2014-LTR-1014

Attachment 6

[Permit Attachment DD]

Procedures to Prevent Hazards

ATTACHMENT DD

Security Procedures and Equipment

MIXED WASTE FACILITY
RCRA/TSCA PERMIT

~~PERMA-FIX~~ NW-R
RICHLAND, WASHINGTON

Permit Number: WAR 0000 10355

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F PROCEDURES TO PREVENT HAZARDS

[WAC 173-303-806(4)(a)(iv), (v), (viii), (ix), 310, 320, 340]

The M~~S~~WF ~~will~~ implements strict controls and formal procedures as part of a hazards prevention program. Attachment 19, the inspection plan, describes the protocols P~~EcoS~~FNW-R ~~will~~ employs to prevent the occurrence of hazardous situations. Appendix ~~a~~ A in ~~a~~Attachment 19 contains schedules for inspections, ~~a~~Appendix ~~b~~B shows examples of inspection checklist forms and Appendix C is the RCRA Leak Detection and Repair (LDAR) plan.

F-1 SECURITY

806 (4)(a)(iv), 310(1) and (2).

This section describes the security measures to be implemented at the MWF.

F-1a Security Procedures and Equipment

310 (2)

The site is designed so that personnel enter and exit through the Access Control Building (ACB). In addition, vehicles and personnel can enter through the main gate. All doors and gates at the MWF are furnished with locking devices.

To prevent inadvertent access by unauthorized individuals and any subsequent damage to plant and property or release of radioactive or dangerous wastes, the MWF ~~will be~~is protected by a security system. The system ~~will~~ consists of (1) a six-foot high chain link fence topped with barbed wire surrounding the perimeter of the MWF (~~shown in Figure 1, Attachment 15)~~GG, (2) warning signs posted around the perimeter, ~~(3) a gate attendant providing surveillance during working hours~~ and (3) ~~during non-working periods,~~ a patrolling security guard providing 24-hour coverage.

Entrances to the facility ~~will b~~are kept locked except during business hours to prevent unauthorized access. The plant manager ~~will~~ distributes keys to personnel depending upon their need for access. Keys are returned to the plant manager at the termination of employment.

Signs posted at the MWF ~~will~~ have the legend "Danger - Unauthorized Personnel Keep Out". These signs ~~will b~~are posted at the entrance gate, at 100 foot intervals on the surrounding fence and at the entrances to each building. The signs ~~will b~~are legible from a distance of at least 25 feet.

The security of the facility, the equipment, and stored materials ~~will b~~are the responsibility of the plant manager.

F-1b Waiver

310 (1)

PFNW-r~~EcoS~~ is not requesting a waiver from the requirements of WAC 173-303-310.

Table F-1 Inspection Schedule Summary[1]

Frequency	Inspection	Record Keeping
DAILY		
• General Facility	Daily Inspection Checklist	
• Tank system Operation	Daily Inspection Checklist	
• Unloading and Loading Areas (when in use)	Daily Inspection Checklist	
• Container Storage (leaks, spills, accumulated liquids, labels)	Daily Inspection Checklist	
• ~~GASVIT™ Area~~MWTH (leaks, spills, fugitive emissions and signs of tampering)	Daily Inspection Checklist	
WEEKLY (at least every 7 days)		
• Perimeter & General Facility	Weekly Inspection Checklist	
• Security Devices	Weekly Inspection Checklist	
• Container Storage (structural integrity, secondary containment)	Weekly Inspection Checklist	
• ~~GASVIT™ Automatic Waste Feed Cut-off System (and associated alarms)~~	~~Weekly Inspection Checklist~~	
MONTHLY (at least every 30 days)		
• Safety & Emergency Equipment	Monthly Inspection Checklist	
• Preparedness and Prevention Equipment (drains, sumps and backup power)	Monthly Inspection Checklist	
• Fire Equipment	Monthly Inspection Checklist	
ANNUALLY (at least once every 365 days)		
• Annual Tank System Condition[2]	Annual Inspection Checklist	

[1] Additional inspections (quarterly and semi-annual) may also be performed as per Attachment 19, Appendix A, Table A-4 and A-5.

[2] Tank integrity testing that may include ultrasonic tests and internal inspections will be performed at least once during the first 365 days after installation and then at a frequency recommended by the independent inspection report.

Table F-2 Corrective Action Schedule

Major Problem Classification	Specific Corrective Actions	Implementation Schedule
CONTAINERS		
Container Leak	Tip container to stop leak	Immediately
	Tighten container closure, if this is related to the leak	Immediately
	Use plug or patch materials to seal leaking container	Immediately
	Overpack if needed (marked and labeled in same manner as contents, noting condition of container inside)	As soon as possible
	Segregate leaking containers	As soon as possible
TANKS		
Tank Leak	Shut-down any related process operations	Immediately
	If necessary, stop flow into system using manual override valves	Immediately
	Tighten fittings and closures if these are related to the leakage	Immediately
	Use plug or patch material to seal tank leak	Immediately
Tank Spillage	Restrict access (pending notification of the emergency coordinator, and implementation of contingency plan)	Immediately
Incident Closure	Trained HAZMAT personnel to clean up any spillage captured by secondary containment; wastes from spillage clean-up are to be transferred to labeled containers	Within 24 hours
	The remaining contents of the tank are to be transferred to a non-leaking tank or to labeled containers if the tank is not readily repairable	Within 24 hours
	Report non-exempt leaks or spills in accordance with the Contingency Plan	As soon as possible
	Certify major repairs before system is returned to service	As required
CONTAINERS AND TANKS		
Containment System Loss of Integrity	Fill in any major floor cracks or gaps	As required within 72 hours
	Make any necessary curbing or berming repairs	As required within 72 hours
	Remove any accumulated spills according to schedule outlined above	As required within 72 hours
	For container storage, ~~b~~verify proper container storage and spacing	As required within 72 hours
	Maintain proper container spacing	As required within 72 hours

F-2 INSPECTION PLAN

806(4)(a)(v), 320, 340

The Inspection Plan for the MWF is provided as Attachment 19. The Inspection Plan presents procedures to be followed by MWF personnel that are designed to prevent malfunctions, deterioration, operator errors, and discharges that may cause or lead to the release of dangerous wastes. These procedures include visual inspections, equipment testing, record keeping, remedial actions, and replacement of deteriorated supplies and equipment.

