

US EPA ARCHIVE DOCUMENT

## **SESSION 12**

### **RCRA PERMIT TRAINING:**

### **DRAFTING A RCRA PERMIT**



## Session 12 Agenda: Drafting a RCRA Permit

- ▶ Introduction
- ▶ Modules



## Introduction

- ▶ Permit development
  - Submission of the Part B application
  - Determined to be complete and/or technically adequate, based on permit writer's review
  
- ▶ Drafting a Draft RCRA Permit
  - Incorporate, by reference, or as an attachment part(s) of the application as permit conditions
  - Develop permit conditions for which those issues that were not addressed in Permit Application
  - Incorporate other information (by reference)
  
- ▶ Draft permit/final review



## Organization of the Example Permit

- ▶ General review of modules in the example permit
  - Module I - General Permit Conditions
  - Module II - General Facility Conditions
  - Module III - Containers
  - Module IV - Tanks
  - Module V – Landfills
  - Module VI - Groundwater Detection Monitoring
  - Module VII - Groundwater Compliance Monitoring
  - Module VIII - Corrective Action for Regulated Units
  - Module IX - Post-Closure



## Organization of the Example Permit

- ▶ The example permit does not have modules that address:
  - Mobile Treatment Units
  - Research, Development and Demonstration (RD&D) Permits
  - Miscellaneous Units
  - Boilers and Industrial Furnaces (BIFs)
  - Containment Buildings
  - Incineration & Short-Term Test Incineration
  - Land Treatment Operations & Demonstrations
  - Waste piles
  - Surface impoundments



## General Permit Conditions

- ▶ Effect of permit
  - Specifies where the facility is allowed to treat, store, or dispose of waste on site. Prohibits any treatment, storage or disposal not authorized by permit
  
- ▶ Permit actions
  - Permit modification, revocation and issuance and termination
  - Permit renewal
  - Permit expiration
    - Usually 10-year duration
    - Allows the permit to remain in effect after expiration date if Agency was not able to issue new permit



## General Permit Conditions

- ▶ Severability
  - Ability to sever permit
  
- ▶ Definitions
  - Usually thoroughly defined in 40 CFR, although others could be added
    - Areas of concern
    - Compliance period
    - Corrective action
    - Hazardous waste management unit



## General Permit Conditions

### ▶ Duties and Requirements

- Duty to comply (requires compliance with all conditions of the permit)
- Duty to reapply
- Duty to Mitigate
  - Minimizes release to environment
- Proper Operation and Maintenance
  - Proper operation and maintenance of system needed to achieve compliance with permit
- Duty to Provide Information
  - Requires the Permittee to submit requested information
- Inspection and Entry
  - Allows representative access to documents, allows EPA to enter and inspect facility, and monitor sampling at the facility



## General Permit Conditions

- ▶ Duties and Requirements
  - Monitoring & Records
    - Samples taken by facility have to be representative
    - Maintain records of monitoring
  - Reporting Planned Changes
    - Notify EPA of alteration in permitted facility
  - Certification of Construction
    - Only applied to new or modified facility
    - Requires submission of modification
    - PE certification



## General Permit Conditions

### ▶ Duties and Requirements

#### – Transfer of Permits

Not transferable until RA notification

24-Hour Reporting

Report any noncompliance that endangers health or the environment

Require a description of occurrence

Written submission in 5 days

#### – Other Noncompliance

Require reporting of other instances

A "catch all" condition

#### – Other Information

Another "catch all" condition



## General Permit Conditions

- ▶ Signatory Requirement
- ▶ Reports, Notifications, and Submissions to Regional Administrator
- ▶ Documents to be submitted prior to operation
  - Important section, requires submittal of any document not complete or ready at time of issuance
  - Often used for engineer as building plans
  - Groundwater monitoring data
- ▶ Confidential Information
  - Right to claim certain information confidential



## General Permit Conditions

- ▶ Documents to be Maintained at the Facility

- Waste Analysis Plan
- Permit Application
- Training Records
- Operating record
- Contingency Plan
- Post-Closure Plan, if applicable
- Annually adjusted cost estimates
- Groundwater monitoring records
- Installation records

Monitoring wells and groundwater elevation during the life of the permit

- Inspection schedules



## General Facility Conditions

- ▶ Design and Operation of Facility
  - To minimize the possibility of fire, explosions, or unplanned releases
  
- ▶ General Waste Analysis
  - Permittee shall follow waste analysis procedures described in waste analysis plan of the approved Permit Application
    - Usually referenced and incorporated into permit as an attachment



## General Facility Conditions

- ▶ Example of permit conditions, when WAP is incomplete
  - Part II General Facility Conditions
    - A. Design and Operation of Facility
    - B. Required Notices
    - C. General Waste Analysis

The Permittee shall follow the waste analysis procedures required by 40 CFR 264.13, as described in the attached Waste Analysis Plan, Permit Attachment \_\_\_\_\_, as amended herein

      - C.1. The Permittee shall incorporate into the Waste Analysis Plan the following test parameters for the waste stream identified as \_\_\_\_\_
        - i) parameter 1 (name)
        - ii) parameter 2 (name)



## General Facility Conditions

- ▶ Example of permit conditions, when WAP is incomplete

- Part II General Facility Conditions (continued)

- C.2. The Permittee shall incorporate into the Waste Analysis Plan the following SW-846 test methods for parameter 1, parameter 2, etc.

