

US EPA ARCHIVE DOCUMENT

Session 7 Groundwater Monitoring Requirements



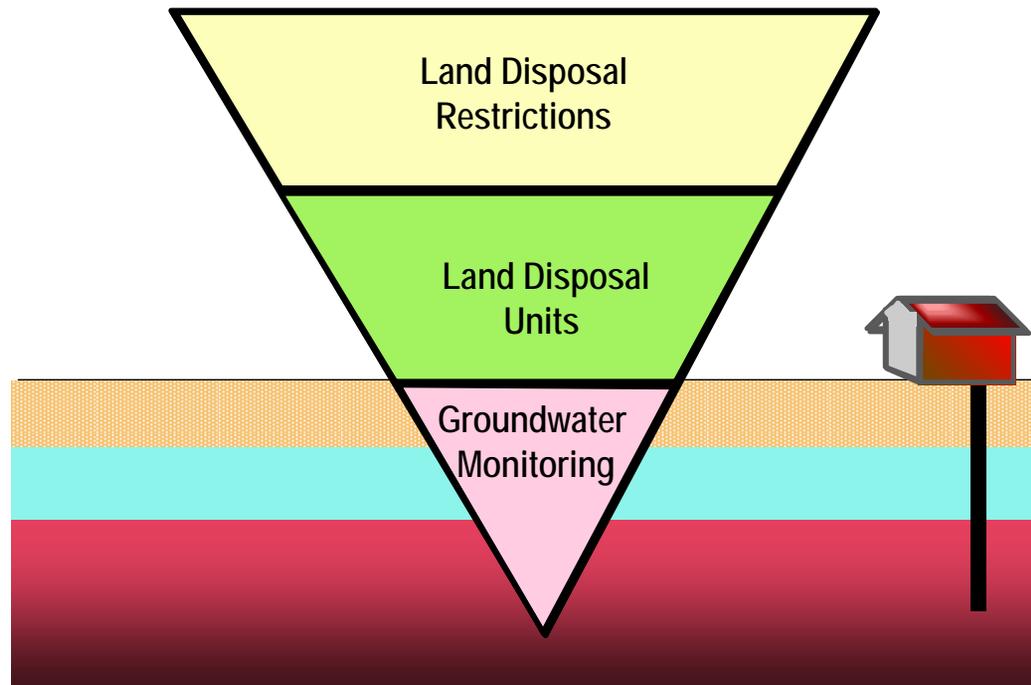
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Session 7 Agenda: Groundwater Monitoring (GWM)

