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Identifying, Inspecting and Addressing Shallow Injection Wells*

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* - Well Classes IV and V

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Regulatory Requirements for Shallow Injection Wells

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Safe Drinking Water Act (1974 and rev.)

- Authorizes EPA to develop minimum federal regulations for state and tribal Underground Injection Control (UIC) programs to protect underground sources of drinking water (USDW)
- Mandates EPA to regulate underground injection of *all* fluids – liquid, gas, or slurry
- Establishes a process for approving primary enforcement authority to states and tribes
- Authorizes EPA to provide grants to states and tribes in support of essential UIC program functions
- Provides states with flexibility to establish effective Class II (oil and gas) programs

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Classification of Injection Wells

- Six classes of wells are addressed in UIC regulations.
- Greater or lesser potential for endangerment depending on their depth, injectate, and geologic setting.
- Categorized based on common design and operating characteristics.

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Classification of Injection Wells

- **Class I -** Wells that inject wastes beneath the lowermost formation containing a USDW.
- **Class II -** Wells used to inject fluids associated with oil and natural gas recovery and storage of liquid hydrocarbons.
- **Class III -** Wells associated with solution mining (e.g., extraction of uranium, copper, and salts).
- **Class IV -** Wells used to inject hazardous or radioactive waste into or above USDWs.
- **Class VI -** Wells associated with the geologic sequestration of carbon dioxide.
- **Class V -** Any injection well that is not contained in Classes I to IV or VI.

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What are Class IV & V Injection Wells?

- Typically, they are shallow disposal systems that are used to place a variety of fluids below the land surface, into or above USDWs.
- Not explicitly identified as Class I, Class II, Class III or Class IV in the Code of Federal Regulations Sections 144.6 and 146.5.
- Class IV wells differ from Class V wells only in that they inject hazardous waste into or above a USDW.
- Generally “low tech” construction - no more than dry wells or septic tank and leachfield combinations designed for sanitary waste disposal.
- There are “high tech” wells which fall into these categories.

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What isn't considered an Injection Well?

- While they may interact with groundwater, pits, ponds and lagoons are not covered by the program.
- Any system which might meet the definition of a well (i.e. deeper than it is wide) but who's main purpose isn't the emplacement of fluids into the subsurface. So pilings or fence post and utility pole holes aren't considered wells nor are things like cathodic protection installations.
- While things may not be considered a well for purposes of the UIC program, they may be covered by Section 1431 of the SDWA.

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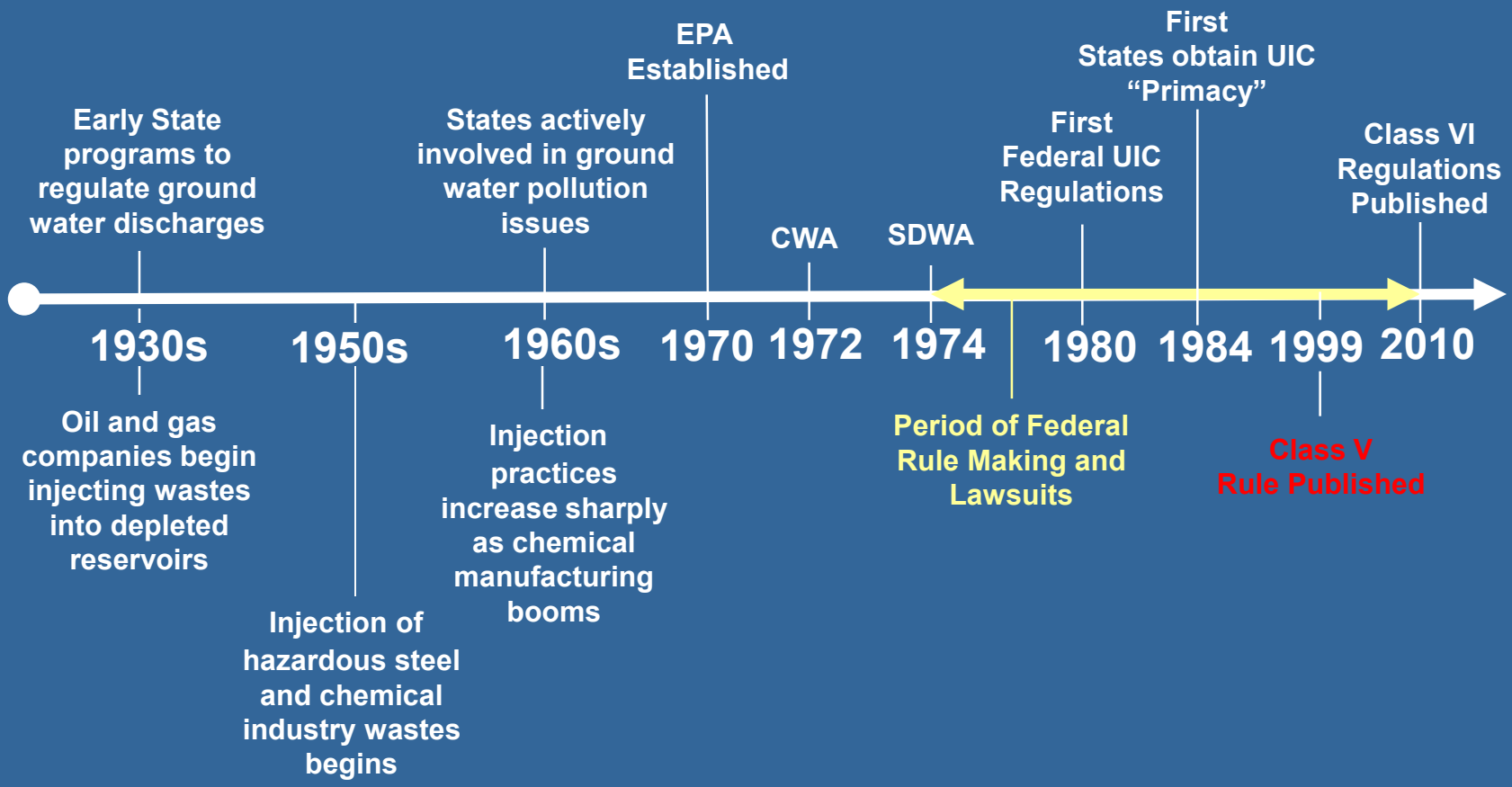
Timeline - Underground Injection Practices & Regulations



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UIC Regulation Development: 1976 - 2014

- EPA Initially Proposes UIC Regulations (1976)
- EPA Re-proposes UIC Regulations (1979)
- Final UIC Regulations Published (1980)
- Challenge from Industry (1980)
- Technical Amendments Published (1981 & 1982)
- EPA Proposes Regulations for State Implementation (1984)
- Class I Hazardous Waste Proposed Rule (1987)
- Class I Hazardous Waste Final Rule (1988)

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UIC Regulation Development: (cont.)

- Class II Mid-Course Evaluation (1988)
- Class II Workgroup (1992)
- Class V Proposed Rule (1998)
- Class V Final Rule (1999)
- Class VI (Geologic Sequestration) Proposed Rule (2007)
- Class VI Final Rule (2010)
- Class II Diesel Hydraulic Fracturing Guidance (2014)*

* - While issued as a guidance, the document contains “interpretive rule making”.

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Class V Strategy: 1987 - 2002

- Class V Report to Congress (1987)
- Several Failed Class V Rule Development Efforts (1988-1990)
- Class V Motor Vehicle Well Enforcement Initiatives (1991-1992)
- Sierra Club Consent Decree (1993)
- Class V Strategy Proposal (1995)
- Class V Proposed Rule (1998)
- Class V Comprehensive Study (1999)

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Class V Strategy (cont.)

- Class V Final Rule (1999)
- 2nd Sierra Club Consent Decree (2000)
- Class V Proposed Regulatory Determination (2001)
- Class V Final Regulatory Determination (2002)

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Requirements for Injection Wells

- All well owners or operators must submit inventory data for the well.
- Some wells may be authorized by rule; permit not required.
- Some well owners or operators must apply for permits to drill and to operate.
- All wells are subject to non-endangerment standard.

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Inventory Requirement

- Inventory required for all injection wells
- Requirements for non-submitting wells
  - Cease injection
  - Submit inventory
  - May resume injection in 90 days unless UIC Director specifies otherwise
  - The owner or operator may be subject to fines for unauthorized injection.
- Must submit inventory before constructing a new well

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Authorization by Rule and Permitting

- Most shallow injection wells are authorized by rule; permit not required if owner/operator complies with basic requirements
- **All** wells must submit inventory data
- **All** wells are subject to non-endangerment standard

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Endangerment of USDWs

- SDWA requires EPA to promulgate regulations to protect drinking water sources from contamination through underground injection activities
- Endangering drinking water sources through underground injection is prohibited

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Identifying Shallow Injection Wells

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Types of Shallow Injection Wells

- 5A19 Cooling Water Return (specify contact or non-contact)
- 5A5 Geothermal Reinjectate
- 5A6 Geothermal Heat source
- 5A7 Heat Pump/AC Return Flow
- 5A8 Geothermal Aquaculture
- 5B22 Saline Barrier/Intrusion Barrier
- 5D2 Stormwater Drainage
- 5D3 Improved Sinkhole
- 5D4 Stormwater Combined with Industrial or Commercial Process Fluids
- 5F1 Agricultural Drainage
- 5G30 Special Drainage (define)
- 5N24 Radioactive Waste Disposal Wells
- 5R21 Aquifer Recharge, Drinking Water Storage
- 5S23 Subsidence Control
- 5W9 Septage Disposal Wells
- 5W10 Cesspools **BANNED**
- 5W11 Septic System
- 5W12 Wastewater Treatment Plant Effluent
- 5W20 Combined Sewage/Industrial Waste discharging to cesspool or septic system
- 5W31 Septic System with seepage pit/drywell disposal
- 5W32 Community Leachfields
- 5X13 Mine Backfill Well
- 5X14 Solution Mining Well
- 5X15 In-situ Fossil Fuel Recovery
- 5X16 Brine Return Flow
- 5X17 Air Scrubber Waste
- 5X18 Water Softener Regeneration
- 5X25 Experimental Technology
- 5X26 Aquifer Remediation
- 5X27 Other (define)
- 5X28 Motor Vehicle Waste Disposal **BANNED**
- 5X29 Abandoned Drinking Water Wells Used for Disposal

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Types of Shallow Injection Wells

- Drainage Wells
- Remediation Wells
- Geothermal Reinjection Wells
- Domestic Wastewater Disposal Wells
- Mineral and Fossil Fuel Recovery Related Wells
- Industrial/Commercial/Utility Disposal Wells
- Aquifer Storage and Recovery or Recharge Wells
- Miscellaneous Wells

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Facilities With Class V Wells

- Automotive Dealers/Repair Shops
- Manufacturing
- Service Stations
- Truck/Car Wash Facilities
- Groundwater Remediation Wells
- Groundwater Source Heat Pump Return Flow
- Large Capacity Septic Systems (≥ 20 persons)

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What's in the Injectate?