- i) SW-846 method \_\_\_\_ for parameter 1

- ii) SW-846 method \_\_\_\_ for parameter 2

- C.3. The Permittee shall sample the waste stream identified \_\_\_\_, for parameters 1, 2, etc., in accordance with SW-846 \_\_\_\_\_. The waste will be sampled in the following manner (you will need to get specific depending on site-specific issues), using \_\_\_\_ type of sample equipment

- C.4. The Permittee shall analyze the waste stream identified in permit condition II.C.1 on an annual basis



## General Facility Conditions

- ▶ Security
  - Specifies the security requirements for the facility
  - Usually referenced and incorporated into the permit
  
- ▶ General Inspection Requirements
  - Usually referenced and incorporated into permit as an attachment
  - Requires that the Permittee address any problems or malfunctions found during an inspection
  - If no Inspection schedule in application, must create permit condition
  
- ▶ Personnel training
  - Usually an attachment
  - Requires Permittee to maintain training documents



## General Facility Conditions

- ▶ Required Notices

- Hazardous waste from off-site sources

Inform generator have appropriate permits in writing

Keep notice as part of operating record

- Hazardous waste imports

Provide notice if receiving hazardous waste from foreign source

<b>HAZARDOUS WASTE</b>			
STATE AND FEDERAL LAW PROHIBIT IMPROPER DISPOSAL. IF FOUND, CONTACT THE NEAREST POLICE OR PUBLIC SAFETY AUTHORITY, THE U.S. ENVIRONMENTAL PROTECTION AGENCY OR THE CALIFORNIA DEPARTMENT OF TOXIC SUBSTANCES CONTROL.			
GENERATOR INFORMATION:			
NAME <u>UNIVERSITY OF CALIFORNIA, BERKELEY</u>			
ADDRESS <u>UNIVERSITY HALL 3RD FLOOR</u>		PHONE <u>510-642-5013</u>	
CITY <u>Berkeley</u>		STATE <u>CA</u>	ZIP <u>94720-1150</u>
EPA / MANIFEST ID NO. / DOCUMENT NO.	CA	ACCUMULATION	
WASTE NO. <u>0008</u>	WASTE NO. <u>181</u>	START DATE	
CONTENTS, COMPOSITION: <u>LEAD BATTERY CHIPS</u>			
SPECIAL STATE CODE: <u>11-01-01</u>			
PHYSICAL STATE: <input checked="" type="checkbox"/> SOLID <input type="checkbox"/> LIQUID <input type="checkbox"/> CORROSIVE <input type="checkbox"/> REACTIVITY <input type="checkbox"/> OTHER			
HAZARDOUS PROPERTIES: <input type="checkbox"/> FLAMMABLE <input checked="" type="checkbox"/> TOXIC			
DO NOT PROPER SHIPPING NAME AND UN OR NA NO. WITH PREFIX			
<b>HANDLE WITH CARE!</b>			
<small>STPLA CFW0403</small>			

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## General Facility Conditions

### ▶ Contingency Plan

#### – Implementation of Plan

Requires that the Contingency Plan in the application be referenced and incorporated as an attachment

Requires wording that specifies that the contingency plan will be implemented when there is a fire, explosion, or release

#### – Copies of Plan

#### – Amendments to Plan

#### – Emergency Coordination

Specify emergency coordinator and an alternate

Name, address, phone number of persons qualified to act as Emergency Coordinator

New facilities may need to supply this information (not hired yet). Place a permit condition also in General Standards - documents to be submitted



## General Facility Conditions

- ▶ Special provisions for ignitable, reactive, or incompatible waste
  - May or may not be an attachment, special permit conditions may be needed, sometimes very generally addressed by the applicant and more detail is needed
  - Should include specific handling procedures that are tailored to the type of waste and type of facility
  
- ▶ Location standards
  - For facilities located in sensitive locations
  - If in a sensitive area, may need special operation procedures
  - Also for facilities located in 100-year flood plain





## General Facility Conditions

- ▶ Preparedness and Prevention
  - Required equipment
  - Fire alarm system
  - Testing and maintenance of equipment
  - Access to communications or alarm systems
  - Required aisle space
  - Arrangements with local authorities
  
- ▶ General Closure Requirements
  - Performance Standard
    - Requires that the Closure Plan (in the application) be referenced and incorporated as an attachment