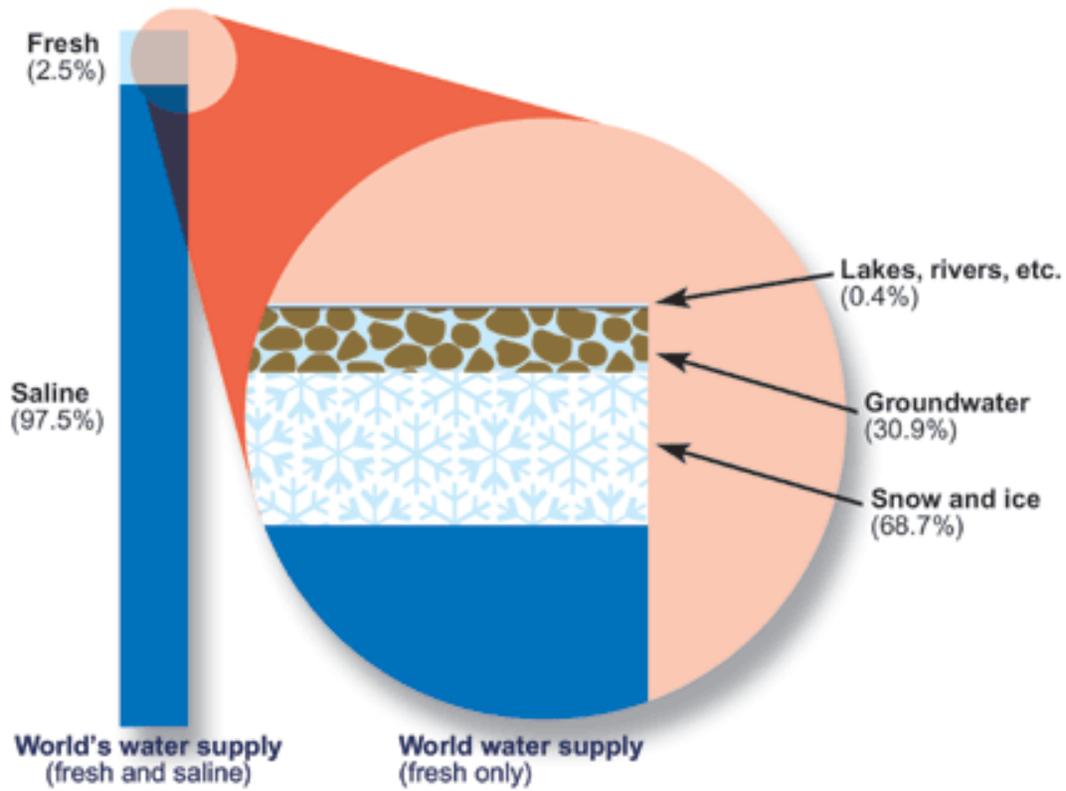
- ▶ Introduction
- ▶ GWM at Permitted Facilities
 - Basic Requirements
 - Framework
 - Point of Compliance
 - Phases of Monitoring and Corrective Action
 - Groundwater Protection Standard (GWPS)
- ▶ GWM at Interim Status Facilities



Three-tiered Groundwater Protection Strategy (Prevention and Early Detection)

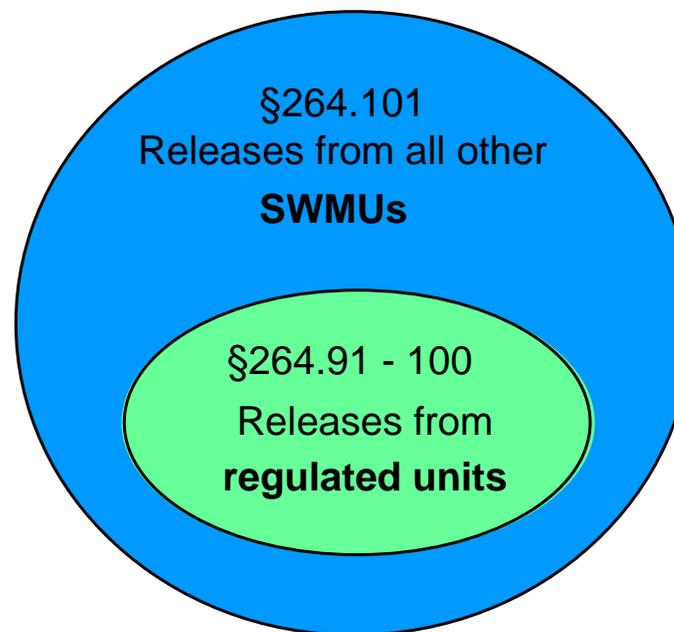


Why is EPA concerned about Groundwater?



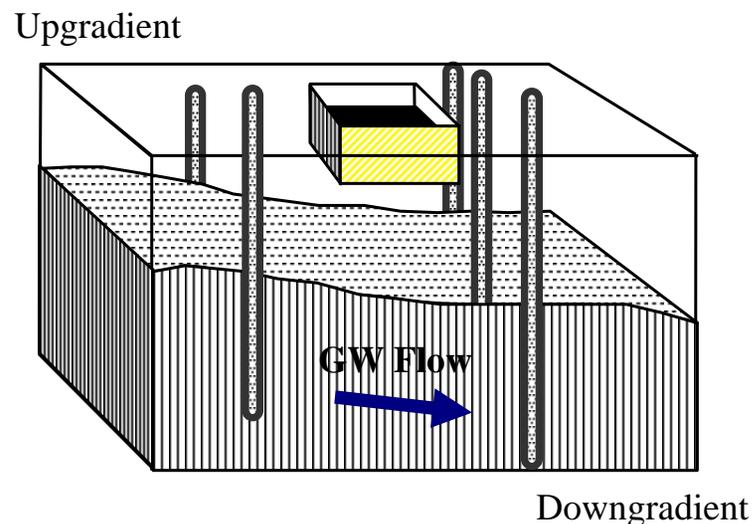
Groundwater Monitoring Regulations for Permitted Facilities

