United States Government Accountability Office

Report to Congressional Requesters

September 2019

OIL AND GAS

Bureau of Land Management Should Address Risks from Insufficient Bonds to Reclaim Wells

GAO-19-615

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GAO Highlights

Highlights of GAO-19-615, a report to congressional requesters

Why GAO Did This Study

The oil and natural gas produced from wells on federal lands are important to the U.S. energy supply and bring in billions in federal revenue each year. However, when wells are not properly managed, the federal government may end up paying to clean up the wells when they stop producing. Specifically, wells on federal lands that an operator does not reclaim and for which there are no other liable parties fall to BLM to reclaim (restore lands to as close to their original natural states as possible). These wells become orphaned if the operator's bond held by BLM is not sufficient to cover reclamation costs. BLM regulations set minimum bond values at $10,000 for all of an operator's wells on an individual lease, $25,000 for all of an operator's wells in a state, and $150,000 for all of an operator's wells nationwide.

GAO was asked to review the status of oil and gas bonding for federal lands. This report (1) describes the value of bonds for oil and gas wells in 2018 compared to 2008, and (2) examines the extent to which BLM's bonds ensure complete and timely reclamation and thus prevent orphaned wells. GAO analyzed agency data on bonds and wells and interviewed BLM officials.

What GAO Recommends

Congress should consider giving BLM the authority to obtain funds from operators to reclaim orphaned wells, and requiring BLM to implement a mechanism to do so. GAO also recommends that BLM take steps to adjust bond levels to more closely reflect expected reclamation costs. BLM concurred. BLM did not concur with a proposed recommendation to develop a mechanism to obtain funds, citing lack of authority. GAO changed it to a matter for Congressional consideration.

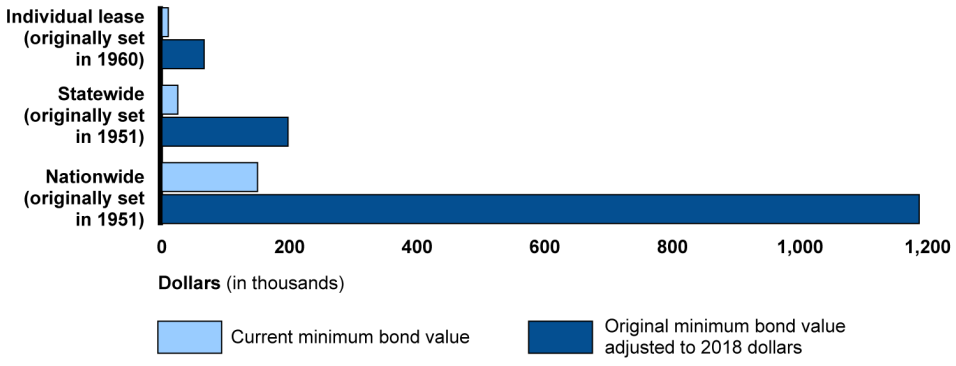
View GAO-19-615. For more information, contact Frank Rusco at (202) 512-3841 or ruscof@gao.gov.

What GAO Found

The average value of bonds held by the Bureau of Land Management (BLM) for oil and gas wells was slightly lower on a per-well basis in 2018 ($2,122) as compared to 2008 ($2,207), according to GAO's analysis of BLM data. The total value of bonds held by BLM for oil and gas operations increased between these years, as did the number of wells on federal land.

Bonds held by BLM have not provided sufficient financial assurance to prevent orphaned oil and gas wells (wells that are not reclaimed by their operators and, among other things, whose bonds were not sufficient to cover remaining reclamation costs, leaving BLM to pay for reclamation). Specifically, BLM identified 89 new orphaned wells between July 2017 and April 2019, and BLM offices identified to GAO about $46 million in estimated potential reclamation costs associated with orphaned wells and with inactive wells that officials deemed to be at risk of becoming orphaned in 2018. In part, bonds have not prevented orphaned wells because bond values may not be high enough to cover the potential reclamation costs for all wells under a bond, as may be needed if they become orphaned. GAO's analysis indicates that most bonds (84 percent) that are linked to wells in BLM data are likely too low to reclaim all the wells they cover. Bonds generally do not reflect reclamation costs because most bonds are set at their regulatory minimum values, and these minimums have not been adjusted since the 1950s and 1960s to account for inflation (see figure). Additionally, these minimums do not account for variables such as number of wells they cover or other characteristics that affect reclamation costs, such as well depth. Without taking steps to adjust bond levels to more closely reflect expected reclamation costs, BLM faces ongoing risks that not all wells will be completely and timely reclaimed, as required by law. It falls to BLM to reclaim orphaned wells, but the bureau does not assess user fees to cover reclamation costs, in part because it believes it does not have authority to do so. Providing such authority and developing a mechanism to obtain funds from operators for such costs could help ensure that BLM can completely and timely reclaim wells.

Bureau of Land Management Current Regulatory Minimum Oil and Gas Bond Values Compared to Original Minimum Bond Values Adjusted to 2018 Dollars



Source: GAO analysis of Bureau of Land Management data. | GAO-19-615

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Abbreviations

AFMSS	Automated Fluid Minerals Support System
BLM	Bureau of Land Management
EPAct 2005	Energy Policy Act of 2005
LR2000	Legacy Rehost 2000
OGOR	Oil and Gas Operations Report

U.S. GOVERNMENT ACCOUNTABILITY OFFICE
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September 18, 2019

The Honorable Raúl M. Grijalva
Chairman
Committee on Natural Resources
House of Representatives

The Honorable Alan S. Lowenthal
Chairman
Subcommittee on Energy and Mineral Resources
Committee on Natural Resources
House of Representatives

Oil and natural gas produced from wells on federal lands are important to the U.S. energy supply and bring in billions in federal revenue each year. However, when oil and gas wells are not properly managed, the federal government may end up paying to clean up the wells when they stop producing. According to the Department of the Interior's Bureau of Land Management (BLM), at the end of fiscal year 2018, BLM oversaw private entities operating over 96,000 oil and gas wells on leased federal lands. BLM is responsible for managing onshore federal oil and gas resources and determining requirements for operators to reclaim leased lands, which BLM defines as restoring lands to as close to their original natural states as possible.[1] The oil and gas industry's boom-and-bust cycles can lead operators to drill wells when prices for oil and gas are high but can contribute to bankruptcies when prices are low. As a result, operators may not always have the resources to reclaim lands around wells that have been degraded by drilling and production.[2] When wells are not fully

[1]BLM is responsible for issuing leases for private entities to develop oil and gas resources on and under roughly 700 million acres of (1) BLM land, (2) other federal agencies' land, and (3) private land where the federal government owns the mineral rights. According to BLM, approximately 26 million acres were leased for oil and gas operations at the end of fiscal year 2018. BLM's regulatory responsibilities also extend in part to development of oil and gas on Indian trust and restricted lands, but those lands and programs are outside the scope of this report.

[2]For the purposes of this report, "operator" refers to lessees, owners of operating rights, and operators of an oil or gas operation, unless indicated otherwise. We use the term "reclamation" to refer to all of the actions and costs to reclaim a well, including well plugging and surface reclamation, and to restoring any lands or surface waters adversely affected by oil and gas operations.

reclaimed, there may be risks of leaking methane or groundwater contamination, among other things.[3]

BLM uses bonds to reimburse at least some of the costs of well reclamation in the event that operators or other liable parties do not reclaim wells. The Mineral Leasing Act of 1920, as amended, requires that federal regulations ensure that an adequate bond is established before operators begin preparing land for drilling to ensure complete and timely reclamation of the land, among other things.[4] BLM regulations set minimum bond values: $10,000 for all of an operator's wells on an individual lease (known as an individual lease bond), $25,000 for all of an operator's wells in a state (known as a statewide bond), and $150,000 for all of an operator's wells nationwide (known as a nationwide bond).[5] In January 2010, we reported on the number and value of bonds BLM held for oil and gas operations for fiscal years 1988 through 2008 and the value of individual lease, statewide, and nationwide bonds as of December 2008.[6] These bonds are designed to help prevent or reduce taxpayer losses because the bond money may be used to reclaim wells when operators or other liable parties do not. When the bonds covering those wells are insufficient to cover reclamation expenses, and there are no other responsible or liable parties to do so, wells are considered "orphaned."

Federal laws and BLM regulations and policies contain requirements aimed at managing BLM's potential oil and gas well liabilities and

[3]In this report, we refer to a well and the site surrounding it as a well.

[4]Specifically, BLM "shall, by rule or regulation, establish such standards as may be necessary to ensure that an adequate bond, surety, or other financial arrangement will be established prior to the commencement of surface-disturbing activities on any lease, to ensure the complete and timely reclamation of the lease tract, and the restoration of any lands or surface waters adversely affected by lease operations after the abandonment or cessation of oil and gas operations on the lease." 30 U.S.C. § 226(g).

[5]BLM coordinates with the Forest Service regarding oil and gas development on National Forest System lands. Where oil or gas development involves surface disturbance of National Forest System lands, the Forest Service must assess whether the existing BLM bond is adequate to meet the estimated cost to the Forest Service to reclaim those surface areas to be disturbed and to restore any lands or surface waters adversely effected by lease operations. If the Forest Service determines that bond is not adequate, the operator has the options of increasing the BLM bond amount or obtaining a separate bond to meet such estimated costs.