## General Facility Conditions

- ▶ General Closure Requirements
  - Amendment to Closure Plan
    - Whenever necessary, such as change in units, facility operations, etc.
  - Notification of Closure
    - 60 days prior to closure (landfills, surface impoundments, waste piles, land treatment units)
    - 45 days prior to closure (tanks, container, incinerators)
    - Specify unit(s) or facility to be closed
    - Partial or final closure
    - Notify Regional Administrator



## General Facility Conditions

- ▶ General Closure Requirements

- ▶ Time Allowed for Closure

  - Usually a closure schedule specified in application and then incorporated as a reference

  - Regional Administrator can grant longer time frame if needed

  - Disposal or Decontamination of Equipment, Structures, and Soils

    - Required decontamination/disposal of all contaminated equipment, structures and soils

  - Certification of Closure

    - Signed by owner/operator and independent registered professional engineer

  - Survey Plat

    - Only for disposal units

    - Submit prior to or by closure certification submission



## General Facility Conditions

- ▶ Cost Estimate for Facility Closure (and Post-Closure)
  - Revise cost estimate if closure (or post-closure) plan is changed
  - Keep most recent estimate at facility
  
- ▶ Financial Assurance for Facility Closure (and Post-Closure)
  - Demonstrate continuous compliance with 40 CFR 264 requirements
  - Changes in financial assurance mechanisms require Regional Administrator approval



## General Facility Conditions

- ▶ Liability Requirements
  - Coverage for sudden and accidental occurrences
  - At least \$1 million per occurrence, \$2 million annual aggregate (excluding legal defense costs)
  - At least \$3 million per occurrence, \$6 million annual aggregate if facility contains surface impoundments, landfills, or land treatment units
  - Regional Administrator may grant variance from above financial requirements
  
- ▶ Incapacity of Owners or Operators, Guarantors, or Financial Institutions



## General Facility Conditions

- ▶ General Post-Closure Requirements
  - Post-Closure Care Period
    - 30 years after completion of closure
  - Post-Closure Security
    - Security maintained during post-closure care period



## General Facility Conditions

- ▶ Post-Closure
  - Example of units requiring post-closure care

Regulated Unit	Dates Unit(s) Operated	Total Maximum Capacity	Description of Wastes Contained	Hazardous Waste Number
Surface Impoundment	1978 - 2001	2000 Cubic Meters	Spent Halogenated Solvents	F001
Waste Pile	1980 - 1990	3000 Cubic Meters	Spent Non-Halogenated Solvents	F005



## General Facility Conditions

- ▶ General Post-Closure Requirements

- Amendment to Post-Closure Plan

As needed

- Post-Closure Notices

Submit records of hazardous waste type, quantity, and location in each disposal unit (60 days after certification)

Record notice on deed and certification of recording of notice on deed (60 days after certification)

Obtain permit modification prior to post-closure removal of hazardous wastes, residues, liners or contaminated soils



## General Facility Conditions

- ▶ General Post-Closure Requirements
  - Certification of Completion of Post-Closure Care
    - Within 60 days of end of post-closure for each unit
    - Signed by owner/operator and independent registered professional engineer
  
- ▶ Cost Estimate for Facility Closure (and Post-Closure)
  - Most recent estimate(s)
  - Adjust for inflation within anniversary date of financial instrument or establishment (or as required by state)



## Containers

- ▶ General Description

- Reference permit application

- General discussion of activities including

- Description and dimensions of each container area

- Maximum amount and types of wastes handled

- Container description

- Description and capacities of primary/secondary containment systems

- Unique or special features

- Reference to special permit conditions



## Containers

- ▶ Permitted and Prohibited Waste Identification
  - The Permittee may store and/or treat (as applicable) the following wastes in containers at the facility as follows:

Container Storage Area	Description of Hazardous Waste	EPA Hazardous Waste Number	Maximum Volume	Maximum Number and Type of Container
CSA-1	Spent Halogenated Solvents	F001	10,000 gallons	200 - 50 gallon drums



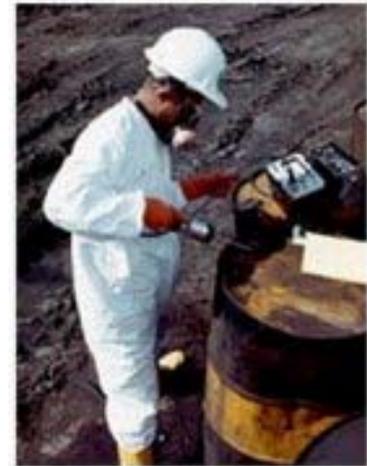
## Containers

- ▶ Condition of containers
  - Hazardous waste stored in containers that are not in good condition or begin to leak shall be stored in containers in good condition or otherwise managed to comply with permit conditions
  
- ▶ Compatibility of waste with containers
  
- ▶ Management of containers
  - Containers shall be kept closed during storage, except to add or remove waste
  - Containers shall not be opened, handled, or stored in a manner that would cause leakage or rupture



