

The Arsenic Rule

Waste Disposal Options

Impacts on Disposal Alternatives

- Concentration of contaminants in the waste stream
 - Non-Hazardous Waste
 - Hazardous Waste
 - Mixed Waste
- Federal, State, & Local Regulations
 - Disposal facility policies
- Type of residuals
 - Liquid
 - Solid

Waste Streams: Solid/Liquid

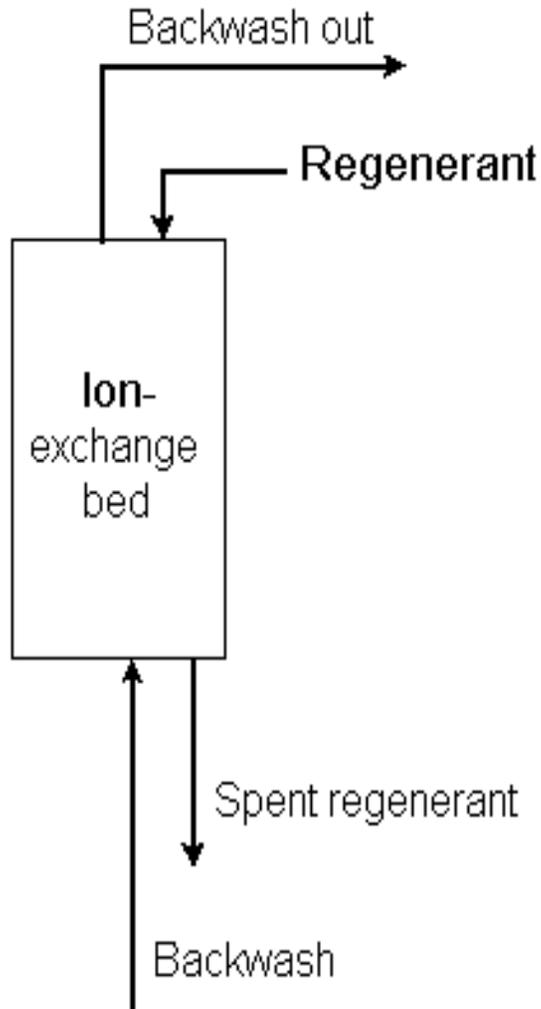
■ Liquid Residual Stream

- Brine
- Backwash Water
- Rinse Water
- Acid Neutralization Water
- Concentrate

■ Solids

- Spent Resins
- Spent Filter Media
- Spent Membranes
- Sludges

Anion Exchange



Consider disposal of regenerate, backwash, and spent resins

Waste Identification

- Solid or Liquid?
 - Paint Filter Liquids Test (EPA SW 846 Method 9095)
- Hazardous or Non-Hazardous?
 - Knowledge of the waste generation process
 - Toxicity Characteristic Leaching Procedure (TCLP) or Waste Extraction Test (WET) in California
 - Exemption for Small Quantity Generators
- Mixed Waste?
 - Hazardous waste and $> 0.05\%$ uranium or thorium by weight (totaling <15 lbs.)

