FEDERAL OIL AND GAS ROYALTIES

Opportunities Exist to Improve Interior's Compliance Program

Report to the Ranking Member
Committee on Natural Resources
House of Representatives

August 2024
GAO-24-103676
United States Government Accountability Office

Accessible Version

GAO Highlights

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Highlights of GAO-24-103676, a report to the Ranking Member, Committee on Natural Resources, House of Representatives
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Opportunities Exist to Improve Interior's Compliance Program

Why GAO Did This Study

The federal government receives significant revenues from royalties paid on the sale of oil and gas extracted from leased federal lands and waters. Interior has faced challenges verifying the accuracy of royalty payments. In 2011, GAO added Interior's management of federal oil and gas resources to its High Risk List. Interior has since taken steps to operate more effectively.

GAO was asked to examine ONRR's federal oil and gas royalty compliance efforts. This report (1) describes ONRR's royalties and compliance activities for 2012 through 2022, the most current data available at the time of our review; (2) examines how staffing resources affected its ability to analyze compliance data; and (3) examines ONRR's latest estimates of an oil and gas royalty gap, and what opportunities ONRR has to improve its royalty gap model. GAO reviewed relevant laws, regulations, agency guidance, and Interior's annual performance documentation and budget justifications for the period. GAO also analyzed ONRR compliance data and interviewed ONRR officials.

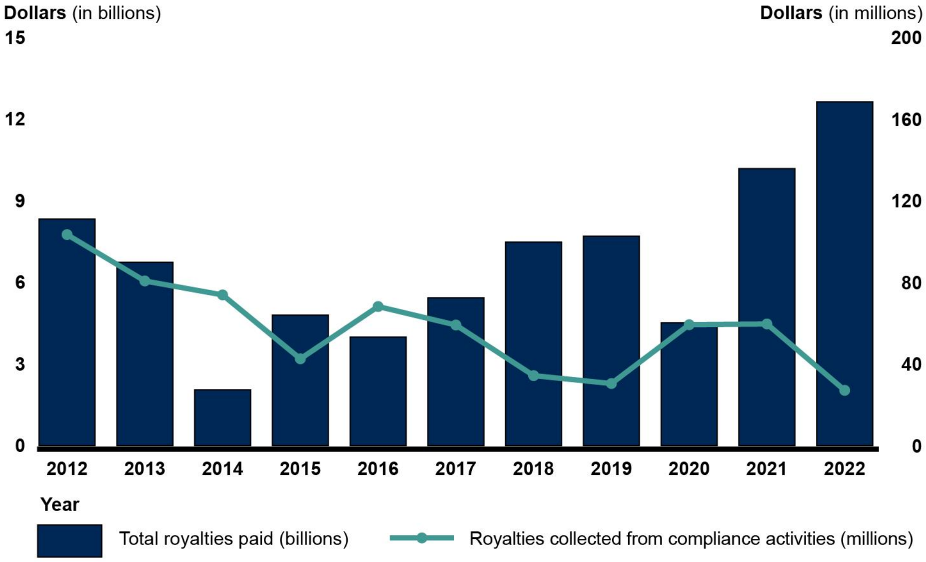
What GAO Recommends

GAO is making 14 recommendations, including that ONRR improve the completeness of its compliance data, assess its human capital needs related to its data and data systems, and periodically estimate a royalty gap of adequate rigor. Interior concurred with GAO's recommendations.

What GAO Found

The Department of the Interior's Office of Natural Resources Revenue (ONRR) collected $74 billion in royalties on $600 billion total sales of oil and gas produced by companies on federal leases from 2012–2022. Royalties collected depended in large part on the price of oil and gas, which increased from 2012 through 2022. ONRR generated $600 million through compliance activities for 2012–2022.

Office of Natural Resources Revenue (ONRR) Royalty and Compliance Collections, 2012–2022



Source: GAO analysis of ONRR data. | GAO-24-103676

Accessible Data for Office of Natural Resources Revenue (ONRR) Royalty and Compliance Collections, 2012–2022

	Royalties Collected From Compliance Activities	Total Royalties Paid
2012	99,937,293	8,321,342,922
2013	77,224,629	6,737,771,534
2014	70,387,686	2,046,213,835
2015	39,086,142	4,794,772,417
2016	64,710,616	3,988,793,215
2017	55,644,846	5,429,720,660
2018	30,858,813	7,474,624,434
2019	26,974,559	7,690,938,631
2020	55,800,623	4,509,069,522
2021	56,160,375	10,174,430,385
2022	23,641,697	12,627,648,614

Source: GAO analysis of ONRR data. I GAO-24-103676

ONRR has made progress developing new risk models for selecting cases for compliance. However, incomplete data and resource challenges have impeded ONRR's ability to analyze its compliance data. ONRR is developing its own risk models for case selection, which should increase its capacity to analyze data, officials said. However, ONRR does not have certain data that could be used to inform the risk models, such as complete data on violations. By assessing the need for complete compliance data, ONRR could better inform its compliance strategy. Additionally, ONRR has not prioritized hiring staff with data analysis skills. By assessing human capital needs, ONRR could better determine what skills and staff it needs to strengthen compliance efforts.

ONRR last estimated a royalty gap of approximately $100 million for both 2010 and 2011. The royalty gap is the difference between the payments ONRR collects from companies and what it should collect. ONRR staff recommended improving the model to continue estimating the royalty gap. However, ONRR management did not continue this effort after

2011. GAO attempted to estimate a royalty gap for more recent years using a different model but was unable to do so due to limitations with ONRR’s data. Rigorous and improved estimates of its royalty gap could help ONRR enhance its decision-making and strategic planning of compliance efforts on an ongoing basis.

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Abbreviations

BLM	Bureau of Land Management
CIM	Compliance Information Management
FOGRMA	Federal Oil and Gas Royalty Management Act of 1982, as amended
IPA	Intergovernmental Personnel Act
IRS	Internal Revenue Service
OIG	Office of the Inspector General
OMB	Office of Management and Budget

OMT	Operations Management Tool
ONRR	Office of Natural Resources Revenue
OPM	Office of Personnel Management
PAD	Payor Assigned Document

U.S. GOVERNMENT ACCOUNTABILITY OFFICE

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August 9, 2024

The Honorable Ra?l M. Grijalva
Ranking Member
Committee on Natural Resources
House of Representatives

Dear Mr. Grijalva:

Royalties that companies pay on the sale of oil and natural gas extracted from leased federal lands and waters constitute a significant source of revenue for the federal government. For example, royalties accounted for $12.6 billion on sales of about $100 billion in 2022, the most recent year for which data were available at the time of our review. In 1982, Congress passed the Federal Oil and Gas Royalty Management Act (FOGRMA), requiring the Department of the Interior (Interior) to establish a comprehensive, consolidated system for the collection, accounting, and disbursement of these revenues.[1] In particular, the act requires Interior to establish a comprehensive inspection, collection, and fiscal and production accounting and auditing system to provide the capability to accurately determine oil and gas royalties, interest, fines, penalties, fees, deposits, and other payments owed, and to collect and account for such amounts in a timely manner.

To accomplish this, Interior tasked the Office of Natural Resources Revenue (ONRR) with collecting and verifying the accuracy of royalties paid by companies that produce oil and gas from over 26,000 federal leases. Each month, these oil and gas companies self-report to ONRR data on the amount of oil and gas they produced and sold, the value of this production, and the amount of royalties owed to the federal government.

To ensure that the data provided to ONRR are accurate and all royalties are being paid, ONRR relies on its compliance program. Because of the significant value of royalties ONRR collects each year, even small improvements to its compliance program could result in the collection of additional tens of millions of dollars per year.

Over the past approximately 15 years, we, Interior's Office of Inspector General (OIG), and Interior's Royalty Policy Committee have raised concerns about whether ONRR is collecting all royalties that are owed to the federal government.[2] For the purposes of this report, the difference between what ONRR collects and what it should collect is the "royalty gap." We added Interior's management of federal oil and gas resources to our list of programs at high risk for fraud, waste, abuse, and mismanagement in February 2011.[3] Our past work identified challenges showing that Interior did not have reasonable assurance that it was collecting its share of

[1]Federal Oil and Gas Royalty Management Act of 1982, Pub. L. No. 97-451, § 101(a), 96 Stat. 2447, 2449–50 (enacted Jan. 12, 1983) (codified as amended at 30 U.S.C. § 1711(a)).

[2]The Royalty Policy Committee was a group of federal, state, and nongovernmental officials who were chartered by the Secretary of the Interior to provide advice on royalty management issues and other mineral-related policies to the Secretary and other departmental officials responsible for managing mineral leasing activities.

[3]GAO, *High-Risk Series: An Update*, GAO-11-278 (Washington, D.C.: Feb. 16, 2011).

revenue from oil and gas produced on federal lands, among other things. Interior has since made progress in recent years to address these challenges.

You asked us to review issues related to ONRR's federal royalty compliance efforts. This report (1) describes ONRR's data from calendar years 2012 through 2022 on royalties and compliance activities;[4] (2) examines how ONRR's compliance data systems and staffing resources affected its ability to analyze compliance data, and any progress ONRR has made to improve its ability to select cases for compliance; and (3) examines ONRR's estimates of an oil and gas royalty gap, and what opportunities ONRR has to improve its royalty gap model.

To examine what the data indicate about ONRR's royalties and compliance activities for calendar years 2012 through 2022, we reviewed database-related documentation and interviewed ONRR officials, which has its headquarters located in Lakewood, Colorado. We obtained ONRR data from four sources: (1) ONRR's royalty data system, which includes royalty payments reported on Form ONRR-2014; (2) its Compliance Information Management (CIM) database, ONRR's legacy compliance data system used to track its audit and compliance activity; (3) its Operations Management Tool (OMT) database, which replaced CIM; and (4) a collection of spreadsheets ONRR used to track early data mining efforts. We reviewed the reliability and completeness of these data through electronic testing, reviewing agency documents, and interviewing agency officials about the results of our tests and reviews. We found certain data to be reliable for the purpose of our reporting on ONRR's royalties and compliance activities. Other data were not reliable for our reporting objective, as discussed in this report, due to lack of completeness and detail.

To examine how ONRR's data systems and staffing resources affected its ability to analyze compliance data, we reviewed ONRR program and guidance documents and interviewed ONRR officials. We examined laws, regulations, and guidance documents relevant to ONRR, such as GAO and Office of Management and Budget (OMB) guidance on internal controls in the federal government and Interior policy documents for data management. We also interviewed officials in the Department of the Treasury's Internal Revenue Service (IRS) about options to address skill gaps. To examine documentation of compliance activities and linkages between violations and royalty collection, we attempted to analyze the frequency of violations across the compliance data systems. We determined that some ONRR data on violations were unreliable for our reporting purposes, as discussed in this report, and did not allow us to analyze the frequency of violations across the compliance data systems to examine linkages between violations and royalty collection. We analyzed ONRR's ability to crosswalk royalty collections resulting from ONRR's compliance activities in its compliance data systems—CIM and OMT—with the associated royalty payments reported in its royalty data.[5]

To examine ONRR's estimates of an oil and gas royalty gap, and opportunities to improve its model, we conducted literature reviews, and we interviewed IRS and ONRR officials about calculating a potential royalty gap. We also reviewed potential alternative royalty gap models, interviewed an IRS consultant who developed a tax gap model for the IRS, and attempted to adapt one IRS tax gap model to use ONRR data. We developed

[4]We selected this time period (2012 to 2022) to reflect historical trends of royalty payments, such as increases or decreases, and compliance efforts. Data from 2022 were the most recent available at the time of our review.

[5]Crosswalk means to map the relationships of data across two systems and, through this comparison, understand to what extent data are consistent across systems.

an econometric model based on a model used by the IRS and explored estimating one component of its tax gap estimate. We found there were insufficient data available for the model to generate useful results.

We conducted this performance audit from February 2020 to August 2024 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 we obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Background

Several bureaus within Interior are responsible for the leasing, permitting, and inspecting of mineral extraction activities on federal lands and waters. Interior's Bureau of Land Management (BLM) is responsible for onshore activities and manages approximately 700 million acres of subsurface mineral rights throughout the country, including the acreage it leases to companies for oil and gas development.[6] At the end of fiscal year 2023, about 34,400 oil and gas leases accounted for approximately 23.7 million acres, according to BLM. For offshore oil and gas activities, the Bureau of Ocean Energy Management is generally responsible for leasing and resource planning and evaluation, among other functions, and the Bureau of Safety and Environmental Enforcement is generally responsible for permitting and inspecting as well as verifying production volumes on offshore leases, among other functions.[7] Under the Outer Continental Shelf Lands Act, as amended, Interior is responsible for leasing and managing approximately 1.71 billion offshore acres.[8] As of May 1, 2021, the Bureau of Ocean Energy Management managed about 2,287 active oil and gas leases on approximately 12.1 million acres.

To begin the leasing process, Interior holds auctions through which companies may secure the rights to federal leases that allow them to drill for oil and gas upon meeting certain conditions. Once a company obtains a lease, it may conduct further exploration and subsequently determine whether it would like to drill a well. If a company plans to drill, it must first secure a permit from Interior. To secure a permit to drill under an onshore lease, a company must submit an application for a drilling permit to the appropriate BLM field office. BLM officials then evaluate the company's proposal to ensure that it conforms to the relevant BLM land use plan for the area as well as applicable laws and regulations, including those focused on protecting the environment. To secure a permit to drill under an offshore lease, a company must submit an application for a drilling permit to the Bureau of Safety and Environmental Enforcement, where it is reviewed for completeness and conformity of technical elements to applicable regulations.

[6]The Mineral Leasing Act of 1920, as amended, gives Interior responsibility for oil and gas leasing on federal and private lands where the federal government has retained mineral rights. Pub. L. No. 66-146, ch. 85, 41 Stat. 437 (codified in relevant part as later amended at 30 U.S.C. §§ 181, 226). The Mineral Leasing Act for Acquired Lands of 1947 extended that authority to lands that the federal government acquired. Pub. L. No. 80-382, ch. 513, 61 Stat. 913 (codified as amended at 30 U.S.C. §§ 351–360).

[7]The Bureau of Safety and Environmental Enforcement is responsible for reviewing drilling permits, inspecting offshore drilling rigs and production platforms, and developing regulations and standards for offshore drilling.

[8]Pub. L. No. 83-212, 67 Stat. 462 (1953) (codified as amended at 43 U.S.C. §§ 1331-1356c). The outer continental shelf (submerged lands) refers to the portion of submerged lands of the North American continental edge that is seaward of the territorial jurisdiction of all 50 states but within U.S. jurisdiction and control, generally extending seaward from 3 geographical miles off the coastline to at least 200 nautical miles.

Once a company secures a permit and begins producing, oil and gas is transported to market and sold. As part of this process, companies may elect to process the natural gas into various products before its sale. Under ONRR regulations, companies may deduct certain costs associated with transportation and natural gas processing from the royalties due. Companies can continue to produce oil and gas until the lease is no longer capable of producing in paying quantities, regardless of the length of the lease.[9] To ensure compliance with applicable laws, regulations, and other requirements, both BLM and the Bureau of Safety and Environmental Enforcement have inspection and enforcement programs that are designed to verify that companies comply with all requirements at lease sites, including those related to measuring oil and gas volumes. The authority for inspecting wells and leases for this purpose is derived from FOGRMA. The act requires the Secretary of the Interior to develop guidelines that specify the coverage and frequency of inspections.[10] Interior has delegated responsibilities for implementing the act to BLM for onshore leases and to the Bureau of Safety and Environmental Enforcement for offshore leases.