[6]GAO, *Oil and Gas Bonds: Bonding Requirements and BLM Expenditures to Reclaim Orphaned Wells*, GAO-10-245 (Washington, D.C.: Jan. 27, 2010).

preventing orphaned wells, including through ongoing oversight of wells and bonds provided by operators. For example, BLM's well review policy calls for field offices to, among other things, periodically review all inactive wells to determine whether they are capable of producing oil or gas or have a future beneficial use and, if not, have operators submit plans to reclaim the wells.[7] In May 2018, we reported on BLM's challenges in implementing these reviews, including differing understandings among field offices of the specific actions that constitute a well review.[8] In that report, we recommended that BLM develop and communicate specific instructions on what actions constitute a well review for annual reporting purposes. BLM concurred with this recommendation, and officials told us they are developing new reporting requirements.

Similar to its well review policy, BLM has a bond adequacy review policy that calls for BLM to regularly review bonds when certain events occur or periodically. Based on these reviews, BLM is to seek to increase bonds as necessary to ensure they reflect risks posed by the operator.[9] In our May 2018 report, we also reported on BLM's challenges in implementing bond adequacy reviews and made recommendations to improve their implementation.[10] In that report, we recommended that BLM strengthen its approach to monitoring field offices' implementation of the bond adequacy review policy, such as by collecting and analyzing data on performance indicators and ensuring the quality of those data. BLM concurred with this recommendation, and officials told us they are working on revising their guidance on data validation and are implementing quality reviews of their data.

You asked us to review issues related to bonds for oil and gas wells on federal lands. This report (1) describes the value of bonds for oil and gas wells in 2018 compared to 2008, and (2) examines the extent to which BLM's bonds ensure complete and timely reclamation and thus prevent orphaned wells.

[7]Bureau of Land Management, *Instruction Memorandum 2012-181* (Sept. 5, 2012).

[8]GAO, *Oil and Gas Wells: Bureau of Land Management Needs to Improve Its Data and Oversight of Its Potential Liabilities*, GAO-18-250 (Washington, D.C.: May 16, 2018).

[9]These bond adequacy reviews use a points-based system to examine aspects of an operator's wells (such as its number of wells idle for at least 7 years), compliance history (such as its number of incidents of drilling without approval), and reclamation stewardship (such as its number of reclamation incidents of noncompliance issued in the last 5 years).

[10]GAO-18-250.

To describe the value of bonds for oil and gas wells in 2018 compared to 2008, we analyzed oil and gas well data from BLM's Automated Fluid Minerals Support System (AFMSS) as of May 2018 and data on bonds from BLM's Legacy Rehost 2000 (LR2000) system as of May 2018. We compared these data to the 2008 data from these systems that we reported in 2010.[11] We matched the May 2018 data from the two systems based on the bond number—a variable in both systems—to identify how many wells were covered by each bond and to determine the average bond value per well for each bond category. To assess the reliability of these AFMSS and LR2000 data elements, we reviewed agency documents, met with relevant agency officials, and performed electronic testing. We found these data to be sufficiently reliable for our purposes.

To examine the extent to which BLM's bonds ensure complete and timely reclamation and thus prevent orphaned wells, we analyzed several sources of data, including AFMSS well data, LR2000 bond data, Office of Natural Resources Revenue's Oil and Gas Operations Report (OGOR) well production data, and well reclamation cost estimates from proofs of claim that BLM files with the Department of Justice when an operator files for bankruptcy.[12] First, we examined whether bonds are sufficient to cover potential reclamation costs for the wells they cover. To do this, we analyzed cost estimates on proofs of claim and identified typical high- and low-cost well reclamation scenarios. We then compared the cost scenarios to the average bond value available per well, for each bond, calculated using bond values in LR2000 and the number of wells covered by each bond in AFMSS. Next, we examined a subset of wells that are at increased risk of becoming orphaned and whether bonds are sufficient to cover their potential reclamation costs. To do this, we used OGOR production data to identify wells that had not produced since at least June 2008 and that met several other criteria. For those at-risk wells, we compared reclamation cost scenarios to the average bond value available for each—calculated by dividing bond value by the number of at-risk wells covered by the bond—using well data from AFMSS and bond value data from LR2000. To assess the reliability of the AFMSS, LR2000, and OGOR data elements we used, we reviewed agency documents, met with relevant agency officials, and performed electronic testing. We found these data to be sufficiently reliable for our purposes.

[11]GAO-10-245.

[12]The Office of Natural Resources Revenue manages and ensures full payment of revenues owed for the development of the nation's energy and natural resources offshore, on the Outer Continental Shelf, and onshore, on federal and Indian lands.

In addition, we examined the number of orphaned wells, comparing the number of orphaned wells identified by BLM as of April 2019 to those identified by BLM as of July 2017 and 2009, the two previous times we reported on orphaned wells.[13] To assess the reliability of the 2019 orphaned well list, we reviewed agency documents and met with relevant agency officials. Though we identified shortcomings with these data, which we discuss in the report where appropriate, we nevertheless found these data to be sufficiently reliable for the purpose of describing the orphaned wells BLM has identified.

To understand how BLM manages bonds, we reviewed BLM's policies and interviewed officials from four BLM state offices and four BLM field offices.[14] We selected these state and field offices because they were responsible for managing the largest numbers of wells on federal land. We also interviewed officials from BLM's headquarters office in Washington, D.C. Findings from the selected BLM offices cannot be generalized to offices we did not interview, but they provide a range of views. Appendix I provides additional information on our scope and methodology.

We conducted this performance audit from January 2018 to September 2019 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Background

Life Cycle of Oil and Gas Wells

Oil and gas exploration and production involves disturbing lands in several ways. For example, when operators drill oil and gas wells, they typically remove topsoil and construct a well pad, where the drilling rig will be located. Other equipment on-site can include generators and fuel tanks. In addition, reserve pits are often constructed to store or dispose of water, mud, and other materials that are generated during drilling and

[13]See GAO-10-245 and GAO-18-250.

[14]The four selected BLM state offices are California, New Mexico, Wyoming, and Utah. The four selected BLM field offices are Bakersfield, Buffalo, Carlsbad, and Farmington.

production, and roads and access ways are often built to move equipment to and from the wells.

Once wells cease production, which may occur many decades after they are drilled, they can become inactive. Inactive wells have the potential to create physical and environmental hazards if operators do not properly reclaim them, a process that may involve plugging the well, removing structures, and reshaping and revegetating the land around the wells. For example, inactive wells that are not properly plugged can leak methane into the air or contaminate surface water and groundwater. Well sites that are not properly reclaimed can contribute to habitat fragmentation and soil erosion, and equipment left on-site can interfere with agricultural land use and diminish wildlife habitat.

Costs for well reclamation vary widely and are affected by factors such as the depth of the well. Although BLM does not estimate reclamation costs for all wells, it has estimated reclamation costs for thousands of wells whose operators have filed for bankruptcy. Based on our analysis of these estimates, we identified two cost scenarios: low-cost wells typically cost about $20,000 to reclaim, and high-cost wells typically cost about $145,000 to reclaim.[15]

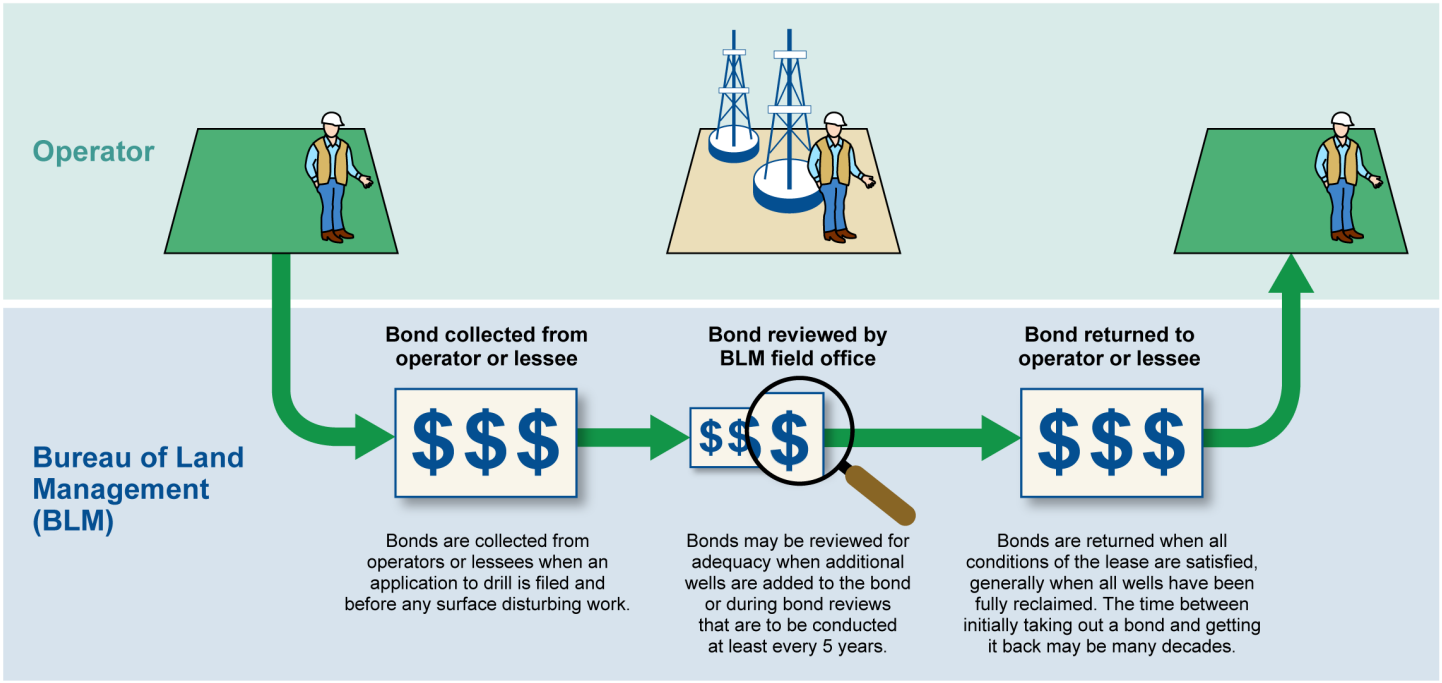
BLM's Bonding Regulations and Policies

As shown in figure 1, BLM regulations or policies outline how BLM is to initially collect bonds from operators, review bonds, and ultimately return the bond to the operator or use it to cover costs of reclamation.

