



# Filling the Hole:

## A Federal Solution to Cleaning Up America's Orphaned and Abandoned Oil and Gas Wells

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*2<sup>nd</sup> Annual Orphan & Idle Wells Texas  
Conference, October 23-24, 2024*



**TED BOETTNER**

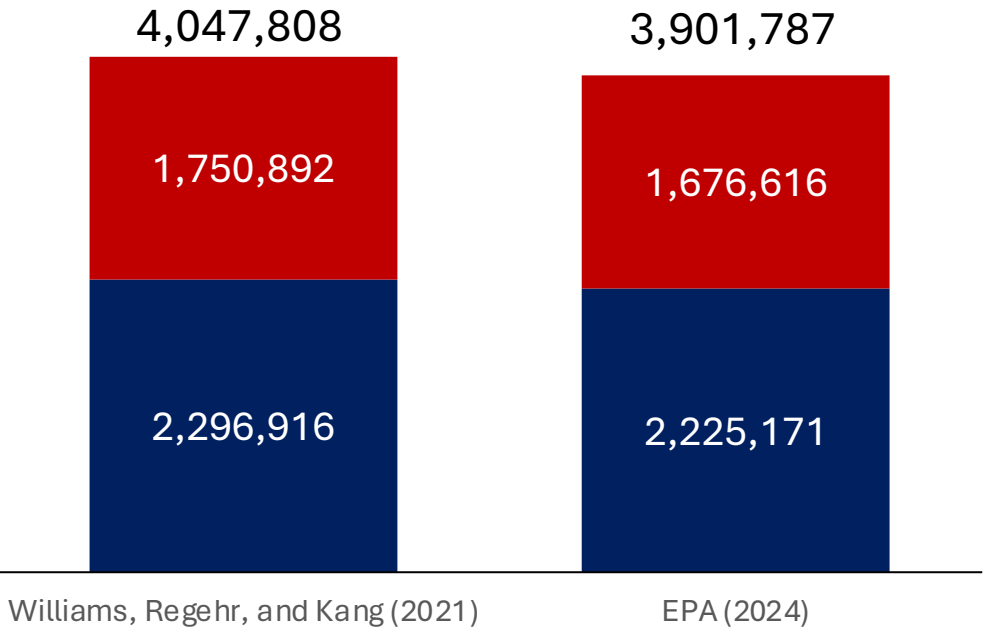
Ohio River Valley Institute

# Estimated 4.9 Million Wells, including 3.2 million unplugged abandoned and active wells

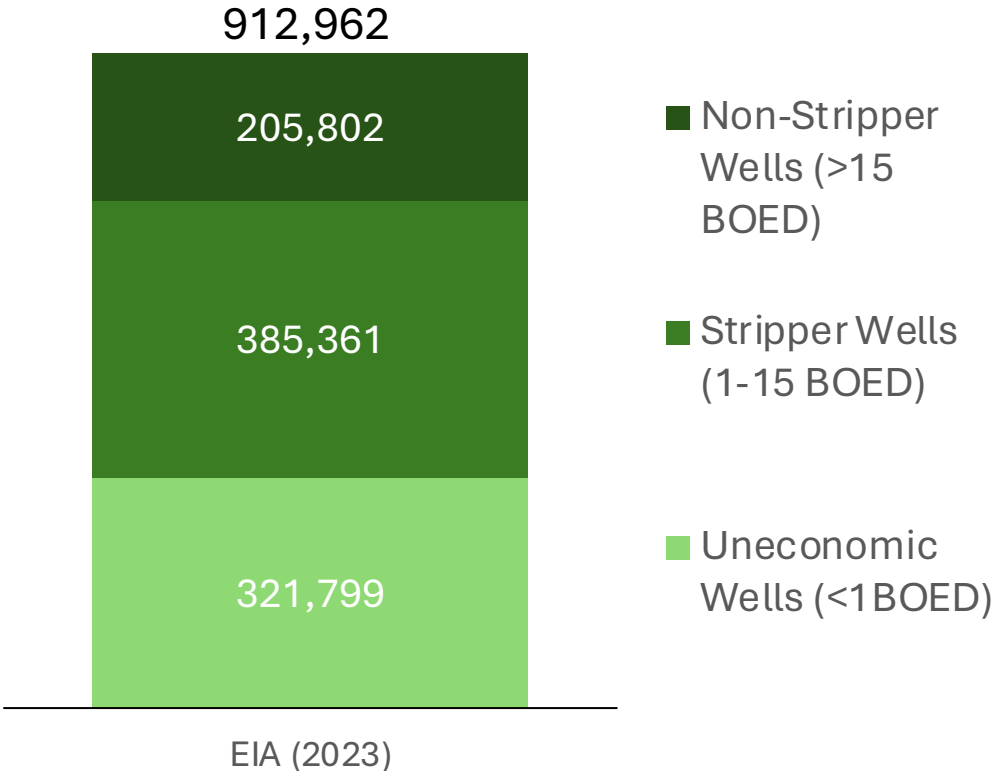
United States Geological Society (USGS)  
Locations for 4,484,202 Oil and Gas Wells  
in the US (1816-2022)