ONRR’s Role in Collecting, Disbursing, and Verifying Royalties

ONRR’s oversight of federal royalties includes collecting company-paid royalties, disbursing these royalties to appropriate accounts, and verifying the company-paid royalties through its compliance activities.[11]

Collecting. Companies that obtain federal onshore or offshore oil and gas leases are typically obligated to pay royalties on any oil or gas they produce and sell. As a condition of producing oil and gas under federal and Indian leases, companies are required to submit two key monthly reports to ONRR—one specifying the total production and disposition of oil and gas and the other stating the royalties due based on sales of production. However, because of various leasing and development arrangements made by companies, these two reports are often submitted by different companies. The companies physically developing the lease, referred to as the operators, are responsible for reporting the production volumes to ONRR in monthly production reports.[12] Payors, which are typically the companies with a financial interest in the lease, are responsible for reporting the cash royalty owed on the federal and Indian oil and gas production in their monthly royalty reports.[13] Each month, payors are to calculate the royalty payment owed to the federal government using the four key variables illustrated in the following equation:

[9]In some cases, several companies may form partnerships to explore and develop oil and gas leases, thereby sharing the risk, costs, and benefits. These companies often elect from among themselves a single company, called the operator, to manage the physical drilling of wells and the installation of production equipment.

[10]30 U.S.C. § 1718(b).

[11]ONRR also verifies company reporting through its compliance activities. ONRR’s collection and verification activities also apply to revenues due to Indian Tribes and their citizens from production of oil and gas subject to Interior’s trust responsibility, but those activities are outside the scope of this report, except as indicated.

[12]Companies are required to self-report monthly production volumes to ONRR on Form-4054, Oil and Gas Operations Report.

[13]Companies are required to self-report monthly royalty payments to ONRR on Form ONRR-2014, Report of Sales and Royalty Remittance Form.

Royalty payment = (sales volume x unit price x royalty rate) – deductions[14]

- Companies are to submit monthly reports via a web-based portal to ONRR's royalty data system. Companies report these royalties to ONRR on Form ONRR-2014 and are to use Form CMP-2014 to report changes to royalty payments resulting from ONRR's compliance activities. Further, when reporting using the Form CMP-2014, companies are to include a Payor Assigned Document (PAD) number provided by ONRR. This PAD number allows payments to be matched between ONRR's compliance and royalty data systems. These data are retained in ONRR's royalty data system.[15]
- Offshore royalty rates are generally 12.5 percent, 16.67 percent, or 18.75 percent, depending on water depth, while the onshore royalty rate is generally 12.5 percent.[16] An implied royalty rate is calculated by dividing the royalty value prior to deductions by the sales value.[17]
- Companies may pay less than the stated royalty rate due to regulations allowing certain deductions. This amount can be considered the effective royalty rate, or the amount less deductions and other adjustments. An effective royalty rate is calculated by dividing the royalty value after deductions by the sales value. Federal regulations allow certain deductions based on reasonable, actual costs.[18] In addition to filing the royalty report with ONRR, companies typically make the actual cash royalty payment via an electronic fund transfer to an account at the Department of the Treasury.

Disbursing. Once ONRR reconciles the self-reported royalty payment data from the monthly royalty reports with the payments to Treasury, ONRR is to disburse the federal lease royalties from the Treasury account to the appropriate federal, state, or other account.[19] All these transactions are to be recorded and stored in ONRR's royalty data system.

Verifying. ONRR is responsible for verifying royalties through its compliance program, which includes ensuring that the royalty revenues generated from the sale of oil and gas extracted from leased federal lands are accurately reported and paid.[20] In conducting its compliance activities, ONRR is to assess the elements of the

[14]Companies report to ONRR on Form ONRR-2014 the volume sold (sales volume), the amount of revenue received from this sale (sales value), and the royalty payment due to ONRR (royalty value less deductions). The average sales price is calculated by dividing sales value by sales volume.

[15]Data from Forms ONRR-2014 and CMP-2014 create a receivable in its eCommerce financial system, which is where actual collections of money can be verified.

[16]Prior to recent legislation and regulation, by law, federal onshore royalty rates were required to be set at 12.5 percent for noncompetitive leases and "not less than" 12.5 percent for competitive leases, although, according to ONRR officials, such rates generally did not vary from 12.5 percent. Likewise, offshore royalty rates generally were required to be "not less than" 12.5 percent, and according to ONRR officials, in practice these rates varied from 12.5 percent to 18.75 percent based on water depth and the date the lease was let. However, with its enactment in 2022, the act commonly known as the Inflation Reduction Act has changed both onshore and offshore royalty rates and eliminated onshore noncompetitive leasing. "An Act to provide for reconciliation pursuant to Title I of S.Con. Res. 14," Pub. L. No. 117-169, §§ 50261, 50262(a)(1), (e)(1), 136 Stat. 1818, 2056, 2057–58 (2022). BLM also implemented these changes to onshore leasing in its April 23, 2024, final rule. 89 Fed. Reg. 30916. However, these recent changes are outside the time frame of the data we examined, and thus do not impact our analysis here.

[17]We calculated an implied royalty rate because the royalty rate was not in the data we examined.

[18]See 30 C.F.R. §§ 1206.110–1206.118, 1206.152–1206.165.

[19]Onshore federal oil and gas revenues are typically shared about half between federal accounts and the states where development occurred. Some offshore federal oil and gas royalty revenues are also shared with Gulf of Mexico coastal states at about 37.5 percent.

[20]ONRR also has upfront edit checks that validate company reporting when the data are initially submitted.

royalty equation: commodity price, volume of oil and gas, transportation and processing deductions, and royalty rate.

ONRR also is responsible for ensuring that all relevant laws, regulations, and lease terms have been followed. ONRR has two key statutory requirements for its compliance program: FOGRMA and the Federal Oil and Gas Royalty Simplification and Fairness Act of 1996. FOGRMA requires that ONRR establish a comprehensive auditing system to provide the capability to accurately determine oil and gas royalties.[21] The Federal Oil and Gas Royalty Simplification and Fairness Act directs ONRR not to conduct audit activities if it and the relevant state determine that the cost of conducting or requiring the audit exceeds the expected amount to be collected by the activity, based on the most current 12 months of activity.[22]

ONRR's work planning groups identify which companies or leases will be subject to compliance activities. In doing so, ONRR relies on a variety of factors, including results from risk models and past compliance activity outcomes. As such, ONRR's data quality is critical so that any results from risk models are based on quality data. Interior's 2008 Data Quality Management Guide states that data quality means that data are relevant to their intended uses, of sufficient detail and quantity, with a high degree of accuracy and completeness, consistent with other sources, and presented in appropriate ways.[23]

The three primary levels of compliance activities ONRR conducts are audits, compliance reviews, and data mining—each of which provides a varying degree of assurance that royalties are accurately paid.

Audits. According to ONRR documents, an audit involves detailed examinations of companies' royalty payments and corresponding reporting to ONRR. As part of an audit, ONRR staff are to assess the accuracy and completeness of the companies' self-reported production and royalty data compared with third-party documents, such as sales contracts and oil and gas sales receipts from pipeline companies. According to ONRR documents, it is to design its audits to ensure that royalty payments and other obligations to ONRR are in substantial compliance with applicable lease terms, federal laws and regulations, and policies.

Compliance reviews. ONRR describes compliance reviews as an analysis designed to determine the reasonableness of company-reported production and royalty data. In contrast to audits, compliance reviews are quicker, more limited checks on the accuracy and completeness of companies' self-reported data and do not include routinely examining the underlying source documentation used to generate the self-reported data.

Data mining. ONRR began its data mining program in 2011 and officially organized it within the compliance program beginning in fiscal year 2018. Data mining is an activity to identify and resolve data errors prior to audits and compliance reviews. According to ONRR officials, data mining examines large sets of company-reported data for certain common errors, such as irregularities in the volume of oil or gas extracted. Officials

[21]30 U.S.C. § 1711(a).

[22]Pub. L. No. 104-185, § 4, 110 Stat. 1700, 1709 (1996) (codified in relevant part at 30 U.S.C. § 1724(g)).

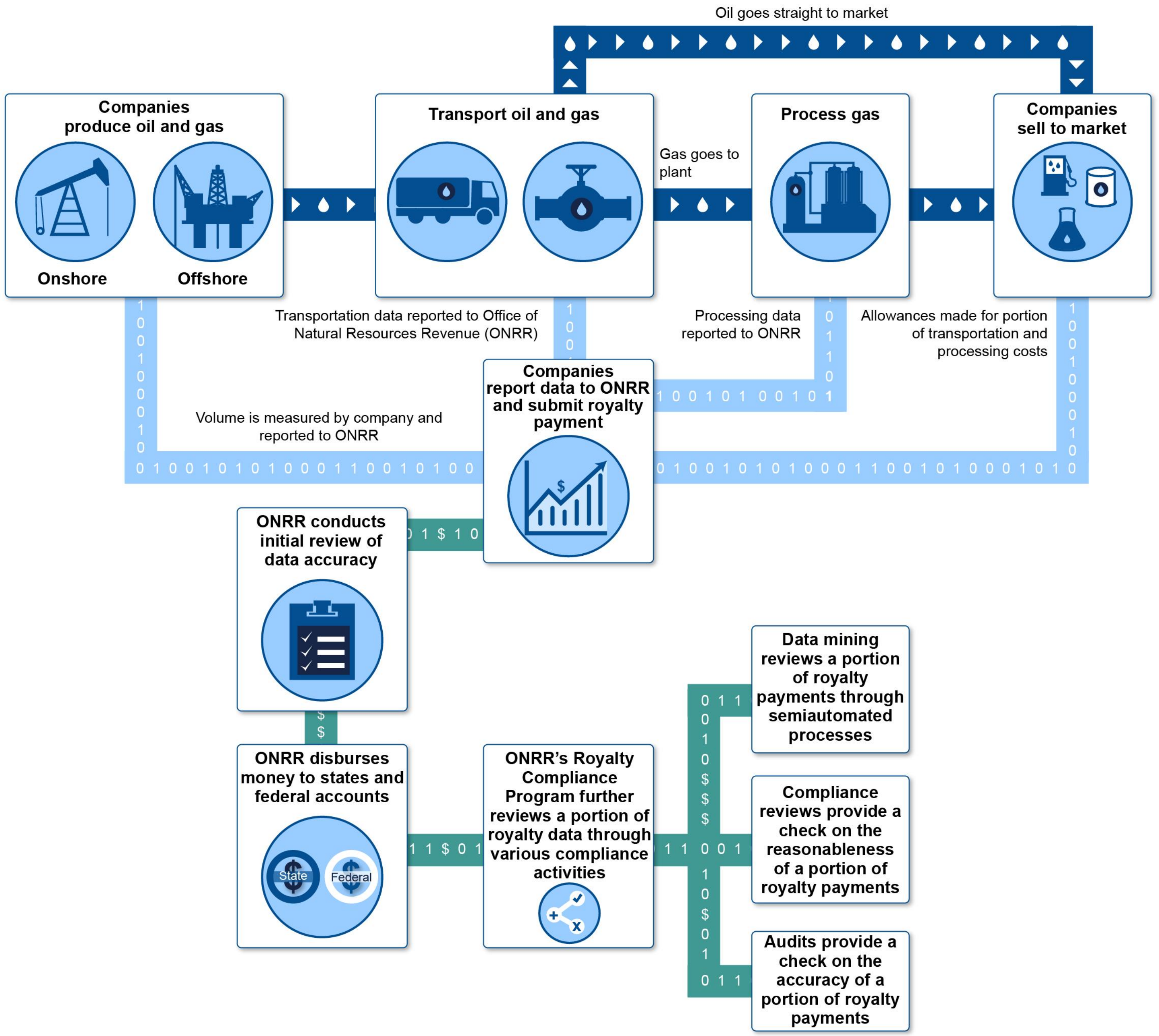
[23]The intended audience for this guide is largely information technology practitioners who are responsible for monitoring and correcting the quality of data in data sources owned and managed by Interior.

stated that data mining generally identifies obvious data errors that ONRR staff work with companies to correct.[24]

The process companies are to follow to produce oil and gas from federal leases, bring it to market, transmit required data to Interior, and pay royalties is outlined in figure 1.

[24]Changes to royalty payments identified through data mining do not require submission of a Form CMP-2014. Rather, they are submitted with specific adjustment reason codes.

Figure 1: The Office of Natural Resources Revenue's (ONRR) Process for Producing, Selling, and Paying Royalties for Oil and Gas on Leased Federal Lands



Source: GAO analysis of ONRR documents. | GAO-24-103676

ONRR's Compliance Data Systems

ONRR currently holds compliance information in two compliance data systems. ONRR has a legacy compliance data system called the Compliance Information Management (CIM) data system, which was designed in 2004 as a replacement for the Compliance Tracking System. CIM includes compliance data going back to 1955. ONRR began work on replacing CIM in 2010 with a new compliance data system called the Operations Management Tool (OMT). OMT had a slow rollout from 2015 through 2017.

While the specific data tracked in these two systems vary, both compliance data systems are intended to track key information about its compliance activities, which includes the following:

- **Violations.** These are issues of non-compliance that may or may not result in additional royalties.
- **Royalty findings.** These are instances when ONRR compliance staff identify incorrect royalty payments. This can be from a company either over- or underreporting royalties.
- **Royalty collections.** These are royalty payments made as a result of ONRR staff having royalty findings.

Other information tracked includes information on leases, companies, and years covered by the compliance activity, among other data. More recently, ONRR has begun an information technology modernization effort in which it is considering plans to replace all current data systems, including OMT, by 2028 with a projected cost of over $170 million.

Interior's Recent Efforts to Address Revenue Challenges

As noted earlier, we placed Interior's management of oil and gas resources on the High Risk List in 2011, in part due to challenges with revenue determination and collection.[25] In our 2023 update we found that Interior made progress addressing some of these challenges.[26] For example, Interior finalized regulations that allow for greater flexibility in setting onshore royalty rates.[27] Overall, Interior has implemented more than 50 of our recommendations related to revenue determination and collection since 2011.

Our most recent report, issued in May 2019, found that additional actions could improve ONRR's ability to assess its royalty collection efforts.[28] Our report also made seven recommendations to the Director of ONRR, all of which have been implemented. For example, we recommended that the Director of ONRR should develop a documented case selection process that includes procedures for how to select compliance cases, which ONRR implemented in May 2021. We also recommended that the Director of ONRR periodically analyze whether the risk model is effectively identifying potential royalty noncompliance, whether the model's results are effectively used to assist case selection, and whether this analysis is used to make changes to the model (e.g., updating it) or to develop a new model. ONRR implemented our recommendation in July 2021 and provided a study that analyzed the effectiveness of ONRR's risk model. The study, dated March 2021,

[25]GAO-11-278.

[26]GAO, *High-Risk Series: Efforts Made to Achieve Progress Need to Be Maintained and Expanded to Fully Address All Areas,* GAO-23-106203 (Washington, D.C.: Apr 20, 2023).

[27]81 Fed. Reg. 83008, 83077 (Nov. 18, 2016) (codified in relevant part at 43 C.F.R. § 3103.3-1 (2017)). This provision subsequently was replaced with the publication of BLM's April 2024 final rule, implementing changes to fiscal terms in recent legislation. See 89 Fed. Reg. 30916, 30975 (Apr. 23, 2024) (codified in relevant part at 43 C.F.R. § 3103.31).

[28]GAO, *Federal Oil and Gas Royalties: Additional Actions Could Improve ONRR's Ability to Assess Its Royalty Collection Efforts,* GAO-19-410 (Washington, D.C.: May 31, 2019).

concluded that the contractor-built risk model ONRR used for selecting compliance cases was not effective in improving ONRR's case assignments.