## Containers

- ▶ Containment systems
  - Included only if secondary containment is required under 40 CFR 264.175
- ▶ Inspection schedules and procedures
  - Weekly inspections
  - Detect leaking/deteriorating containers and containment systems
- ▶ Recordkeeping
  - Waste analyses, trial tests, and other compliance documents in facility operating record



## Containers

- ▶ Closure
  - Remove all hazardous waste and hazardous waste residues
  
- ▶ Special Container Provisions for Ignitable or Reactive Waste
  - Containers more than 15 meters (50 feet) from facility property line
  - Use specified procedures to prevent accidental ignition or reaction



## Containers

- ▶ Special Container Provisions for Incompatible Waste
  - Use specified procedures if placing incompatible wastes/materials in same container
  - Wash container prior to emplacing incompatible hazardous waste
  - Separate containers of incompatible wastes
  - Plans/procedures should address
    - Layout of hazardous waste storage facility
    - Aisle space
    - Stacking height of containers



## Containers

- ▶ Compliance Schedule
  - Included in permit if Permittee required to perform specific task within a specified time period (beyond other permit conditions) in order to retain permit
  - Permit writer should prepare schedule if not included in application
- ▶ Example: The Permittee shall provide the following information to the Regional Administrator

Item	Date due to Regional Administrator
Construct 2 inch curb around drum storage area	January 5, 2004



## Tanks

- ▶ General description includes
  - Brief description of each tank system including
    - Feed systems
    - Safety cutoffs
    - Bypass systems
    - Pressure controls (e.g., valves)
  - Tank system capacity
  - Location of tank system and ancillary equipment (e.g., above ground, on ground, in ground, or underground)
  - Age of existing tank system
  - Waste types stored and/or treated
  - Description of any treatment processes
  - Description and capacity of secondary containment system
  - Unique or special features of tank systems
  - Reference to special permit conditions



## Tanks

- ▶ Permitted and Prohibited Waste Identification
  - Permittee may [specify store and/or treat] a total volume of [specify number] gallons of hazardous waste in [specify number] tanks, subject to terms of this permit and as follows

### Example

Storage Tank No. and Location	Capacity (Gallons).	Tank Dimensions	Secondary Containment Required	Hazardous Waste Description	Hazardous Waste No.
Tank System A: C-10, Room B1	5,000	10 ft. (diam) x 20 ft.	In place	Waste organic solvents	F005
Tank System B: C-17, Room B1	5,000	10 ft. (diam) by 20 ft.	In place	Wastewater treatment sludge	F006
C-18, Room B1	6,000	18 ft. (diam) x 16 ft.	Due March 15, 2001	Waste organic solvents	F005

- Permittee is prohibited from storing or treating hazardous waste not identified above



## Tanks

### ▶ Secondary containment and integrity assessments

- For tank systems storing newly regulated waste without secondary containment

Permittee shall obtain a written assessment of existing tank system integrity (certified by independent qualified registered professional engineer) within 12 months of date the waste is defined as hazardous

- For tank systems with a secondary containment variance

Permittee shall design, operate, construct, and maintain tank in according to the detailed plans and engineering and hydrogeologic reports in section \_\_\_\_ of the approved permit application to maintain the variance requirements

- For tank systems with secondary containment

Permittee shall design, operate, construct and maintain tank in according to the detailed plans and engineering and hydrogeologic reports in section \_\_\_\_ of the approved permit application



## Tanks

- ▶ Secondary containment and integrity assessments

- Tanks with a schedule for secondary containment

Permittee shall comply with following conditions until required secondary containment is provided:

For non-enterable underground tanks and annual leak test (or other RA-approved tank integrity method) shall be conducted

For other than non-enterable underground tanks, a leak test (or other RA-approved tank integrity method) shall be conducted at a frequency determined by Permit Writer

For ancillary equipment, an annual leak test (or other RA-approved integrity method) shall be conducted

For tank system or component found leaking or unfit for use as a result of leak test (or other assessment), Permittee will notify Regional Administrator and comply with leak/spill response conditions



## Tanks

- ▶ Operating requirements

- Damage protection

- Permittee shall not place hazardous waste or treatment reagents in tank system if they could cause failure of tank, ancillary equipment, or containment system as specified in Section \_\_\_ of the approved permit application

- Air emissions standards

- Permittee will ensure that hazardous waste placed in tank is managed to comply with air emissions regulations

- Spill and overflow protection

- Permittee shall prevent spills and overflows from tank or containment systems as specified in Section \_\_\_ of the approved permit application



## Tanks

- ▶ Response to leaks or spills

- In event of leak or spill from tank or secondary containment system, or if system becomes unfit for continued use, Permittee shall remove system from service immediately and complete following actions:

- Spill or leak cessation - Stop hazardous waste flow into system, and inspect system to determine cause of release

- Spill or leak removal - Remove waste and accumulated precipitation from system within 24 hours of release detection to prevent further release and allow inspection/repair of system

- Spill or leak cleanup - Contain visible releases to environment and, based on visual inspection, prevent further leak/spill migration to soils or surface water remove and properly dispose of visible soil or surface water contamination