- ▶ Addresses hazardous constituent releases from Solid Waste Management Units (SWMUs)
 - Defined in Section 3004(u) of the RCRA Statute as all areas from which hazardous constituents may migrate
 - Includes areas where solid wastes have been placed (intentionally or unintentionally)
 - Includes **regulated units**



GWM Program Objectives

- ▶ Samples representative of groundwater quality both upgradient and downgradient of the SWMU
- ▶ Sampling and analysis program yielding consistent, verifiable, and comprehensive results
- ▶ Monitoring frequency sufficient to quickly identify new releases from the SWMU



These specifics
documented in
facility permit



Basic GWM Program Requirements

- ▶ Focus on uppermost aquifer
- ▶ Routine measurement of groundwater surface elevations
- ▶ Background levels should be determined
- ▶ Properly constructed and cased monitoring wells
- ▶ Statistical methods used to evaluate data and compare with background data or previous results

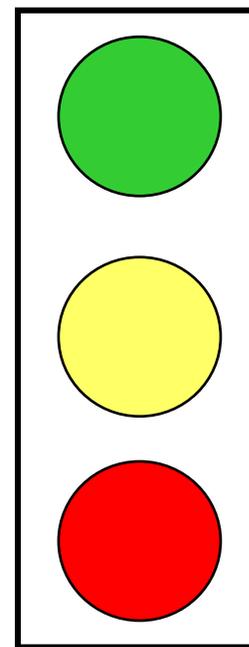


Three Types of GW Monitoring

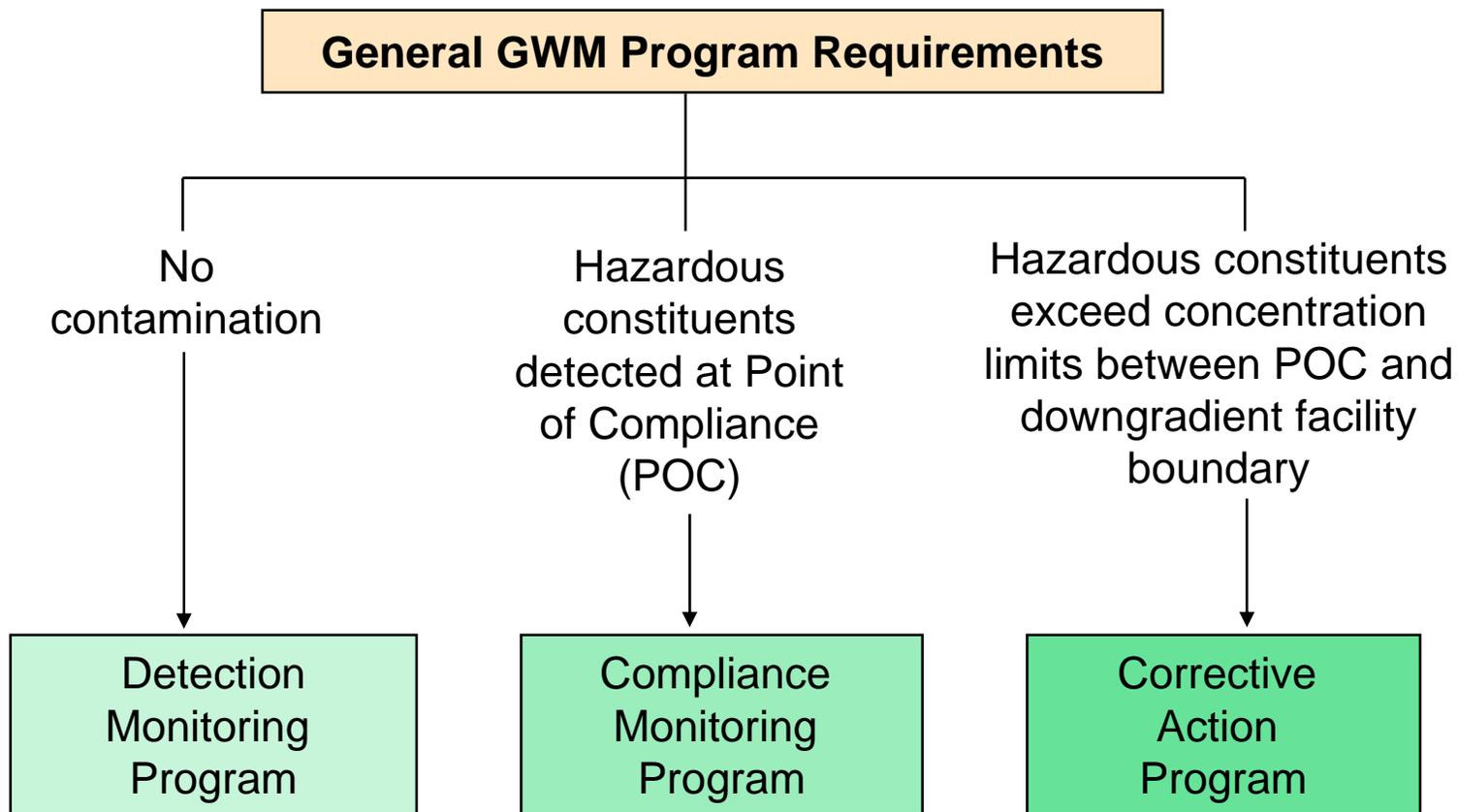
- ▶ **Detection Monitoring**
 - Begins concurrently with waste management
 - Provides initial leak detection in case of release