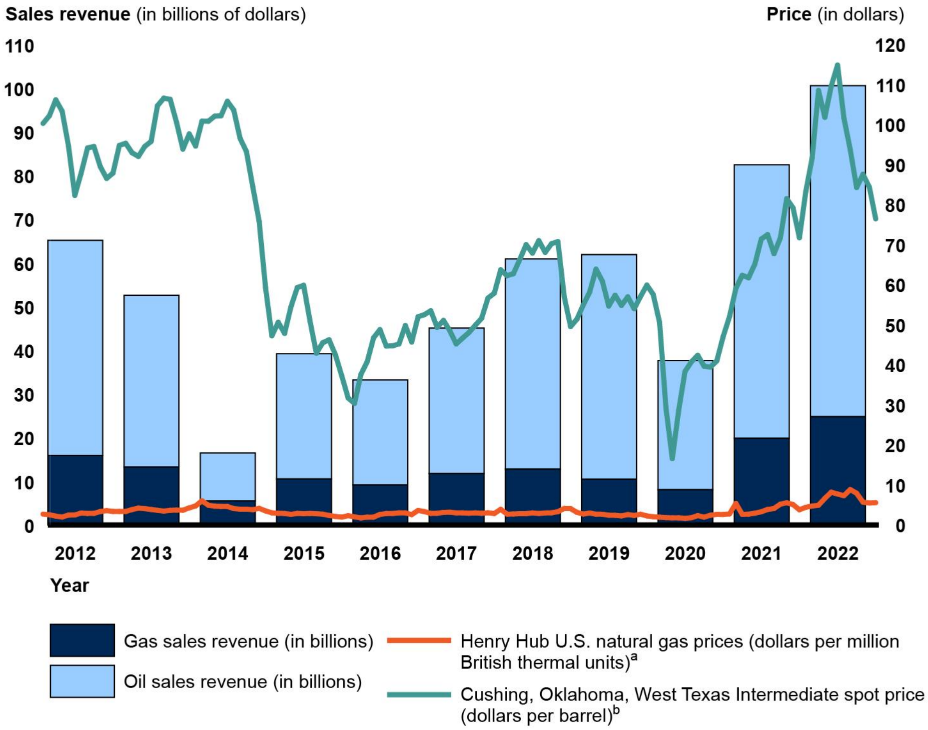
ONRR Collected $74 Billion in Royalties on Sales Revenue of about $600 Billion, and Generated $600 Million through Compliance Activities for 2012–2022

Companies Generated Total Sales Revenue of about $600 Billion, and ONRR Collected $74 Billion in Royalties

Total sales revenue. Companies generated about $600 billion in sales revenue from the sale of oil and gas produced from federal oil and gas leases from 2012 through 2022 according to our analysis of ONRR data. Sales revenue varied by year from a low of around $16.5 billion in 2014 to a high of about $100 billion in 2022 (see fig. 2). About 79 percent of companies' revenue was generated from the sale of oil, with the remainder coming from the sale of gas. The fluctuation in sales revenue depends on the prices and the volumes of oil and gas produced. Oil prices ranged between approximately $17 and $115 per barrel while natural gas prices ranged between approximately $2 and $9 per million British thermal units.[29]

[29]The Energy Information Agency defines the Cushing, Oklahoma, West Texas Intermediate as a crude stream produced in Texas and southern Oklahoma, which serves as a reference or "marker" for pricing a number of other crude streams traded in the domestic spot market at Cushing, Oklahoma. It defines the spot price as a one-time open market transaction for immediate delivery of a specific quantity of product at a specific location where the commodity is purchased "on the spot" at current market rates. Natural gas prices are based on delivery at the Henry Hub in Louisiana and are the official daily closing prices at 2:30 p.m. from the trading floor of the New York Mercantile Exchange for a specific delivery month.

Figure 2: Total Sales Revenue of Oil and Gas Produced from Federal Leases, 2012–2022



Source: GAO analysis of Office of Natural Resources Revenue and Energy Information Agency data. | GAO-24-103676.

Accessible Data for Figure 2: Total Sales Revenue of Oil and Gas Produced from Federal Leases, 2012–2022

	Oil	Gas	Total (combined)
2012	49,214,466,901	15,952,677,737	65,167,144,638
2013	39,353,726,916	13,253,175,168	52,606,902,084
2014	10,941,556,706	5,531,940,724	16,473,497,430
2015	28,697,111,450	10,543,180,657	39,240,292,107
2016	24,072,844,145	9,154,155,019	33,226,999,164
2017	33,313,329,025	11,793,634,395	45,106,963,420
2018	48,134,758,913	12,788,726,750	60,923,485,663
2019	51,422,534,000	10,494,550,646	61,917,084,646
2020	29,542,333,972	8,104,926,840	37,647,260,812
2021	62,627,739,828	19,858,179,492	82,485,919,320
2022	75,780,201,751	24,813,643,637	100,593,845,388

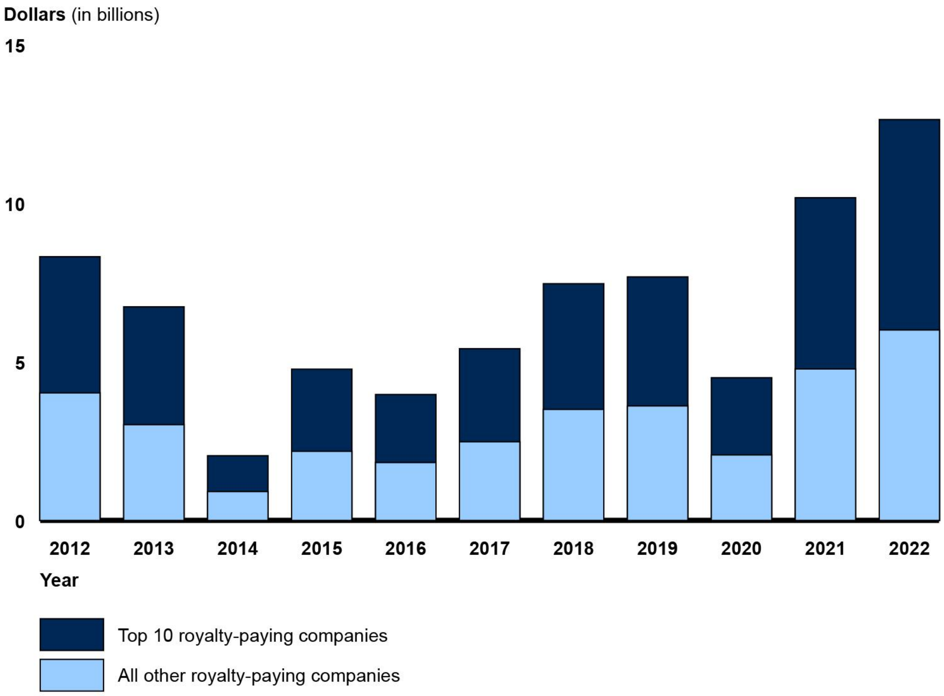
Source: GAO analysis of Office of Natural Resources Revenue and Energy Information Agency data. I GAO-24-103676.

[a]Natural gas prices are based on delivery at the Henry Hub in Louisiana and are the official daily closing prices at 2:30 p.m. from the trading floor of the New York Mercantile Exchange for a specific delivery month.

[b]The Energy Information Agency defines the Cushing, Oklahoma, West Texas Intermediate as a crude stream produced in Texas and southern Oklahoma, which serves as a reference or "marker" for pricing a number of other crude streams traded in the domestic spot market at Cushing, Oklahoma. It defines the spot price as a one-time open market transaction for immediate delivery of a specific quantity of product at a specific location where the commodity is purchased "on the spot" at current market rates.

Total royalties. ONRR collected approximately $74 billion in royalties paid by companies from the sale of oil and gas produced from federal oil and gas leases from 2012 through 2022. Royalties varied by year from a low of around $2 billion in 2014 to a high of about $12.6 billion in 2022 (see fig. 3). Over this time, the number of companies paying royalties declined from 1,359 in 2012 to 1,018 in 2022. Approximately 43 percent of the total royalties paid to ONRR came from the top 10 royalty-paying companies for the time period we analyzed.

Figure 3: Total Royalties Collected by the Office of Natural Resources Revenue (ONRR) and Portion Paid by Top 10 Companies, 2012–2022



Source: GAO analysis of ONRR data. | GAO-24-103676

Accessible Data for Figure 3: Total Royalties Collected by the Office of Natural Resources Revenue (ONRR) and Portion Paid by Top 10 Companies, 2012–2022

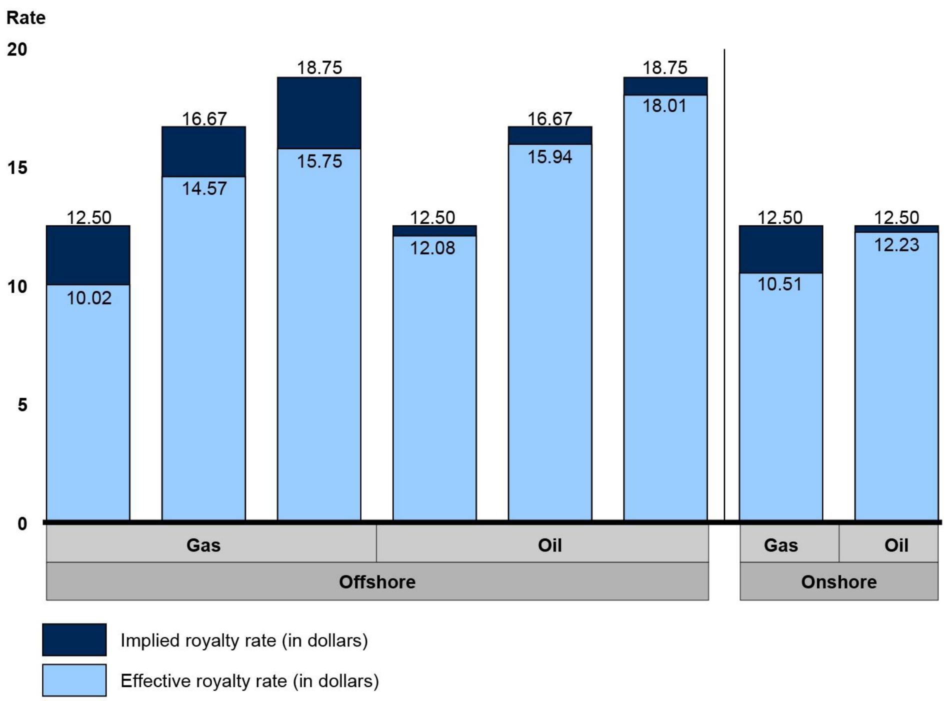
Calendar Year	Z_RV_PRIOR_ALL	Top 10 Companies	Top 10 companies percent of total
2012	8,313,784,581	4,018,375,547	48.33
2013	6,731,109,163	3,018,310,888	44.84
2014	2,039,543,891	908,852,706	44.56
2015	4,766,512,864	2,176,530,907	45.66
2016	3,968,740,428	1,822,668,243	45.93
2017	5,415,453,504	2,478,034,738	45.76
2018	7,464,953,168	3,499,208,545	46.88
2019	7,676,995,247	3,609,566,723	47.02
2020	4,498,780,527	2,065,394,514	45.91
2021	10,175,269,586	4,774,052,283	46.92

Calendar Year	Z_RV_PRIOR_ALL	Top 10 Companies	Top 10 companies percent of total
2022	12,637,059,075	6,004,633,945	47.52

Source: GAO analysis of ONRR data. I GAO-24-103676

Effective royalty rate on oil and gas sales. Companies' effective royalty rates were less than implied royalty rates for 2012 through 2022 (see fig. 4). The effective royalty rate accounts for deductions and other adjustments allowed per regulations before the royalty value is divided by the sales value. The implied royalty rate is calculated by dividing the royalty value by the sales value without considering deductions.

Figure 4: Implied Royalty Rate and Effective Royalty Rate for Federal Oil and Gas Leases, 2012–2022



Source: GAO analysis of Office of Natural Resources Revenue data. | GAO-24-103676

Accessible Data for Figure 4: Implied Royalty Rate and Effective Royalty Rate for Federal Oil and Gas Leases, 2012–2022

2012-2022: Aggregate Effective Rate by Onshore/Offshore, Product, and Implied Royalty Rate	2012-2022: Aggregate Effective Rate by Onshore/Offshore, Product, and Implied Royalty Rate	2012-2022: Aggregate Effective Rate by Onshore/Offshore, Product, and Implied Royalty Rate	Effective_Rate
OnShore_OffShore	Product	Implied_Rate	
OFFshore	Gas		
OFFshore	Gas	12.50	10.02
OFFshore	Gas	16.67	14.57
OFFshore	Gas	18.75	15.75
OFFshore	Oil		
OFFshore	Oil	12.50	12.08

2012-2022: Aggregate Effective Rate by Onshore/Offshore, Product, and Implied Royalty Rate	2012-2022: Aggregate Effective Rate by Onshore/Offshore, Product, and Implied Royalty Rate	2012-2022: Aggregate Effective Rate by Onshore/Offshore, Product, and Implied Royalty Rate	Effective_Rate
OFFshore	Oil	16.67	15.94
OFFshore	Oil	18.75	18.01
ONshore	Gas		
ONshore	Gas	12.50	10.51
ONshore	Oil		
ONshore	Oil	12.50	12.23

Source: GAO analysis of Office of Natural Resources Revenue data. I GAO-24-103676

Note: The implied royalty rate is calculated by dividing the royalty value prior to deductions by the sales value. The effective royalty rate is calculated by dividing the royalty value after deductions by the sales value.

We found the overall value of transportation and natural gas processing deductions companies claimed per regulations and lease terms from 2012 through 2022 was approximately $5.5 billion. Additionally, Interior's Office of the Inspector General (OIG) recently examined this issue and, in June 2023, the OIG reported that ONRR did not perform any analysis of effective royalty rates for federal oil and gas developed on federal lands or offshore.[30] After the OIG analyzed ONRR's sales reporting data, it found that application of royalty relief and statutorily authorized deductions could significantly decrease and, for roughly 15 percent of offshore oil and gas leases, eliminate the amount of royalties owed. The OIG made two recommendations to help ONRR provide quality information to decision-makers and stakeholders regarding the financial return on federal energy resources.

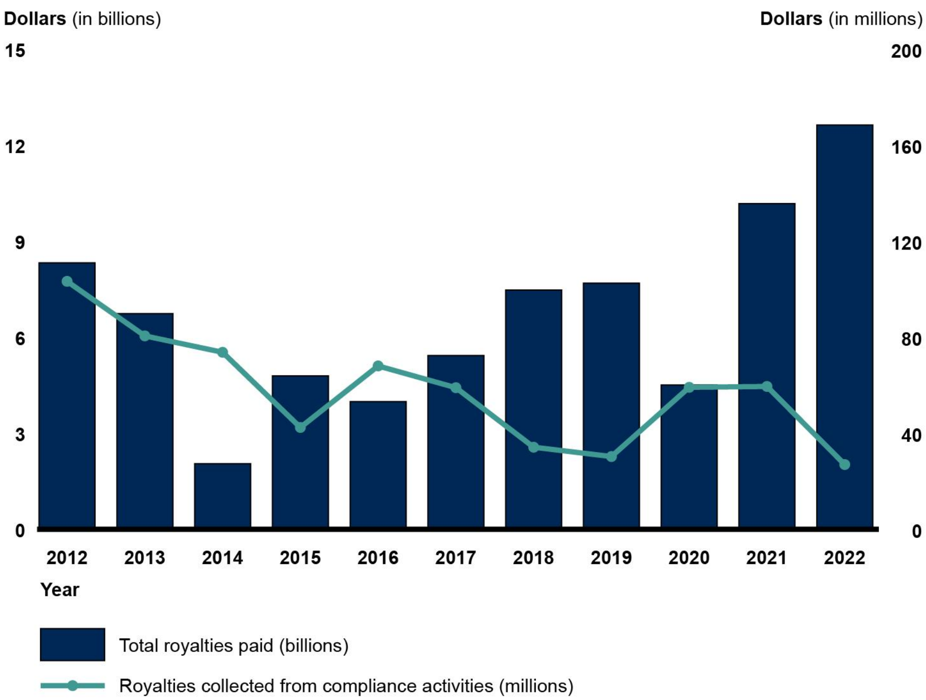
ONRR Generated an Additional $600 Million through Compliance Activities

Additional royalties collected through compliance. ONRR collected over $600 million in additional royalties through its compliance activities—audits and compliance reviews—in 2012 through 2022 (see fig. 5). During this time, the additional royalties collected varied between approximately a low of about $24 million in 2022 and a high of $100 million in 2012.[31]

[30]Office of the Inspector General, Department of the Interior, *The U.S. Department of the Interior Does Not Analyze Effective Royalty Rates*, 2021-CR-042 (Washington, DC.: June 2023).

