoid worker exposure. This automated bypass event would result in slight increases in the discharge of acid gases, VOCs, NOx and mercury until the dissipation of the cold caps is complete.

5 Recommendations

Recommendations for preventing the potential for bypass events as well as minimizing their impact and frequency are as follows:

1. Operating procedures: Operating procedures have not been written, but the need to avoid melter pressurization for safety reasons is well documented and there is a large safety focus on the prevention of melter offgas release to occupied areas. The description of procedures will be addressed in accordance with Permit Condition III.10.H.5.c, as appropriate.
2. Maintenance procedures: Maintenance procedures have not been written, but maintenance involving a bypass will not be performed on the offgas system unless the melters are properly idled.
3. Redundant equipment: The HEPA filters have redundant trains. Other treatment systems are not expected to have frequent maintenance and generally have slow and readily detected failure modes. The six pumps in the system each have an installed spare (total of 12 pumps). The exhausters are three 50 % units, two of which are normally in operation and one that is a spare. One exhauster can vent the melters although with a lower capacity to adjust to changes in offgas rates.
4. Redundant instrumentation: Each of the automatic bypasses has redundant instrumentation. Additionally the melter pressurization control has redundant pressure transmitters. The interlock for feed termination is through the safety class Programmable Protection System.
5. Alternate equipment: The offgas system has been extensively analyzed to optimize equipment. Alternatives considered are documented in best available radionuclide control technology, best available control technology, and best available control technology analysis for toxic air pollutants reports. The annulus around the melter provides additional capacity to avoid worker exposure to hot, toxic, corrosive, and radioactive materials.
6. Alternate materials of construction: The materials of construction for offgas equipment were selected based on bounding process conditions. These include exposure to high temperatures, corrosive gases and liquids, and erosion. Materials of construction were selected in a formal process that included

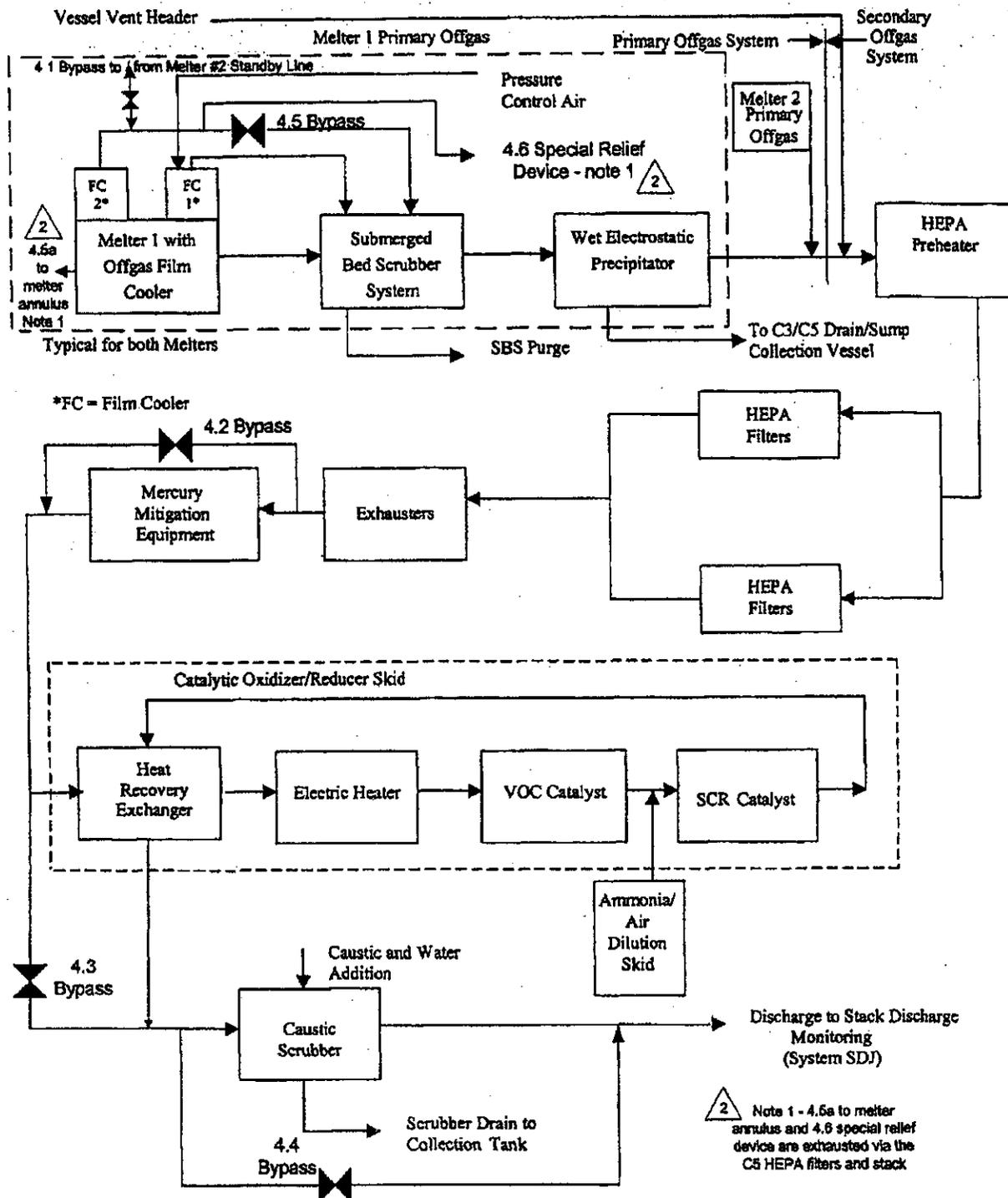
recommendations from material specialists and documentation of the selection of appropriate materials.

6 Conclusion

Bypasses are designed into the offgas system to allow maintenance of equipment without preventing the primary task of venting the melter and controlling melter plenum pressure. The automated bypasses around the mercury mitigation equipment, catalytic oxidizer/reducer skid and caustic scrubber perform an additional safety function of maintaining a flow path to the top of the stack. Three other bypasses can occur as a result of limiting melter pressurization during an upset condition as described in sections 4.5, 4.6 and 4.7.

The primary driver for the offgas system design has been safety, followed by an environmentally compliant discharge. Every effort has been made to avoid bypass events that would challenge either of these goals. All bypass events are either preceded by the termination of melter feed and cold cap dissipation or interlocked to achieve the same result.

Figure 1 Melter Offgas System



Bechtel National, Inc. Certification

The following certification statement is provided consistent with Contract No. DE-AC27-01RV14136, Section H.26, Environmental Permits, paragraph (g) for the submittal of the Hanford Facility Resource Conservation and Recovery Act Permit Modification Notification Form 24590-LAW-PCN-ENV-06-007.

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 assure 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.



W. S. Elkins
Project Director

June 13 2007

Date

Quarter Ending September 30,
2007

24590-LAW-PCN-ENV-06-012

Hanford Facility RCRA Permit Modification Notification Form

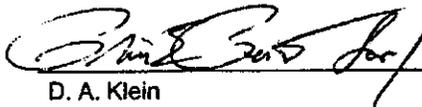
Part III, Operating Unit 10

Waste Treatment and Immobilization Plant

Index

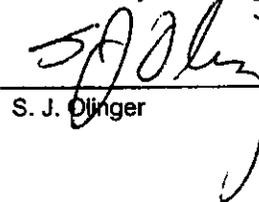
Page 2 of 3: Hanford Facility RCRA Permit, Part III, Operating Unit 10, Waste Treatment and Immobilization Plant
Update the integrity assessment for the LAW Vitrification Building, LFP Melter Feed Prep Vessels (LFP-VSL-00001/3), LFP Melter Feed Vessels (LFP-VSL-00002/4), and their appurtenances, located in cells L-0123/L-0124 respectively, at Elevation 2'-0" of the LAW Vitrification Building in Appendix 9.11 of the Dangerous Waste Permit.

Submitted by Co-Operator:


D. A. Klein

8/7/07
Date

Reviewed by ORP Program Office:


S. J. Olinger

8/22/07
Date

Quarter Ending September 30,
2007

24590-LAW-PCN-ENV-06-012

Hanford Facility RCRA Permit Modification Notification Form					
Unit: Waste Treatment and Immobilization Plant		Permit Part & Chapter: Part III, Operating Unit 10			
<u>Description of Modification:</u>					
The purpose of this modification is to update the Integrity Assessment of the Low Activity Waste (LAW) Melter Feed Process System (LFP) Elevation 2'-0" (24590-101-SC-HXYG-0074-03-00002, REV. 00A) currently located in Appendix 9.11 of the Dangerous Waste Permit (DWP).					
Appendix 9.11					
Replace:	24590-CM-HC4-HXYG-0074-03-00002, Rev 00A	With:	CCN: 139507, AREVA-IA-100, Rev.0; Low-Activity Waste (LAW) Melter Feed Process (LFP) System; Melter Feed Prep Vessels (LFP-VSL-00001/3) and Melter Feed Vessels (LFP-VSL-00002/4)		
This modification requests Ecology approval and incorporation into the permit the above mentioned integrity assessment report. The report has been updated by the Independent Qualified Registered Professional Engineer (IQRPE). The report reflects the IQRPE's review of the following final design documents:					
<ul style="list-style-type: none"> • Mechanical Data Sheets, Facility, Vendor Fabrication Drawings, Specifications, Drawings, and Mechanical Data Sheets produced in accordance with References: <ul style="list-style-type: none"> ○ ASME Boiler and Pressure Vessel Code (BPV), Section VIII, Division 1, Rules for Construction of Pressure Vessels, American Society of Mechanical Engineers ○ UBC 1997, Uniform Building Code, International Conference of Building Officials ○ AISC Manual of Steel Construction, Allowable Stress Design, American Institute of Steel Construction • 24590-CM-POA-MVA0-00002-02-03, Rev. 00F, Design Calculations for LFP-VSL-00001 and LFP-VSL-00003 • 24590-CM-POA-MVA0-00002-02-01, Rev. 00E, Design Calculations for LFP-VSL-00002 and LFP-VSL-00004. 					
For each item of "Information Assessed" in the integrity assessment report, the items listed under the "Source of Information" column were reviewed and found to furnish adequate design controls and requirements to ensure the design fully satisfies the requirements of Washington Administrative Code, WAC-173-303-640, "Tank Systems," <i>Dangerous Waste Regulations</i> .					
WAC 173-303-830 Modification Class: ^{1 2}		Class 1	Class ¹ 1	Class 2	Class 3
Please mark the Modification Class:			X		

¹ Class 1 modifications requiring prior Agency approval.² If the proposed modification does not match any modification listed in WAC 173-303-830 Appendix 1, then the proposed modification should automatically be given a Class 3 status. This status may be maintained by the Department of Ecology, or down graded to a Class '1, if applicable.

Quarter Ending September 30,
2007

24590-LAW-PCN-ENV-06-012

Enter Relevant WAC 173-303-830, Appendix I Modification citation number: N/A	
Enter wording of WAC 173-303-830, Appendix I Modification citation: In accordance with WAC 173-303-830(4)(d)(i), this modification notification is requested to be reviewed and approved as a Class 1 modification. WAC 173-303-830(4)(d)(ii)(A) states, "Class 1 modifications apply to minor changes that keep the permit current with routine changes to facility or its operation. These changes do not substantially alter the permit conditions or reduce the capacity of the facility to protect human health or the environment. In the case of Class 1 modifications, the director may require prior approval."	
Modification Approved: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No (state reason for denial)	Reviewed by Ecology:
<u>Reason for denial:</u>	 9/11/07
	B. Becker-Khaeel Date



AREVA

**APP-WTP
RECEIVED**

AUG 01 2007

139507

BY PDC

AREVA-07-074

Ms. Anne Weldon
Subcontracts
Bechtel National, Inc.
2435 Stevens Center Place
Richland, Washington 99354

July 31, 2007

Dear Ms. Weldon:

BECHTEL NATIONAL, INC. CONTRACT NO. 24590-CM-HC4-HXYG-00211 - STRUCTURAL INTEGRITY ASSESSMENT OF THE LOW ACTIVITY WASTE (LAW) MELTER FEED PROCESS (LFP) SYSTEM MELTER FEED PREP VESSELS (LFP-VSL-00001/3) AND MELTER FEED VESSELS (LFP-VSL-00002/4) (AREVA-IA-100, REV. 0)

The integrity assessment has been completed per the contract requirements and is enclosed for your use. The assessment found that the design is sufficient to ensure that the vessels are adequately designed and will have sufficient structural strength, compatibility with the waste(s) to be processed/stored/treated, and corrosion protection to ensure that they will not collapse, rupture, or fail.

