



April 2015

OIL AND GAS RESOURCES

Interior's Production
Verification Efforts and
Royalty Data Have
Improved,
but Further Actions
Needed

Why GAO Did This Study

Production of oil and natural gas from leased federal lands and waters is a significant source of revenue for the federal government—accounting for almost \$48 billion for fiscal years 2009 through 2013. GAO has issued many reports on Interior’s management of federal oil and gas resources, including its programs for verifying oil and gas production volumes and ensuring accurate royalty collections. These reports raised questions about whether the government was collecting all the revenue it was due and included 36 recommendations to strengthen royalty collection, among other things. In 2011, GAO added Interior’s management of federal oil and gas resources to its list of programs at high risk of fraud, waste, abuse, and mismanagement.

GAO was asked to review Interior’s efforts to improve verification of oil and gas produced from federal leases and the accuracy of royalty data. This report examines efforts Interior has taken since fiscal year 2009 and the reasonableness and completeness of Interior’s royalty data. GAO reviewed relevant laws, regulations, and guidance; analyzed Interior data for fiscal years 2009 through 2013; and interviewed Interior officials.

What GAO Recommends

GAO recommends that Interior meet its established time frames for updating its onshore measurement regulations, reconvene its gas and oil measurement team, and schedule and complete the review of the implementation of its commingling agreement guidance, among other things. Interior generally concurred with GAO’s recommendations.

View [GAO-15-39](#). For more information, contact Frank Rusco at (202) 512-3841 or ruscof@gao.gov.

OIL AND GAS RESOURCES

Interior’s Production Verification Efforts and Royalty Data Have Improved, but Further Actions Needed

What GAO Found

The Department of the Interior has made considerable progress in improving both the verification of oil and gas produced from federal leases and the reasonableness and completeness of royalty data. Since fiscal year 2009, Interior has implemented 28 of 36 GAO recommendations made in these areas; however, key challenges remain, including the following:

- Interior has not updated its regulations for onshore oil and gas measurement in over 25 years and, as a result, they do not reflect newer measurement technologies and standards adopted by industry, hampering Interior’s ability to have reasonable assurance that oil and gas are being measured accurately. According to agency officials, Interior is developing and plans to issue draft regulations in fiscal year 2015 and finalize them in fiscal year 2016. However, Interior has twice before unsuccessfully attempted to update these regulations. Interior officials noted that updating the regulations has been a lengthy process, in part, because the agency has been focused on updating other regulations. Until its regulations better reflect current measurement technologies and standards, Interior cannot provide reasonable assurance that companies have a consistent and sound basis from which to measure the production of oil and gas.
- Interior’s team of oil and gas measurement specialists—a team tasked with improving the consistency of onshore and offshore measurement policies and other ongoing responsibilities outlined in GAO recommendations—is no longer meeting as required by the team’s charter. Historically, there was limited coordination between Interior’s onshore and offshore measurement staff, which affected the consistency of its measurement regulations and policies. Interior officials said that the team provided a useful venue for discussing measurement issues, but it has not officially met since September 2011. By ensuring the team meets, Interior could increase communication among its staff with measurement expertise and better ensure consistent measurement policies.
- Interior issued new guidance outlining criteria for approving agreements that allow oil or gas produced from onshore federal leases to be commingled with oil or gas produced from other federal, state, or private leases before being measured but did not schedule or complete a review of its effectiveness after its implementation. In March 2010, GAO found that Interior staff were approving onshore commingling agreements inconsistently, and that the agreements were structured in a manner that made it difficult for staff to verify volumes of oil and gas produced. In June 2010, Interior committed to issuing revised guidance and then scheduling a review of its implementation after 1 year. In July 2013, Interior issued guidance that requires it to have the ability to verify that production is accurately measured and reported. By scheduling and completing the review, Interior would be better informed about the extent to which its staff are consistently applying the new guidance to commingling agreement requests and whether the guidance is effective and has corrected identified deficiencies or produced improvements. This would reduce the risk that the agency is continuing to approve commingling agreements that put federal royalties at risk.

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Abbreviations

AFMSS	Automated Fluid Minerals Support System
BLM	Bureau of Land Management
BOEM	Bureau of Ocean Energy Management
BOEMRE	Bureau of Ocean Energy Management, Regulation, and Enforcement
BSEE	Bureau of Safety and Environmental Enforcement
BTU	British thermal unit
EDI	Electronic Data Interchange
GOADS	Gulfwide Offshore Activities Data System
GVS	Gas Verification System
IT	information technology
LLS	Light Louisiana Sweet
LVS	Liquid Verification System
MMS	Minerals Management Service
MRMSS	Minerals Revenue Management Support System
NPR-A	National Petroleum Reserve Alaska
NTL	Notice to Lessees
OEMM	Offshore Energy and Minerals Management
OGOR	Oil and Gas Operations Report
ONRR	Office of Natural Resources Revenue
TIMS	Technical Information Management System

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April 7, 2015

The Honorable Raúl Grijalva
Ranking Member
Committee on Natural Resources
House of Representatives

The Honorable Ron Wyden
United States Senate

The Honorable Peter DeFazio
House of Representatives

Production of oil and natural gas from leases on federal lands and waters is an important part of the nation's energy portfolio and a significant source of revenue for the federal government. For fiscal years 2009 through 2013, the Department of the Interior's Office of Natural Resources Revenue (ONRR) reported collecting almost \$48 billion in royalties and other payments from companies that developed and produced oil and natural gas from federal leases.¹ These royalties represent one of the federal government's largest nontax sources of revenue.

Interior's Bureau of Land Management (BLM) is responsible for leasing federal lands, and its Bureau of Ocean Energy Management (BOEM) is responsible for leasing federal waters. Federal leases give companies the option to develop oil and natural gas over a specified period of time. Companies that purchase these leases are then obligated to pay royalties on any oil and gas they produce from them to ONRR. The royalty payments are determined by multiplying a royalty rate specified in the lease by the sales value of the resource. Because the sales value is based in part on measured production volumes, BLM is responsible for

¹In 2010 and 2011, Interior reorganized its Minerals Management Service's Offshore Energy and Minerals Management into the Bureau of Ocean Energy Management, Regulation, and Enforcement, which was subsequently split into the Bureau of Ocean Energy Management and the Bureau of Safety and Environmental Enforcement. It also reorganized the Minerals Management Service's Minerals Revenue Management into the Office of Natural Resources Revenue. For the purposes of this report, we refer to the current relevant bureaus when describing our prior recommendations and actions the bureaus have taken.

verifying that production volumes are measured accurately for onshore leases, and Interior's Bureau of Safety and Environmental Enforcement (BSEE) is responsible for verifying production volumes for offshore leases. BLM and BSEE regulations establish the basis for policies on how companies are to measure the quantity of oil and gas and for how BLM and BSEE are to conduct oil and gas production inspections to ensure that oil and gas are accurately measured. Additionally, companies are to report production volumes and sales values from the leases to ONRR, which uses the information to verify that companies are accurately paying royalties.

Over the past several years, we have issued a number of reports identifying Interior's challenges in managing federal oil and gas resources,² including reports on its programs for verifying oil and gas production volumes and ensuring accurate royalty collections. For example, in September 2008 and July 2009,³ we found shortcomings in Interior's ability to ensure that royalty payment data were reasonable and complete. In addition, in March 2010,⁴ we found that Interior's policies and practices did not provide reasonable assurance that oil and gas produced from federal leases was being accurately measured. These reports raised questions about whether the government was collecting all the revenue it was due and included numerous recommendations intended to provide greater assurance that oil and gas were accurately measured and that royalties were paid.⁵ In February 2011, in part because of these challenges and the large number of recommendations that remained unimplemented, we added Interior's management of

²A list of related GAO products appears at the end of this report.

