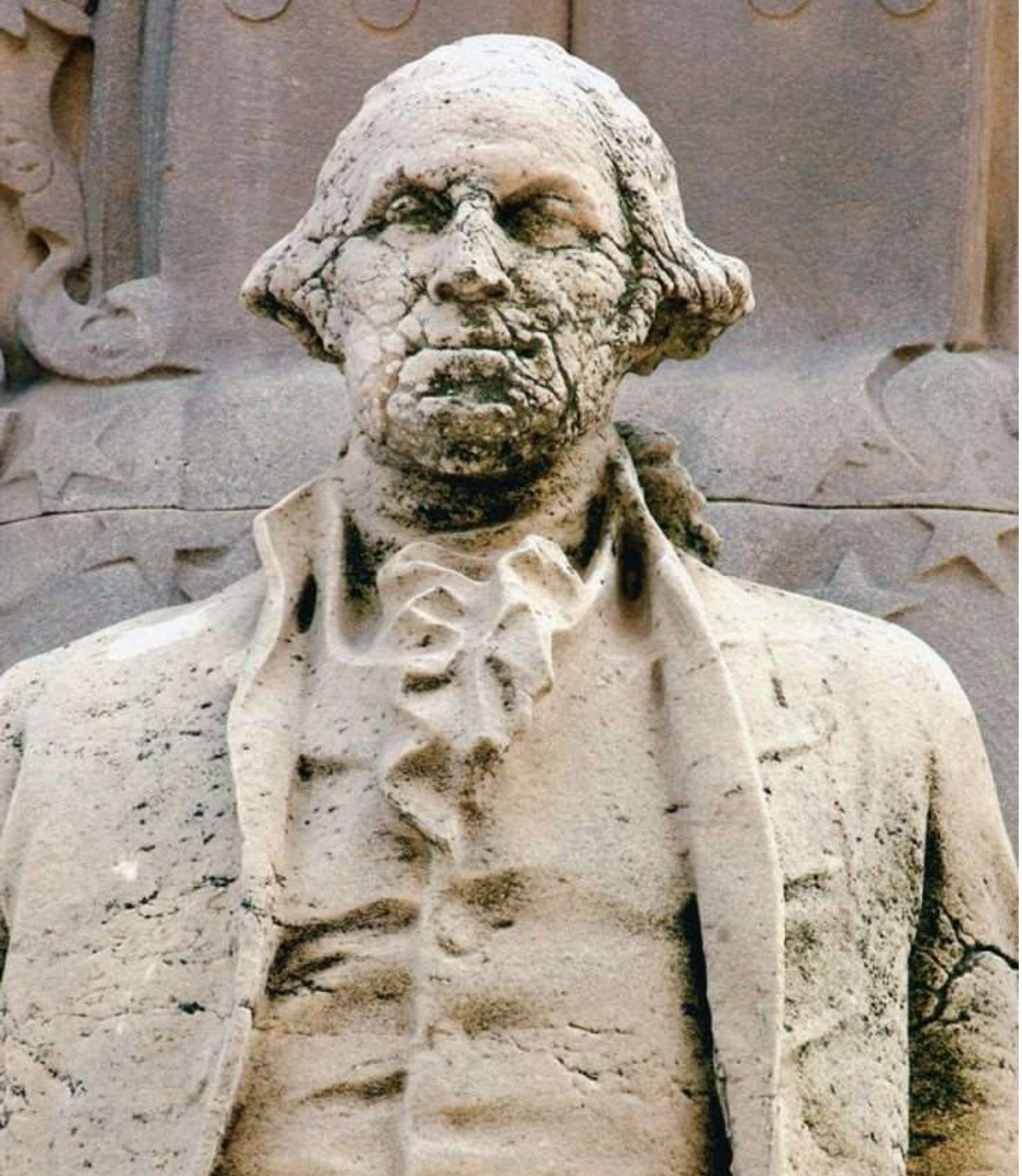

Acid Rain Weathered Statue in Washington D.C.

DACAAR Biosand filter poster with cartoons on what it is and how to use it with instructions in Dari language. Used for bacteriological contaminant filtering and treatment of household water. *From www.DACAAR.org*

Managing People's Environmental Impact

EPA and Clean Water and Air Acts

- Because people were polluting the U.S. so terribly, the EPA and environmental laws like the Clean Water and Air Acts were created.
  - Examples of pollution:
    - Rivers like the Cuyahoga in Ohio were routinely catching fire because of chemical pollution in them (oil and industrial waste). The Cuyahoga River made repeatedly made the national news and was the springboard for the start of the EPA.
    - Love Canal, NY – site of a neighborhood built on an industrial waste landfill. Many people died and were made sick from this pollution.
    - Air quality was also low in the industrial areas of the U.S. and there were no regulations against air pollution! Acid rain was a major problem for plant and animal life in the northeastern U.S and southeastern Canada.