- ▶ **Compliance monitoring**
 - Ensures that contamination does not exceed acceptable levels

- ▶ **Corrective action**
 - Triggered when a “release” to the environment occurs (action levels defined by RECAP)



Three Types of Monitoring (cont.)



Point of Compliance (POC) for regulated units

- ▶ Vertical surface located at the hydraulically downgradient limit of the waste management area (WMA)
- ▶ Extends down into the uppermost aquifer underlying the regulated units
- ▶ Designates the point at which GWM requirements must be met
- ▶ 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



Detection Monitoring

- ▶ Goal is to detect and characterize any release of hazardous constituents from a **regulated unit**
- ▶ Indicator parameters are specified in the permit
- ▶ Annual determination of groundwater flow rate and direction
- ▶ Number of samples dependent on selected statistical test
- ▶ Facility determines if there is statistically significant evidence (SSE) of contamination

Detection Monitoring (cont.)

- ▶ If there is SSE that a release occurred, a facility must:
 - Notify administrative authority/EPA within 7 days
 - Immediately sample for the full list of groundwater monitoring constituents in 40 CFR Part 264, Appendix IX

- ▶ **Option 1:**
 - Submit ***permit modification*** to establish compliance monitoring program within 90 days
 - Submit ***engineering feasibility plan*** for a corrective action program within 180 days
 - Begin compliance monitoring.

- ▶ **Option 2:** Demonstrate release is from another source



Groundwater Monitoring – Permitted Facilities

Compliance Monitoring

- ▶ Goal is to ensure that hazardous constituent concentrations do not exceed acceptable levels
- ▶ Establish a GWPS to determine if the facility must move to Corrective Action
- ▶ EPA will specify the site-specific GWPS in the permit when the facility submits its permit modification to establish compliance monitoring