F-2a General Inspection Requirements

806(4)(a)(v), 320(1), 320(2)(a), (b) and ©, 340(1)(d)

This section describes general inspection requirements for process equipment, instrumentation, monitors, controls, security devices, and preparedness and prevention equipment used to help prevent, detect, or respond to environmental or human health hazards related to dangerous waste handling, treatment and storage at the MWF. Loading and unloading operations are included in the inspection protocol.

F-2a(1) Inspection Items and Schedule

Details of items and groups of items to be inspected, and corresponding inspection locations and procedures are provided in Section 2.0 and Appendix A (tables A-1 to A-6) of Attachment 19. Scheduled inspections are performed daily, weekly, monthly, quarterly, semiannually and annually. Inspection frequencies meet or exceed regulatory requirements.

F-2a(2) Problem Indicators

Table A-8 in Appendix A of Attachment 19 provides details of inspection procedures, problem indicators and applicable corrective actions for the "inspection types" identified in tables A-1 through table A-7. ~~Section 4.4.2.2.1 provides an example of a safeguard, the Automatic Waste Feed Cut-Off and the critical process parameters that need to be monitored in weekly inspections~~.

Comment [BN1]: Related to GasVit

F-2a(3) Frequency of Inspections

A general summary of item groups, the related frequency of inspection and record keeping is shown in Table F-1 and is discussed in more detail in Section 2.0 of the Inspection Plan (Attachment ~~19~~EE). Inspection frequencies are based on state or federal rules and in some instances, the rate of possible deterioration of equipment and the probability of an environmental or human health incident if the deterioration, malfunction, or operator error goes undetected between inspections.

F-2a (4) Location of Inspection Schedule

The inspection schedule ~~will be~~ is posted in the Incident Command Center, located in the Access Control Center.

F-2a (5)Employees Responsible for Inspections

Inspections will be conducted by MWF plant operators under the direction of the plant ~~engineering supervisor~~manager ~~(PES)~~. The inspector will receive training as outlined in Section H.

F-2b Inspection Log

320(2)(d)

Each inspection will be documented on a checklist as described in Section 2.0 of Attachment 19. Examples of checklist forms are provided in Appendix B of Attachment 19.

The checklists include the date and time of the inspection, the printed name and handwritten signature of the inspector, an area for notation of observations, including an account of spills or discharges in accordance with WAC 173-303-145 and the date and nature of any remedial actions taken.

The checklist inventory will be maintained in the Access Control Building by the plant ~~engineering supervisor~~manager. The completed checklist forms will be organized by inspection frequency (i.e. daily, weekly, monthly, quarterly, semi-annually, annually) and by location as required.

F-2c Schedule for Remedial Action for Problems Revealed

320(3)

F2-c(1) Schedules and Procedures

The schedule for remedial action for problems revealed during inspections will depend on the potential risk to human health or the environment. Actions may require equipment repair and/or procedural change and will be implemented as provided in Section 5.2 of Attachment 19.

F2-c(1)(a) Schedule Where Hazard is Imminent or Already Occurred

Where a hazard is imminent or has already occurred, remedial action will be taken immediately. Examples include faulty instrumentation, deteriorated safety equipment and broken seals in secondary containment areas.

F2-c(1)(b) Schedule for Replacement of Deteriorated Equipment and Supplies

Unless stated otherwise or where a hazard is imminent or already occurred, ordering and restocking supplies will be completed in 30 days and making structural repairs will be 90 days.

(i) In accordance with manufacturer recommendations, protective equipment will have recommended schedules for replacement. The inspection checklists (Attachment 19, Appendix B) are designed to flag the need for the restocking of equipment prior to its deterioration affecting its usability. The plant engineering supervisor will be responsible for ensuring protective equipment is replaced.

(ii) Likewise, preparedness and prevention supplies have limited storage life and will be replaced according to the schedules recommended by the manufacturers. The inspection checklists (Attachment 19, Appendix B) are designed to flag the need for the restocking of supplies prior to deterioration affecting usability.

~~(iii)~~

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F2-c(1)(c) Corrective Measures Timelines

- Corrective measures (or action) timelines are shown in table F-2 and are further described in Section 5.2 of the Inspection Plan (Attachment 19). In summary:

Problems Threatening Human Health or the Environment: Problems that pose an imminent threat to human health or the environment will be responded to as soon as possible but no later than twenty-four (24) hours from the time of discovery.

Problems Not Threatening to Human Health or the Environment: Problems that do not pose an imminent threat to human health or the environment are responded to within seventy-two (72) hours of discovery.

Problems Requiring More than 72 Hours to Resolve: If a longer time period is required to correct the problem, PFNW-R~~EcoS~~ will propose a time schedule for correcting the problem. The correction schedule must be approved by Ecology.

F2-c(1)(d) Corrective Action Responsibilities

The Plant Engineering Supervisor is responsible for ordering corrective action and assigning personnel to management and implementation of corrective actions.

F2-c(2) Corrective Measures

Corrective measures to be taken to address problems identified during inspections are described in Section 5 and Table A-8, Appendix A of Attachment 19. Table F-2 summarizes specific corrective actions and implementation schedules.

F2-d Specific Process or Waste Type Inspection Requirements

Inspection procedures for specific areas are provided in Section 4.0 of Attachment 19.

F-2d(1) Container Inspections

806(4)(a)(v), 630(3) and (6), 320(2)(c) and (3)

Inspection procedures for container storage areas and containers are provided in Section 4.2 of Attachment 19. At a minimum, containers are inspected for leaks and the condition of labels on a daily basis and for container condition, cracks in protective coatings or sealants and excessive dirt or debris on a weekly basis.

F-2d(1)(a) Container Inspection Schedule

The container inspection schedule is shown in Table F-1 and is discussed in more detail in Section 4.2 of Attachment 19.

