SESSION 11

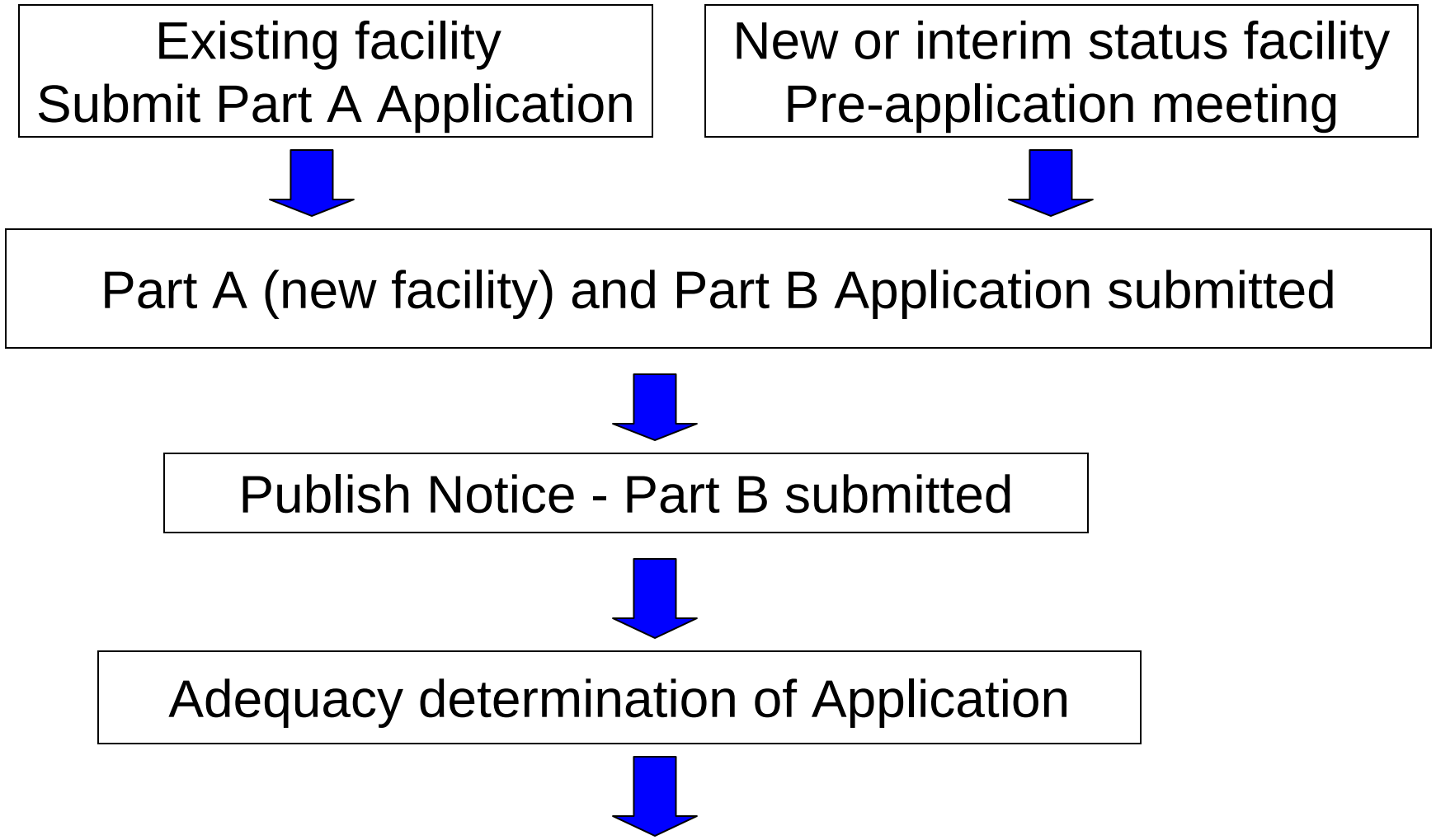
RCRA PERMIT TRAINING:

REVIEWING THE PERMIT APPLICATION

Session 11 Agenda:
Reviewing the Permit Application

- Introduction
- Checklist Section A
- Checklist Section B
- Checklist Section C
- Checklist Section D
- Checklist Section E
- Checklist Section F
- Checklist Section G
- Checklist Section H
- Checklist Section I
- Checklist Section J
- Checklist Section K
- Checklist Section L
- Checklist Section M
- Checklist Section N
- Checklist Section O

Permit Process



Permit Process

Issue draft permit or intent to deny permit

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Public notice – 45 days for comments

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Public hearing if requested or or if any adverse comments

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Final decision and response to comments

Contents of the Permit Application

- Overview of the two parts of the permit application:
  - Part A application - is standard form (Form 8700-23) for reporting basic information about the facility and the hazardous waste management units
  - Part B application - contains detailed, site-specific information about the facility location, hazardous waste management unit design and operation, and other essential facility operational requirements to ensure protection of human health and the environment
- Checklist used to review application for technical adequacy and completeness, and prepare Notice of Deficiency
- Generally conduct a completeness review first, and if complete follow with a review of the technical adequacy

Part A Application

- General information required in all applications
  - Form 8700-23
  - Activities which require the RCRA permit
  - Location, mailing address, contact info, etc.
  - Standard Industrial Classification Codes
  - Waste designation, waste codes
  - Processes used for treating, storing, disposing of wastes
  - Listing of all permits applied for or received

Part B Application

- General information required in all applications
  - General facility description (including location information, flood plain and topographic maps, traffic patterns)
  - Process description (including engineering and structural details, identification of all primary and ancillary equipment, operational procedures, monitoring devices/procedures)
  - Waste characterization
  - Procedures to prevent hazards (including security provisions, inspections, special waste management practices)