Groundwater Monitoring – Permitted Facilities

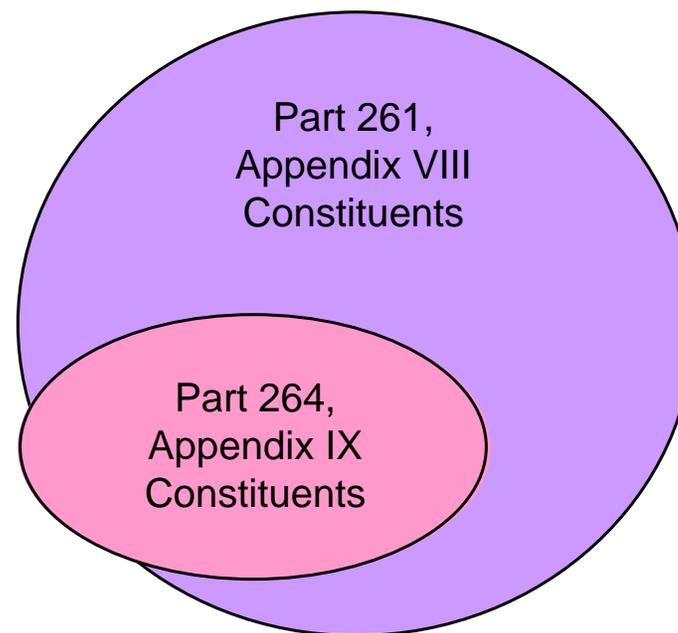
GWPS

- ▶ Hazardous Constituents (§264.93)
- ▶ Concentration Limits (§264.94)
- ▶ Point of Compliance (§264.95)
- ▶ Compliance Period (§264.96)



GWPS Applies to Permit-Specified Hazardous Constituents

- ▶ Detected in uppermost aquifer
- ▶ Expected to be in, or derived from waste in the regulated unit
- ▶ Listed as hazardous constituents in Appendix VIII of Part 261