F-2d(1)(b) Corrective Actions for Containers and Secondary Containment

Corrective actions for problems encountered with container condition and management and secondary containment for containers are described in Table F-2 and in Table A-~~7~~8, Appendix A of Attachment 19. Remedies such as repairing cracks in secondary containment will be implemented within 72 hours. Remedies to prevent spills will be devised so as not ~~ne~~to reduce secondary containment volume. Any spilled or leaked material resulting from remedial repairs or procedures will be immediately removed from secondary containment.

Comment [BN2]: Correction made.

F-2d(2) Tank System Inspections and Corrective Actions

640(6) and (7)

Inspection procedures for tank systems are addressed in Section 4.3 of Attachment 19.

F-2d(2)(a) Tank System Inspections

806(4a)(v), 640(6)

Inspection Procedures

Tank systems used to treat or store dangerous waste will be inspected for deficiencies or signs of potential deficiencies on a daily, weekly, monthly and annual, biannual (or other approved frequency) as specified in the WAC 173-303-640. Tank systems include the tanks and ancillary equipment, such as pipes, sumps and secondary containment system. Tank systems will be inspected according to the summary schedule and procedures provided in Section 2.0 of Attachment 19 and Appendix A of Attachment 19.

Checklists completed for each inspection frequency are documented in the facility operating record.

On a daily basis, the inspector shall visually check the exterior surfaces of each tank and the surrounding areas (ground surface, supporting blocks, concrete) of all permitted facility tanks storing hazardous waste to detect corrosion, and to ensure that there exists no evidence of leaks or releases or the potential for possible leaks or releases. The inspector shall inspect the tank areas for problems such as discolored surface appearance, corrosion, leaks, peeling point, pooled liquid, or running liquid. Overfill control devices including level sensors, high level alarms, ~~automatic feed cut-off~~ or by-passes to stand-by tanks, identified in Attachment 19, Appendix A, Table A-1, will also be inspected daily.

Comment [BN3]: GasVit related.

Surfaces and sealants of the secondary containment area will also be checked to ensure that there exists no evidence of leak, corrosion, cracks or deterioration.

At least once every seven days, the inspector shall inspect the liquid level in all hazardous waste tanks. The inspector looks into each tank or at the tank level gauges to determine the level of liquid in the tank, and whether the liquid level is at or above the point alarm level. If the liquid is above the alarm level, the inspector documents whether the alarm was functional. The inspector also checks the overfilling detection equipment by either engaging an internal self-checking mechanism or by simulating an overfill condition.

Tank System Integrity Testing

At least once during the first 365 days after installation, the inspector checks the interior and exterior of the tank using appropriate means of lighting, assistance, and access. The inspector will examine the tank for evidence of corrosion, wall thinning, erosion, rusting, cracking, peeling paint, distress, and discoloration.

Before an internal inspection is done, the tank shall be emptied and decontaminated. The internal surface area will be inspected visually for corrosion, erosion, cracks, leaks and pitting of the tank sides and bottom using a fiber-optic television camera or by visual internal inspection using confined space entry procedures. Wall thinning may be assessed by a qualified independent contractor using an ultrasonic sensor or another such device which measures wall thickness. The inspector shall attach the written results of testing to the ~~checklist~~operating record. Tank entry requires a minimum of two people to ensure immediate response in an emergency. Prior to tank entry, the tank shall be decontaminated. ~~The results of the testing will be presented in a written report to the Department of Ecology within 60 days of performing the assessment.~~

Comment [BN4]: Not required by WAC 173-303-640

Subsequent integrity testing will be performed according to a schedule based on the recommendation of a qualified, independent professional engineer whose assessment will be based on the previous integrity assessments over the life of the tank, the age of the tank system, the materials of construction and the characteristics of the waste.

F-2d(2)(b) Tank Systems - Corrective Actions

640(7)

When there has been a leak or spill from a tank or a tank system the following actions will be taken:

- Flow of waste into the system will be stopped
- Waste will be removed from the system within 24 hours
- Visible releases to the environment will be contained
- Non-exempt leaks or spills will be reported
- The system will be closed, repaired, or provided with secondary containment
- Major repairs will be certified before the tank system is returned to service

F-2d(3) Storage of Ignitable or Reactive Wastes

806(4)(a)(v), 395(1)(d)

Inspection of areas where water-reactive or ignitable waste storage containers and treatment tanks are located will be conducted on an annual basis as described in Section 4.3.3.2 of Attachment 19. The inspector of these waste storage areas shall be the plant engineering supervisor who shall be knowledgeable of the Uniform Fire Code and be trained in accordance with the procedures outlined in Section H. Records of these inspections shall be made in accordance with the record keeping requirements described in Section 6.0 of Attachment 19. Documentation will include the following:

- Date and time of inspection
- Name of inspector
- Observations and notes from the checklist

Any remedial actions required or taken, with date of inspections will also be documented and placed in the facility operating record.

An example of the annual checklist addressing the storage of ignitable and reactive wastes in tank systems is presented in Appendix B of Attachment 19. On an annual basis, the inspector shall ensure that storage and treatment operations for incompatible reactive and ignitable wastes are provided in a manner that segregates these wastes from incompatible wastes or water and from sources or conditions promoting ignition. This will be accomplished by inspecting checklists and the operating record for any operational changes during the year that may have compromised waste segregation requirements.

F-2d(4) Air Emissions Control and Detection - Inspections, Monitoring, and Corrective Actions

Applicable procedures for inspection, monitoring, and corrective action for specific closed vent systems and control devices, equipment leaks and tank and container systems at the MWF are described in the following sections.

F-2d(4)(a) Process Vents

Inspections of process vents and control devices are required if these devices are used to meet the requirements of Part 264 Subpart AA which addresses venting from the treatment of wastes having an organic concentration exceeding 10 parts per million by weight (ppmw). The dryer system (TP-8) in the STB is the only unit covered by this regulation. The MWF operates such that the total air emissions from the dryer process vent subject to Part AA regulations meets limits without air pollution control devices. Re-evaluation of the status is required annually. A description of this process vent and compliance requirements is presented in Section D-8(1)(a).

