



Reclaiming Oil and Gas Wells and Addressing Climate Impacts: *State Policy Recommendations*

Western Organization of Resource Councils

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About the Western Organization of Resource Councils

WORC is a regional network of grassroots community organizations that include 19,949 members and 41 local chapters. WORC's network includes: Dakota Resource Council (North Dakota); Dakota Rural Action (South Dakota); Idaho Organization of Resource Councils; Northern Plains Resource Council (Montana); Powder River Basin Resource Council (Wyoming); Western Colorado Alliance for Community Action; and Western Native Voice. WORC's mission is to advance the vision of a democratic, sustainable, and just society through community action.

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Glossary of Terms

Terminology to describe well status varies among states. In this white paper, we are using the following definitions for these terms:

Abandoned Well is most often used to refer to wells that have been permanently taken out of production. Many, but not all, regulators refer to wells as abandoned only once plugged. Others regularly use the term differently, to describe both legacy and orphaned wells, which can cause confusion. In this white paper, we have attempted to use this term only when it's used by the source cited or the specific state uses the term in their regulations.

Idle well is used in this white paper to refer to wells that are not currently producing. Wells can remain idle for a few months in response to weak market conditions or years as companies avoid the costs to plug and reclaim a well. Oil and gas regulators generally do not consider a well to be idle until it has not produced for a certain time — often 12 months. Some states also refer to wells in this state as inactive.

Legacy well is used in this white paper to describe wells that are long-term idle wells but have not been officially categorized as orphaned. The owner may be unknown, no longer in business, or simply avoiding paying the costs for plugging these wells and reclaiming the sites.

Orphaned wells are unplugged wells where the owner is insolvent or there is no owner of record. States have a variety of definitions for exactly how to determine whether and when a well should be classified as orphaned.

Stripper wells are minimally producing wells, often defined as less than 10 or 15 barrels of oil per day or the gas equivalent. Stripper wells “strip” the last remaining oil and gas before closing down, but can operate at low levels for years or decades. These wells are sometimes also called marginal wells, although the term marginal well is also used to refer to wells that have a higher cost of production.

Temporarily abandoned wells are idle wells that have been temporarily shut-in or plugged, and are able to be returned to production. Some states also refer to wells in this state as shut-in.

Introduction

Ensuring complete and timely plugging and reclamation of oil and gas wells should be a basic cost of doing business in the oil and gas industry and is fundamental to the industry's social license to operate. However, there are significant limitations in existing regulatory policy that have led to — and are likely to lead to more — oil and gas wells that have not been properly plugged or sites remediated.

Fundamentally flawed regulations, lax tracking and enforcement, and decades of corporations abandoning their obligations combine to create a perfect storm of conditions. Hundreds of thousands of oil and gas wells, tanks, pipelines, pits, and roads across the country have been built without adequate assurances that they will ever be cleaned up. Notably, oil and gas operators are rarely required to post reclamation bonds at or near the actual cost of plugging and reclamation of wells, and some associated infrastructure, such as pipelines, are not covered by reclamation bonds; instead, most operators post blanket bonds that cover multiple well sites and are often unrelated to the full cost of reclamation. Some states impose fees or additional bonds that help fund reclamation of some sites but are not adequate to address the full scale of the problem. Without significant changes, most oil and gas wells may not be plugged and reclaimed by their operators, and regulators will not have the funds to cover these costs if they are orphaned.

While the federal government plays a role in regulating many aspects of the oil and gas industry, states have primacy in regulating the exploration, production, and reclamation of wells for state and private minerals, which comprise the vast majority of onshore oil and gas operations in the U.S. Federal environmental laws such as the Clean Air Act and Clean Water Act apply, but there are numerous exemptions for oil and gas production. There is no equivalent of the Surface Mining Reclamation and Control Act, which governs the coal industry, for setting standards for the reclamation of oil and gas wells. The Bureau of Land Management (BLM) regulates exploration, production, and reclamation of wells and operations on leased federal minerals, and the BLM and Bureau of Indian Affairs regulate operations on tribal minerals and lands, but federal managed oil and gas production only represented 24% of the nation's total oil production and 13% of the nation's total gas production in 2017.¹ Thus, state regulatory programs play a pivotal role in ensuring that oil and gas wells are plugged and reclaimed.

Regulators in several states have expressed alarm about the growing number of idle and orphaned wells,² but most states have not updated their rules, which were designed as if oil and gas companies are too big to fail. This vision of the industry was never accurate, given its boom and bust cycles, and certainly is not applicable today, when major industry players are acknowledging that peak oil is behind us.^{3,4}

In addition to negative impacts on land use and water supplies, leaking idle and orphaned wells threaten our climate. Recent research estimates that these wells could be responsible for up to 10% of methane emissions from the oil and gas sector.⁵ Properly plugging and reclaiming these wells should be part of our nation's strategy to address climate change.

This paper seeks to summarize the challenges state regulatory programs face, and make recommendations for stronger policies that will help ensure that oil and gas sites are plugged and

¹ Congressional Research Service, [U.S. Crude Oil and Natural Gas Production in Federal and Nonfederal Areas](#)

² Pittsburgh Post-Gazette, [Pa. strikes well-plugging deal with largest conventional oil and gas operator in Appalachia](#)

³ Bloomberg.com, [Peak Oil is Suddenly Upon Us](#)

⁴ Pew Charitable Trusts, [Why 'Orphan' Oil and Gas Wells Are a Growing Problem for States](#)

⁵ Environmental Science & Technology, [Correction to Methane Emissions from Abandoned Oil and Gas Wells in Canada and the United States](#)

reclaimed in a complete and timely way. The most critical policy solution to ensure wells are cleaned up is to require financial assurance or bonds at a level that covers the full cost to plug and reclaim them. This strategy can ensure that industry — not states — will be responsible for these costs.

The Scale of the Problem

EPA estimates that there are 3.2 million abandoned⁶ wells (with around 2.6 million abandoned oil wells and 0.6 million abandoned gas wells) in the U.S.⁷ More than 240 oil and gas companies declared bankruptcy in the past five years, and many analysts warn that the industry will not bounce back due to structural declines in the industry, and more wells will be orphaned in the coming years.⁸

Beyond orphaned wells, there is a problem related to idle wells and stripper wells that are at the end of their economic life and produce less than 10-15 barrels of oil per day. According to research by Carbon Tracker, idle and stripper wells now outnumber producing wells in most major oil and gas producing states. In New Mexico, for example, 19% of wells are producing while 47% of wells are stripper wells and 3% are temporarily abandoned or longer-term idle wells.⁹

Research shows that these wells are at high risk of being orphaned. Rystad Energy recently noted that even though current low prices make the economics of stripper wells more difficult, companies are likely to try to avoid plugging them because the loss they incur from operating the wells is less than the cost to permanently close them down. However, Rystad's analysis shows that temporarily abandoned stripper wells have rarely been reactivated when oil prices have recovered because of the high cost of restarting them and the loss of reservoir pressure that would occur with the closures.¹⁰

An L.A. Times/Center for Public Integrity analysis of 40 years of state data on wells in California found that “once a well has been dormant for just ten months, there’s a 50-50 chance it will never produce again. By the time federal regulators begin raising concern — at five years of inactivity — the chance that a well is ever active again falls to one in four.”¹¹

In recent years, an indication of the future liabilities that many states may face has been evident in some large scale transfers of idle and stripper wells to under-resourced companies. These companies’ business models are based on obtaining wells at low or no cost from other companies looking to reduce their reclamation costs, and trickling out small amounts of oil and gas from large numbers of wells while keeping operating costs low. In November 2015, Wyoming regulators took possession of 2,300 idled wells after High Plains Gas failed to meet its bonding requirements. Earlier that year, the company had closed its doors, owing over \$50 million in unpaid royalties, taxes and debts. These wells were added to 3,888 wells orphaned during the coalbed methane bust that the state was working to plug and reclaim at that time.¹²

California Resource Corporation (CRC) filed for bankruptcy in July 2020. At the time CRC owned over 7,800 idle wells and it was estimated that it could cost more than \$1 billion to properly

⁶ The EPA uses the term ‘abandoned well’ to encompass various types of wells including wells with no recent production and not plugged, wells with no recent production and no known owner, and plugged wells that emit methane and carbon dioxide.