[15]Based on our analysis of BLM reclamation cost estimates, the costs to reclaim wells were clustered into distinct groups: relatively low-cost and relatively high-cost wells. Due to this pattern of clustering and a wide variation in reclamation costs, we used these data as a basis to define two scenarios of potential reclamation costs for any individual well. Although we do not have information about the reclamation costs for all BLM wells, or the extent to which the proofs of claim sample is representative of all BLM wells, we consider these two scenarios to reflect a reasonable range of potential reclamation costs for a typical well.

The low-cost scenario is based on the 25th percentile of average well reclamation costs in proofs of claim, and the high-cost scenario is based on the 75th percentile. These scenarios do not encompass the complete range of BLM's well reclamation cost estimates. For example, on the low end, the 5th percentile average was about $15,000, and the lowest average estimate was $3,096. On the high end, the 95th percentile average was about $174,000, and the highest estimate was $603,000. Reclamation costs can vary based on a number of factors, such as well depth or location.

Figure 1: Life Cycle of a Bureau of Land Management Bond for Oil and Gas Operations



Source: GAO analysis of Bureau of Land Management information. | GAO-19-615

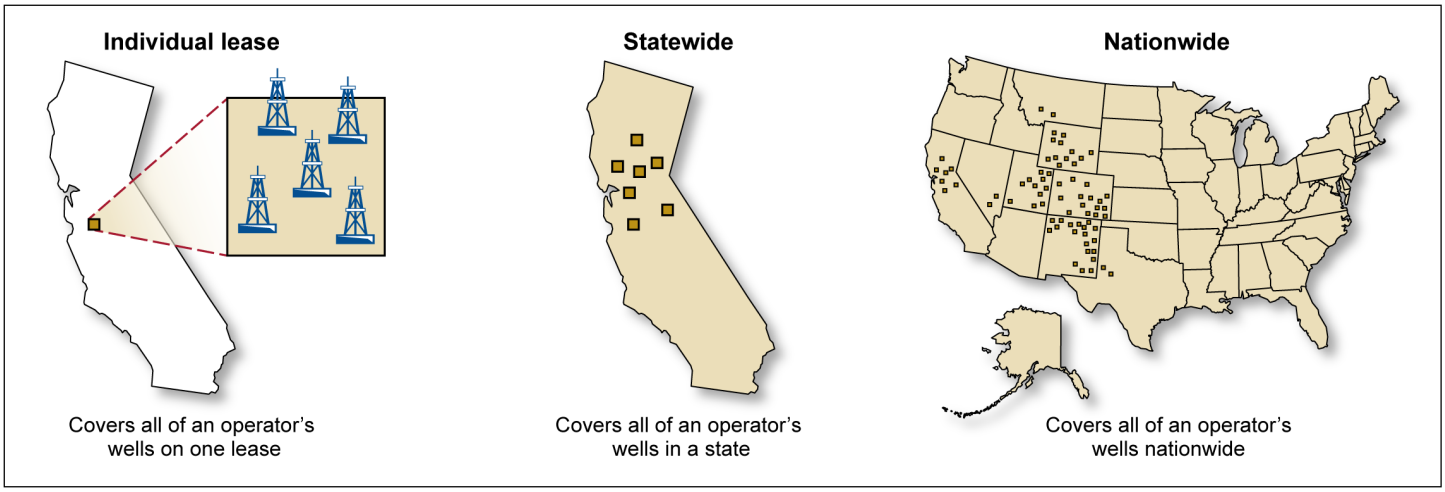
Bonds collected from operator. BLM regulations require operators to submit a bond to ensure compliance with all of the terms and conditions of the lease, including, but not limited to, paying royalties and reclaiming wells.[16] BLM regulations generally require operators to have one of the following types of bond coverage:[17]

[16]43 C.F.R. § 3104.1(a).

[17]Other bonds include unit operator bonds that cover all operations conducted on leases within a specific unit agreement and bonds for leases in the National Petroleum Reserve in Alaska. Unit agreements refer to multiple lessees who unite to adopt and operate under a single plan for the development of any oil or gas pool, field, or like area. The amount of a unit operator bond is determined on a case-by-case basis by BLM officials, and the minimum amount of a National Petroleum Reserve in Alaska bond is set in regulation—not less than $100,000 for a single lease or not less than $300,000 for a reserve-wide bond (submitted separately or as a rider to an already existing nationwide bond).

- individual lease bonds, which cover all of an operator's wells under one lease;[18]
- statewide bonds, which cover all of an operator's leases and operations in one state;[19] or
- nationwide bonds, which cover all of an operator's leases and operations nationwide.[20] (See figure 2.)

Figure 2: Bureau of Land Management Individual Lease, Statewide, and Nationwide Bonds for Oil and Gas Operations



Source: GAO analysis of Bureau of Land Management information. | GAO-19-615

BLM can accept two types of bonds: surety bonds and personal bonds. A surety bond is a third-party guarantee that an operator purchases from a private insurance company approved by the Department of the Treasury. The operator pays a premium to the surety company that can vary depending on various factors, including the amount of the bond and the assets and financial resources of the operator. If operators fail to reclaim

[18]An individual lease bond posted by a lessee may cover all operators on a lease. Otherwise, each operator on a lease must provide a separate bond covering just the wells operated by that operator. As we previously reported, according to BLM officials, most leases have only one operator. See GAO, *Oil and Gas Bonds: BLM Needs a Comprehensive Strategy to Better Manage Potential Oil and Gas Well Liability*, GAO-11-292 (Washington, D.C.: Feb. 25, 2011).

[19]A statewide bond posted by a lessee can cover all well operators with the consent of the company providing the bond.

[20]A nationwide bond posted by a lessee can cover all well operators with the consent of the company providing the bond.

their wells, the surety company is responsible for paying BLM up to the amount of the bond to help offset reclamation costs.

A personal bond must be accompanied by one of the following financial instruments:

- certificates of deposit issued by a financial institution whose deposits are federally insured, granting the Secretary of the Interior full authority to redeem it in case of default in the performance of the terms and conditions of the lease;
- cashier's checks;
- certified checks;
- negotiable Treasury securities, including U.S. Treasury notes or bonds, with conveyance to the Secretary of the Interior of full authority to sell the security in case of default in the performance of the lease's terms and conditions; or
- irrevocable letters of credit that are issued for a specific term by a financial institution whose deposits are federally insured and meet certain conditions and that identify the Secretary of the Interior as sole payee with full authority to demand immediate payment in case of default in the performance of the lease's terms and conditions.

BLM bond reviews. BLM regulations provide flexibility to increase bonds above minimums and require increases above minimum amounts if operators meet certain criteria. Specifically, BLM regulations require BLM to increase the bond amount when an operator who applies for a new drilling permit had previously failed to reclaim a well in a timely manner. For such an operator, BLM must require a bond in an amount equal to its cost estimate for reclaiming the new well if BLM's cost estimate is higher than the regulatory minimum amount. BLM regulations also authorize increases in the bond amount—not to exceed the estimated cost of reclamation and any royalties or penalties owed—whenever the authorized officer determines that the operator poses a risk due to factors such as that the expected reclamation costs exceed the present bond.

In response to our previous recommendation in 2011 that BLM develop a comprehensive strategy to revise its bond adequacy review policy to more clearly define terms and conditions that warrant a bond increase,[21] BLM issued a bond adequacy review policy in July 2013, Instruction

[21]GAO-11-292.

Memorandum 2013-151. The policy contained directives for conducting reviews when bonds meet certain criteria. Specifically, the 2013 bond adequacy review policy called for field offices to, among other things, review each bond at least every 5 years to determine whether the bond value appropriately reflected the level of potential risk posed by the operator. If it did not, authorized officers were to propose an increase (or decrease) in the bond value.

In November 2018, BLM issued a revised bond adequacy review policy, Instruction Memorandum 2019-014, which supersedes the 2013 policy. The 2018 policy continues to call for field offices to review each bond at least every 5 years, but it revised the point system worksheet that field offices are to use when determining whether a bond increase (or decrease) is warranted. Also, in response to our 2018 recommendation that BLM ensure that the reviews of nationwide and statewide bonds reflect the overall risk presented by operators, the 2018 policy calls for additional coordination between BLM headquarters, state offices, and field offices when reviewing nationwide and statewide bonds.