F-2d(4)(b) Equipment Leaks

The standards of 40 CFR Subpart BB (Air Emission Standards for Equipment Leaks) are applicable to *equipment* that contains or contacts hazardous wastes with organic concentrations of at least 10 percent by weight that are managed in units that are subject to the permitting requirements of 40 CFR § 270, or recycling units that are located at facilities otherwise subject to these permitting requirements. *Equipment* is defined at 40 CFR § 264.1031 as each valve, pump, compressor, pressure relief device, sampling connection system, open-ended valve or line, or flange, and any control devices or systems.

~~The continuous liquids feeder pump and associated valves and flanges for the GasVit unit contact dangerous waste containing at least 10 percent by weight organic content, and are therefore subject to Subpart BB standards.~~ No ~~other~~ equipment at the MWF is subject to 40 CFR Subpart BB.

~~Based on currently available information on anticipated waste streams, the feeder pump will be in both light liquid service and heavy liquid service, as defined at 40 § 264.1031 and is, therefore, subject to the requirements of 40 CFR § 264.1052 and 40 CFR § 264.1058. An open-ended valve, as defined at 40 CFR § 264.1031, will provide access for sample collection from the waste stream between the feeder pump and the GASVIT unit. This open-ended valve is subject to the requirements of 40 CFR § 264.1056. The liquid feeder system will not operate in gas/vapor service.~~ A~~n a~~nnual re-evaluation of the applicability of Subpart BB Standards to the equipment will be conduced annually. See Section D-8b(1)(c) for details.

Procedures for ensuring compliance, marking equipment and ensuring records are up to date are described in Section D-8b(2)(a); and in the RCRA Leak Detection and Repair Plan in Appendix C of the Inspection Plan (Attachment 19). The portable organic gas analyzer will be inspected to ensure

that it is calibrated and operates properly. The procedure and a description of the analyzer are presented in Attachment 14.

F-2d(4)(c) Tanks and Containers

The required inspections and monitoring will be conducted as described in Sections 4.2, 4.3, and 4.4 of Attachment 19. The inspections and monitoring will include tank systems and containers identified below:

F-2d(4)c Tank Systems

- System TP-04, Liquid Treatment
- System TP-06, Liquid Holding
- System ~~GV-02, Liquid Feed~~TP-16, Evaporation System
- System GV-11, Secondary Waste Treatment.

The above systems are defined in the process engineering descriptions for the Stabilization building (STB) and ~~GASVIT~~ Mixed Waste Thermal building (~~GVB~~MWTH), Attachments 5 and 6, respectively. Waste acceptance criteria and limitations for these tank systems are described in Attachment 1, Waste Analysis Plan (WAP).

Process flow diagrams for the tank systems are included in Attachment 7, Construction Drawings. All processes within the MWF are batch processes except the evaporation process which is semi-continuous. Tank systems have independent control mechanisms. Control requirements for each tank system are discussed in Attachments 5, Process Engineering Description for Stabilization Building, and Attachment 6, Process Engineering Description for ~~GASVIT~~ MWTH Building. Additionally, tank system vendors provide P & ID for the components of the tank systems they supply no later than at the time of purchase. Additional details are provided in Section D-2. The control instrumentation subject to inspection will include:

- level sensors
- level switches
- level alarms
- flow measurement and controls
- ~~automatic shut-off valves~~
- motor control devices
- ~~weight sensor~~
- temperature monitoring regulation and controls

Secondary containment for tank systems in the MWF consists of a flat stainless steel pan that is secured directly beneath the tank system. Secondary containment for the evaporation system (TP-

16) consists of a concrete containment with a capacity exceeding the largest tank (i.e. 10,950 gallons). The pan free volume is designed to contain 110% of the volume capacity of one tank. The free volume in the secondary containment space takes into account the space occupied (e.g., displaced volume) by the tank support structure and any equipment that is placed inside the containment area during the normal operation of the system.

As part of waste acceptance, all wastes and proposed treatment agents are assessed for compatibility with materials of construction in the tank systems selected for holding and treatment. This assessment is routine and is based on process knowledge, treatability test results and equipment and reagent vendor information. Before processing waste, a process data sheet is used to evaluate the compatibility of the tank material of construction with the planned ~~chemical adjustment~~ process as defined in Attachment 1, Waste Analysis Plan.

F-2d (4) (c) Containers

The Mixed Waste Facility (MWF) will accept waste materials in a variety of containers appropriate for the physical matrix of the waste - for example, drums and intermediate bulk liquid containers for liquids and free-flowing particulate solids; B-25 boxes for soil and gravel; and International Standards Organization (ISO) cargo containers for loose debris.

The MWF will also accept a wide variety of low-level mixed waste from both commercial and government generators. This waste will be in a variety of physical forms, including liquids, powders, soil and gravel, debris, lab packs, metal, and other forms

The MWF will provide secondary containment systems for areas in which containers hold free liquids ~~or wastes with the designations F027, whether or not these F-wastes hold free liquids~~. The facility will also provide secondary containment systems for wastes exhibiting the characteristics of ignitability or of reactivity as described in WAC 173-303-090(5) and (7). As these types of waste may be handled in any of the tank systems (except tanks T-101 through T-105), each such tank system in the facility includes one or more secondary containment systems. Containment requirements for both the WSB and the STB are discussed in Section D-1. Secondary containment areas for wastes containing PCBs must hold the greater of twice the volume of the largest container in a storage area or 25% of the volume of all the containers in the storage area.

F-2d(5) Waste Pile Inspection

Wastes piles are not being permitted.

F-2d(6) Surface Impoundment Inspection

Surface impoundments are not being permitted.

F-2d(7) Landfill Inspection

Landfills are not being permitted.

F-2d(8) Land Treatment Facility Inspection

Land treatment is not being permitted.

F-3 PREPAREDNESS AND PREVENTION REQUIREMENTS

806(4)(a)(vi), 340

This section documents the preparations and preventive measures to help avoid or mitigate the possibility of a fire, explosion, or any unplanned release of dangerous waste or dangerous waste constituents that could threaten human health or the environment.