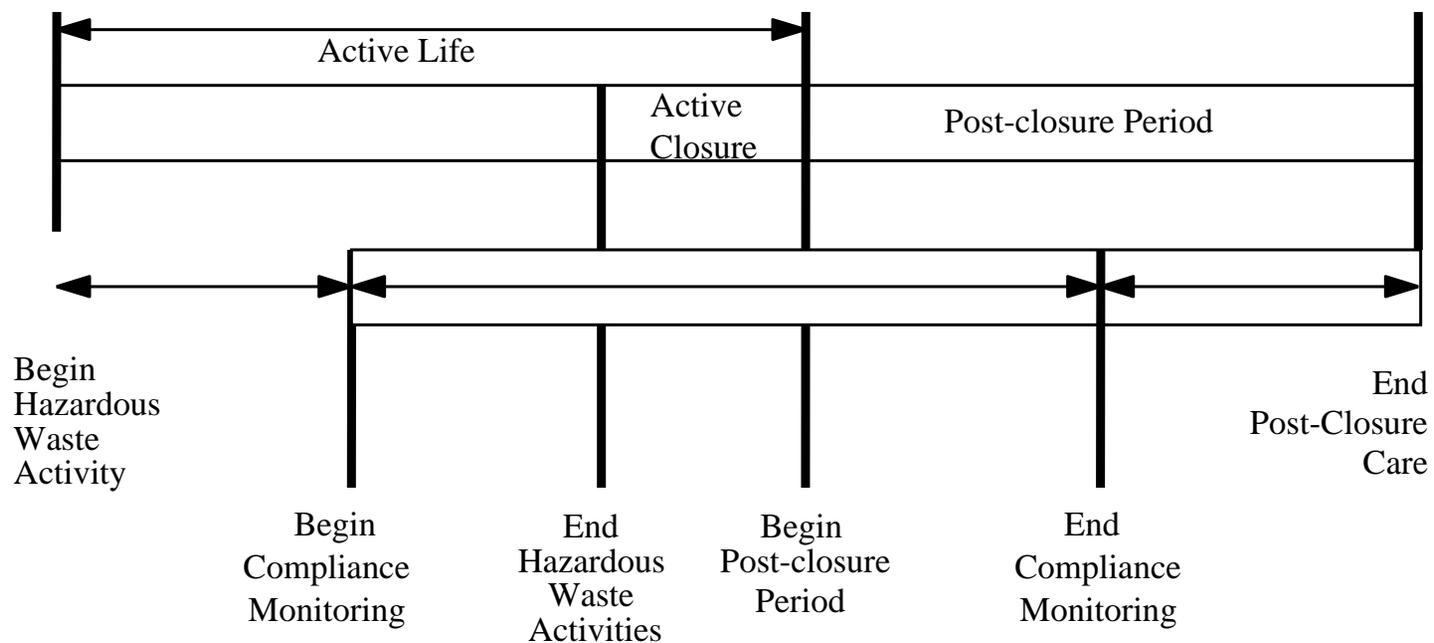


GWPS Lists Site-Specific Hazardous Constituent Concentration Limits

- ▶ Exceedance of these limits triggers corrective action

- ▶ Concentration limits based on:
 - Background levels
 - Maximum concentrations listed in the regulations for certain constituents
 - Alternative concentrations levels (ACL) determined through discussions between EPA and the facility

GWPS Specifies the Compliance Period



Compliance Monitoring Requirements

- ▶ Sample for Appendix IX constituents annually
- ▶ Check groundwater flow rate and direction
- ▶ If GWPS is exceeded:
 - Notify administrative authority/EPA within 7 days
 - Option 1: Submit permit modification to establish corrective action program (90/180 days)
 - Option 2: Demonstrate release is from another source