## Estimated Onshore Plugged and Unplugged Abandoned Oil and Gas Wells in the U.S.

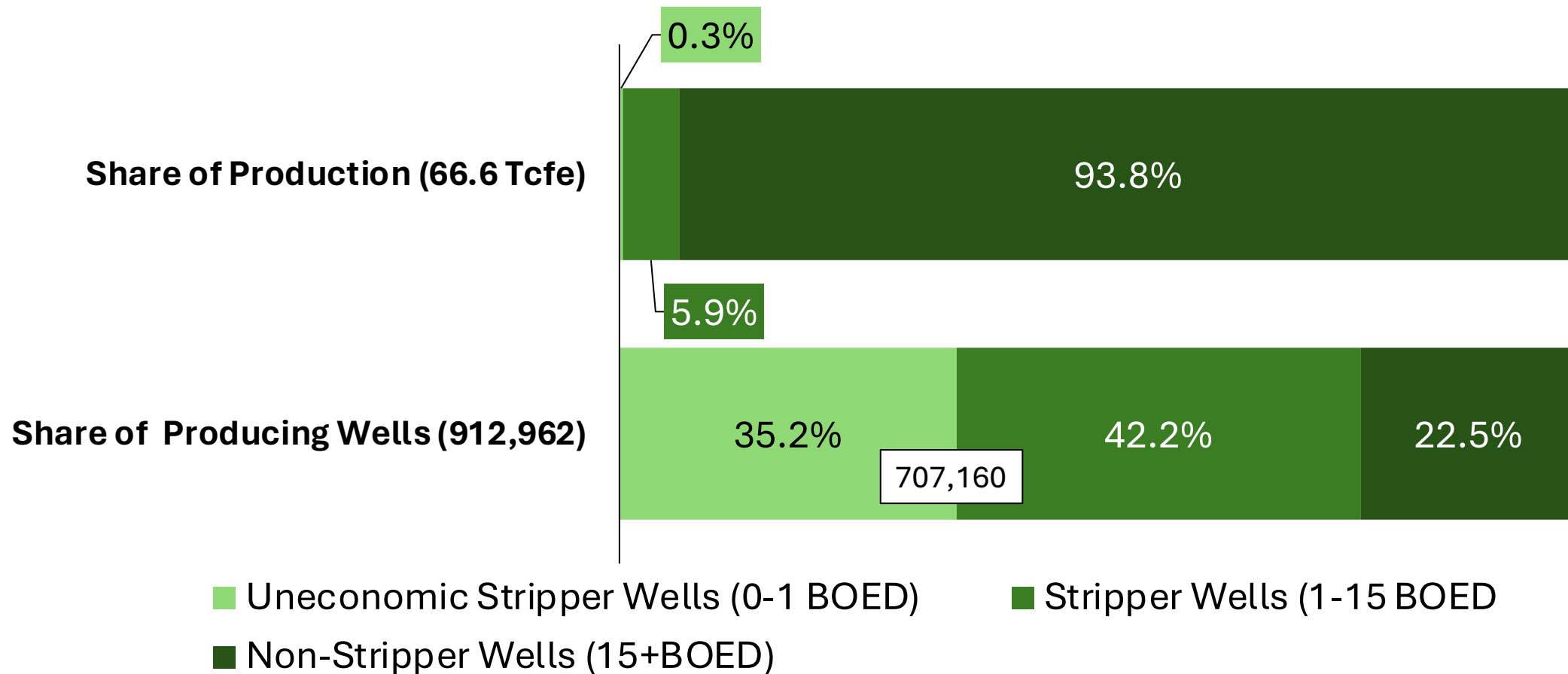
■ Unplugged ■ Plugged



## Estimated Onshore Active Oil and Gas Wells in the U.S.

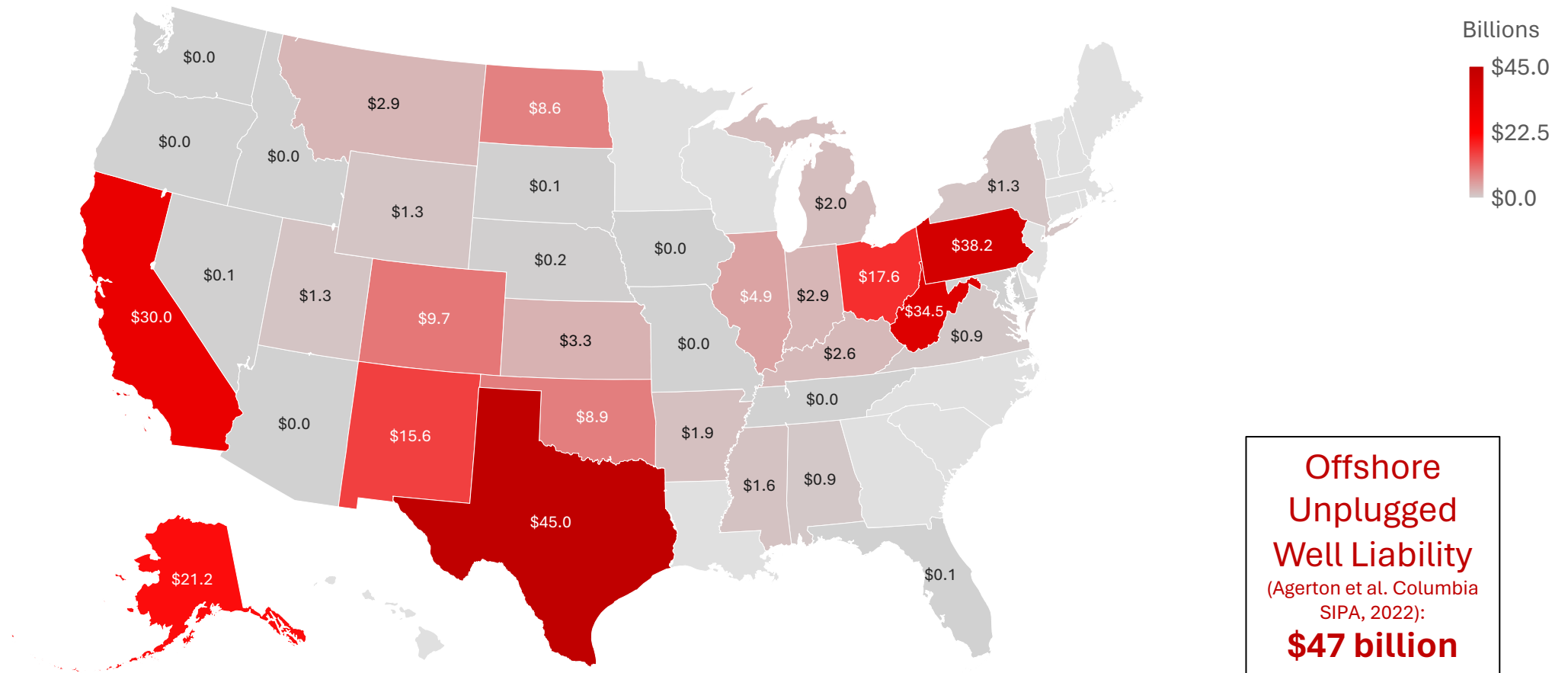


# Well Liability and Production: 78% of Producing Wells Contribute Just 6% of Supply



# Estimated Decommissioning Costs for Onshore Unplugged Wells: **\$271 Billion**

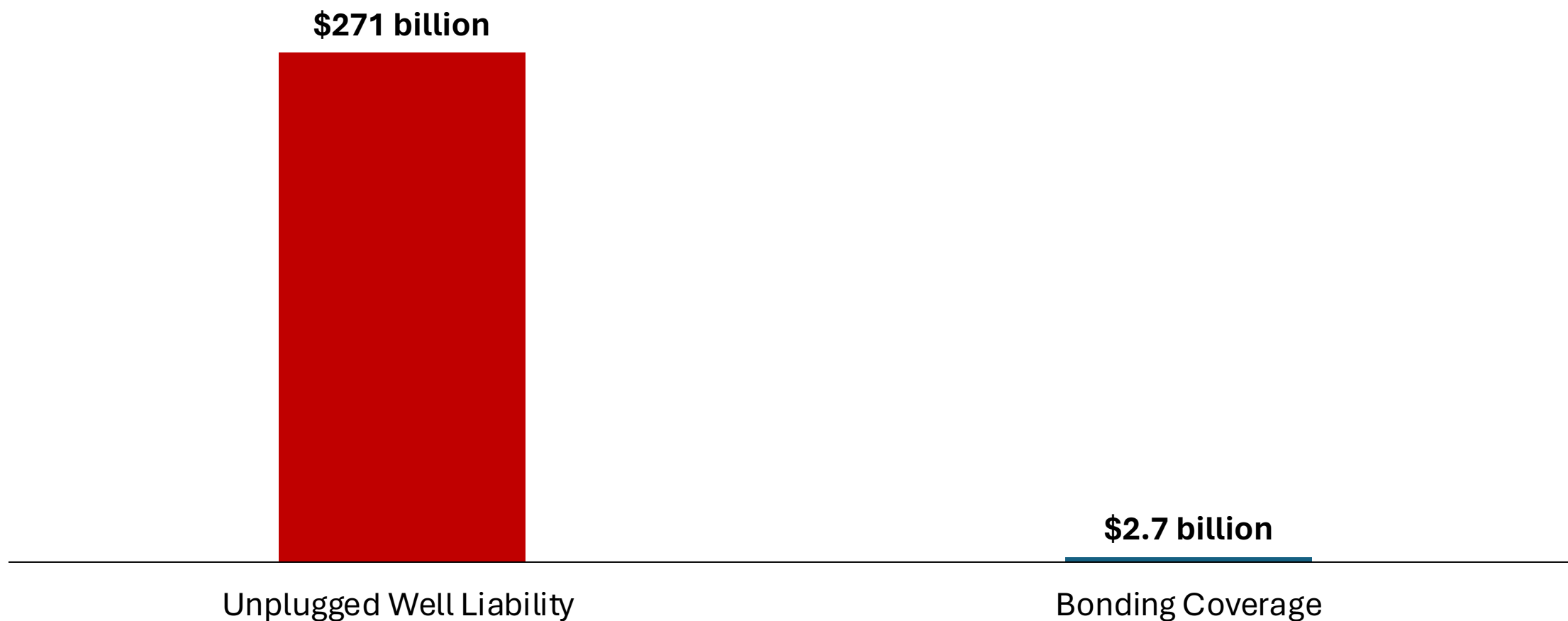
US Oil & Gas  
Extraction GDP in  
2023 = **\$257 billion**