Part B Application

- General information required in all applications
  - Contingency plan
  - Training plan
  - Closure plan, post-closure plan, financial requirements
  - Information on solid waste management units
  - Compliance with other federal laws
  - Application certification
- Unit-specific information required
  - Design and operational details for each hazardous waste management unit
  - Groundwater monitoring system (if required)

Facility Description

- General Facility Description
- Topographic map that shows 1,000 feet around the units and does not exceed a scale of 1 inch equals 200 feet
- General requirements for units
  - 100 year flood plain
  - Surrounding land use
  - Wind rose
  - SWMU locations

Facility Description

- Land disposal facility information
  - Groundwater flow
  - Monitoring wells
  - Point of compliance
  - Plume locations
- Seismic requirements
  - Fault locations if any
- Flood plain requirements (only if in 100 year flood plain)
- Traffic Patterns
  - Number and type of vehicles
  - Signs and controls
  - Road surface composition

Waste characterization

- Chemical and physical analysis of waste
  - Data from waste testing
- Waste analysis plan (WAP)
  - Parameters and rationale for parameters
  - Test and sampling methods
- Unit-specific requirements
- Additional requirements for off-site facilities
- Analytical requirements to meet land disposal restrictions (LDR) standards
- As an alternative, provide documentation of process and generator knowledge

Waste characterization

- Examples of unit specific requirements

Containerized Wastes	Tank Systems	Landfilled Wastes	Land Treated wastes
- Demonstrate that waste is compatible with container materials	- Demonstrate that waste is compatible with tank system material	- Demonstrate that sorbent materials are non-biodegradable	- Identify hazardous constituents expected to be in or derived from waste, if food-chain crops will be grown in treatment zone

EPA Test and Sampling Methods

- SW-846, Test Methods for Evaluating Solid Waste Physical/Chemical Methods
  - Must reference specific methods
  - Other references (e.g., ASTM methods)
- 40 CFR Part 261, Appendix I describes acceptable sampling methods or may petition for equivalent testing or analytical method (40 CFR 260.21)
- Sampling methods must be representative

Process Information – Container Storage Requirements

- Description of containers (including design information)
  - Numbers, sizes of containers
- Container management practices (including procedures for transferring wastes)
  - Containers closed and handling procedures
  - Aisle space and stacking height
- Container storage area containment (including containment system design, capacity, drainage, control of run-on)
- Special requirements for ignitable, reactive, or incompatible wastes
- Response to spills/leakage

Container Storage Requirements

- Compatibility of container with waste
  - Discussion of location of incompatible wastes and buffer zones for containers
- Free liquid tests
- Handling to prevent rupture or leakage
- Reaction temperatures
- Solidification/stabilization

Process Information – Tanks

- Existing tank system or component
  - Handled hazardous waste, or installation commenced, prior to July 14, 1986
- New Tank System or component
  - Installation commenced after July 14, 1986

Tank Types

- Aboveground tank - entire surface is completely above plane of adjacent surrounding surface; entire surface; including bottom, can be visually inspected
- Onground tank - bottom of tank on same level as adjacent surrounding surface; tank bottom cannot be visually inspected
- Inground tank - base below plane of ground level; not completely buried; portion of tank surface cannot be visually inspected
- Underground tank - entire surface area below ground level

New Tank Systems

- Written assessment
  - Construction design standards
  - Hazardous characteristics of waste(s)
  - Corrosion assessment
  - Protection from damage from vehicular traffic
  - Foundation conditions
- Certification of design
  - Certified engineering drawings
  - PE certification of installation
- Proper system installation, testing and procedures
  - Leak detection operation and maintenance
  - Over flow and over filling controls

Performance Standards for Secondary Containment

- Design, installation, and operation to prevent migration of wastes or liquids outside of tank system to soil, groundwater, or surface water at any time during use of system
- System capable of detecting and collecting releases until materials removed (detection within 24 hours, removal within 24 hours of detection)
- Variance from secondary containment requirement
  - Equivalent protection of groundwater and surface water
  - No substantial present or potential hazard
  - No free liquids; location inside building

Options for Secondary Containment

- External liner system
- Vault
- Double-walled tank
- Equivalent device
- Containment building
- Variance

Surface Impoundments

- Definition
  - Natural or man-made depression
  - Constructed primarily of earthen materials
  - Designed to hold liquid wastes or those with free liquids
  - Also referred to as pits, ponds, lagoons, etc.

Surface Impoundments

- Design and operation
  - Must have a liner
  - Liner must prevent migration of any wastes to surrounding soil, ground water and surface water
  - Liner must resist
    - Chemical attack
    - Forces and pressure gradients from operations
    - Physical contact with wastes
    - Climate conditions (e.g., sunlight, drying, etc.)
    - Stresses from installation and daily operations
    - Foundation must support all loads, pressures and movements (uplift and settlement)

Surface Impoundments

- New Impoundments
  - Part B application received after November 8, 1984
  - Includes new, replacement and expansion units
  - Two or more liners required
  - Leachate collection and removal systems between all liners
  - All liners meet containment requirements given above
- Exemption for alternate designs and some monofills

Waste Piles

- Definition
  - Waste is not "containerized"
  - Holds "solid," nonflowing wastes
  - Used for storage or treatment
- Design and operation
  - Must have single liner similar to surface impoundments
  - Leachate collection system above the liner
  - Run-on and run-off control
  - Wind dispersion control as needed

Waste Piles

- Exemptions for alternate designs, enclosed dry piles, replacement waste piles, and some monofills

- New waste piles
  - Applies to units newly constructed after January 29, 1992
  - Applies to expansion or replacement piles constructed after July 29, 1992
  - Two or more liners required
  - Leachate collection and removal system above top liner
  - Leachate collection and removal systems between all liners
  - Run-on and run-off control
  - Wind dispersion control as needed