[31]Because of the manner in which data is tracked in ONRR's compliance data systems during the time period of the review, there is no differentiation between findings with additional compliance collections versus findings that were reporting issues with zero increase in royalties. ONRR also collects additional royalties through its data mining efforts. This adds tens of millions of additional royalty collections each year. However, due to the manner in which the data were tracked for years included in our review time frame—for example, by not specifying Indian or federal—we were unable to include it in our analysis. Our analysis did not include collections from open compliance cases or for cases that had been appealed. Including these amounts would likely result in greater collections.

Figure 5: Royalties Collected from Compliance Activities Conducted by the Office of Natural Resources Revenue (ONRR), 2012–2022



Source: GAO analysis of ONRR data. | GAO-24-103676

Accessible Data for Figure 5: Royalties Collected from Compliance Activities Conducted by the Office of Natural Resources Revenue (ONRR), 2012–2022

	Royalties Collected From Compliance Activities	Total Royalties Paid
2012	99,937,293	8,321,342,922
2013	77,224,629	6,737,771,534
2014	70,387,686	2,046,213,835
2015	39,086,142	4,794,772,417
2016	64,710,616	3,988,793,215
2017	55,644,846	5,429,720,660
2018	30,858,813	7,474,624,434
2019	26,974,559	7,690,938,631
2020	55,800,623	4,509,069,522
2021	56,160,375	10,174,430,385
2022	23,641,697	12,627,648,614

Source: GAO analysis of ONRR data. I GAO-24-103676

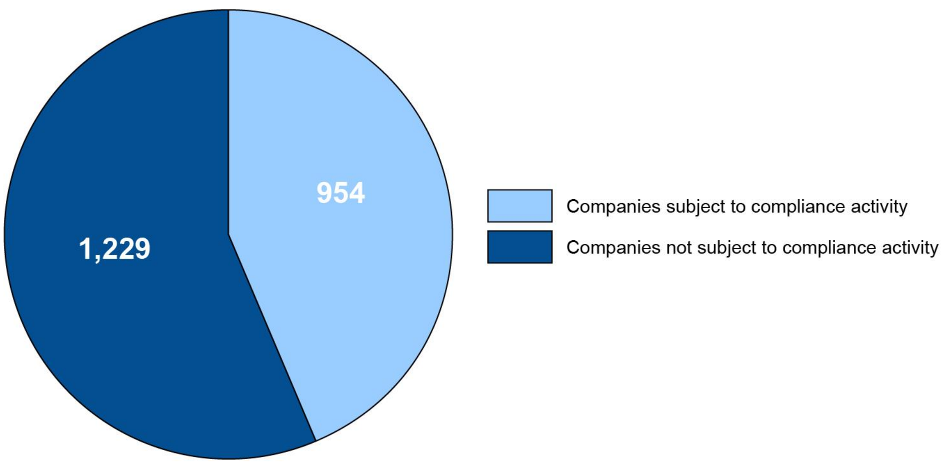
According to ONRR, there are several reasons why royalty collections can vary. For example,

- ONRR work planning groups assign cases for compliance reviews and audits throughout the course of each year, so, depending on the scope and complexity of the case, the time required to complete the work can vary greatly, which impacts the timing of any related royalty collections. If several cases have royalty findings within the same year, this could create an influx of royalty collections.

- When companies appeal case royalty findings, the resolution and additional royalty may not occur for many years after the case is assigned and work is complete. ONRR occasionally enters into settlement agreements with companies to resolve identified compliance issues. Settlement dollars impact royalty collections during the accounting year received because the royalty collection often represents compliance issues over a multiple-year period. ONRR acknowledged that there were settlements that occurred that resulted in additional royalties during this period.

Number of companies subject to compliance activities. Of the 2,183 companies that paid royalties to ONRR from 2012 through 2022, ONRR conducted compliance activities on 954, or about 44 percent of the companies (see fig. 6).[32]

Figure 6: Companies Subject to Compliance Activities Conducted by the Office of Natural Resources Revenue (ONRR), 2012–2022



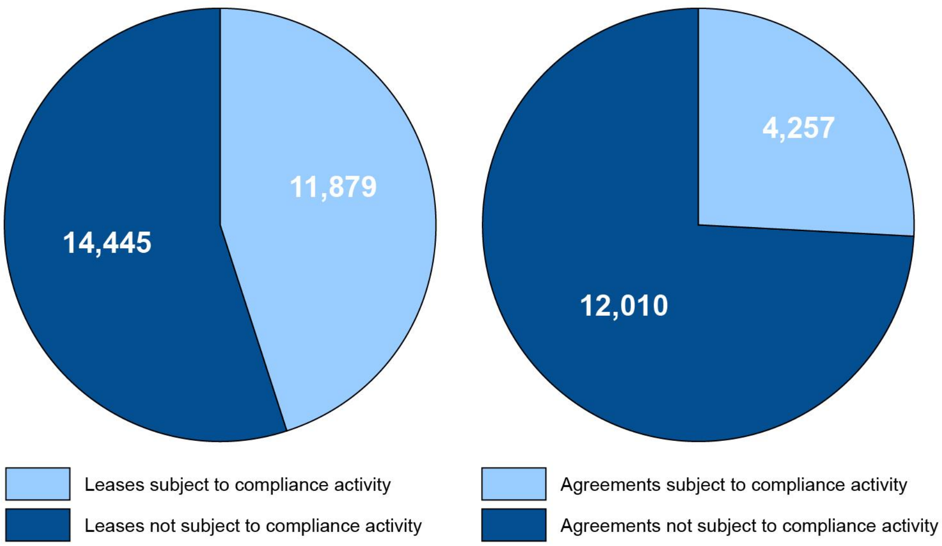
Source: GAO analysis of ONRR data. | GAO-24-103676

Number of leases and agreements subject to compliance activities by ONRR. There were 26,324 producing leases and 16,267 producing agreements in 2012 through 2022.[33] For leases, 11,879, or about 45 percent, were subject to compliance activities. For agreements, 4,257, or about 26 percent, were subject to compliance activities (see fig. 7).

[32]In conducting this analysis, we used a code to identify companies. However, according to ONRR officials, some companies may have multiple codes. This may occur if a company has various affiliates.

[33]An agreement is an approved document grouping leases together for various purposes. Types of agreements include communitization, unitization, and compensatory royalty agreements.

Figure 7: Leases and Agreements Subject to Compliance Activities Conducted by the Office of Natural Resources Revenue (ONRR), 2012–2022

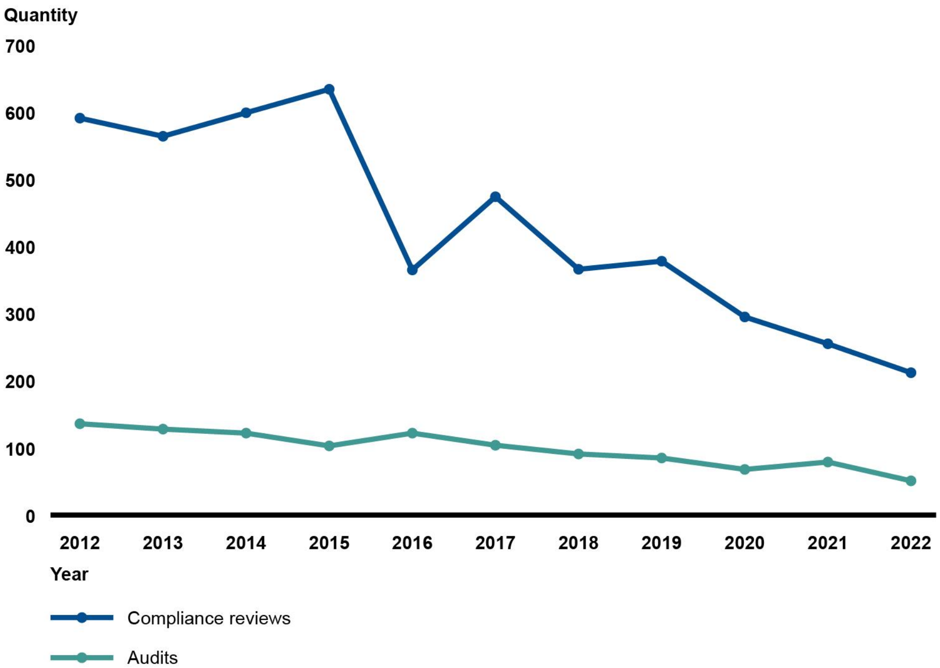


Source: GAO analysis of ONRR data. | GAO-24-103676

According to ONRR officials, the number of federal leases and agreements subject to compliance activities may have declined because, during this period, ONRR shifted work resources to prioritize Indian leases, thereby reducing the number of resources committed to federal leases and agreements. Also, ONRR changed its process for audit assignments by moving away from full company audits to a more geographically focused audit strategy. For example, an audit assignment may be for ABC Company's offshore leases only or ABC Company's New Mexico federal leases only. In doing this, individual audit assignments provided less coverage of the lease and agreement universe.

Number of audits and compliance reviews. The numbers of audits and compliance reviews generally declined from 2012 through 2022 (see fig. 8). The number of audits decreased from a high of 136 in 2012 to 51 in 2022. The number of compliance reviews generally declined from a level of around 600 in 2012 to around 200 in 2022. According to ONRR officials, there are several possible reasons for the decline in these compliance activities. First, ONRR shifted some resources to Indian cases from federal cases. Additionally, ONRR officials stated that overall staffing resources for audits had declined in recent years.

Figure 8: Number of Audits and Compliance Reviews Conducted by the Office of Natural Resources Revenue (ONRR), 2012–2022



Source: GAO analysis of ONRR data. | GAO-24-103676

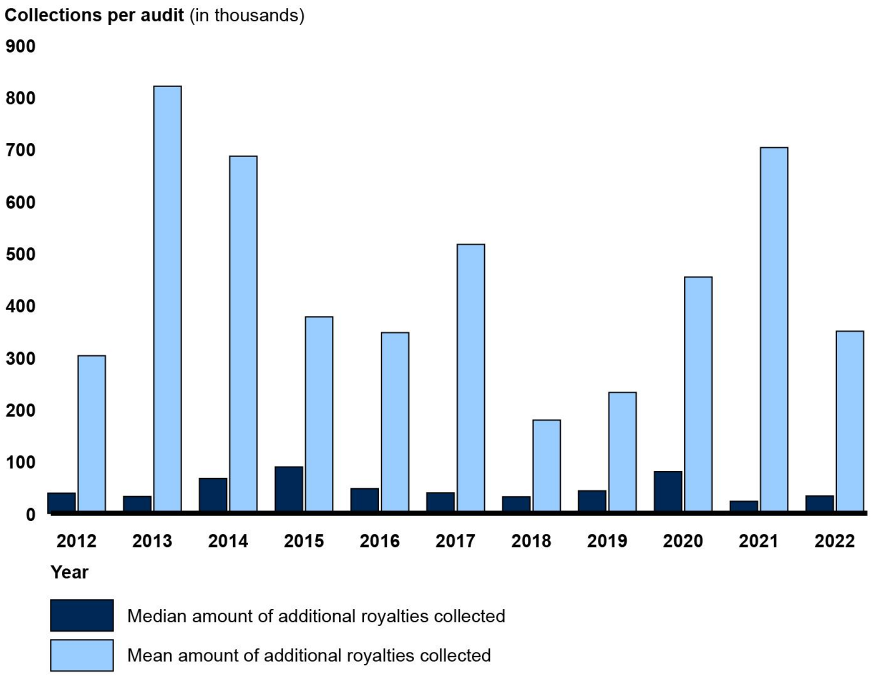
Accessible Data for Figure 8: Number of Audits and Compliance Reviews Conducted by the Office of Natural Resources Revenue (ONRR), 2012–2022

Year	Number of Audits	Number of Compliance Reviews
2012	136	591
2013	128	564
2014	122	599
2015	103	634
2016	122	365
2017	104	474
2018	91	366
2019	85	378
2020	68	295
2021	79	255
2022	51	212

Source: GAO analysis of ONRR data. I GAO-24-103676

Median and mean royalty collections. For audits, the median, or typical, amount of additional royalties collected was $48,789, while the mean, or average, amount of additional royalties collected was $466,628 in 2012 through 2022 (see fig. 9).

Figure 9: Median and Mean (Average) Royalty Collections per Audit Conducted by the Office of Natural Resources Revenue (ONRR), 2012–2022



Source: GAO analysis of ONRR data. | GAO-24-103676

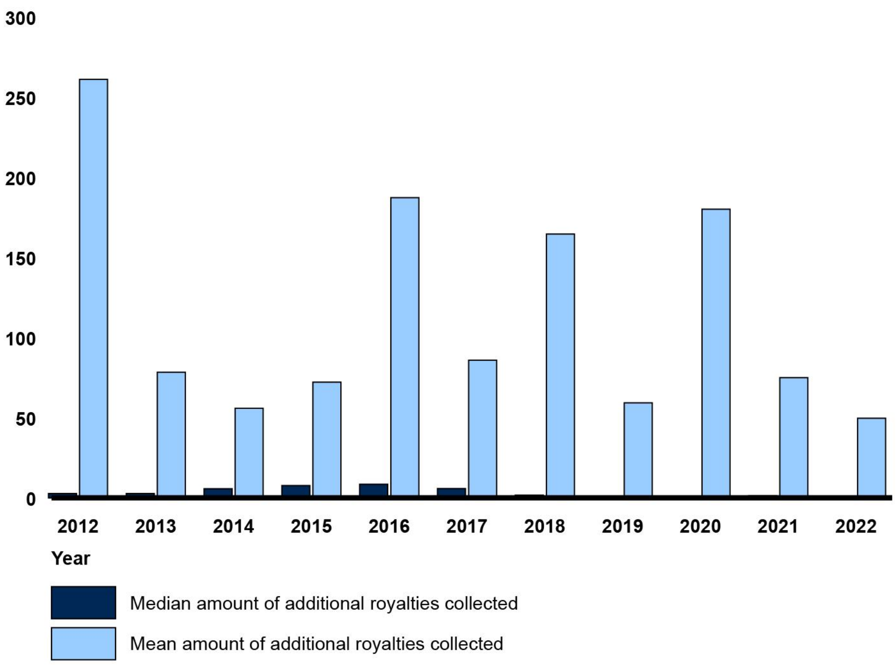
Accessible Data for Figure 9: Median and Mean (Average) Royalty Collections per Audit Conducted by the Office of Natural Resources Revenue (ONRR), 2012–2022

Year	Number of cases	Additional_Dollars_Median	Additional_Dollars_Mean
2012	136	38,672	302,555
2013	128	32,420	820,495
2014	122	66,824	686,060
2015	103	89,085	377,287
2016	122	47,454	346,936
2017	104	39,224	516,403
2018	91	31,618	179,066
2019	85	43,104	232,181
2020	68	79,941	453,944
2021	79	23,025	702,520
2022	51	33,169	349,669