BLM returns or uses bond. If operators reclaim their wells, BLM returns the bond to the operator.[22] Many decades may pass between when BLM collects a bond and when it is returned. If operators do not reclaim their wells, BLM may redeem the certificate of deposit, cash the check, sell the security, or make a demand on the letter of credit to pay the reclamation costs. Liability for reclaiming a well on onshore federal lands can fall to either the lease holder or the operator, and BLM may also hold past owners or operators liable. The liability for past owners or operators extends only to reclamation obligations that accrued before BLM approved the transfer of their lease to a subsequent lessee. They are not liable for reclamation and lease obligations incurred after that transfer is approved.

[22]Bonds are released after final abandonment is approved by BLM, indicating compliance with all lease terms, including reclamation. Statewide or nationwide bonds are not released until final approval of abandonment of all activities under those bonds.

Average Bond Values Per Well Were Slightly Lower in 2018 as Compared to 2008

Based on our review of BLM data, the value of bonds held by BLM for oil and gas operations on a per-well basis were slightly lower in 2018 as compared to 2008. Although the total value of bonds held by BLM for oil and gas operations was higher in 2018 than in 2008 (about $204 million compared to about $188 million, in 2018 dollars), the average bond value per well was slightly lower because the number of wells on federal land was also higher in 2018 than in 2008 (96,199 wells compared to 85,330). Specifically, in 2008, BLM held bonds worth an average of $2,207 per well in 2018 dollars.[23, 24] BLM held bonds worth an average of $2,122 per well in 2018, a decrease of 3.9 percent as compared to 2008 (see table 1).[25]

Table 1: Bureau of Land Management's Oil and Gas Bonds and Wells in 2008 and 2018, in 2018 dollars

	Value of Bonds	Number of Wells	Average Bond Value Per Well
2008	188,316,757	85,330	2,207
2018	204,181,121	96,199	2,122
Percent Change	8.4	12.7	-3.9

Source: GAO analysis of Bureau of Land Management data. | GAO-19-615

Note: The value of bonds in 2008 is as of September 2008. The value of bonds in 2018 is as of May 2018. Data on the number of wells are as of September 2008 and September 2018.

We used BLM data to identify how many wells were covered by each bond and to determine the average bond value per well for each bond

[23]BLM bonds do not typically cover an individual well; however, we calculated the average bond value on a per-well basis (bond amount divided by the number of wells covered by the bond) to compare the value over time adjusted for the increased number of wells. When reporting on all wells, we calculated the average bond value per well as the aggregate value of all BLM bonds divided by the total number of producible well bores. Appendix I provides additional information on our scope and methodology.

[24]GAO-10-245.

[25]Data on the value of bonds in 2008 are as of September 2008. Data on the value of bonds in 2018 are as of May 2018. Data on the number of wells in 2008 are as of September 2008. Data on the number of wells in 2018 are as of September 2018.

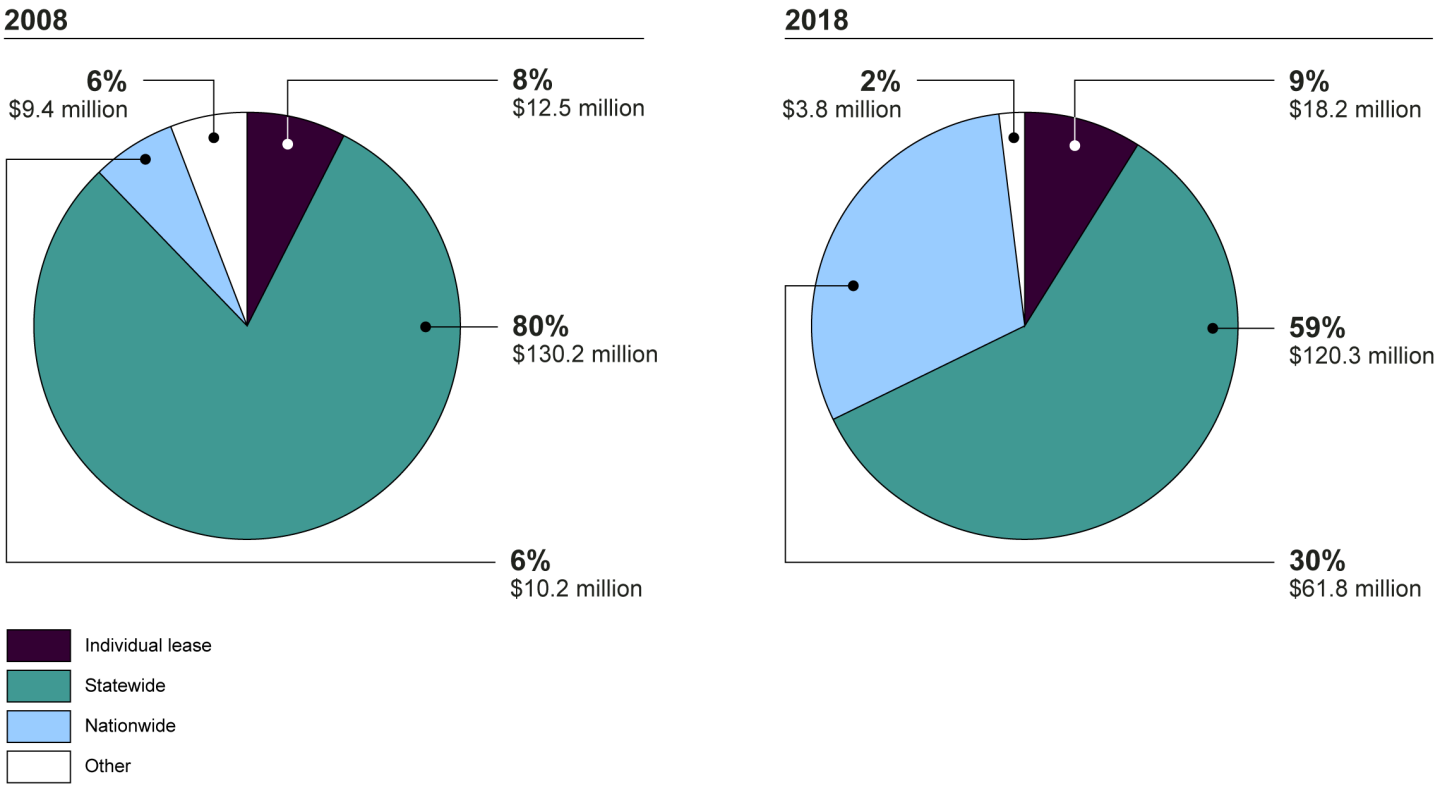
category for bonds that were linked to wells in the data.[26] We found that, on average, as of 2018 an individual lease bond covered about 10 wells, a statewide bond covered about 49 wells, and a nationwide bond covered 374 wells. However, some bonds cover more than the typical number of wells and some fewer. As of 2018, individual lease bonds had the highest average bond value per well at $2,691, and nationwide bonds had the lowest average bond per well value at $890. Statewide bonds had an average bond value per well of $1,592.

The share of the total value of bonds held by BLM that are individual lease, statewide, or nationwide bonds differed in 2018 from 2008 (see Figure 3). The share of individual lease bonds was slightly higher in 2018 as compared to 2008 (about 8 percent in 2008 and about 9 percent in 2018). In 2008, statewide bonds represented about 80 percent (approximately $130 million) of the total value of bonds. In 2018, statewide bonds represented about 59 percent of total bond value (approximately $120 million), but this category still represented the largest share of total bond value. In contrast, nationwide bonds were a lower share of total bond value in 2008 (about 6 percent, approximately $10.2 million) than in 2018 (30 percent, approximately $61.8 million).

[26]To report on the average number of wells per bond by bond category and the average bond value per well by bond category, we analyzed bonds that were linked to wells in BLM's data. Specifically, of 3,357 unique bond numbers in LR2000, 1,547 showed wells were tied to them in AFMSS. These 1,547 bonds covered about 80 percent of the wells in AFMSS. The other 20 percent of wells in AFMSS did not match a bond number in LR2000. These wells may not have listed a bond number, or the bond number listed may not have appeared in LR2000.

Based on this sample, the average bond value per well by bond category is calculated as the aggregate value of BLM bonds in a category divided by the total number of wells covered by bonds of that category. Due to the difference in samples, the total bond value used in the calculations of average bond value per well by bond category differs from the total bond value for all bonds in LR2000. Appendix I provides additional information on our scope and methodology.

Figure 3: Value of Bonds Held by Bureau of Land Management, by Bond Category, in 2008 and 2018



Source: GAO analysis of Bureau of Land Management data. | GAO-19-615

Note: Other category consists of National Petroleum Reserve-Alaska and unit bonds.

BLM officials told us that changes in the composition of the oil and gas industry may have contributed to these changes in the composition of bonds. In particular, officials said some larger companies may have expanded their operations in recent years, sometimes acquiring smaller companies. Large companies with expansive operations are more likely than small companies to have nationwide bonds because such bonds can cover operations in multiple states, which statewide and individual lease bonds do not. Therefore, an industry shift to larger companies would tend to increase the share of nationwide bonds.