If you have any questions, please feel free to contact Ruben Mendoza at (509) 372-2684.

Sincerely,

M. D. Rickenbach, Director
Engineering & Services
AREVA NC Inc.
Richland

llm

Enclosure

cc: D. C. Pfluger MS 5-L w/enclosure (2)

AREVA NC INC.

**STRUCTURAL INTEGRITY ASSESSMENT
FOR
LOW ACTIVITY WASTE (LAW) MELTER FEED PROCESS (LFP) SYSTEM MELTER
FEED PREP VESSELS (LFP-VSL-00001/3) AND
MELTER FEED VESSELS (LFP-VSL-00002/4)**

Please note that source, special nuclear and byproduct materials, as defined in the Atomic Energy Act of 1954 (AEA), are regulated at the U.S. Department of Energy (DOE) facilities exclusively by DOE acting pursuant to its AEA authority. DOE asserts, that pursuant to the AEA, it has sole and exclusive responsibility and authority to regulate source, special nuclear, and byproduct materials at DOE-owned nuclear facilities. Information contained herein on radionuclides is provided for process description purposes only.

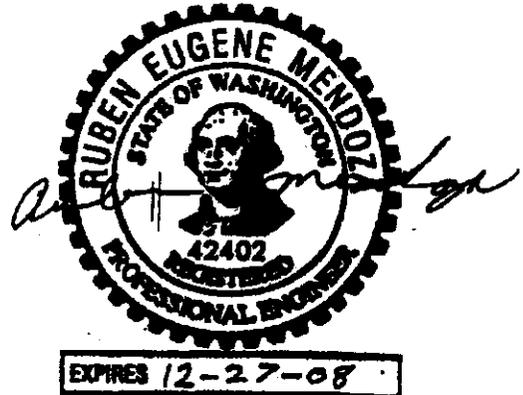
**IQRPE REVIEW
FOR
LOW ACTIVITY WASTE (LAW) MELTER FEED PROCESS (LFP) SYSTEM MELTER
FEED PREP VESSELS (LFP-VSL-00001/3) AND
MELTER FEED VESSELS (LFP-VSL-00002/4)**

"I, Ruben E. Mendoza, have reviewed, and certified a portion of the design of a new tank system or component located at the Hanford Waste Treatment Plant, owned/operated by Department of Energy, Office of River Protection, Richland, Washington. My duties were independent review of the current design for the Low-Activity Waste (LAW) Facility Melter Feed Process (LFP) System Melter Feed Prep Vessels (LFP-VSL-00001/3) and Melter Feed Vessels (LFP-VSL-00002/4) as required by the Washington Administrative Code, *Dangerous Waste Regulations*, Section WAC-173-303-640(3) (a) through (g) applicable components."

"I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, 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."

The documentation reviewed indicates that the design fully satisfies the requirements of the WAC.

The attached review is nine (9) pages numbered one (1) through nine (9).



Ruben Mendoza
Signature

7-31-07
Date

**Low-Activity Waste (LAW) Melter Feed Process (LFP) System
Melter Feed Prep Vessels (LFP-VSL-00001/3) and Melter Feed Vessels (LFP-VSL-00002/4)**

AREVA-IA-100, Rev.0

Scope	Scope of this Integrity Assessment	<p>This integrity assessment includes the following LFP system vessels and their appurtenances, located in cells L-0123/L-0124 respectively, at Elevation 2'-0" in the LAW Vitrification Building:</p> <ol style="list-style-type: none"> 1. Two LFP Melter Feed Prep Vessels (LFP-VSL-00001/3), 2. Two LFP Melter Feed Vessels (LFP-VSL-00002/4).
References	Material Requisition, Specifications, and System Description	<p><u>Material Requisition (MR):</u> 24590-CM-MRA-MVA0-00002, Rev. 2 (including Supplement Nos. S0013, S0014, and S0015 to Rev. 2), Pressure Vessels, Stainless Steel, Shop Fabricated, Medium (N026)(MS005).</p> <p><u>Specifications:</u> The following Specifications with their respective revision and Specification Change Notices (SCNs) are listed in the above listed Material Requisition:</p> <p>24590-WTP-3PS-MV00-T0001, Engineering Specification for Pressure Vessel Design and Fabrication; 24590-WTP-3PS-MVB2-T0001, Engineering Specification for Welding of Pressure Vessels, Heat Exchangers and Boilers; 24590-WTP-3PS-G000-T0001, General Specification for Supplier Quality Assurance Program Requirements; 24590-WTP-3PS-G000-T0002, Engineering Specification for Positive Material Identification (PMI); 24590-WTP-3PS-G000-T0003, Engineering Specification for Packaging, Handling, and Storage Requirements; 24590-WTP-3PS-MV00-T0002, Engineering Specification for Seismic Qualification Criteria for Pressure Vessels; 24590-WTP-3PS-MV00-T0003, Engineering Specification for Pressure Vessel Fatigue analysis; 24590-WTP-3PS-FB01-T0001, Engineering Specification for Structural Design Loads for Seismic Category III and IV Equipment and Tanks.</p> <p><u>System Description:</u> 24590-LAW-3YD-LFP-00001, Rev. 1, System Description for LAW Melter Feed Process (LFP) System.</p>
Summary of Assessment		<p>For each item of "Information Assessed" (i.e., Criteria) on the following pages, the items listed under "Source of Information" were reviewed and found to furnish adequate design controls and requirements to ensure the design fully satisfies the requirements of Washington Administrative Code, WAC-173-303-640, <i>Dangerous Waste Regulations</i>.</p>

References (cont'd)	Mechanical Data Sheets, Facility and Vendor Fabrication Drawings	<p><u>Mechanical Data Sheets:</u></p> <p>24590-LAW-MVD-LFP-00010, Rev. 3, Melter 1 Feed Prep Vessel (LFP-VSL-00001); 24590-LAW-MVD-LFP-00011, Rev. 3, Melter 2 Feed Prep Vessel (LFP-VSL-00003); 24590-LAW-MVD-LFP-00007, Rev. 3 Melter 1 Feed Vessel (LFP-VSL-00002); 24590-LAW-MVD-LFP-00008, Rev. 3 Melter 2 Feed Vessel (LFP-VSL-00004).</p> <p><u>Facility Drawings:</u></p> <p>24590-LAW-P1-P01T-00001, Rev. 2, LAW Vitrification Building General Arrangement Plan at El (-)21'-0"; 24590-LAW-P1-P01T-00002, Rev. 5, LAW Vitrification Building General Arrangement Plan at El. 3'-0"; 24590-LAW-M5-V17T-00001, Rev. 5, Process Flow Diagram LAW Concentrate Receipt & Melter 1 Feed (System LCP, GFR, and LFP); 24590-LAW-M5-V17T-00002, Rev. 5, Process Flow Diagram LAW Concentrate Receipt & Melter 2 Feed (System LCP, GFR, and LFP); 24590-LAW-M6-LFP-00001, Rev. 4, P & ID-LAW Melter Feed Process System Melter 1 Feed Preparation and Feed; 24590-LAW-M6-LFP-00003, Rev. 4, P & ID-LAW Melter Feed Process System Melter 2 Feed Preparation and Feed.</p> <p><u>Vendor Fabrication Drawings (* Bechtel Code 1, 2, or 4 Drawings):</u></p> <p>24590-CM-POA-MVA0-00002-03-22, Rev. 00F, General Arrangement Vessel LFP-VSL-00001 - Melter 1 Feed Prep VSL; 24590-CM-POA-MVA0-00002-03-23, Rev. 00G, Plan View Vessel LFP-VSL-00001 - Melter 1 Feed Prep VSL; 24590-CM-POA-MVA0-00002-03-04, Rev. 00F, General Arrangement Vessel LFP-VSL-00002 - Melter 1 Feed Vessel; 24590-CM-POA-MVA0-00002-03-01, Rev. 00I, Plan View Vessel LFP-VSL-00002 - Melter 1 Feed Vessel; 24590-CM-POA-MVA0-00002-03-11, Rev. 00F, General Arrangement Vessel LFP-VSL-00003 - Melter 2 Feed Prep VSL; 24590-CM-POA-MVA0-00002-03-12, Rev. 00G, Plan View Vessel LFP-VSL-00003 Melter 2 Feed Prep VSL; 24590-CM-POA-MVA0-00002-03-42, Rev. 00E, General Arrangement Vessel LFP-VSL-00004 - Melter 2 Feed Vessel; 24590-CM-POA-MVA0-00002-03-43, Rev. 00H, Plan View Vessel LFP-VSL-00004 Melter 2 Feed Vessel.</p> <p>* Bechtel Code 1 Drawing is an "as fabricated vendor drawing" approved/accepted by Bechtel. Bechtel Code 2 Drawing is an "as fabricated vendor drawing" approved (with comments)/accepted by Bechtel. Bechtel Code 4 Drawing is an "as fabricated vendor drawing" approved/accepted by Bechtel without review.</p>
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**Low-Activity Waste (LAW) Melter Feed Process (LFP) System
Melter Feed Prep Vessels (LFP-VSL-00001/3) and Melter Feed Vessels (LFP-VSL-00002/4)**

AREVA-IA-100, Rev.0

	Information Assessed	Source of Information	Assessment
Design	Vessel design standards are appropriate and adequate for the vessel's intended use.	<p>Specifications, Drawings, Mechanical Data Sheets, listed above under References;</p> <p>ASME Boiler and Pressure Vessel Code (BPV), Section VIII, Division 1, Rules for Construction of Pressure Vessels, American Society of Mechanical Engineers;</p> <p>UBC 1997, Uniform Building Code, International Conference of Building Officials;</p> <p>AISC Manual of Steel Construction, Allowable Stress Design, American Institute of Steel Construction.</p>	<p>The LAW Melter Feed Process (LFP) system includes two melter feed prep vessels (MFPV) [LFP-VSL-00001/3] and two melter feed vessels (MFV) [LFP-VSL-00002/4]. LAW concentrate will be transferred from the concentrate receipt vessels to the MFPVs where glass formers are added and mixed. The resulting batch of melter feed will be transferred from the MFPV to a MFV, then to a melter. The LFP vessels, LFP-VSL-00001/2/3/4 are identical vertical vessels. The drawings show that each vessel has a 132 in. ID and a height of 126 in. from bottom tangent line to top tangent line. The vessel's top and bottom Flanged & Dished (torispherical) heads are built with 1" thick plate (top head) and 3/4" thick plate (bottom head). The shell is made of 3/4" thick plate. Each vessel is supported on a cylindrical skirt (1/2" thick by approx. 2'-6" high) which is supported on a base plate anchored to the concrete floor at Elev. 2'-0". The vessels have internal equipment such as an agitator, pumps, and spray nozzles that are supported from the vessel's top. Material for the shell, top, and bottom heads is SA-240 316 stainless steel (with max. 0.030% carbon content, dual certified) and is hereafter referred to as 316 SS. The supporting skirt is specified as SA-240 304 stainless steel and is hereafter referred to as 304 SS. The total internal volume is to be approximately 9,120 gallons with an operating volume of approximately 7,690 gallons. The Mechanical Data Sheets identify the LFP components as seismic category SC-III and a quality level of Commercial Material. The LFP system vessels are designed to the ASME Section VIII, Division 1 rules (with UBC-97 implemented for seismic loads on the vessels) and the vessel supports are designed to ASME Section VIII, Division 1 and the AISC manual. Supplementary requirements are identified in the Engineering Specifications and include positive material identification, seismic load requirements, welding requirements, fabrication tolerances, NDE inspections and records, quality assurance requirements, and packaging, handling and storage requirements. These are appropriate and adequate design codes and standards for pressure vessels operating over the pressure and temperature ranges specified for these vessels.</p>