Process Information

- Examples of unit specific requirements

Containers	Tank Systems	Surface Impoundments (SI)	Waste Piles
-Basic design parameters, dimensions and materials of construction -How design promotes drainage -Capacity relative to number and volume of containers	-Dimensions and capacity of each tank -Description of feed systems, safety cutoffs, bypass systems -Diagrams of piping,instrumentation, and process flow	-A list of wastes to be placed in SI - Engineering plans and report on SI design, construction, operations, and maintenance	I- A list of wastes to be placed in the waste pile -Detailed engineering plans on waste pile construction -Details of treatment process in waste piles

Land Treatment

- Definition
  - Waste applied onto or incorporated into the soil surface
  - Units are considered disposal facilities if the waste will remain after closure
- Design and operation
  - Must maximize degradation, transformation and/or immobilization of hazardous constituents within the treatment zone
  - Demonstrate effectiveness prior to land application
    - Lab analyses
    - Field tests
    - Available data
    - Prior operating data
  - Run-on and run-off control
  - Wind dispersion control as needed

Land Treatment

- Food-chain crops
  - Must demonstrate no substantial risk to human health to grow food-chain crops on unit
- Unsaturated zone monitoring required
- Special requirements for ignitable, reactive, incompatible, dioxin, furan and LDR wastes

Landfills

- Definition
  - Disposal facility where waste is placed in or on the land
  - Unit is not a
    - Surface impoundment
    - Waste pile
    - Land treatment unit
    - Underground injection well
    - Salt dome or bed
    - Underground mine or cave

- Design and operation
  - Essentially the same requirements as for surface impoundments
    - including those for "new" units
  - Plus run-on, run-off and wind dispersion control

Landfills

- Exemptions for alternate designs, replacement units, and some monofills
- Monitoring and inspections
  - Construction Quality Assurance (CQA) program must be developed and implemented during construction for workmanship and materials
  - Action Leakage Rate must be identified
  - Leakage Response Action Plan must be developed

Landfills (cont'd)

- Special requirements for
  - Ignitable and reactive wastes
  - Incompatible wastes
  - Bulk and containerized liquids
  - Containers
  - "Lab packs"
  - Dioxin, furan and LDR wastes

Containment Buildings

- Definition
  - New storage and treatment unit added August 18, 1992
  - A completely enclosed, self-supporting structure designed to contain wastes (in essence, an indoor waste pile)
  - Unlike waste piles, however, these units are not considered land disposal units in which wastes must meet land disposal requirements prior to placement
  - Used for uncontainerized waste storage or treatment
  - May be used as secondary containment for tank system

Containment Buildings

- Design and operation
  - Must be constructed of man-made materials
  - Units managing non-liquid wastes only required to have primary barrier
  - Units managing liquids must have:
    - Primary barrier
    - Liquid collection system
    - Secondary barrier
    - Leak detection system
  - Must have fugitive dust control system
  - Design must be certified by registered engineer
- Exemptions for certain wastes with limited liquid contents

Incinerators

- Definition
  - Enclosed device
  - Uses controlled flame combustion
  - Not a boiler or industrial furnace

    Unless the purpose is to destroy the hazardous waste
- Trial burn requirements
  - Trial feed based on anticipated concentrations and difficulty to destroy constituents
  - Engineering description of incinerator
  - Sampling procedures, methods, and test protocols
  - Pollution control equipment operation
  - Shutdown procedures

Incinerators

- Performance standards
  - For each Principal Organic Hazardous Constituent (POHC)
  - 99.99% destruction and removal efficiency (DRE) for most POHCs
  - 99.9999% ("6-nines") DRE for dioxins and furans
  - Control HCI and particulate emissions

- Operating requirements
  - Must operate in accordance with permit
    - Feed type and rate
    - Exhaust gases
    - Combustion parameters
  - Cannot burn hazardous wastes during start-up and shut-down conditions
  - Control exhaust and fugitive emissions
  - Provide automatic waste feed cutoff systems

Boilers and Industrial Furnaces (BIFs)

- Boilers are enclosed devices using controlled flame combustion and specific characteristics (40 CFR 260.10)
  - Recover and export thermal energy in the form of steam, heated fluid, or heated gases, and the unit combustion chamber must be of integral design

- Industrial furnaces are those designated devices that are an integral component of a manufacturing process that use thermal treatment to recover material or energy, specifically:
  - Cement, lime, phosphate and aggregate kilns
  - Blast, methane reforming, and halogen acid furnaces
  - Titanium dioxide chloride process oxidation reactors
  - Coke ovens, smelting, melting, refining furnaces
  - Pulping liquor recovery furnaces
  - Combustion devices used in the recovery of sulfur values from spent sulfur acid

BIFs

- Permitting process (266.102)
  - Trial burn plan
  - Trial burn
  - Part B permit
- Operating requirements for BIFs
  - Analysis and feed rate monitoring of all feed materials
  - Feed rate limits on hazardous waste
  - Feed rate limits on metals, chlorine, ash
  - Air pollution control system operating requirements (if applicable)
  - Continuous Emissions Monitors (CEMs)
  - Inspections
  - Proper operations of automatic hazardous waste feed cut off system
  - Record keeping provisions

BIFs

- Performance standards
  - 99.99% DRE
  - 99.9999% Dioxin
  - Limits on CO and HC in stack gas
  - Metals, HCL, and chlorine
  - Particulate matter
  - Fugitive emissions must be controlled
  - Testing and risk assessment for dioxins, furans when emissions potential is high
  - Emission standards (266.104 –266.107)

Subpart X Units (Miscellaneous Units)

- Definition of a miscellaneous unit
  - A hazardous waste management unit where hazardous waste is treated, stored, or disposed of and that is not a container, tank, surface impoundment, pile, land treatment unit, landfill incinerator, boiler, industrial furnace, underground injection well with appropriate technical standards under 40 CFR Part 264, containment building, corrective action management unit, or a unit eligible for research, development, and demonstration permit under 40 CFR 270.65