Source: GAO analysis of ONRR data. I GAO-24-103676

For compliance reviews, the median amount of additional royalties collected was $2,935, while the mean amount of additional royalties collected was $115,746 in 2012 through 2022 (see fig. 10).[34]

Figure 10: Median and Mean (Average) Royalty Collections per Compliance Review Conducted by the Office of Natural Resources Revenue (ONRR), 2012–2022



Source: GAO analysis of ONRR data. | GAO-24-103676

Accessible Data for Figure 10: Median and Mean (Average) Royalty Collections per Compliance Review Conducted by the Office of Natural Resources Revenue (ONRR), 2012–2022

Year	Number of cases	Additional_Dollars_Median	Additional_Dollars_Mean
2012	591	2,659	261,046
2013	564	2,689	78,386
2014	599	5,702	55,824
2015	634	7,697	72,173
2016	365	8,475	187,281
2017	474	5,725	85,901
2018	366	1,704	164,594
2019	378	946	59,288
2020	295	1,033	180,109
2021	255	1,272	75,019

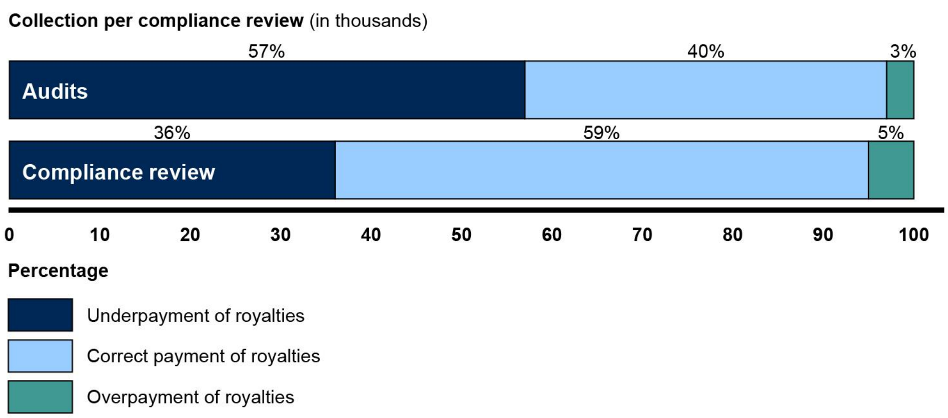
[34]There were also 75 light cases in 2021 and 2022. A light case is a case entered by either a state or Tribe that includes less information than a case entered by ONRR. The median amount of additional royalties collected was $1,906, while the mean amount of additional royalties collected was $27,571.

Year	Number of cases	Additional_Dollars_Median	Additional_Dollars_Mean
2022	212	80	49,661

Source: GAO analysis of ONRR data. I GAO-24-103676

Percentage of cases with additional royalty collections. According to our analysis of ONRR data, about 57 percent of audits resulted in additional royalty collections for 2012 through 2022, while about 36 percent of compliance reviews resulted in such collections (see fig. 11).[35] The remainder of the audits and compliance reviews determined that either royalties were correctly paid or overpaid.[36]

Figure 11: Percentage of Cases with Additional Royalty Collections from Audits and Compliance Reviews Conducted by the Office of Natural Resources Revenue (ONRR), 2012–2022



Source: GAO analysis of ONRR data. | GAO-24-103676

Accessible Data for Figure 11: Percentage of Cases with Additional Royalty Collections from Audits and Compliance Reviews Conducted by the Office of Natural Resources Revenue (ONRR), 2012–2022

Review type	Category	Cases (number)	Cases (percentage)
Audit	Underpayment of Royalties	617	56.66%
Audit	No Change to Royalties	436	40.04%
Audit	Overpayment of Royalties	36	3.31%
Compliance Review	Underpayment of Royalties	1,696	35.83%
Compliance Review	No Change to Royalties	2,796	59.07%
Compliance Review	Overpayment of Royalties	241	5.09%

Source: GAO analysis of ONRR data. I GAO-24-103676

[35]ONRR officials stated compliance activities also include having companies correct Form ONRR-2014 data that does not affect overall royalty collections.

[36]For the 75 light cases in 2021 and 2022, the likelihood of additional royalty collections was about 52 percent.

ONRR Has Made Progress Developing New Models for Case Selection but Has Incomplete Data and Faces Resource Challenges

ONRR Is Developing New Compliance Risk Models but Does Not Have Certain Data to Validate Those Models

As we reported in May 2019, ONRR had not analyzed the effectiveness of its risk model to assist in selecting compliance cases.[37] ONRR's vendor developed the model in 2014, which resulted in a risk scoring program for both companies and properties. We recommended that ONRR should periodically analyze whether the risk model is effectively identifying potential royalty noncompliance, whether the model's results are being effectively used to assist case selection, and whether the model needs to be changed (e.g., updated) or a new model is needed. In July 2021, Interior provided us with a study that analyzed the effectiveness of ONRR's risk model.[38] The study concluded that the risk model was not effective in improving ONRR's case assignments. ONRR officials stated they are now in the process of building, testing, and evaluating multiple risk models without vendor involvement.

ONRR has undergone a reorganization, and a new team—ONRR's Analytics and Compliance Planning group—is spearheading the in-house effort to develop the risk models used for selecting compliance cases as part of its ongoing work to improve ONRR's compliance process. According to ONRR officials, ONRR's development of new risk models should allow the office to take steps to increase its capacity to analyze data, whereas, in the past, they have been more reliant on vendors to understand the risk model used for selecting compliance cases.

According to ONRR officials, ONRR has been unable to fully assess the effectiveness of its risk models in part because it does not use a methodology that employs a random sample to select compliance cases. A random sample is important to the development of risk models because it serves as a proxy for the overall universe of all companies, properties, or products, including those that have never been subject to compliance activities. Access to this proxy is essential for determining the indicators that predict risk. ONRR has conducted random audits in the past and stated that random audits are necessary to determine if risk exists.[39] ONRR officials further stated that if they only focus audits on the outliers or the areas of high risk, there is no fear of an audit if a company does not operate in one of those areas, which could lead to complacency and inaccuracy in both royalty reporting and payment.

[37] ONRR developed a quantitative model using past royalty data to produce scores for companies and properties based on their potential risk for royalty noncompliance and then uses those scores to inform case selection decisions. GAO-19-410.

[38] ONRR, Strategy & Analytics Office, *ONRR Risk Model Assessment: Response to GAO Recommendation #4 Report 19-410,* March 5, 2021.

[39] Under the Federal Oil and Gas Royalty Simplification and Fairness Act of 1996, ONRR should not perform or require audit activities if it or the state concerned determines that the cost of conducting or requiring the activity exceeds the expected amount to be collected by the activity, based on the most current 12 months of activity. The act explains that this direction is intended to most effectively utilize ONRR's resources to maximize the collection of oil and gas receipts from leases within the period of limitations, and consequently to maximize the state share of such receipts. 30 U.S.C. § 1724(g). In examining the effectiveness of the compliance program overall, random audits could improve risk models so that they are more likely to lead to compliance cases that return additional royalty revenue to the government.

We analyzed ONRR's compliance data and found that the last time an audit was coded "Random Audit" was in 2011 for royalty data from 2003. We did not identify any data on random compliance reviews. ONRR staff stated that while random audits have always been a part of ONRR's audit strategy, their ability to conduct random audits is limited by resources. Interior is required by statute to establish a comprehensive accounting and auditing system to provide the capability to accurately determine oil and gas royalties, as previously stated.[40] By assessing the benefits of incorporating randomly selected compliance activities into its workplans, including the resources necessary to conduct the appropriate number of random compliance activities, ONRR could be better informed about how it could possibly validate its risk models for compliance case selection.

ONRR Improved Its Documentation of Compliance Activity Results, but OMT Does Not Always Link Specific Compliance Violations to Royalties

The current version of ONRR's compliance data system, OMT, has improved some aspects of data on violations due to compliance activities over CIM and an earlier iteration of OMT, according to our analysis. Specifically, ONRR staff can now select specific violations or no violation in OMT at the conclusion of the analysis phase of a compliance activity. In contrast, ONRR staff did not have the option to select "no violation" in CIM when no issues were identified, unless the auditor first entered a royalty finding amount.

In examining compliance activities in CIM for 2012 through 2022, we found a total of 4,284 cases—of which 2,298 did not have a violation selected and the data entry field was left blank. ONRR officials stated that CIM did not have the functionality to record a violation in instances without a royalty collection, so they considered the absence of a violation documented in CIM to mean there was no violation. However, in looking at comments related to specific cases where no violation was recorded, we identified instances where issues were identified but did not have a net effect on royalty payments. For example, there were multiple instances of reporting errors where royalties were reported to the wrong lease or agreement that were corrected despite the case not having a violation. In addition, there were multiple instances where a royalty collection of $0 was entered so that a violation could be recorded. As a result, ONRR did not have complete data on violations because CIM was unable to identify a violation unrelated to royalty collections.

We also examined the compliance activities in OMT for the same period. In the first iteration of OMT, we found a total of 677 cases, of which around 15.5 percent had no recorded finding but were associated with royalty collections totaling almost $16 million. For example, one compliance review had a royalty collection of over $11.7 million; however, there was no associated violation. Consequently, ONRR did not have complete data on violations.

With the rollout of the current version of OMT beginning in 2020, we found no instances of audits and compliance reviews completed by ONRR staff in which there were royalty collections, but no violation recorded. States and Tribes that conducted compliance activities through a cooperative agreement with ONRR were given access to the current version of OMT to enter compliance data. However, their entries, called light cases, did not include all the data that ONRR staff enter when documenting a compliance activity. Among the data that states and Tribes could not enter were violation data. We found that of the 55 light cases in the current version of OMT, 40 cases had royalty findings but no violation. The total amount of these royalty collections was approximately $1.5 million. As a result of the incomplete violation data, if ONRR were to attempt to identify which violations contributed to the most royalty findings, it would not have accurate and

[40] 30 U.S.C. § 1711(a).

reliable data to do so. This could hamper its efforts in developing risk models for compliance case selection. An ONRR official told us that states and Tribes were given the ability to document violations in light cases in November 2023 and a presentation was given in December 2023. This should help assure that, going forward, ONRR will have more complete data on violations.

Additionally, in analyzing ONRR's compliance data in OMT, we found that there is not always a link between specific violations with royalty findings. In some cases where ONRR staff find a single violation, OMT directly links it to the royalty findings. However, in cases where there are multiple violations, OMT has no data on how each individual violation contributed to the overall royalty finding. For example, in one case, 10 violations led to a royalty collection amount of over $150,000, including multiple volume-related violations, multiple value or pricing violations, and a processing violation. ONRR officials stated that they considered linking violations with royalty findings during the design of OMT but determined it would be challenging to apportion specific royalty collections to certain violations. While it may be difficult in some cases to apportion the royalty findings to specific violations, OMT makes no attempt to do so, according to ONRR officials. In examining OMT data, we found that it was possible to link some violations with royalty findings. For example, for cases with a unique combination of property, company, and commodity associated to a single violation, it was possible to link that violation with specific royalty findings.

As previously stated, under FOGRMA, Interior is to establish a comprehensive accounting and auditing system to provide the capability to accurately determine oil and gas royalties.[41] Additionally, federal standards for internal control call for agencies to use quality information to achieve their objectives. Quality information should be accessible, complete, and accurate to help management make informed decisions and evaluate performance in achieving key objectives and address risks. ONRR does not have complete and accurate data on violations and how violations link to royalty findings. By adding these data on violations and how they link to royalty findings, the office could further its efforts to develop risk models to inform compliance case selection.

ONRR Does Not Have Consistent and Complete Data to Assess Historical Compliance Program Performance

ONRR has not developed a single, consistent, and complete dataset from its compliance data systems. Additionally, as ONRR retired CIM and implemented OMT, it did not transfer the legacy compliance data between systems, and it did not take steps to ensure that OMT would be able to accept the information as it was coded in CIM. As a result, compliance data were stored in an inconsistent manner across two data systems. For example, OMT contains a variable indicating whether a compliance activity examined a federal or Indian property, but CIM does not contain a consistent indicator, resulting in uncertainty about how to categorize these cases. Additionally, CIM had one set of specific violation categories, while OMT had two sets of categories that were different from CIM's. Therefore, as previously mentioned, we had challenges tracking which violations were most common over the time frame we reviewed, 2012 through 2022. As a result, it is difficult to accurately assess historical compliance program trends.

Our work to combine data from CIM and OMT, the results of which are presented earlier in this report, required extensive efforts. For example, we compared tables in each compliance data system to identify their purposes and determine the degree to which they were relatable. We also had to compare alphabetic fields in one table with numeric fields in other tables (having different field names) to identify the extent to which their functions

[41] 30 U.S.C. § 1711(a).

overlapped and the extent to which they were unique to each database. When we discussed these challenges with ONRR, an ONRR official told us that any attempt to combine CIM and OMT data would be very difficult. Officials further stated that ONRR cannot efficiently analyze data from the multiple systems due to differences in how the data were captured and formatted. Additionally, ONRR is now undergoing an information technology modernization effort projected to cost over $170 million, which may include replacing OMT. Should this occur, it has the potential to create further challenges in having a consistent and complete set of compliance data.

ONRR officials stated that they considered transferring the legacy data. However, ONRR officials stated that there were some data integrity challenges in trying to transition CIM data into OMT. Therefore, to protect the integrity of the data, they decided not to transfer the data. ONRR officials further stated that they did not develop a single complete and consistent compliance dataset as they had other priorities, and that they had some capacity to analyze the data if necessary.

As previously stated, ONRR is required by statute to establish a comprehensive accounting and auditing system to provide the capability to accurately determine oil and gas royalties.[42] Additionally, federal standards for internal control call for agencies to use quality information to achieve their objectives. Quality information should be accessible, complete, and accurate to help management make informed decisions and evaluate performance in achieving key objectives and address risks. By assessing the need for a consistent and complete set of compliance data, ONRR could be better informed about its ability to assess historical compliance program performance and whether such data could inform its compliance strategy.

ONRR Cannot Comprehensively Crosswalk Royalty Collections and Payments across Its Compliance and Royalty Data Systems but Has Made Improvements

ONRR cannot comprehensively crosswalk royalty collections resulting from ONRR's compliance activities in its compliance data systems—CIM and OMT—with the associated royalty payments reported in its royalty data system, which captures all royalty payments. For the purposes of this report, crosswalk means to map the relationships of data across two systems and, through this comparison, understand to what extent data are consistent across systems. In analyzing ONRR's data for 2012 through 2022, we successfully crosswalked about 20 percent of royalty collections resulting from compliance activities in CIM—which increased to almost 60 percent in OMT—with the associated royalty payments in the royalty data system.