³GAO, *Mineral Revenues: Data Management Problems and Reliance on Self-Reported Data for Compliance Efforts Put MMS Royalty Collections at Risk*, [GAO-08-893R](#) (Washington, D.C.: Sept. 12, 2008) and *Mineral Revenues: MMS Could Do More to Improve the Accuracy of Key Data Used to Collect and Verify Oil and Gas Royalties*, [GAO-09-549](#) (Washington, D.C.: July 15, 2009).

⁴GAO, *Oil and Gas Management: Interior's Oil and Gas Production Verification Efforts Do Not Provide Reasonable Assurance of Accurate Measurement Production Volumes*, [GAO-10-313](#) (Washington, D.C.: Mar. 15, 2010).

⁵See [GAO-08-893R](#), [GAO-09-549](#), and [GAO-10-313](#) for details on recommendations. See appendix I for a listing of recommendations from these reports and their status.

federal oil and gas resources to our list of programs at high risk of fraud, waste, abuse, and mismanagement or in need of transformation.⁶

You asked us to provide information on Interior's efforts to improve verification of oil and gas produced from federal leases and the accuracy of royalty data. This report examines steps Interior has taken to improve the verification of volumes of oil and gas produced from federal leases since fiscal year 2009 and the reasonableness and completeness of Interior's royalty data.

To do our work, we reviewed relevant laws, regulations, and guidance from Interior, BLM, ONRR, BSEE, and BOEM. We also reviewed documentation Interior provided to support actions it took to implement our prior recommendations. We interviewed officials in BLM headquarters, 7 selected BLM field offices, and 8 of the 10 BLM state offices with a State Inspection and Enforcement Coordinator (that responded to our requests) about their oil and gas production verification programs.⁷ The field offices we selected were the same ones we examined in our March 2010 report, which were selected using a nongeneralizable sample that provided a range of oil and gas operations and state jurisdictions.⁸ Specifically, we interviewed officials in BLM's field offices in Colorado River Valley and White River in Colorado,⁹ Buffalo and Pinedale in Wyoming, Vernal in Utah, and Carlsbad and Farmington in New Mexico. We contacted all 10 of the BLM state offices where a State Inspection and Enforcement Coordinator was located, and 8 responded to our requests for information: California, Colorado, Eastern States (Northeastern), Eastern States (Southeastern), Montana, New Mexico, Nevada, and Utah.¹⁰ Additionally, we interviewed officials in BSEE's New Orleans Regional Office—which has oversight of production verification in the Gulf of Mexico, where the majority of oil and gas produced from

⁶GAO, *High-Risk Series: An Update*, [GAO-11-278](#) (Washington, D.C.: February 2011).

⁷State Inspection and Enforcement Coordinators are to provide oversight of BLM field offices' inspection and enforcement activities within the state.

⁸[GAO-10-313](#).

⁹The jurisdiction of the Colorado River Valley Field Office was previously included within the Glenwood Springs Field Office.

¹⁰We were unable to obtain information from the Alaska and Wyoming state offices as they did not respond to our request for information.

federal offshore leases occurs—and all five Gulf of Mexico District Offices about the agency’s oil and gas production verification program. Those district offices were Houma, Lafayette, Lake Charles, and New Orleans in Louisiana, as well as Lake Jackson in Texas. We also interviewed officials in BOEM’s New Orleans Regional Office—which has oversight of leases in the Gulf of Mexico—about the agency’s oversight of oil and gas activities. Additionally, we interviewed officials in ONRR’s Lakewood, Colorado, office—which is responsible for collecting royalties paid on oil and gas produced from both onshore and offshore federal leases—about the agency’s efforts to improve royalty collections. We also interviewed members of an Interior panel of oil and gas measurement specialists about the status of the team’s ongoing activities and their efforts to implement our recommendations, among other topics.

We obtained fiscal year 2009 through fiscal year 2013 inspection data from BSEE’s Technical Information Management System (TIMS) information technology (IT) system for offshore inspections and BLM’s Automated Fluid Minerals Support System (AFMSS) IT system for onshore inspections. We assessed the reliability of these data by (1) reviewing existing documentation about the data and the system that produced them; (2) interviewing agency officials knowledgeable about the data; and (3) verifying the results of our work with agency officials. We determined that BSEE’s and BLM’s data for completed production inspections were sufficiently reliable for the purposes of this report. In addition, to assess Interior’s progress toward improving the completeness and reasonableness of ONRR’s royalty data, we obtained and assessed the reliability of the fiscal year 2013 royalty data from ONRR’s Minerals Revenue Management Support System (MRMSS) IT system by (1) conducting electronic testing for obvious errors in completeness and accuracy, (2) reviewing documentation, (3) interviewing agency officials knowledgeable about the data, and (4) verifying the results of our work with agency officials. We determined that the ONRR royalty data were sufficiently reliable for the purposes of our report. We also compared actions that Interior took to standards for internal control in the federal government.¹¹

¹¹GAO, *Standards for Internal Control in the Federal Government*, [GAO/AIMD-00-21.3.1](#) (Washington, D.C.: November 1999).

We conducted this performance audit from September 2013 to April 2015 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 objective.

Background

This section provides an overview of (1) Interior's oversight of oil and gas resources, (2) the oil and gas leasing and permitting process, (3) how oil and gas are measured, (4) Interior's production accountability inspection program, (5) venting and flaring of natural gas, and (6) our prior recommendations on Interior's management of federal oil and gas resources.

Interior's Oversight of Oil and Gas Resources

Created by Congress in 1849, Interior oversees the nation's publicly owned natural resources, including parks, wildlife habitat, and natural resources—including oil and natural gas—on millions of acres onshore and offshore in the waters of the outer continental shelf. With regard to oil and gas, Interior leases federal lands and waters to companies that produce oil and gas, issues permits for oil and gas drilling, establishes guidelines for measuring oil and gas, and conducts production inspections. Historically, Interior's BLM managed onshore federal oil and gas activities, while the Minerals Management Service (MMS) managed offshore activities and collected royalties for all leases.

In May 2010, shortly after the explosion of the *Deepwater Horizon* drilling rig in the Gulf of Mexico and the associated oil spill, in an effort to separate major functions of offshore oil and gas management, Interior announced the reorganization of MMS into the Bureau of Ocean Energy Management, Regulation, and Enforcement (BOEMRE), responsible for offshore oil and gas management, and the ONRR, responsible for revenue collections. Subsequently, on October 1, 2011, BOEMRE was separated into two bureaus—BOEM, which is responsible for leasing and resource management, and BSEE, which is responsible for permitting and inspections.

Leasing and Permitting Process

To drill on federal lands and waters, companies must first obtain a federal lease and permit from Interior.

Leasing

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 secures a lease and begins producing oil and gas, it 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. In some cases, several companies form partnerships to explore and develop oil and gas leases, thereby sharing the risk, the costs, and the 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.

Interior's management of oil and gas leases varies depending on whether the lease is onshore or offshore. For onshore leases, the Mineral Leasing Act of 1920 charged Interior with leasing oil and gas on both federal lands and private lands where the federal government has retained mineral rights. Interior's BLM is responsible for managing approximately 700 million subsurface onshore acres, including the acreage leased for oil and gas development, through its 12 state offices; 38 district offices; and 127 field offices, 32 of which have oil and gas activities within their jurisdiction and are located mostly in the western United States.¹² For offshore leases, the Outer Continental Shelf Lands Act, as amended, gave Interior the responsibility for leasing and managing approximately 1.71 billion offshore acres.¹³ Interior is to oversee this through BOEM's three regional offices.