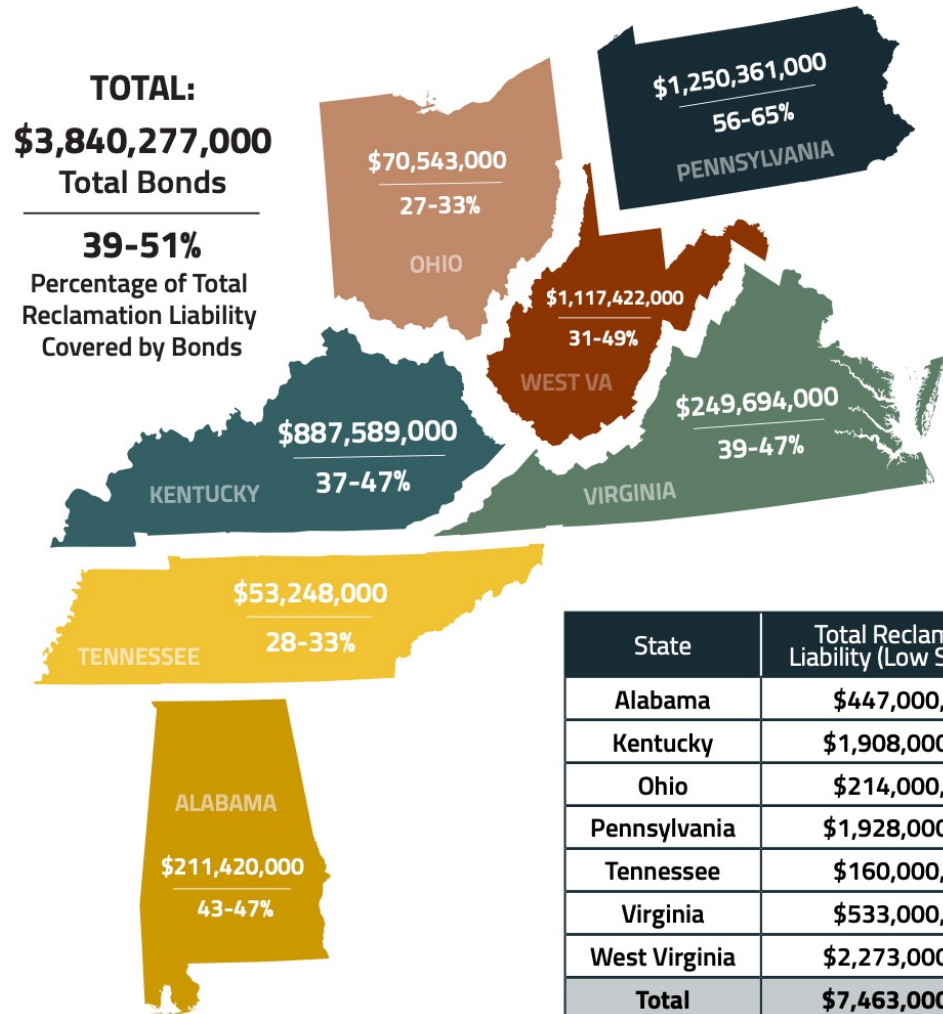


**Offshore  
Unplugged  
Well Liability**  
(Agerton et al. Columbia  
SIPA, 2022):  
**\$47 billion**

**Sources:** ORVI analysis of well and plugging cost data from US DOI (2022), US EIA (2023), IOGCC (2024), EQT 2023 10-K, Range Resources 2023 10-K, TCF Upstream and Williams et al. (2021). Decommissioning costs for 3.2 million unplugged wells in 36 states (171,432 horizontal wells, 3,065,136 abandoned wells, and 745,484 conventional wells) . Horizontal P&A @\$261,000 per well.