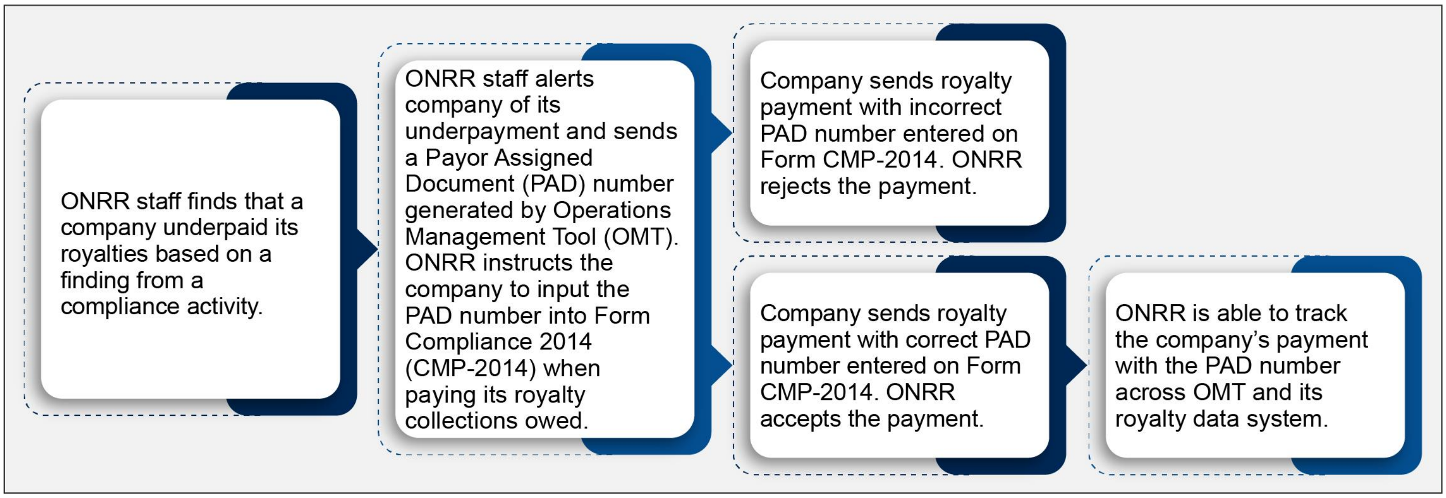
ONRR's compliance and royalty data systems cannot comprehensively crosswalk compliance-related royalty collections across CIM or OMT with royalty payments in its royalty data system. In CIM, royalty collections could be crosswalked but only if companies used the correct Payor Assigned Document (PAD) number on the Form ONRR-2014, as previously mentioned.[43] Then in 2014, ONRR created Form CMP-2014 for companies to report compliance-related royalty payments. After transitioning to Form CMP-2014, ONRR created a policy and provided training to companies and ONRR staff on how to use the Form CMP-2014. However, CIM does not automatically input Form CMP-2014 PAD numbers, according to ONRR officials. As a result, Form CMP-2014 royalty payments could not be comprehensively crosswalked unless the company used the PAD number

[42] 30 U.S.C. § 1711(a).

[43] Within CIM the PAD number is referred to as a Unique Finding Identifier.

provided to companies when making their payments.[44] In OMT, however, a PAD number is automatically generated and provided to companies for reporting compliance-related royalty payments on the Form CMP-2014, according to ONRR officials. Using the automatically generated PAD number would allow ONRR to comprehensively crosswalk the royalty collection in OMT with the royalty payment on the Form CMP-2014 (see fig. 12).

Figure 12: Office of Natural Resources Revenue's (ONRR) Process to Crosswalk Royalty Collections and Payments



Source: GAO representation of ONRR process. | GAO-24-103676

Our analysis of ONRR data found a low percentage of matching PAD numbers included in OMT records, indicating that ONRR staff have not consistently enforced its policy for companies to include the correct OMT-generated PAD number when making royalty payments. ONRR officials acknowledged that staff were not following agency policy. Furthermore, these officials stated that companies have not always followed guidance to submit the required PAD number, submitting instead a PAD number of their choosing on the Form CMP-2014.

When we crosswalked PAD numbers across ONRR's CIM and royalty data systems, we found that approximately 78 percent of PAD numbers were found only in CIM, meaning we could not readily crosswalk the associated royalty collections in CIM with the associated royalty payments in the royalty data system. Some of the unmatched PAD numbers were due to cases closed with a blank or $0 royalty collection, which would not require any royalty finding adjustments on a Form CMP-2014. Out of the approximately $484 million in royalty collections in CIM from 2012 through 2022, we were able to crosswalk transactions with PAD numbers accounting for about $104 million, or about 22 percent, with royalty payments in the royalty data system.

When we crosswalked PAD numbers across ONRR's OMT and royalty data systems, we found that approximately 38 percent of PAD numbers were found only in OMT, meaning that we could not readily

[44]The CIM compliance data system predated the Form CMP-2014. According to ONRR officials, prior to the use of Form CMP-2014 forms compliance collections were made using Form ONRR-2014 royalty payment forms and royalty collections could be crosswalked within CIM if the company used a PAD number provided by ONRR when making its collection payments. According to ONRR officials, when companies did not use the provided PAD number, ONRR staff could also crosswalk payments by manually entering a valid Form ONRR-2014 document number with a reason adjustment code number 17 in CIM.

crosswalk the royalty collections in OMT with the associated payment in the royalty data system. Some of the unmatched PAD numbers were due to cases closed with a $0 royalty collection, which would not require any royalty finding adjustments on a Form CMP-2014, according to ONRR officials. Out of the approximately $117 million in royalty collections in OMT, we were able to crosswalk royalty collections with PAD numbers accounting for about $68 million, or about 60 percent, with royalty payments in the royalty data system. For example, one case we were unable to crosswalk was a royalty collection of over $1.3 million because the company was incorrectly instructed to use the case number in place of the PAD number reported on the Form CMP-2014, according to ONRR officials. As a result, we were unable to find the payment in the royalty data system.

ONRR staff acknowledged that they did not always communicate the correct PAD number to companies to use when paying compliance royalties. As a result, crosswalking royalty collections between ONRR's compliance and royalty data systems is challenging. According to ONRR officials, OMT requirements originally called for an automated crosswalk of payments submitted through Form CMP-2014 to the OMT case, which would require an accurate PAD number. However, according to ONRR officials, ONRR revised its design of OMT such that the vendor that developed OMT did not have to include this functionality. As a result, ONRR now relies solely on its policy—for which ONRR provided training to staff—to ensure accurate reporting. This policy has not always been followed. For example, in a few cases, ONRR staff provided the case number from OMT rather than the correct PAD number.

Although ONRR is unable to comprehensively crosswalk compliance collections and payments across its data systems, ONRR documents state that before a case is closed, the supervisor of the case is to confirm compliance, for example by verifying the correct royalty payments were made. Further, ONRR officials stated that they can retrospectively verify that correct compliance-related royalty payments are made on a case-by-case basis. However, this would likely require additional time and could be challenging.

Interior is required by statute to establish a comprehensive accounting and auditing system to provide the capability to accurately determine oil and gas royalties.[45] Additionally, federal standards for internal control state that agencies should use quality information to achieve their objectives. Quality information should be accessible, complete, and accurate to help management make informed decisions and evaluate performance in achieving key objectives and address risks. However, ONRR's efforts to do so are hindered by its inability to comprehensively crosswalk the amount owed from royalty findings to the amount of revenues collected across all compliance cases. By reiterating its existing policy for using PAD numbers—for example, through additional training and adding functionality to its current and future compliance data systems to comprehensively crosswalk the PAD number between its compliance and royalty data systems—Interior could better ensure the comprehensive collection of revenues resulting from compliance activities.

Percentage of Royalties on Which ONRR Conducted Compliance Activities Is Uncertain

The amount of federal oil and gas royalties on which ONRR conducted compliance activities—referred to as compliance coverage—is uncertain. Specifically, ONRR did not document the royalty amount on which it

[45] 30 U.S.C. § 1711(a).

conducted compliance activities in CIM, and we were unable to verify the amounts that ONRR says are documented in OMT.

According to ONRR officials, ONRR had a performance measure for compliance coverage, but the office stopped using it in 2016. Prior to that, a review by Interior's OIG found that the compliance coverage measure was misleading.[46] The OIG found issues with the measure, including that the measure's focus on the amount of royalties subject to compliance activities resulted in many of the same companies and properties being reviewed year after year, leaving many to go without compliance activities. Based in part on this finding, according to ONRR officials, ONRR stopped calculating its compliance coverage estimate. The OIG recommended that ONRR instead develop performance measures for companies and properties subject to compliance coverage, and ONRR concurred.

One ONRR official told us that OMT does track the scope of audit royalties as well as the specific sample royalties reviewed. The official said that OMT uses this information to create individual audit reports that includes royalty compliance coverage. For example, if ONRR conducts an audit of a lease from 2018 through 2020, OMT is to include the total amount of royalties reported during that time frame. OMT is also to include the amount of those royalties that were sampled for examination during that audit. However, data are only captured at a compliance case level. According to ONRR officials, ONRR does not have a standardized report that aggregates the total amount of royalties paid, the total amount of royalties subject to an audit or compliance activity, and the amount of those royalties sampled for examination during an audit of compliance activity. We acknowledge the prior limitations of using compliance coverage as a performance goal. However, internally tracking such data would provide management better measures of the scope of its compliance activities. Further, such data could be useful in modeling a royalty gap, which we discuss later in this report.

Under FOGRMA, Interior is required to establish a comprehensive accounting and auditing system to provide the capability to accurately determine oil and gas royalties, as previously stated.[47] Additionally, ONRR's Audit Manual states that ONRR's audit management work is coordinated to provide maximum audit coverage to achieve its mandate to develop and implement effective compliance strategies.[48] With aggregate data about the percentage of royalties covered by compliance activities, management could better assure that work that staff perform is coordinated to provide maximum audit coverage and improve management capacity to develop and implement effective compliance strategies.

ONRR Did Not Have Complete and Accurate Documentation for Its Compliance Data Systems

ONRR did not have complete and accurate documentation for its compliance data systems—CIM and OMT. ONRR provided us with its CIM and OMT data dictionaries; however, these dictionaries were incomplete.

[46]According to the OIG, ONRR's compliance coverage measure calculated the percentage of reported royalties from a production year for which it would have conducted compliance work within a 3-year period. For example, the fiscal year 2005 performance goal was to complete compliance work on 71 percent of calendar year 2002 reported royalties. Department of the Interior, Office of Inspector General, *Minerals Management Service's Compliance Review Process*, C-IN-MMS-0006-2206 (Washington, D.C.: December 2006).

[47]30 U.S.C. § 1711(a).

[48]Department of the Interior, Office of Natural Resources Revenue, Audit Manual, rev. 5.2 (July 2019).

Specifically, the data dictionaries did not provide clear definitions of all tables, variables, and values to accurately reflect the data.

The CIM data dictionary included the names of tables and variables included within those tables but did not include values of those variables. For example, the CIM data dictionary did not have a description of which table held the violations, or a list of the values for the violations and their plain language descriptions. In addition, the OMT data dictionary did not have descriptions of three new tables and the variables and values contained within them which tracked violations. ONRR provided its 2023 Technical Metadata Dictionary, which is intended to be its official document covering all of ONRR's data. However, this dictionary was also incomplete. For example, it did not include key variables we relied upon in our analysis, such as certain violation variables. For those key variables that were included, the document did not include the values of the variables. For example, while the document included a definition of the variable used to uniquely identify an OMT violation name or category, it did not include the values for the violations and their plain language descriptions. Additionally, the schematic—the figures depicting the structure of the database—ONRR provided for OMT did not include three key tables on violation data, giving no indication of their existence. ONRR officials stated that due to other priorities, they were unable to fully update the data dictionaries and schematics.

Interior's 2008 data management guide directs managers to ensure quality data by defining data accurately.[49] In 2023, Interior directed all its bureaus and offices to document data definitions in data dictionaries to ensure data quality.[50] By having accurate documentation for its data systems, such as its data dictionary and schematics, ONRR could better ensure the quality of the data by facilitating oversight.

ONRR's Gaps in Staffing Resources and Data Analysis Capacity Inhibit Its Ability to Fully Support Compliance Efforts

According to ONRR officials, ONRR has not previously prioritized efforts to hire data analysts or statisticians. Instead, the office relied on a vendor to develop data systems and drive progress in certain parts of its compliance program. Additionally, a senior ONRR official stated that over time, ONRR had become overly reliant on its vendor when it came to understanding its own data, in part due to allocating resources elsewhere within the agency. Moreover, according to ONRR's 2022 workforce analysis, it needed a systematic effort to build cutting-edge employee talent and skills in data analytics, among other areas. ONRR officials stated that in recent years it sought to hire more data analytics staff, and, while it has had some success in hiring two data scientists, the office still has gaps.

As previously stated, Interior's Information Resources Management Strategic Plan 2020–2025 states that Interior's workforce will achieve data literacy by developing competencies required to work with data, analyze the data, and present evidence-based cases to best inform policy decisions. Additionally, federal standards for internal control state that effective management of an entity's workforce and its human capital is essential to achieve results and an important internal control.[51] It further states that operational success is only possible when the right personnel for the job are onboard and provided the right training, tools, structure, incentives,

[49]U.S. Department of the Interior, Office of the Chief Information Officer, *Data Quality Management Guide* (August 2008).

[50]U.S. Department of the Interior, Office of the Chief Information Officer, *Data Sharing Policy* (Washington, D.C.: May 8, 2023).

[51]GAO-14-704G.

and responsibilities. In part, because of a skills gap, ONRR relied on an ineffective risk model developed by a vendor for selecting compliance cases. This may have led to ONRR not selecting the cases most likely to lead to additional royalty payments for years. By assessing human capital needs with respect to data analysis and the ability to understand its compliance data systems, ONRR could better determine what skills and staff it needs to support its compliance efforts more effectively.

IRS and other agencies use the Office of Personnel Management's (OPM) Intergovernmental Personnel Act (IPA) Mobility Program to help agencies address their mission critical skills gaps with temporary assignments.[52] Specifically, IRS officials stated that the IRS has brought in experts to analyze data to help inform tax compliance efforts through the program in a cost-effective way to improve oversight. According to IRS officials, the agency has used the program for over 10 years, with part of the outcome of this work contributing to tax gap estimates.

IRS officials stated that one of the conditions for assuring success with the IPA program was getting IRS data organized in an accessible way, as it is then easier for researchers and the public to make productive use of the data. The IRS officials acknowledged that staff time was required to get the data into accessible formats. Additionally, given the sensitive nature of the IRS data, IRS officials stated that IPA program researchers undergo background checks and must be cleared before being given access to IRS data, which can only be done through IRS information technology equipment.

Currently, Interior's May 2021 bulletin provides guidance and promotes the use of the IPA program for temporary assignments of personnel between the federal, state, and local governments, as well as colleges and universities.[53] Among the goals of the program are to strengthen the management capabilities of federal agencies. Also, in January 2022, we found that the personnel mobility program can address skills gaps by providing temporary assignments for purposes that benefit both the federal agencies and certain non-federal organizations.[54] We discussed the use of the IPA program with ONRR officials, and they expressed an interest in it, but said that ONRR had no plans to use it. By considering the use of the OPM IPA program to bring in additional skills while it works to fill its skills gaps, the office could leverage the necessary skills to further its compliance efforts as an interim or long-term measure.

The Royalty Gap Is Unknown, and ONRR's Preliminary Model Has Design and Data Limitations

The royalty gap is unknown because ONRR has not recently attempted to estimate the gap. The royalty gap is the estimated amount of royalty revenues that ONRR has not collected, which may be due in part to companies not reporting or misreporting revenues (see fig. 13). A preliminary model developed by ONRR was

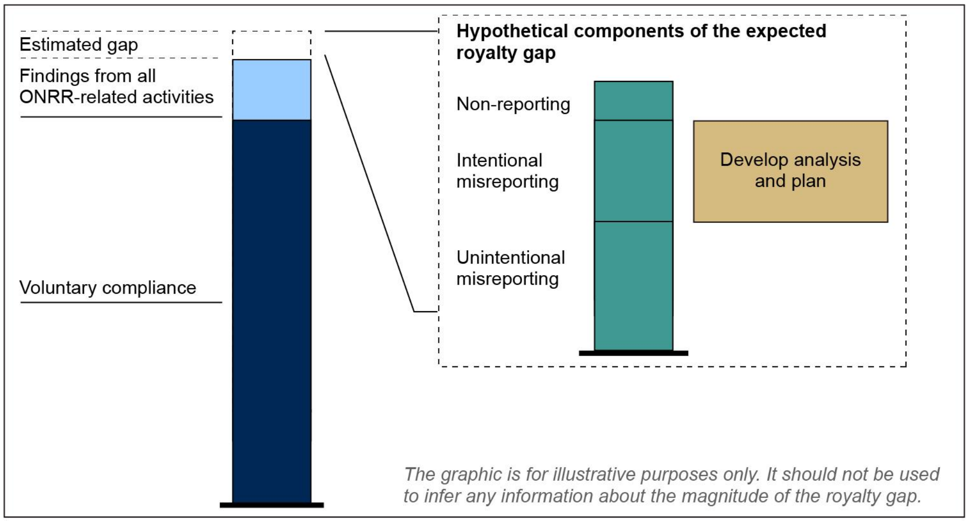
[52]The IPA program provides for the temporary assignment of personnel between the federal government and state and local governments, colleges and universities, tribal governments, federally funded research and development centers, and other eligible organizations. Agencies use this program across the government; for example, the IRS uses the program to assist in examining tax compliance data to help program oversight.