Permitting

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. As with leases, Interior's management of drilling permits varies depending on whether the lease is onshore or offshore.

¹²BLM is also responsible for managing the approximately 23 million acres of land in the National Petroleum Reserve Alaska (NPR-A) in the North Slope of Alaska. The Naval Petroleum Reserve Production Act of 1976, as amended, Pub. L. No. 94-258, 90 Stat. 307 (Apr. 5, 1976), governs federal oil and gas leasing in the NPR-A.

¹³The outer continental shelf (submerged lands) is outside the territorial jurisdiction of all 50 states but within U.S. jurisdiction and control and consists of submerged federal lands, generally extending seaward between 3 and 200 nautical miles of the U.S. coastline.

To secure a permit to drill on onshore leases, a company must submit an application for a drilling permit to the appropriate BLM field office. BLM officials evaluate the company's proposal for drilling to ensure that it conforms with the relevant BLM land use plan for the area and applicable laws and regulations, including those focused on protecting the environment. In evaluating an application for a drilling permit, a BLM petroleum engineer is to review technical aspects of the proposed well design and drilling practices. In most cases, a BLM petroleum engineer will not need to specifically approve any oil or gas measurement equipment if a company plans to use metering technologies addressed by BLM's measurement regulations. However, at a company's request, BLM will also consider whether to approve a variance from regulations governing the use of alternative metering technologies. After BLM approves a drilling permit, the company may drill the well and commence production. Within 60 days of drilling, the operator must file a diagram of the facility that accurately reflects the relative positions of the production equipment, piping, and metering systems.

To secure a permit to drill on offshore leases, the operator must submit an application for a drilling permit to the appropriate BSEE district office, where the district engineer is to first review it for completeness. The district engineer is to then review the technical elements of the application to verify that they conform to all applicable regulations. After all reviewing is complete, the district engineer may approve the permit. Once drilling is completed—and if the operator discovers that oil and gas can be economically produced from the well—the operator may be required to submit an application to the appropriate BSEE regional office to begin production that describes, among other things, how oil and gas will be measured. If the application is approved, the BSEE regional office is to assign a facility measurement point, which is an identifier for each location where oil and gas produced will be measured for royalty purposes, a requirement that BLM does not have.

Oil and Gas Measurement

Interior has established specific regulations and other mechanisms for how operators and lease holders may measure oil and gas produced from federal leases. Key controls include using the appropriate meter and

other processing equipment, witnessing meter calibrations, witnessing sales, and verifying that volume calculations were completed accurately.¹⁴

Interior also has the authority to approve measurement agreements that allow oil or gas produced from a federal lease to be combined with oil or gas from another federal, state, or private lease. These agreements allow the combined volumes and varying qualities of oil or gas to be measured for royalty determination at some specified point downstream, rather than on each of the individual upstream leases. Each lease is then allocated a specific portion of the combined volume according to an agreement filed with Interior known as a commingling agreement. Operators may request approval for commingling for several reasons, including reducing the costs of installing and maintaining facilities and meters in marginally producing fields and simplifying their measurement operations. Additionally, BLM may encourage commingling to reduce the need for additional equipment at each well, which reduces the environmental impacts on the land surrounding the well.

Interior's Production Accountability Inspection Programs

To ensure compliance with applicable laws, regulations, and other requirements, both BLM and BSEE have inspection and enforcement programs that are designed to verify that the operator complies with all requirements at a well or lease site, including those related to measurement. The authority for inspecting wells and leases for this purpose is derived from the Federal Oil and Gas Royalty Management Act of 1982, as amended. This act requires the Secretary of the Interior to develop guidelines that specify the coverage and frequency of inspections. Interior has delegated responsibilities for implementing the act to BLM for onshore leases and to BSEE for offshore leases. Together, BLM and BSEE are currently responsible for ongoing oversight of oil and gas operations on more than 29,000 producing leases. BLM and BSEE have developed regulations, policies, and procedures to conduct inspections of onshore and offshore leases, respectively.

¹⁴Because 100 percent measurement accuracy is not possible, measurement specialists commonly refer to uncertainty ranges—or ranges of expected values. Both regulators and industry acknowledge this uncertainty and, to varying extents, incorporate uncertainty ranges into their measurement requirements. What both regulators and industry attempt to avoid, however, is systematic error or bias—volumes that are consistently over- or under-measured.

For federal onshore leases, production inspections are BLM’s primary mechanism for providing reasonable assurance that oil and gas are being measured and handled appropriately. The requirements that companies are to follow on federal leases, and which are used to verify compliance during inspections, are currently specified in three BLM onshore orders issued pursuant to regulation. Onshore Order Number 3 specifies requirements for the minimum standards for site security by ensuring that oil and gas produced from federal onshore leases are properly handled to prevent theft and loss and enable accurate measurement. Included in the order’s requirements is that the operator is to submit a diagram of the facility that includes the locations of key infrastructure, such as metering equipment. Onshore Order Number 4 specifies requirements for oil measurement. Onshore Order Number 5 specifies requirements for gas measurement.

BLM’s petroleum engineer technicians are responsible for conducting production inspections.¹⁵ Production inspections typically consist of four key activities: (1) reviewing 6 months of production records to look for any anomalies, (2) assessing the physical conditions of the production area by looking for refuse or any leaking equipment, (3) verifying that the company-submitted diagram of the facility reflects what is actually at the site, and (4) examining a sample of both oil and gas measurement operations.¹⁶ Onshore production inspections are tracked in BLM’s AFMSS IT system.

For federal offshore leases, BSEE’s efforts to verify measurement include physical inspections of offshore oil and gas production platforms. BSEE’s inspectors are responsible for a variety of inspections, including safety and environmental inspections, as well as those focusing on oil and gas

¹⁵Petroleum engineer technicians also conduct other types of inspections, including for drilling, abandonment (when wells stop producing and are plugged), and environmental (to insure abandoned sites are properly reclaimed). Petroleum engineer technicians conduct and track production inspections by inspecting “cases”—which may be a lease or a unit agreement, which can have from 1 to over 100 wells—to verify that oil and gas are being measured in accordance with regulations and policies.

¹⁶Such examination may involve witnessing a gas meter calibration, independently recalculating the gas production volumes using key values recorded by the electronic flow computer—a device attached to meter to track key parameters for calculating and a variety of other information, or gauging an oil tank. BLM also has production accountability technicians that are responsible for completing in-office detailed reviews of meter statements, calibration records, and oil and gas production volumes reported to ONRR.

production. BSEE’s production inspections include two types: site security inspections and witnessing of meter calibrations. Site security inspections typically include verifying that piping connected to the meter is sealed to prevent theft and ensuring there are no bypasses around meters that could allow oil or gas to flow unmeasured. Witnessing of meter calibrations requires an inspector be physically present and to witness oil meter provings and gas meter calibrations.¹⁷ Offshore production inspections are tracked in BSEE’s TIMS IT system.¹⁸

Venting and Flaring of Natural Gas

Throughout the production of oil and gas on federal leases, operators may intermittently release some gas directly to the atmosphere (vent), or burn the gas (flare) in response to maintenance needs or equipment failures.¹⁹ BLM and BSEE allow operators to release certain amounts of

¹⁷The process for ensuring that oil meters remain accurate through many years of use is called “proving.” Meters are proved by comparing their measurement with the measurement of another device called a prover. The prover itself is also tested for accuracy and must comply with standards maintained by the U.S. National Institute of Standards and Technology.