# Estimated Bonding Coverage is 1% of Unplugged Well Decommissioning Costs





We included all bond types in the total for each state, except in Virginia, where we did not include self-bonds because of the uncertainty in whether the state will be able to collect those bonds.

| State         | Total Reclamation Liability (Low Scenario) | Total Reclamation Liability (High Scenario) |
|---------------|--------------------------------------------|---------------------------------------------|
| Alabama       | \$447,000,000                              | \$491,000,000                               |
| Kentucky      | \$1,908,000,000                            | \$2,376,000,000                             |
| Ohio          | \$214,000,000                              | \$262,000,000                               |
| Pennsylvania  | \$1,928,000,000                            | \$2,250,000,000                             |
| Tennessee     | \$160,000,000                              | \$193,000,000                               |
| Virginia      | \$533,000,000                              | \$634,000,000                               |
| West Virginia | \$2,273,000,000                            | \$3,569,000,000                             |
| <b>Total</b>  | <b>\$7,463,000,000</b>                     | <b>\$9,774,000,000</b>                      |

Bonding coverage less than half of reclamation costs in the coal industry, which is seen as a failure to pre-fund reclamation in Appalachia

**Sources:** Erin Savage, "Repairing the Damage: The costs of delaying reclamation at modern-mines," *Appalachian Voices*, July 2021. See also Ken Ward, "West Virginia Could Get Stuck Cleaning Up the Coal Industry's Messes," *Pro Publica*, December 1, 2023.

# Oil and Gas Wells Need to be Monitored Forever...

Bloomberg Law

## Failed Oil Well Plugs Are Silent Polluters That No One Watches

By Bobby Magill and Drew Hutchinson  
March 13, 2024, 5:05 AM



Sarah Stogner, manager of a West Texas ranch, examines an abandoned well that appears to be leaking. Photographer: Bobby Magill/Bloomberg Law

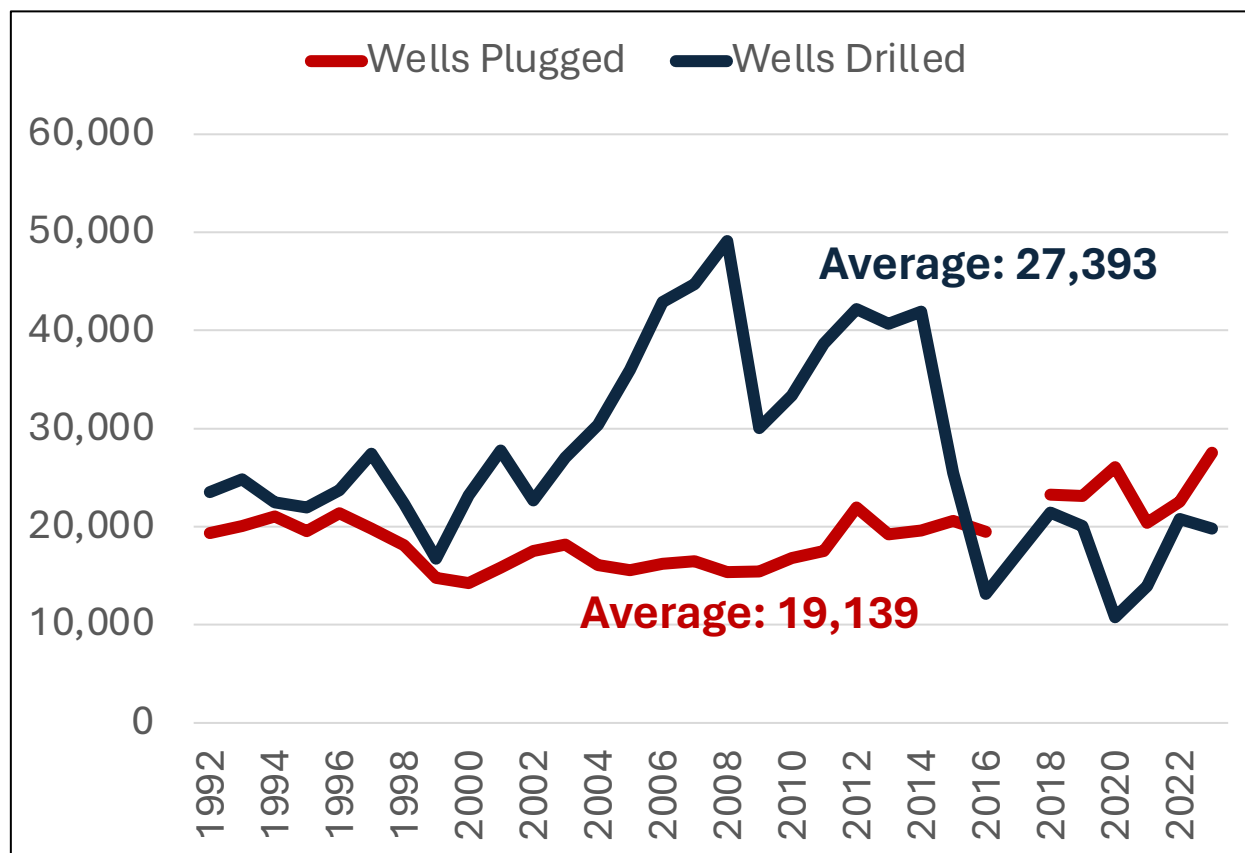
**S**arah Stogner plucked a piece of cement off a rusted steel pipe jutting from the ground on a West Texas ranch. The chunk, part of the plug for a long-dormant oil well, crumbled in her hand.