## Tanks

- ▶ Response to leaks or spills
  - Tank System Closure or Repair

Close system according to Closure Plan in Section \_\_\_ of the approved permit application, unless the following actions are taken:

For release that has not damaged tank system integrity, remove release waste and make necessary repairs to fully restore system integrity prior to return to service (applies to all tank systems)

For release from primary tank system to secondary containment system, repair primary system prior to its return to service (applies to systems with secondary containment)

For release from below-grade component without secondary containment, provide secondary containment to achieve compliance prior to returning component to service

For release from above-grade component without secondary containment which can be visually inspected, repair tank system prior to its return to service



## Tanks

- ▶ Response to leaks or spills

- Tank System Closure or Repair

- For release from component that cannot be visually inspected, provide secondary containment to achieve compliance prior to returning component to service

- If component is replaced to eliminate leak, the new component must satisfy requirements for new tank systems or components

- Tank System Repair Certification

- Obtain certification (by independent, qualified, registered professional engineer) for major repairs that repaired system is capable of handling hazardous wastes without release for the intended life of system prior to returning system to service



## Tanks

- ▶ Inspection schedules and procedures

- Permittee shall inspect the tank system in accordance with the inspection schedule approved in Section\_\_ of the approved Permit Application

- Inspect overflow controls according to schedule

- Inspect following tank system components daily:

- Above-grade portions of system for corrosion/release detection

- Data from monitoring/leak detection equipment to ensure system operating according to design

- Construction materials and externally accessible portion of system (e.g., secondary containment system) for erosion/release detection



## Tanks

- ▶ Inspection schedules and procedures

- ▶ Inspect cathodic protection system

- Confirm proper operation of system within 6 months of initial installation and annually thereafter

- Inspect and test all impressed current sources every other month

- Documentation of compliance with relevant permit conditions is part of facility operating record
  - Minimum tank wall thickness
  - Measurement of tank wall thickness
  - Visual tank inspection

- Open tank every two years for visual inspection



## Tanks

- ▶ Recordkeeping and Reporting

- Report leak or spill from tanks or secondary containment to Regional Administrator within 24 hours of detection

- No report required if volume of hazardous waste <1lb; or immediately contained/cleaned up

- No report required if release contained by secondary containment

- Report following information to Regional Administrator within 30 days of detecting leak or spill from tanks or secondary containment:

- Likely migration route

- Characteristics of surrounding soil, including

- Soil composition

- Geology/hydrogeology

- Climate



## Tanks

### ▶ Recordkeeping and Reporting

Monitoring/sampling results associated with release

Proximity of downgradient drinking water sources, surface water, and populated areas

Description of response actions planned or taken

- Submit to Regional Administrator certifications of major repairs to correct leaks within 7 days of returning tank system to service
- Obtain and keep at facility written statements by certifying personnel regarding design and installation of tank system
- Maintain at facility written assessments of tank system integrity
- Maintain record of leak test and integrity test results at facility



## Tanks

- ▶ Closure and post-closure care

- Closure procedures

- At closure of tank systems, Permittee shall follow Closure Plan procedures approved in Section \_\_\_\_ of the approved permit application

- Inability to close by removal or decontamination

- Contingent closure and post-closure care procedures in Closure Plan and Post-Closure Plan must be followed if demonstrated that not all contaminated soils can be practically removed or decontaminated

- Contingent Post-Closure Plan required at permit issuance if no secondary containment system present



## Tanks

- ▶ Special tank provisions for ignitable or reactive wastes
  - Permittee shall not place ignitable or reactive waste in tank or secondary containment systems unless waste is treated, rendered, or mixed before or immediately after placement in tank system so that one of following applies:
    - Resulting waste, mixture, or dissolved material no longer meets definition of ignitable or reactive waste, and 40 CFR 264.17(b) precautions are complied with
    - Waste is managed so that it is protected from any material or conditions which might cause ignition or reaction
    - Tank system is used solely for emergencies
  - Compliance with requirements for maintenance of protective distances between waste management area and any public ways, streets, alleys or adjoining property lines that can be built upon



## Tanks

- ▶ Special tank provisions for incompatible wastes

- Placement in same tank

Permittee shall not place incompatible wastes, or incompatible wastes and materials in the same tank system or secondary containment system unless procedures specified in the Section \_\_\_ of the approved permit application are followed [40 CFR 264.17(b) and 40 CFR 264.199(a)]

- Placement in undecontaminated tank

Hazardous waste shall not be placed in tank system that has not been decontaminated that previously held an incompatible waste unless precautions in 40 CFR 264.17(b) are met



## Tanks

- ▶ Compliance Schedule Example
  - Permittee shall provide following information to Regional Administrator:

Compliance Item	Date due to Administrator or State Department
As-built construction drawing for the secondary containment system for Tank B	January 25, 2004
Engineering design report for the secondary containment system for Tank B	January 5, 2004