¹⁸According to Interior officials, BSEE also has a Liquid Verification System (LVS) program and a Gas Verification Systems (GVS) program. The LVS and GVS programs require operators to submit source measurement documents (meter/tank run tickets, meter proving reports, and gas volume statements) for all federal offshore sales metering points. These documents are to be reviewed, entered, and processed through BSEE’s TIMS IT system to verify the accuracy of these documents. This includes independent recalculations of all oil sales volumes. The findings from LVS and GVS are compared with the volumes reported by the lessees on the monthly production reports. These comparisons are forwarded to ONRR as supporting documents for its royalty collection efforts.

¹⁹This intermittent venting and flaring may take place when operators purge water or hydrocarbon liquids that collect in wellbores—known as liquid unloading—to maintain proper well function, or when they expel liquids and mud with pressurized natural gas after drilling during the well completion process. In addition, production equipment often emits gas to maintain proper internal pressure or, in some cases, the release of pressurized gas itself is the power source for the equipment, particularly in remote areas that are not linked to an electrical grid. This “operational” venting may include the continuous releases of gas from pneumatic devices—valves that control gas flows, levels, temperatures, and pressures in the equipment and rely on pressurized gas for operation—as well as leaks, or “fugitive” emissions. It also includes natural gas that vaporizes from oil or condensate storage tanks or during the normal operation of natural gas dehydration equipment.

gas during the course of production without prior approval or incurring royalties on this gas.²⁰

While venting and flaring of natural gas is often a necessary part of production, it may have economic and environmental implications. On federal oil and gas leases, natural gas that is vented or flared during production instead of captured for sale represents a loss of royalty revenue for the federal government. In October 2010,²¹ we found that reductions in natural gas lost to venting and flaring could increase federal royalty payments. We also found that data collected by Interior likely underestimated the volumes of natural gas that were vented and flared. Venting and flaring natural gas also adds to greenhouse gases in the atmosphere. In general, flaring emits CO₂, while venting releases methane, both of which the scientific community agrees are contributing to global warming.²² In addition, production equipment often emits gas to maintain proper internal pressure, or in some cases, the release of pressurized gas itself is the power source for the equipment, particularly in remote areas that are not linked to an electrical grid. This “operational” venting may include the continuous releases of gas from pneumatic devices as well as leaks. Until recently, the industry considered these operational losses from venting and flaring to be small, but its recent use of infrared camera technology has revealed that, in some instances, losses may be much higher than they originally thought.

²⁰These amounts are laid out in BLM and BSEE regulations and guidance and allow certain volumes from a number of operations, such as well completions. Operators are required to notify these agencies if they plan to intentionally vent and flare beyond these amounts. BLM and BSEE then classify the gas as either unavoidably or avoidably lost based on its judgment of the technical or economic feasibility of capturing the gas, and royalties are due on losses deemed avoidably lost.

²¹GAO, *Federal Oil and Gas Leases: Opportunities Exist to Capture Vented and Flared Natural Gas, Which Would Increase Royalty Payments and Reduce Greenhouse Gases*, [GAO-11-34](#) (Washington D.C.: Oct. 29, 2010).

²²Other hydrocarbons and compounds in vented and flared gas can also harm air quality by increasing ground-level ozone levels and contributing to regional haze. In addition, because methane is considered a potent greenhouse gas, overall emissions can have significant impacts on the climate.

Prior Recommendations on Interior's Management of Federal Oil and Gas Resources

Since September 2008, we have made a total of 36 recommendations related to oil and gas production verification and the accuracy of royalty and production data in four reports. In September 2008 and July 2009,²³ we found shortcomings in Interior's ability to ensure that royalty payment data were reasonable and complete and made 12 recommendations, including recommendations to better ensure complete and accurate royalty data. In March 2010,²⁴ we found that Interior's regulations and policies did not provide reasonable assurance that oil and gas produced from federal leases were being accurately measured and made 19 recommendations, including recommendations aimed at centralizing Interior's measurement expertise and its onshore oil and gas production accountability inspection program. In October 2010,²⁵ we reported that data on vented and flared natural gas collected by Interior likely underestimated the volumes of such gas. Accordingly, we made 5 recommendations to Interior, including recommendations related to economically capturing sources of vented and flared gas—which could lead to higher royalty payments—and improving its collection of data on vented and flared gas. Interior did not disagree with any of the 36 recommendations from these reports.²⁶

²³[GAO-08-893R](#) and [GAO-09-549](#).

²⁴[GAO-10-313](#).

²⁵[GAO-11-34](#).

²⁶In particular, Interior concurred with 30 recommendations and partially concurred with the remaining 6.

Interior Has Taken Steps to Improve Verification of Federal Oil and Gas Production and the Reasonableness and Completeness of Royalty Data, but Key Challenges Remain

Interior has taken steps to improve both the verification of oil and gas produced from leased federal lands and waters and the reasonableness and completeness of its royalty data, but key challenges remain. Since fiscal year 2009, Interior has made considerable progress in improving both the verification of oil and gas produced from federal leases and the reasonableness and completeness of royalty data—implementing 28 of our 36 recommendations in these areas. Interior, however, faces four key challenges related to measurement policies and meeting its annual goals for oil and gas production inspections, thereby reducing assurances that oil and gas are accurately measured and verified and putting royalty collections at risk. First, Interior has not issued updated onshore oil and gas measurement and site security regulations. Second, a centralized panel of Interior oil and gas measurement specialists is no longer meeting. Third, Interior issued new onshore oil and gas commingling guidance but did not conduct a required internal review of the effectiveness of its new guidance after its implementation. Fourth, Interior’s ability to meet its oil and gas production accountability inspection program’s goals is uneven—Interior came close to meeting its offshore goals but not onshore goals.

Interior Has Made Considerable Progress in Improving the Verification of Federal Oil and Gas Production and the Reasonableness and Completeness of Royalty Data

Interior has made considerable progress in improving both the verification of oil and gas produced from federal leases and the reasonableness and completeness of royalty data since fiscal year 2009, implementing 28 of our 36 related recommendations.²⁷ Table 1 provides a summary of the status of these recommendations.

²⁷ [GAO-08-893R](#), [GAO-09-549](#), [GAO-10-313](#), and [GAO-11-34](#).

Table 1: Status of GAO Recommendations Related to Improving Interior’s Verification of Oil and Gas Produced from Federal Leases and the Reasonableness and Completeness of Royalty Data

GAO report/issuance date	Subject	Total recommendations	Recommendations implemented	Recommendations partially implemented ^a
GAO-08-893R (Sept. 12, 2008)	Royalty data	7	7	0
GAO-09-549 (July 15, 2009)	Royalty data	5	5	0
GAO-10-313 (Mar. 15, 2010)	Production verification	19	16	3
GAO-11-34 (Oct. 29, 2010)	Venting and flaring	5	0	5
Total		36	28	8

Source: GAO. | GAO-15-39

^aRecommendations partially implemented represent instances where Interior has taken steps toward implementation of the recommendations, but the efforts are not yet complete.