⁷ EPA, [Inventory of US GHG Emissions and Sinks, 1990-2018](#)

⁸ Haynes Boone, [Oil Patch Bankruptcy Monitor](#)

⁹ Carbon Tracker, [Billion Dollar Orphans](#)

¹⁰ Argus Media, [U.S. stripper wells among first to face shut down](#)

¹¹ L.A. Times, [The toxic legacy of old oil wells: California’s multibillion dollar problem](#)

¹² Casper Star-Tribune, [After High Plains Gas, Wyoming Contemplates the Next Step In Coal Bed Methane Cleanup](#)

plug these wells.¹³ CRC was created, in part, to rid the wells' previous owner, Occidental Petroleum, of its cleanup liabilities. CRC pays \$3.5 million in idle wells fees to defer more than 385 times that amount in future costs to plug and reclaim these wells.¹⁴ In the East, Diversified Gas and Oil has built up a portfolio of 60,000 low-producing wells.

Climate Impacts

Unplugged wells pose significant climate problems, as well as having impacts on water, air, and public health and safety. Unplugged wells release methane, a potent greenhouse gas. According to EPA, each year, unplugged wells in the United States emit as much greenhouse gas as 2.1 million passenger cars — an estimated 7 MMT carbon dioxide and 281 kg methane in 2018.¹⁵ A more recent study pinned the emissions from unplugged wells in the U.S. at 20% higher and estimated that abandoned¹⁶ oil and gas wells are responsible for up to 10% of the total methane emissions from the oil and gas sector.¹⁷

Research also shows that methane emissions from abandoned¹⁸ wells persist over many years and likely decades. Unplugged gas wells and certain gas wells that must be vented after they are plugged appear to be high emitters.¹⁹ Studies in California²⁰, Kentucky, Oklahoma²¹ and Pennsylvania²² reached the same conclusion: that abandoned wells continue to leak methane and cause environmental and public health damage. Researchers have found that average plugging costs are justified by the avoided social cost of methane emissions, and that reducing methane emissions from abandoned²³ wells is a cost-effective strategy for addressing climate change.^{24, 25}

¹³ IEEFA, [Largest oil and gas exploration firm in California files Chapter 11, taxpayers potentially on hook for cleanup](#)

¹⁴ Carbon Tracker, [CA Gives New Meaning to Stripper Wells](#)

¹⁵ EPA, [Inventory of US GHG Emissions and Sinks, 1990-2018](#)

¹⁶ This article defines abandoned oil and gas wells as wells with no recent production, following the definitions used by both the Canadian and U.S. inventories 1,2 that include terms such as suspended, idle, orphaned, plugged, dormant, deserted, inactive, junked, temporarily abandoned, and shut-in.

¹⁷ Environmental Science & Technology, [Correction to Methane Emissions from Abandoned Oil and Gas Wells in Canada and the United States](#)

¹⁸ This study defined abandoned wells as the number of wells drilled annually compiled from multiple sources and minus the number of active wells. They include wells drilled for enhanced recovery purposes.

¹⁹ Proceedings of the National Academy of Sciences, [Identification and characterization of high methane-emitting abandoned oil and gas wells](#)

²⁰ Environmental Science & Technology, [Methane Emissions from Abandoned Oil and Gas Wells in California. Abandoned wells are defined as plugged, unplugged and idle wells](#)

²¹ OSTI.gov, [Methane Emissions from Abandoned Oil and Gas Wells](#). Abandoned wells are defined as wells having a last reported date of production 1+ years ago.

²² National Energy Technology Laboratory, [Methane Emissions from Abandoned Oil and Gas Wells: A Case Study in Oil Creek State Park, Pennsylvania](#). This study did not define abandoned wells, but it did test emissions from both plugged and unplugged, legacy wells that were previously undocumented.

²³ This analysis builds off of previous research led by Mary Kang that considered abandoned oil and gas wells to be all plugged and unplugged inactive wells.

²⁴ SIPA Center of Global Energy Policy, [Green Stimulus for Oil and Gas Workers: Considering a Major Federal Effort to Plug Orphaned and Abandoned Wells](#)

²⁵ Energy Policy, [Reducing methane emissions from abandoned oil and gas wells: Strategies and costs](#)

Fiscal Impacts

Beyond the climate implications, orphaned wells pose a significant fiscal danger to state governments, which may be left “holding the bag” for oil and gas remediation. The fundamental problem is that states rarely have sufficient bonding to meet the true clean-up costs of oil and gas sites, especially in the case of unconventional wells.

The costs to reclaim oil and gas wells vary significantly, depending on several factors, including well depth. The Interstate Oil and Gas Compact Commission has documented that wells plugged by states in 2018 averaged \$18,940, and ranged from \$3,667 per well in Kentucky to \$97,626 per well in Michigan.²⁶ The Government Accountability Office identified two scenarios for the cost to plug and reclaim federal wells: low-cost wells typically cost \$20,000 and high-cost wells typically cost \$145,000. However, many of today’s unconventional wells are significantly deeper — sometimes over 25,000 feet — and are significantly more expensive to plug and reclaim: they require more expensive equipment, specialized cement and cement additives and more complicated processes.²⁷ For example, in 2010, Carbon Oil and Gas Corporation estimated that it spent about \$700,000 per well to plug and abandon three vertical Marcellus Shale gas wells in Susquehanna County, Pennsylvania.²⁸ This added expense means that some companies cannot afford the higher costs to plug and reclaim these wells, and their existing bonds will be insufficient to cover the full costs.²⁹

Carbon Tracker estimates that “plugging 2.6 million documented onshore wells in the U.S. alone will cost \$280 billion. This estimate excludes costs to plug an additional estimated 1.2 million undocumented abandoned onshore wells.” However states have only 1% of this total cost secured by bonds.³⁰

State Regulatory Challenges and Recommended Policy Solutions

Weak state policies can increase the costs landowners, communities and taxpayers bear from oil and gas development as well as increasing climate risk. New research by the Stockholm Environmental Institute (SEI) that is currently under review finds that transferring financial liability for reclamation to the government and taxpayers through inadequate bonding requirements and inadequate fees for orphaned well cleanup increases the profitability and viability of prospective oil and gas production. SEI calculated that these subsidies increased the internal rate of return for new oil and gas fields by 1 to 2 percentage points (combined) across the U.S.

Unfortunately, existing state policies are not up to the task of managing the current idle and orphaned well problems and looming threat. While some state policies are more successful than others, no state has a comprehensive set of policies that is strong enough to ensure that all wells will be plugged and reclaimed, or provide funding to do so.

²⁶ Interstate Oil and Gas Compact Commission, [Idle and Orphaned Oil and Gas Wells: State and Provincial Regulatory Strategies](#)

²⁷ Carbon Tracker, [It’s Closing Time](#)

²⁸ Environmental Science and Technology, [Economic Incentives and Regulatory Framework for Shale Gas Well Site Reclamation in Pennsylvania](#)

²⁹ Carbon Tracker, [Billion Dollar Orphans](#)

³⁰ Carbon Tracker, [Billion Dollar Orphans](#)

Regulatory agencies' legal authorities vary by state and pose some limits, but too often regulators fail to use their full authority to re complete and timely plugging and reclamation that is paid for by oil and gas companies. The following section outlines common problems with existing state regulations and recommends policies to utilize agencies' authority to the greatest extent possible. Where possible, we highlight states that currently have incrementally better policies in place. The most successful programs rely on a number of policies, and enforce those policies vigorously.

Financial Assurance/Bonding Mechanisms

An operator applying for a permit to drill (APD) is required to submit proof of financial assurance for reclamation before the permit is approved. Often this is a surety bond, for which the operator annually pays a third party guarantor a percentage of the total bond amount. Oil and gas regulators can collect on this financial assurance from the guarantor in the event the operator fails to complete reclamation. Other financial assurance mechanisms include cash, letters of credit, or in some cases, equipment, property or self-bonds.

Statutes that require financial assurance that ensures complete and timely reclamation suggest that, if the operator fails to plug and reclaim the permitted well, the financial assurance amount should cover the government's cost of reclamation. However, oil and gas operators are allowed to post "blanket bonds" that cover multiple well sites — often an unlimited number — for a set bond amount that is often unrelated to the actual cost of reclamation. Blanket bonds, which result in average per well bond values of as low as \$80 per well,³¹ are at the core of the growing idle and orphaned well crisis, and must be replaced.