GWM Program Corrective Action

- ▶ Once the GWPS is exceeded, ***corrective action*** is triggered
- ▶ Goal is to bring **regulated units** back into compliance with the GWPS at the point of compliance.
- ▶ Ensure compliance with GWPS by:
 - Removing the hazardous constituents
 - Treating the hazardous constituents in place
- ▶ Aiming for permanent results, not a temporary fix



GWM Program Corrective Action (cont.)

- ▶ Monitoring requirements
 - Demonstrate effectiveness
 - Semi-annual report on effectiveness
- ▶ Cleanup may be required beyond compliance point and facility boundary
- ▶ Duration is indefinite – until GWPS is achieved
- ▶ May go back to compliance monitoring when GWPS reached

Groundwater Monitoring – Corrective Action

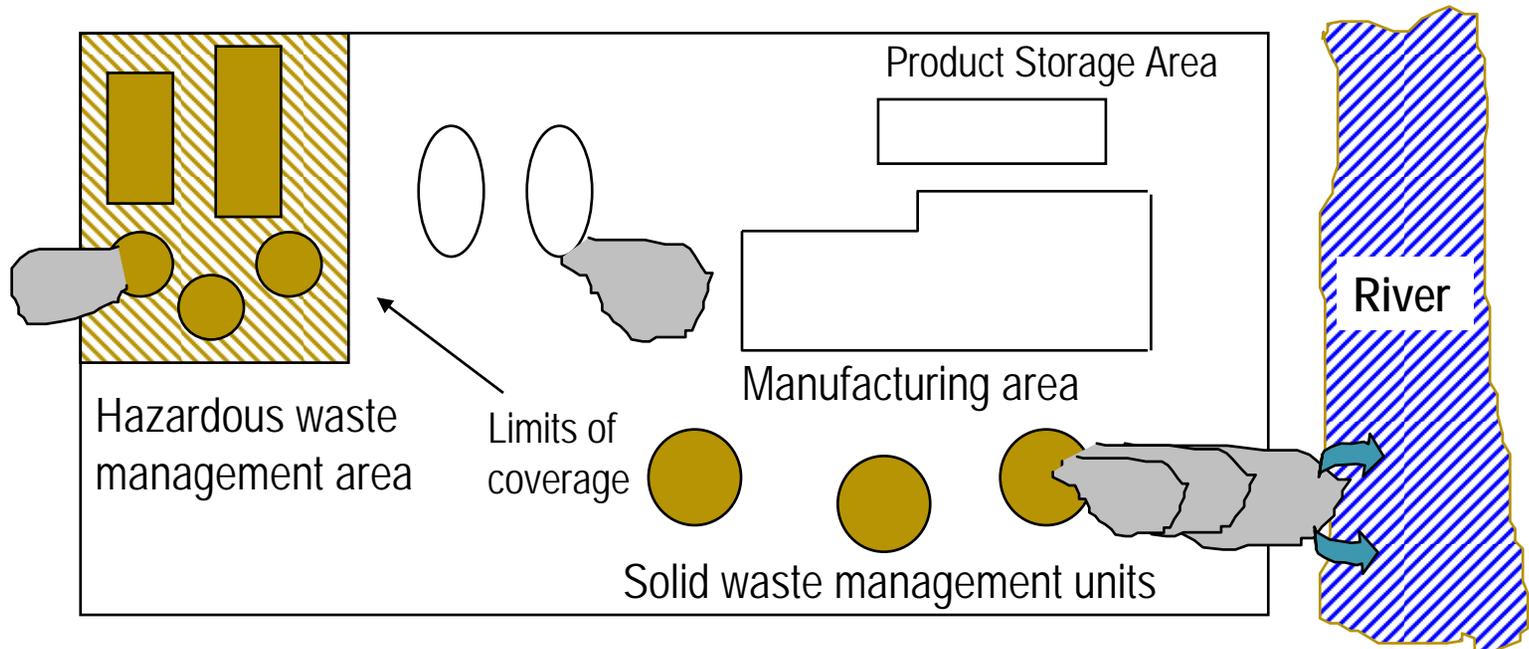
GWM Program for Solid Waste Management Units