As previously noted, in February 2011,²⁸ we added Interior’s management of federal oil and gas resources to our list of programs at high risk of fraud, waste, abuse, and mismanagement or in need of transformation. We added Interior to this list in part because of shortcomings we identified in reports issued since September 2008 related to Interior’s revenue collection policies. In particular, we found that Interior did not have reasonable assurance that volumes of oil and gas produced from federal leases were accurately measured so that companies could properly pay royalties. Additionally, we found that Interior did not have sufficient controls in place to provide reasonable assurance that royalty data were complete and accurate. Another factor for adding Interior to our high-risk list was the number of recommendations related to these shortcomings that remained unimplemented as of February 2011.

In September 2008 and July 2009, we found shortcomings in Interior’s ability to ensure that royalty data were reasonable and complete and made 12 recommendations—all of which Interior has implemented—to help the agency better ensure complete and accurate royalty data.²⁹ For example, in September 2008, we identified concerns about the completeness of Interior’s royalty data. Specifically, we found that Interior did not have sufficient procedures in place to identify when an expected royalty report had not been filed in a timely manner and recommended

²⁸[GAO-11-278](#).

²⁹[GAO-08-893R](#) and [GAO-09-549](#).

that Interior develop such procedures. Interior officials provided documentation in September 2010 that demonstrated it had developed procedures to identify these royalty reports, thereby reducing the risk that Interior may not be collecting royalties in a timely manner.

In addition, in July 2009, we found several instances where fiscal year 2006 and 2007 data Interior used to collect and verify royalties were either missing or appeared to be erroneous.³⁰ For example, we found that 0.20 percent of royalty values were negative numbers, which would not have been expected and, therefore, appeared to be erroneous. While this percentage is small, it represented about \$41 million in royalties that may not have been collected if these instances were not detected in future Interior audits or other efforts. We recommended that Interior develop better controls for its IT system to prevent potentially erroneous data from being entered by royalty payors and to highlight potentially erroneous data to Interior staff. Interior provided us with documentation demonstrating that, beginning in December 2009 and continuing through August 2012, it had added additional controls to its IT system to prevent erroneous data from being entered and to highlight potentially erroneous data to Interior. Based on our review of fiscal year 2013 data, Interior's royalty data are more complete and appear to be more reasonable since we last reported in September 2008 and July 2009 reports.³¹ See appendix II for details on this review.

In March 2010, we reported on numerous challenges Interior faced in providing reasonable assurance that oil and gas produced from federal leases was measured accurately and made 19 recommendations—16 of which Interior has implemented.³² For example, we found that Interior faced challenges both onshore and offshore in hiring, training, and retaining qualified measurement staff and recommended that Interior

³⁰The methodology we used to examine ONRR's royalty data in our July 2009 report, and in this report, was not intended to assess the accuracy of individual royalty transactions; rather, it allowed us to assess whether royalty transactions aggregated by the month fell within parameters we established for expected values. We established these parameters based on ONRR's reporting, regulatory, and other requirements. For example, we examined whether royalties paid fell within the allowed range of royalty rates. We determined that data that were within those parameters appeared reasonable, and that data outside those parameters were potentially erroneous or appeared erroneous.

³¹[GAO-08-893R](#), [GAO-09-549](#).

³²[GAO-10-313](#).

determine what additional policies or incentives were necessary, if any, to attract and retain staff. In June 2011, BLM issued guidance on using retention and recruitment incentives. In March 2012, BSEE and BOEM established a special pay rate in the Gulf of Mexico region for certain petroleum engineers and geoscientists. In January 2014, BSEE officials told us that they had identified and were pursuing 26 strategies to attract and retain inspectors and engineers. And, in August 2014, BSEE established a retention incentive for its inspectors bureau-wide. The other 3 recommendations are partially implemented. For more information, see appendix I.

In October 2010, we reported that data on vented and flared natural gas collected by Interior likely underestimated the volumes of such gas and made 5 recommendations, including recommendations related to economically capturing sources of vented and flared gas—which could lead to higher royalty payments—and improve its collection of data on vented and flared gas.³³ Interior has not implemented these recommendations but has actions under way and made progress on all 5. For example, we found that Interior’s data on vented and flared natural gas were not complete and recommended that it take additional steps to improve its data. In 2014, BOEM officials told us that the agency completed an internal reconciliation of its data, leading to improvements in the completeness of its vented and flared data. See appendix I for a more detailed summary of our recommendations and their status for the four reports discussed.³⁴

Key Onshore Regulatory Updates Remain Incomplete, Reducing Assurances of Accurate Measurement and Verification

Interior has not issued updated onshore oil and gas measurement regulations and site security regulations in over 25 years. As a result, Interior’s measurement regulations do not reflect current measurement technologies and standards, and its site security regulations do not require the tracking of the number or location of its royalty measurement points (i.e., where oil and gas is measured for royalty purposes). This hampers the agency’s ability to have reasonable assurance that oil and gas production is being measured accurately and verified and limits its

³³ [GAO-11-34](#).

³⁴ [GAO-08-893R](#), [GAO-09-549](#), [GAO-10-313](#), and [GAO-11-34](#).

ability to meet the requirements under the Federal Oil and Gas Royalty Management Act of 1982.³⁵

In March 2010,³⁶ we found that BLM had attempted to update its regulations twice since 1989, and was attempting to complete the process for the third time. The first attempt began in the early 1990s, when BLM published proposed gas measurement regulations in the *Federal Register* in 1994 for public comment. The second attempt occurred in the late 1990s, when it proposed revisions to its oil and gas measurement and site security regulations in the *Federal Register* in 1998. We found that, without updated measurement regulations, BLM relied on regulations that did not reflect current measurement technologies and standards that were adopted by industry and designed to improve oil and gas measurement. As a result, BLM had relied to some extent on individual BLM state and field office policies to approve measurement technologies, which led to inconsistencies in how oil and gas were measured across states that could affect the accuracy of these measurements and, therefore, affect the accuracy of federal royalty payments.³⁷ Additionally, we found that BLM's site security regulations did not require BLM to track either the number or location of its official royalty measurement points, which complicated BLM's production verification efforts as BLM staff, in certain instances, found it challenging to correctly identify the location of the meter responsible for measuring oil and gas for royalty purposes. Moreover, a 2003 Wyoming BLM state office memo stated that, without a clear understanding of where BLM's point of measurement is, it is impossible to correctly account for production volumes, among other things.³⁸ In August 2009, a BLM official estimated that the earliest the oil and gas measurement regulations and site security regulations would be finalized was the end of 2011.

³⁵Pub. L. No. 97-451, 96 Stat. 2447 (1983), codified at 30 U.S.C. §1711(a). Under the act, the Secretary of the Interior is 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.

³⁶[GAO-10-313](#).

³⁷These BLM state office policies allowed for certain measurement technologies that were not specifically addressed in the agency's regulations.

³⁸Wyoming BLM, Instruction Memorandum No. WY-2003-036: *Policy Clarification Regarding BLM's Point of Measurement* (May 30, 2003).

Since its fiscal year 2013 budget justification, BLM has stated in its annual budget justifications to Congress that it was updating its measurement and site security regulations, but it has not provided an explanation for the delays. In May 2014, a BLM official told us they had developed draft regulations and that they were under internal review. BLM officials told us that the review process is lengthy because the regulations are technical in nature, and that the process has been hindered because the agency was focused on updating other key regulations, particularly those that apply to hydraulic fracturing and venting and flaring. Some of the revisions under consideration (see table 2) would implement or make permanent actions called for in our prior recommendations. For example, the regulations for site security, according to BLM officials, could establish a new nationwide process for designating official onshore royalty measurement points and make permanent a new commingling policy—both related to actions we recommended in March 2010.³⁹ In November 2014, Interior established a time frame for issuing updated onshore measurement and site security regulations that calls for the agency to publish proposed regulations in fiscal year 2015 and to finalize them in fiscal year 2016. However, Interior has twice in over 25 years developed draft regulations but never finalized them. Until its onshore oil and gas measurement regulations better reflect current measurement technologies and standards, Interior cannot provide reasonable assurance that companies have a consistent and sound basis from which to measure the production of oil and gas. Further, until its site security regulations are updated to require, among other things, that BLM designate official onshore royalty measurement points—similar to BSEE’s requirements for offshore facility measurement points—Interior cannot provide reasonable assurance that its inspection staff can consistently conduct oil and gas production verification activities, including inspections, to ensure that oil and gas produced from federal leases is accurately measured and accounted for.