## Landfills

- ▶ General description includes
  - Brief description of each landfill unit
    - Dimensions and capacity
    - Liner description
    - Leachate collection and detection systems
  - Waste types to be disposed
  - Unique or special features of landfill
  - Reference to special permit conditions
  
- ▶ Permitted and Prohibited Waste Identification
  - Permittee may dispose of the following hazardous wastes in [specify landfills and/or landfill cells], subject to the terms of this permit



## Landfills

- ▶ Design and operating requirements
  - Two (or more) liners, leachate collection and removal system above top liner, leachate detection system between each liner shall be provided. Design plans and engineering reports should be provided as a permit attachment
  - Collected leachate management plan should be included as attachment and/or described in permit
  - Run-on and runoff control system plans and operating practices should be included as a permit attachment (must be capable of handling peak discharge resulting from a 24-hour, 25-year storm)
  - Wind dispersal control systems or procedures should be included as a permit attachment
  - For landfills granted an exemption from minimum technology requirements or operating practices, detailed design and operating plans, hydrogeologic reports, and location information must be included as an attachment to the permit



## Landfills

- ▶ Inspection Schedules and Procedures
  - Inspect condition and structures, run-on and runoff control systems, wind dispersal control, and leachate collection and detection systems at least weekly and after storms
  - Attach schedule for inspecting all other items (e.g., monitoring wells, cover, liners, gas collection system)
  - Inspect liners and covers during construction
  - Inspect landfill immediately after construction



## Landfills

- ▶ Cell Location Surveying
  - Note in operating record
    - Exact location and dimensions of each cell
    - Types of hazardous wastes in each cell and approximate location of each waste type in each cell
  
- ▶ Closure and Post-Closure Care
  - Attach Closure Plan
  - Attach Post-Closure Plan



## Landfills

- ▶ Special Landfill Provisions for Ignitable or Reactive Wastes
  - Specific procedures for management of ignitable or reactive wastes should be included as a permit attachment
  - Ignitable wastes in containers may be disposed if
    - Containers are non-leaking when placed
    - Containers are managed to avoid ignitable conditions
    - Ignitable wastes covered daily with 6-inches non-combustible material
    - Co-managed wastes in cell will not generate heat sufficient to ignite wastes



## Landfills

- ▶ Special Landfill Provisions for Incompatible Wastes
  - Specific procedures to manage incompatible wastes in same landfill cell should be included as a permit attachment
  
- ▶ Special Landfill Provisions for Hazardous Wastes F020, F021, F022, F023, F026, and F027
  - Specific procedures for managing these "F" listed wastes should be included as a permit attachment
  - Permit writer should determine whether additional requirements are necessary to protect groundwater, surface water, or air



## Landfills

- ▶ Special Landfill Provisions for Hazardous Wastes Restricted from Landfill Units
  - Permit writer must document the basis for granting all exceptions to the land disposal restrictions
  - Information on specific wastes granted a case-by-case extension and the expiration date of that extension must be specified
  - Information on specific wastes granted an exemption from land disposal restrictions must be specified



## Landfills

- ▶ Special Landfill Provisions for Liquid Wastes
  - No bulk or non-containerized wastes with free liquids allowed
  - Containers of wastes with free liquids prohibited unless
    - All free standing liquid is decanted or absorbed
    - Container is a lab pack or no larger than an ampule
    - Container is designed to hold free liquids for other than storage (e.g., batteries)
  
- ▶ Special Requirements for Empty Containers
  - Containers (larger than ampules) shall be at least 90% full
  - Empty containers must be crushed or shredded



## Landfills

- ▶ Provisions for Containerized Landfill Disposal of Lab Packs
  - Specific procedures for lab-pack disposal should be included as a permit attachment
- ▶ Compliance Schedule
  - Identify specific activities and milestone or completion dates



## Groundwater Detection Monitoring

- ▶ Detection monitoring includes
  - Development of list of indicator parameters
  - Establishment of sampling and statistical analyses
  - Establishment of additional requirements if statistically significant release occurs
  
- ▶ General description in permit includes
  - Brief description of waste management units needing detection monitoring
  - Number, location, depth of wells
  - Up gradient vs. down gradient wells
  - Indicator parameters, monitoring constituents
  - Background levels
  - Unique or special features
  - Reference to any special permit conditions



## Groundwater Detection Monitoring

- ▶ Well Location, Installation, and Construction
  - Specify number of monitoring wells. Attach map showing uniquely identified wells to permit
  - Construction and maintenance plans and specifications should be attached to the permit
  - If wells are to be abandoned, permit writer may include specific procedures and require report documenting abandoning procedures to be submitted to Regional Administrator
  
- ▶ Indicator Parameters and Monitoring Constituents
  - Specify parameters and constituents and their established background concentrations (if known)
  - Specify procedures for establishing background concentrations if they are not known