F-3a Equipment Requirements

340(1) and (2)

The following sections describe the internal and external communications and emergency equipment to be used at the MWF. The locations of preparedness and prevention equipment are shown in Figure ~~6~~5, Attachment ~~15~~ GG (Contingency Plan) of the Permit.

F-3a(1) Internal Communications

Alarm systems, two-way radios, and telephone lines ~~will be established~~are available for internal communications at the MWF. All of these systems can be used to summon internal emergency assistance. Whenever dangerous waste is being handled, all personnel involved will have immediate access to the telephone and alarm systems that will allow notification of the Emergency Coordinator in the event of an emergency situation. There will always be at least two employees at the MWF.

F-3a(2) External Communications

Fire and radiation alarms monitoring conditions at the MWF will summon direct response from the Richland Fire Department. The telephone system can be used to access emergency assistance by dialing the emergency number 911. In addition, a cellular phone will be available for external communications on an as needed basis.

F-3a(3)Emergency Equipment

A fire hydrant ~~will be~~is located in the main yard of the MWF. The MWF design includes portable fire extinguishers, spill control equipment, and decontamination equipment located

throughout the facility. Several types of fire extinguishers are available in the MWF and are located in areas considered appropriate based on the waste being handled or the equipment in use. The list of emergency equipment is provided in Table 5 of Attachment 15.

To minimize the combustible loading, the building design ~~will make~~ uses of components of fire resistant and noncombustible material wherever possible, particularly walls, partitions, columns, beams, floors, and roofs. Other building design components such as suspended ceilings, pipe and duct insulation, adhesives, and other such materials ~~will be~~is made of low or noncombustible substances. Any concealed spaces will contain a minimum number of combustible materials. To minimize flame-spread potential, the building design ~~will~~ includes cable enclosures, non-flame propagating electrical insulation, and fire stops in the penetrations through walls, floors, and ceilings.

Emergency eye washes and safety showers ~~will be~~is distributed strategically throughout the MWF for emergency situations involving dangerous materials. For personnel decontamination in emergency situations, an area will be designated. Personnel will be issued with respirators that will be stored in an area convenient to the work station.

F-3a(4)Water for Fire Control

The primary water supply for fire protection ~~will be~~is supplied ~~from~~ by the City of Richland water systems. Water ~~will be~~is supplied to the MWF fire hydrant through an underground pipeline that ~~will~~ is tied into existing water mains. All underground installations will be in accordance with National Fire Protection Association, Code 24 (NFPA 1989).

For fires requiring high water volume and pressure, additional water for fire control at the MWF ~~will be~~ is supplied by the Richland Fire Department. Each fire station normally has a truck equipped with a hydraulically operated aerial ladder, and one pumper (a backup fire engine without a boom, in case the aerial ladder is inoperable). Fire engines have a pumping capacity of at least 1,500 gallons of water per minute. Fire engines are also equipped with other fire protection equipment which use chemicals rather than water as an extinguishing media.

F-3b Aisle Space Requirement

340(3)

Aisle spacing will be based on WAC 173-303-630(5)(c), National Fire Protection Association, Code 101 (NFPA ~~1989~~2012), or other appropriate national building standards. Daily inspections will ensure that all areas, including aisle ways, are maintained in a manner that allows for unobstructed movement of personnel and equipment (e.g., fire protection equipment, spill control equipment, decontamination equipment) that may be required to respond to any emergency event. At times operation and maintenance activities may cause obstructions, but daily inspections will ensure that unnecessary obstructions are removed in a timely manner. Details of inspections that will demonstrate adequate aisle space are included in Section 4.2.2.2 of Attachment 19.

F-4 PREVENTIVE PROCEDURES, STRUCTURES, AND EQUIPMENT

896(4)(a)(viii)

Hazard prevention systems in the STB, ~~GVB~~ MWTH and WSB are summarized in tables F-3 and F-4. In the following section, procedures, structures and equipment used to prevent key potential hazards are described.

F-4a Unloading Operations

The following methods will be implemented to minimize the potential for puncturing or opening containers during waste unloading, waste packaging, and loading:
Containers will be inspected for damage before being loaded.

Waste containers will be handled by appropriate equipment such as a forklift or crane during unloading. Off-site generator or onsite generating units will be required to provide rigging and instructions for unloading packages requiring special handling. Containers will not be stored in the unloading area. Floor in the receiving area(s) ~~will b~~are sloped towards blind sumps to collect any spills that might occur during unloading operations. Hazardo0us wastewaters received in tanker trucks will be unloaded using flexible hose to connect truck outlets to the hard-piping leading to the wastewater storage tanks (T-101 through T-104). Personnel will be present during unloading processes to check for any leaks.

F-4b Prevention of Run-Off

Structures and equipment to prevent run-off and flooding at the MWF ~~will be~~is -included in

the facility design in accordance with the safety requirements of WAC 173-303. To prevent run-off and subsequent releases, dangerous waste and hazardous chemical handling areas ~~will~~ include design features such as secondary containment structures to contain spills, leaks, wash water, and precipitation.

The liquid waste handling areas in the STB include a system of bermed areas, drains, and sumps to provide for containment of leaks, spills, and overflows of dangerous waste. The ~~GASVIT~~ MWTH building has a coated concrete floor with a 6 to 12-inch high perimeter curbing to provide a secondary containment system in accordance with RCRA standards. The floor is constructed with expansion joints to prevent cracking and is coated with a chemical-resistant coating designed to prevent break through of the most reactive chemical stored for a minimum of three hours. Spills will be contained within the secondary containment floor and directed by the sloped surface toward a ~~dry~~ blind sump ~~with a leak sensor and an alarm~~. In case of a spill, the plant operators will immediately implement corrective measures to stop the leaks and contain and cleanup the spilled substance.

Details of secondary containment design, construction and volume calculations are provided in Sections D-1 and D-2 and Attachment 7 (Construction Drawings).

F-4c Prevention of Contamination of Water Supplies

The MWF ~~will be~~is designed and operated to safely contain wastes and prevent the contamination of water supplies. The MWF ~~will be~~is inspected regularly for the present of leaks or other abnormal conditions with potential to affect water supplies. The structures and equipment included in the facility design to prevent contamination of water supplies ~~will be~~are the same as the structures and equipment used to prevent run-off from dangerous waste handling areas (see Sections D-1 and D-2).