Bonds Held by BLM Are Insufficient to Prevent Orphaned Wells

Bonds Do Not Provide Sufficient Financial Assurance to Prevent Orphaned Wells

Bonds do not provide sufficient financial assurance to prevent orphaned wells for several reasons. First, BLM has identified new orphaned wells—wells whose bonds were not sufficient to pay for needed reclamation when operators or other parties failed to reclaim them. As we reported in May 2018, BLM does not track the number of orphaned wells over time and so cannot identify how many wells became orphaned over specific time frames.[27] However, our analyses of BLM's orphaned well lists from different years have shown that BLM has continued to identify new orphaned wells since 2009. We reported in January 2010 that BLM identified 144 orphaned wells in 2009.[28] Then, in May 2018, we reported that BLM identified 219 orphaned wells in July 2017—an increase of 75 orphaned wells.[29] In April 2019, BLM provided a list of 296 orphaned wells that included 89 new wells that were not identified on the July 2017 list.[30]

Bonds are not sufficient to prevent orphaned wells in part because they do not reflect full reclamation costs for the wells they cover. Bonds that are high enough to cover all reclamation costs provide complete financial assurance to prevent orphaned wells because, in the event that an operator does not reclaim its wells, BLM can use the bond to pay for reclamation. On the other hand, bonds that are less than reclamation

[27]See GAO-18-250. We recommended that BLM systematically and comprehensively track orphaned wells. BLM concurred with our recommendation, and officials told us they were exploring making changes to their data systems to improve their ability to track orphaned wells.

[28]GAO-10-245.

[29]GAO-18-250.

[30]BLM headquarters officials told us that some of the wells on the April 2019 list may no longer be orphaned, based on their well status. However, according to officials in one field office, at least some wells in those statuses are still orphaned. As a result, we included all the wells identified in AFMSS as orphaned in our analysis.

costs may not create an incentive for operators to promptly reclaim wells after operations cease because it costs more to reclaim the wells than the operator could collect from its bond. We analyzed bonds that are linked to wells in BLM's data, and found that most of these bonds would not cover reclamation costs for their wells.[31] Specifically, we compared the average bond coverage available for these wells to the two cost scenarios we described above. About 84 percent of these bonds—covering 99.5 percent of these wells—would not fully cover reclamation costs under a low-cost scenario (these bonds have an average value per well of less than $20,000).[32] Less than 1 percent of bonds—covering less than 0.01 percent of these wells—would be sufficient to reclaim all the wells they cover if they were high cost (these bonds have an average value per well of $145,000 or more). The remaining bonds—about 16 percent—have average bond values per well of between $20,000 and less than $145,000.

The majority of bond values do not reflect reclamation costs in large part because most bonds—82 percent—remain at their regulatory minimum

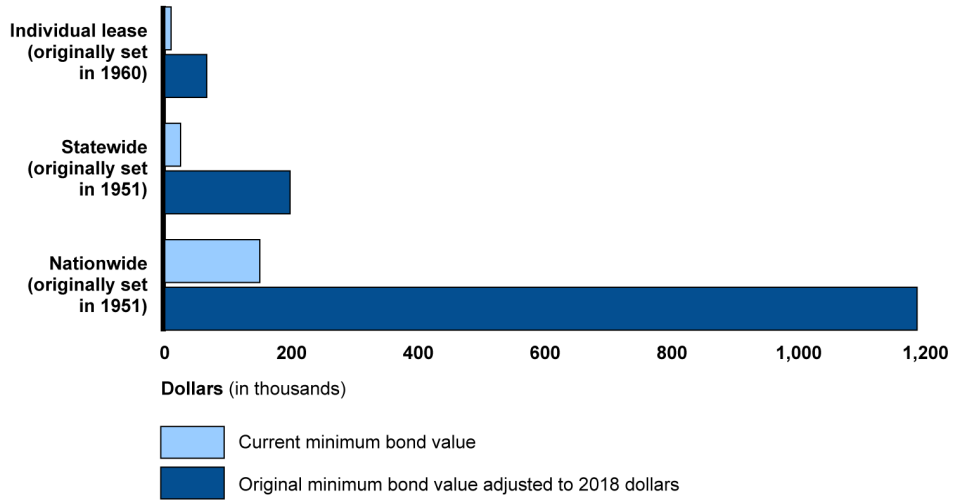
[31]We analyzed bonds that were linked to wells in BLM's data. Specifically, of 3,357 unique bond numbers in LR2000, 1,547 showed wells were tied to them in AFMSS. These 1,547 bonds covered about 80 percent of the wells in AFMSS. The other 20 percent of wells in AFMSS did not match a bond number in LR2000. These wells may not have listed a bond number, or the bond number listed may not have appeared in LR2000. Appendix I provides additional information on our scope and methodology. In our May 2018 report, we found problems with the quality of data in AFMSS, and recommended that the Director of BLM take steps to improve its data quality, for example, by conducting more edit checks and by having data stewards certify the quality of the data. BLM concurred with this recommendation and stated that it would update its policy to provide guidance on standard procedures for data validation review and certification. See GAO-18-250.

[32]We calculated average bond value per well—for each bond—as the bond's value divided by the total number of wells covered the bond, for the sample of wells that were linked to bonds in BLM data. This assessed whether the bond amount is sufficient to cover the reclamation costs associated with all wells covered by the bond. Appendix I provides additional information on our scope and methodology.

values.[33] These regulatory minimums are not reflective of reclamation costs for a number of reasons:

- Regulatory bond minimums have not been adjusted since the 1950s and 1960s to account for inflation. As shown in figure 4, when adjusted to 2018 dollars, the $10,000 individual lease bond minimum would be about $66,000, the $25,000 statewide bond minimum would be about $198,000, and the $150,000 nationwide bond minimum would be about $1,187,000.

Figure 4: Bureau of Land Management Current Regulatory Minimum Oil and Gas Bond Values Compared to Original Minimum Bond Values, Adjusted to 2018 Dollars



Source: GAO analysis of Bureau of Land Management data. | GAO-19-615

- Bond minimums are based on the bond category and do not adjust with the number of wells they cover, which can vary greatly. According to BLM's data, in 2018 the number of wells covered by a single bond

[33]About 14 percent of bonds are above their regulatory minimum values. About 1 percent of bonds are in the other category. About 3 percent of bonds are below their regulatory minimum values. According to BLM officials, bonds below regulatory minimums either (1) do not cover any wells and therefore have no associated liability, or (2) were put in place when regulatory minimums were lower. According to the 2018 BLM bond adequacy review policy, field offices are to review bonds and cannot adjust values to be less than the regulatory minimum values. In 2018, we recommended that BLM strengthen its approach to monitoring field office implementation of bond adequacy review policies, such as collecting and analyzing data on performance indicators and ensuring the quality of the data. Officials told us they are working on revising their guidance on data validation and are implementing quality reviews of their data. See GAO-18-250.

ranged from one well to 6,654 wells. On average, a single bond covered about 68 wells.[34] As wells are added to a bond, the total associated reclamation cost increases even if the bond value does not. A bond that increases with each additional well it covers and then decreases as wells are reclaimed could increase the financial incentive for operators to reclaim their wells in a timely manner. This is because operators would have to contribute additional bond value or would recover some bond value when they add or reclaim a well, respectively. Currently, bond minimums do not automatically adjust in this manner and therefore provide limited financial incentives for an operator to reclaim wells in a timely manner.

- Bond minimums do not reflect characteristics of individual wells such as depth or location, but such characteristics can affect reclamation costs, according to BLM officials. Wells are being drilled deeper than in the past; in 1950, well depth averaged about 3,700 feet, and in 2008, it averaged about 6,000 feet. Newer wells may be drilled 10,000 feet vertically. Officials from one BLM field office told us they assume a cost of $10 per foot of well depth to plug a well, so as wells are drilled deeper, plugging costs typically increase proportionally. Additionally, the location of some wells makes them more expensive to reclaim. For example, BLM officials told us about several wells that may cost three times more to reclaim than other nearby wells because they are located in the middle of a river, making them hard to reach.

In addition to BLM having identified orphaned wells over the last decade, we identified inactive wells at increased risk of becoming orphaned and found their bonds are often not sufficient to reclaim the wells. Our analysis of BLM bond value data and Office of Natural Resources Revenue production data showed a significant number of inactive wells remain unplugged and could be at increased risk of becoming orphaned. Specifically, we identified 2,294 wells that may be at increased risk of becoming orphaned because they have not produced since June 2008 and have not been reclaimed.[35] Further, for a majority of these at-risk wells, their bonds are too low to cover typical reclamation costs for just these at-risk wells. Our analysis of oil and gas production data showed

[34]The number of wells covered by a single bond was calculated using wells that are linked to bonds in BLM's data.

[35]Our analysis used conservative assumptions to estimate a lower bound of the number of wells at the end of their useful life that have not been reclaimed. In particular, our lower-bound estimate does not include some coalbed methane wells that have been inactive for less than 9 years but are unlikely to produce at current prices because of the relatively higher cost of coalbed methane production. Appendix I provides additional information on our scope and methodology.

these wells have not produced oil or gas or been used in other ways, such as serving as injection wells, since at least June 2008, when oil and gas prices were at or near record highs.[36] Given that the Energy Information Administration projects oil and natural gas prices will remain at levels significantly below the 2008 highs through 2050, it is unlikely price will motivate operators to reopen these wells. Some of these wells have been inactive for far longer.[37] Since these at-risk wells are unlikely to produce again, an operator bankruptcy could lead to orphaned wells unless bonds are adequate to reclaim them. If the number of at-risk wells is multiplied by our low-cost reclamation scenario of $20,000, it implies a cost of about $46 million to reclaim these wells. If the number of these wells is multiplied by our high-cost reclamation scenario of $145,000, it implies a cost of about $333 million.[38] When we further analyzed the available bonds for these at-risk wells, we found that most of these wells (about 77 percent) had bonds that would be too low to fully reclaim the at-risk wells under our low-cost scenario.[39] More than 97 percent of these at-risk wells have bonds that would not fully reclaim the wells under our high-cost scenario.