## Groundwater Detection Monitoring

- ▶ Sampling and Analysis Procedures
  - Specify procedures and techniques for obtaining and analyzing groundwater samples
    - Collection
    - Preservation
    - Analysis
    - Chain-of-custody
  
- ▶ Elevation of Groundwater Surface
  - Permittee must determine groundwater elevations each time sampling occurs
  - Well elevation must be surveyed when well is installed



## Groundwater Detection Monitoring

- ▶ Statistical Procedures

- Specify statistical method to be used to evaluate detection monitoring groundwater data

- Parametric ANOVA

- ANOVA based on ranks

- Tolerance or prediction interval procedure

- Control chart approach

- Students t-test

- Other approved method



## Groundwater Detection Monitoring

- ▶ Monitoring Program and Data Evaluation
  - Specify monitoring frequency (at least semi-annually)
  - Permittee must determine groundwater flow rate and direction at least annually
  - Permittee must determine, for each constituent, whether levels are above background.
  - Permit should specify number of days following sampling event that a statistical evaluation report must be submitted



## Groundwater Detection Monitoring

### ▶ Recordkeeping and Reporting

- All monitoring, testing, and analytical data must be entered into operating record
- Established background values and statistical comparisons must be submitted to regulatory authority (This is optional, permit writer may require reporting only when statistically significant results are noted)
  - Specify sampling and analysis and reporting schedule
- If statistically significant increase above background is detected
  - Notify Regional Administrator in writing within 7 days
  - Immediately resample all wells
  - Establish background values for Appendix IX constituents
  - Within 90 days, Permittee must submit permit modification to establish a compliance monitoring program
  - Within 180 days, Permittee must submit a corrective action feasibility plan



## Groundwater Detection Monitoring

### ▶ Recordkeeping and Reporting

- If Permittee determining statistically significant increase is due to source other than regulated unit

Notify Regional Administrator in writing within 7 days of intended demonstration

Permittee shall submit demonstration within 90 days

If necessary, within 90 days, submit permit modification for any monitoring changes

Permittee shall continue detection monitoring

### ▶ Assurance of Compliance

- "Boiler plate" language that monitoring and corrective action will comply with groundwater protection standard



## Groundwater Detection Monitoring

- ▶ Special Requirements of Significant Increases Occur in Values for Parameters or Constituents
  - Submission of a corrective action feasibility plan is not required if concentrations do not exceed values in Table 1 of 40 CFR 264.94, or Permittee has sought an Alternate Concentration Limit (ACL) variance
  
- ▶ Request for Permit Modification
  - Required within 90 days, if detection monitoring is no longer appropriate



## Groundwater Compliance Monitoring

- ▶ Compliance monitoring includes
  - Development of list of 40 CFR Part 261 Appendix IX constituents that may be derived from facility
  - Specification of concentration limit for each constituent
  - Establishment of groundwater protection standard at compliance point
  - Establishment of duration of compliance period
  
- ▶ General description in permit includes
  - Same information identified in Module VI for compliance monitoring wells
  
- ▶ Well location, installation, and construction
  - Same requirements as described in Module VI



## Groundwater Compliance Monitoring

- ▶ Groundwater Protection Standard
  - Specify hazardous constituents and their concentration limits
  - Under certain circumstances, the Permittee may establish a concentration limit by sampling up gradient wells during each sampling event
  - Specify wells requiring compliance monitoring
  - Specify duration compliance monitoring period
  
- ▶ Sampling and Analysis Procedures
  - Same as described for Module VI
  - Compliance monitoring is to be conducted at least quarterly [specify if more frequently]
  - Annual resampling of compliance point wells for all 40 CFR Part 261 Appendix IX constituents



## Groundwater Compliance Monitoring

- ▶ Elevation of Groundwater Surface
  - Same as described for Module VI
  
- ▶ Statistical Procedures
  - Same as described for Module VI to evaluate whether migration of hazardous constituents into and through the aquifer is detected



## Groundwater Compliance Monitoring

- ▶ Monitoring Program and Data Evaluation
  - Specify monitoring frequency (at least quarterly)
  - Permittee to determine groundwater flow rate and direction (at least annually)
  - Permittee to monitor all compliance permit wells for all 40 CFR Part 261 Appendix IX constituents (at least annually)
  - Permittee to determine, for each compliance monitoring constituent, whether levels are above concentration limits
  - Specify number of days following sampling that a report on statistical evaluations required above must be submitted



## Groundwater Compliance Monitoring

- ▶ Reporting and recordkeeping
  - All monitoring, testing, and analytical data must be entered into operating record
  - Permittee must submit analytical results of compliance monitoring in accordance with a [specified] schedule
  - If statistically significant increase above concentration limits is detected, must notify Regional Administrator in writing within 7 days
  - If additional 40 CFR Part 261 Appendix IX constituents are detected, they must be reported within 7 days of completing analysis