F-4d Equipment Failure and Power Outage

~~A 750 KVA~~ Three diesel generators provide~~s~~ emergency backup power for critical components associated with both the STB and the ~~GVB~~ MWTH in the event of power outage. Systems supported by the emergency generator for maintenance of safe operating conditions, including treatment of dangerous in-process waste and vent gases, are shown in table F-5. Emergency power requirements, summarized in table F-6, show that the generator is sized to meet the

expected load in an emergency situation that results in a power outage.

In the event of equipment failure or power outage, the general safety features and additional safety features associated with the ~~GasVit~~ MWTH building are presented below.

F-4d(1) General Safety Features

To minimize random failure of equipment, preventive maintenance and surveillances ~~will be~~are performed. The batch nature of the MWF systems (except evaporation), coupled with in-process surge storage capabilities, will minimize process downtime and allow for preventive maintenance.

To minimize random failure of equipment, only commercially available and proven equipment will be used. Equipment operational data will be used to predict expected reliability of equipment. New equipment will be tested to establish confidence in operational life and maintainability. Based on equipment information, replacements will be made available before equipment reaches its expected design life.

The design and layout of the process systems will enhance physical access for operation and maintenance. Redundant equipment and systems will be provided for crucial systems which run continuously during process operations, and spare parts will be maintained for essential production and safety equipment.

F-4d(2) ~~GASVIT™~~MWTH Building

~~The GASVIT thermal unit will include features to ensure that the process will safely shut down if a critical utility or key component were to fail or a subsystem were to malfunction. Utility failure may include interruption of electricity, service water, process/instrument air, steam or nitrogen. Failure of a key component could include refractory failure or glass drain valve failure. Potential subsystem malfunction may be related to one or more utility and component failures and may include fire in the screw feed hopper, loss of process cooling water, loss of chilled water, loss of exhaust quench, loss of RO water treatment, natural gas leak and loss of electrode heating. A description of safety features to prevent hazards resulting from incidents described above is presented in the following sections.~~

~~F-4d(2)(a) Automatic Safe Shutdown~~

~~The GASVIT™ will have an automatic waste feed cut-off (AWFCO). A computerized control system connected to a series of sensors will automatically shut the system down in the event of a process condition discrepancy or key component failure. (Text deleted.)~~

~~F-4d(2)(b) Post Shut-Down Syngas Handling~~

~~Once a safe shutdown is initiated, feedstock will cease entering the chamber and power to the plasma arc will be cut off. The chamber's refractory walls and the molten bath will contain sufficient thermal energy to gasify up to approximately 9 kilograms (20 pounds) of the waste remaining in the chamber. Process calculations show that after the shutdown, gasification will continue for approximately 3 minutes. The system will continue to process the syngas produced as follows: 1) the syngas fan powdered by an emergency power system will move the residual syngas through the cleaning process; 2) the flow of syngas will ensure that the first-stage filter will perform its basic function; 3) the quench tank will revert to its back-up water supply to quench the gas, 4) the scrubber tank will have sufficient reserve capacity to supply the water and sorbent needed to scrub the residual syngas; 5) the converter heat exchange media will have sufficient thermal energy to convert the residual syngas into carbon dioxide and water; and 6) the building ventilation fan, powered by an emergency power unit, will perform the normal HEPA/charcoal filtration and discharge of the converter effluent.~~

~~F-4d(2)(c) Protection Against Pressure Surges~~

~~The system will also ensure safe shutdown in the event of a rapid or instantaneous pressure surge. Such a pressure surge could be caused by an inadvertent introduction of a high energy feedstock or air inleakage into the process chamber or a premature oxidation of syngas in the low temperature sections of the syngas cleaning components, such as the scrubber.~~

~~A pressure surge in the process chamber will be released through the emergency seal relief seal pot. The process chamber and waste feed units will be purged with nitrogen. Oxygen monitors located in the process chamber will signal a shutdown of the system if oxygen is detected.~~

~~A pressure surge in the scrubber or other units in the syngas train could occur as a result of air intrusion combined with the presence of an ignition source such as a spark- a double event scenario which is highly unlikely. To prevent such an event, both air in-leakage prevention and spark arrest features will be included in the design. As an additional safety measure, rupture discs will be installed at the scrubber and quench tanks. In the event of an air/syngas reaction, the pressure surge will cause the rupture disk to open, releasing pressure to a separate duct connected to the inlet of the converter. Any relieved gas will be oxidized in the converter and filtered by the HEPA/charcoal filters before it is released. The pressure surge will also activate the safe shutdown, as discussed above. Before restarting the system after any such shutdown, the rupture disc will be replaced.~~

~~F-4d(2)(d) Protection Against Syngas Leakage~~

~~The GASVIT™ process will operate at a negative pressure with respect to the room pressure. As an additional safety measure, sensors will be located outside the process lines to detect and alert the operators of any syngas leakage.~~

~~During the demonstration test and subsequent operations. The GASVIT™ system will be periodically monitored for leaks as described in Section 4.4.2.1.1 of the Inspection Plan included in Attachment 19.~~

Evaporator System:

Each evaporator is equipped with KOYO DL06 Micro-PLC in conjuction with the C-more Micro operator panel controls which display all of the functions on the evaporator and its accessories. By reading the display on the panel, an operator can quickly see if the evaporator is operating properly and can schedule maintenance procedures easilgy based on the displayed information. Each evaporator has set points established for proper operation. These set point include:

- Low air pressure
- High air pressure
- High water temperature
- Blower shut-off

Each evaporator screen will display operational alarms (alarms while the evaporator is operating) and deagnotic alarms (hardware-related alarms). In case of a power outage, the evaporator process will continue with the emergency generator power until the operator discontinues operation.