Waste types	Potential contaminants
Sewage or sanitary waste	Pathogens, medicines, nitrate, phosphorus
Animal waste	Pathogens, medicines, insecticides, nitrate
Industrial or automotive waste	Fuel, waste oil, solvents, metals
Agricultural waste	Pesticides, fertilizers (NO3), pathogens, fuel
Storm water runoff	A little bit of everything it touches

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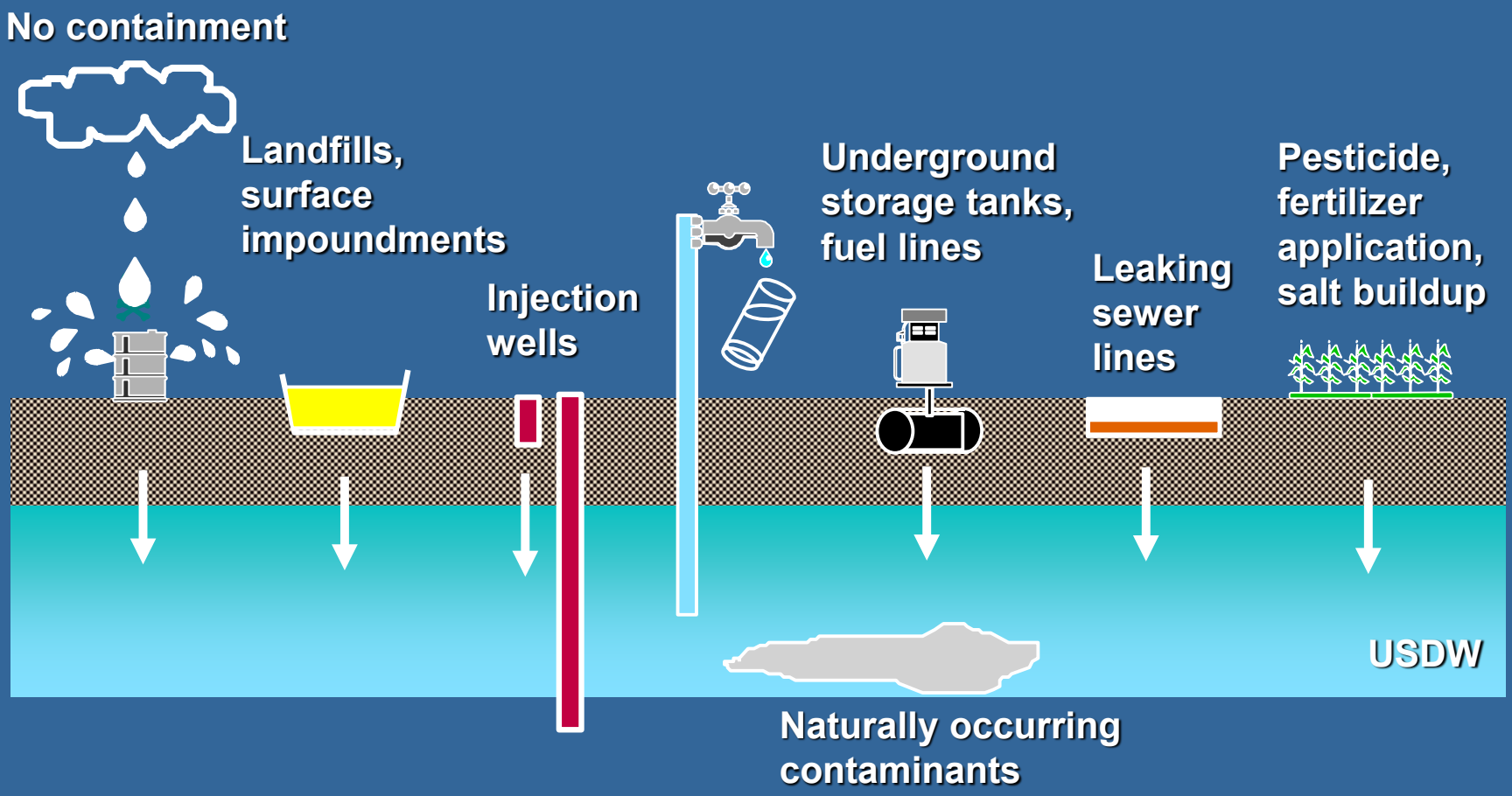
How Is Ground Water Contaminated?



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Risk Considerations

- What is in the injectate
- Site practices
- Soil type and interaction with injectate
- Depth to ground water
- Vulnerable USDW
- Proximity of drinking water wells
- Discharge to surface water
- Determination about rule authorization may change if site conditions change

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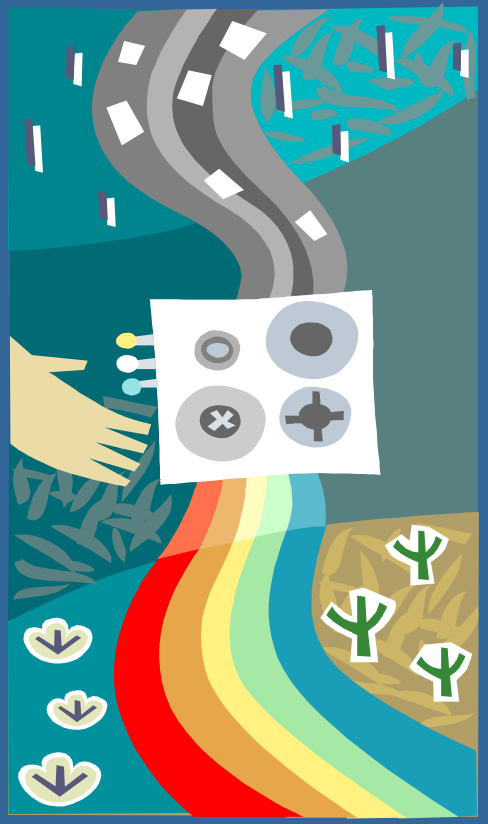
What Happens to Waste on the Way Down the Drain?

- Mixing
- Chemical treatment
- Physical treatment
- Dilution
- Biological treatment



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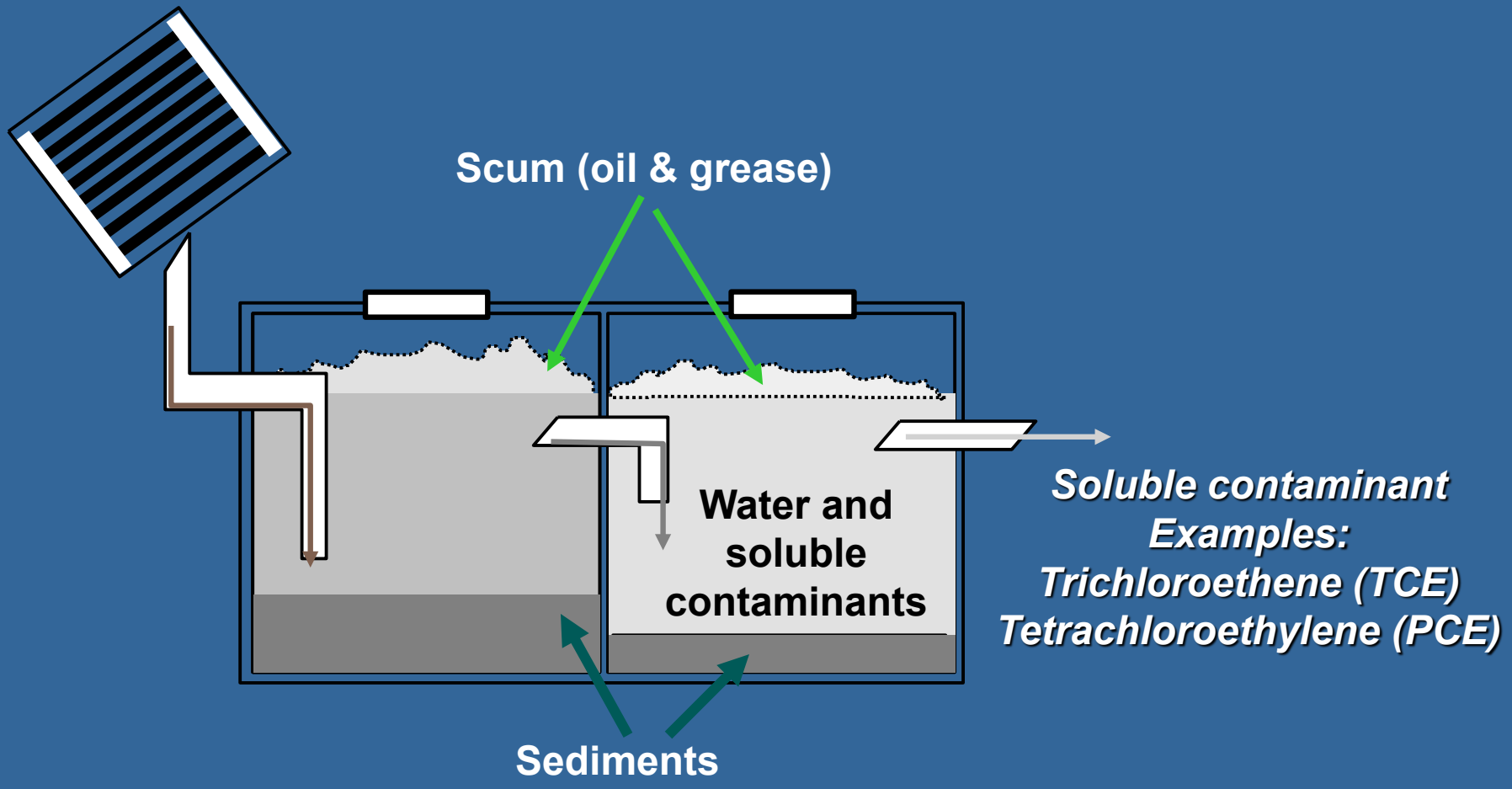
Pretreatment – Oil/Water Separator



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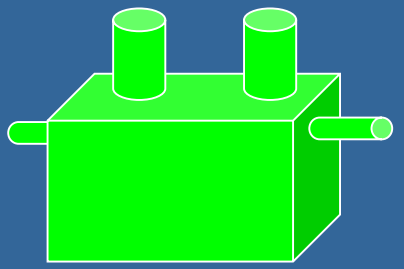
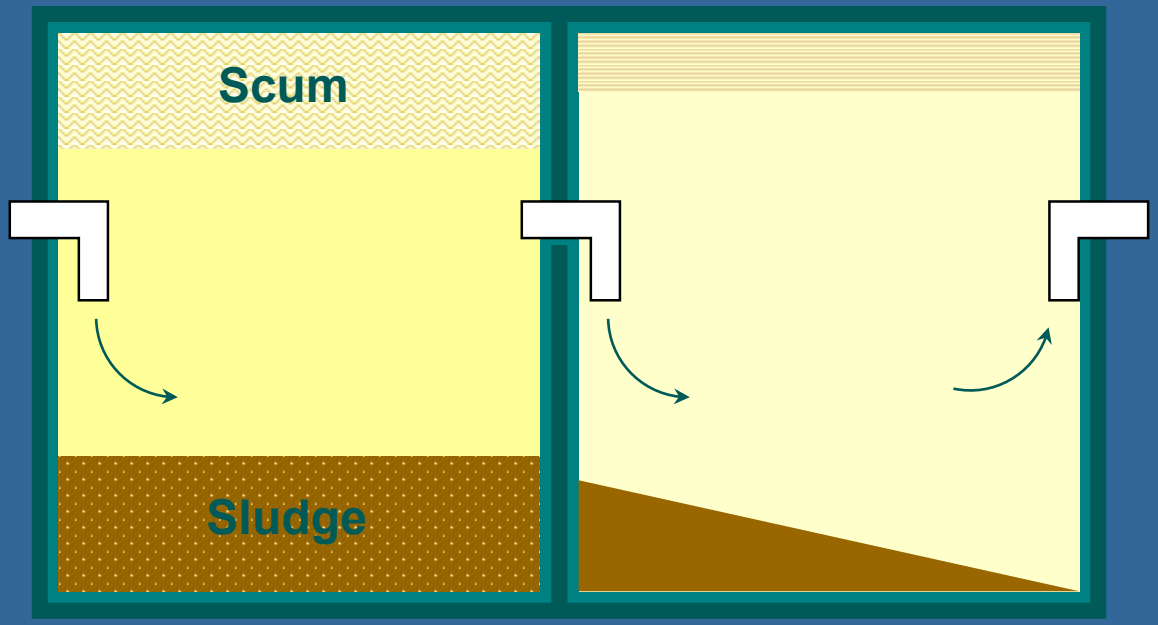
Biological Treatment:
Two-compartment Septic Tank



Sanitary
Waste Inlet



Outlet to
leachfield,
seepage pit
or other
dispersal
mechanism

Bacteria assist in the decomposition of solids and fats, to clarify the effluent as it flows towards outlet