- Examples of miscellaneous units
  - Open burning and open detonation grounds
  - Salt domes
  - Burn pans

OB/OD units

- Open Burning/Open Detonation (OB/OD) Units
  - Most typical subpart X unit
  - High potential for impact as usually performed on the ground or in treatment devices that are open to the air
- Major permitting issues
  - Definition of “Potential to Detonate”
  - Containment
  - Air assessment
  - Sampling and monitoring requirements
    - Analytical issues and detection limits
    - Groundwater monitoring
    - Unsaturated zone monitoring and soil sampling
  - OB/OD units on active impact ranges

OB/OD units

- Specific Part B general standards such as the Part A, general facility information, procedures to prevent hazards, contingency plan, personnel training, are consistent with the requirement for other RCRA Part Bs

- Waste analysis plan
  - Waste characterization
  - Test methods, often on-site methods
  - Subpart X (OB/OD) units are required to evaluate treatment effectiveness – (modeling data often required)

Permitting Requirements

- Unit description (OB/OD)
  - Unit (burn pans, burn vaults, etc.)
    - Engineered diagrams and drawing (PE certification)
    - Preparation cover
  - Inspection, monitoring and maintenance plan
    - Control of deterioration of device
  - Ash and residue management
    - Collective residues, product ejection
    - Control of release of ash
  - Run-on/run-off control
    - Prevention of accumulation of precipitation

Environmental Performance Assessment

- Quality and physical and chemical characteristics of waste
- Hydrogeological characteristic of site
- Protection of groundwater
- Protection of surface water, wetlands and soil
- Air quality assessments
- Human health and ecological risk assessments
  - Risks for both existing and future contamination

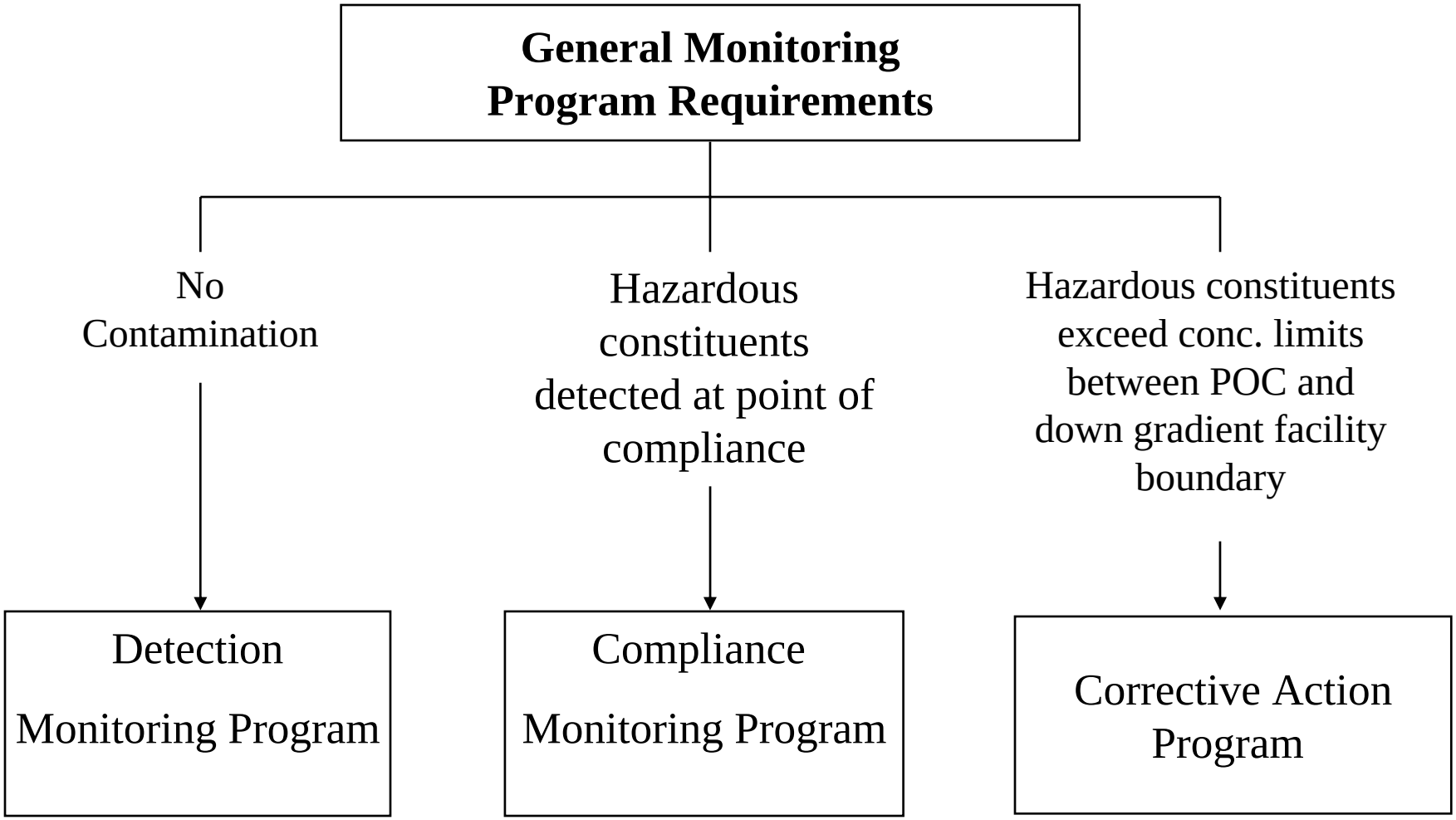
Groundwater Monitoring Requirements

- General monitoring requirements
  - Specify the point of compliance
  - Sufficient wells properly located to yield both background groundwater quality and water quality passing the point of compliance
  - Consistent sampling/analysis procedures
  - Determination of groundwater elevations during all sampling periods
  - Background groundwater quality
  - Statistical comparison procedures
  - Any other required monitoring (e.g., vadose zone, air)