F-4e Personal Protective Equipment

Personal protective equipment (PPE) is used by all personnel working at the MWF. The level of protection is selected to be commensurate with the work being performed. The minimum level is level E (safety glasses, hard hat etc.). Occasionally additional personal protective equipment will be required for employees working with hazardous chemicals or dangerous waste, and in activities that might result in unnecessary injury or illness because of exposure. The process data sheets will identify the PPE for the specific operation. Under normal operations, minimal PPE requirements are expected throughout the MWF. The requirements may be upgraded depending on the operation and waste type. A detailed description of PPE availability and its use may be found in Section 6, Attachment 15. A summary of key equipment and usage follows:

Foot Protection

Prior to the start of any operation that might expose employees to the risk of foot injury, a review of the operation will be performed to ensure that the appropriate foot protection is available and used.

Eye and Face Protection

Each work area ~~will be~~is evaluated to determine the need for eye and face protection, and signs reading "Eye Protection Required" ~~will be~~are posted at access points to appropriate areas, as necessary. Flexible-fitting goggles with hooded ventilation or a face shield with spectacles ~~will be~~is worn for chemical handling with potential for splashing, acid burns, fumes, or glass breakage. Eye and face protection will be provided for personnel when they are located in areas or assigned to tasks where a potential for eye and face injury exists.

The MWF design ~~will~~ includes eyewash stations and safety showers in all locations where liquid chemicals are used or liquid wastes are managed and there is potential for contact.

Respiratory Protection

Under normal operations, fugitive emissions to the building are expected to be insignificant. Exposures to toxic particulates, fumes, mists, gases, and vapors will be controlled by accepted engineering and/or administrative controls ,wherever possible. Respiratory protection will be used only

when effective engineering or administrative controls are not feasible.

All respirators will be approved by the National Institute for Occupational Safety and Health (NIOSH) and the Mine Safety and Health Administration. The type of respirator used will be based on a thorough evaluation of the job and associated hazards. The proper respirator to be used for each respiratory hazard will be specified in the MWF work procedures.

Protective Apparel

Employees will be required to wear protective clothing that covers their legs, trunks, and shoulders when performing physical work at the MWF, unless job hazards dictate more stringent protective measures. Material safety data sheets and procedures will outline protective apparel requirements.

Head Protection

Employees working in locations where there is a potential for falling or flying objects will be required to wear adequate head protection. Hard hats can be worn to satisfy this requirement. The MWF personnel will evaluate work areas for potential hazards, clearly designate head protection areas, and strictly enforce the use of protection in designated areas.

Additional Personnel Protection

To further minimize exposure to dangerous waste and hazardous chemicals, equipment design will follow guidelines such as the following:

- All loads will be securely fastened for transport, inspection, and storage.
- Design of equipment and piping will minimize any arrangement that requires employees to place extremities of the body in potential pinch point areas.
- The design will avoid personnel contact with, or exposure to, corrosive chemicals.

Table F-3: Stabilization Building (STB) Hazard Prevention Systems

Area/ Room No.	Area/ Room Name	Hazard Prevention System						
		Process Unit Controls	Secondary Contain-ment	Enclosed Process Units	Process Venting -ΔP	Personnel Radiation Monitor-	Hooded Work Station	Stack Monitor-
Yard	Main yard		X					
STB	Stabilization building	X	X		X	X		X
1	Access corridor					X		
2	Containerized waste staging				X		X	
3	Bulk container staging				X			
4	Container inspection				X		X	
5	Cutting and shearing	X			X		X	
6	Size reduction and screening	X		X	X		X	
7	Sorting and stabilization	X		X	X		X	
8	Compaction and liquid handling	X	X	X	X		X	
9	Empty container rinsing		X	X	X			
10	STB ventilation			X				
11	Reagent storage		X					
12	Interconnection corridor							
13	STB control room					X		

Table F-4: ~~GasVit~~ MWTH Building (~~GVB~~) and Waste Storage Building (WSB)

Hazard Prevention Systems

Area/ Room No.	Area/ Room Name	Hazard Prevention System						
		Process Unit Controls	Secondary Contain-ment	Enclosed Process Units	Process Venting -ΔP	Personnel Radiation Monitor-	Hooded Work Station	Stack Monitor-
~~GVB~~ MWTH	MWTH~~GasVit~~ building							X
~~1~~	~~GasVit system unit A~~Evaporators	X	X		~~X~~			
~~2~~	~~GasVit system Unit B~~Hazardous Wastewater Storage Tanks	~~X~~	X		~~X~~			
~~3~~	~~PCB Storage Area~~Evaporator sludge storage tank		X					
~~4~~	~~HAZMAT enclosure~~							
5	Electrical	X						
6	MWTH~~GVB~~ ventilation	X						
~~7~~	~~Control room~~					~~X~~		
~~8~~	~~Utility room~~							
~~9~~	~~Equipment pad (west)~~							
~~10~~	~~Equipment pad (east)~~							
WSB	Waste storage building		X					
1	Raw waste storage		X					
2	Treated waste storage (north)		X					
3	Treated waste storage (south)		X					
4	Covered storage racks		X					

~~Table F-5 Systems Supported by the Emergency Generator & Uninterruptible Power System (UPS)~~

Comment [BN5]: Duplicate

~~SYSTEM~~	~~BACK UP POWER FUNCTION~~
~~EMERGENCY GENERATOR~~	
~~STB~~	
~~HVAC to all systems except container rinse (TT-6) and liquid holding (TP-6)~~	~~To maintain dust/vapor collection~~
~~TT-1 Container Staging~~	
~~TT-2 Bulk Staging~~	
~~TP-1 Size Reduction~~	
~~TP-2 Cutting/Shearing~~	
~~TP-3 Sorting~~	
~~TP-4 Liquid Treatment~~	~~To maintain power to vapor collection hoods and mixer, and prevent heat buildup~~
~~TP-5 Filter~~	~~To maintain power to vapor collection hoods~~
~~TP-6 Liquid Holding~~	~~No anticipated hazard~~
~~TP-7 Compaction~~	
~~TP-8 Dryer~~	
~~TP-9 Liquid Consolidation~~	~~To maintain power to vapor collection hoods~~
~~TT-1 Bulk Mixing~~	~~To maintain power to the mixer and prevent waste solidification in tank~~
~~TT-2 Solids Mixing~~	~~To maintain power to the mixer and prevent waste solidification in tank~~
~~TT-3 In-Container Mixing~~	~~To maintain power to the mixer and prevent waste solidification in tank~~
~~TT-4 Polymer Mixing~~	~~To maintain power to cooling water pump and prevent overheating~~
~~TT-5 Physical Extraction~~	
~~TT-6 Container Rinse~~	~~No anticipated hazard~~
~~GVB~~	
~~Plasma Electrode~~	~~Upon shutdown, electrodes will be lifted out of the molten bath~~
~~Blower~~	~~To maintain syngas treatment and prevent fugitive emissions.~~
~~Syngas Converter~~	~~Conversion of any gas generated in the process chamber~~
~~Scrubber~~	~~Maintain offgas flow and scrubbing to minimize emissions~~
~~Pumps~~	~~Maintain cooling of the process chamber and offgas system components~~
~~Feed System~~	~~Close feed cut-off valves~~
~~Monitoring Devices~~	~~Monitor and control GASVIT system temperature and pressure parameters.~~