**Low-Activity Waste (LAW) Melter Feed Process (LFP) System
Melter Feed Prep Vessels (LFP-VSL-00001/3) and Melter Feed Vessels (LFP-VSL-00002/4)**

AREVA-IA-100, Rev.0

Information Assessed		Source of Information	Assessment
Design (cont'd)	If a non-standard vessel is to be used, the design calculations demonstrate sound engineering principles of construction.	<p>Mechanical Data Sheets, Material Requisition, and Drawings listed above under References;</p> <p>ASME Boiler and Pressure Vessel Code (BPV), Section VIII, Division 1, Rules for Construction of Pressure Vessels, American Society of Mechanical Engineers;</p> <p>24590-CM-POA-MVA0-00002-02-03, Rev. 00F, Design Calculations for LFP-VSL-00001 and LFP-VSL-00003;</p> <p>24590-CM-POA-MVA0-00002-02-01, Rev. 00E, Design Calculations for LFP-VSL-00002 and LFP-VSL-00004.</p>	<p>The LFP system vessels, LFP-VSL-00001/2/3/4 are standard ASME Section VIII vessels. The Mechanical Data Sheets require that the ASME Section VIII, Division 1 vessels be delivered after design, fabrication, inspection and testing with an ASME code stamp and that the vessels be nationally registered. Review of the Design Calculations and fabrication drawings show that the vessels have been designed as standard vessels per applicable requirements of the ASME Section VIII, Div. 1 code and additional requirements documents listed in the Material Requisition for the vessels demonstrating that sound engineering principles of construction and fabrication have been implemented for the vessels.</p>

**Low-Activity Waste (LAW) Melter Feed Process (LFP) System
Melter Feed Prep Vessels (LFP-VSL-00001/3) and Melter Feed Vessels (LFP-VSL-00002/4)**

AREVA-IA-100, Rev.0

Information Assessed	Source of Information	Assessment
<p>Design (cont'd)</p> <p>Vessel has adequate strength, after consideration of the corrosion allowance, to withstand the operating pressure, operating temperature, and seismic loads.</p>	<p>Specifications, Material Requisition, Drawings, and Mechanical Data Sheets listed above under References;</p> <p>ASME Boiler and Pressure Vessel Code (BPV), Section VIII, Division 1, Rules for Construction of Pressure Vessels, American Society of Mechanical Engineers;</p> <p>ASME Boiler and Pressure Vessel Code (BPV), Section VIII, Division 2, Rules for Construction of Pressure Vessels – Alternative Rules, American Society of Mechanical Engineers;</p> <p>UBC 1997, Uniform Building Code, International Conference of Building Officials;</p> <p>24590-CM-POA-MVA0-00002-02-03, Rev. 00F, Design Calculations for LFP-VSL-00001 and LFP-VSL-00003;</p> <p>24590-CM-POA-MVA0-00002-02-01, Rev. 00E, Design Calculations for LFP-VSL-00002 and LFP-VSL-00004.</p>	<p>The Mechanical Data Sheets identify the vessel operating pressure and temperature ranges, the materials selected for the vessels, the corrosion/erosion allowances, the vessels' quality level and seismic category, and design requirements. The design specification for the vessels and ASME Section VIII, Div. 1 requires specific consideration of the operating pressures and temperatures and seismic loads in the design process and also requires that the corrosion/erosion allowance thickness be excluded from nominal vessel thickness when evaluating the adequacy of vessel components for these loads through the end of life. The Engineering Specification for Seismic Qualification Criteria for Pressure Vessels adopts ASME Section VIII, Div. 1 as the governing design code to address seismic design and analysis of the vessels with acceptance criteria in accordance with ASME Section VIII, Div. 2. Detailed requirements for seismic load determination are furnished in the Specification for Structural Design Loads for Seismic Category III & IV Equipment and Tanks. This specification specifies that the UBC 1997 code be used for seismic load determination for SC-III components. Design Calculations were reviewed and found to appropriately incorporate requirements of ASME Section VIII, Div.1/Div.2 and the design specifications. Calculations use the correct vessel material properties and include multiple configurations and load combinations for the vessels including maximum vessel temperatures and pressures, empty/full vessel, new/corroded walls, and seismic loads. The calculations correctly incorporate the materials, dimensions, corrosion allowances, and configurations identified in the engineering design requirements documents. Calculation results show that the vessels, nozzles, and welds have adequate strength after the appropriate consideration of corrosion/erosion allowance to withstand the applicable loads. Additionally, approval and acceptance of the vendor calculations and fabrication drawings by Bechtel National Inc. (BNI) is an added assurance that all applicable requirements pertaining to the design of the vessels have been met.</p>

	Information Assessed	Source of Information	Assessment
Foundation	Vessel foundation will maintain the load of a full vessel.	<p>Specifications and drawings listed above under References;</p> <p>ASME Boiler and Pressure Vessel Code (BPV), Section VIII, Division 1, Rules for Construction of Pressure Vessels, American Society of Mechanical Engineers;</p> <p>AISC Manual of Steel Construction, Allowable Stress Design, American Institute of Steel Construction; 24590-WTP-DB-ENG-01-001, Rev. 1I, Basis of Design;</p> <p>24590-CM-POA-MVA0-00002-02-03, Rev. 00F, Design Calculations for LFP-VSL-00001 and LFP-VSL-00003;</p> <p>24590-CM-POA-MVA0-00002-02-01, Rev. 00E, Design Calculations for LFP-VSL-00002 and LFP-VSL-00004.</p>	<p>The Engineering Specification for Pressure Vessel Design and Fabrication requires the use of ASME Section VIII, Division 1 and the AISC manual for design of the vessel supports. These codes ensure an adequate design for the vessel supports. Design Calculations include the vessel skirt, base plate, and anchor bolts. These calculations were reviewed and found to appropriately evaluate the support system of the vessels incorporating the requirements of ASME Section VIII, Div.1 and the design specification documents including vessel support materials, fluid specific gravity, new/corroded vessel weights and seismic loading. The calculations correctly incorporate the dimensions and configurations identified in the vessel fabrication drawings. Calculation results show acceptable stresses on the tank supports. The Basis of Design document requires that the foundation underlying the vessel support must be adequate to support the loads from the full vessel however the adequacy of the underlying foundation is not part of this integrity assessment. The foundation adequacy is part of a separate integrity assessment report for the Secondary Containment of the LFP vessels.</p>
	If in an area subject to flooding, the vessel is anchored.	Specifications and Mechanical Data Sheets listed above under References.	<p>The Specification of Pressure Vessel Design and Fabrication requires supports and anchors to secure the buoyant vessel in case the vessel is empty and submerged to the level indicated in the Mechanical Data Sheets. The Mechanical Data Sheets for these vessels do not indicate any such conditions; therefore, the flooding consideration does not apply.</p>
	Vessel system will withstand the effects of frost heave.	24590-WTP-DB-ENG-01-001, Rev. 1I, Basis of Design.	<p>The Basis of Design document requires that all structural foundations extend a distance below grade that exceeds the 30" depth of the frost line. The vessels are located inside/interior of the building at above grade (Elevation 2'-0" level) and the building's lower level floor is at Elevation (-)21'-0", therefore, the vessel system is not subject to frost heave.</p>

**Low-Activity Waste (LAW) Melter Feed Process (LFP) System
Melter Feed Prep Vessels (LFP-VSL-00001/3) and Melter Feed Vessels (LFP-VSL-00002/4)**

AREVA-IA-100, Rev.0

	Information Assessed	Source of Information	Assessment
Waste Characteristics	<p>Characteristics of the waste to be stored or treated have been identified (ignitable, reactive, toxic, specific gravity, vapor pressure, flash point, storage temperature)</p>	<p>Mechanical Data Sheets listed above under References; 24590-LAW-N1D-LFP-00004, Rev. 2, Corrosion Evaluation LFP-VSL-00001/3 Melter 1 & 2 Feed Preparation Vessels; 24590-LAW-N1D-LFP-00006, Rev. 0, Corrosion Evaluation LFP-VSL-00002/4 Melter 1 & 2 Feed Vessels; 24590-WTP-PER-PR-03-001, Rev. 1, Prevention of Hydrogen Accumulation in WTP Tank Systems and Miscellaneous Treatment Unit Systems; 24590-WTP-PER-PR-03-002, Rev. 2, Toxic Vapors and Emissions from WTP Tank Systems and Miscellaneous Treatment Unit Systems.</p>	<p>The Mechanical Data Sheets identify the waste process conditions and design parameters of the vessels including the waste specific gravity, storage temperatures and pressures. The Corrosion Evaluation documents address the pH range and chemical composition of the waste to select appropriate vessel materials and specify the corrosion/erosion allowances. Waste characteristics that are hazardous, such as ignitability, reactivity and toxicity are appropriately addressed in the Toxic Vapors and Emissions document and Prevention of Hydrogen Accumulation document. These two documents do not specifically list these vessels to exhibit any hazardous characteristics.</p>
	<p>Vessel is designed to store or treat the wastes with the characteristics defined above and any treatment reagents.</p>	<p>System Description listed above under References; 24590-LAW-N1D-LFP-00004, Rev. 2, Corrosion Evaluation LFP-VSL-00001/3 Melter 1 & 2 Feed Preparation Vessels; 24590-LAW-N1D-LFP-00006, Rev. 0, Corrosion Evaluation LFP-VSL-00002/4 Melter 1 & 2 Feed Vessels.</p>	<p>The Corrosion Evaluations demonstrate that the vessels are designed to process the wastes as discussed above. The System Description discusses normal and abnormal operations for the LFP vessels. Compatible fluid (demineralized water) will be used for flushing/rinsing or wash downs of the vessels. The 316 SS material selected for the vessels is appropriate for the waste to be stored and the rinsing fluid.</p>
	<p>The waste types are compatible with each other.</p>	<p>System Description listed above under References.</p>	<p>The System Description for the LAW Melter Feed Process (LFP) does not describe any operations where incompatible wastes are mixed in these vessels for processing. The LFP vessels function primarily to receive LAW concentrate waste from the concentrate receipt vessels to mix with glass formers prior to transfer to the melters. No other wastes are used in these vessels.</p>

**Low-Activity Waste (LAW) Melter Feed Process (LFP) System
Melter Feed Prep Vessels (LFP-VSL-00001/3) and Melter Feed Vessels (LFP-VSL-00002/4)**