Point of Compliance

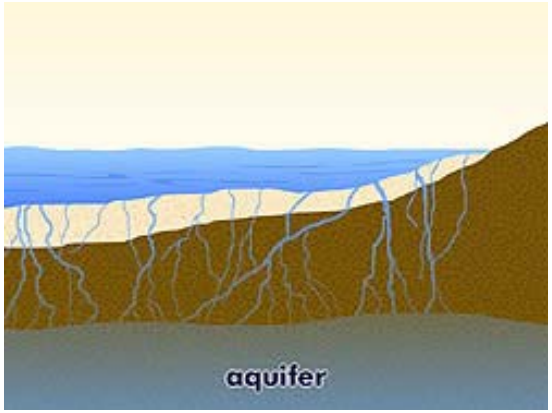
- Vertical surface located at the hydraulically down gradient limit of the waste management area that extends down into the uppermost aquifer underlying the regulated units
- Waste management area (WMA) includes horizontal space taken up by any liner, dike, or other barrier designed to contain waste in a regulated unit
- If more than one regulated unit exists, the WMA is an imaginary line circumscribing several regulated units

Groundwater Monitoring During Permit Life



Groundwater Monitoring – Contents of a Part B Permit Application

- The Part B should include:
  - Summary of interim status groundwater monitoring data
  - Identification of aquifers and associated information (e.g., groundwater flow direction and rate, interconnection of aquifers)
  - Delineation of waste management area, including the proposed POC and groundwater monitoring system
  - Description of contaminant plumes (if present)
  - Groundwater monitoring program
    - Sampling and analysis plan
    - Statistical methods
    - Contaminants of concern



Groundwater Monitoring Plan

- If detection monitoring is warranted, submit analytical parameters, proposed groundwater monitoring system, background data for each proposed monitoring parameter, sampling/analysis plan

- If compliance monitoring is warranted, submit information to establish compliance monitoring program, which may include corrective action engineering feasibility plan. Also include waste description, groundwater contaminant characterization data, analytical suite, proposed concentration limits for each hazardous constituent, sampling/analysis plan

Groundwater Monitoring Plan

- If corrective action program is warranted, sufficient information should be submitted to establish a corrective action program (unless alternate contaminant level (ACL) established), that includes characterization of contaminated groundwater, contaminant concentration limits, corrective action plan, description of how the monitoring program will demonstrate the adequacy of corrective action, and a schedule for information submittal

Procedures to Prevent Hazards

- Security
- Inspection schedule
- Equipment requirements
- Prevention procedures, structures and equipment
- Procedures for ignitable, reactive and incompatible wastes

Security

- Security procedures and equipment:
  - 24-hour surveillance system; OR
  - Barrier and means to control entry
    - Procedures and personnel
    - Location and description of equipment
    - Signs in English, posted at entrances and legible from 25 feet
  - Must be able to prevent unauthorized entry of persons and livestock
    - Ensure that physical injury from waste will not injure unknowing intruder

Inspection Schedule

- Inspection schedule for general facility requirements
  - Items to be inspected (i.e. specific types and numbers of each piece of equipment, storage locations at the facility for each item)
  - Types of problems
  - Frequency of inspection
  - Remedial actions
  - Inspection log to document inspection
  - Inspection schedule is commonly used to ensure (and verify) compliance

Inspection Schedule

- Examples of items to be inspected

Mobile Equipment
Tire/tracks
Brakes
Hydraulics
Trailer hitches
Lights-running/emergency
Horns/sirens
Engine conditions

Area
Loading area
Unloading area
Storage area
Main roadways
Gates and fences
Periphery

Emergency Equipment

Fire control equipment

Personal Protection Equipment

Spill Control Equipment

Structures
Dikes
Berms
Ramps
Lifts (elevators)
Tank support
Bases/foundations
Roofs
Walls

Communication Equipment
Telephones
Radios
Intercoms
Public address system
TV monitoring system

Inspections

- Example of inspection frequencies
  - Areas subject to spills - daily
  - Container storage areas - weekly
  - Tank systems - daily
    - Above ground portion
    - Operating data
    - Construction materials and surrounding area
  - Tank systems - schedule to be established
    - Overfill control
  - Tank systems
    - Cathodic protection, within 6 months of installation/annually thereafter
    - Compressed current, bimonthly

Inspections

- Unit specific requirements
  - Important that inspection section and process section of the checklists be cross referenced in order to ensure that the unit structure, all primary and ancillary equipment, secondary containment, monitoring equipment, and all unit specific safety equipment is accounted for in the inspection schedule

Inspections-Examples of unit specific inspection items

Containment buildings	Monitoring equipment	Leak detection equipment	Building and surrounding areas	
Tanks	Corrosion of above ground pipes and areas	Cathodic Protection	Overfill controls	Leak detection system
Landfills	Describe weekly inspections and after storms	Run-on and run-off controls	Wind dispersal system	Leachate collection system
Surface impoundments	Describe weekly inspections and after storms	Sudden drops in level of impoundment contents	Overtopping Control System	
Waste piles	Describe how waste pile is inspected daily and after storms	Run-on and Run-off control systems for deterioration	Leachate collection and removal system	Inspect wind dispersal system
BIFs	Demonstrate that the BIF will be inspected daily	Monitoring equipment	Automatic waste feed cutoff	Direct Transfer area
Drip Pads	Drip pad surface	Run-on and run-off controls	Leak detection equipment	

Equipment Requirements

- Internal communications
  - Alarms
  - Intercoms
- External communications
  - Device to summon emergency response
- Emergency equipment
  - Fire extinguishers
  - Spill control equipment
- Water for fire control
  - Sprinklers, water volume and pressure
- Aisle space requirements (movement of personnel)