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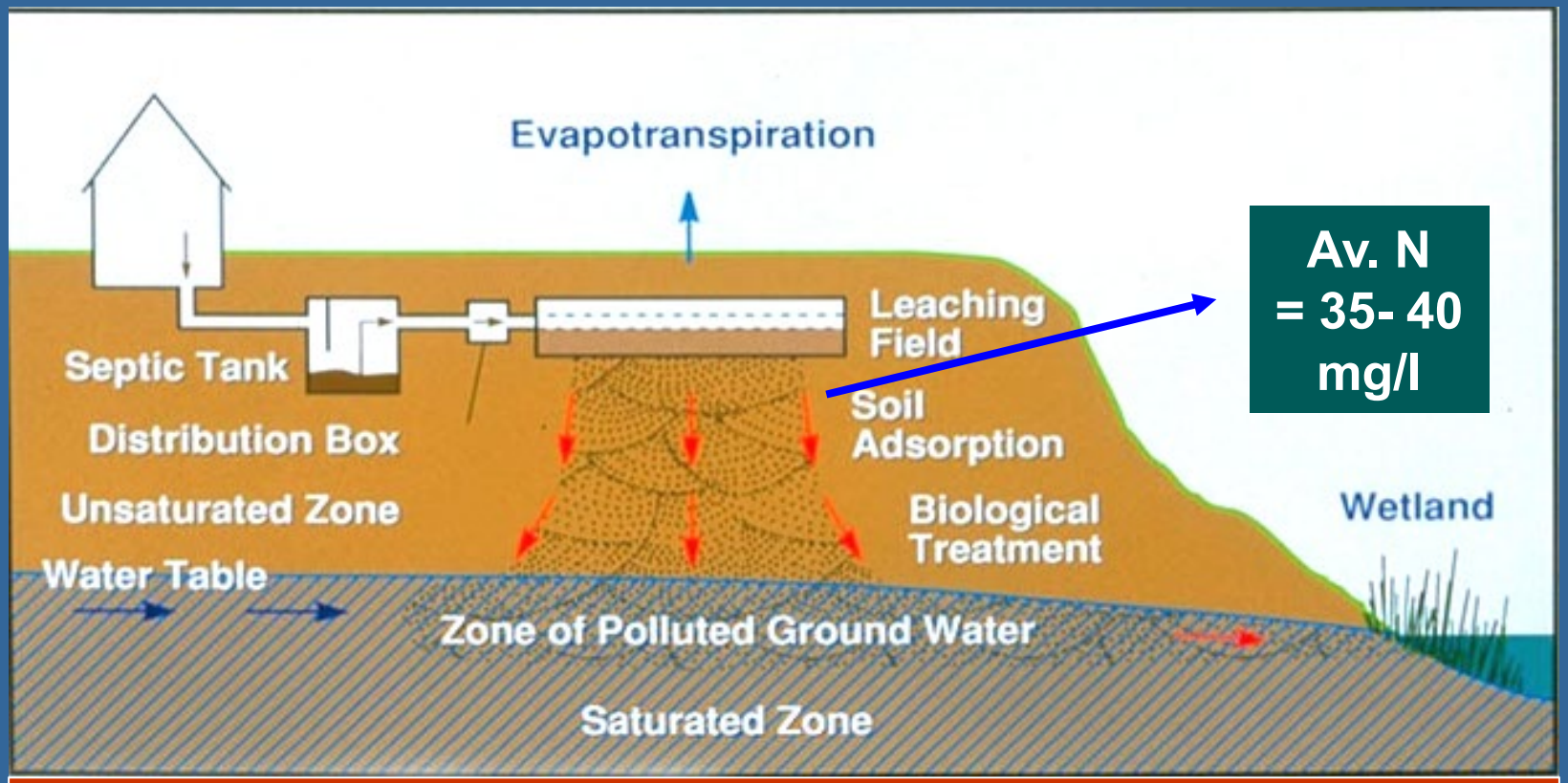
Septic Systems and Nitrogen and Viral Loading



Septic Systems Only Pretreat Sanitary Waste

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Potential Effects on USDWs

- USDW Characteristics?
- Is there separation between the point of injection and the USDW?
- Is the injection directly into USDW?

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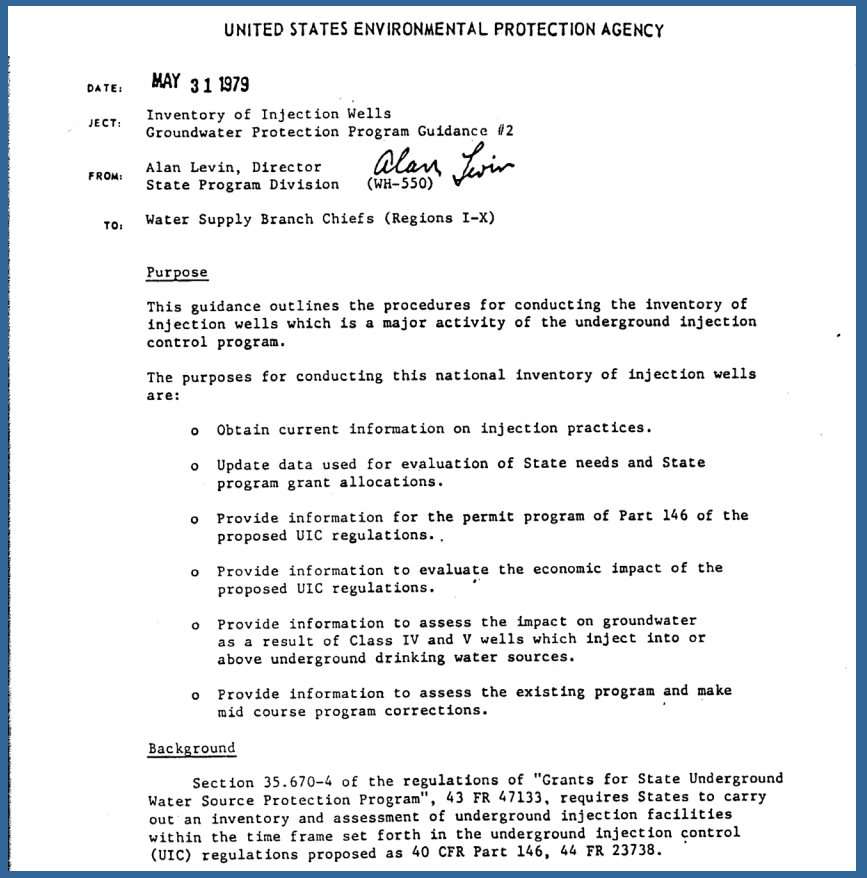
Inventory Data Collection and Management



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DATE: MAY 31 1979

JECT: Inventory of Injection Wells
Groundwater Protection Program Guidance #2

FROM: Alan Levin, Director
State Program Division (WH-550)

TO: Water Supply Branch Chiefs (Regions I-X)

Purpose

This guidance outlines the procedures for conducting the inventory of injection wells which is a major activity of the underground injection control program.

The purposes for conducting this national inventory of injection wells are:

- Obtain current information on injection practices.
- Update data used for evaluation of State needs and State program grant allocations.
- Provide information for the permit program of Part 146 of the proposed UIC regulations.
- Provide information to evaluate the economic impact of the proposed UIC regulations.
- Provide information to assess the impact on groundwater as a result of Class IV and V wells which inject into or above underground drinking water sources.
- Provide information to assess the existing program and make mid course program corrections.

Background

Section 35.670-4 of the regulations of "Grants for State Underground Water Source Protection Program", 43 FR 47133, requires States to carry out an inventory and assessment of underground injection facilities within the time frame set forth in the underground injection control (UIC) regulations proposed as 40 CFR Part 146, 44 FR 23738.

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Identifying Shallow Wells: Data Sources

- **Area or watershed information**
  - Zoning maps
  - USGS topographic maps
  - Source water or wellhead assessment areas
  - Sole source aquifers
  - Sewer maps

- **Site-specific information**
  - Parcel maps
  - Building permit files
  - Business licenses
  - Business telephone directories
  - Hazardous materials or septic tank permits

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Identifying Shallow Wells: Data Sources

- **Local governments may have relevant information**
  - Inspection results from other programs
  - Personal knowledge and local data bases

- **Local governments may also have relevant responsibilities**
  - Hazardous waste management
  - Sewage management
  - Ground water protection

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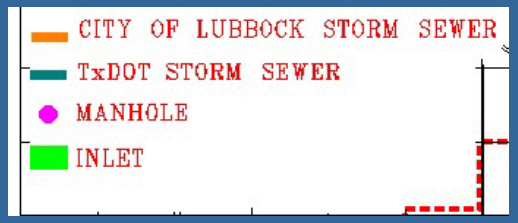
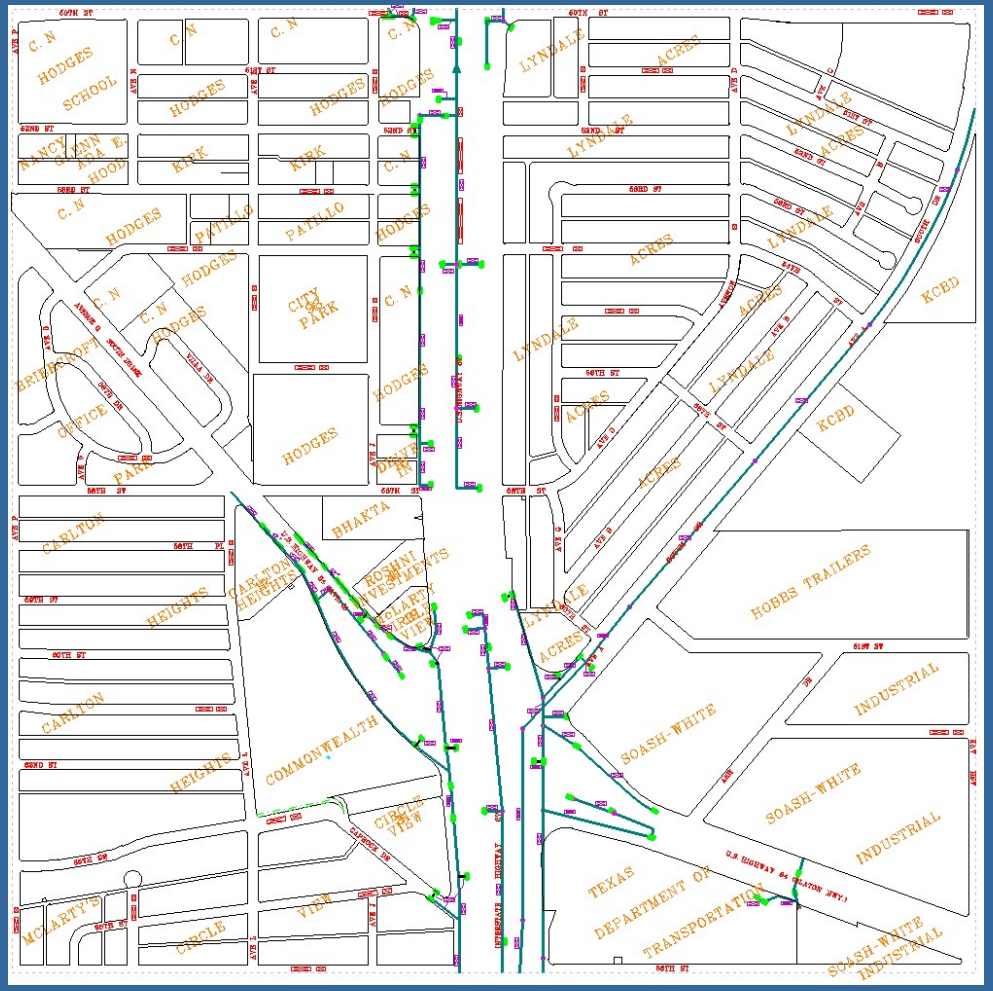
Geographic Information Systems





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Information Request

INJECTION WELL INFORMATION (Complete this section for each Injection Well at Facility)

Well Type: CESSPOOL ❑ DRAINAGE WELL ❑ DRY WELL ❑ HEAT PUMP RETURN FLOW WELL ❑

SEPTIC SYSTEM ❑ (tank size in gallons: _____)

OTHER ❑ (please describe: _____)

Well Status: PROPOSED ❑ ACTIVE ❑ ABANDONED ❑ PLUGGED ❑

Approximate Date Installed: _____ If Plugged or Abandoned, When? _____

Well Location: Township: _____ Range: _____ Section: _____ 1/4 Section: _____

Latitude: _____ Longitude:_____

Depth of Well (In Feet): _____ Injection Formation: _____

Nature of Injected Fluid(s): _____

_____

_____

_____

Has any chemical analysis been done on the injectate? YES ❑ NO ❑ (if yes please attach copies of the results)