Cuyahoga River Fire, 1969

The river was so polluted that it caught fire many times… Before the EPA, pollution levels in the U.S. were TERRIBLE!!!

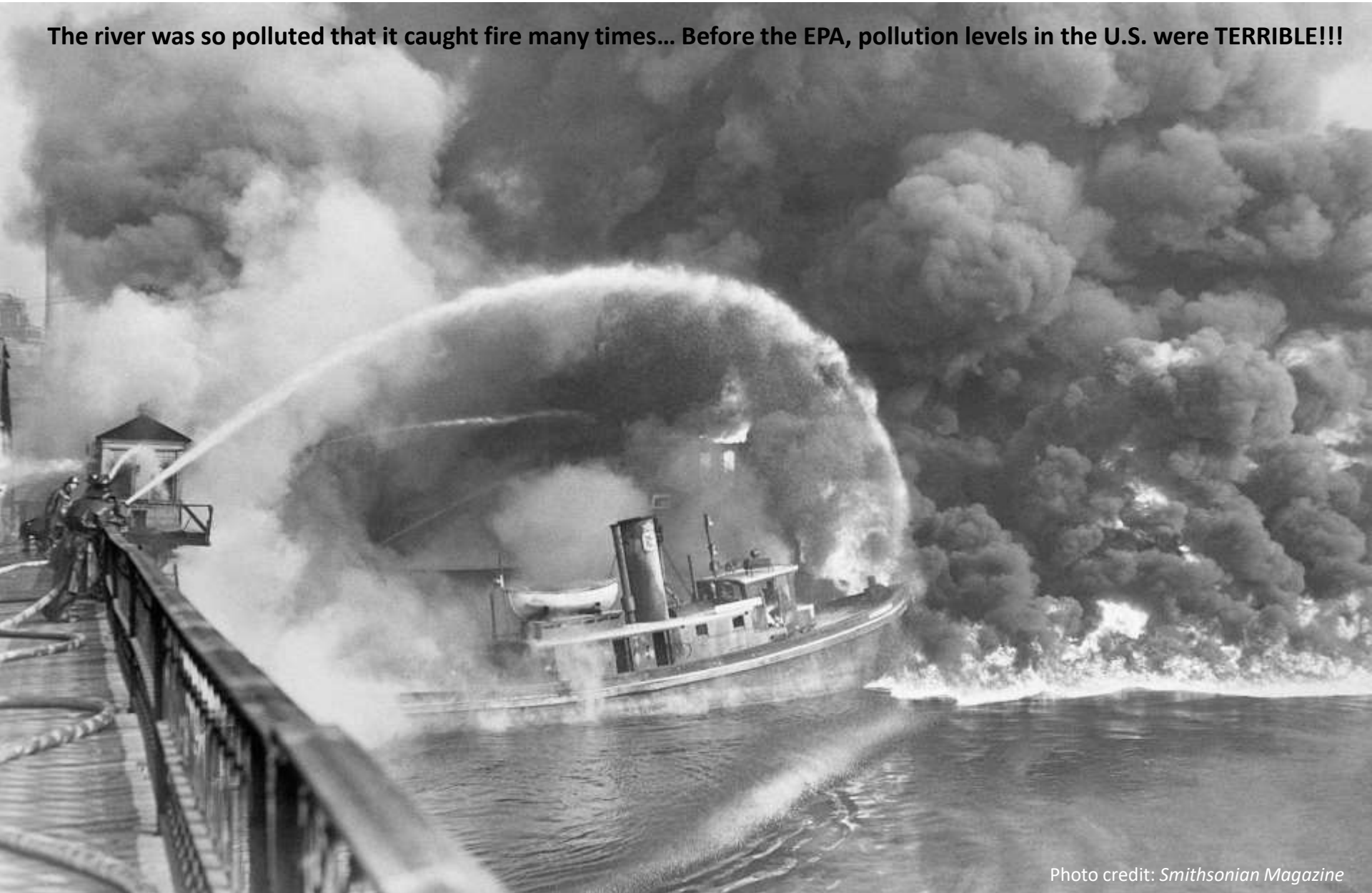

Photo credit: *Smithsonian Magazine*

The EPA and Environmental Action Clean Polluted Places! This is the Cuyahoga River before/after

Photo credit: *Joshua Gunter/The Plain Dealer/AP Photo*

The Three Rs of Recycling (RRR)

- R1
  - Reuse
    - A water bottle is clean, so it can be used for any other food-grade product…now it's a milk glass, then recycle it. Now you used it TWICE!
- R2
  - Reduce
    - Once you've reused a water bottle like above, you should crush it and maybe even put the cap on so it stays crushed. That's Reducing!
- R3
  - Recycle
    - After you've reused and reduced something as many times as you can, its time to recycle it so it can be remanufactured into something else.