In the coal mining sector, the federal Surface Mining Control and Reclamation Act (SMCRA) requires operators to submit financial assurance in an amount sufficient to ensure that adequate funds will be available for the regulatory agency to complete the reclamation if the operator does not do so. The amount is based on the estimated cost to complete the reclamation plan. However, SMCRA also allows regulators to implement alternative systems, including self-bonds, which allow an operator to guarantee it will complete reclamation based on its own finances. After three of the largest coal mining companies in the U.S. filed for bankruptcy in 2015 and 2016, the Government Accountability Office (GAO) found that self-bonding presents a risk to the government because it is difficult to evaluate the financial health of an operator, and to replace self-bonds when an operator's financial health declines. GAO also found that the risk of self-bonding to the government became greater when coal demand dropped and the industry entered a period of structural decline.³² Bond pools, another alternative to full-cost bonds, have also failed to provide adequate financial assurance.³³

Current oil and gas financial assurance requirements are similar to self-bonds and bond pools in that widespread use of blanket bonds means that forfeited bonds are not adequate to complete reclamation and regulators are relying on operators to complete reclamation even though the regulatory system provides financial disincentives to do so. The oil and gas industry is now in a structural decline³⁴ and the lack of full cost bonds poses higher risks to the government and taxpayers, as well as landowners who pay the price if sites are not fully reclaimed. The solution is full-cost bonding.

³¹ Center for Biological Diversity, [Undercover Risks: How Big Oil's 'Blanket Bonds' Jeopardize the Environment and State Budgets](#)

³² Government Accountability Office, [Coal Mine Reclamation: Federal and State Agencies Face Challenges in Managing Billions in Financial Assurances](#)

³³ Virginia Mercury, [With coal in crisis, will Virginia be saddled with millions in mine cleanup costs?](#)

³⁴ Haynes Boone, [Oil Patch Bankruptcy Monitor](#)

Recommendations — General Financial Assurance/Bonding:

- Regulators should eliminate blanket bonds that are not tied to the projected cost of reclamation, and require site-specific reclamation bonds that will fund the full projected cost to plug and reclaim all of an operator's wells and associated sites.
- Until bonds are set at the actual cost of reclamation, regulators should establish bond amounts that increase as the factors that contribute to reclamation cost increase, including the number of wells, well depth, location, the amount and nature of surface disturbance, facilities and infrastructure to be reclaimed.
- Bond amounts should be reviewed annually, and minimum bond amounts should be increased every three years based on the consumer price index or actual plugging costs.

Current State Bond Policies:

While these states, except for North Carolina, still allow blanket bonds that do not tie bonds to the total actual cost of reclamation, several have tiered bonding systems under which the statewide bond is relative to the number of wells.

- **Alaska** has the highest blanket bond amounts and ties bond amounts to the number of wells on each bond. They have the following tiers for blanket bonding:
 - 1 - 10 wells: \$400,000 per well; 11 - 40 wells: \$6 million; 41 - 100 wells: \$10 million; 101 - 1,000 wells: \$20 million; Over 1,000 wells: \$30 million³⁵
- **California** has the following tiers for blanket bonding³⁶ :
 - \$25,000 for each well that is less than 10,000 feet deep or \$40,000 for each well that is 10,000 or more feet deep.
 - 20 - 50 wells: \$200,000; More than 50 wells: \$400,000; More than 50 wells, including idle wells: \$2 million.
 - Regulators can require owners to provide additional bonds to cover the full cost to plug and abandon all wells and decommission all facilities or require a bond of \$30 million.³⁷
It is not clear that this has actually been required of any companies to date.
- **North Carolina** requires a plugging and abandonment bond in the amount of \$5,000 plus \$1 per foot proposed to be drilled for all wells, and does not allow blanket bonds. The state also requires a disturbed land bond based on the cost of the conditions set in the reclamation plan, and an environmental damage bond in the amount of \$1 million or more.³⁸
- **North Dakota** has a blanket bond for multiple wells set at \$100,000, but each blanket bond can't have more than six of the following: a well with a dry hole not plugged, a well that is plugged but the site not properly reclaimed, or a well that is abandoned and not properly plugged or reclaimed.³⁹
- **Virginia** has minimum individual bond amounts of \$10,000 per well plus \$2,000 per acre of disturbed land, calculated to the nearest tenth of an acre.⁴⁰
- **Wyoming** adjusts reclamation bond amounts every three years based on the consumer price index.⁴¹

³⁵ [Alaska Admin Code, 20 AAC 25.025. Bonding](#)

³⁶ [California Public Resource Code, Article 4, Sec 3205](#)

³⁷ [California Public Resource Codes, Article 4, Sec 3205.3](#)

³⁸ [North Carolina Administrative Code, 15A NCAC 05H .1404](#)

³⁹ [North Dakota Administrative Code, Section II, 43-02-03-15](#)

⁴⁰ [Code of Virginia, 45.1-361.31](#)

⁴¹ [WOGCC Rules, Ch. 3, § 4\(b\) \(iv\)\(A\)](#)

Recommendations — Infrastructure Financial Assurance and Reclamation:

Some infrastructure, such as flow lines and pipelines, is often not required to be removed and sites reclaimed. Even when decommissioning and reclamation are required, such as with water impoundments, waste facilities, roads and other surface disturbance, current blanket bonds are insufficient to ensure that reclamation occurs, particularly if spills occur. As a result, these sites are at risk of going unreclaimed, posing risks to public health and safety and the environment, and impeding other uses of the land.

- Regulators should have limited discretion to exempt infrastructure from reclamation requirements, such as at the request of surface owners or to protect sensitive areas.
- Regulators should require that bond amounts are adequate to ensure decommissioning and reclamation of all associated well infrastructure, including increased bonds or separate bonds for infrastructure that is expensive to reclaim, such as water impoundments, waste facilities, and pipelines.

Current State Infrastructure Policies:

The policies described below are some of the incrementally better policies currently in place, but they do not cover the full reclamation of infrastructure associated with oil and gas wells.

- **North Dakota** requires bonds for underground gathering pipeline systems.⁴²
 - **Wyoming** requires bonds to ensure that surface impoundments that hold produced water from coalbed methane development are reclaimed. Bond amounts were set at \$7,500 or \$12,500 in 2009 based on an estimate of the full cost of reclamation, and increased 3% each year.⁴³
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Recommendations — State Land Office Financial Assurance:

Many states manage a portion of the minerals within their boundaries, which are held in trust and leased to support public institutions, often schools and hospitals. For example, in New Mexico, nearly 13 million acres or 17% of all minerals in the state are trust minerals managed by the State Lands Office. Of the state's 46,566 producing wells, 30% are on state trust land.⁴⁴ When wells on state trust lands are orphaned, states may be forced to pay for cleanup with the funds that are intended to go to education and health. These agencies have authority to set lease terms and administration, including requiring surface reclamation bonds but, like oil and gas regulatory agencies, commonly require blanket bonds that are significantly lower than projected reclamation costs. These agencies should utilize their statutory authority to the greatest extent possible to ensure complete and timely reclamation of the operations under their jurisdictions.

- If oil and gas regulatory agencies do not set bonds at the full projected cost of reclamation, surface management agencies such as State Lands Offices should use their authority to require additional reclamation bonds to ensure that lands and waters within their jurisdiction are fully reclaimed.

⁴² [North Dakota Administrative Code Section 38-08- 04 §1 d: Section 43-02-03-15 §8 a](#)

⁴³ WY DEQ, [Implementation Guidance for Reclamation and Bonding of On-Channel Reservoirs that Store Coalbed Natural Gas Produced Water](#)

⁴⁴ Santa Fe New Mexican, [Land commissioner: Oil, gas cleanup could cost billions](#)

Current State Land Office Financial Assurance Policies:

The Colorado policy is incrementally stronger than other State Lands Office bonding policies we reviewed, but North Carolina’s statewide policy would ensure bonds cover the full cost of surface reclamation.

- **Colorado’s** State Land Trust Board requires separate surface reclamation bonds for development on state trust lands. For 1-3 Leases and/or Agreements: \$25,000 each, and for 4 or more Leases and/or Agreements: \$100,000 blanket bond per lessee.⁴⁵
- **North Carolina** requires a disturbed land bond based on the cost of the conditions set in the reclamation plan, and an environmental damage bond in the amount of \$1 million or more.⁴⁶

Recommendations — Allowable Forms of Financial Assurance:

Surety bonds, cash deposits and irrevocable letters of credit are widely accepted as forms of financial assurance that are sufficiently secure to ensure reclamation will occur, but a number of states allow operators who are considered to be in good financial standing to evade posting a bond (Kansas, Michigan and Ohio), or provide for other unnamed forms of financial assurance (Mississippi and North Dakota)⁴⁷ that put taxpayers at risk for shouldering the burden of reclamation, and lands at risk of going unreclaimed.