AREVA-IA-100, Rev.0

Information Assessed		Source of Information	Assessment
Corrosion Protection	Vessel material and protective coatings ensure the vessel structure is adequately protected from the corrosive effects of the waste stream and external environments (expected to not leak or fail for the design life of the system)	<p>Drawings and Mechanical Data Sheets listed above under References;</p> <p>24590-LAW-N1D-LFP-00004, Rev. 2, Corrosion Evaluation LFP-VSL-00001/3 Melter 1 & 2 Feed Preparation Vessels; 24590-LAW-N1D-LFP-00006, Rev. 0, Corrosion Evaluation LFP-VSL-00002/4 Melter 1 & 2 Feed Vessels.</p>	<p>The Corrosion Evaluations and Mechanical Data Sheets show that the LFP Melter Feed Prep vessels (LFP-VSL-00001/3) and Feed Vessels (LFP-VSL-00002/4) normally operate at a pH of 13.9 to 14.7 with an operating temperature of 98 °F and an operating pressure of 0.07 psig. The vessels are designed for a maximum temperature of 150°F and a maximum pressure of 15 psig. The material selection corrosion considerations include the effects of general corrosion, pitting corrosion, stress corrosion cracking, galvanic corrosion, and erosion. The material selected for the vessels is 316 SS with a corrosion/erosion allowance of 0.04 in. for the upper head and 0.125 in. for the bottom head and shell which is adequate and appropriate for the waste to be stored. The material for the vessel support is 304 SS. The drawings show that the LFP vessels are located in LAW cells L-0123 and L-0124 at Elevation 2'-0". These cells are equipped with a sump to pump out any leaked fluid. Therefore, the cells should remain dry during normal operations which will limit external corrosion of the vessels and their supports over the facility design life of 40 years.</p>
Corrosion Allowance	Corrosion allowance is adequate for the intended service life of the vessel.	<p>Mechanical Data Sheets listed above under References;</p> <p>24590-LAW-N1D-LFP-00004, Rev. 2, Corrosion Evaluation LFP-VSL-00001/3 Melter 1 & 2 Feed Preparation Vessels; 24590-LAW-N1D-LFP-00006, Rev. 0, Corrosion Evaluation LFP-VSL-00002/4 Melter 1 & 2 Feed Vessels; 24590-CM-POA-MVA0-00002-02-03, Rev. 00F, Design Calculations for LFP-VSL-00001 and LFP-VSL-00003; 24590-CM-POA-MVA0-00002-02-01, Rev. 00E, Design Calculations for LFP-VSL-00002 and LFP-VSL-00004.</p>	<p>The bases for the LFP vessel's material selection and corrosion allowance are furnished in the Corrosion Evaluations. Selection of 316 SS material with a corrosion/erosion allowance of 0.04 in. for the upper head and 0.125 in. for the bottom head and shell for a service life of 40 years is adequate and appropriate. The material selections and corrosion/erosion allowances are correctly carried forward to the Mechanical Data Sheets and are used in the vessel Design Calculations consistently and correctly. A corrosion allowance for the supports is not identified but as mentioned above, the cells should remain dry preventing corrosion of the supports. Therefore, the 304 SS vessel supports are adequate for this application.</p>

Information Assessed		Source of Information	Assessment
Pressure Relief	Pressure controls (vents and relief valves) are adequately designed to ensure pressure relief if normal operating pressures in the vessel are exceeded.	Drawings and System Description listed above under References.	The drawings and System Description document show and/or describe that the LFP Vessels, LFP-VSL-00001/2/3/4 are designed with an unrestricted overflow through a 4" diameter line. The MFVs and MFPVs overflow to a common overflow header to the C3/C5 Drains/Sump Collection Vessel (RLD-VSL-00004) located at Elevation (-) 21'-0". A high-high tank level alarm and trip is designed to prevent the contents from reaching the overflow. The vessels are also connected to the LAW vessel vent system which includes backup power if power is lost during normal operations and a backup fan if one of the two ventilation fans fails. A high pressure alarm will alert operations if the headspace pressure is approaching the surrounding process cell pressure. All above listed features will prevent the over pressurization of the LFP vessels.



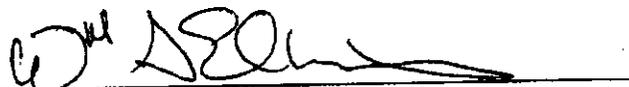
Master Distribution Schedule for WTP Project Subcontract Management Group

SUBMITTAL TRANSMITTAL: <input type="checkbox"/> First Submittal <input type="checkbox"/> Re-Submittal <input type="checkbox"/> QVRP Package <input type="checkbox"/> No Review Required <input type="checkbox"/> No Review Required Re-Submittal <input type="checkbox"/> Submittal Supplement							
CORRESPONDENCE: <input checked="" type="checkbox"/> With Attachment <input type="checkbox"/> W/O Attachment (letter only) <input type="checkbox"/> Fax as Original (Letter Only) <input type="checkbox"/> Fax as Original (With Attachment)							
<input type="checkbox"/> Pre-Award/Award Package				<input type="checkbox"/> Executed Change Order Package			
<input type="checkbox"/> Executed Amendment Package				<input type="checkbox"/> Back Charge			
Subcontract Number:		24590-CM-HC4-HXYG-00211					
Subcontract Title:		Tank Integrity Design Assessments by IQRPE					
Subcontractor Name:		AREVA NC, Inc.					
Subcontract Administrator:		Jean Renner					
PDC Document Number			Rev	Document Title			Rev
139507			0	AREVA-07-074 transmitting AREVA-IA-100, Rev. 0 "Structural Integrity Assessment for LAW Melter Feed Process System Melter Feed Prep Vessels (LFP-VSL-00001/3) and Melter Feed Vessels (LFP-VSL-00002/4)			0
INCOMING DISTRIBUTION							
Name	MSIN/ E-mail	Original	Copy	Copy of cover sheet / transmittal only	Primary File Index	Alternate File Index	Assigned Action or Remarks
PDC	MS9-A	X		B.8			
Dan Pfluger	MS5-I		x				
			x				
OUTGOING DISTRIBUTION FOR RETURNED STATUSED STICKER SUBMITTALS							
Name	MSIN/ E-mail	Original	Copy	Copy of cover sheet / transmittal only	Primary File Index	File Index Alternate	Assigned Action or Remarks
PDC	MS9-A	X					

Bechtel National, Inc. Certification

The following certification statement is provided consistent with Contract No. DE-AC27-01RV14136, Section H.26, Environmental Permits, paragraph (g) for the submittal of the Hanford Facility Resource Conservation and Recovery Act Permit Modification Notification Form 24590-LAW-PCN-ENV-06-012.

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 assure 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.



W. S. Elkins
Project Director

9 AUG 2007

Date

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Quarter Ending September 30,
2007

24590-LAW-PCN-ENV-07-005

Hanford Facility RCRA Permit Modification Notification Form
Part III, Operating Unit 10
Waste Treatment and Immobilization Plant

Index

Page 2 of 2: Hanford Facility RCRA Permit, Operating Unit 10, Waste Treatment and Immobilization Plant
Update LAW Vitrification Building Process Flow Diagram - LAW Vitrification Ammonia and Secondary Offgas
System (24590-LAW-M5-V17T-P0010) in Appendix 9.1 of the Dangerous Waste Permit

Submitted by Co-Operator:

D. A. Klein
D. A. Klein

7/31/07
Date

Reviewed by ORP Program Office:

S. J. Olinger
S. J. Olinger

8/22/07
Date

Quarter Ending September 30,
2007

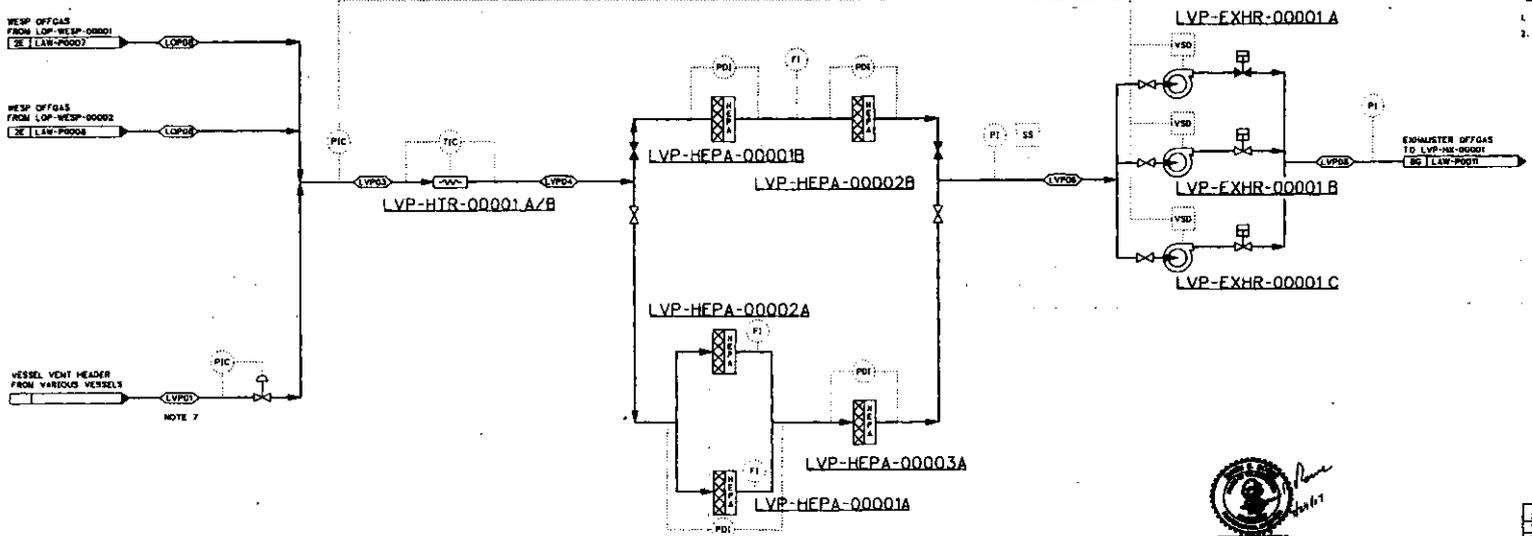
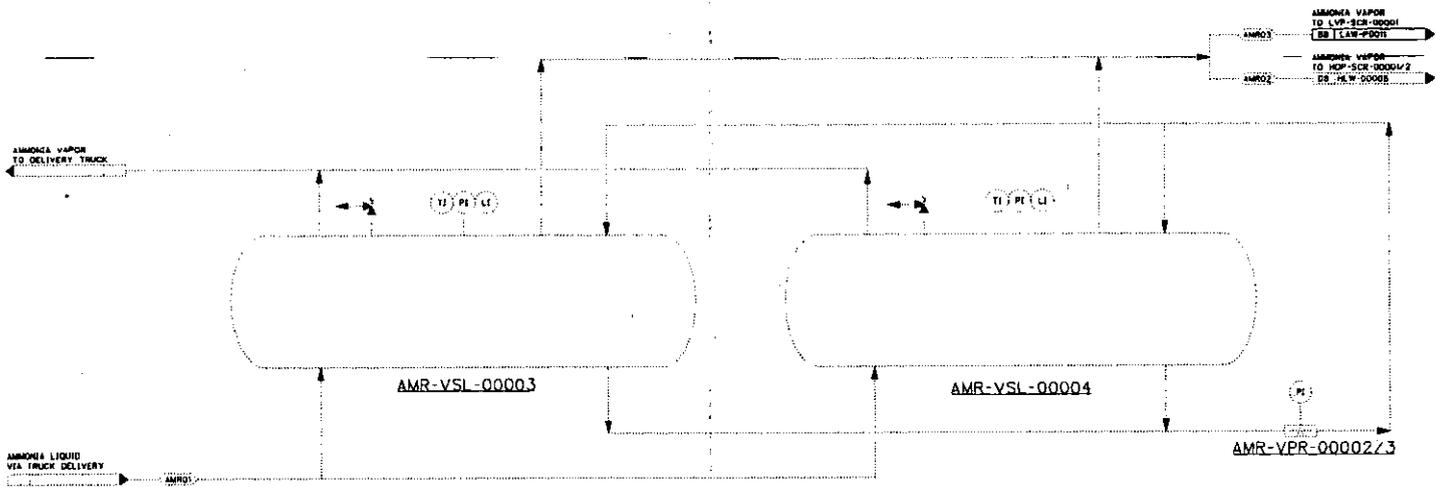
24590-LAW-PCN-ENV-07-005