³⁹[GAO-10-313](#).

Table 2: Revisions to BLM Measurement Regulations under Consideration

Regulation	Last revised	Possible revisions currently under review by the Bureau of Land Management (BLM)
Onshore Order 3 – site security	1989	According to BLM officials, possible revisions would strengthen minimum standards for ensuring that oil and gas produced from federal onshore leases are properly handled, so as to prevent theft and loss and to enable accurate measurement. According to these officials, potential changes could address: (1) establishing a new nationwide process for designating official points for royalty measurements; (2) new standards for commingling approvals; (3) use of seals; (4) meter by-passes (pipelines that transport oil or gas off-lease without being measured by a meter); (5) reporting incidents of unauthorized removal or mishandling of production; (6) site facility diagrams; and (7) off-lease measurement.
Onshore Order 4 – oil measurement	1989	According to BLM officials, potential revisions include incorporating by reference current or revised industry standards, and adding new requirements for the equipment and procedures to ensure accurate and verifiable oil measurement and royalty payment. According to these officials, BLM is currently considering: (1) enhanced requirements for oil sales by tank gauging; (2) vapor tight tanks; (3) lease automatic custody transfer components and requirements; and (4) allowing the use of Coriolis measurement systems, which measure and output flow, temperature, density and viscosity.
Onshore Order 5 – gas measurement	1989	According to BLM officials, potential revisions include incorporating by reference current or revised industry standards, and adding new requirements for the equipment and procedures to ensure accurate and verifiable oil measurement and royalty payment. According to these officials, BLM is considering: (1) enhanced requirements for electronic gas meters; (2) enhanced inspection requirements for gas meters; (3) improved standards for gas sampling and thermal content determinations; (4) improved testing and review standards for the department’s Gas and Oil Measurement Team; and (5) overall performance goals for gas measurement meters based on the volume of gas measured.

Source: BLM. | GAO-15-39

Interior’s Centralized Measurement Panel Provided a Useful Venue for Discussing Measurement Issues, but Management Support Has Declined

Interior’s Gas and Oil Measurement Team, a centralized panel composed of fluid measurement and technical experts from BLM and BSEE, was a useful venue for discussing measurement issues, according to Interior officials. However, management support for the team has declined, and the team has not been meeting twice per year as prescribed by its charter.

In March 2010,⁴⁰ we found little coordination had occurred between Interior’s offshore and onshore measurement staff, which resulted in inefficient and duplicative efforts. As a result, we made a number of recommendations aimed at improving the consistency and efficiency of Interior’s oil and gas measurement regulations and policies. Some of these recommendations included ongoing responsibilities. In commenting

⁴⁰GAO-10-313.

on the report, Interior did not disagree with these recommendations.⁴¹ For example, we recommended that a centralized staff panel from BLM and BSEE with measurement expertise annually review changes in industry measurement technologies and standards to determine whether any of Interior's related regulations should be updated. In June 2011, Interior officials told us that it had empowered its Gas and Oil Measurement Team to improve the consistency and efficiency of measurement policies onshore and offshore and implement our related recommendations.⁴² According to the team's August 10, 2010, charter, the team was to meet twice per year and provide recommendations to Interior's Production Coordination Committee—a committee established in 2008 and responsible for facilitating ongoing internal coordination, communication, and information sharing between BLM, BSEE, and ONRR, among other responsibilities—for consideration.

According to an Interior official, since 2010, the team formally met in person twice and held one teleconference. The team also met informally, for example, when members jointly attended oil and gas related conferences. Several team members told us that the formal meetings were productive. For example, they told us that, prior to these meetings, onshore and offshore measurement staff had limited interaction, so having an official venue to discuss common measurement challenges was beneficial.

However, an Interior official stated the team has not officially met since September 2011. Interior officials stated that the team has not met because of funding and competing priorities. For example, an Interior official said that management had not recently provided funding to support the team to conduct its work in person. In addition, Interior officials said that management assigned one key team member other responsibilities that prevented his regular participation.

Also, Interior's Production Coordination Committee, the entity to which the charter specifies that the team is to report, is no longer active, and Interior

⁴¹In particular, Interior agreed with the formation of a centralized panel of measurement specialists and the need to address the specific areas we recommended but believed the Secretary should have flexibility in forming the panel and the steps it took to address the recommendations.

⁴²[GAO-10-313](#).

has not updated the team's charter, leaving the team without a prescribed means of transmitting any policy recommendations it might develop. By revising the team's charter so that it has an entity to report to and by ensuring the team meets regularly, consistent with its charter, Interior could (1) increase the communication among the bureaus' staff with specialized knowledge on these issues, (2) better inform its policies and regulations, and (3) improve efficiencies in both onshore and offshore measurement issues. By not meeting and having key staff not able to regularly participate in discussions, it will be difficult for the team to execute ongoing responsibilities outlined in our recommendations.

Interior Issued New Onshore Commingling Guidance but Did Not Schedule or Complete an Internal Review to Assess Its Effectiveness after Implementation

BLM issued new onshore oil and gas commingling guidance but did not schedule or complete an internal review to assess the overall effectiveness of the new guidance after its implementation by BLM staff in its field offices. Under federal standards for internal controls, internal control monitoring should assess the quality of performance over time and ensure that findings of audits and other reviews are promptly resolved. The resolution process begins when audit or other review results are reported to management, and it is completed only after action has been taken that (1) corrects identified deficiencies, (2) produces improvements, or (3) demonstrates the findings and recommendations do not warrant management action.⁴³ In March 2010,⁴⁴ we found that BLM did not have sufficient policies and a consistent process for determining whether to allow federal production to be commingled with other federal, state, or private production prior to measurement. We also found that the commingling agreements were structured in a manner that made verifying oil and gas production difficult, putting accurate collection of royalties at risk. We recommended that BLM require its petroleum engineers to work with BLM staff conducting production verification to confirm that commingling agreements are (1) consistent with Interior guidance and (2) structured to facilitate key production verification activities before such agreements are approved. Interior concurred with our recommendation, and officials stated in June 2010 that the department would issue new commingling guidance and schedule a review to assess the effectiveness of its implementation after 1 year.

⁴³ [GAO/AIMD-00-21.3.1](#).

⁴⁴ [GAO-10-313](#).

In September 2011, BLM issued new commingling guidance, which was later revised in July 2013.^{45, 46} The revised guidance outlines criteria for approving commingling requests and identifies considerations for determining whether commingling is in the public interest, which includes ensuring that BLM has the ability to verify that production is accurately measured and properly reported.