- Acceptable forms of financial assurance should include surety bonds, letters of credit, or cash deposits. Less secure options such as self-bonding and equipment liens should be eliminated.

Idle Wells

If bonds are not posted at the full cost of reclamation, operators have a greater incentive to keep wells idle and delay paying the significant costs to plug and reclaim these wells. In addition, regulators are often directed to foster or maximize production, which can provide another incentive to keep wells from being permanently plugged, even when they are uneconomical to operate.

While most state regulators have timelines requiring operators to plug idle wells or return them to production, many give operators near indefinite ability to postpone compliance. Colorado’s state well database displays wells that are reported as being idle for over 100 years.⁴⁸

Many regulators provide an option for operators to extend idle status by demonstrating “future economic use,” such as showing that the well could produce in paying quantities at a certain price point or marking the well as a candidate for conversion into an Underground Injection Control well for use for waste disposal. This criteria is ripe for abuse and — while there are legitimate reasons to idle wells — strict limits on this ability are essential to end the growing backlog of long-idle wells. Other loopholes include using a practice known as “swabbing.” Operators will produce a well long enough to remove it from idle status and reset their timeline to plug or produce. Regulations should close these loopholes.

⁴⁵ [Colorado State Board of Land Commissioners: OIL AND GAS DEVELOPMENT POLICY](#)

⁴⁶ [North Carolina Administrative Code, 15A NCAC 05H .1404](#)

⁴⁷ [Interstate Oil and Gas Compact Commission, State Financial Assurance Requirements](#)

⁴⁸ [COGCC, Colorado Oil and Gas Information System](#)

Recommendations — Idle Well Approval:

- Wells that have not produced in paying quantities for six months should be considered idle.
- After a well is idle for one year, the operator should be required to either plug the well, return the well to production in paying quantities, or show legitimate cause for continued idle status.
- After a well is idle for a year, and every two years following, operators should be required to conduct a Mechanical Integrity Test with inspectors present.
- After a well is idle for three years, regulators should require operators to plug the well or return it to production.

Current State Idle Well Approval Policies:

The policies described below are some of the incrementally better policies currently in place, but no state has a comprehensive set of policies that meet all of the above recommended solutions to ensure wells don't remain idle indefinitely or that funding (bonds or fees) is in place to cover their future cleanup costs.

- A number of states, including **Arizona, Indiana** (60 days), and **Kansas** (90 days), and **Alabama, South Dakota** (60 months) allow wells to idle for 6 months or less without approval.⁴⁹
- A number of states, including **Alabama, Kansas, Michigan, Nebraska, Nevada, North Dakota, Ohio** and **Utah** allow wells to idle up to a year with approval, but allow renewals or extensions of idle well status.⁵⁰
- **Kentucky** requires a field inspection to ensure wells are properly capped and leakage is prevented before approving idle status.⁵¹
- No states demonstrate a “future economic use” criteria stringent enough to prevent unnecessary idle wells at this time.

Recommendations — Idle Well Financial Assurance and Fees:

Idle wells pose a significant risk of becoming orphaned because they are uneconomic to operate and, over time, it is increasingly unlikely they will ever return to production and increasingly likely they will have negative environmental impacts. As noted earlier, research shows idled wells returning to production is the exception, not the rule. To address this risk, several states have policies in place to require additional bonding for idle wells or require companies to pay idle wells fees.

- If bonds are not already set at the projected cost to plug and reclaim wells, regulators should increase bond amounts to the projected cost of reclamation when wells are idled. Alternatively, idle wells should be assessed an annual fee paid into an orphaned well cleanup fund. This is particularly important for operators who hold a large number or large percentage of idle wells.
- Operators with idle wells should be required to submit an idle well inventory management plan that includes a timeline to plug and reclaim idle wells. Approvals of new permits, well transfers and ongoing operations should be contingent on full compliance with an approved plan.

⁴⁹ Interstate Oil and Gas Compact Commission, [Idle and Orphan Oil and Gas Wells: State and Provincial Regulatory Strategies](#)

⁵⁰ Interstate Oil and Gas Compact Commission, [Idle and Orphan Oil and Gas Wells: State and Provincial Regulatory Strategies](#)

⁵¹[https://eec.ky.gov/Natural-Resources/Oil-and-Gas/Forms%20Library/TA%20Permit%20\(OG-12\)%20Rev%2006-19.pdf](https://eec.ky.gov/Natural-Resources/Oil-and-Gas/Forms%20Library/TA%20Permit%20(OG-12)%20Rev%2006-19.pdf), Kentucky Dept of Natural Resources, Oil and Gas Division, Temporary Abandonment Permit

Current State Idle Well Financial Assurance and Fee Policies:

While some state policies are more successful than others, no state has a comprehensive set of policies that meet all of the above recommended solutions. Below are some state policies that better reduce the risks posed by idle wells.

- **Arkansas** requires operators to secure additional bonding (\$35,000 per gas well or \$15,000 per oil well) in order for the well to be in approved temporary abandonment status. Wells can stay in temporarily abandoned status for up to three years before they are required to be plugged or the operator requests a hearing for an exemption.⁵²
- **California** requires operators to pay idle well fees annually ranging between \$150-\$1,500 per well depending on how long a well has remained idle. Operators with a \$200,000 or \$400,000 blanket bond must pay either idle-well fees, maintain an escrow account, or file idle well bonds at \$5,000 each. As an alternative to paying this fee, an operator may submit an idle well management plan that commits it to eliminate a certain number of long-term idle wells each year based on the total number of idle wells they own.⁵³ The California Council on Science & Technology orphan well report noted that while California's idle well regulations may be less stringent than other states, California has taken steps to try and limit the amount of time operators maintain wells in this status by increasing the fees. As of 2018, California has collected \$4.3 million in idle well fees that could be used to plug and reclaim abandoned or orphaned wells in the state.⁵⁴
- **Colorado** requires that if an operator's inactive well count exceeds its current financial assurance divided by \$10,000 per inactive well under 3,000 feet in depth or by \$20,000 per inactive well over 3,000 feet in depth, the operator must secure additional bonding. The additional bonding is set at \$10,000 per inactive well under 3,000 feet in depth or \$20,000 per inactive well over 3,000 feet in depth. However, regulators can waive this requirement if they approve an operator's plan to return wells to production or if the operator agrees to plug and abandon the wells on its own.⁵⁵
- **New Mexico** requires operators requesting to place a well in temporary abandonment for more than two years to either secure financial assurance in the amount of \$25,000 plus \$2 per foot of the depth the well or a blanket bond of \$150,000 for one to five wells; \$300,000 for six to 10 wells; \$500,000 for 11 to 25 wells; and \$1 million for more than 25 wells.⁵⁶
- **North Dakota** recently added limits on blanket bonds for wells idle more than seven years and increased its single well bonding amount for inactive wells to \$180,000.⁵⁷
- **Wyoming** regulators can require an operator to secure additional bonding of \$10/foot of depth per well after a well has been shut in for one year. Operators can submit an idle well plan in lieu of increased bonding. These plans must include a process to return the wells to production or plug at least 10% of their idle wells each year. As of June 1, 2020, the state held \$159 million idle well bonds (\$122 million in surety bonds) and some larger operators had opted to pay the additional bonding rather than spend time developing a plan to return the wells to production.⁵⁸

⁵² [Arkansas Oil & Gas Commission General Rules, Rule B-7](#)

⁵³ [California Pub. Resources Code, § 3206, subd. \(a\)\(2\)\(B\)\(v\)](#)

⁵⁴ California Council on Science and Technology, [Orphan Wells In California: An Initial Assessment](#)

⁵⁵ [COGCC, Rule 707](#)

⁵⁶ [New Mexico Administrative Code Subsection D of 19.15.8.9](#)

⁵⁷ [North Dakota DMR, "North Dakota's Abandoned Wells"](#)

⁵⁸ WOGCC [Bonding, Shut-in and Plugging Requirements Presentation to the Joint Minerals, Business and Economic Development Committee](#), June 1, 2020

Orphan Well Cleanup

Orphan well cleanup funds enable states to take action when oil and gas fields play out and/or the industry is in decline, and wells are orphaned and bonds do not cover the cost of reclamation. This funding is used to plug wells, restore the surface and land surrounding wells, fix roads and other infrastructure damaged in the operating process, and fund many other important and necessary recovery efforts. These funds will become increasingly important as oil and gas demand and production decline, because they serve as an additional safety net when reclamation costs exceed bond amounts. Even if a state puts full-cost bonding into effect, this funding source is critical to addressing the significant backlog of orphaned wells.