RCRA Regulatory Tests

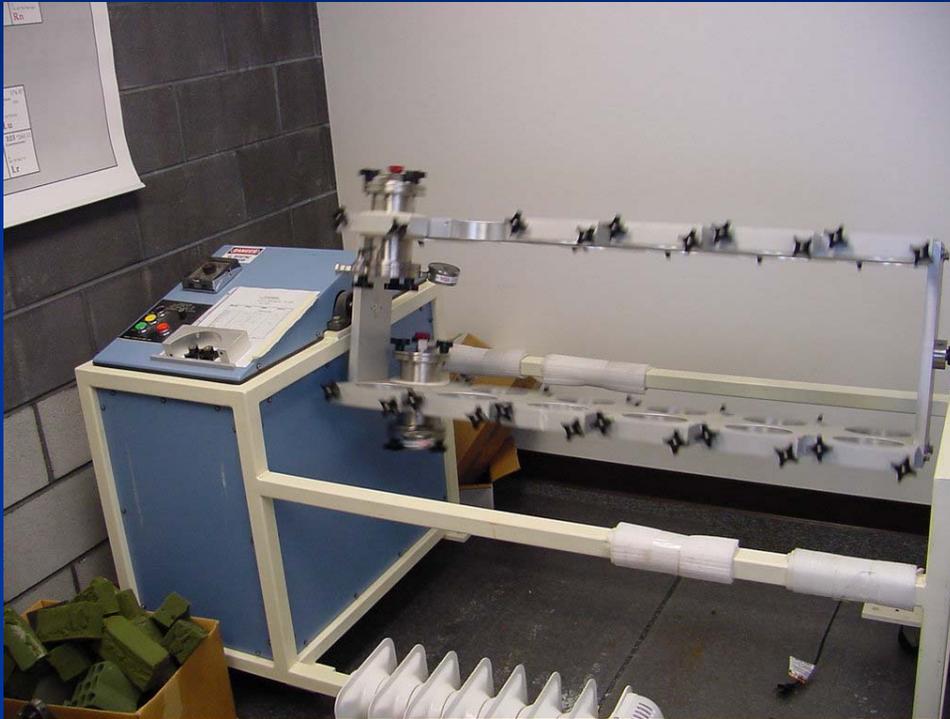
- Paint Filter Liquids Test
- TCLP
 - Arsenic is one of the eight metals regulated under RCRA
 - Arsenic > 5.0 mg/L = Hazardous

Paint Filter Liquids Test



- Determines if “free” liquids are present in a waste
- Wastes containing free liquids banned from disposal in municipal solid waste landfills and hazardous waste landfills
- Liquid wastes must be treated or disposed in an alternative manner

Toxicity Characteristic Leaching Procedure



- Predicts if hazardous components of a waste are likely to leach out
- Regulatory levels established for
 - 8 metals
 - 32 organics
- Exceeding regulatory levels result in designation as hazardous

Waste Type: Mixed Waste

- Contains both hazardous waste and source. . . or byproduct material subject to the Atomic Energy Act
- Also regulated by RCRA

>0.05% U/TH
by weight
(totaling <15 lbs.)

+

Hazardous
Waste

=

Mixed waste
Subject to license
from NRC or
Agreement State

Disposal

Liquid Residuals

Brine, Backwash Water, Rinse Water, Acid Neutralization Water, Concentrate

Disposal Option	Waste Type	Applicable Authority	Key Considerations
Discharge directly to surface waters	Non-hazardous	CWA	<ul style="list-style-type: none">■ NPDES Permit■ Appropriate receiving body
Discharge to a Publicly Owned Treatment Works (POTW)	Non-hazardous	CWA	<ul style="list-style-type: none">■ Meet TBLs, POTW and state requirements
Injection to a Class 1 UIC Well	Hazardous, Non-hazardous, & Mixed	SDWA/UIC Regs.	<ul style="list-style-type: none">■ Expensive, complex, and few wells■ Permit required
Injection to a Class V UIC Well	Non-hazardous	SDWA/UIC Regs.	<ul style="list-style-type: none">■ Injection prohibited if it will endanger an underground source of drinking water

Disposal

Solid Residuals

Spent Resins, Spent Filter Media, Spent Membranes, Sludge

Disposal Option	Waste Type	Applicable Authority	Key Considerations
Municipal or industrial solid waste landfill	Non-hazardous	RCRA Subtitle D	<ul style="list-style-type: none">■ No free liquids■ At discretion of landfill owner
Hazardous waste landfill	Hazardous & Non-hazardous	RCRA Subtitle C	<ul style="list-style-type: none">■ No free liquids■ Can accept hazardous waste from all generator classes
Low-level Radioactive Waste Landfill	TENORM and possibly Mixed Waste	AEA or Agreement State	<ul style="list-style-type: none">■ Limited number of landfills in the nation

Intermediate Processing

- Evaporation ponds
- Settling basins
- Sludge drying beds
- Mechanical dewatering



Intermediate
processing methods
each creating its own
residual stream