However, BLM did not schedule a review within 1 year of issuance of either the September 2011 or the revised July 2013 guidance and has not yet scheduled the review it committed to in June 2010. BLM officials told us that competing priorities and limited resources hindered their ability to schedule and complete the review. By scheduling and completing the internal review as expeditiously as possible, BLM would be better informed about the extent to which staff are consistently applying the new guidance to commingling agreement requests and whether the guidance is effective and has corrected deficiencies or produced improvements. Having effective guidance that is consistently applied also reduces the possibility that the agency is continuing to approve commingling agreements that would be difficult for BLM staff to verify the volumes of oil and gas produced. Such difficulties could put the accurate collection of federal royalties at risk.

Interior's Ability to Meet Production Accountability Inspection Program Goals Is Uneven

Interior came close to meeting its production accountability inspection program goals offshore in the Gulf of Mexico, but not onshore. Specifically, Interior's offshore oil and gas production accountability inspection program came close to meeting its oil and gas production inspection goals in the Gulf of Mexico from fiscal year 2009 through fiscal year 2013, and Interior is implementing a pilot project to create a dedicated team of BSEE inspectors whose primary focus is on oil and gas production inspections. Interior's onshore inspection program generally did not meet its goals during the same time frame, and has implemented a new, risk-based inspection strategy designed to ensure all meters are inspected within a reasonable time frame.

⁴⁵BLM, *Policy for Approving Requests for Commingling and Allocation Approval and Off-lease Measurement Approval*, IM-2011-184, Sept. 22, 2011.

⁴⁶BLM, *Reviewing Requests for Surface and Downhole Commingling of Oil and Gas Produced from Federal and Indian Leases*, IM-2013-152, July 3, 2013.

Interior Came Close to Meeting Offshore Inspection Program Goals in the Gulf of Mexico and Is Implementing a Pilot Project on Measurement Inspections

Interior came close to meeting its Gulf of Mexico oil and gas production inspection goals for both conducting site security inspections and witnessing meter calibrations for fiscal years 2009 through 2013. In March 2010,⁴⁷ we found that for the four district offices we reviewed,⁴⁸ BSEE met its site security and calibration witnessing goals just once—in fiscal year 2008—during fiscal years 2004 through 2008.^{49,50} Our more recent analysis of BSEE’s five Gulf of Mexico district office’s inspection data for fiscal years 2009 through 2013 found that BSEE district offices came close to meeting its goals for site security inspections and met its goals for witnessing oil meter provings and gas meter calibrations.

Among BSEE’s current production inspection goals are the following:

- annually inspect the site security of all high-producing oil and gas facilities—defined as those facilities that produce more than 1,000 barrels of oil per day, or the equivalent heating value for gas, and all other locations on a 3-year cycle; and
- annually witness the proving of 10 percent of oil meters and the calibration of 5 percent of gas meters.

For site security inspections for oil and gas measurement, BSEE district offices generally came close to or met their goal for inspecting high-producing facilities in the Gulf of Mexico’s five district offices we examined for fiscal years 2009 through 2013. For high-producing oil site security

⁴⁷GAO-10-313.

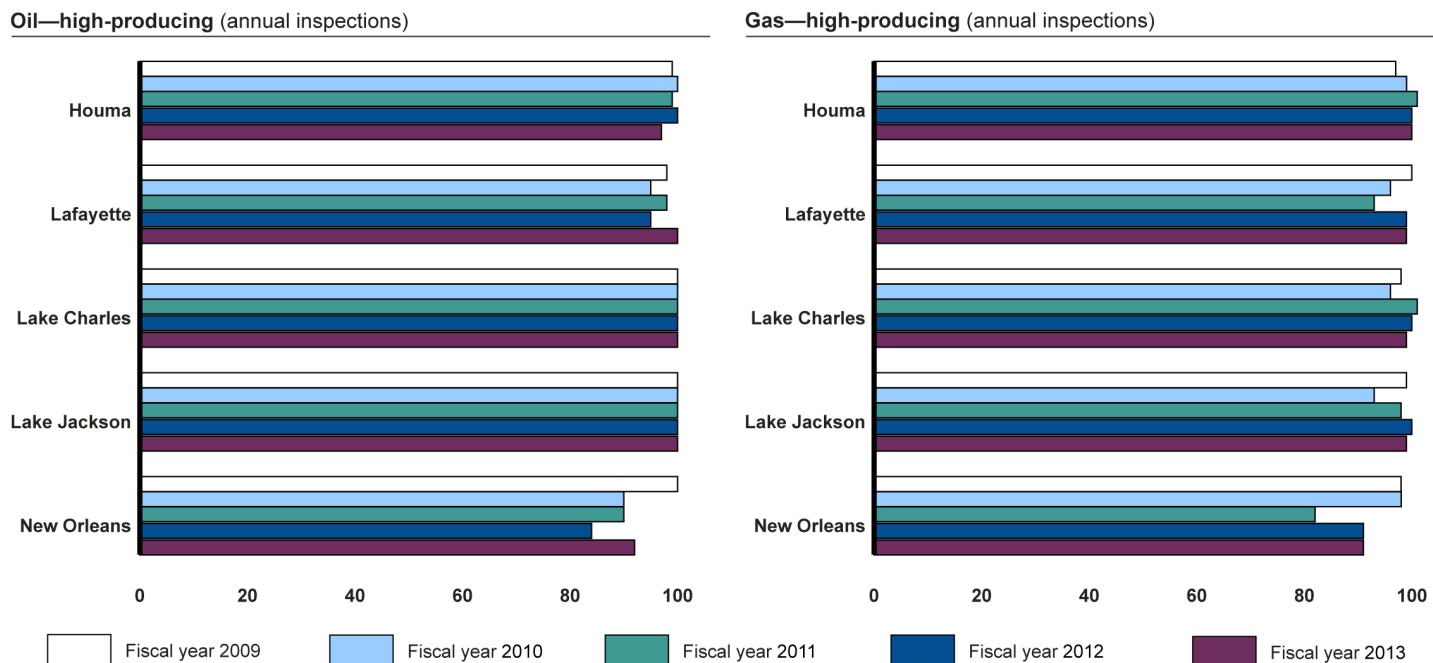
⁴⁸The four district offices we reviewed were Lake Charles, Lake Jackson, New Orleans, and California.

⁴⁹In 2008, BSEE’s site security inspection goal for the Gulf of Mexico was to inspect the 100 highest-volume oil and gas measurement locations; its goal in the Pacific region was to inspect all meters. BSEE’s calibration witnessing goals were to witness 10 percent of oil meter proving and 5 percent of gas meter calibrations.

⁵⁰We were unable to present data for these years because, according to BSEE officials, district offices often did not correctly record site security inspections on their inspection forms. Interior identified this problem in 2007; since then, BSEE has instituted a new policy to ensure that these inspections are being recorded correctly. Additionally, we were unable to report data for witnessing calibrations from 2004 through 2007 because BSEE expressed concern about the reliability of data for those years. An OEMM official told us that, for fiscal years prior to 2008, BSEE could not precisely identify the number of meters that inspectors were required to witness. In addition, for fiscal years prior to 2008, the official told us that inspectors may not have recorded every meter witnessing.

inspections, BSEE achieved from 84 to 100 percent of its goal of inspecting high-producing facilities annually for fiscal years 2009 through 2013. For high-producing gas site security inspections, BSEE achieved from 82 to 100 percent of its goal for the same time frame. See figure 1 for more detailed data for the five district offices we reviewed.