Recommendations — Orphan Well Fees and Funds:

- States should require oil and gas companies to pay into a fund for orphan well cleanup, at a level that is sufficient to locate orphaned wells that are not yet mapped, address all orphaned wells, and provide a backstop for bonds that do not cover the full cost to plug and reclaim wells that are currently under permit but orphaned in the future.

Current Industry-Funded Orphan Well Fee and Fund Examples:

While some states may have made significant, recent appropriations to pay for orphan well cleanup (e.g. Colorado⁵⁹), we want to highlight states that have created orphan well cleanup funds with funding from industry, not taxpayers. As with other policies we have highlighted, the states below have some of the better programs in place, but few states have orphan well cleanup funds sufficient enough to clean up all orphan wells in their state.

- **Ohio** funds orphan well cleanup through a severance tax collected from oil and gas companies. In 2018, the state legislature unanimously passed legislation⁶⁰ to direct state regulators to spend at least 30% (up from 14%) of the money in the orphan well fund each year to ensure that this fund was being used as intended and that more wells could be plugged in the future. The state also has a landowner pass-through program that allows pre-qualified landowners to act as general contractors to plug and restore orphan wells through approved contractors. Wells must already be on the state's priority list for plugging.⁶¹ However, at the end of FY 2019, the state had 910 documented orphan wells.⁶²
- **Texas** has one of the largest orphan well plugging programs in the country, plugging 1,710 wells in 2019, at a cost of \$70 million. However at the end of FY2019, Texas still had 6,208 known orphan wells and 13,385 non-compliant inactive wells. These inactive wells include wells that have been shut-in for longer than 12 months and wells that have not been granted a plugging extension. The state's orphan well cleanup is funded through industry-paid regulatory and permitting fees.⁶³
- **West Virginia's** legislature passed four bills that provided different industry funding mechanisms to bring in an estimated \$10 million/year to the state's orphan well cleanup fund.

⁵⁹ The Colorado Independent, [Hickenlooper calls his executive order for orphan gas wells the 'second-best solution'](#)

⁶⁰ Ohio Legislature, [HB 225](#), 132nd General Assembly

⁶¹ Ohio Dept of Natural Resources, [Orphan Well Program](#)

⁶² Interstate Oil and Gas Compact Commission, [Idle and Orphan Oil and Gas Wells: State and Provincial Regulatory Strategies](#)

⁶³ Railroad Commission of Texas, [2019 Oilfield Cleanup Program Annual Report](#)

These funding sources include severance taxes, increased permit fees and unclaimed royalties.⁶⁴ At the end of FY 2019, the state had 4,646 documented orphaned wells.⁶⁵

- **Wyoming's** Oil and Gas Commission (WOGCC) assesses a 5/10 of a percent conservation tax on every barrel of oil and every mcf of natural gas to pay for plugging and reclaiming orphan wells. The tax can be raised or lowered by the WOGCC, and was suspended during the COVID pandemic in 2020.⁶⁶ The governor and legislature also have provided additional funding to plug orphan oil and gas wells, and increased planned orphaned well remediation in 2020 from 600 to 1,034 wells.⁶⁷ At the end of FY 2019, the state had 3,083 documented orphan wells.⁶⁸

Recommendations — Orphan Well Plans and Prioritization

At a minimum, states need to know the current condition of each orphaned well and the likelihood of leaks coming into contact with people, water supplies or other sensitive areas. Most states have policies in place to provide some basic prioritization of their orphan wells for cleanup. However, immediate emergencies created by leaks are often the primary factor determining when an orphaned well is plugged. While it is important to address these immediate and dangerous threats, states with more robust and transparent prioritization plans can give regulators, state legislatures and community members a much better understanding of the true scope of the problem, how much it will cost to plug and reclaim these wells, and whether the state has enough funding to fully address their known orphan wells. States can do a better job of addressing their orphan well crisis when they can fully analyze what is needed to plug and reclaim each well.

If states monitor air emissions from orphaned wells, they can prioritize the worst leaks for cleanup and reduce the greatest threats to our climate. Research has shown that the majority of methane emissions from abandoned wells can be mitigated by addressing just 5-10% of so-called 'super-emitter' wells.⁶⁹

- Regulators should develop or update prioritized plans for cleanup of orphaned wells with public input and based on leaks or emissions, proximity to residents, environmental justice criteria, threat to water supply, impacts to wildlife and environment, conflict with current land use and other risk factors, as well as well location (to take advantage of any economies of scale).
- Regulators should monitor air emissions from documented orphaned wells in order to appropriately prioritize wells for plugging and reclamation.
- Plugging best practices (based on the best technical data) should be set in regulations and reviewed and updated frequently. Plugged wells must be inspected on site.

Current State Practices to Prioritize Orphan Well Cleanup:

⁶⁴ West Virginia Surface Owner Rights Organization, [Spring 2020 Newsletter](#)

⁶⁵ Interstate Oil and Gas Compact Commission, [Idle and Orphan Oil and Gas Wells: State and Provincial Regulatory Strategies](#)

⁶⁶ Wyoming Oil and Gas Conservation Commission, [WOGCC Commissioners Pass Reduction in Conservation Tax](#)

⁶⁷ Wyoming Oil and Gas Conservation Commission, [The Wyoming Oil and Gas Conservation Commission Wraps up their 2020 Orphan Well Project on Successful Note](#)

⁶⁸ Interstate Oil and Gas Compact Commission, [Idle and Orphan Oil and Gas Wells: State and Provincial Regulatory Strategies](#)

⁶⁹ Stanford News, [Stanford study of abandoned oil and gas wells reveals new ways of identifying and fixing the worst methane emitters](#)

The policies described below are some of the better policies currently in place, but no state regularly monitors air emissions from orphaned wells to prioritize ‘super-emitters’ for plugging and reclamation.

- **Colorado** regulators prioritize known orphan wells into low, medium, and high-priority categories based on risk factors, including population density and urbanization, environmental factors, years in service, active spills, stormwater issues, noxious weeds, wildlife/livestock/vegetation impacts, surface equipment, bradenhead pressure, mechanical integrity test data, and history of venting or leaking.⁷⁰
- **Ohio** regulators inspect known orphaned wells and determine the risk these wells pose on public health, human safety and the environment. They have developed a Risk Evaluation Matrix to determine risk based on the condition of a well (what is leaking and how much) and what could come in contact with what is leaking (public and environmental factors).⁷¹
- **Pennsylvania** uses a well scoring sheet⁷² to assess a variety of environmental and health risks to rank their orphaned wells. The Pennsylvania Department of Environmental Protection completed a study of a representative sample of orphaned and plugged legacy wells (historically drilled wells that have been plugged or abandoned) to better understand factors that affect legacy well integrity and estimate GHG and methane emissions from these wells. Ultimately, they used this information to better quantify the plugging liabilities for these wells.⁷³
- **Texas** ranks wells for plugging to ensure that those wells posing the greatest threat to public safety and the environment are plugged first. The priority system weighs a variety of factors in four categories including well completion, wellbore conditions, well location with respect to sensitive areas; and unique environmental, safety, or economic concerns.⁷⁴

Well Transfers and Bankruptcy

When wells are sold, the operating permit must be transferred from the operator of record to the new owner, and the transfer must be approved by the regulator. The transfer of wells presents another opportunity for state regulators to protect wells from becoming orphaned by requiring additional financial assurance from new operators. Enforcement of regulations regarding the transfer of wells, particularly for high-risk idle or stripper wells, is a critical component in preventing the growth of orphaned well inventories.

As wells become less profitable, they are often transferred from a larger company looking to offload reclamation costs onto a smaller company which, in turn, is less likely to have the resources to plug and reclaim the well. Transferred wells are often stripper wells or idle. Many wells are “sold” for no money at all; rather the “buying” company just agrees to take on the reclamation and associated environmental liabilities of the wells. Often these smaller purchasing companies are no better off than the predecessor company in bringing the wells into economic production, particularly because these companies often lack access to capital financing.