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Requiring Additional Information

- EPA can require other submissions to determine if USDWs are endangered
  - Ground water monitoring and reporting of results
  - Injection fluid analysis and reporting
  - Geologic data
  - Other

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Injection Well Inventory as of 2017

EPA Region	Class I Hazardous Wells	Other Class I	Class II Disposal Wells	Class II Recovery Wells	Class II Other	Class III Sites	Class III Wells	Class IV Sites	Class IV Wells	Class V Wells	Class VI Wells
1										22,064	
2			6	312	2	6	179			8,089	
3			86	2,387		3	38			47,465	
4	8	262	799	3,778		1	4	2		84,680	
5	25	51	4,417	8,788	4	9	102	1	2	73,930	2
6	101	126	23,167	52,371	51	154	6,140	8		52,732	
7	6	72	5,610	14,054		7	4,938			21,954	
8		97	2,012	8,918		30	16,669	2	19	17,359	
9		49	1,806	54,152		4	1,547			66,150	
10		23	51	1,487	9			106	106	119,999	
Total	**140**	**680**	**37,954**	**146,247**	**66**	**214**	**29,617**	**119**	**127**	**514,422**	**2**

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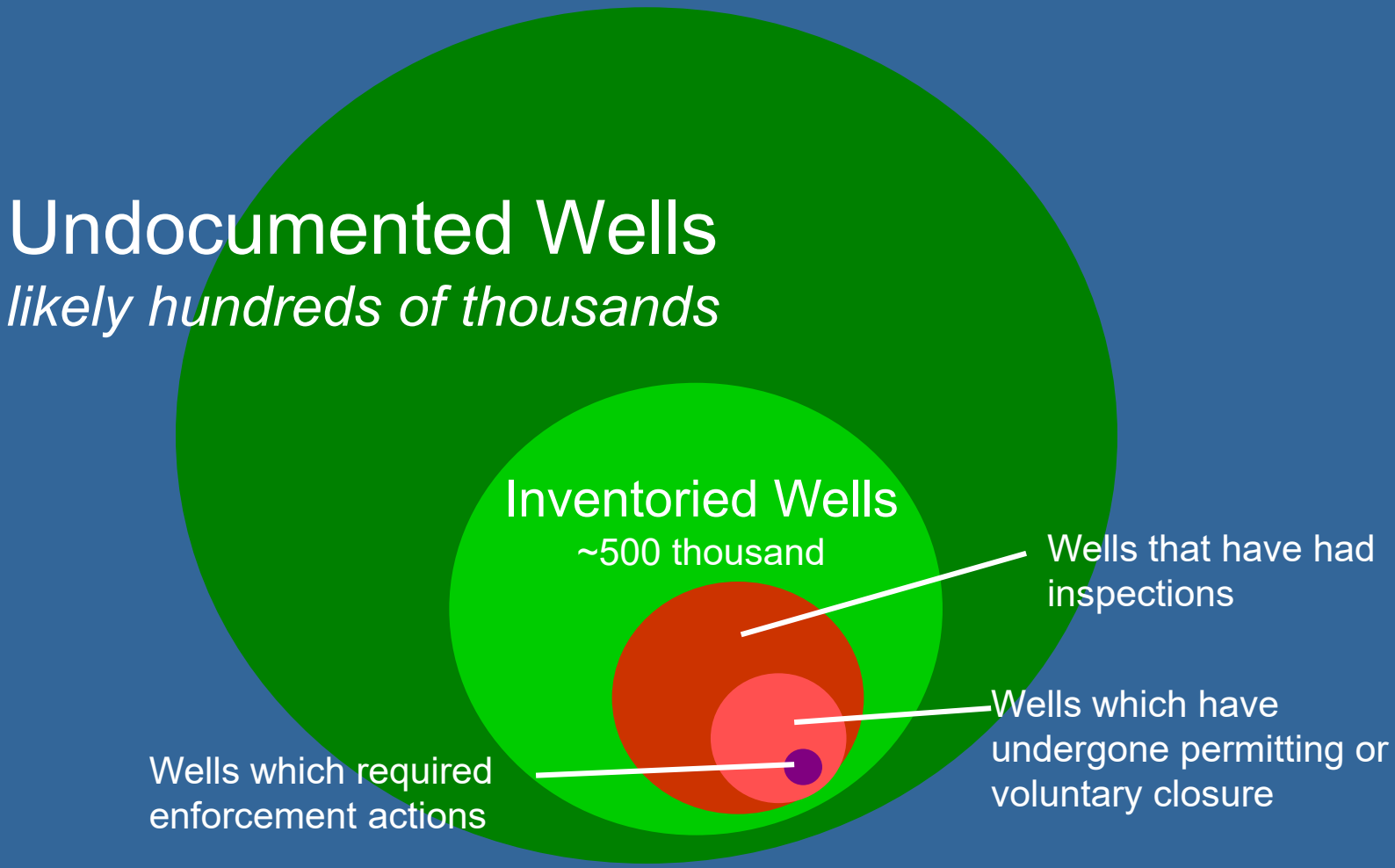
What's Out There?



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Determining if a System is a Well

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Key Definitions

- **Well:** A bored, drilled, or driven shaft whose depth is greater than the largest surface dimension; or a dug hole whose depth is greater than the largest surface dimension; or an improved sinkhole; or a subsurface fluid distribution system.
- **Improved Sinkhole:** A naturally occuring karst depression or other natural crevice found in volcanic or other geologic settings which have been modified by man for the purpose of directing and emplacing fluids into the subsurface
- **Subsurface Fluid Distribution System:** An assemblage of perforated pipes, drain tiles, or other similar mechanisms intended to distribute fluids below the surface of the ground.
- **Fluid:** Any material or substance which flows or moves whether in a semisolid, liquid, sludge, gas or any other form or state.
- **Underground Injection:** Subsurface emplacement of fluids through a well.

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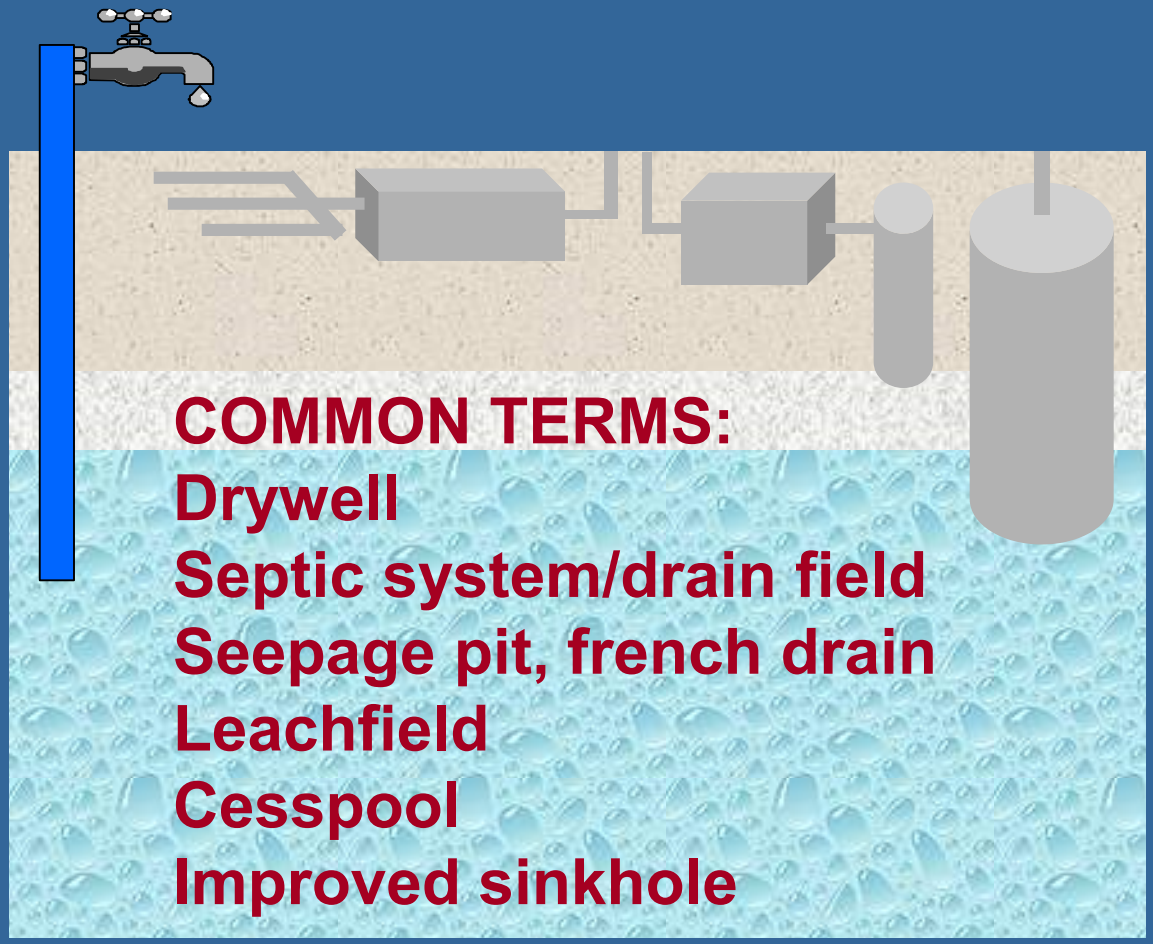
Shallow Injection Wells



These devices are intended to allow fluid to percolate into or above shallow ground water.

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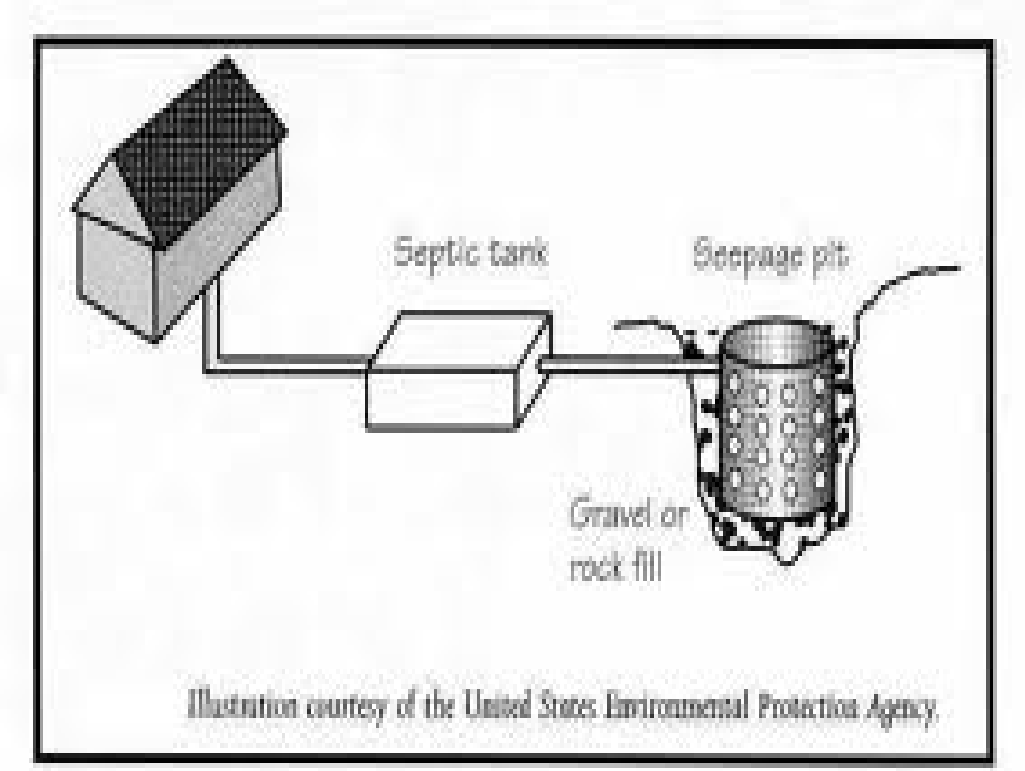
Seepage Pit/Dry Well



Schematic of a Seepage Pit (Dry Well)