Table F-5 Systems Supported by the Emergency Generator & Uninterruptible Power System (UPS)

SYSTEM	BACK UP POWER FUNCTION
EMERGENCY GENERATOR	
STB	
HVAC to all systems except container rinse (TT-6) and liquid holding (TP-6)	To maintain dust/vapor collection
TT-1 Container Staging	
TT-2 Bulk Staging	
TP-1 Size Reduction	
TP-2 Cutting/Shearing	
TP-3 Sorting	
TP-4 Liquid Treatment	To maintain power to vapor collection hoods and mixer, and prevent heat buildup
TP-5 Filter	To maintain power to vapor collection hoods
TP-6 Liquid Holding	No anticipated hazard
TP-7 Compaction	
TP-8 Dryer	
TP-9 Liquid Consolidation	To maintain power to vapor collection hoods
TT-1 Bulk Mixing	To maintain power to the mixer and prevent waste solidification in tank
TT-2 Solids Mixing	To maintain power to the mixer and prevent waste solidification in tank
TT-3 In-Container Mixing	To maintain power to the mixer and prevent waste solidification in tank
TT-4 Polymer Mixing	To maintain power to cooling water pump and prevent overheating
TT-5 Physical Extraction	
TT-6 Container Rinse	No anticipated hazard
~~GVB~~MWTH	
~~Plasma Electrode~~Evaporators	~~Upon shutdown, electrodes will be lifted out of the molten bath~~Evaporation process will continue until the operator shuts the unit down or if the set points are exceeded.
~~Blower~~	~~To maintain syngas treatment and prevent fugitive emissions.~~
~~Syngas Converter~~	~~Conversion of any gas generated in the process chamber~~
~~Scrubber~~	~~Maintain offgas flow and scrubbing to minimize emissions~~
~~Pumps~~	~~Maintain cooling of the process chamber and offgas system components~~
~~Feed System~~	~~Close feed cut-off valves~~
~~Monitoring Devices~~	~~Monitor and control GASVIT system temperature and pressure parameters.~~
Instrument Air	Maintain operation of instruments and air operated devices.

Table F-5 Systems Supported by the Emergency Generator & Uninterruptible Power System (UPS)

SYSTEM	BACK UP POWER FUNCTION
UNINTERRUPTABLE POWER SUPPLY	
STB	
Alarm Panel	UPS maintains the integrity of the settings and logic in the control devices in the event of a power failure.
~~GVB~~MWTH	
~~Entire GASVIT System Computerized control unit including PLC1 and PLC 2~~Evaporator PLC ~~(GV-03 through GV-06)~~	UPS maintains the integrity of the settings and logic in the ~~control devices~~ evaporator PLC in the event of a power failure.
~~Converter PLC (GV-07)~~	~~UPS maintains the integrity of the settings and logic in the control devices in the event of a power failure.~~
~~Process Cooling Water PLC~~	~~UPS maintains the integrity of the settings and logic in the control devices in the event of a power failure.~~
Instrument air compressor PLC	UPS maintains the integrity of the settings and logic in the control devices in the event of a power failure.

Table F-6 Emergency Generator and Uninterruptible Power Supply Load Distribution

AREA	ITEM	APPROX. KW@.90PF	APPROX.FLA @480
EMERGENCY GENERATOR POWER SUPPLY			
	Emergency Generator		
~~GASVIT#1~~ MWTH	Evaporator WWE-01~~Process Chamber~~(including PLC)	23~~265~~	30~~355~~
	Evaporator WWE-02~~Scrubber~~(including PLC)	23~~60~~	30~~88.4~~
	~~Confinement~~	~~19.72~~	~~28~~
	~~Process Vent~~	~~15.81~~	~~23.6~~
	Service/Instrument Air	148	192
	~~Heat Recovery Boiler~~	~~20~~	~~28.6~~
	~~Process Cooling Water~~	~~14.78~~	~~22~~
	~~Chilled Water~~	~~29.6~~	~~44~~
	Non System Loads	40	56
	SUBTOTAL	~~613~~231	~~837~~308
~~2~~STB			
	Line 100 (Cooling Water)	9.86	14
	Line 300 (Extruder Cooling Pump)	7.89	14
	Misc. (Blowers/Exhaust Units)	167.65	223
	Emergency Lighting	15	30
	TOTAL	200	281
	MWF TOTALS	~~813~~431	~~1118~~820
	For 75 % Diversity Factor	~~610~~497	
UNINTERRUPTIBLE POWER SUPPLY			
AREA	**ITEM**	**APPROX. KW@.90PF**	**APPROX.FLA @208**
STB	Alarm Panel	**5**	**13.9**
	Total STB	**5**	**13.9**
~~GVB~~			
	~~Entire GASVIT System Computerized control unit including PLC1 and PLC 2 (GV-03 through GV-06)~~	~~4.4~~	~~12.22~~
	~~Converter PLC (GV-07)~~	~~2.2~~	~~6.11~~

	~~Process Cooling Water PLC~~	~~2~~	~~5.56~~
	Instrument air compressor PLC	2.2	6.11
	Total ~~GVB~~MWTH	~~10.8~~7.2	~~30~~20