## Groundwater Compliance Monitoring

- ▶ Assurance of Compliance
  - "Boiler plate" language ensuring compliance with groundwater protection standards
- ▶ Special requirement if groundwater protection standard is exceeded
  - Notify Regional Administrator in writing within 7 days
  - Submit permit modification for a corrective action program within 180 days (or 90 days if engineering feasibility study has previously been submitted)
- ▶ Request for Permit Modification
  - Submit a permit modification for a corrective action program within 180 days (or 90 days if engineering feasibility study has been prepared)
  - Submit permit modification for changes to compliance monitoring within 90 days, if the compliance monitoring program is no longer appropriate



## Corrective Action for Regulated Units

- ▶ Corrective action is required to bring a regulated unit back into compliance when a groundwater protection standard has been exceeded
- ▶ General description in permit includes
  - Same information described in Module VII for corrective action wells
- ▶ Well location, installation, and construction
  - Same requirements as described in Module VII



## Corrective Action for Regulated Units

- ▶ Groundwater Protection Standard
  - Specify hazardous constituents and their concentration limits
  - Specify hazardous constituents to be monitored and duration of compliance period
  
- ▶ Corrective Action Program
  - Specify when corrective action is to begin
  - Corrective action must be implemented, including
    - Removing hazardous waste constituents, or
    - Treating them in place
  - Permit writer must specify corrective action measures required for constituents exceeding concentrations between compliance point and down gradient facility boundary



## Corrective Action for Regulated Units

- ▶ Corrective action program
  - Corrective action compliance period may be extended as necessary to ensure protection
  
- ▶ Sampling and Analysis Procedures
  - Same as described in Module VII
  
- ▶ Groundwater Surface Elevation
  - Same as described in Module VII
  
- ▶ Statistical Procedures
  - Same as described in Module VII



## Corrective Action for Regulated Units

- ▶ Monitoring Program and Data Evaluation
  - Specify monitoring frequency (at least quarterly)
  - Permittee to monitor all compliance point wells for all 40 CFR Part 261 Appendix IX constituents (at least annually)
  - Permittee to determine groundwater flow rate and direction (at least annually)
  - Permittee to determine, for each monitored constituent, whether levels are above concentration limits



## Corrective Action for Regulated Units

- ▶ Recordkeeping and Reporting
  - All monitoring, testing, and analytical data must be entered into operating record
  - Semi-annual reporting of effectiveness of corrective action program [specify report due dates] is required
  - Permittee must submit analytical results of corrective action monitoring in accordance with a [specified] schedule
  
- ▶ Request for Permit Modification
  - Submit a permit modification with 90 days, if corrective action program is no longer appropriate



## Post Closure

- ▶ General description in permit
  - Brief description of activities covered
  - Identification of affected units
  - Types of wastes in each unit
  - Anticipated date of closure
  - Anticipated length of post-closure period
  - Monitoring and maintenance activities
  - Special features of post-closure operations
  - Reference to any special permit conditions



## Post Closure

- ▶ Unit Identification
  - Permittee shall provide post-closure care for the following hazardous waste management units, subject to the terms of the permit
  
- ▶ Post-Closure Procedures and Use of Property
  - Specify start and duration of post-closure care period (typically 30 years)
  - Groundwater monitoring required during post-closure period
  - For surface impoundments
    - Maintain final cover
    - Prevent run-on and runoff from damaging cover



## Post Closure

- ▶ Post-Closure Procedures and Use of Property
- ▶ For land treatment units
  - Continue operations to land treat hazardous constituents
  - Maintain vegetative cover over closed portions
  - Maintain run-on and runoff control systems
  - Control wind dispersal of wastes (if applicable)
  - Continue any prohibitions against growth of food-chain crops
  - Continue unsaturated zone monitoring



## Post Closure

- ▶ Post-Closure Procedures and Use of Property
  - For landfills
    - Maintain final cover
    - Continue operation of leachate collection systems
    - Maintain groundwater monitoring system
    - Prevent run-on and runoff from damaging cover
    - Protect surveyed benchmarks
  - Comply with security requirements during post-closure
  - Ensure subsequent use of property does not disturb final cover, liners, or monitoring systems during post-closure period
  - Include Post-Closure Plan as a permit attachment



## Post Closure

- ▶ Inspections
  - Attach post-closure inspection schedule to permit
  
- ▶ Notices and Certifications
  - 60 days following certification of closure of each unit, notify Regional Administrator and local land authority of type, location, and quantity of wastes in each unit
  - 60 days following certification of closure of final unit
    - Notation in deed to property
    - Survey plat showing unit locations
  - Permittee may submit a permit modification to remove all hazardous constituents from unit and demonstrate clean closure
  - 60 days following completion of post-closure care, submit certification signed by Permittee and independent registered professional engineer



## Post Closure

- ▶ Financial assurance
  - Permittee must maintain financial assurance through post-closure care period
  - Permit writer should include conditions and procedures for Permittee to be released from financial assurance



- ▶ Post-closure permit modifications
  - Permittee must submit a permit modification request within 60 days, if events occur that affect the post-closure plan or proposed changes will affect required post-closure activities