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Drain Field

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Infiltration Gallery

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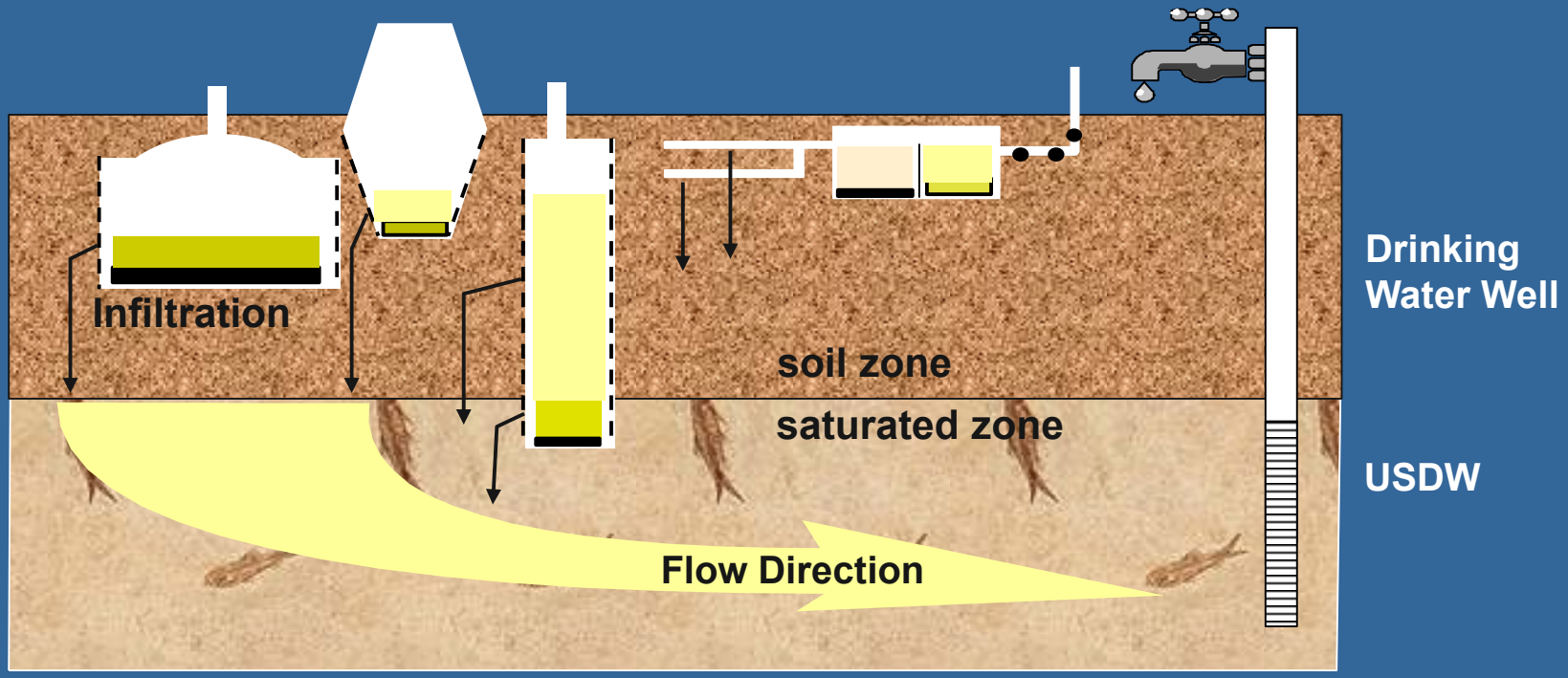
Common Construction Methods



Diagrams are examples only; no federal construction requirements apply.

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Is this a Class V Well?

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Specific UIC Program Exclusions

- **Excluded shallow wells** [40 CFR 144.1(g)] :
  - Individual and single family domestic cesspools or septic systems
  - Non-residential cesspools, septic systems or similar waste disposal systems used ***solely*** for sanitary waste disposal ***and*** less than 20 people/day service capacity
  - Dug holes not used for subsurface fluid discharge

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Is This a Class V Well?

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Is This a Class V Well?

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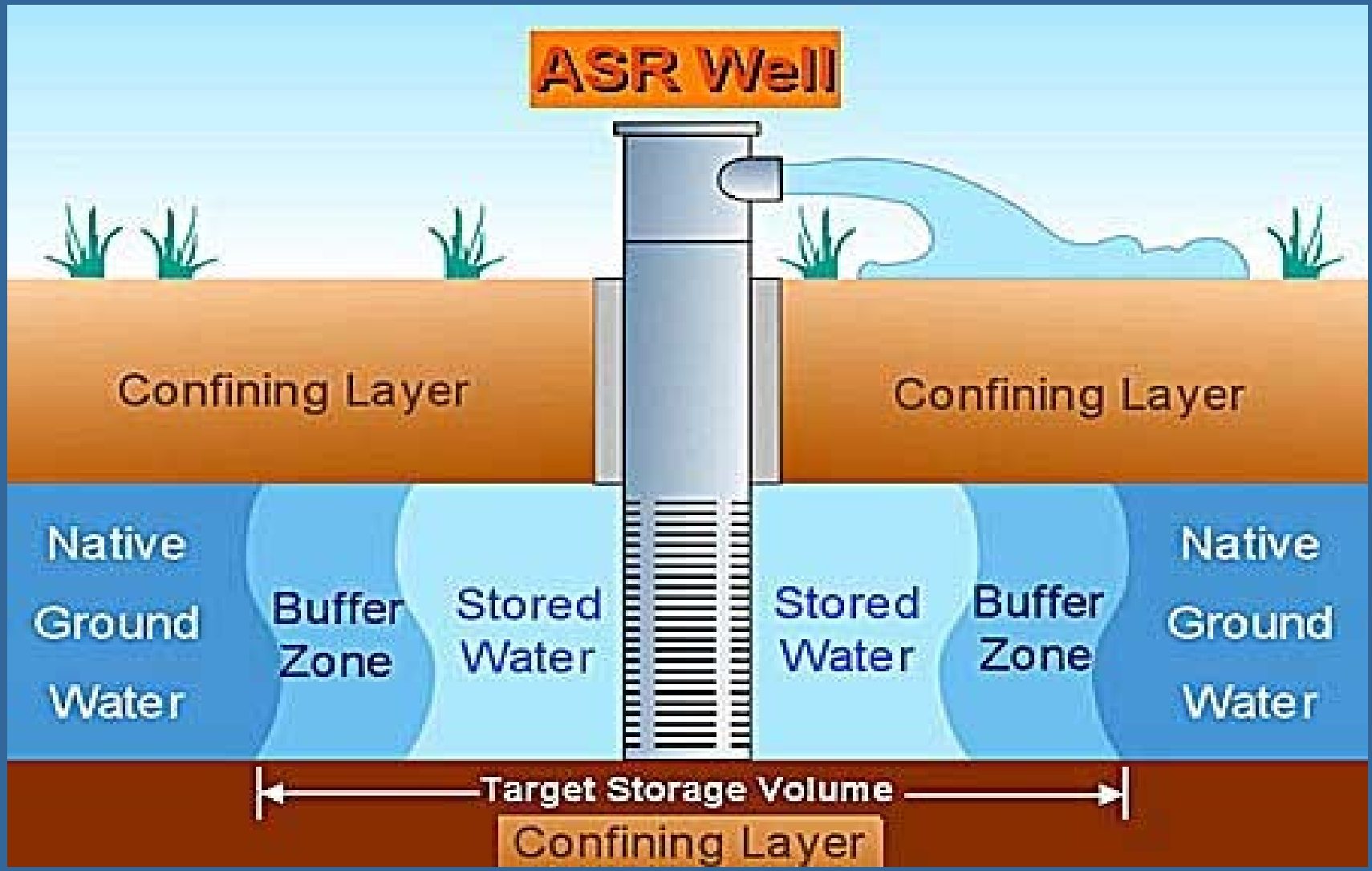
Emerging Class V Wells

- Aquifer Storage and Recovery Wells
- Drinking Water Treatment Residual Disposal Wells
- Experimental Technology