Stogner manages the Antina Ranch, which spans an old oil field southwest of

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- There is no “permanent” plugging solution (yet).
- Nobody knows how long cement plugs last, but we know Portland cement degrades and plugged wells can, and do, leak.
- Hundreds of thousands of wells are not properly plugged (pre-1970s).
- Wells will need to be re-plugged.

# We are drilling more than we are filling...



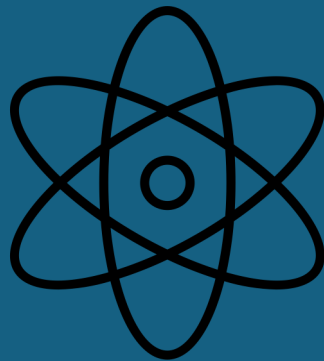
- Companies rarely plug in the normal course of business ([CTI 2021](#)).
- At current rates of plugging, it will take 150+ years to P&A today's unplugged onshore wells.
- Little to no enforcement to P&A abandoned wells.
- Current bonding practices (e.g., blanket bonds) have failed to prevent orphaned and abandoned (inactive) wells.
- Stripper well operators likely cannot afford full bonding coverage, even if they could get it.
- Surety companies constitute their own risks.
- The time to pre-fund (escrow) decommissioning is when the well is completed, not near the end of its economic life.
- Some shale operators are already abandoning wells without plugging them ([link](#)).

*EIA projects 722,735 oil and natural gas wells will be drilled between 2025 and 2050 (US EIA AEO 2023)*

# Precedents for Federal Role in Decommissioning and Fees to Clean Up Sites

## Nuclear Decommissioning Trust Funds

- Nuclear Regulatory Commission (NRC) requires plant owners to pre-pay to ensure ultimate decommissioning of facility (e.g., external sinking fund) based on a formula.
- Nuclear decommissioning trust fund balances totaled \$81 billion in 2022 or 82% of projected decommissioning costs. The funding ratio in 2021 was 97% (Callan Institute, 2023). Drop was due to poor stock performance in 2022.



## Environmental Fees/Taxes to Clean Up Waste, Spills, and Pollution

### Superfund Trust Fund (CERCLA/SARA)

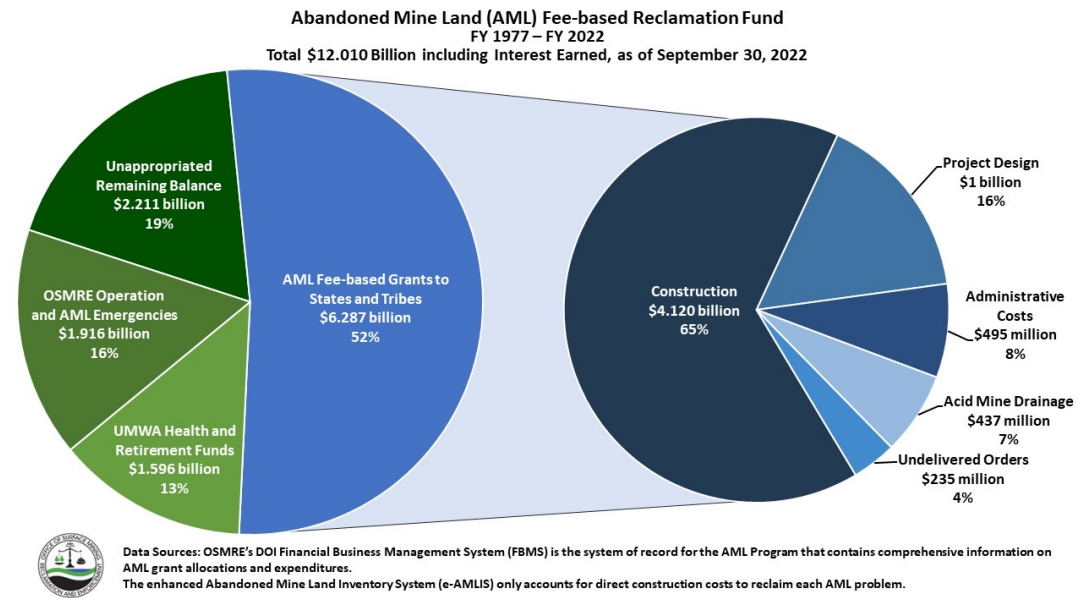
- Per ton tax on chemicals (\$0.44 to \$9.74 per ton) to clean up hazardous waste sites (1,300).
- Petroleum Superfund tax (17¢ per barrel) on crude oil used in a refinery to clean up contaminated waste.

**Oil Spill Liability Trust Fund** - (9¢ per barrel) to clean up oil spills in navigable waters (U.S. Coast Guard).

**Methane Waste Emissions Charge (WEC)** - to reduce harmful methane emissions in the oil and gas sector (\$900 per ton in 2024)