BLM has a policy for reviewing the adequacy of bonds but has not been able to consistently secure bond increases when needed, and this policy

[36]According to the Energy Information Administration, the weekly spot price for West Texas Intermediate oil at Cushing, Oklahoma, was $142.52 per barrel the first week of July 2008. As of the first week of May 2019, the price was $62.90 per barrel. Similarly, the Energy Information Administration reported that the Henry Hub weekly spot price for natural gas was $13.20 per million British thermal units the first week of July 2008. It was $2.59 per million British thermal units the first week of May 2019.

[37]We reported in May 2018 on over 1,000 wells that had been inactive for 25 years or more. That number includes some wells on Indian land, which are not included in the scope of this report. GAO-18-250.

[38]Not all of these wells may become orphaned, although they are at an increased risk of becoming orphaned as compared to active wells or wells that have been inactive for fewer years.

[39]We analyzed bonds linked to at-risk wells in BLM's data. Of the 2,294 at-risk wells, 2,041 were linked to bonds in BLM's data (about 89 percent) and these formed the basis of our analysis of bond value per at-risk well; the remaining wells were not tied to any bonds in LR2000. In addition, we examined costs associated with at-risk wells covered by these bonds and did not count any other wells covered by the bond if they were not at risk. Appendix I provides additional information on our scope and methodology.

has not resulted in bonds that would be adequate to reclaim most wells.[40] BLM's bond adequacy review policy calls for field office staff to review oil and gas bonds at least every 5 years to determine whether the bond amount appropriately reflects the level of potential risk posed by the operator. However, according to BLM documentation, its offices did not secure about 84 percent of the proposed bond increases in fiscal years 2016 and 2017. BLM officials at one field office and one state office noted it is difficult to secure increases from bond reviews when firms are already in difficult financial situations. In November 2018, BLM updated its bond adequacy review policy and called for the agency to focus on securing bond increases from operators that show the highest risk factors. BLM's updated policy more explicitly lays out steps to secure bond increases, including that BLM should not approve new applications to drill from an operator while waiting for a bond increase. The new policy also gives BLM officials discretion to not pursue a bond increase after considering other priorities demanding staff time and workload. It is unclear whether the update will improve BLM's ability to secure bond increases, as it may not address the underlying challenge of attempting to increase bonds from operators who are already in a difficult financial position.

While BLM's federal oil and gas bond minimums do not sufficiently reflect the costs of well reclamation, requirements for bond amounts for other federal mining and energy development activities account for potential reclamation costs to some extent. For example, for bonds for surface coal mining and hardrock mining on federal lands, the Department of the Interior requires bond amounts based on the full estimated cost of reclamation.[41] For grants of federal rights-of-way for wind and solar energy development in designated leasing areas, BLM requires bonds based on a minimum amount per wind turbine or per acre of solar. For such grants in all other areas, the bonds are based on the estimated cost of reclamation but cannot be less than the per-turbine or per-acre amounts previously mentioned.

[40]BLM's bond adequacy reviews use a points-based system to examine aspects of an operator's well status (such as its number of wells idle for at least 7 years), compliance history (such as its number of incidents of drilling without approval), and reclamation stewardship (such as its number of reclamation related incidents of noncompliance issued in the last 5 years).

[41]GAO, *Financial Assurances for Reclamation: Federal Regulations and Policies for Selected Mining and Energy Development Activities*, GAO-17-207R (Washington, D.C.: Dec. 16, 2016).

Additionally, some states have minimum bond requirements for oil and gas wells on lands in the state that, unlike federal bond minimums, adjust with the number of wells they cover or the characteristics of the wells, or both. For example, Texas and Louisiana offer operators with wells on lands in those states the choice of a bond based on total well depth or based on the number of wells. Specifically, the Texas Railroad Commission lets operators choose bonds based on either the total depth of all wells on lands in the state multiplied by $2 per foot, or minimums based on the number of wells covered. If operators choose the latter, the bond for 0 to 10 wells is $25,000; the bond for 11 to 99 wells is $50,000; and the bond for 100 or more wells is $250,000. In Louisiana, the Office of Conservation offers operators with wells on lands in the state the choice of a bond based on total well depth or based on the number of wells. Louisiana further specifies a multiplier that varies depending on the total depth of the well. For example, the bond calculation is $2 per foot for wells less than 3,000 feet deep, $5 per foot for wells from 3,001 to 10,000 feet deep, and $4 per foot for wells 10,001 feet deep or deeper. Operators in Louisiana can alternatively choose to follow a system based on number of wells, with a minimum bond for 10 or fewer wells set at $50,000, a minimum bond for 11 to 99 wells set at $250,000, and a minimum bond for 100 or more wells set at $500,000. Pennsylvania's Department of Environmental Protection requires bonds for unconventional wells that vary based on the number of wells and well bore length.[42]

The Mineral Leasing Act of 1920, as amended, requires federal regulations to ensure that an adequate bond is established before operators begin surface-disturbing activities on any lease, to ensure complete and timely reclamation of the lease tract as well as land and surface waters adversely affected by lease operations. The Mineral Leasing Act of 1920 does not require that BLM set bonds at full reclamation costs. However, the gap between expected reclamation costs and minimum bond amounts has grown over time because the minimums have not been adjusted since they were established in the 1950s and 1960s, whereas reclamation costs have increased due to inflation and the changing characteristics of wells being drilled. In the absence of bond

[42]Pennsylvania defines conventional wells as those that produce oil or gas from a conventional formation. It defines an unconventional well as a gas well that is drilled into an unconventional formation, which is defined as a geologic shale formation below the base of the Elk Sandstone or its geologic equivalent where natural gas generally cannot be produced economically except by horizontal or vertical well bores stimulated by hydraulic fracturing or other techniques to expose more of the formation to the well bore.

levels that more closely reflect expected reclamation costs, such as by increasing regulatory minimums and incorporating consideration of the number of wells on each bond and their characteristics, BLM will continue to face risks that its bonds will not provide sufficient financial assurance to prevent orphaned wells. In particular, adjusting bond minimums so that bonds more closely reflect expected reclamation costs up front could help decrease the need for bond increases later when companies are potentially in financial distress.

BLM Does Not Currently Assess User Fees to Fund Orphaned Well Reclamation

In addition to fulfilling its responsibility to prevent new orphaned wells, it falls to BLM to reclaim wells that are currently orphaned, and BLM has encountered challenges in doing so. We reported in May 2018 that 13 BLM field offices identified about $46.2 million in estimated potential reclamation costs associated with orphaned wells and with inactive wells that officials deemed to be at risk of becoming orphaned. There is also a risk more wells will become orphaned in coming years, as we described above. Based on the most recent orphaned well lists we received from BLM, 51 wells that BLM identified in 2009 as orphaned had not been reclaimed as of April 2019.

The Energy Policy Act of 2005 (EPAct 2005) directs Interior to establish a program that, among other things, provides for the identification and recovery of reclamation costs from persons or other entities currently providing a bond or other financial assurance for an oil or gas well that is orphaned, abandoned, or idled.[43] One way in which BLM may be able to accomplish this is through the imposition of user fees.[44] In 2008, we found that well-designed user fees can reduce the burden on taxpayers to finance those portions of activities that provide benefits to identifiable

[43]The Secretary of the Interior is to establish this program in cooperation with the Secretary of Agriculture.

[44]Generally, under the miscellaneous receipts statute, money an agency receives for the government from a source outside of the agency must be deposited into the Treasury. 31 U.S.C. § 3302. However, BLM "may establish reasonable filing and service fees and reasonable charges, and commissions with respect to applications and other documents relating to the public lands and may change and abolish such fees, charges, and commissions." 43 U.S.C. § 1734(a). All such fees "for processing, recording, or documenting authorizations to use . . . public land natural resources (including . . . mineral) and for providing specific services to public land users, and which are not presently being covered into any [BLM] appropriation accounts, and not otherwise dedicated by law for a specific distribution, shall be made immediately available for program operations in this account and remain available until expended." *Id*. § 1734a.

users.[45] Further, according to Office of Management and Budget guidance, it may be appropriate for an agency to request authority to retain the fee revenue if the user fees offset the expenses of a service that is intended to be self-sustaining.[46]

The volume of drilling applications and inactive wells provide an opportunity to fund reclamation costs. According to BLM data, the agency processes more than 3,500 applications to drill each year, on average, and has over 14,000 inactive wells. Based on our calculations, a separate fee of about $1,300 charged at the time a drilling application is submitted (in addition to the current drilling application filing fee, which is $10,050), or an annual fee of less than $350 for inactive wells could generate enough revenue to cover, in a little over a decade, the entire $46 million potential reclamation costs field offices identified to us.[47] In commenting on a draft of this report, BLM stated that it does not have the authority to seek or collect fees from lease operators to reclaim orphaned wells. Developing a mechanism to obtain funds from operators to cover the costs of reclamation, consistent with EPAct 2005, could help ensure that BLM can completely and timely reclaim wells without using taxpayer dollars.