Hanford Facility RCRA Permit Modification Notification Form														
Unit: Waste Treatment and Immobilization Plant	Permit Part & Chapter: Part III, Operating Unit 10													
<u>Description of Modification:</u>														
The purpose of this Class 1 modification is to update the Process Flow (PFD) for the LAW Ammonia and Secondary Offgas System (24590-LAW-M5-V17T-P0010). The following permit PFD is being submitted to replace the PFD currently in Appendix 9.1.														
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td colspan="5" style="padding: 2px;">Appendix 9.1</td> </tr> <tr> <td style="width: 15%; padding: 2px;">Replace:</td> <td style="width: 35%; padding: 2px;">24590-LAW-M5-V17T-P0010, Rev. 0</td> <td style="width: 15%; padding: 2px;">With:</td> <td colspan="2" style="width: 35%; padding: 2px;">24590-LAW-M5-V17T-P0010, Rev. 2</td> </tr> </table>					Appendix 9.1					Replace:	24590-LAW-M5-V17T-P0010, Rev. 0	With:	24590-LAW-M5-V17T-P0010, Rev. 2	
Appendix 9.1														
Replace:	24590-LAW-M5-V17T-P0010, Rev. 0	With:	24590-LAW-M5-V17T-P0010, Rev. 2											
The referenced PFD is a complete revisions. It incorporates changes provided in applicable document change forms (e.g., DCN, SCN, SDDR, FCN, FCR, etc.) and changes associated with the resolution to comments on change documents since the issuance of the last revision of the permitted drawing. This modification requests Ecology approval and incorporation into the permit, the specific changes to these P&IDs that are indicated by note 14, clouds, and revision triangles. Revisions are the result of ongoing design changes. The following identifies the significant types of changes on the attached drawings.														
<ul style="list-style-type: none"> • Revised numbering and nomenclature for Ammonia Product Storage Vessels (AMR) throughout the drawing • Corrected document number for "Process Flow Diagram Legend and Symbols" in the References section. • Added flow indicators to the HEPA configuration. • Revised numbering of LAW Secondary Offgas Vessel Vent Process System (LVP) HEPA filters. • Revised offsheet connector labels • Revised ammonia vaporization heater plant item numbers 														
The following is a list of outstanding change documents that have not been incorporated into this modification: None														
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width: 45%; padding: 2px;">WAC 173-303-830 Modification Class: ^{1,2}</td> <td style="width: 10%; padding: 2px;">Class 1</td> <td style="width: 10%; padding: 2px;">Class '1</td> <td style="width: 10%; padding: 2px;">Class 2</td> <td style="width: 15%; padding: 2px;">Class 3</td> </tr> <tr> <td style="padding: 2px;">Please mark the Modification Class:</td> <td style="text-align: center; padding: 2px;">x</td> <td></td> <td></td> <td></td> </tr> </table>					WAC 173-303-830 Modification Class: ^{1,2}	Class 1	Class '1	Class 2	Class 3	Please mark the Modification Class:	x			
WAC 173-303-830 Modification Class: ^{1,2}	Class 1	Class '1	Class 2	Class 3										
Please mark the Modification Class:	x													
Enter Relevant WAC 173-303-830, Appendix I Modification citation number: A.1. & A.3.														
Enter wording of WAC 173-303-830, Appendix I Modification citation: A.1. Administrative and informational changes A.3. Equipment replacement or upgrading with functionally equivalent components (e.g., pipes, valves, pumps, conveyors, controls)														
Modification Approved: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No (state reason for denial)			Reviewed by Ecology:											
<u>Reason for denial:</u>			<div style="text-align: right;"> </div>											
			<div style="text-align: right;"> 9/11/07 Date </div>											

¹ Class 1 modifications requiring prior Agency approval.

² If the proposed modification does not match any modification listed in WAC 173-303-830 Appendix I, then the proposed modification should automatically be given a Class 3 status. This status may be maintained by the Department of Ecology, or down graded to a Class '1, if applicable.

PLANT ITEM NUMBER	LVP-HTR-00001A/B	LVP-HEPA-00001A/B	LVP-HEPA-00001A	AMR-VSL-00003/4	LVP-HEPA-00002A/B	AMR-VPR-00002/3	LVP-EXHR-00001A/B/C
DESCRIPTION	LAW MELTERS OFFGAS HEPA PREHEATERS	LAW MELTER OFFGAS HEPA	LAW MELTER OFFGAS HEPA	AMMONIA HOLDING VESSEL	LAW MELTER OFFGAS HEPA	AMMONIA VAPORIZATION HEATER	LAW MELTER OFFGAS EXHAUSTERS



- NOTES:**
1. DELETED
 2. MAJOR INDICATION AND CONTROL INSTRUMENTATION ONLY SHOWN
 3. VALVES SHOWN ONLY TO INDICATE PROCESS INTENT
 4. DELETED
 5. DELETED
 6. DELETED
 7. VENT HEADER HAS FLUVEY CAPABILITY
 8. CONTENTS OF THIS DRAWING ARE DANGEROUS WASTE PERMIT AFFECTING
 9. DELETED
 10. DELETED
 11. DELETED
 12. AMR-VSL-00003 & -00004 ARE LOCATED IN THE BOP FACILITY.
 13. THE COMPONENTS SHOWN ON THIS DRAWING IN PHANTOM DO NOT REQUIRE INDEPENDENT QUALIFIED REGISTERED PROFESSIONAL ENGINEER ASSESSMENTS OF DESIGN OR INSTALLATION INSPECTIONS BY A QUALIFIED INSTALLATION INSPECTOR IN ACCORDANCE WITH THE BWP AND/OR WASHINGTON ADMINISTRATIVE CODE REQUIREMENTS.
 14. THIS REVISION UPDATED NOTE 13 TO COMPLY WITH NEW GUIDANCE. ADDED SYSTEM DESCRIPTION IN REFERENCE. A REBUILT VERSION OF 24680-LAW-MS-V177-00008 IS NOT PLANNED.

- REFERENCES:**
1. 24680-WSP-LOP-00001 SYSTEM DESCRIPTION FOR LOP AND LVP LAW MELTER OFFGAS
 2. DELETED
 3. 24680-WSP-MS-V177-P0001 PROCESS FLOW DIAGRAM LEGEND & SYMBOLS
 4. DELETED
 5. DELETED
 6. DELETED
 7. DELETED
 8. DELETED
 9. DELETED
 10. DELETED
 11. DELETED

- HOLDS:**
1. DELETED
 2. DELETED

PLEASE NOTE THAT SOURCE, SPECIAL NUCLEAR AND BYPRODUCT MATERIALS, AS DEFINED IN THE ATOMIC ENERGY ACT OF 1954 (AEA), ARE REGULATED AT THE U.S. DEPARTMENT OF ENERGY (DOE) FACILITIES EXCLUSIVELY BY DOE ACTING PURSUANT TO ITS AEA AUTHORITY. DOE ASSENTS THAT PURSUANT TO THE AEA, IT HAS SOLE AND EXCLUSIVE RESPONSIBILITY AND AUTHORITY TO REGULATE SOURCE, SPECIAL NUCLEAR, AND BYPRODUCT MATERIALS AT DOE-OWNED NUCLEAR FACILITIES. INFORMATION CONTAINED HEREIN ON RADIOISOTOPES IS PROVIDED FOR PROCESS DESCRIPTION PURPOSES ONLY.



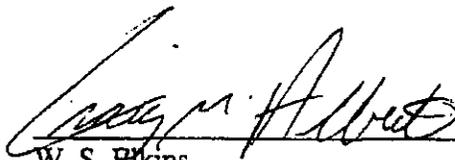
2	ISSUED FOR PERMITTING USE	ADJUSTED	10/1/2010
1	ISSUED FOR PERMITTING USE	UN	08/24/2010
0	ISSUED FOR PERMITTING USE	UN	08/24/2010
REV	DESCRIPTION	DESIGNED BY	DATE

PROJECT NO.	24680-LAW-MS-V177-P0010	REVISION HISTORY	1. RIVER PROTECTION PROJECT WASTE TREATMENT PLANT 2455 STEVENSON GEMER PLACE RICHMOND, VA 23264
BY	ADJUSTED	DATE	10/1/2010
DESIGNED BY	UN	DATE	08/24/2010
CHECKED BY	UN	DATE	08/24/2010
APPROVED BY	UN	DATE	08/24/2010
REVIEWER	UN	DATE	08/24/2010
<p>PROCESS FLOW DIAGRAM AMMONIA & SECONDARY OFFGAS (SYSTEM AMR & LVP)</p>		<p>24680-LAW-MS-V177-P0010</p>	

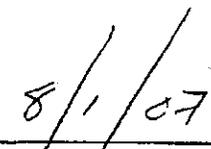
Bechtel National, Inc. Certification

The following certification statement is provided consistent with Contract No. DE-AC27-01RV14136, Section H.26, Environmental Permits, paragraph (g) for the submittal of the Hanford Facility Resource Conservation and Recovery Act Permit Modification Notification Form 24590-LAW-PCN-ENV-07-005.

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 assure 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.



W. S. Elkins
for Project Director



Date

Quarter Ending September 30, 2007

WA7 89000 8967, Part V, Closure Unit 5

Replacement Sections

300 Area WATS

Hanford Facility RCRA Permit Modification Notification Forms

Part V, Closure Unit 5

300 Area Waste Acid Treatment System

Remove and Replace the Following Sections:

Permit Part V, Closure Unit 5, Unit-Specific Conditions

Chapter 1.0, Part A Form, Closed 10/30/2005

This page intentionally left blank.

September 30, 2007

WA7890008967, Part V, Closure Unit 5
300Area Waste Acid Treatment System

1 **PART V, CLOSURE UNIT 5 UNIT-SPECIFIC CONDITIONS**
2 **300 Area Waste Acid Treatment System**
3 **Closed 10/30/2005**

4 The 300 Area Waste Acid Treatment System (300 WATS) was a tank system that was used to treat and
5 store nonrecoverable uranium-bearing waste acid from reactor fuel fabrication operations. Waste acid
6 neutralization occurred in portions of what now is the 300 Area WATS before operation of the system as
7 a Resource Conservation and Recovery Act (RCRA) of 1976 unit. The Closure Plan detailed closure of
8 300 Area WATS components, areas, and contamination resulting from RCRA operations. This unit
9 consisted of portions of four (4) buildings and two (2) tank farms: 334-A Building, 313 Building,
10 303-F Building, 333 Building, 334 (tank 4), and 311 Tank Farms (tanks 40 and 50).

11 Closure activities were completed in September 1999, in accordance with the approved Closure Plan
12 contained in Attachment 46 that was retired during Revision 6 of this Permit.

13 **CLOSURE UNIT 5:**

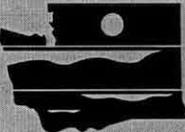
14 Chapter 1.0 Part A Form, Revision 7, dated July 2005, Closed 10/30/2005

September 30, 2007

WA7890008967, Part V, Closure Unit 5
300Area Waste Acid Treatment System

1
2
3
4
5

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 WASHINGTON STATE DEPARTMENT OF E C O L O G Y		Dangerous Waste Permit Application Part A Form	
		Date Received: _____ Reviewed by: <i>[Signature]</i> Date: 1 0 1 0 2 0 0 5 Month Day Year	
Approved by: <i>[Signature]</i> Date: 1 0 3 0 2 0 0 5 Month Day Year		Closed 10/30/2005	
I. This form is submitted to: (place an "X" in the appropriate box)			
<input checked="" type="checkbox"/>	Request modification to a final status permit (commonly called a "Part B" permit)		
<input type="checkbox"/>	Request a change under interim status		
<input type="checkbox"/>	Apply for a final status permit. This includes the application for the initial final status permit for a site or for a permit renewal (i.e., a new permit to replace an expiring permit).		
<input type="checkbox"/>	Establish interim status because of the wastes newly regulated on:	(Date)	
List waste codes: _____			
II. EPA/State ID Number			
W	A	7	8
9	0	0	0
8	9	6	7
III. Name of Facility			
US Department of Energy - Hanford Facility			
IV. Facility Location (Physical address not P.O. Box or Route Number)			
A. Street			
825 Jadwin			
City or Town		State	ZIP Code
Richland		WA	99352
County Code (if known)	County Name		
0 0 5	Benton		
B. Land Type	C. Geographic Location		D. Facility Existence Date
	Latitude (degrees, mins, secs)	Longitude (degrees, mins, secs)	Month Day Year
F	S	E	E
	T	O	P
	O	M	A
	P		
		0	3
		0	2
		1	9
		4	3
V. Facility Mailing Address			
Street or P.O. Box			
P.O. Box 550			
City or Town		State	ZIP Code
Richland		WA	99352