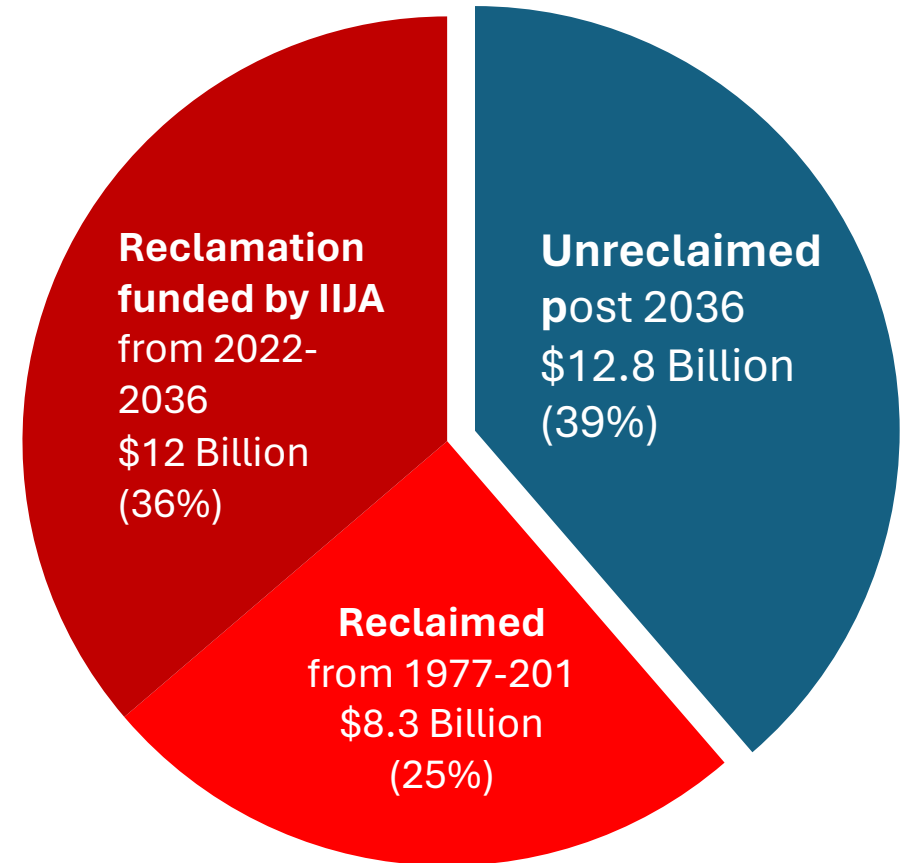
# In Focus: Abandoned Mine Land (AML) Reclamation Fund

- **Goal:** The AML program was created in 1977 under the Surface Mining Control and Reclamation Act (SMCRA) with the explicit goal of addressing the legacy costs associated with thousands of coal mines that were left abandoned across the country prior to 1977.
- **Structure:** U.S. Department of Interior, the Office of Surface Mining Reclamation and Enforcement, with three regional offices. State-federal partnership.
- **AML Fee on Coal Production:** 35¢ on surface coal, 15¢ on underground coal, and 10¢ on lignite coal from 1979-2009 (Today: 24.4¢, 9.6¢, and 6.4¢). The effective fee rate in 1978 was 1.6% (avg coal price in 1978: \$21.86)
- **Distribution:** Formula based primarily on state coal production and fees paid into AML Fund, historical coal mining, and other factors. Within a state/tribe, cleanup projects selected based on Priority scale from 1 to 3.

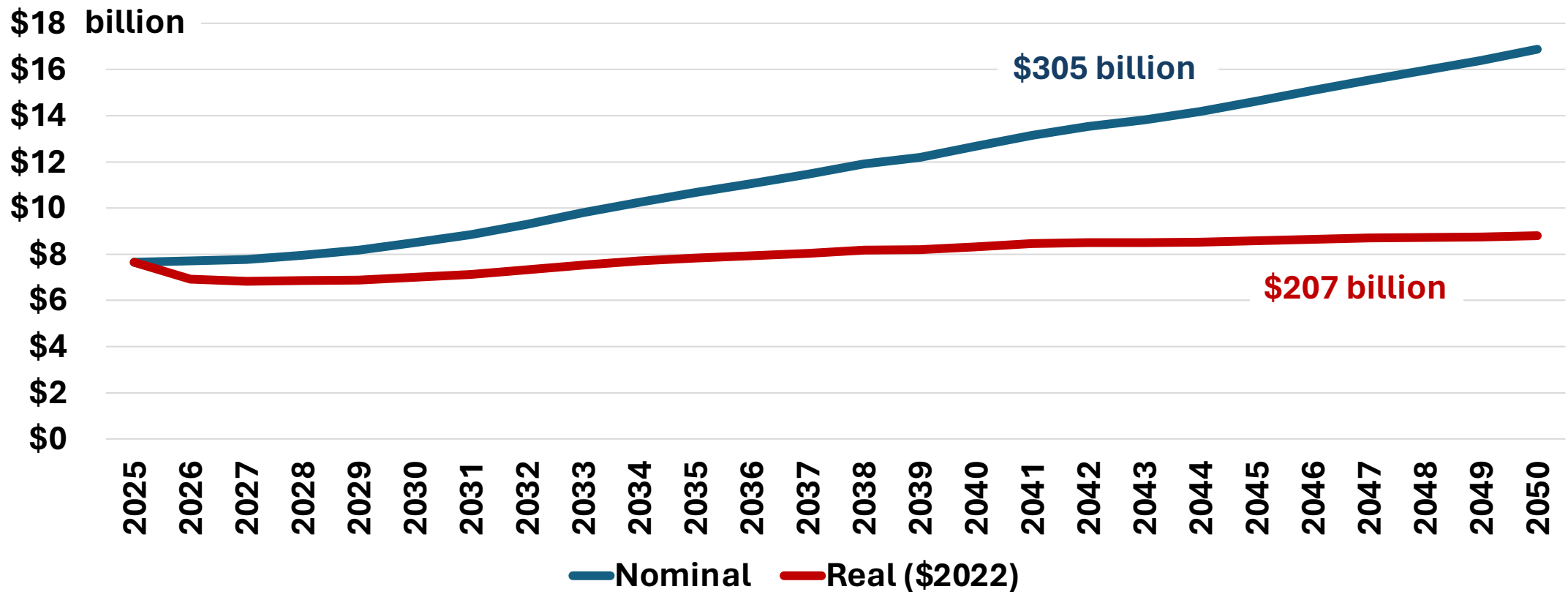


# AML Lessons Learned: Successful in Cleaning Up \$8.3 billion in AML problems

- AML's state **funding formula** mostly based on a state's coal production, not the amount of cleanup (AMLs) needed in each state.
- **Fee rates** and collections never based on the projected amount of cleanup (AMLs) needed to be reclaimed; fee rates thus proved too low to fund all necessary cleanup.
  - The per ton fee was not tied to prices or inflation, but production, which can make it difficult to fund clean up. For example, Wyoming operators paid the most into the AML fund, while Pennsylvania had the most AMLs.
  - Fee rates reduced despite large amounts of additional clean up needed (IIJA injected Treasury funds into cleanup).