- When we do this, we are putting things where they belong, very similar to "cleaning house" and being thrifty with our materials and money… It's the smart way to go, versus just throwing everything into a dump.
- **Don't rinse recyclables with clean water… it's a waste of water.** Its doesn't make any sense to rinse "trash". Rinsing doesn't sanitize the recycling trash materials…
  - Clean water (bottled) already costs more than gasoline in many places (World Series - 16 ounce bottle = $8 [that's $.50/ounce], concerts, etc.)

National Environmental Policy

- **Policies—**specific plans of action and principles that guide future decisions
- Environmental policies are established to guide how people's (or companies) actions affect the environment
  - National Environmental Policy Act (NEPA)
  - **Clean Water Act (CWA)**
  - Clean Air Act (CAA)
  - Resource Conservation and Recovery Act (RCRA)
  - Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)

National Environmental Policy Act, 1970

- “to declare a national policy which will encourage productive and enjoyable harmony between humans and their environment; to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of humans; to enrich the understanding of the ecological systems and natural resources important to the Nation.”

National Environmental Policy Act, 1970 (cont.)

- **Environmental Impact Statement** (EIS)— required for projects that impact the environment, includes:
  - Effects on water quality or habitat
  - Impact on economic, social, health, and cultural resource factors
  - Evaluate alternatives
    - Identify **stakeholders**—the public—other interested or affected parties
    - Public hearings, written comments
    - Input usually solicited at beginning to clarify the scope of EIS studies
      - Stakeholder input is required by law
      - EIS can be legally challenged

Clean Water Act, 1972

also known as Federal Water Pollution Control Act

- Primary goal is to restore and maintain the quality of surface and groundwater resources so that they are satisfactory for public water supplies, fish and aquatic life, and industrial purposes—in common terms **“swimmable and fishable”**

- System for managing the discharge of pollutants to the nation’s waterways and provides mechanisms for enforcing its requirements

Clean Water Act, 1972 (cont.)

also known as Federal Water Pollution Control Act

- Under the CWA, all discharges of water pollutants must be formally permitted
  - National Pollutant Discharge Elimination System (NPDES)
  - **Point sources** (e.g., industrial wastewater, marine sanitation devices)
  - **Nonpoint sources** (e.g., storm-water runoff from urban areas)
- Enforcement mechanisms provided by the CWA include financial penalties and both civil and criminal legal remedies.

Toxic Waste—Dumps

Figure 15-5 Regulations Guide How Hazardous Wastes Are Handled and Disposed Of
Hazardous wastes, defined as chemicals that are toxic, ignitable, corrosive, or reactive, include solvents, paints, acids, and organic chemicals.

Subtitle C and D Landfills

- **Hazardous waste landfills—**called **Subtitle C landfills**
  - Especially tight “dry tombs”
  - At least a double layer of impermeable material (liner) at their base
  - Overlying impermeable cover that also controls surface runoff (Fig.15-6)
  - Must meet specific EPA criteria for location, design, construction, operation, monitoring, and eventual closure

Subtitle C Landfills

- Facilities must rigorously account for the amounts of hazardous materials generated, accumulated, transported, and disposed of
- A “cradle to grave” accounting system
- Landfills that receive solid and hazardous waste must meet specific EPA criteria for location, design, construction, operation, monitoring, and eventual closure
- The typical engineered landfill design is like a “dry tomb” that physically isolates the waste from interaction with air, surface water, and groundwater