[53]Department of the Interior, Office of the Secretary, *Intergovernmental Personnel Act (IPA) Mobility Program*, Personnel Bulletin No:21-051 (Washington, D.C.: May 5, 2021).

[54]GAO, *Personnel Mobility Program: Improved Guidance Could Help Agencies Address Skills Gaps and Maximize Other Benefits*, GAO-22-104414 (Washington, D.C.: Jan. 27, 2022).

last used to estimate a royalty gap in 2010 and 2011 but has design and data limitations. We attempted to use a more rigorous model to estimate the royalty gap. However, ONRR did not have the data needed to generate more rigorous estimates.

Figure 13: Hypothetical Components of the Expected Royalty Gap



Source: GAO adaptation of Office of Natural Resources Revenue (ONRR) graphics. | GAO-24-103676

Note: The royalty gap is the estimated amount of royalty revenues that are not collected.

The office performed limited work that resulted in a preliminary royalty gap estimate of $80 million and $146 million for fiscal years 2010 and 2011. For these years, the model attempted to estimate the additional royalty collections ONRR would receive if compliance activities were performed on all federal oil and gas leases.[55]

ONRR's preliminary model did not estimate the royalty gap with sufficient rigor due to design and data limitations.[56] For the model to have sufficient rigor, ONRR would, among other things, need to implement an appropriate design and methods. The preliminary model implicitly assumed that the royalty gap was less than the discrepancies found through ONRR compliance efforts. The documentation supporting the estimate did not include evidence for this assumption. Due to this assumption, the approach may result in an underestimate, especially if compliance activities cover a small portion of the total royalties in any given year.

The data analytics staff who performed the analysis for fiscal years 2010 and 2011 recommended that the effort should be ongoing and conducted periodically, and that the preliminary model should be refined. However, ONRR's management stopped efforts to estimate an annual royalty gap after 2011, and ONRR could not provide documentation to explain management's decision.

[55]ONRR's methodology included all compliance findings (including settlements and data mining) in its model.

[56]For this report, we use Interior's definition of rigor as described in its Department Manual: "An evaluation must have the most appropriate design and methods to answer key questions. Organizations must have sound practices for interpreting findings and reporting and sharing these findings within the organization and with external stakeholders and partners. The scope and rigor of an evaluation (or set of evaluations) requires balancing of the organization's goals, breadth of investments/activities, timeline, feasibility for sound conduct, and available resources."

We attempted to develop a royalty gap estimate based on a more established model that IRS uses to estimate one component of its tax gap estimate—the Small Corporation Income Tax Underreporting Tax Gap Model.[57] We chose this model because, among the different subpopulations that make up IRS's tax gap estimate, it was the most analogous. When we discussed this choice with ONRR officials, they generally agreed that the model could be a good fit for its compliance program.

In adapting the IRS model for estimating a royalty gap, we attempted to calculate the likelihood of an entity being selected for a compliance review, the likelihood of that compliance review having royalty findings, and the amount of additional royalty collections based on those royalty findings. Our model attempted to group companies with similar attributes to more accurately estimate what the likely gap might be if all companies were subject to compliance reviews or audits.

This approach requires a sufficient number of variables to account for differences in characteristics of companies or properties associated with the likelihood of being selected for compliance activities, such as geographic location, company size, or other unique features. However, these data were not readily available through CIM or OMT. ONRR has some information in its royalty and compliance databases that could be used, but we did not find this information to be sufficient to estimate a more rigorous royalty gap estimate.

Based on our review of IRS tax gap models and interviews with stakeholders, ONRR could design a rigorous model that considers variables such as geographic location, company size, and the amount of royalties subject to compliance activities; however, this may require additional data collection efforts.

As previously stated, ONRR is required by statute to establish a comprehensive accounting and auditing system to provide the capability to accurately determine oil and gas royalties.[58] Furthermore, Interior's Departmental Manual states that ONRR is to use evidence-based decision-making, or the collection and analysis of information—aligned to evaluation standards—that informs decisions about current and future programs.[59] By assessing the costs and benefits of developing a plan and implementation timeline to create a royalty gap model of adequate rigor, ONRR could have a better basis for deciding on actions to improve its estimating capabilities. Further, if ONRR uses a more rigorous model to periodically estimate a royalty gap, the office could enhance its decision-making and strategic planning of compliance efforts on an ongoing basis.

[57]The IRS and other countries use various models to estimate taxes that are not paid. IRS has an ongoing effort to estimate the "tax gap" using several methodologies. The effort examines the difference between the amount of federal taxes owed by taxpayers and the amount they pay voluntarily on time. IRS periodically estimates the tax gap and its associated compliance rate to monitor the level of compliance for use in formulating tax administration and enforcement strategies.

[58]30 U.S.C. § 1711(a).

[59]Department of the Interior Departmental Manual Part 309, Chapter 4 sets forth standards, best practices, and requirements that will enable Interior to assess more fully the planning, performance, execution, equity, impacts, and outcomes of the Interior's portfolios, programs, projects, services, and operations through program evaluation. The policy includes minimum standards and practices for designing, conducting, and using evaluations that better enable Interior to achieve its goals and provide benefit for its stakeholders. This policy also provides guidance and sets forth requirements for Interior's organizations to plan, budget, implement, and use results of evaluations as an element of evidence-based decision-making. Finally, it establishes key roles and responsibilities for evaluation at Interior. The Departmental Manual chapter applies across all bureaus and offices.

In addition, Interior's Office of Policy Analysis provides leadership and coordination on statistics and evidence for Interior. The Director serves as Interior's Statistical Official, working closely with the Chief Data Officer and the Evaluation Officer to cultivate a culture of evidence and develop evidence-based decision-making policies, among other things.

Conclusions

Each year, companies pay the U.S. government billions in royalties on the sale of oil and gas produced from federal lands, which constitute a significant source of federal revenue. ONRR is tasked with verifying the accuracy of these royalty payments. ONRR has taken some steps to improve aspects of its compliance data systems to more accurately track royalty findings, violations, and royalty collections resulting from its compliance work. Further, ONRR's new compliance data system, OMT, allows staff to document an outcome to all cases, even those with no royalty findings.

However, we found that challenges remain with ONRR's compliance data system. For example, ONRR does not have an efficient way to comprehensively crosswalk compliance royalty findings with the corresponding royalty payments. Moreover, ONRR did not always have complete and accurate documentation for its compliance data systems, nor did its staff have sufficient capacity to analyze its compliance data.

We identified several opportunities to improve ONRR's data systems and compliance oversight: assessing resources necessary to conduct random compliance activities, assessing the need for a consistent and complete compliance dataset, assuring consistent and complete data, training on procedures for tracking payments resulting from compliance activities, examining the need for added functionalities to current and future information systems, ensuring data dictionaries and documentation are maintained and current, and increasing data analytics staff within the agency. By taking these actions, ONRR can better ensure that its compliance data systems are accurate and reflect the work that has been conducted, its staff have the skills to accurately record compliance data, and its data will be useful for informing and validating risk models for case selection.

We also identified opportunities for ONRR to develop an updated royalty gap model and collect additional data for this model. To improve on its preliminary model, ONRR could use a more rigorous approach, such as those used by the IRS for its tax gap modeling. ONRR could use information within its current compliance data systems, as well as identify a cost-effective approach to collect additional data needed for a more rigorous approach. By developing an updated royalty gap model and identifying the data needed to create this model, ONRR may be better able to fulfill its mission to collect, account for, and verify natural resource and energy revenues due to states, Tribes, and the U.S. Treasury. If the agency could improve its royalty collections by even one percent, it could increase royalties collected by tens of millions of dollars per year.

Recommendations for Executive Action

We are making a total of 14 recommendations to ONRR. Specifically:

The Director of ONRR should assess the benefits of incorporating randomly selected compliance activities into its workplans, including the resources necessary to conduct the appropriate number of random compliance activities, to validate its risk models. (Recommendation 1)

The Director of ONRR should consider adding related violation data to already closed cases in OMT to better assure ONRR has complete data on violations in its current compliance data system. (Recommendation 2)

The Director of ONRR should consider examining how to better link compliance royalty collections with the associated violation. (Recommendation 3)

The Director of ONRR should assess the need to develop a consistent and complete dataset from ONRR's multiple compliance data systems to better analyze historical compliance performance and inform its compliance strategy. (Recommendation 4)

The Director of ONRR should consider how to better assure that it will have a consistent and complete compliance dataset should OMT be replaced, including an assessment of migrating key compliance data to its future compliance data system. (Recommendation 5)

The Director of ONRR should reiterate its existing policy for using PAD numbers—for example, through additional training—to ONRR staff about how payments resulting from compliance activities are to be recorded in accordance with existing policies (i.e., PAD number). (Recommendation 6)

The Director of ONRR should examine adding functionality in its current and future compliance data systems to comprehensively crosswalk the PAD number between its compliance and royalty data systems as a means of providing greater assurance that all compliance payments are correct. (Recommendation 7)

The Director of ONRR should create a report with aggregate data on the federal oil and gas royalties subject to audits and compliance reviews, respectively. (Recommendation 8)

The Director of ONRR should ensure that its Technical Metadata Dictionary is accurate, including descriptions of variables and the associated values and categories. (Recommendation 9)

The Director of ONRR should ensure that its compliance data system schematic is accurate and updated to reflect any changes. (Recommendation 10)

The Director of ONRR should determine the number of staff it needs to better assure it has the necessary staff with skills to both understand ONRR's compliance data systems and analyze its data. (Recommendation 11)

The Director of ONRR should consider using the OPM IPA program to bring in additional skills needed to enhance its own compliance data analysis, which could improve compliance efforts. (Recommendation 12)

The Director of ONRR, in coordination with Interior's Statistical Official, should assess the costs and benefits of developing a plan and implementation timeline to create a royalty gap model of adequate rigor, including the collection of additional data, as needed, to inform decision-making and strategic planning of compliance efforts. (Recommendation 13)

The Director of ONRR, in coordination with Interior's Statistical Official, should periodically estimate a royalty gap to inform decision-making and strategic planning of compliance efforts. (Recommendation 14)

Agency Comments

We provided a draft of this report to Interior for review and comment. Interior concurred with all 14 recommendations. Agency comments are reproduced in appendix II.

As agreed with your office, unless you publicly announce the contents of this report earlier, we plan no further distribution until 30 days from the report date. At that time, we will send copies to the appropriate congressional committees, the Secretary of the Interior, and other interested parties. In addition, the report will be 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 members who made major contributions to this report are listed in appendix III.

Sincerely,

Frank Rusco
Director, Natural Resources and Environment

Appendix I: Objectives, Scope, and Methodology

This report (1) describes the Office of Natural Resources Revenue's (ONRR) data from calendar years 2012 through 2022 on royalties and compliance activities; (2) examines how ONRR's compliance data systems and staffing resources affected its ability to analyze compliance data, and any progress ONRR has made to improve its ability to select cases for compliance; and (3) examines ONRR's estimates of an oil and gas royalty gap, and what opportunities ONRR has to improve on its royalty gap model.

To gain a general understanding of ONRR's work, we reviewed ONRR budget, program, and guidance documents; project work plans; laws and regulations; database-related documentation; and reports; and we interviewed officials at ONRR, the Department of the Interior (Interior), and the Department of the Treasury's Internal Revenue Service (IRS).

Analysis of ONRR's Data on Royalties and Compliance Activities

To describe ONRR's royalties and compliance data, we reviewed ONRR database-related documentation; and we interviewed ONRR officials, which has its headquarters located in Lakewood, Colorado. We also reviewed guidance documents from Interior and the Office of Management and Budget (OMB). We obtained ONRR data from four sources:

1. ONRR's royalty data system, which include royalty payments reported on Form ONRR-2014;
2. its Compliance Information Management (CIM) database, ONRR's legacy compliance data system used to track its audit and compliance activity;
3. its current Operations Management Tool (OMT) database, which replaced CIM; and
4. a collection of spreadsheets ONRR used to track its nascent data mining efforts between 2013 and 2020, as the agency incorporated data mining tracking data into its OMT software.

To analyze ONRR-2014 royalty data, we obtained an extract from the database containing all federal oil and gas royalty records from calendar years 2012 through 2022. We created variables for calendar year and fiscal year, as well as a date variable with month and year based on the sale date in ONRR-2014 records. We created a variable to categorize records related to oil and gas product codes. We removed records not within calendar years 2012–2022, and those related to compliance payments. Our resulting analysis used 43,727,421 records from the ONRR-2014 database. We used the ONRR-2014 database to identify all federal oil and gas leases and agreements that had paid royalties from calendar year 2012 through 2022 and to identify all unique oil and gas companies that paid these royalties. We used these ONRR-2014 data for additional analyses using data from the ONRR compliance data systems noted below.

We used the ONRR-2014 data to identify and rank the companies based on the amount of oil and gas royalties they paid, to identify the top 10 companies that paid royalties, and to present the amount the companies paid each calendar year from 2012 through 2022. We used the ONRR-2014 data on royalties paid and sales value to estimate the effective royalty rate paid by oil and gas companies by dividing the total amount of royalties paid by the total sale amount. We identified the royalties paid for onshore and offshore production to estimate the effective royalty rate for onshore versus offshore. We used the resulting list of leases and agreements to analyze the amount of royalties collected by ONRR due to sales revenue. We also used these data to identify and count the number of companies, leases, and agreements.

To assess the reliability, reasonableness, and completeness of the ONRR-2014 database, we analyzed key data fields based on our review of data reliability studies documented in previous GAO reports.[1] We reviewed related documentation, interviewed knowledgeable agency officials, and reviewed related internal controls. We also reviewed the reliability of these data through electronic testing of the data to seek outliers, which we did not find. We found the ONRR-2014 data to be reliable for the purpose of our reporting objectives.

To obtain the CIM data, we requested that ONRR provide specific tables from the CIM database. We filtered the data to select only compliance activities for the 11 years from 2012 through 2022. We also filtered the data to select only data related to ONRR's federal oil and gas compliance activities, excluding compliance activities related to non-oil and gas products such as geothermal energy. In total, we obtained compliance data for 15,037 cases, with related data held in 29 tables, of which we used five tables.

To generate summary statistics using CIM data about ONRR compliance activities, we first filtered data for calendar years 2012 through 2022. We chose this time frame because it represented the most recent data at the time of our review for compliance activities. CIM is a relational database, meaning it is composed of tables that can be linked together in a relational system.

To test the reliability and completeness of CIM data, we consulted ONRR documentation, such as data dictionaries and a historic database schematic, and interviewed ONRR officials to understand how to accurately connect CIM tables and properly filter fields to correctly analyze the data. We also conducted electronic testing, reviewed agency documents, and interviewed agency officials about the results of our tests and reviews.