- ▶ Owner/Operator of TSDFs must institute corrective action for all releases of hazardous waste from any solid waste management units (SWMU or AOC)
- ▶ The permit must specify schedules of compliance
- ▶ Assurances of financial responsibility for completing corrective action
- ▶ May be for beyond the facility boundary



Corrective Action

Corrective action: pre-HSWA

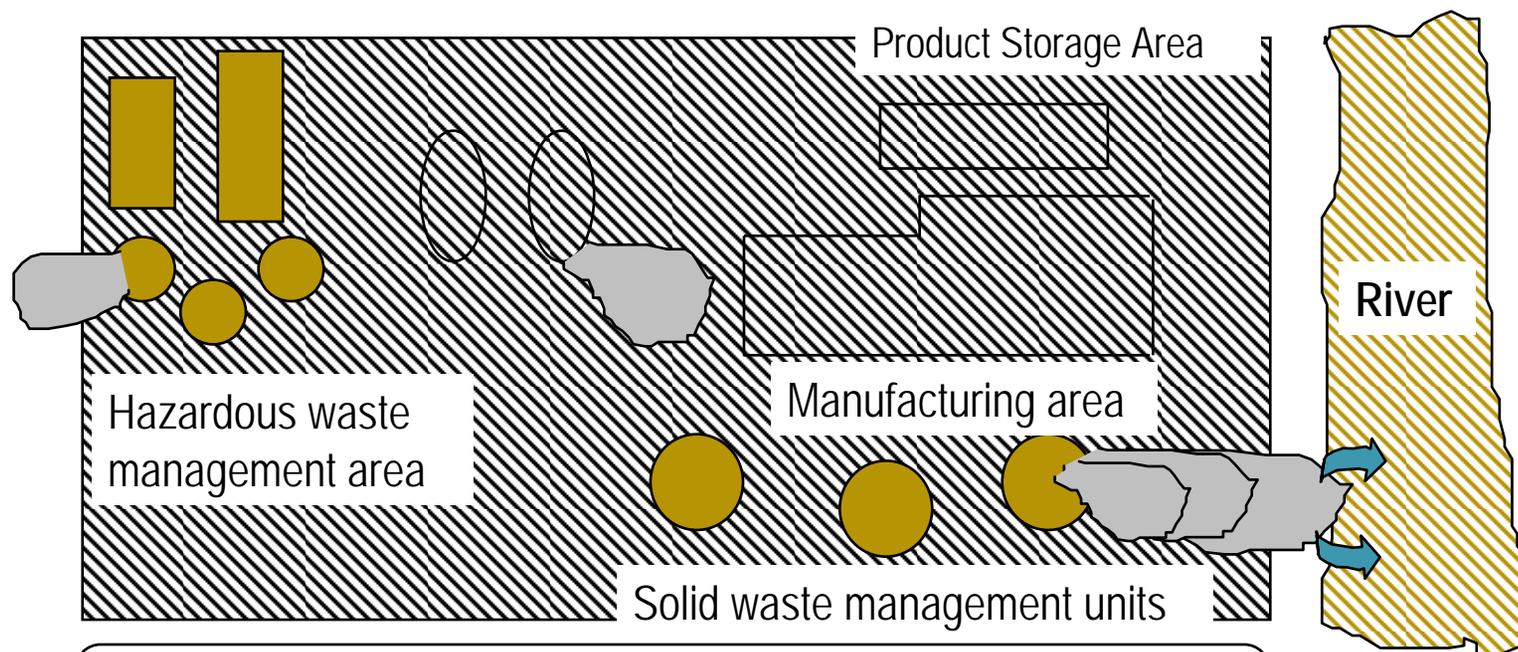


Before HSWA, the RCRA Corrective Action program only addressed releases to groundwater from RCRA units



Corrective Action

Corrective action: post-HSWA

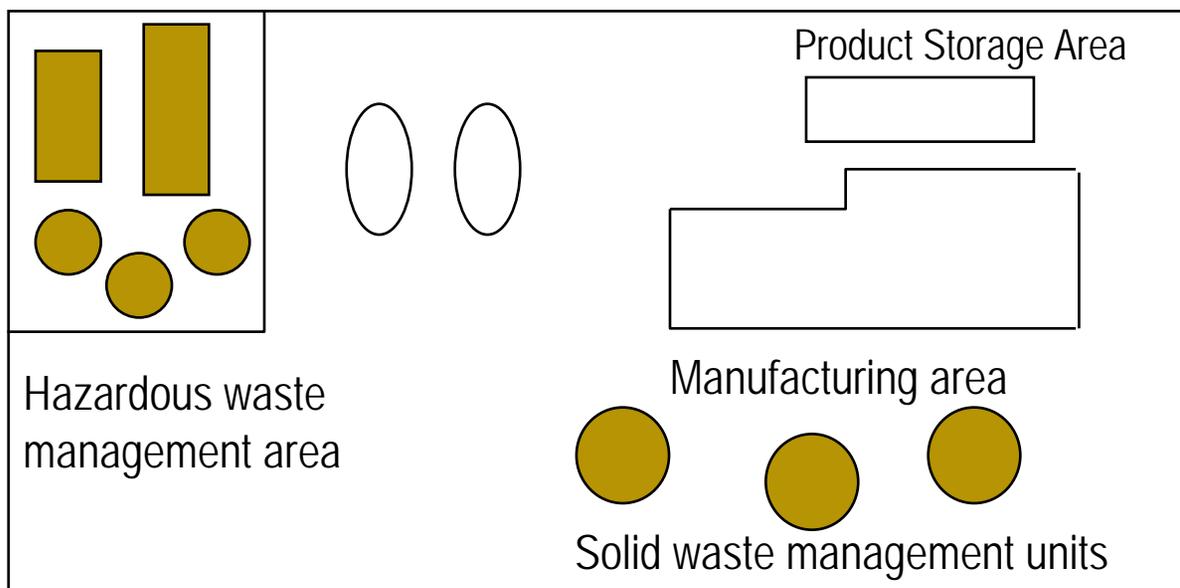


The HSWA Corrective Action program addresses releases to all media, both on and off site, and sources across the entire facility



Corrective Action

“Facility”



HSWA Corrective Action encompasses the entire property under the owner/operator’s control at RCRA interim status and permitted facilities (also releases that extend off site)



Groundwater Monitoring – Interim Status Facilities

Groundwater Monitoring Regulations for Interim Status Facilities

- ▶ Interim status facilities have two stages
 - Indicator Parameter Evaluation
 - Groundwater Quality Assessment Program

- ▶ No Corrective Action program in Part 265 regulations, but EPA can require cleanup via a HSWA-module in a post-closure permit or through an enforcement action.