VI. Facility contact (Person to be contacted regarding waste activities at facility)												
Name (last)						(first)						
Klein						Keith						
Job Title						Phone Number (area code and number)						
Manager						(509) 376-7395						
Contact Address												
Street or P.O. Box												
P.O. Box 550												
City or Town						State		ZIP Code				
Richland						WA		99352				
VII. Facility Operator Information												
A. Name						Phone Number (area code and number)						
Department of Energy * Owner/Operator Washington Closure Hanford** Co-Operator for 300 Area Waste Acid Treatment System						(509) 376-7375* (509) 372-9951**						
Street or P.O. Box												
P.O. Box 550* 3070 George Washington Way**												
City or Town						State		ZIP Code				
Richland						WA		99352				
B. Operator Type		F										
C. Does the name in VII.A reflect a proposed change in operator?						<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No						
If yes, provide the scheduled date for the change:						Month		Day		Year		
D. Is the name listed in VII.A. also the owner? If yes, skip to Section VIII.C.						<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No						
VIII. Facility Owner Information												
A. Name						Phone Number (area code and number)						
Keith A. Klein, Operator/Facility-Property Owner*						(509) 376-7395*						
Street or P.O. Box												
P.O. Box 550												
City or Town						State		ZIP Code				
Richland						WA		99352				
B. Operator Type		F										
C. Does the name in VII.A reflect a proposed change in operator?						<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No						
If yes, provide the scheduled date for the change:						Month		Day		Year		
IX. NAICS Codes (5/6 digit codes)												
A. First						B. Second						
5	6	2	2	1		9	2	4	1	1	0	Administration of Air & Water Resource & Solid Waste Management Programs
C. Third						D. Fourth						
9	9	9	9	9	9	5	6	2	9	1	0	Remediation Services

X. Other Environmental Permits (see instructions)													
A. Permit Type			B. Permit Number							C. Description			
													None

XI. Nature of Business (provide a brief description that includes both dangerous waste and non-dangerous waste areas and activities)

The 300 Area Waste Acid Treatment System (300 Area WATS) operated from 1973 and ceased operations in 1995. The 300 Area WATS consisted of various buildings and pipe trenches. Information provided on this form pertaining to unit processes, design capacities, or dangerous waste managed at the unit is for historical purposes only.

The 300 WATS was used to treat both mixed and dangerous waste from fuels fabrication operations occurring in the 333 Building and from nonroutine waste additions. Treatment was performed to make the waste more amenable for further treatment and for storage. The 333 Building waste primarily consisted of hydrofluoric acid, nitric acid, sulfuric acid, and copper nitrate. Approximately 2,086,525 kilograms (4,600,000 pounds) of waste were treated and stored yearly in this system. Approximately 907 kilograms (2,000 pounds) of waste (D007, chromium VI to chromium III) were treated per year.

The 311 tank system was used for the treatment and storage of waste. This waste was effluent from the waste acid treatment and uranium recovery process. Approximately 2,086,525 kilograms (4,600,000 pounds) of waste were treated and stored per year in the 311 tanks.

'Partial' closure activities for this unit began in 1996 and were completed September 1999. Closure activities occurred in three phases and in accordance with the approved closure plan and the requirements of the Hanford Facility RCRA Permit, WA7890008967, Revision 7. Clean closure was achieved for RCRA components for all 300 Area WATS locations, with the exception of two locations of potential soil contamination. The areas of potential soil contamination are shown as Area 1 and 2 in the Figure. Area 1 is located beneath the concrete WATS and U-Bearing Piping trench. Area 2 is located beneath the scabbled concrete floor of the old 313 Building.

In December 2001, Ecology (Letter, G. P. Davis, Ecology, to J. B. Hebdon, U.S. Department of Energy) accepted certification for the clean closed 300 Area WATS locations and released these clean closed locations from the requirements of RCRA and WAC 173-303. The soil at Areas 1 and 2 will remain unclosed and regulated by RCRA, Chapter 173-303 WAC until soil disposition in conjunction with the future 300-FF-2 Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) Operable Unit remedial action. Concrete surfaces over unclosed soil will remain until the time of soil disposition. Closure of these areas will complete 300 Area WATS closure.

Continued in *Comments* section.

EXAMPLE FOR COMPLETING ITEMS XII and XIII (shown in lines numbered X-1, X-2, and X-3 below): A facility has two storage tanks that hold 1200 gallons and 400 gallons respectively. There is also treatment in tanks at 20 gallons/hr. Finally, a one-quarter acre area that is two meters deep will undergo *in situ vitrification*.

Section XII. Process Codes and Design Capacities							Section XIII. Other Process Codes							
Line Number	A. Process Codes (enter code)			B. Process Design Capacity		C. Process Total Number of Units	Line Number	A. Process Codes (enter code)			B. Process Design Capacity		C. Process Total Number of Units	D. Process Description
	1.	2.	3.	1. Amount	2. Unit of Measure (enter code)			1.	2.	3.	1. Amount	2. Unit of Measure (enter code)		
X 1	S	0	2	1,600	G	002	X 1	T	0	4	700	C	001	In situ vitrification
X 2	T	0	3	20	E	001								
X 3	T	0	4	700	C	001								
1							1							
2							2							
3							3							
4							4							
5							5							
6							6							
7							7							
8							8							
9							9							
1 0							1 0							
1 1							1 1							
1 2							1 2							
1 3							1 3							
1 4							1 4							
1 5							1 5							
1 6							1 6							
1 7							1 7							
1 8							1 8							
1 9							1 9							
2 0							2 0							
2 1							2 1							
2 2							2 2							
2 3							2 3							
2 4							2 4							
2 5							2 5							

XIV. Description of Dangerous Wastes

Example for completing this section: A facility will receive three non-listed wastes, then store and treat them on-site. Two wastes are corrosive only, with the facility receiving and storing the wastes in containers. There will be about 200 pounds per year of each of these two wastes, which will be neutralized in a tank. The other waste is corrosive and ignitable and will be neutralized then blended into hazardous waste fuel. There will be about 100 pounds per year of that waste, which will be received in bulk and put into tanks.

Line Number	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)]						
X 1	D	0	0	2	400	P	S	0	1	T	0	1					
X 2	D	0	0	1	100	P	S	0	2	T	0	1					
X 3	D	0	0	2												Included with above	
300 Area Waste Acid Treatment System																	
	1	D	0	0	1	2,086,525	K	T	0	1	S	0	2	T	0	4	Includes Debris
	2	D	0	0	2		K	T	0	1	S	0	2	T	0	4	Includes Debris
	3	D	0	0	4		K	T	0	1	S	0	2	T	0	4	Includes Debris
	4	D	0	0	5		K	T	0	1	S	0	2	T	0	4	Includes Debris
	5	D	0	0	6		K	T	0	1	S	0	2	T	0	4	Includes Debris
	6	D	0	0	7		K	T	0	1	S	0	2	T	0	4	Includes Debris
	7	D	0	0	8		K	T	0	1	S	0	2	T	0	4	Includes Debris
	8	W	T	0	2		K	T	0	1	S	0	2	T	0	4	Includes Debris
	9	D	0	0	9		K	T	0	1	S	0	2	T	0	4	Includes Debris
	10	D	0	0	7	907	K	T	0	1							Includes Debris
311 Tanks																	
	11	W	T	0	2	2,086,525	K	T	0	1	S	0	2				Includes Debris
	12	D	0	0	2		K	T	0	1	S	0	2				Includes Debris
	13	D	0	0	4		K	T	0	1	S	0	2				Includes Debris
	14	D	0	0	5		K	T	0	1	S	0	2				Includes Debris
	15	D	0	0	6		K	T	0	1	S	0	2				Includes Debris
	16	D	0	0	7		K	T	0	1	S	0	2				Includes Debris
	17	D	0	0	8		K	T	0	1	S	0	2				Includes Debris
	18	D	0	0	9		K	T	0	1	S	0	2				Includes Debris
	19																
	20																
	21																
	22																
	23																
	24																
	25																

XV. Map

Attach to this application a topographic map of the area extending to at least one (1) mile beyond property boundaries. The map must show the outline of the facility; the location of each of its existing and proposed intake and discharge structures; each of its dangerous waste treatment, storage, recycling, or disposal units; and each well where fluids are injected underground. Include all springs, rivers, and other surface water bodies in this map area, plus drinking water wells listed in public records or otherwise known to the applicant within ¼ mile of the facility property boundary. The instructions provide additional information on meeting these requirements.

XVI. Facility Drawing

All existing facilities must include a scale drawing of the facility (refer to instructions for more detail).

XVII. Photographs

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

XVIII. Certifications

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 assure 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.

<p>Operator* Name and Official Title (type or print) Keith A. Klein, Manager U.S. Department of Energy Richland Operations Office</p>	<p>Signature </p>	<p>Date Signed 8/25/05</p>
<p>Co-Operator** Name and Official Title (type or print) Patrick L. Pettiette Project Manager Washington Closure Hanford LLC</p>	<p>Signature </p>	<p>Date Signed 8-7-05</p>
<p>Co-Operator** – Address and Telephone Number 3070 George Washington Way Richland, WA 99352 (509) 372-9951</p>		
<p>Facility-Property Owner* Name and Official Title (type or print) Keith A. Klein, Manager U.S. Department of Energy Richland Operations Office</p>	<p>Signature </p>	<p>Date Signed 8/25/05</p>

CommentsT01, S02, T04

The 300 Area Waste Acid Treatment System (300 WATS) and Tank 40 and 50 began waste management operations in April 1973; auxiliary equipment and centrifuge operations began in November 1995. The 300 WATS was used for the treatment and storage of mixed waste generated during fuel fabrication operations in the 300 Area. The 300 WATS also was used for disposing of used and/or unneeded chemicals for other Hanford Facility operations. A portion of the waste initially was treated in two tanks (tanks 7 and 11) in the 333 Building to reduce the chromium (VI) to chromium (III). From May 1983 to January 1987, tanks 7 and 11 were used twice a year to treat up to 757 liters (200 gallons) per day of waste (T01). This waste, along with all other waste acid generated in the 333 Building, was drained to the 334-A Building and stored in two storage tanks (tanks Band C) (S02), with a combined volume of 15,142 liters (4,000 gallons). Previously, waste entered the 334-A Building passing through a settling tank [tank A, volume 1,363 liters (360 gallons)] before entering tanks B and C. Tank A ceased receiving waste in August 1984, when piping was disconnected to the tank and waste was routed directly to tanks B and C. Tank A was cleaned out and the polyvinyl chloride liner removed in 1988.

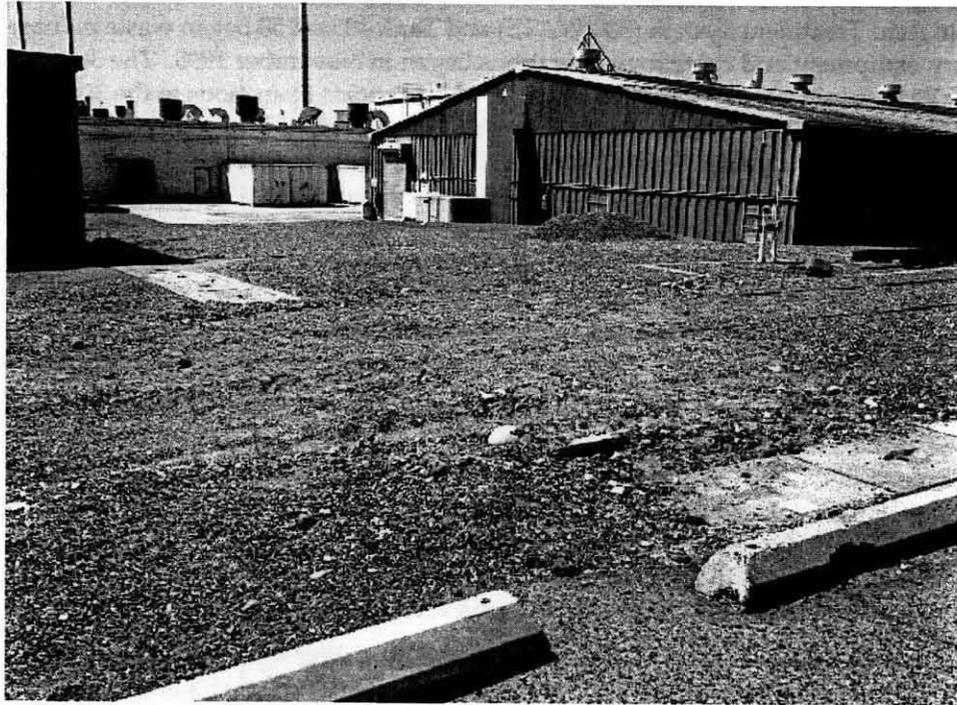
From startup in April 1973 until August 1973, the waste acid from the 333 Building was collected in a plastic-lined steel underground 14,385 liter (3,800 gallon) tank and a plastic-lined steel aboveground 22,712 liter (6,000 gallon) tank (tank 4) in the 334 Tank Farm. At that time, the underground tank developed a leak and was removed from service. The 334-A Building storage tanks replaced this underground tank in December 1974. Tank 4 was retained for emergency storage when the 313 Building neutralization activities were down for maintenance or modifications. Tank 4 usually was empty and when the tank was filled in January 1986, a leak developed near the top of the tank. Tank 4 was emptied and abandoned at that time. Tank 4 was removed, cleaned, and disposed of onsite in 1988.