As discussed earlier, High Plains Gas, CRC and Diversified Gas and Oil are high profile examples of the problems with well transfers that are approved without additional assurances. Some

⁷⁰ COGCC, [Annual Comprehensive Orphan Wells and Orphaned Sites List as Directed by Executive Order D 2018-12](#), July 1, 2020

⁷¹ Ohio Dept of Natural Resources, Division of Oil and Gas Resources Management [Orphan Well Program Plugging Expansion Presentation](#)

⁷² Pennsylvania Department of Environmental Protection Office of Oil and Gas Management [Well Scoring Sheet](#)

⁷³ The Geological Society of America, [Pennsylvania Legacy Well Integrity and Emissions Study](#)

⁷⁴ Railroad Commission of Texas, [2020 Oilfield Cleanup Program Annual Report](#)

companies hold a disproportionate number of high-risk wells compared to their available level of financial assurances. Regulators are often reluctant to take enforcement action with regard to these wells and companies because of the high risk of orphaning if costs are increased, but allowing these companies to amass large numbers of stripper and idle wells creates a ticking time bomb that will ultimately result in a large-scale orphan well crisis when the company's low-investment, low-return model eventually becomes unsustainable.

Ohio regulators have taken a simpler approach by making permits non-transferrable. While regulators have little, if any, authority to prevent the sale of a well to a new party, they have every right to approve or disapprove of the operation of that well. By requiring new operators to apply for a new permit, Ohio regulators have put the onus on operators to prove their ability to plug and reclaim their sites. As regulations are updated, wells are no longer 'grandfathered' in with inadequate financial assurance.

Another option for states is to hold previous operators responsible for covering the cost to clean up wells, should they be orphaned. This can create a deterrent to companies selling off high risk wells to smaller operators that do not have the financial resources to cover their clean up liabilities. However, not all regulators have legal authority to hold prior operators responsible for reclamation, and pursuing preceding operators can take significant time and legal resources.

Recommendations — Well Transfers:

- If bonds are not set at the actual cost of reclamation, regulators should require stripper wells or idle wells that are transferred to new operators to be covered by bonds or fees that are sufficient to cover the full cost to plug and reclaim these wells.
- Regulators should have authority to hold previous operators in the chain of custody of an orphaned site responsible for covering the cost of plugging and reclaiming the site.
- Permits should not be transferable. New owners should be required to apply for a new permit, and regulators should only approve permits accompanied by financial assurance at the cost of reclamation.

Current State Policies on Well Transfers:

Several states use a variety of measures from increasing bonding for transferred idle wells, to developing risk models to assess a company's financial health, to going back to previous owners in their attempt to prevent companies from selling idle or abandoned wells to avoid paying to plug and reclaim them.

- **Arkansas** requires any low-producing (25 MCF/day) or temporarily abandoned (TA) wells to secure a \$35,000 bond per natural gas well that meets this definition before a transfer can be approved. This additional bond is not required for transferred low-producing or TA oil wells.⁷⁵ Orphaned or abandoned wells can only be transferred if the new owner pays a \$500 per well under 3,000 foot depth or \$1,000 per well over 3,000 foot depth salvage fee, with additional salvage fees to cover equipment and any oil stored on site and provides the required bond.⁷⁶
- **California** retains the ability to go back to mineral owners or previous operators to cover the cost to plug and reclaim wells if they determine that the current operator does not have the financial resources to cover these costs.⁷⁷ The state can only go back to operators that had

⁷⁵ [Arkansas Oil & Gas Commission General Rules, Rule B-4](#)

⁷⁶ [Arkansas Oil & Gas Commission General Rules, Rule G-3](#)

⁷⁷ [California Public Resources Code, Article 4, Sec 3237](#)

rights to the well after 1996.⁷⁸ The Bureau of Land Management, in its role as lessor of federal minerals, also retains this ability.⁷⁹

- **Colorado's** Financial Assurance Technical Working Group recommended that state regulators develop a risk model to assess potential costs to plug and reclaim wells being transferred to assess the company's ability to pay for these costs in the future. Higher levels of risk related to inactive wells, inactive equipment, or reclamation liability could result in additional mandatory bonding at the time of transfer.⁸⁰ The Colorado Oil and Gas Conservation Commission is expected to take up new rules regarding financial assurance and the recommendations from this report in early 2021.
- **North Dakota** requires a single well bond in an amount equal to the cost of plugging the well and reclaiming the well site before an abandoned well⁸¹ well be transferred.⁸² This change in state rules was initiated in 2019 when the number of abandoned wells in the state jumped 10% in one year.⁸³
- **Ohio** does not allow operators to transfer well permits. New operators are required to reapply for permits.⁸⁴
- **Wyoming** requires a bonding review when wells are transferred, which provides an opportunity to require additional bonding before the transfer is approved. Idle wells cannot be transferred to a new operator unless the increased idle well bond is in place or there is an approved plan to address these wells.⁸⁵ In effect, this has prevented companies from shedding their idle wells to smaller, less resourced companies. However, now that larger oil and gas companies are declaring bankruptcy this may become a problem if the increased bonds are still not enough to fully cover the cost to plug and reclaim these wells.

Recommendations — Bankruptcy:

Bankruptcy is a key moment when there is a need for strong action on the part of regulatory agencies to ensure that companies pay for cleanup. Bankruptcy courts can allow companies to transfer the responsibility and costs to plug and reclaim sites that are uneconomic to states and taxpayers, but continue to allow companies to operate profitable sites. In 2019, the Colorado-based company PetroShare filed for Chapter 11 bankruptcy. Under the bankruptcy plan, PetroShare's assets were liquidated, and one of its main creditors chose to take any assets it wanted. The state of Colorado allowed Wattenburg, the new company formed by the creditors, to abandon any of PetroShare's 89 wells it didn't want, leaving the cost to clean them up to the taxpayers of Colorado. Carbon Tracker predicted that Wattenburg will not want 67 idle wells and stripper wells, with an

⁷⁸ Center for International Environmental Law, [Oil and Gas's Gift to California: A \\$5.7 Billion Cleanup Bill](#)

⁷⁹ [43 CFR 3137.63](#) and GAO-19-615, [OIL AND GAS Bureau of Land Management Should Address Risks from Insufficient Bonds to Reclaim Wells](#)

⁸⁰ Colorado Oil and Gas Conservation Commission, [Executive Order D 2018-12 Financial Assurance Technical Working Group Final Report](#), December 1, 2018

⁸¹ A well may be deemed as abandoned in North Dakota upon the removal of production equipment or the failure to produce oil or gas (or failure to inject) for one year.

⁸² [North Dakota Administrative Code, 43-02-03-15](#)

⁸³ The Bismarck Tribune, [As abandoned oil wells climb, regulators consider ways to stop problem from worsening](#)

⁸⁴ [Ohio Administrative Code, 1501:9-1-02](#)

⁸⁵ [WOGCC Rules, Chapter 3, Section 4](#)

estimated clean up cost of \$11.7 million. The agreement allows the state to seize \$325,000 of PetroShare's \$425,000 bond.⁸⁶

In some cases, operators simply walk away from their operations without entering bankruptcy. In either case, corporations and their officers who leave liabilities to taxpayers through orphaned wells should not be considered for additional leases or permits by any regulator. These recommendations are not currently seen in state codes, but should be incorporated in the future.

- Attorneys General Offices should intervene and strongly oppose proposals by oil and gas companies to offload the responsibility for reclaiming wells at the end of their profitable life onto the public through bankruptcy proceedings, and should rescind all permits for operators who orphan wells.
- Regulators should deny new permits and leases and suspend or rescind existing permits and leases for operators who fail to plug and reclaim wells in a complete and timely manner.

Data Availability, Clarity and Transparency

Publicly available data on oil and gas wells shared by state regulators, including information on well status, current operator, bond amounts and the full liability for cleanup, is often out-of-date, incomplete and/or inaccessible. Yet, knowing the full extent of the orphan well crisis in each state, as well as the wells at higher risk of becoming orphaned (stripper, idle, temporarily abandoned) and potential taxpayer liability is critical to ensure that the policies in place are adequate to address the scale of the problem and put the responsibility on operators to clean up their wells, not on the state.

When operators are late filing required reports or payments, this can be a sign that their wells are at-risk of becoming orphaned because small operators who do not have the financial means to file for bankruptcy protection may simply close their doors when they cannot afford to continue. If state regulators are conducting frequent on-site inspections and permit reviews, they will have the best understanding of the true state of the industry and be able to better address well cleanup before time and lack of use make the process more complicated and costly.

In many states, raising awareness about the negative environmental and fiscal impacts of orphaned wells has been key towards building the political support to get state agencies to collect the needed data and make it readily available to the public. Once that data is available, community organizations and others have been able to push state legislatures and regulatory agencies to enact some of the policies needed to address the current backlog of orphaned wells and attempt to prevent this crisis from worsening.