Other federal programs, including other BLM programs, collect fees from users to fund reclamation activities. For example, the federal government collects fees from mining companies to reclaim abandoned mines. Specifically, the federal abandoned mine reclamation program is funded in part by fees on coal production. We reported in March 2018 that the

[45]In May 2008, we issued a user fee design guide that examined how the four key design and implementation characteristics—how fees are set, collected, used, and reviewed—may affect the economic efficiency, equity, revenue adequacy, and administrative burden of the fees. GAO, *Federal User Fees: A Design Guide*, GAO-08-386SP (Washington, D.C.: May 2008).

[46]According to Office of Management and Budget Circular A-25, every 2 years, agencies should review programs that are not currently funded by user fees to determine whether fees should in fact be assessed for government services. Once user fees are implemented, revenue from the fees will be credited to the general fund of the U.S. Treasury as miscellaneous receipts unless otherwise specified by law. (See: Office of Management and Budget, Circular No. A-25 Revised, Memorandum for Heads of Executive Departments and Establishments (July 8, 1993).

[47]To arrive at these example fees, we divided the $46 million in potential reclamation costs by 10 and divided the result by the number of drilling permits and inactive wells, respectively, in 2018.

program had spent about $3.9 billion to reclaim abandoned mine lands since the program's creation in 1977.[48]

Additionally, some states with oil and gas development have dedicated funds for reclaiming orphaned wells. In Wyoming, the state's Oil and Gas Conservation Commission's Orphan Well Program reclaims orphaned wells on state or private lands for which bonds and operator liability are unavailable or insufficient to fund reclamation. The program is funded through a conservation tax assessed on the sale of oil and natural gas produced in Wyoming. Through this program, the Wyoming Oil and Gas Conservation Commission has reclaimed approximately 2,215 wells since 2014, according to a Commission official. Similarly, in Arkansas, operators make annual payments to its abandoned well plugging fund based on the number of wells and permits they have, on a sliding scale. For example, at the low end, operators with one to five wells or permits pay $100 per well, and at the high end, operators with over 300 wells or permits pay $4,000 per operator.[49] The Arkansas fund was used to reclaim 136 wells in fiscal years 2016 through 2018, according to an official with the state's Oil and Gas Commission. Virginia's Orphaned Well Fund is funded through a $200 surcharge on each permit application. The fund is administered by the Virginia Division of Gas and Oil, which prioritizes wells to reclaim according to their condition and potential threat to public safety and the environment.

Conclusions

BLM oversees private entities operating thousands of oil and gas wells on leased federal lands and has taken steps over the years to strengthen its management of the potential liability that oil and gas operations represent should operators not fully reclaim wells and return lands to their original condition when production ceases. For example, the agency's 2013 bond adequacy review policy outlined how bonds were to be reviewed every 5 years and bond amounts adjusted depending on risks presented by operators. However, we found average bond values were slightly lower in 2018 as compared to 2008 and BLM has not obtained bond increases for the majority of instances in which its reviews identify that increases are

[48]GAO, *Coal Mine Reclamation: Federal and State Agencies Face Challenges in Managing Billions in Financial Assurances*, GAO-18-305 (Washington, D.C.: Mar. 6, 2018).

[49]According to an Arkansas Oil and Gas Commission official, the state also makes transfers from other agency sources and deposits forfeited bonds into the abandoned well plugging fund.

needed. Instead, most bonds are at their regulatory minimum values, which are not sufficient to cover reclamation costs incurred by BLM. Without adjusting bond levels to more closely reflect expected reclamation costs—such as by considering the effects of inflation, the number of wells covered by a single bond, and the characteristics of those wells—BLM faces ongoing risks that not all wells will be completely and timely reclaimed, resulting in additional orphaned wells.

Further, BLM faces a backlog of orphaned wells to reclaim—with 51 dating back at least 10 years. Unlike some other federal and state programs that obtain funds from industry through fees or dedicated funds, BLM does not do so for reclaiming orphaned wells. According to BLM, it does not have the authority to seek or collect fees from lease operators to reclaim orphaned wells. Authorizing and requiring the implementation of a mechanism to obtain funds from oil and gas operators to cover the costs of reclamation could help ensure BLM can completely and timely reclaim wells.

Matter for Congressional Consideration

Congress should consider giving BLM the authority to obtain funds from operators to reclaim orphaned wells, and requiring BLM to implement a mechanism to obtain sufficient funds from operators for reclaiming orphaned wells. (Matter for Consideration 1)

Recommendation for Executive Action

The Director of BLM should take steps to adjust bond levels to more closely reflect expected reclamation costs, such as by increasing regulatory minimums to reflect inflation and incorporating consideration of the number of wells on each bond and their characteristics. (Recommendation 1)

Agency Comments and Our Evaluation

We provided a draft of this product to BLM for comment. In its written comments, reproduced in appendix II, BLM concurred with the recommendation. BLM stated that it is committed to ensuring that its field offices continue to review oil and gas bonds at least every 5 years, or earlier when warranted, and noted its November 2018 Instruction Memorandum 2019-014 updated its bond review policy. BLM further stated that, while the adjustment of bond values may not reflect the inflation index, the policy is intended to increase bond amounts while fostering an environment conducive to BLM's leasing operations. As we

point out in this report, BLM has historically had difficulties securing bond increases through bond reviews, and so additional steps may be needed to adjust bond levels to more closely reflect expected reclamation costs.

In the draft we provided to BLM for comment, we included a recommendation that the Director of BLM should take steps to obtain funds from operators for reclaiming orphaned wells. BLM did not concur with this recommendation, saying it does not have the authority to seek or collect fees from lease operators to reclaim orphaned wells. We continue to believe a mechanism for BLM to obtain funds from oil and gas operators to cover the costs of reclamation for orphaned wells could help ensure BLM can completely and timely reclaim these wells, some of which have been orphaned for at least 10 years. We have therefore instead made a matter for Congressional consideration.

BLM also provided technical comments, which we incorporated as appropriate.

We are sending copies of this report to the appropriate congressional committees, the Secretary of the Interior, and other interested parties. In addition, the report is available at no charge on the GAO website at http://www.gao.gov.

If you or your staff have any questions about this report, please contact me at (202) 512-3841 or ruscof@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made key contributions to this report are listed in appendix III.

Frank Rusco
Director,
Natural Resources and Environment

Appendix I: Objectives, Scope, and Methodology

This report (1) describes the value of bonds for oil and gas wells in 2018 compared to 2008, and (2) examines the extent to which the Bureau of Land Management's (BLM) bonds ensure complete and timely reclamation and thus prevent orphaned wells.

To describe the value of bonds for oil and gas wells in 2018 compared to 2008, we analyzed oil and gas well data from BLM's Automated Fluid Minerals Support System (AFMSS) as of May 2018 and data from BLM's Legacy Rehost 2000 (LR2000) system on bonds as of May 2018. Bond data we reviewed included the bond category (e.g., individual lease or nationwide) and bond value. We compared these data to data obtained from the same systems for 2008 and reported by GAO in 2010.[1] We matched the May 2018 data from the two systems based on the bond number—a variable in both systems—to identify how many wells were covered by each bond and to determine the average bond value per well for each bond category. To assess the reliability of AFMSS and LR2000 data elements, we reviewed agency documents, met with relevant agency officials, and performed electronic testing. We found these data to be sufficiently reliable for our purposes. We also interviewed BLM headquarters officials to understand why bond composition may have changed over time. To report on the number of bonded wells held by BLM, we used a published BLM value for producible well bores—wells capable of production—which should represent a lower bound on the number of bonded wells in September 2018 because some wells may be plugged or temporarily incapable of production but would still require a bond if the surrounding site had not been fully reclaimed. To determine the average value of bonds per well in 2018, we divided the total value of all bonds held by BLM by the total number of producible well bores.

To examine the extent to which BLM's bonds ensure complete and timely reclamation and prevent orphaned wells, we conducted the following analyses:

- Reclamation cost scenarios: To determine whether bonds are sufficient to cover potential reclamation costs for the wells they cover, we identified typical high- and low-cost scenarios for well reclamation (including plugging the well and reclaiming the surrounding well site) and compared those scenarios to the average bond value available per well. To determine high- and low-cost reclamation scenarios, we

[1]GAO, *Oil and Gas Bonds: Bonding Requirements and BLM Expenditures to Reclaim Orphaned Wells*, GAO-10-245 (Washington, D.C.: Jan. 27, 2010).

analyzed BLM's well reclamation cost estimates on proofs of claim submitted to the Department of Justice from calendar year 2016 through May 2018.[2] These 59 proofs of claim listed estimated reclamation costs for 8,664 well sites. We calculated the average reclamation cost per well for each individual proof of claim by dividing the total dollar value claimed for reclamation liability (actual liability plus potential liability) by the total number of wells listed in each proof of claim document. We found the average reclamation cost estimates for each proof of claim have a bimodal distribution, meaning that data are clustered around two distinct cost levels, rather than clustered around a single average cost. As a result, we determined that using two separate measures that indicate typical values for separate groups of low-cost and high-cost wells would provide more meaningful statistics about cost. We therefore selected reclamation costs of $20,000 for the low-cost reclamation scenario and $145,000 for the high-cost scenario based on the 25th and 75th percentiles of the distribution of average estimated reclamation cost per proof of claim, weighted by the number of wells on each proof of claim.