Documentation of Arrangements

- Police and Fire Department
- Emergency response
- Local Hospitals

Preventive Procedures, Structures, and Equipment

- Procedures, structures, and equipment for prevention of:
  - Hazards in unloading operations
  - Runoff from waste handling areas
  - Contamination of water supplies
  - Equipment failure and power outages
  - Personnel exposure
  - Releases to atmosphere
- Precautions to Prevent Ignition or Reaction of Ignitable or Reactive Wastes
  - Separation from sources of ignition or reaction of ignitable or reactive wastes
  - NO SMOKING signs posted

Description of Management of Ignitable, Reactive, or Incompatible Wastes in Containers

- Demonstrate that containers of ignitable or reactive wastes are located at least 50 feet from site property line
- Prevent incompatible wastes from being placed in same container
- Separation or protection of containers holding incompatible wastes
- Unit specific requirements

Contingency Plan

- Contingency plan designed to minimize hazards to human health or the environment from:
  - Fires
  - Explosions
  - Unplanned releases of hazardous waste or constituents
- Self-contained document

Contents of the Contingency Plan

- General facility information
  - Facility name and location
  - Owner/operator
  - Site plan
  - Description of facility operations
- Emergency coordinators - primary and alternates
- Names, addresses, and phone numbers
- Description and location of emergency equipment
  - (e.g., fire control equipment, PPE, first aid)

Contents of the Contingency Plan

- Emergency Actions
  - Notification
  - Identification of materials

    Observation, manifest, records, analysis

    Character, source, amount, areal extent of release materials

    Hazardous waste labels

    DOT placards

    Facility Operating Record 264.73

    Instrumentation

    HNU photoionization detector

    OVA organic vapor analyzer
  - Assessment

    Assess possible hazard to human health or the environment (may include evacuation)

Contingency Plan

- Emergency procedures (cont'd)
  - Control procedures for different releases (e.g., fires, explosions)
  - Prevention of recurrence or spread of fires, explosions or release
    - How waste will be isolated, contained and/or removed
  - Storage and treatment of released materials
  - Provision for preventing incompatible wastes
  - Post-emergency equipment management

Contents of the Contingency Plan

- Description of coordination agreements
  - Fire and police departments,
  - Hospitals
  - State and local emergency response teams
- These agencies receive copies of contingency plan
- Description of evacuation plan
  - Evacuation signals
  - Evacuation routes and alternates
  - Rally points

Contents of the Contingency Plan

- Reporting
  - Note details
  - Incident report to Regional Administrator
- Contingency plan amended if
  - Plan fails
  - Permit is revised
  - Facility design or operations changes
- Unit specific requirements
  - Tank spills
  - SI Spills
  - Drip pad spills

Personnel Training

- Training Program Elements
  - Need to describe both introductory and continuing training program
  - Classroom training needs to be distinguished from on-the-job training
  - Amount of time for introductory and continuing training programs - based on specific training tasks
  - Individuals to be trained

    Supervisory personnel

    All persons handling hazardous waste

    Anyone having a role in the contingency plan, or in implementing emergency procedures related to hazardous waste

Personnel Training

- Training Program Elements
  - Description of content, frequency and techniques used in training (both introductory and continuing training)
  - Description of emergency response procedures, emergency equipment use, emergency systems
- Training Areas
  - Training program typically consists of many courses, not all of which are offered to all employees
  - Outlines showing covered topics (for both classroom and on-the-job) including hours of training and frequency of repetition, must be provided for each training course
  - A job training matrix that ensures job descriptions and course descriptions are provided for each element of the training plan can be useful

Checklist Section H

Personnel Training

- Job Training Matrix

	Intro. Haz Waste Handling Course	Intro. OSHA Course – Annual Refresher	Contingency Plan Implementation	Detailed Fire and Spill response (Initial and refresher)
Job Title 1 Forklift operators		X		X
Job Title 2 Warehouse Supervisors	X			
Job Title 3		X		X
Job Title 4			X	X

Personnel Training

- Titles/qualifications
  - Job title and job descriptions of each employee whose position is related to hazardous waste
  - Description of Training Director's qualification
  - Demonstration relevance of training to job description
- Implementation
  - Within six months of date of employment or assignment to facility or new position
  - No work unsupervised until trained
  - Annual reviews of initial training

Personnel Training

- Records
  - Job title and name of employee
  - Job description
  - Training description
  - Documentation of completion of training
  - Records kept until closure for current employees
  - Records kept three years for former employees

Closure and Post-Closure

- Closure plan
  - Documents procedures facility will follow to close permitted or interim status units
  - Sets schedule
  - Provides basis for financial responsibility
- Post-closure plan
  - Documents procedures for post-closure maintenance monitoring at permitted units where wastes will remain after closure
  - Sets schedule
  - Provides basis for financial assurance

Program Applicability

- Owners/operators are required to prepare closure or post-closure plans for hazardous waste management units
  - Closure requirements are applicable to all active units (TSD)
  - Post-closure care requirements are applicable to all units that close with waste in place

    Landfills

    Disposal surface impoundments

    Land treatment units

    Surface impoundments

    waste piles

    Miscellaneous units

    Containment buildings

    Tanks that cannot "clean close" and must close as a landfill

Types of Closure

- Clean closure and risk-based clean closure (e.g., containers, tanks)
- Close in place (e.g., landfills, land treatment units)
- Contingent closure (in the event clean closure cannot be demonstrated)
- Partial closure
  - Subject to Subpart G requirements for each partial closure event
  - Examples
    - Closure of one individual unit
  - Partial closure must be addressed explicitly in application

Types of Closure

- Note that post-closure care can now be conducted through corrective action in lieu of a post-closure permit if the following conditions are met:
  - The hazardous waste unit must be situated among SWMUs or AOCs, and both the unit and the SWMU likely contributors
  - When EPA determines that post-closure care is not necessary because the cleanup remedy developed through corrective action is deemed protective
  - When the remedy selected will satisfy RCRA Closure Performance Standards