Recommendations — Public Information and Oversight:

- Regulators should provide annual updates to the public and to state legislatures on the number of documented orphaned wells, the estimated number of undocumented orphaned wells, the number of wells at-risk of becoming orphaned, the number of idled wells and length of time in idle status, the number and cost of orphaned wells plugged and reclaimed, amount of financial assurance held per company and well, and potential taxpayer liability.
- Regulators should provide public access to regularly updated databases that include clear and detailed information about the amounts of reclamation bonds or other financial assurance, and the wells and other infrastructure covered by those bonds.

⁸⁶ Carbon Tracker, [PetroShare gets the Oil and Colorado, the hole](#)

- Regulators should conduct on-site inspections at least once per year, and should verify operator and well status whenever required reports or payments are late.
- Regulators should conduct regular reviews of well permits to ensure accurate data is being used.

Current State Public Information Practices:

_____The states below have better practices in place to provide public access to the information outlined in the above recommendations, however gaps still exist in the available information for long-term idle or legacy wells.

- **Colorado's** Oil and Gas Conservation Commission (COGCC) has taken steps to make data fully accessible to the public.⁸⁷ The agency's online database provides detailed information relevant to reclamation including well status and bond amount. State regulators are also directed to release an annual report on the state orphaned well program⁸⁸ that includes updates on the progress and costs to plug and reclaim wells on the state's prioritized orphan well list, bond and surety amounts and state fund expenditures for to plug and reclaim orphan wells. Following the passage of groundbreaking legislation that changed COGCC's mission to regulate the industry rather than foster it, the agency will create a "first-of-its-kind cumulative impacts data gathering system with an annual reporting requirement to the public."⁸⁹
- **Pennsylvania's** Department of Environmental Protection (DEP) maintains a detailed list of cost estimates to plug wells in DEP's orphaned and abandoned⁹⁰ well database including location, number of wells, high and low cost estimates, priority level, proximity to water supplies and people, Congressional and state legislative districts, miles to designated use streams and recreational area acres.⁹¹
- **Texas** regulators release quarterly and annual Oilfield Cleanup Reports that include progress on well plugging and site remediation, the number of orphaned and inactive wells, and oilfield cleanup fund expenditures. The annual reports also include projected funding needed for the next biennium for plugging orphaned wells, investigating, assessing, and cleaning up abandoned sites, and remediating surface locations.⁹²
- **Wyoming's** Oil and Gas Conservation Commission (WOGCC) Supervisor publishes a monthly report that includes a snapshot of APD, production, total bond amounts and idle well bonds being held, and number of orphan wells plugged and abandoned (PA) to-date for the year or in progress.⁹³ WOGCC bi-annual reports to legislative committees provide an update on the orphan well plugging program, including the number of PA wells, wells under PA contract, and estimated and actual costs for each contract.⁹⁴

⁸⁷ Western Resource Advocates, [Making Great Strides towards Improving Public Access to Oil and Gas Data – Working Together with the Colorado Oil and Gas Conservation Commission](#)

⁸⁸ COGCC, [Fiscal Year 2020 Annual Report Orphaned Well Program](#)

⁸⁹ Natural Gas Intelligence, [Colorado's Updated Oversight of Oil, Gas Development Called 'Watershed Moment'](#)

⁹⁰ Pennsylvania considers a well abandoned if it has not been used to produce, extract, or inject any gas, petroleum, or other liquid within the preceding 12 months, or the equipment necessary for production, extraction, or injection has been removed, or a dry well have has not been equipped for production within 60 days after drilling, re-drilling, or deepening.

⁹¹ Pennsylvania Dept of Environmental Protection, [Plugging Projects CFA 2 9 18](#)

⁹² Texas Railroad Commission, [Oil & Gas Regulation And Cleanup Fund](#)

⁹³ https://drive.google.com/file/d/1JzQrSNxIPiqtMM_zayVkz1WLxMSNzzG4/view, WOGCC Supervisor's Report, January 2021

⁹⁴ WOGCC [Update Orphan Well/Reclamation & Recent APD Rule Change](#) presentation to the Joint Minerals, Business, and Economic Development Committee, November 5, 2020

Recommendation — Infrastructure Tracking:

In some instances, regulators do not record the locations of infrastructure associated with production. This has led to some high profile, dangerous incidents due to leaks from unknown oil and gas infrastructure near homes. Following a natural gas leak from a nearby pipeline that forced eight families in Arvin, CA to evacuate their homes for over eight months, California legislators directed agency officials to improve pipeline safety and mapping.⁹⁵ In April 2017, an explosion from a severed gas line in Firestone, CO killed two people and injured another.⁹⁶ In response to this disaster, state regulators began a multi-year process to improve safety⁹⁷ and eventually enacted some of the most robust regulatory changes in the country.

- Regulators should require information and reclamation plans for associated wellsite infrastructure (e.g., flowlines, surface equipment), as well as midstream infrastructure location and type.

State Policies on Mapping Pipelines:

_____ The state policies discussed below highlight better current requirements for mapping pipelines, but these policies do not directly ensure that reclamation for all associated wellsite infrastructure is in place.

- **California** established rules requiring that active, older pipelines near "sensitive areas" such as occupied buildings must undergo mechanical integrity testing.⁹⁸ Agency officials are currently developing new regulations to require operators to submit mapping data on active pipelines in sensitive areas (within 300 feet of an occupied building) on an annual basis.⁹⁹
- **Colorado** regulators require operators to provide GIS data for all off-location flowlines, crude oil transfer lines, and produced water transfer systems.¹⁰⁰

Regulatory Agency Purpose, Mandate, Capacity

Many of the policy weaknesses that have set up the growing crisis of idle and orphaned wells and taxpayer liability are rooted in regulatory agencies with missions that focus on fostering or maximizing oil and gas production, and with insufficient capacity and resources to provide appropriate oversight of the industry. As the industry begins to decline, now is a critical time to provide regulatory agencies with the purposes, resources and tools needed to ensure a well-managed contraction that prioritizes public health and safety, and a clean environment.

⁹⁵ California Legislative Information, [AB 1420](#) text

⁹⁶ Colorado Public Radio, [Colorado Announces \\$18.25 Million Fine For 2017's Deadly Firestone Explosion](#)

⁹⁷ The Denver Post, [Hickenlooper signs order to release the locations of orphan wells, sets deadline to cap them](#)

⁹⁸ [CALIFORNIA CODE OF REGULATIONS, TITLE 14, CHAPTER 4](#). DEVELOPMENT, REGULATION, AND CONSERVATION OF OIL AND GAS RESOURCES

⁹⁹ California Dept of Conservation, [Gas Pipeline Mapping: Pipeline Information Data Design \(draft\)](#), May 16, 2019

¹⁰⁰ COGCC, [Flowlines-GIS data](#)

Recommendations — Regulatory Agency Purpose, Mandate and Capacity:

- The missions of regulatory agencies should be to regulate oil and gas development in a manner that protects public health and safety, clean air and water, and broader public interests, and to ensure complete and timely reclamation.
- States should budget for the full amount needed to fulfill all responsibilities, including permitting, bond reviews, monitoring, inspections, and enforcement, and allocate the necessary funds. If needed, fees on permits or production should be established to fund regulatory programs.

Current State Policies:

- In **Colorado**, following the passage of SB 181 in 2019 that prioritizes the protection of public safety, health, welfare and the environment in the regulation of the oil and gas industry,¹⁰¹ the Oil and Gas Conservation Commission enacted some of the most sweeping regulatory changes in the country, enabled by a change in its statutory mission from “fostering” to “regulating” oil and gas development in a manner that protects public health, safety, welfare, the environment and wildlife resources. The new rules include a new 2,000’ setback of oil and gas facilities from homes and schools, legal standing for all impacted residents before the COGCC, the first ever environmental justice rules for oil and gas permitting in Colorado, a near prohibition of venting and flaring,¹⁰² riparian buffers, groundwater protections and more.¹⁰³

Conclusion

Now is a critical time to act to protect the climate. Research has documented abandoned wells as a known source of methane emissions and that prioritizing the ‘super-emitters’ for plugging can greatly reduce the threat. Given that the cost to plug and reclaim these wells is well within the range of other climate protections measures, addressing our orphaned and legacy well crisis makes good economic and climate sense.

Immediate action can prevent the unsecured cleanup costs for orphaned wells from further spiraling out of control. Setting reclamation bond levels at the actual cost of reclamation is the most direct single policy option available to ensure timely and complete reclamation of oil and gas wells. Without the ability to apply this policy retroactively, regulators are left to deal with more than a century of development that has failed to consider the cleanup costs. A holistic regulatory approach that addresses the many problems outlined in this paper can drastically decrease the climate, public health, environmental and financial risk of oil and gas well cleanup.