The waste acid was pumped from the 334-A Building to the 313 Building where the waste acid underwent pH adjustment in a waste acid neutralization tank (tank 2) (T01). Tank 2 was capable of treating a maximum of 13,249 liters (3,500 gallons) per day of waste acid. The waste acid was pumped from tank 2 to tank 11 and then to a centrifuge where the waste acid underwent further treatment to separate the liquid and solid phases (T04). A maximum of 11,356 liters (3,000 gallons) of waste acid per day could be treated in the centrifuge. The solid waste from the centrifuge was collected in containers and transferred to the 303-K Storage Unit. The liquid effluent was pumped from the centrifuge to tank 5 and to a filter press for additional treatment to remove fine solids (T04), which remained following treatment in the centrifuge. The filter press treated a maximum of 4,542 liters (1,200 gallons) per day. Solids collected in the filter press were sent to the uranium recovery system or to the 303-K Storage Unit. The filtered liquid effluent was drained into effluent collection tanks (tanks 9 and 10), where the liquid effluent was stored temporarily before being pumped to the 311 Tank Farm.

T01, S02 - The 311 Tank Farm was used for storage of treated liquid effluents from both the 300 Area WATS and the uranium recovery process. Storage occurred in two tanks (tanks 40 and 50) with capacities of 15,142 and 18,927 liters (4,000 and 5,000 gallons), respectively. Tanks 40 and 50 are constructed of stainless steel. Tank 50, the 18,927 liter (5,000 gallon) tank, occasionally was used for decanting waste when the centrifuge in the 313 Building was down for maintenance. Tank 50 was capable of treating up to 18,927 liters (5,000 gallons) per day, but only was used occasionally for decanting waste (a total of five times between January 1986 and December 1987).

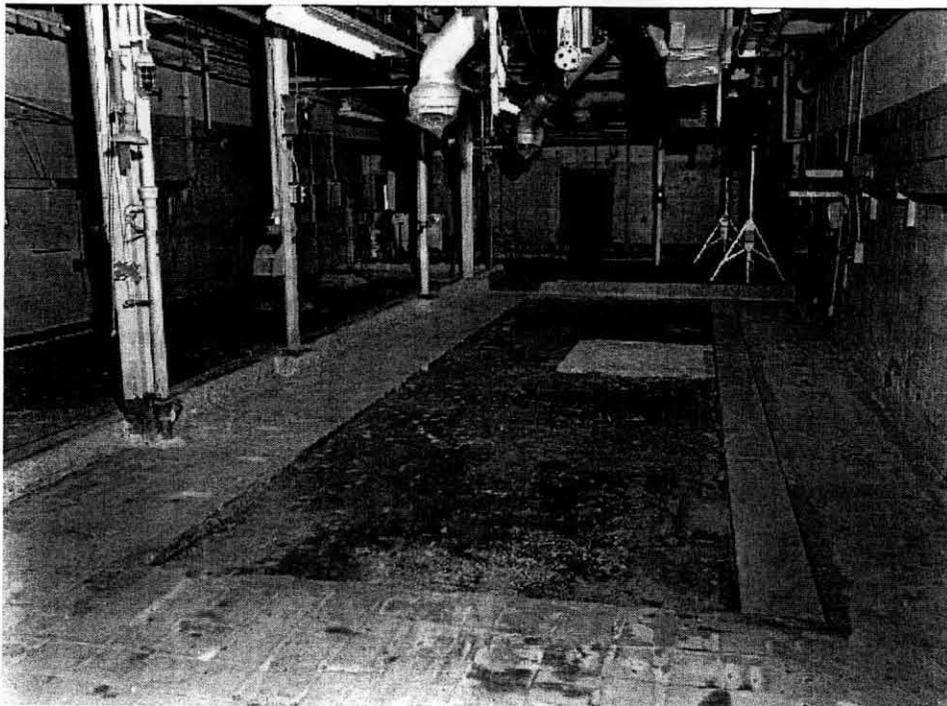
Auxiliary equipment (two pumps, two cartridge filters, and two sample ports) are housed in the adjacent 303-F Building. Auxiliary equipment was used to filter solutions and to recirculate the solutions between various tanks and the 313 Building for reprocessing.

300 Area Waste Acid Treatment System



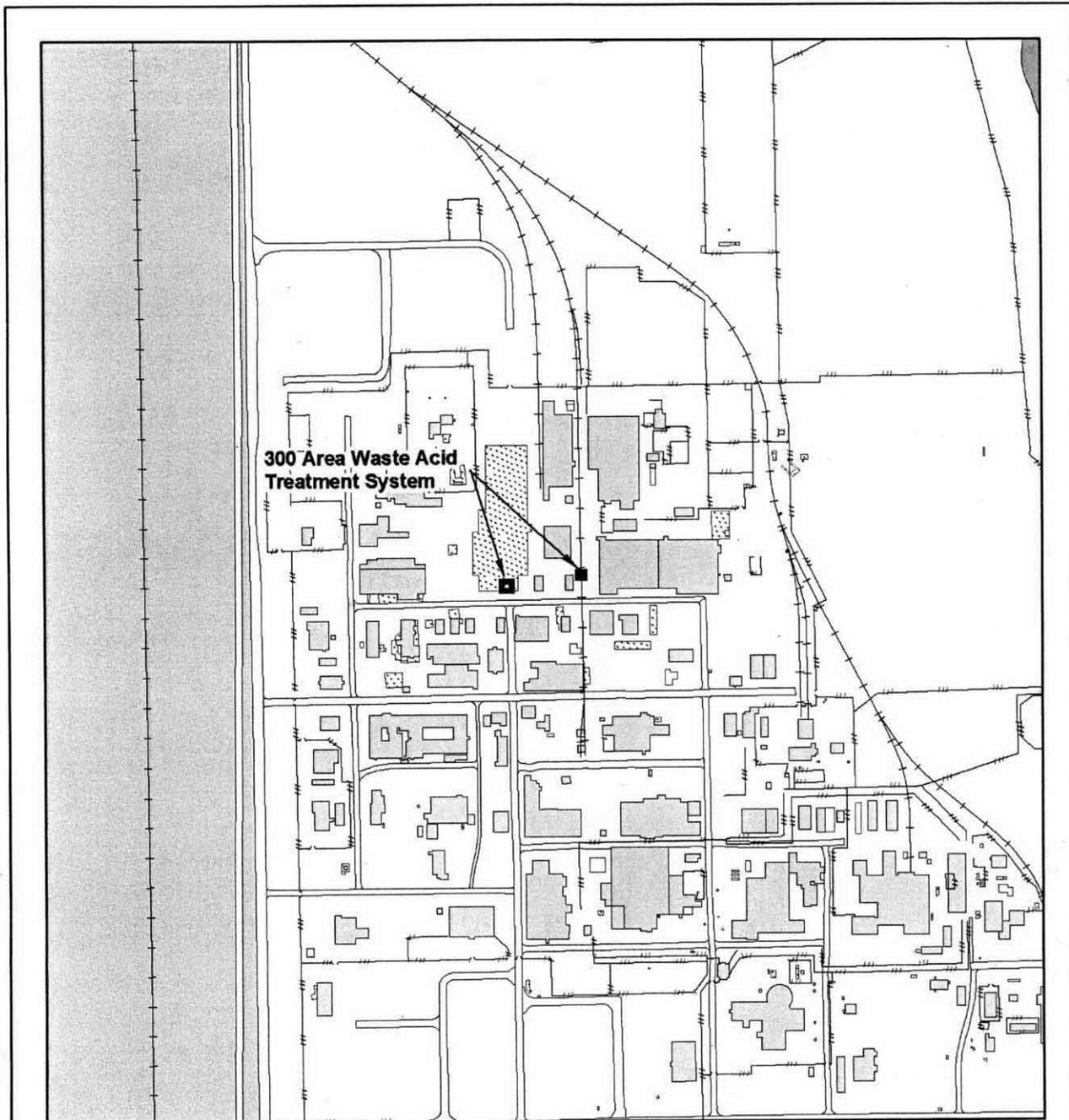
Substructure Soil Contamination Location, Area 1

00070107-6CN
(PHOTO TAKEN 2000)



Substructure Soil Contamination Location, Area 2

00070107-2CN
(PHOTO TAKEN 2000)



300 Area Waste Acid Treatment System

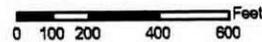
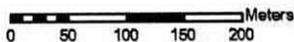
Prepared for:
 US DEPARTMENT OF ENERGY
 RICHLAND OPERATIONS OFFICE



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- | | |
|---------------------|-----------------------|
| TSD Unit Boundary | Buildings and Mobiles |
| DOE Operating Areas | Structures |
| Hanford Facility | Concrete |
| Columbia River | Railroads |
| Major Roads | Fences |
| Service Roads | |



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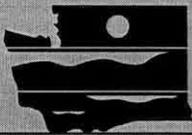
Quarter Ending September 30, 2007

Closed Part A Form:
216-U-12 Crib

**Hanford Facility RCRA Permit
Closed Part A Form**

Remove and Replace the Following Part A Forms:

216-U-12 Crib



WASHINGTON STATE
DEPARTMENT OF
E C O L O G Y

**Dangerous Waste Permit Application
Part A Form**

Date Received	Reviewed by: <i>John Price</i>	Date: 0 3 1 3 2 0 0 6
Month Day Year	Approved by: <i>Sheldon P. Davis</i>	Date: 0 3 1 3 2 0 0 6
Closed 7/19/07		

I. This form is submitted to: (place an "X" in the appropriate box)

<input checked="" type="checkbox"/>	Request modification to a final status permit (commonly called a "Part B" permit)
<input type="checkbox"/>	Request a change under interim status
<input type="checkbox"/>	Apply for a final status permit. This includes the application for the initial final status permit for a site or for a permit renewal (i.e., a new permit to replace an expiring permit).
<input type="checkbox"/>	Establish interim status because of the wastes newly regulated on: (Date)
List waste codes:	

II. EPA/State ID Number

W	A	7	8	9	0	0	0	8	9	6	7
---	---	---	---	---	---	---	---	---	---	---	---

III. Name of Facility

US Department of Energy - Hanford Facility

IV. Facility Location (Physical address not P.O. Box or Route Number)

A. Street

825 Jadwin

City or Town	State	ZIP Code
Richland	WA	99352

County Code (if known)	County Name
0 0 5	Benton

B. Land Type	C. Geographic Location		D. Facility Existence Date																			
	Latitude (degrees, mins, secs)	Longitude (degrees, mins, secs)	Month	Day	Year																	
F	S	E	E	T	O	P	O	M	A	P					0	3	2	2	1	9	4	3

V. Facility Mailing Address

Street or P.O. Box		
P.O. Box 550		
City or Town	State	ZIP Code
Richland	WA	99352