In our electronic tests, we found a small percentage of outlier data records. For example, we found records showing royalty collections much higher than other records. ONRR officials told us that some of these outliers were appropriate. In these cases, we included such records. We generally found CIM data to be reliable for the purposes of our reporting objectives.

To obtain the OMT data, we requested from ONRR specific tables from the OMT database. We filtered the data to select compliance activities for the 11 years from 2012 through 2022. We also filtered the data to select data related to ONRR's federal oil and gas compliance activities, excluding compliance activities related to non-oil and gas products such as geothermal energy. In total, we used compliance data for 11,083 cases, with related data held in 48 tables, of which we used nine tables.

To generate summary statistics using OMT data about ONRR compliance activities, we first filtered data for calendar years 2012 through 2022. As with data from CIM, OMT's predecessor system, we chose this time frame because it represented the most recent data at the time of our review for compliance activities. Like CIM, OMT is a relational database.

To test the reliability and completeness of OMT data, we consulted ONRR documentation, such as incomplete data dictionaries and a historic database schematic, and interviewed ONRR officials to understand how to

[1]GAO-19-410 and GAO-09-549.

accurately connect OMT tables and properly filter data to correctly analyze the data. We also conducted electronic testing, reviewed agency documents, and interviewed agency officials about the results of our tests and reviews. We generally found OMT data to be reliable for the purposes of our reporting objectives.

During our analysis, we continually conducted electronic testing of OMT data for completeness. We found that OMT data indicated a larger-than-expected decrease in the number of violations from 2018 through 2021. We consulted with ONRR officials, who told us that ONRR had not provided complete data about violations from OMT. The officials explained that, in about 2017, ONRR created three additional, separate tables within the OMT database to store violations, and that this was the reason for the decline in violations. The OMT documentation ONRR provided did not mention the nature or use of these tables. We requested the data from these tables and were able to correct and complete our analysis.

We learned that as ONRR transitioned from its CIM database to its OMT database, some ONRR individual compliance activities were represented in both databases. To accurately analyze ONRR data about its compliance activities, we combined CIM and OMT into a single dataset.

To analyze the data mining spreadsheets ONRR used to track its nascent data mining efforts between 2011 and 2020, we obtained the spreadsheets used to track data mining reporting errors or variances prior to their inclusion in OMT and available documentation from ONRR officials. ONRR's data mining spreadsheets report ONRR's work from 2011 through 2020 to detect and resolve data errors in the oil and gas royalty data prior to audits and compliance reviews. Officials stated that data mining generally identifies obvious data errors that ONRR staff work with companies to correct. ONRR used these data mining spreadsheets until it moved its data mining efforts within its OMT system.

To test the reliability of ONRR's data mining spreadsheets, we reviewed related documentation, such as instructional documentation corresponding to its data mining spreadsheets and interviewed knowledgeable agency officials. We also conducted electronic manual data testing for missing data, outliers, and obvious errors.

Our manual tests of the data mining spreadsheets that corresponded to our reporting period found that some key variables were missing from some of the spreadsheets that would indicate the time frame of royalty payments. We also found that some of the spreadsheets did not separate tribal royalties on oil and gas produced from trust lands from federal royalties. We found that we were not able to combine the compliance activities shown in these spreadsheets with the rest of ONRR's compliance activities. As a result, we found that these data were reliable only for the purpose of presenting as background information in our report.

Analysis of How ONRR's Compliance Data Systems and Staffing Resources Affected Its Ability to Analyze Compliance Data

To examine how ONRR's data systems and staffing resources affected its ability to analyze compliance data, and any progress ONRR has made to improve its ability to select cases for compliance, we reviewed laws, regulations, and guidance documents relevant to ONRR, such as GAO and OMB guidance on internal controls in the federal government,[2] Interior policy documents for data management,[3] data sharing,[4] and ONRR program documentation on data management. We interviewed ONRR officials knowledgeable about the agency's data systems. We also interviewed the Department of the Treasury's Internal Revenue Service (IRS) officials about options to address the skills gap.

To examine use of random compliance reviews or audits in ONRR compliance work, we reviewed CIM and OMT documentation and data. Our analysis found one random compliance type, coded as "Random Audit" within the CIM database. We analyzed all instances of this compliance type within the CIM data to identify the last case conducted with the "Random Audit" compliance type.

To examine documentation of compliance activities and linkages between violations and royalty collection, we attempted to analyze the frequency of violations across the compliance data systems. However, in presenting our analysis of violation data to ONRR officials, we learned that because of how CIM tracks violation data, it is not possible to determine the number and type of violations, and the method in which we attempted to do so led to an overcount of violations. At the same time, we also learned that ONRR had not initially allowed states and Tribes to record violations in its "light cases" in OMT, meaning that our analysis would lead to an undercount. As a result, we determined that the violation data were unreliable, as discussed in this report, for the purposes of our reporting objectives.

To examine the ability to crosswalk royalty collection payments, we used the CIM and OMT data to identify all royalty collections payments for federal oil and gas properties for 2012–2022, as well as their Payor Assigned Document (PAD) number. We then attempted to match these PAD numbers with records in the ONRR-2014 royalty data system to generate statistics on the number and percentage of CIM and OMT cases that could be crosswalked.

Analysis of ONRR's Estimates of an Oil and Gas Royalty Gap

To examine ONRR's estimates of an oil and gas royalty gap, and what opportunities ONRR has to improve its royalty gap model, we conducted literature reviews examining both federal and foreign royalty gap modeling efforts; reviewed relevant past GAO reports; and interviewed an IRS consultant who developed a tax gap model, and IRS and ONRR officials about calculating a potential royalty gap. To examine ONRR's royalty gap model, we analyzed the assumptions inherent to the model and the reasonableness of the model's output. We also reviewed alternative royalty gap methodologies with ONRR officials. To examine a potential alternative royalty gap model and estimate, we attempted to adapt an IRS tax gap model used for small corporations. We developed an econometric model based on this IRS model and explored estimating a royalty gap with available data from ONRR's CIM and OMT databases. We found there were insufficient data to build the level of detail necessary for the model.

[2]GAO, *Standards for Internal Control in the Federal Government*, GAO-14-704G (Washington, D.C.: September 2014); and Office of Management and Budget, Management's Responsibility for Enterprise Risk Management and Internal Control, OMB Circular No. A-123 (July 15, 2016).

[3]U.S. Department of the Interior, Office of the Chief Information Officer, *Data Quality Management Guide* (August 2008).

[4]U.S. Department of the Interior, Chief Information Officer, *Data Sharing Policy, Memorandum to Interior Heads of Bureaus and Offices and Bureau and Office Deputy Directors* (May 8, 2023).

We conducted this performance audit from February 2020 to August 2024 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.

Appendix II: Comments from the Department of the Interior

United States Department of the Interior

OFFICE OF THE SECRETARY
Washington, DC 20240

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) an opportunity to review and comment on the draft Government Accountability Office (GAO) report titled *Federal Oil and Gas Royalties: Opportunities Exist to Improve Interior's Compliance Program* (GAO-24-103676). We appreciate GAO's review of the Department's Office of Natural Resources Revenue's (ONRR) federal royalty compliance efforts.

In the report, GAO issued the Department 14 recommendations to address its findings. Below is a summary of actions planned or taken to address implementation of the recommendations.

Recommendation 1: The Director of ONRR should assess the benefits of incorporating randomly selected compliance activities into its workplans, including the resources necessary to conduct the appropriate number of random compliance activities, to validate its risk models.

Response: Concur. The Director of ONRR will assess the benefits of incorporating randomly selected compliance activities into its workplans, including the resources necessary to complete the cases, and if the impact of those cases and their results will validate the risk models in use.

Recommendation 2: The Director of ONRR should consider adding related violation data to already closed cases in OMT to better assure ONRR has complete data on violations in its current compliance data system.

Response: Concur. The Director of ONRR will consider adding related violation data to already closed cases in OMT through cost-benefit analysis for a system modification and manual research to identify accurate violation(s) information in OMT. System users cannot make changes (edits, additions, or deletions) to case information once it is closed in OMT without an intervention from the IT contractor. This is a system requirement ONRR established to protect the case record. ONRR will evaluate the possibility and cost of adding violation information to closed OMT cases.

Recommendation 3: The Director of ONRR should consider examining how to better link compliance royalty collections with the associated violation.

Response: Concur. The Director of ONRR will consider examining how to better link compliance royalty collections with the associated violation. For most audits and compliance reviews, ONRR identifies multiple interdependent violations. Therefore, any breakdown of royalty underpayments by violation type may not always be feasible, and even when possible, will require a significant number of additional manual steps and analyses, by both ONRR and industry, further impacting ONRR's ability to engage in new compliance efforts.

Recommendation 4: The Director of ONRR should assess the need to develop a consistent and complete dataset from ONRR's multiple compliance data systems to better analyze historical compliance performance and inform its compliance strategy.

Response: Concur. The Director of ONRR will assess the need to develop a consistent and complete dataset from ONRR's multiple compliance data systems to normalize the data between CIM and OMT as a foundation for building a more complete historical picture of our compliance results. ONRR will consider the cost-benefit of combining historical compliance data systems with current systems (OMT), as well as focusing efforts on moving forward with a planned and documented approach for using the current OMT system information to measure compliance performance and inform our compliance strategy.

Recommendation 5: The Director of ONRR should consider how to better assure that it will have a consistent and complete compliance dataset should OMT be replaced, including an assessment of migrating key compliance data to its future compliance data system.

Response: Concur. Should ONRR decide to replace OMT before the end of fiscal year 2025, the Director of ONRR will consider assessing the existing dataset to identify key compliance data fields to carry into future compliance systems.

Recommendation 6: The Director of ONRR should reiterate its existing policy for using PAD numbers, for example through additional training, to ONRR staff about how payments resulting from compliance activities are to be recorded in accordance with existing policies (i.e., PAD number).

Response: Concur. The Director of ONRR agrees to emphasize the proper use of PAD numbers and adjustment codes per the policy. ONRR will communicate its existing policy for using the assigned PAD numbers and the appropriate adjustment reason codes both internally, as part of the training curriculum, and externally through reporter training.

Recommendation 7: The Director of ONRR should examine adding functionality in its current and future compliance data systems to comprehensively crosswalk the PAD number between its compliance and royalty data systems as a means to provide greater assurance that all compliance payments are correct.

Response: Concur. The Director of ONRR will examine adding functionality to automatically populate collections to OMT. ONRR will initiate discussions with our IT contractor to evaluate the cost-benefit of a system change to add this functionality. Should ONRR decide to replace

OMT before the end of fiscal year 2025, ONRR will consider functionality that links compliance related CMP-2014 adjustments to the compliance data system.

Recommendation 8: The Director of ONRR should create a report with aggregate data on the federal oil and gas royalties subject to audits and compliance reviews, respectively.

Response: Concur. The Director of ONRR is currently evaluating a report that aggregates data on the federal oil and gas royalties subject to audits and compliance reviews and determines the percentage of royalties covered by these activities as compared to the total royalties paid for a sales year. Federal oil and gas royalties reported on the ONRR-2014 and CMP-2014, subject to audits and compliance reviews, are currently identified in OMT at the case level. This includes the royalty value for the lease universe (scope of the work), the royalty value for the sample selection (sample), and the percentage of coverage based on that sample. ONRR is researching methods to summarize this information in the aggregate for all audits and compliance reviews to compare to the royalty universe.

Recommendation 9: The Director of ONRR should ensure that its Technical Metadata Dictionary is accurate, including descriptions of variables and the associated values/categories.

Response: Concur. The Director of ONRR will identify and address gaps in the compliance system technical metadata dictionary to include associated values and variable descriptions. ONRR will evaluate current processes and controls to improve the accuracy of, and timely updates to, the technical metadata dictionary.

Recommendation 10: The Director of ONRR should ensure that its compliance data system schematic is accurate and updated to reflect any changes.

Response: Concur. The Director of ONRR acknowledges the importance of complete and accurate system schematics. ONRR will work with key stakeholders to evaluate the current schematic and identify any gaps.

Recommendation 11: The Director of ONRR should determine the number of staff it needs to better assure it has the necessary staff with skills to both understand ONRR's compliance data systems and analyze its data.

Response: Concur. Considering current and future budgetary constraints, the Director of ONRR will determine the number of staff needed to both understand ONRR's compliance data system and analyze the data. Continued budgetary reductions hamper ONRR's ability to reallocate or hire additional staff.

Recommendation 12: The Director of ONRR should consider using the OPM IPA program to bring in additional skills needed to enhance its own compliance data analysis, which could improve compliance efforts.

Response: Concur. The Director of ONRR will consider the OPM IPA program for future additional staffing considerations to enhance its compliance data analysis. Continued budgetary reductions negatively impact ONRR's current ability to fund additional resources through OPM's IPA program.

Recommendation 13: The Director of ONRR, in coordination with Interior's Statistical Official, should assess the costs and benefits of developing a plan and implementation timeline to create a royalty gap model of adequate rigor, including the collection of additional data, as needed, to inform decision-making and strategic planning of compliance efforts.

Response: Concur. The Director of ONRR will conduct a study to assess the costs and benefits of conducting a royalty gap analysis of adequate rigor, including the collection of additional data. ONRR will consult with Interior's Statistical Official in this process. ONRR strongly recommends combining Recommendations 13 and 14 due to their interconnected nature.

Recommendation 14: The Director of ONRR, in coordination with Interior's Statistical Official, should periodically estimate a royalty gap to inform decision-making and strategic planning of compliance efforts.

Response: Partially concur. Based on the outcome of the cost benefit study from recommendation 13, the Director of ONRR may institute a process to periodically estimate a royalty gap to inform decision making and strategic planning efforts. ONRR strongly recommends combining Recommendations 13 and 14 due to their interconnected nature.

If you have any questions or need additional information about this response, please contact the PFM AM team at DOI_PFM_AM@ios.doi.gov.

Sincerely,

JOAN MOONEY

Digitally signed by JOAN MOONEY
Date: 2024.07.22 14:26:26 -04'00'

Joan M. Mooney
Principal Deputy Assistant Secretary
Exercising the Delegated Authority of the Assistant Secretary for Policy, Management and Budget

Accessible Text for Appendix II: Comments from the Department of the Interior

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Sincerely,

JOAN MOONEY

Digitally signed by JOAN MOONEY
Date: 2024.07.22
14:26:26 -04'00'

Joan M. Mooney
Principal Deputy Assistant Secretary
Exercising the Delegated Authority of the Assistant
Secretary for Policy, Management and Budget

Appendix III: GAO Contact and Staff Acknowledgments

GAO Contact

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

Staff Acknowledgments

In addition to the contact named above, Christine Kehr (Assistant Director), Glenn C. Fischer (Analyst in Charge), Adrian Apodaca, Lee Carroll, Wil Gerard, Cindy Gilbert, Cristian Ion, Michael Kendix (in memoriam), Jesse Lamarre-Vincent, Josh Leiling, Joe Maher, Jerry Sandau, Caitlin Scoville, Tom Short, Jared Smith, Courtney Tepera, and Robyn Trotter made key contributions to this report.

In Memoriam

Michael Kendix
Assistant Director, Applied Research and Methods

Michael Kendix was a key contributor to this report before his death in June 2024, and we dedicate this report in his memory. For the past almost two decades, Michael made significant and essential contributions to countless reports on energy issues. His skills and insights led to numerous findings and recommendations that improved the functioning of energy markets, improved public understanding of programmatic challenges, and ultimately saved taxpayers money. Some of the areas in which his work was instrumental include federal energy and water management, the Federal Energy Regulatory Commission’s oversight of electricity markets, Interior’s management of oil and gas lease auctions, royalty relief to oil and gas operators, and the America Competes Act.

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