- Bond value per well: To determine the average bond value available per well, we analyzed bonds listed in LR2000 that were tied to wells listed in AFMSS using the bond number—a variable in both systems. We found that 1,547 out of the 3,357 unique bond numbers in LR2000 had wells tied to them in AFMSS. These 1,547 bonds covered about 80 percent of the wells in AFMSS.[3] The other 20 percent of wells in AFMSS either did not list a bond number, or the bond number listed was not in LR2000. For each bond in LR2000 covering wells in AFMSS, we calculated the bond available per well as the bond value divided by the number of wells it covers. We then compared the bond values per well against both high ($145,000 per well) and low ($20,000 per well) reclamation cost scenarios to identify which bonds would be adequate to reclaim all the wells they covered under different cost scenarios. If AFMSS bond information was incomplete, it is possible that there are more wells covered by bonds than we were able to identify—and therefore the bond value per well would be lower than we found.

[2]These estimates come from proofs of claim that BLM submits when an operator files for bankruptcy.

[3]In this report we refer to the wells that the bonds were tied to as the wells the bonds covered.

- At-risk wells: To identify wells that may be at greater risk of becoming orphaned and determine whether their bonds are sufficient to cover potential reclamation costs, we used well production data from the Office of Natural Resources Revenue's Oil and Gas Operations Report (OGOR) as of June 2017 and bond values from LR2000. First, we defined wells as "at risk of becoming orphaned" if they met several criteria. Specifically, we identified wells that (1) had recent OGOR reports (on or after March 2017); (2) had not been used productively from at least June 2008 through the most recent record (meaning the well did not report producing any volume of oil or gas during this timeframe, nor were any volume of water or materials injected into the well during this timeframe); (3) were not being used as a monitoring well in the most recent record, which we considered a productive use; and (4) had not been plugged and abandoned. We selected June 2008 as the cutoff date for productivity because in June and July of 2008, oil and gas prices hit peaks that have not since been reached again, and which the Energy Information Administration does not expect prices to reach again through at least 2050.[4] We believe our analysis is a conservative estimate of wells at greater risk, in part because we did not include wells that produced when prices were at their peaks and stopped producing soon afterward and may be unlikely to produce in the future unless prices reach the same peaks again. In addition, our lower-bound estimate does not include some coalbed methane wells that have been inactive for less than 9 years but are unlikely to produce at current prices because of the relatively higher cost of coalbed methane production. We also excluded wells that reported any volume of oil or gas production or water injection since June 2008, although some very low-producing wells may also be at risk of becoming orphaned.
- Bond value for at-risk wells: To calculate the average bond value per at-risk well, we identified bonds listed in LR2000 that were tied to at-risk wells in AFMSS to determine the value of bonds available to reclaim these at-risk wells if needed. We identified 2,041 of the 2,294 at-risk wells were linked to bonds. For each bond, we divided the bond value by the number of at-risk wells it covered to determine the bond amount per at-risk well. In cases in which an at-risk well was linked to more than one bond, we additionally calculated the average

[4]According to the Energy Information Administration, the weekly spot price for West Texas Intermediate oil at Cushing, OK was $142.52 per barrel the first week of July 2008. As of the first week of May 2019 the price was $62.90 per barrel. Similarly, Energy Information Administration reported the Henry Hub weekly spot price for natural gas was $13.20 per million British thermal units the first week of July 2008. It was $2.59 per million British thermal units the first week of May 2019.

of the bond value per at-risk well for each bond linked to the well. To determine the sufficiency of bonds for at-risk wells, we identified the number of wells with an average bond value per at-risk well equal to or greater than $20,000 (low cost reclamation scenario) or $145,000 (high cost reclamation scenario).

- Orphaned wells: We compared three lists of orphaned wells based on data provided by BLM in 2009, July 2017, and April 2019. The 2009 data are from our January 2010 report, which used Orphaned Well Scoring Checklists that list information such as the well's name and location.[5] The July 2017 data are from our May 2018 report, which used an orphaned well list generated through a query of AFMSS by BLM.[6] The April 2019 list was generated through a query of an updated version of AFMSS known as AFMSS 2.[7] We compared the lists to identify how many wells that were on the 2009 list remained on the 2019 list, and how many wells that were on the 2017 list were on the 2019 list.

To assess the reliability of the AFMSS, LR2000, and OGOR data elements we used, we reviewed agency documents, met with relevant agency officials, and performed electronic testing. We found these data elements to be sufficiently reliable for our purposes. Similarly, to assess the reliability of the 2019 orphaned well list, we reviewed agency documents and met with relevant agency officials. Though we identified shortcomings with data on orphaned wells, we nevertheless found these data to be sufficiently reliable for the purpose of describing the orphaned wells BLM has identified. To assess the reasonableness of proofs of claim data, we interviewed relevant agency officials and reviewed agency documents.

To understand how BLM manages bonds, we reviewed BLM's policies and interviewed officials from four BLM state offices and four BLM field offices. We selected these state and field offices because, according to AFMSS data, they were responsible for managing the largest numbers of wells on federal land. These BLM state offices were California, New

[5]GAO-10-245

[6]GAO, *Oil and Gas Wells: Bureau of Land Management Needs to Improve Its Data and Oversight of Its Potential Liabilities*, GAO-18-250 (Washington, D.C.: May 16, 2018).

[7]BLM headquarters officials told us that some of the wells on the list may no longer be orphaned, based on their well status. However, according to officials in one field office, at least some wells in those statuses are still orphaned. As a result, we included all the wells identified in AFMSS as orphaned in our analysis.

Mexico, Utah, and Wyoming. These BLM field offices were Bakersfield, Buffalo, Carlsbad, and Farmington. We also interviewed officials from BLM's headquarters office in Washington, D.C. Findings from the selected BLM offices cannot be generalized to officials we did not interview but provide a range of views. To understand how some states with oil and gas development on state lands set minimum bonds and fund orphaned well reclamation, we contacted officials from oil and gas oversight agencies in Arkansas, Louisiana, Pennsylvania, Texas, Virginia, and Wyoming.[8]

We conducted this performance audit from January 2018 to September 2019 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

[8]The state agencies we contacted are the Arkansas Oil and Gas Commission; the Louisiana Office of Conservation; the Pennsylvania Department of Environmental Protection; the Texas Railroad Commission; the Virginia Department of Mines, Minerals, and Energy; and the Wyoming Oil and Gas Conservation Commission.

Appendix II: Comments from the Department of the Interior

United States Department of the Interior
BUREAU OF LAND MANAGEMENT
Washington, D.C. 20240
http://www.blm.gov

AUG 30 2019

Mr. Frank Rusco
Director, Natural Resources and Environment
U.S. Government Accountability Office
441 G Street, NW
Washington, DC 20548

Dear Mr. Rusco:

Thank you for providing the Department of the Interior (Department) the opportunity to review and comment on the draft Government Accountability Office (GAO) report entitled, *Oil and Gas: Bureau of Land Management Should Address Risks from Insufficient Bonds to Reclaim Wells* (GAO-19-615). We appreciate GAO's review of the bonds that operators, operating rights owners, or lessees submit to BLM to ensure compliance with the Mineral Leasing Act (30 U.S.C. §§ 181 *et seq.*), including complete and timely plugging of the oil and gas wells and reclamation of the lease(s).

The GAO issued BLM two recommendations to address its findings. Below is BLM's response to GAO's recommendations.

Recommendation 1: The Director of BLM should take steps to adjust bond levels to more closely reflect expected reclamation costs, such as by increasing regulatory minimums to reflect inflation and incorporating consideration for the number of wells on each bond and their characteristics.

Response: Concur. The BLM recently updated its bonding program policy by issuing Instruction Memorandum 2019-014. The BLM is committed to ensuring that its field offices continue to review oil and gas bonds at least every five years, or earlier when warranted. The updated policy requires BLM to review oil and gas bonds to determine whether the bond amount appropriately reflects the level of potential risk(s) (liability) posed by the operators along with their positive compliance history. While the adjustment of bond levels may not reflect the inflation index, it is intended to increase bond amounts while fostering an environment conducive to BLM's leasing operations.

Recommendation 2: The Director of BLM should take steps to develop a mechanism to obtain funds from operators for reclaiming orphaned wells and if needed, request additional authority from Congress for such a mechanism.

Response: Do Not Concur. The BLM does not have the authority to seek or collect fees from lease operators to reclaim orphaned wells. To the extent Congress decides

to authorize this activity as in Section 349 of the Energy Policy Act of 2005, it is within Congress' purview.

The enclosure contains comments for your consideration when finalizing the report.

If you have any questions about this response, please contact Corey Grant, Acting Chief, Division for Evaluations and Management Services, at (202) 912-7040 or LaVanna Stevenson, Audit Liaison Officer, at (202) 912-7077.

Sincerely,

Joseph R. Balash
Assistant Secretary
Land and Minerals Management

Enclosure

Appendix III: GAO Contact and Staff Acknowledgments

GAO Contact

Frank Rusco at (202) 512-3841 or ruscof@gao.gov

Staff Acknowledgments

In addition to the contact named above, Quindi Franco (Assistant Director), Marietta Mayfield Revesz (Analyst-in-Charge), Marie Bancroft, William Gerard, Cindy Gilbert, Gwen Kirby, Joe Maher, Shaundra Patterson, Dan Royer, and Jerry Sandau made key contributions to this report.