VI. Facility contact (Person to be contacted regarding waste activities at facility)												
Name (last)						(first)						
Klein						Keith						
Job Title						Phone Number (area code and number)						
Manager						(509) 376-7395*						
Contact Address												
Street or P.O. Box												
P.O. Box 550												
City or Town						State		ZIP Code				
Richland						WA		99352				
VII. Facility Operator Information												
A. Name						Phone Number (area code and number)						
Department of Energy * Owner/Operator Fluor Hanford** Co-Operator for 216-U-12 Crib						(509) 376-7395* (509) 375-3576 **						
Street or P.O. Box												
P.O. Box 550 * P.O. Box 1000 **												
City or Town						State		ZIP Code				
Richland						WA		99352				
B. Operator Type		F										
C. Does the name in VII.A reflect a proposed change in operator?						<input type="checkbox"/> Yes		<input checked="" type="checkbox"/> No				
If yes, provide the scheduled date for the change:						Month		Day			Year	
D. Is the name listed in VII.A. also the owner? If yes, skip to Section VIII.C.						<input type="checkbox"/> Yes		<input checked="" type="checkbox"/> No				
VIII. Facility Owner Information												
A. Name						Phone Number (area code and number)						
Keith A. Klein, Operator/Facility-Property Owner						(509) 376-7395*						
Street or P.O. Box												
P.O. Box 550												
City or Town						State		ZIP Code				
Richland						WA		99352				
B. Operator Type		F										
C. Does the name in VII.A reflect a proposed change in operator?						<input type="checkbox"/> Yes		<input checked="" type="checkbox"/> No				
If yes, provide the scheduled date for the change:						Month		Day			Year	
IX. NAICS Codes (5/6 digit codes)												
A. First						B. Second						
5	6	2	2	1	0	9	2	4	1	1	0	Administration of Air & Water Resource & Solid Waste Management Programs
C. Third						D. Fourth						
5	4	1	7	1		9	9	9	9	9	9	Unclassified Establishments
Waste Treatment & Disposal						Research & Development in the Physical, Engineering, & Life Sciences						

EXAMPLE FOR COMPLETING ITEMS XII and XIII (shown in lines numbered X-1, X-2, and X-3 below): A facility has two storage tanks that hold 1200 gallons and 400 gallons respectively. There is also treatment in tanks at 20 gallons/hr. Finally, a one-quarter acre area that is two meters deep will undergo *in situ* vitrification.

Section XII. Process Codes and Design Capacities							Section XIII. Other Process Codes							
Line Number	A. Process Codes (enter code)			B. Process Design Capacity		C. Process Total Number of Units	Line Number	A. Process Codes (enter code)			B. Process Design Capacity		C. Process Total Number of Units	D. Process Description
				1. Amount	2. Unit of Measure (enter code)						1. Amount	2. Unit of Measure (enter code)		
X 1	S	0	2	1,600	G	002	X 1	T	0	4	700	C	001	In situ vitrification
X 2	T	0	3	20	E	001								
X 3	T	0	4	700	C	001								
1	D	8	0	50,000	U	001	1							
2							2							
3							3							
4							4							
5							5							
6							6							
7							7							
8							8							
9							9							
1 0							1 0							
1 1							1 1							
1 2							1 2							
1 3							1 3							
1 4							1 4							
1 5							1 5							
1 6							1 6							
1 7							1 7							
1 8							1 8							
1 9							1 9							
2 0							2 0							
2 1							2 1							
2 2							2 2							
2 3							2 3							
2 4							2 4							
2 5							2 5							

XIV. Description of Dangerous Wastes

Example for completing this section: A facility will receive three non-listed wastes, then store and treat them on-site. Two wastes are corrosive only, with the facility receiving and storing the wastes in containers. There will be about 200 pounds per year of each of these two wastes, which will be neutralized in a tank. The other waste is corrosive and ignitable and will be neutralized then blended into hazardous waste fuel. There will be about 100 pounds per year of that waste, which will be received in bulk and put into tanks.

Line Number	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)]						
X 1	D 0 0 2	400	P	S	0	1	T	0	1						
X 2	D 0 0 1	100	P	S	0	2	T	0	1						
X 3	D 0 0 2														Included with above
	1 D 0 0 2	4,454,000	P	D	8	1									Percolation
	2														
	3														
	4														
	5														
	6														
	7														
	8														
	9														
	1 0														
	1 1														
	1 2														
	1 3														
	1 4														
	1 5														
	1 6														
	1 7														
	1 8														
	1 9														
	2 0														
	2 1														
	2 2														
	2 3														
	2 4														
	2 5														

XV. Map

Attach to this application a topographic map of the area extending to at least one (1) mile beyond property boundaries. The map must show the outline of the facility; the location of each of its existing and proposed intake and discharge structures; each of its dangerous waste treatment, storage, recycling, or disposal units; and each well where fluids are injected underground. Include all springs, rivers, and other surface water bodies in this map area, plus drinking water wells listed in public records or otherwise known to the applicant within ¼ mile of the facility property boundary. The instructions provide additional information on meeting these requirements.

XVI. Facility Drawing

All existing facilities must include a scale drawing of the facility (refer to Instructions for more detail).

XVII. Photographs

All existing facilities must include photographs (aerial or ground-level) that clearly delineate all existing structures; existing storage, treatment, recycling, and disposal areas; and sites of future storage, treatment, recycling, or disposal areas (refer to Instructions for more detail).

XVIII. Certifications

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 assure 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.

<p>Operator* Name and Official Title (type or print) Keith A. Klein, Manager U.S. Department of Energy Richland Operations Office</p>	<p>Signature </p>	<p>Date Signed 5/2/05</p>
<p>Co-Operator** Name and Official Title (type or print) Ronald G. Gallagher President and Chief Executive Officer Fluor Hanford</p>	<p>Signature </p>	<p>Date Signed 4/20/05</p>
<p>Co-Operator** – Address and Telephone Number 2420 Stevens Center P.O. Box 1000 Richland, WA 99352 (509) 376-3576</p>		
<p>Facility-Property Owner* Name and Official Title (type or print) Keith A. Klein, Manager U.S. Department of Energy Richland Operations Office</p>	<p>Signature </p>	<p>Date Signed 5/2/05</p>

Comments

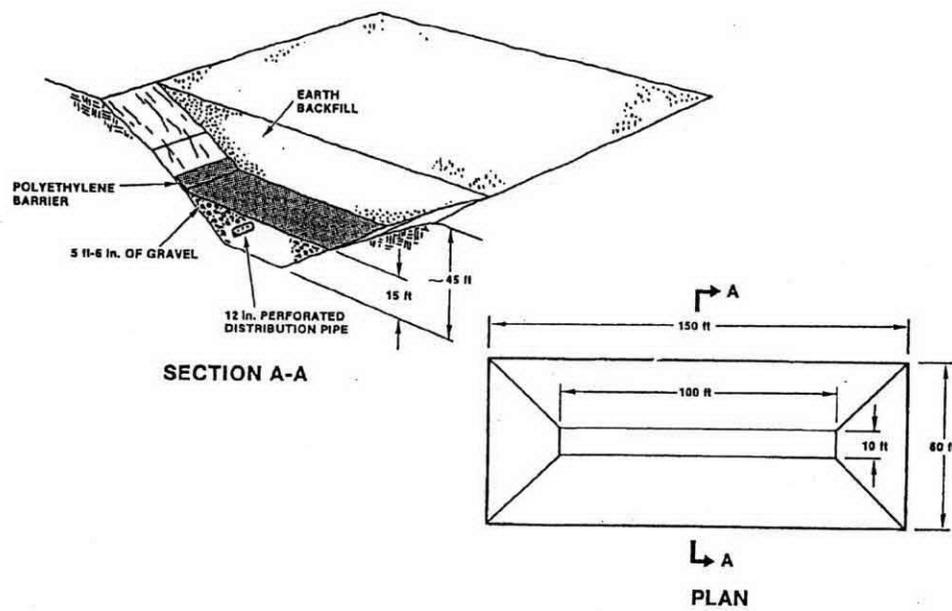
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216-U-12 Crib



8704509-1CN

(PHOTO TAKEN 1987)

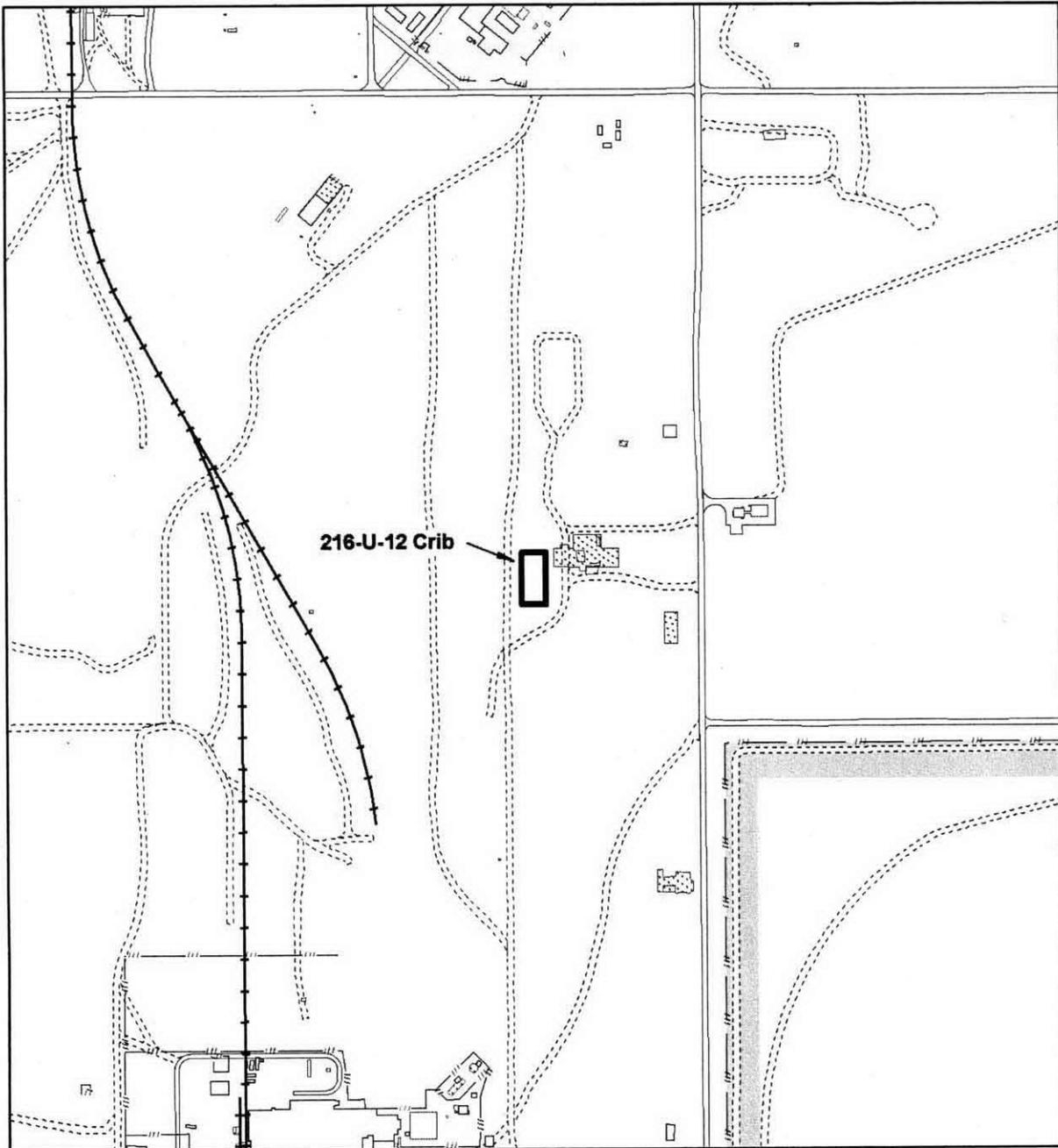


For conversions, apply the following:

Feet to meters—multiply feet by 0.3048

Inches to centimeters—multiply inches by 2.54.

288707-12.00



216-U-12 Crib

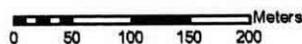
Prepared for:
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 RICHLAND OPERATIONS OFFICE



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- | | |
|---------------------|-----------------------|
| TSD Unit Boundary | Buildings and Mobiles |
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