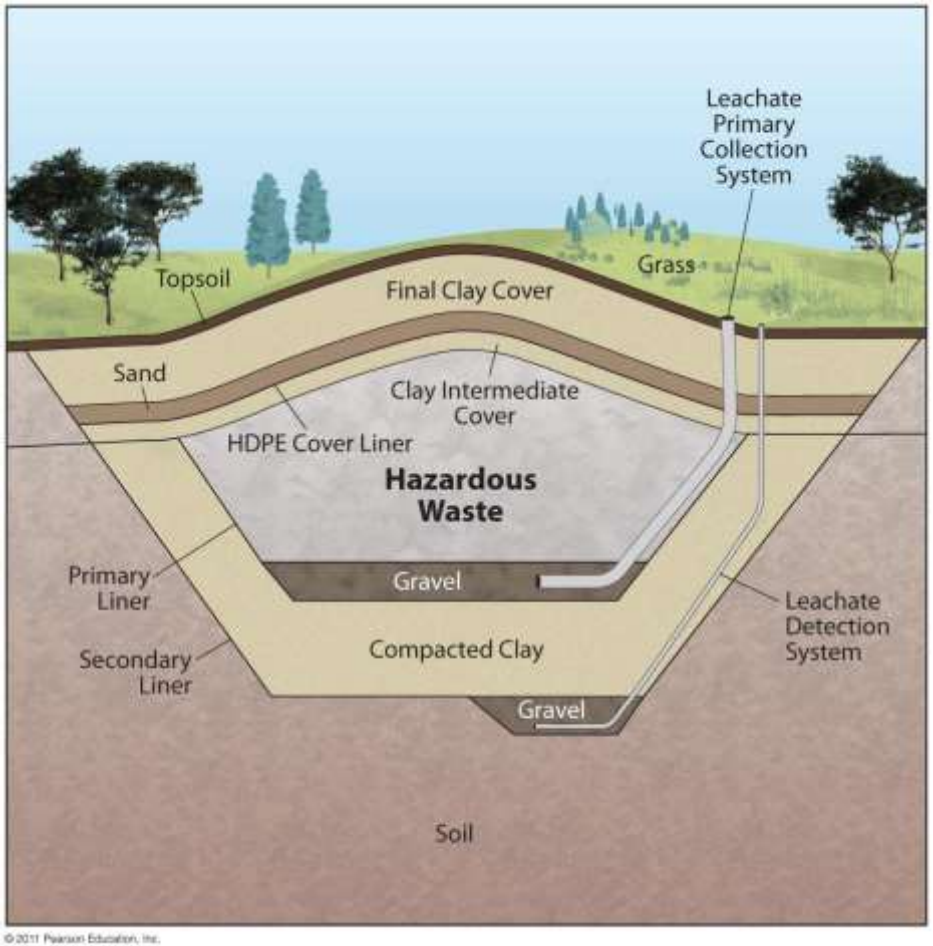

Figure15-6 A Subtitle C Landfill Design
The leachate detection system checks for leaks that could contaminate groundwater.

Comprehensive Environmental Response, Compensation, and Liability Act, 1980

- Addresses environmental consequences of historical actions
  - Authorizes the federal government to respond to releases of hazardous substances from closed and abandoned sites, provides ways to allocate liability for these releases, and establishes a trust fund (**Superfund**)—(with tax revenues from the chemical and petroleum industries) to clean them up
- **Hazard Ranking System** (HRS) determines:
  - If site has released (or has the potential to release) hazardous substances
  - The characteristics of the substance (such as its toxicity)
  - Evaluates effects of release
- **National Priority List** (NPL)
  - List of sites for continued study and potential cleanup

ASARCO EPA Superfund Site - Omaha

Omaha Lead, Nebraska
Site Description
The Omaha Lead Site covers over 9,000 acres and makes up most of the eastern portion of metropolitan Omaha, Nebraska and centers on the former location of ASARCO's lead smelter and refinery. EPA became involved with the site in the 1990s when it was learned that up to 40% of the children in some areas of eastern Omaha were reported to have elevated blood lead levels. EPA has embarked on one of the largest residential yard response actions in the nation in the area surrounding the Omaha Lead Site.
Funding Level
Over $186 million ($219,451,414 with interest) will be deposited into an EPA special account for cleanup.
Contaminants
surface soils that have been contaminated by air emissions from lead smelting/refining operations.
residential soils in the vicinity of Omaha's two former lead processing facilities were heavily contaminated with lead and other metals.
Settlement Information
This site is associated with the Residual Sites Settlement Agreement.
For more information on the Omaha Lead Superfund Site

ASARCO EPA Superfund Site - Omaha

- There was a lead smelting operation in downtown Omaha many years ago.
- The lead ore was brought in by railcar, smelted, then shipped out the same way.
- There was no EPA to regulate lead particles coming out of the smokestacks.
  - Lead particles were deposited in nearby soils.
- This lead was detected in the blood of local children at action levels, which triggered the Superfund and cleanup efforts…
  - People still find high lead levels in their yards in Omaha, and the cleanup costs are covered by the superfund.
  - Soil testing in Omaha is available, and free to homeowners.

Anaconda Copper Mine, Butte, MT

- "worst legacy environmental issues associated with mining."
- Largest Superfund
- Acid Rock Drainage
- Arsenic and SO2 air pollution
- Costs of cleanup are inherited with sales