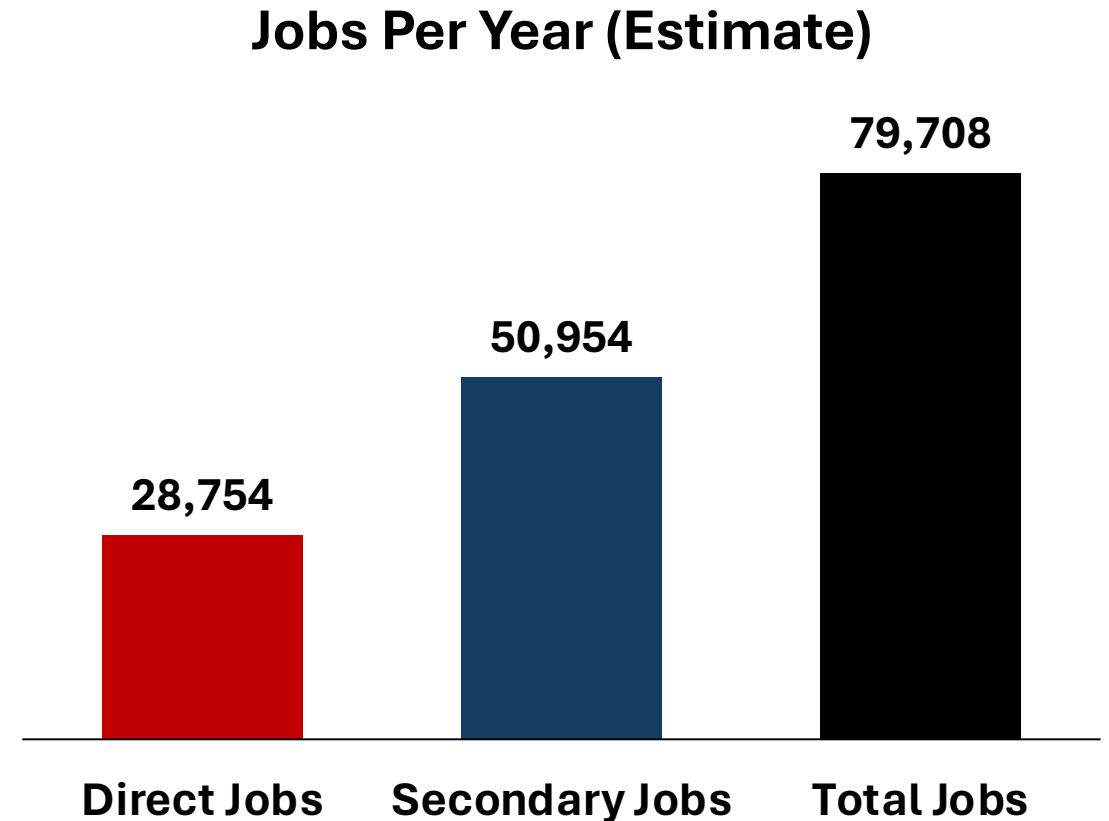


# Illustrative: Potential Revenue from AML Equivalent Fee (1.6%) on Crude Oil and Dry Natural Gas Production from 2025 to 2050

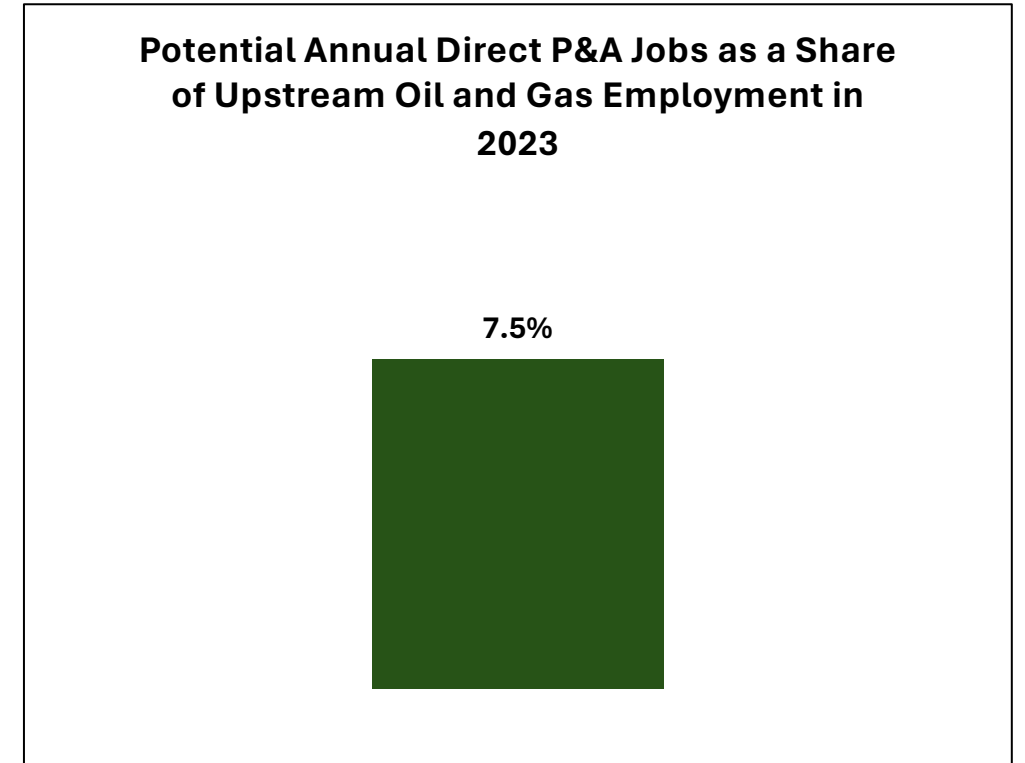
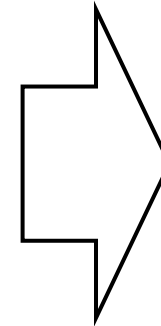
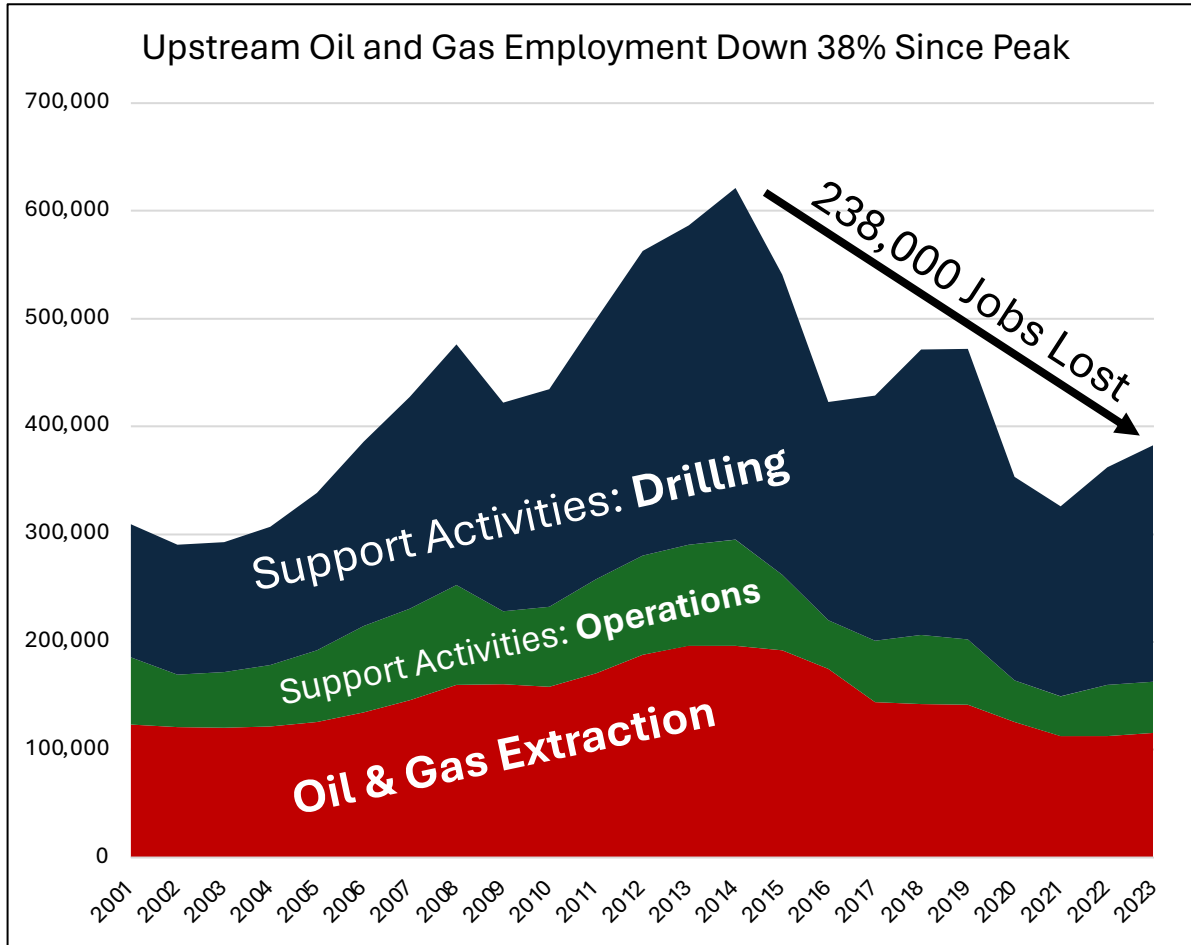