Florida Class V ASR Facilities

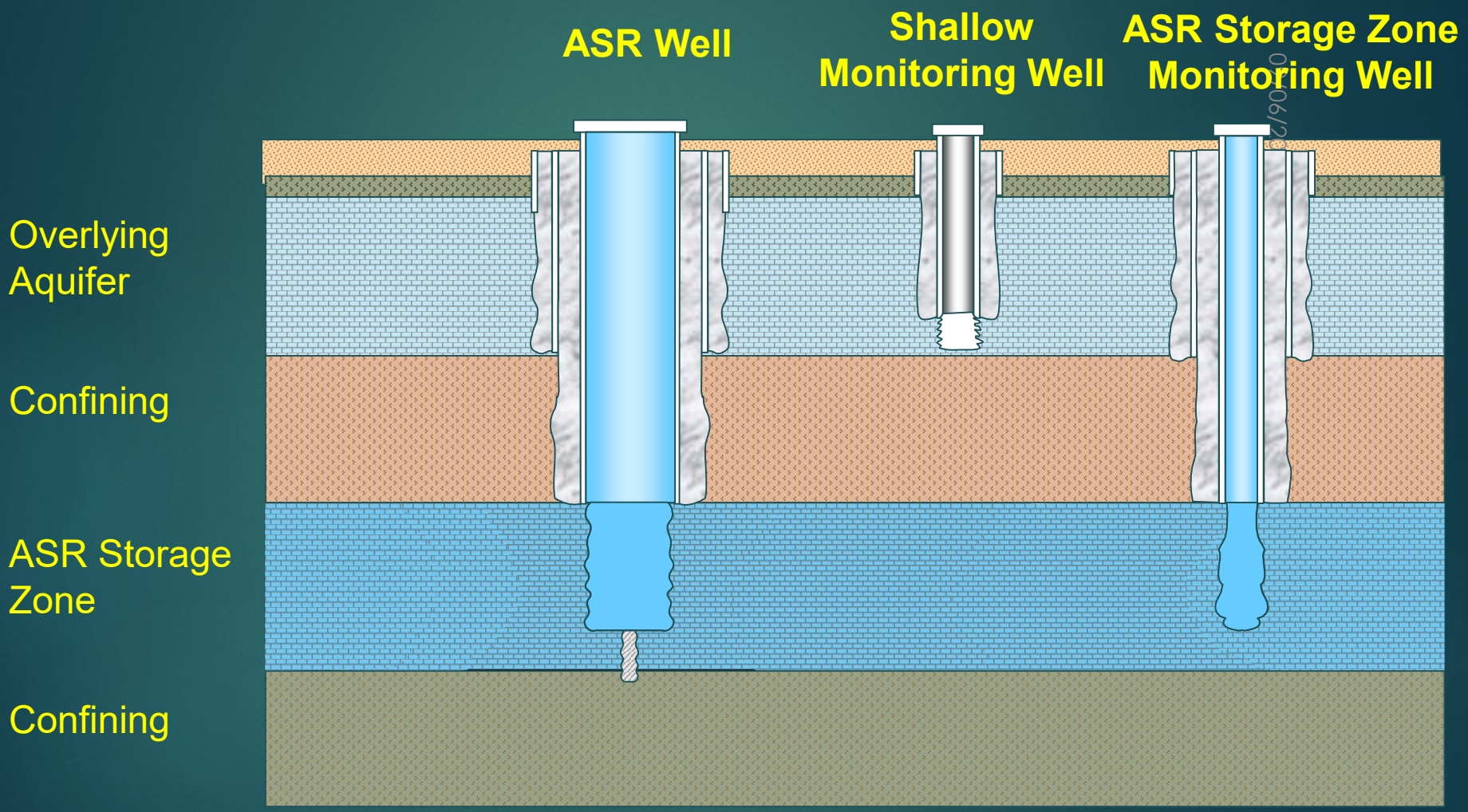
Aquifer Storage and Recovery (ASR) Well



ASR Fluids Stored

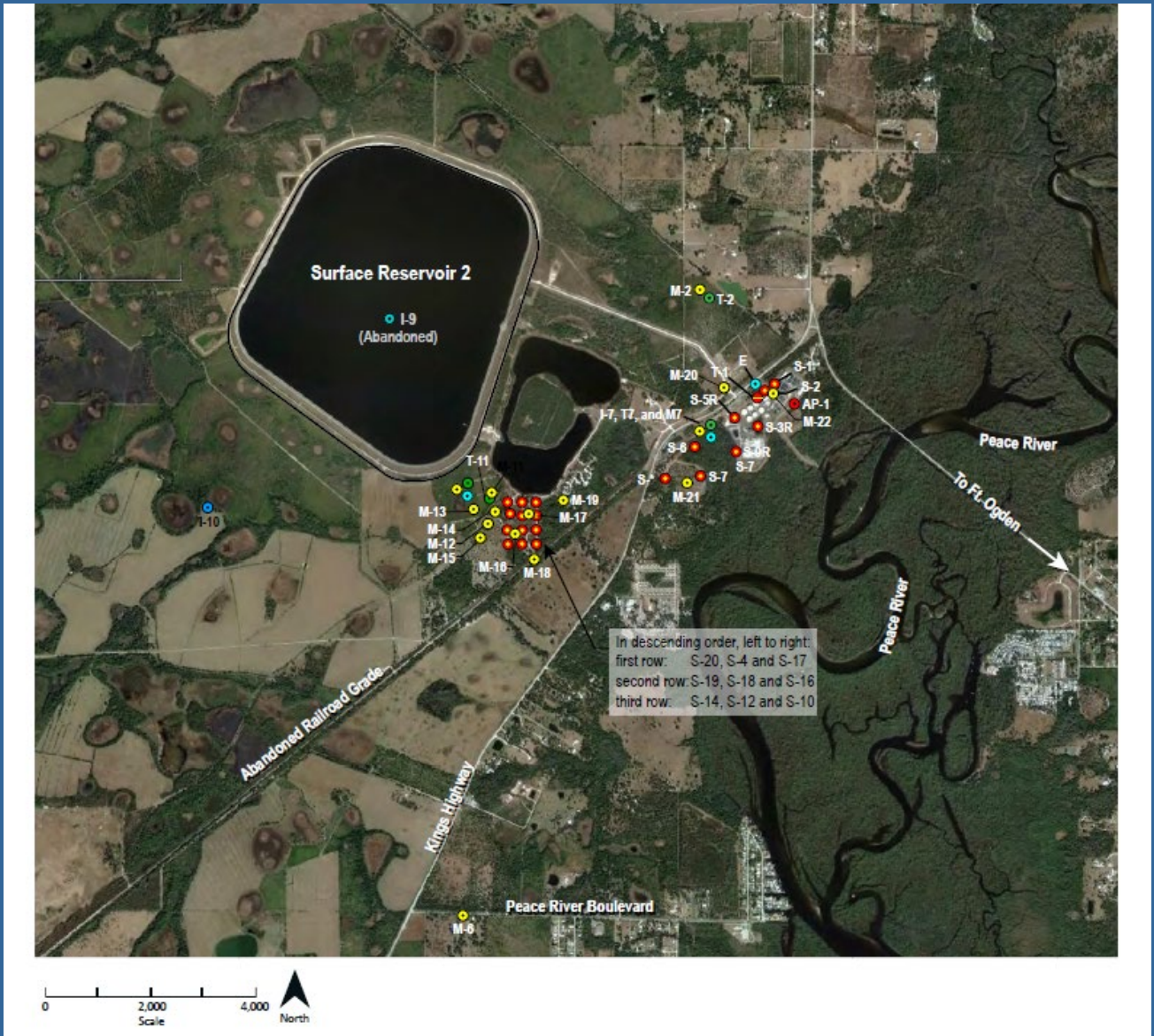
- **Treated Drinking Water**
  - Surface water source
  - Ground water source
- **Surface Water**
  - Streams, canals, lakes, wetlands
- **Ground Water**
  - From other aquifers
- **Reclaimed Water**

ASR – Cross Section View



Peace River ASR Well

Peace River ASR Site Map



Peace River Reservoir

ASR Pros and Cons

Advantages

- Large volume can be stored
- Little land area needed
- No evaporation losses
- Cost savings

Concerns

- Contaminants introduced during injection
- Reactions between injected fluid and aquifer material/formation fluids

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Drinking Water Treatment Residual Disposal Wells

- Wells used to dispose of fluids generated during treatment of water to remove contaminants (usually removal of salts or nitrate/nitrite but could also include treatment for radionuclides).
- Can use either deep or shallow wells to dispose of these fluids.
- Deep wells can fall under either Class I or Class V
- Fluids will exceed the MCL for the contaminant that is being treated for.
- Becoming common at small Public Water Supplies.

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Experimental Technology Wells

- Experimental wells are wells used to test new or unproven technologies.
- The category was created to allow for demonstration of injection practices which may have been prohibited by the current regulations or don't fit directly into the existing well classifications.
- Examples include: Early CO2 geologic sequestration projects, Biosolids injection above fracture pressure, Tracer injection using rare earths of radioactive materials
- This type of well needs to be permitted and the project monitored.
- Once the project is done, EPA is to review the data and make a determination on what the next steps are.

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What Shallow Wells Currently Have Specific Requirements

- Class IV Wells
- Motor Vehicle Waste Disposal Wells
- Large Capacity Cesspools

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Class IV or Class V Well?

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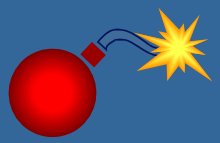
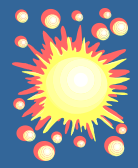
What is Hazardous Waste?

- Solid wastes that exhibit at least one of four characteristics:


Reactive


Corrosive


Toxic


Ignitable

- Listed hazardous wastes:
  - From non-specific sources
  - From specific sources
  - Discarded or off-specification chemicals

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What's wrong with this picture?

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Motor Vehicle Waste Disposal Wells

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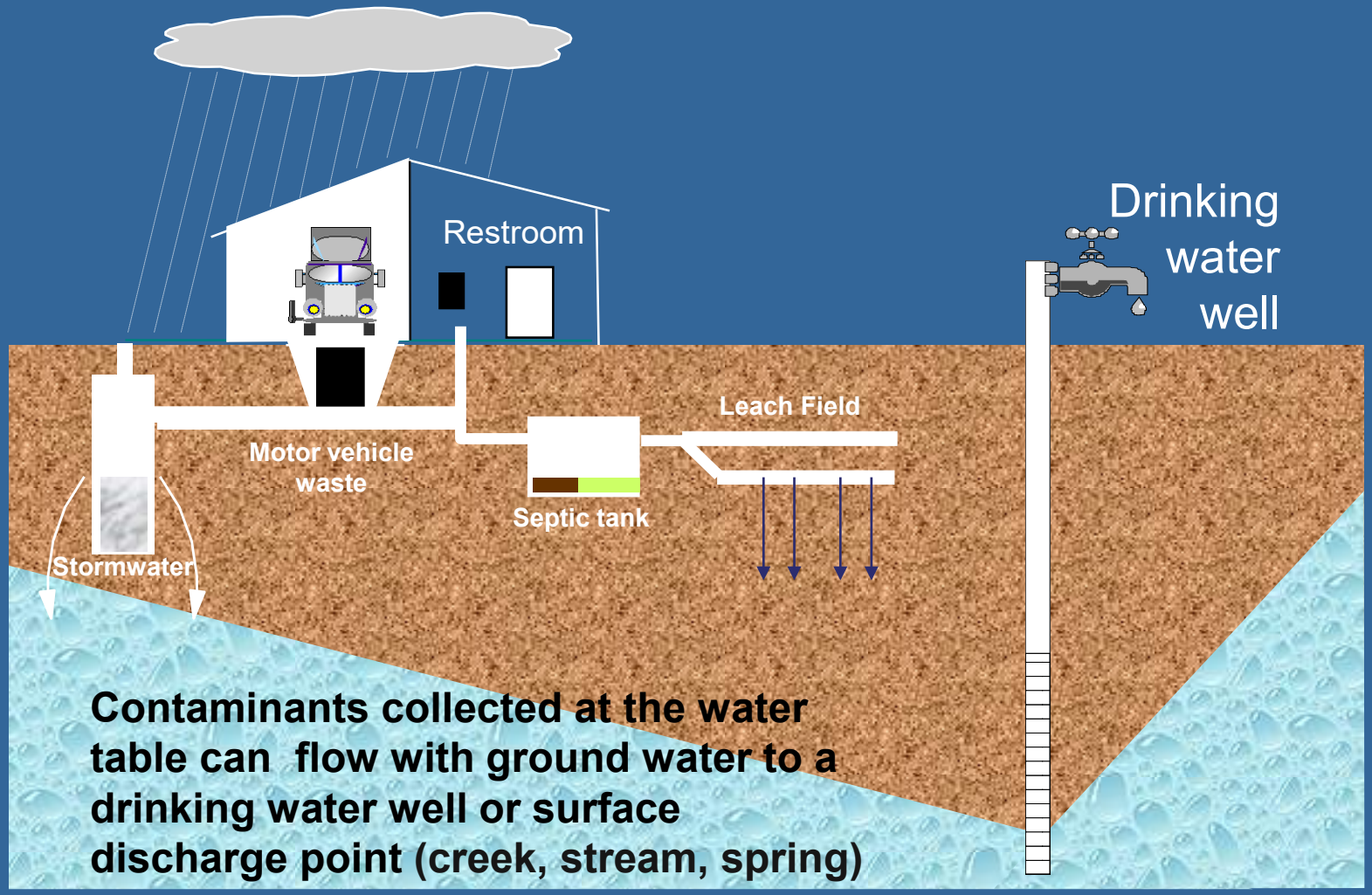
Risky Business



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What Is Required?

Repair bay with drain and clarifier cover

Clarifier leading to seepage pit

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What Is Required?

Closeup of manhole
to seepage pit

Waste oil storage area with spillage

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Permit Requirements for Existing Motor Vehicle Waste Disposal Wells

- Fluids must meet the MCL at the point of injection
- Facility must follow BMPs
- Facility must monitor to ensure compliance of injectate and sludge with the MCLs

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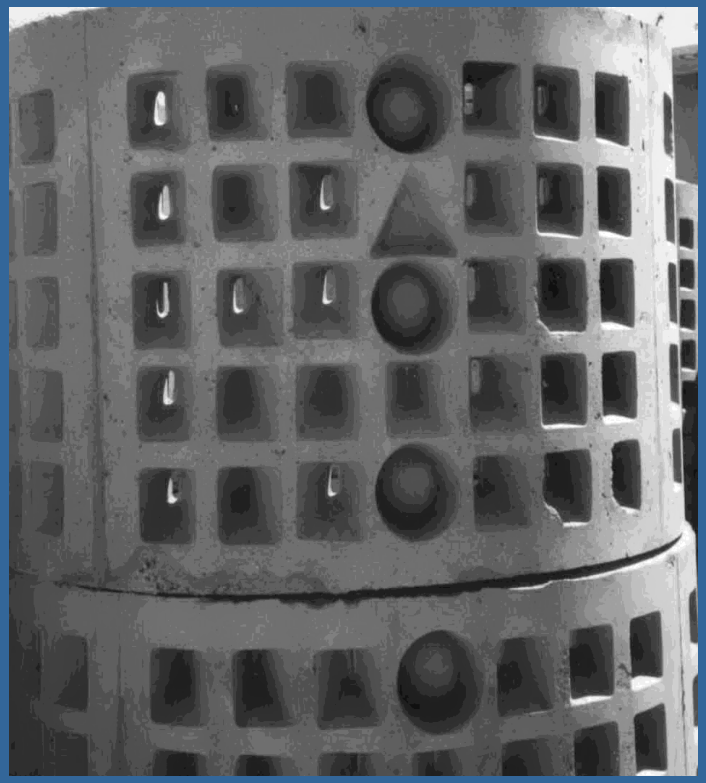
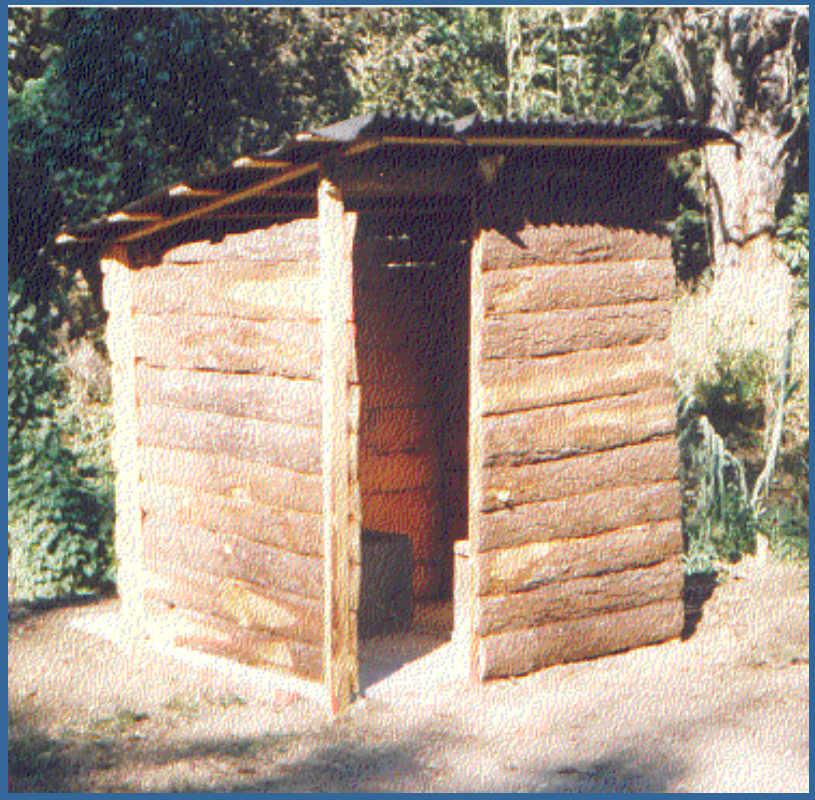
Large Capacity Cesspools