U.S. Environmental Protection Agency. Post-Closure Permit Amendment Addresses Corrective Action. October 1998. EPA530-F-98-031

Closure Performance Standard

- Minimizes the need for future maintenance
- Identifies the specific criteria that will be used to demonstrate clean closure
- Complies with closure requirements (e.g., demonstrates successful clean closure, removal of hazardous constituents, proper installation of final cover, etc.)
- Controls, minimizes or eliminates escape of
  - Hazardous waste
  - Hazardous constituents
  - Leachate
  - Contaminated runoff
  - Hazardous waste decomposition products

Contents of a Closure Plan

- Facility description
- Time and activities required for closure
- Schedule of closure
- Estimate of maximum waste inventory that may ever be on hand
- Procedure for waste inventory removal
- Procedure for facility, equipment, structures, and soil decontamination

Content of a Closure Plan

- Any other activities necessary to satisfy closure performance standards
  - Sampling/analysis to confirm equipment and structure decontamination
  - Confirmatory soil sampling where impacts to soil may have occurred
  - Confirmatory groundwater sampling where impacts to soil and groundwater may have occurred
- Closure plan must be sufficiently detailed so that it can be implemented by a third party

Content of a Closure Plan

- Closure certification
- Survey plat for disposal units
  - Deed restrictions
- Cost for closure
- Financial assurance
- Unit specific requirements

Examples of Unit Specific Closure Plan Requirements

Tanks	Waste removal from tanks and equipment, decontamination of all equipment, disposal of wastes and residues, and maximum inventory.
Waste Piles	Procedures for determining whether decontamination has been successful, and sampling and analytical techniques.
Surface impoundments	Those with out liners or liners that do not meet requirements must provide contingent closure and post-closure plans.
Incinerators	Describe how all wastes, residues (including ash, scrubber waters and sludge) will be removed from incinerator, including ductwork, piping, air pollution equipment, etc. that have contacted waste. Or describe how the incinerator will be removed and dismantled.
Landfills	Provide engineering diagrams that describe final cover components in detail. Cover installation and construction quality assurance procedures should be thoroughly described.
BIFs	Describe how all wastes, residues (including ash, scrubber waters, scrubber sludges) will be removed from the BIF including ductwork, piping, air pollution equipment, that have contacted waste. Or describe how BIF will be removed and dismantled. Also if any wastes or components remain after closure, provide plans for closing BIF as a landfill include post-closure plan.
Containment Buildings	Demonstrate that all hazardous waste will be removed, including subsoils, structures, equipment contaminated with waste, waste residue or leachate. If any wastes, structures, etc. remain after closure provide plans for closing as a landfill and include post-closure plan.

Closure and Post-Closure Cost Estimates

- Closure cost estimates are required for all TSDFs
- Post-closure cost estimates are required for all disposal facilities based on 30 years of post-closure care
- Contingent cost estimates are required for
  - Permitted surface impoundments and waste piles without double liners
  - Tank systems without secondary containment

Scope of Closure and Post-closure Care Cost Estimates

Closure Activities	Post-Closure Care Activities
Inventory management — Transportation of off-site TSDF — On-site treatment or disposal Facility decontamination Monitoring activities Final cover installation Maintenance of security Survey plat (if applicable) Closure certification Sampling and Analysis	Monitoring Leachate management Routine maintenance Filing post-closure notices Maintenance of security Post-closure certification

Updating Cost Estimates (Overview)

- Updates required for
  - Annual inflation
  - Changes in operations or design that increase costs
  - Increased facility capacity or additional units
- Deadlines are established for annual updating of cost estimates

Information on Solid Waste Management Units

- Description of each SWMU (hazardous and non-hazardous waste units)
- Alternatively, justification for claiming no SWMUs are present
- Information on known releases
- Justification for claiming no releases have occurred

Compliance With Other Federal Laws

- Application must address compliance with other federal laws, such as
  - Wild and Scenic Rivers Act
  - National Historic Preservation Act of 1966
  - Endangered Species Act
  - Coastal Zone Management Act
  - Fish and Wildlife Coordination Act
  - Other relevant laws (e.g., Clean Air Act, Clean Water Act, etc.)

Part B Certification

- Exact wording is specified in 270.11(d)
- Required signature
  - Corporation: principal executive officer
  - Partnership or sole proprietorship: general partner or proprietor
  - Municipal, State, Federal, public agency:

    principal executive officer or ranking elected official

Subpart AA Process Vents

- Process vents
  - Any open-ended pipe or stack that is vented to the atmosphere either directly, through a vacuum-producing system, or a tank and is associated with the following:

    Distillation

    Fractionation

    Air stripping

    Thin firm evaporation

    Solvent extraction

    Steam stripping

- Manage hazardous waste with organic concentrations of at least 10 parts per million by weight

- Permitted unit, including a permitted hazardous waste recycling unit

Owners/operators affected by Subpart AA must:

- Reduce total organic emissions from all affected process vents below 3 pounds per hour and 3.1 tons per year, or
- Install control devices capable of reducing total organic emissions from all affected process vents by 95% by weight
  - Demonstrate the reduction by engineering calculations or performance tests

Closed Vent Systems and Control Devices

- For units in operation before 12/21/90 and not in compliance, owners/operators must prepare a compliance implementation schedule
- Units that began operation after 12/21/90 must comply immediately
- Control devices involve:
  - Vapor recovery (condenser or adsorber)

    Recover at least 95% by weight of the organic vapors

    Less than 95% recovery is permissible if total organic emissions from all affected process vents are below 3 pounds per hour and 3.1 tons per year (40 CFR 264.1032(a)(1))

Control Devices

- Enclosed combustion device (a vapor incinerator, boiler, process heater)
  - Recover at least 95% by weight of organic emissions
  - Achieve a total organic compound concentration of 20 parts per million (by volume) or provide a minimum residence time of ½ second at 760°C (1400°F)