¹⁰¹ Colorado General Assembly, [SB19-181](#) Protect Public Welfare Oil And Gas Operations, 2019 Regular

¹⁰² [Code of Colorado Regulations, 5 CCR 1001-9](#)

¹⁰³ COGCC, [Colorado Oil & Gas Conservation Commission Unanimously Adopts SB 19-181 New Mission Change Rules, Alternative Location Analysis and Cumulative Impacts](#), November 23, 2020

Appendix A. State Policy Recommendations Chart

Not all of the problems listed below apply to all states. This chart includes a comprehensive list of the current problems related to oil and gas development and regulation and suggested policy solutions states could enact to address these issues. While some state policies are more successful than others, no state has a comprehensive set of policies that is strong enough to ensure that all wells will be plugged and reclaimed, or provide funding to do so. There is no silver bullet—the most successful programs rely on a number of policies, and enforce those policies.

Current Regulatory Problem	Policy Recommendations
<i>Financial Assurance Mechanisms/Bonding</i>	
<p>Bonds are insufficient to cover the cost to plug wells and reclaim the surface.</p>	<ul style="list-style-type: none"> ● Regulators should eliminate blanket bonds that are not tied to the projected cost of reclamation, and require site-specific reclamation bonds that will fund the full projected cost to plug and reclaim all of an operator’s wells and associated sites. ● Until bonds are set at the actual cost of reclamation, regulators should establish bond amounts that increase as the factors that contribute to reclamation cost increase, including the number of wells, well depth, location, the amount and nature of surface disturbance, facilities and infrastructure to be reclaimed. ● Bond amounts should be reviewed annually, and minimum bond amounts should be increased every three years based on the consumer price index or actual plugging costs.
<p>Some infrastructure, such as flow lines and pipelines, is not required to be removed and sites reclaimed.</p>	<ul style="list-style-type: none"> ● Regulators should have limited discretion to exempt infrastructure from reclamation requirements, such as at the request of surface owners or to protect sensitive areas. ● Regulators should require that bond amounts are adequate to ensure decommissioning and reclamation of all associated well infrastructure, including increased bonds or separate bonds for infrastructure that is expensive to reclaim, such as water impoundments, waste facilities, and pipelines. ● If oil and gas regulatory agencies do not set bonds at the full projected cost of reclamation, surface management agencies such as State Lands Offices should use their authority to require additional reclamation bonds to ensure that lands and waters within their jurisdiction are fully reclaimed.
<p>Some forms of financial assurance are less secure.</p>	<ul style="list-style-type: none"> ● Acceptable forms of financial assurance should include surety bonds, cash deposits, or letters of credit. Less secure options such as self-bonding, property and equipment liens should be eliminated.

Current Regulatory Problem	Policy Recommendations
<i>Idle Wells</i>	
<p>Wells that are not producing are often not promptly labeled as such, and are often allowed to remain idle for years or indefinitely.</p>	<ul style="list-style-type: none"> ● Wells that have not produced in paying quantities for six months should be considered idle. ● After a well is idle for one year, the operator should be required to either plug the well, return the well to production in paying quantities, or show legitimate cause for continued idle status. ● After a well is idle for a year, and every two years following, operators should be required to conduct a Mechanical Integrity Test with inspectors present. ● After a well is idle for three years, regulators should require operators to plug the well or return it to production.
<p>Idle wells are at high risk of being orphaned.</p>	<ul style="list-style-type: none"> ● If bonds are not already set at the projected cost to plug and reclaim wells, regulators should increase bond amounts to the projected cost of reclamation when wells are idled. Alternatively, idle wells should be assessed an annual fee paid into an orphaned well cleanup fund. This is particularly important for operators who hold a large number or large percentage of idle wells. ● Operators with idle wells should be required to submit an idle well inventory management plan that includes a timeline to plug and reclaim idle wells. Approvals of new permits, well transfers and ongoing operations should be contingent on full compliance with an approved plan.
<i>Orphan Well Cleanup</i>	
<p>Regulators have inadequate funds to plug and reclaim wells when they are orphaned.</p>	<ul style="list-style-type: none"> ● States should require oil and gas companies to pay into a fund for orphan well cleanup, at a level that is sufficient to locate orphaned wells that are not yet mapped, address all orphaned wells, and provide a backstop for bonds that do not cover the full cost to plug and reclaim wells that are currently under permit but orphaned in the future.
<p>Some orphaned well plugging programs do not have comprehensive plans that prioritize wells for plugging and reclamation.</p>	<ul style="list-style-type: none"> ● Regulators should develop or update prioritized plans for cleanup of orphaned wells with public input and based on leaks or emissions, proximity to residents, environmental justice criteria, threat to water supply, impacts to wildlife and environment, conflict with current land use and other risk factors, as well as well location (to take advantage of any economies of scale). ● Regulators should monitor air emissions from documented orphaned wells in order to appropriately prioritize wells for plugging and reclamation.

Current Regulatory Problem	Policy Recommendations
Plugging standards are often vague and/or lenient	<ul style="list-style-type: none"> ● Plugging best practices (based on the best technical data) should be set in regulations and reviewed and updated frequently. Plugged wells must be inspected on site.
<i>Well Transfers and Bankruptcy</i>	
Large operators often transfer less profitable wells to smaller operators who often do not have the resources for plugging and reclamation.	<ul style="list-style-type: none"> ● If bonds are not set at the actual cost of reclamation, regulators should require stripper wells or idle wells that are transferred to a new operator to be covered by bonds or fees that are sufficient to cover the full cost to plug and reclaim these wells. ● Regulators should have authority to hold previous operators in the chain of custody of an orphaned site responsible for covering the cost of plugging and reclaiming the site. ● Permits should not be transferable. New owners should be required to apply for a new permit, and regulators should only approve permits accompanied by financial assurance at the cost of reclamation.
Bankruptcy courts can allow companies to transfer the responsibility and costs to plug and reclaim sites that are uneconomic to states and taxpayers, but continue to operate profitable sites.	<ul style="list-style-type: none"> ● Attorneys General Offices should intervene and strongly oppose proposals by oil and gas companies to offload the responsibility for reclaiming wells at the end of their profitable life onto the public through bankruptcy proceedings, and should rescind all permits for operators who orphan wells.
Operators who have orphaned wells should be barred from further operations.	<ul style="list-style-type: none"> ● Regulators should deny new permits and leases and suspend or rescind existing permits and leases for operators who fail to plug and reclaim wells in a complete and timely manner.

Current Regulatory Problem	Policy Recommendations
<i>Data Availability, Clarity, and Transparency</i>	
Public information about orphaned wells and taxpayer liability is sometimes limited.	<ul style="list-style-type: none"> ● Regulators should provide annual updates to the public and to state legislatures on the number of documented orphaned wells, the estimated number of undocumented orphaned wells, the number of wells at-risk of becoming orphaned, the number of idled wells and length of time in idle status, the number and cost of orphaned wells plugged and reclaimed, amount of financial assurance held per company and well, and potential taxpayer liability.
Public data about well status and bonding amounts is often inadequate and/or inaccessible.	<ul style="list-style-type: none"> ● Regulators should provide public access to regularly updated databases that include clear and detailed information about the amounts of reclamation bonds or other financial assurance, and the wells and other infrastructure covered by those bonds.
Regulators' data about operator and well status is sometimes out of date.	<ul style="list-style-type: none"> ● Regulators should conduct on-site inspections at least once per year, and should verify operator and well status whenever required reports or payments are late. ● Regulators should conduct regular reviews of well permits to ensure accurate data is being used.
Regulators sometimes do not record the locations of infrastructure associated with production	<ul style="list-style-type: none"> ● Regulators should require information and reclamation plans for associated wellsite infrastructure (e.g., flowlines, surface equipment), as well as midstream infrastructure location and type.
<i>Regulatory Purpose, Mandate, Capacity</i>	
Regulators are often directed to foster or even maximize production over other considerations.	<ul style="list-style-type: none"> ● The missions of regulatory agencies should be to regulate oil and gas development in a manner that protects public health and safety, clean air and water, and broader public interests, and to ensure complete and timely reclamation.
Regulators often have inadequate capacity and staff resources.	<ul style="list-style-type: none"> ● States should budget for the full amount needed to fulfill all responsibilities, including permitting, bond reviews, monitoring, inspections, and enforcement, and allocate the necessary funds. If needed, fees on permits or production should be established to fund regulatory programs.