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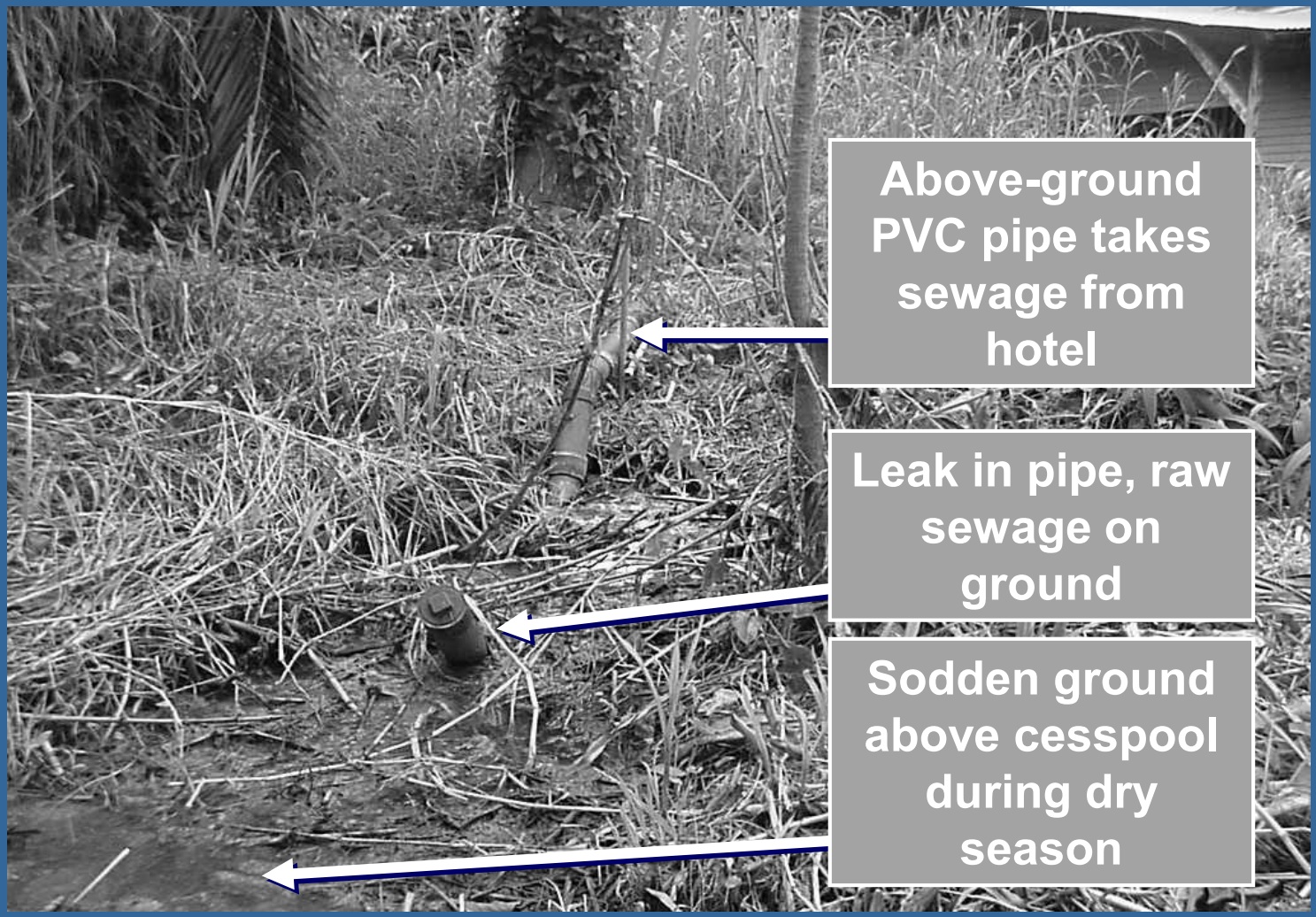
Accident Waiting to Happen



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Inspecting Shallow Injection Wells

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Preparing for and Conducting an Inspection

- Developing an approach
- Where do I look?
- Key questions
- Signs to watch for
- What to put in a report
- Follow-up

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Questions to Consider as You Plan

- What communities in my jurisdiction rely on ground water for a public water supply or for individual drinking water wells?
- What industrial, agricultural, commercial or other sources exist in that community that use, store, or generate hazardous waste or other potential pollutants?
- What contaminants must be removed from the drinking water before it is safe?
- Who should I contact and with whom should I coordinate as I plan to address shallow injection wells in this community?

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What Does the Inventory Data Tell You?

- Number of wells, identified by type
- Percent of wells in the same geographic area
- Percent of wells in sensitive areas
- Number of wells:
  - Authorized by rule
  - Authorized by rule with BMPs or conditions
  - With permits
  - Closed
  - To be closed (sewered)
  - To be closed (zero discharge)
- Geographic boundaries of jurisdiction
- Reference to codes authorizing inspection or enforcement by your agency

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Selecting Inspection Sites

- Class IV vs. Class V
- Risk of the waste stream
- Actively used or sensitive USDWs
- Areas where ground water is contaminated
- Source water protection areas
- Sole Source Aquifers
- Recalcitrant owner/operator
- Enforcement policy or targeted industry

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Planning Inspections

- Review applicable BMPs
- Review site characteristics
- Coordinate with other agencies
- Review any site specific information received
- Know the UIC regulations applicable to the site

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Tools for Inspections

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SDWA Authorities for Inspectors

- Authority to Inspect: §1445
- Civil Enforcement: § 1423
- Emergency Enforcement: § 1431

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Useful 40 CFR Shallow Well References

- 144.3 Definitions
- 144.12 Non-Endangerment Provision
- 144.13 Class IV Well Prohibition
- 144.23 Rule Authorization for Class IV Wells
- 144.24 Rule Authorization for Class V Wells
- 144.25 Requiring a Permit
- 144.26 Inventory Requirement
- 144.27 Requiring Other Information
- 144 Subpart G Class V Well Requirements

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During the Inspection

- Identify yourself
- Explain the purpose of your visit
- Explain what you plan to do during and after the inspection
- Note any limitations imposed by the owner/operator
- Take detailed notes

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Evaluating the Site

- All waste generating activities
- Hazardous materials and waste storage
  - Housekeeping
  - Collection and disposal points for storm water, sewage, other fluids
- Receipts and manifests from waste haulers, sewer bill
- Monitoring data, if available

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Where Did it Come From and Where Does it Go?

- Storm Water Management
- Excess Industrial Waste
- Car Wash Waters
- Contact and Non-Contact Cooling water
- Drinking Water Treatment Residuals

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On-Site or Off-Site Waste Disposal?

Where does that drain go?

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Evaluating the Site

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Evaluating the Site

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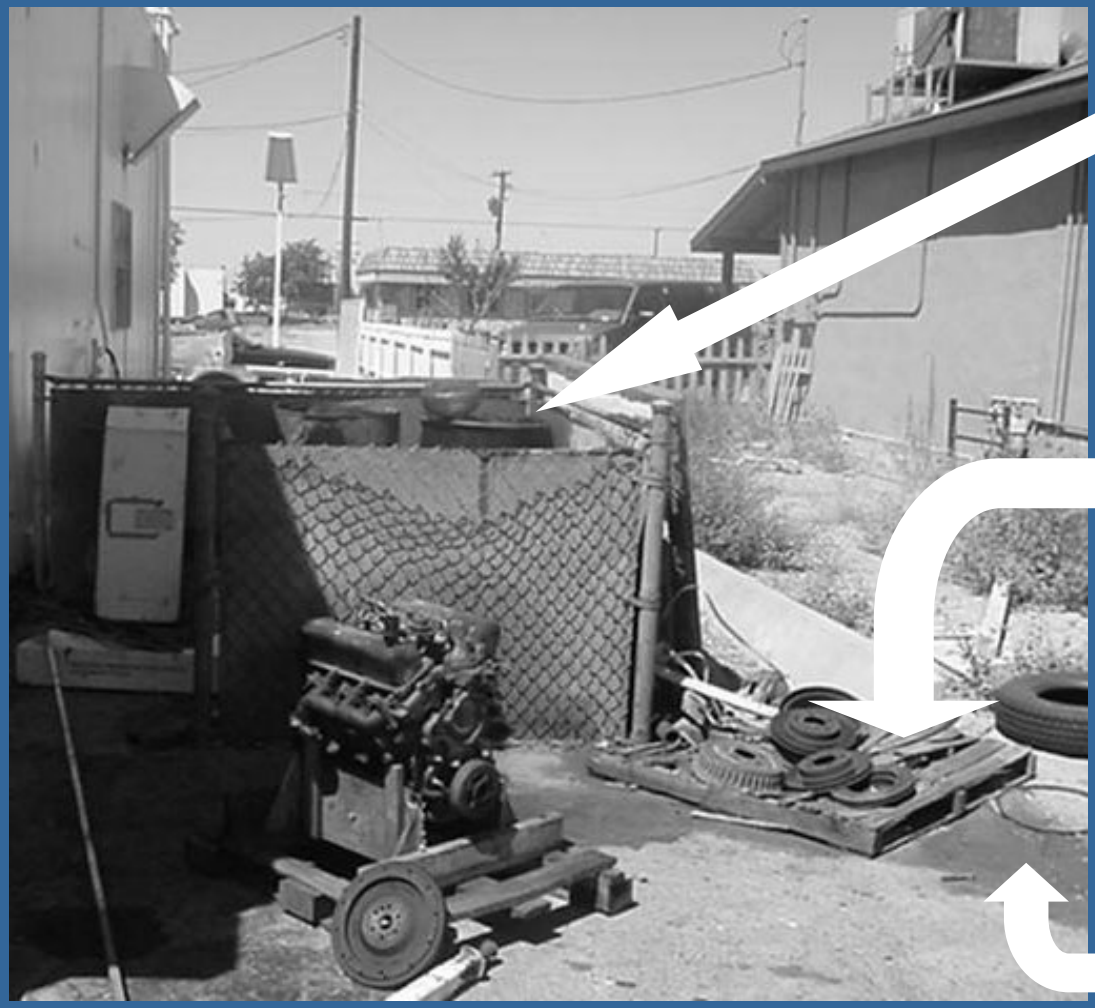
Questionable Management Practices



What is in the 55-gallon drums?

What is under the pallet?

What is staining the soil?