- Flares must be designed and operated with:
  - No visible emission
  - A flame present at all times
  - Net heating value of at least:
    - 300 btu/scf for a steam or air-assisted flare
    - 200 btu/scf for an unassisted flare
  - An appropriate exit velocity

Requirements for Closed Vent Systems and Control Devices

- Monitoring –
  - Record flow information for each process vent stream once an hour
- Inspection
  - Inspect equipment and record readings at least once a day
- Maintenance requirements for carbon adsorption systems
  - carbon must be replaced at regular intervals
- Record keeping requirements
  - Maintain records of systems in operating record
- Reporting Requirements
  - Submit report if system operates outside design specifications

Subpart BB Equipment Leaks

- Applies to owners/operators who manage hazardous wastes:
  - In equipment that contains or contacts hazardous waste with organic concentrations of at least 10% by weight
  - In units subject to, or recycling units located on facilities otherwise subject to, the permitting requirements of 40 CFR Part 270
- Equipment includes:
  - Valves
  - Pumps
  - Compressors
  - Pressure relief devices
  - Flanges
  - Sampling connection system
  - Open ended valve or line

Subpart BB Equipment Leaks

Required activities for equipment:

- Monthly monitoring for leaks
- Record keeping and reporting requirements
- Visual inspections
- Leak Detections
  - Considered a leak if instrument reads 10,000 parts per million or greater
  - Indications of liquid dripping from pump seal
- Leak repair
  - 15 calendar days after detection unless meet exemptions

Repairs of leaking equipment may be delayed when:

- The repair is technically infeasible without a shutdown of a hazardous waste management unit
- The affected equipment is isolated from the hazardous waste management unit and no longer contains or contacts a hazardous waste system with an organic concentration of at least 10% by weight
- Repairing a valve would result in:
  - Emissions greater than those from delaying the repair
  - The purged hazardous material being collected and destroyed (or recovered) in a control device that complies with Subpart AA requirement

Repairs of leaking equipment may be delayed when

- Repairing a pump would:
  - Require using a dual mechanical seal system that includes a barrier fluid system
  - Be completed as soon as practicable, but not later than 6 months after the leak was detected

Test methods and procedures

- All leak detection monitoring must comply with Method 21 in 40 CFR 60
- Owners/operators have three choices in determining if equipment contains or contacts hazardous waste with an organic concentration equal to or greater than 10% by weight
  - ASTM methods referenced under 40 CFR 260.11 (D2267-88, E169-87, E168-88, E260-85)
  - SW-846 methods referenced under 40 CFR 260.11 (Methods 9060 and 8240)
  - Documentation of the hazardous waste characteristics or the process by which it is produced
- Use standard reference texts or ASTM D-2879-86 to determine if pumps or valves are in light liquid service

Subpart CC: Organic Air Emission Standards for surface impoundments, tanks and containers

- Applies to owners/operators who treat, store or dispose of hazardous wastes:
  - In tanks, surface impoundments, or containers subject to either Subparts I, J, or K of Part 264 and Part 265 [includes RCRA permit-exempt tanks and containers, Part 262.34(a)]
  - In affected waste management units that receive wastes on or after June 5, 1995
  - In affected waste management units where the average volatile organic concentration is equal to or greater than 100 parts per million by weight (ppmw) (based on the organic composition of the hazardous waste at the point of waste origination)

Exemptions to the Subpart CC Regulations

- A waste management unit that contains treated hazardous waste that meets the standards of §265.1083(c)(1) and (2)
- A waste management unit in which no hazardous waste was added to the unit on or after June 5, 1995
- A container with a design capacity less than or equal to 0.1m3 (approximately 26 gallons)
- A waste management unit that is used solely for the on-site treatment or storage of hazardous wastes generated as a result of remedial activities
- A waste management unit used solely for the management of radioactive mixed waste

Specific Regulatory Standards for Units

- Tanks §264.1084, §265.1085
- Surface Impoundments §264.1084, §265.1085
- Containers §264.1086, §265.1087
- Closed Vent Systems and Control Devices §264.1087, §265.1088

Inspection and Monitoring Requirements

- Each cover subject to Subpart CC must be visually inspected and monitored for detectable organic emissions semi-annually according to the procedures outlined in 40 CFR §265.1086(f)(1) through (f)(7)
- Each closed-vent system subject to Subpart CC must be inspected and monitored for leaks at least once per year, in accordance with the procedures outlined in 40 CFR §264.1033(k)
- Each control device subject to Subpart CC must be continuously inspected and monitored in accordance with the procedures outlined in 40 CFR §264.1033(f) and 264.1033(i)
- The owner/operator must develop and implement a written plan and schedule to perform all inspection and monitoring requirements

Recordkeeping Requirements

- Owner/operator must maintain the following information in the facility operating record:
  - Information, including design specifications, certification of design specifications, and assigned identification numbers, for each tank cover, surface impoundment floating membrane cover, each container enclosure and closed-vent system and control device, subject to Subpart CC
  - Test plans and results for all performance tests
  - All Method 27 test records and detectable organic emission monitoring results
  - An inspection log containing information on all detected leaks and repairs
  - Records of the management of carbon removed from carbon adsorption systems
  - A log containing the information needed to determine exemptions under Subpart CC (e.g., waste determination data)

Reporting Requirements

- Facilities must:
  - Submit a report to the Regional Administrator within 15 days for each occurrence when hazardous waste is managed in a tank, surface impoundments or container that does not comply with the Subpart CC requirements
  - Submit a semi-annual report to the Regional Administrator for each control device operated in noncompliance for a period of 24 hours or longer
- Exemption:
  - If during the semi-annual reporting period, no control devices were operated in noncompliance for a period of 24 hours or longer, a report is not required