# Potential Job Impact of Abandoned Well Trust Fund Program

- **Assumptions:** \$165.2 billion (80%) spent to directly decommission abandoned wells from 2026 to 2050.
- **Abandoned Wells Decommissioned:** 2 million from 2026 to 2050.
- **Jobs:** 29,000 direct jobs per year from 2026 to 2050



# A Softer Landing: Decommissioning could provide a steady flow of oil and gas jobs



**\*Decommissioning is more labor intensive than extraction, resulting in more jobs** (comp % of GDP is 11.3% for oil and gas extraction compared to 50% for oil and gas support activities)

# Other Potential Benefits and Features

- Lowers exposure to risk and asset retirement obligations (AROs).
- Lowers debt ratings and borrowing costs.
- Improves relationship with stakeholders (regulators, investors, public) and reinforces emerging sustainable values (ESG).
- Levels the playing field between all operators.
- Guaranteed market (\$8b per year) for operators and other services companies making decommissioning an integral part of doing business.

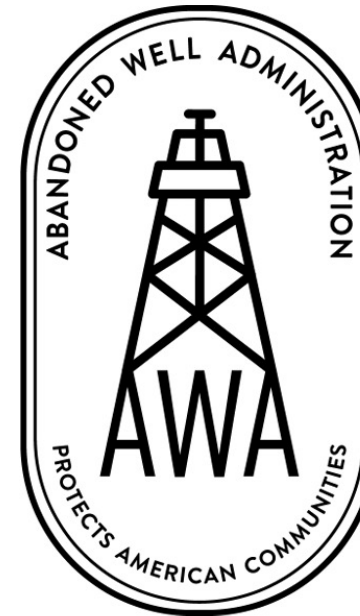


# Other Potential Program Features

- Federal-state partnership (e.g. AML)
- Tiered fee rates based on price (fee rate drops when prices are low and grows when prices are high).
- Deducibility of P&A expenses
- Workforce Development
- Long-term monitoring
- Financial stress tests and risk analysis for wells.
- R&D in P&A procedures, methods, and practices.
- Any well spud before 1995 (30 years ago), would be decommissioned by new program. Post-1995 wells would have owner operated escrow accounts based on a formula to fund decommissioning.
- Creation of a government-owned asset management company (e.g., Resolution Trust Corporation) to take over operation, decommissioning, and long-term responsibility for breaches of plugged wells.

# Other Models

The AWA will have multiple programmatic areas, but the guiding missions are:



**1**

## Identify

catalogue and prioritize the safe decommissioning of former oil and gas wells and related infrastructure across the nation.

**2**

## Coordinate

across Federal, State, Local and Tribal Governments to ensure yearly prioritized decommissioning schedules are met.

**3**

## Oversee

and manage a national abandoned oil and gas monitoring, safety, and response program.



# Ohio River Valley Institute

Questions?

**Ted Boettner**, Senior Researcher  
[ted@ohiorivervalleyinstitute.org](mailto:ted@ohiorivervalleyinstitute.org)

# Decommissioning Liability vs Oil and Gas Production by State (2023)