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Inspection Photos: Flow

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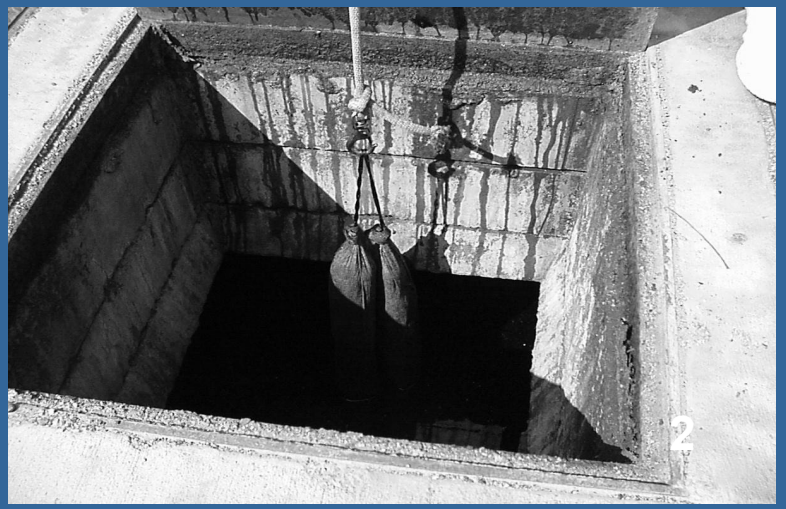
Inspection Photos: Drains



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Tricks of the Trade

- Have the facility staff open any drain you need to inspect
- Do not sample without training
- Visually examine contents
  - Rainbow sheen indicates petroleum product
  - Apparent hard surface = scum layer
- Listen for trickles, flows and pours
- Note any containers located around floor drains and if possible, fluid levels in the containers
- ***Do not*** directly inhale vapors or odors from a shallow injection well!

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Compliance Assistance or Enforcement

- Inspectors may provide:
  - Existing information
  - Written materials
  - Referral to Web site or assistance programs
- Inspectors should not provide:
  - Site-specific interpretive information
- Coordination with enforcement and legal counsel is essential

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Compliance Assessment

- Assessment may be determined at the **point of injection**
  - Last accessible sampling point before subsurface
  - Required assessment point for motor vehicle waste disposal wells
  - May be compliance point for others - depends on well type and EPA regional or state practice
- Sampling and assessment moves outward from the well until a plume is delineated, as necessary

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Inspection Reports

- Facility name and location
- Facility contact name
- Inspector's name
- Date and time in and time out
- Site description
- Site map
  - Structures
  - Waste generating areas
  - Disposal points
- Observations, with photographs
- Findings and compliance determination
- Follow up recommended?
  - Inventory only
  - Characterization needed
  - Inquire with other agencies
  - Referral

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What Next?

- Internal report review
- Is more information needed?
- Is there an imminent threat?
- Does data gathered indicate rule authorization is appropriate or other requirements necessary?

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Case History 1: The Site

- Small, rural business servicing and selling snowmobiles in DI state
- Inventory had been submitted
- Owner claims county and state authorized system
- Floor drain in snowmobile repair area, connected to septic system
- Detailed notes taken; provided suggestions for alternatives

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Case History 1: The Next Steps

- Owner wanted exact instructions for achieving compliance
- Inspector did not photograph, due to owner's distress
- Fall 1999 – no response
- Phone calls, notice of noncompliance
- Enforcement referral
- State agency personnel testified for owner regarding thick clay underlying facility

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Case History 1: Conclusion

- Final result of hearing, as ruled by Presiding Officer in fall 2002
  - Owner must comply with terms of notice of noncompliance and close well
  - Penalty of $1,500
  - Presiding Officer noted violations were not considered serious since EPA had no waste stream samples

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Addressing Shallow Injection Wells

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Rule Authorization

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Guidelines for Rule Authorization

- All wastes are properly and legally managed
- Dilution is not a method of treatment
- All disposal points are known
- All receiving waters are known
- Safe operation of wells is assured with routine inspection, maintenance and monitoring
- Confident that fluids meet 144.12 standard
- Close wells that cannot demonstrate compliance

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Risk Considerations

- What is in the injectate
- Site practices
- Soil type and interaction with injectate
- Depth to ground water
- Vulnerable USDW
- Proximity of drinking water wells
- Discharge to surface water
- Determination about rule authorization may change if site conditions change

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Best Management Practices

- Signage for injection wells
- Temporary plugging or covers
- Construct swales, berms, other barriers
- Standpipes
- Housekeeping
- Dry shop practices
- Recycling, pollution prevention

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What's the Better Management Practice?

- Parts cleaned with solvent that is poured into shallow injection well
- Parts cleaned in a recirculating solvent sink serviced periodically by a contractor
- Parts cleaned in a recirculating self-contained steam unit that reclaims water and filters out metals and oils

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How can we deal with this site?!

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Permitting

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Permitting Options

- Individual permit
- Area permit
- General permit
- A permit may be required due to:
  - Violating 40 CFR 144.12
  - Motor vehicle waste disposal well requirements
  - Out of compliance with other UIC requirements
  - USDW protection necessitates site-specific well limits and regulation

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Requiring a Permit

- 40 CFR 144.25 and 144.84
- Only option for motor vehicle waste disposal wells granted waiver from requirement to close
- May require any other Class V to obtain a permit in order to protect USDWs
- State or local requirement

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Permits for Other Wells

- Ensure consistent injectate quality
- Verify frequency of well use
- Make BMP use enforceable
- Require periodic reporting
- May be individual, area or general permits

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Requiring Other Information

- EPA can require other submissions to determine if USDWs are endangered
  - Ground water monitoring and reporting of results
  - Injection fluid analysis and reporting
  - Geologic data
  - Other

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Site Characterization and Closure

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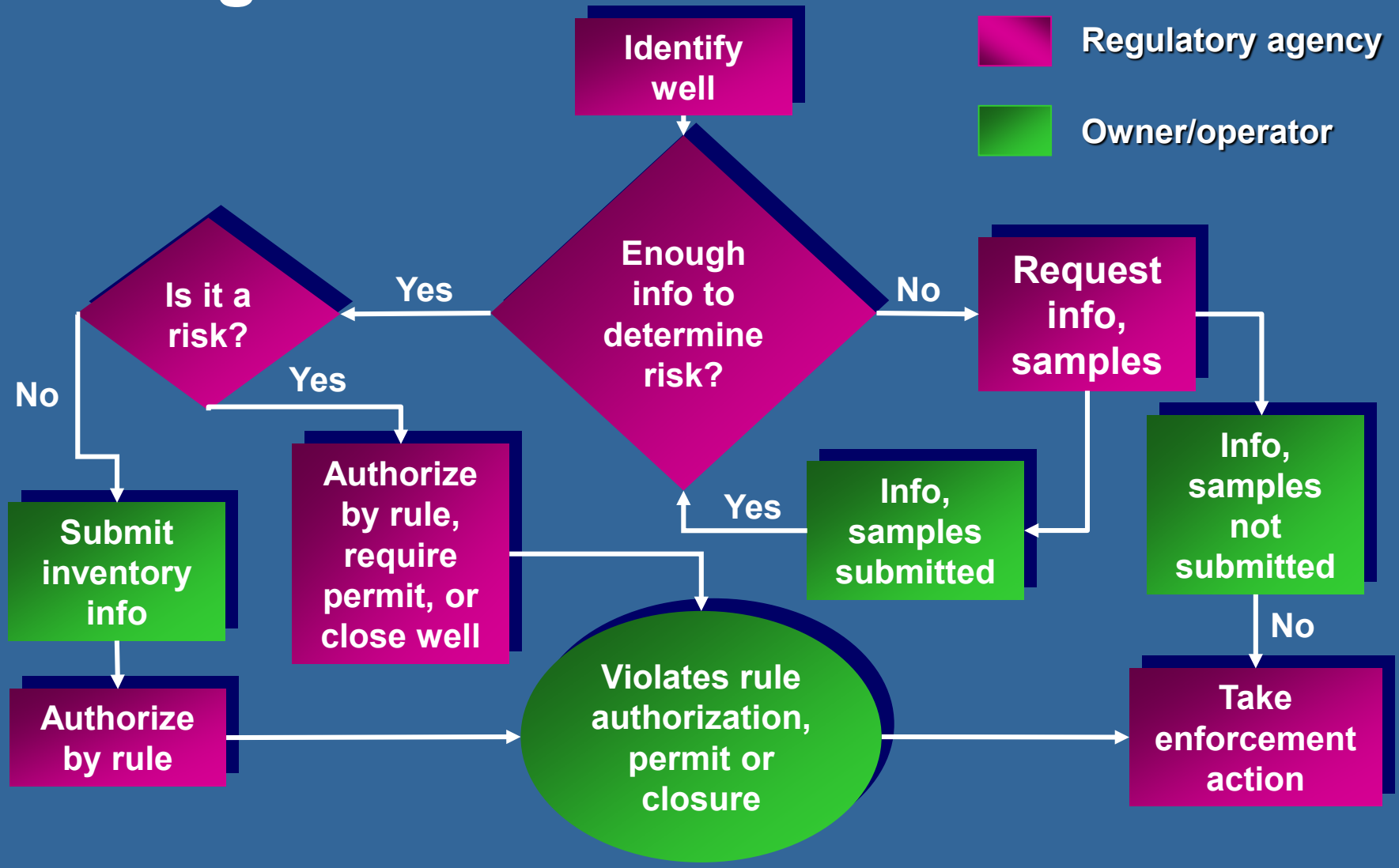
Making the Decision



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Closing a Site

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Summary of EPA Pre-Closure Notification

- National Pre-Closure Notification Form (OMB No. 2040-0214)
  - Required for DI programs
  - Optional for primacy States
- Large capacity cesspools and motor vehicle waste disposal wells subject to pre-closure notification requirement
- May be required for other wells, at Director's discretion

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Pre-Closure Notification

- Facility and owner/operator information
- Well description
- Discharge type and description
- Closure activities
- Planned closure dates

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Pre-Closure Notification

- No approval needed from EPA
- EPA can determine proposed closure is inadequate
- Additional steps may be required
- No word from EPA assumes adequacy of proposed closure

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Well Closure Requirements

- Prevent movement of contaminated fluids that may endanger USDWs
- Remove and dispose of soil, gravel, sludge, liquids, or other materials
- In limited cases, may convert motor vehicle waste disposal wells to other Class V types

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Closure Options

- Total removal?
- Fill and abandon in place?
- Convert well to another use?

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Prioritizing for Action

- Class IV vs. Class V
- Risk of the waste stream
- Actively used or sensitive USDWs
- Source water protection areas
- Recalcitrant owner/operator
- Enforcement policy

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Site Characterization

- Define site geologic, hydrologic and waste characteristics
- Define extent of contamination before closure or conversion
- Assess “hot spots”
- Determine environmental effects

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Sampling Standards

- MCLs
- Pretreatment standards
- Soil Screening Levels or Preliminary Remediation Goals from Superfund
- State soil or ground water standards

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Establishing Sampling Parameters

- Generator knowledge
- MSDS, reports to other programs
- Site observations
- Likely constituents by industry

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When Is the Site Clean Enough?

- Based on USDW protection
- Develop site-specific remedial plan
- Consult with other agency staff with remediation experience

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Example Investigative Process

- Auto dismantling facility that had been under investigation by county for 10 years due to poor waste management practices
- Facility submitted inventory information for one motor vehicle waste disposal well
- Letter sent to facility March 2001; no response.
- Inspection conducted May 2001
- Sumps (depressions to collect fluid) were noted; facility personnel said they were built to prevent leakage to the subsurface
- Dug waste pit in rear, approx. 6 feet deep, allegedly used for disposal of waste fluids

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Results

- Regulatory status of sump unclear
- Additional site characterization warranted
- Facility was required to:
  - Conduct soil sampling in and around pit to determine whether remedial action required
  - Characterize the waste stream to the sump
  - Report findings to EPA
  - Required by EPA to implement improved containment, waste minimization, improved documentation of waste handling via Order

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Share the Knowledge

- Share information gathered by inventory and inspection efforts with other state and local authorities with similar missions or charges
- Local participation ensures localities stay informed, helps protect their drinking water and increases field presence

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Questions?

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