Figure 1: Percentage of Goals Attained for High-Producing Site Security Inspections, BSEE Gulf of Mexico District Office Fiscal Years 2009-2013

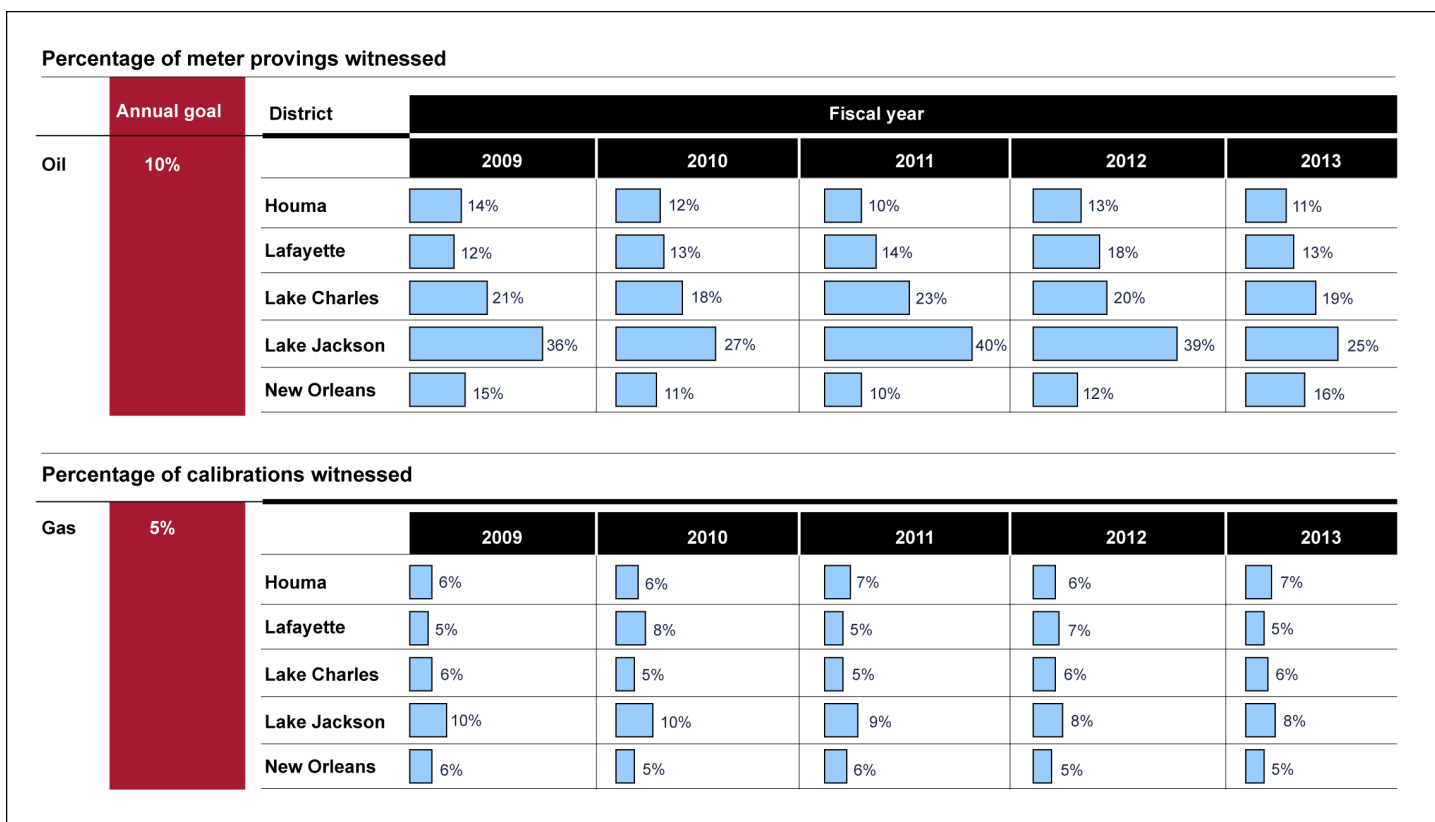


Source: GAO analysis of Bureau of Safety and Environmental Enforcement (BSEE) data. | GAO-15-39

For the low-producing site security inspections, the data indicated that BSEE’s five district offices were generally inspecting most low-producing facilities annually. Our analysis did not allow us to specifically assess the inspections of each low-producing facility; however, given the high percentage of low-producing facilities inspected each year, the data suggest that BSEE was likely meeting its goal of inspecting all other facilities on a 3-year cycle. For low-producing oil site security inspections, BSEE inspected from 71 to 100 percent of facilities annually for fiscal years 2009 through 2013. Similarly, for low-producing gas site security inspections, BSEE inspected from 73 to 100 percent of gas facilities annually during the same time frame.

For witnessing of oil meter provings and gas meter calibrations, BSEE district offices met or exceeded its goals for fiscal years 2009 through 2013. Witnessing of oil meter provings ranged from 10 to 40 percent for fiscal years 2009 and 2013. Witnessing of gas meter calibrations ranged from 5 percent to 10 percent for the same time frame. See figure 2 for more detailed information for the five district offices we reviewed.

Figure 2: BSEE Gulf of Mexico Liquid Oil Proving and Gas Meter Calibration Witnessing, Fiscal Years 2009-2013



Source: GAO analysis of Bureau of Safety and Environmental Enforcement (BSEE) data. | GAO-15-39

Interior is implementing a pilot project for oil and gas production inspections conducted in BSEE's Lafayette District Office area. Beginning on October 1, 2013, a new Measurement Inspection Unit and Measurement Office funded by ONRR through an agreement with BSEE was established in the Lafayette District Office. The overall goal of this pilot project is to create a dedicated team of inspectors whose primary focus is on oil and gas production inspections. According to Interior

officials, the benefits of having a team of inspectors dedicated to oil and gas production inspections include: (1) allowing other BSEE inspectors to focus on safety and environmental inspections; (2) ensuring consistency in how BSEE production inspections occur throughout the Gulf of Mexico; and (3) allowing for a more efficient and streamlined measurement approval, verification, and inspection process by BSEE.

As of May 2014, BSEE was overseeing three oil and gas measurement inspectors, all of whom were based in BSEE's Lafayette District Office's new Measurement Office. According to Interior officials, the goals during the pilot phase are to conduct measurement inspections at all high- and low-producing facilities in the Lafayette District area and to witness oil meter provings and gas meter calibrations at 5 percent of gas royalty metering locations and 10 percent of oil royalty metering locations. According to Interior officials, the results of this pilot for fiscal year 2014 indicate that 600 violations have been issued by the Lafayette Measurement Office inspectors. BSEE officials stated that is an increase in violations over what its nonspecialized inspectors have identified in the past.⁵¹ According to BSEE officials, the agency is continuing to evaluate the effectiveness of the pilot project to determine if, and how, the program should be expanded to BSEE's four other Gulf of Mexico District Offices but has not committed to a time frame for completing a final evaluation of the pilot.

Interior Is Generally Not Meeting Onshore Inspection Goals and Has Implemented a New Risk-Based Production Accountability Inspection Strategy

Interior generally did not meet its onshore oil and gas production inspection goals for fiscal years 2009 through 2013, but it has implemented a new risk-based inspection strategy designed to help meet its inspection goals in a more reasonable time frame. Because it revised its strategy several times during the period we examined, it is difficult to compare Interior's performance over time. In March 2010,⁵² we found that BLM had been unable to consistently meet its goals for completing production inspections. We recommended that BLM consider an alternative inspection strategy that enabled BLM to inspect all wells within a reasonable time frame, given available resources. In response to our

⁵¹Based on a preliminary review of these violations, BSEE officials stated that these violations had little or no impact on the oil and gas volumes measured by the royalty meters.

⁵²[GAO-10-313](#).

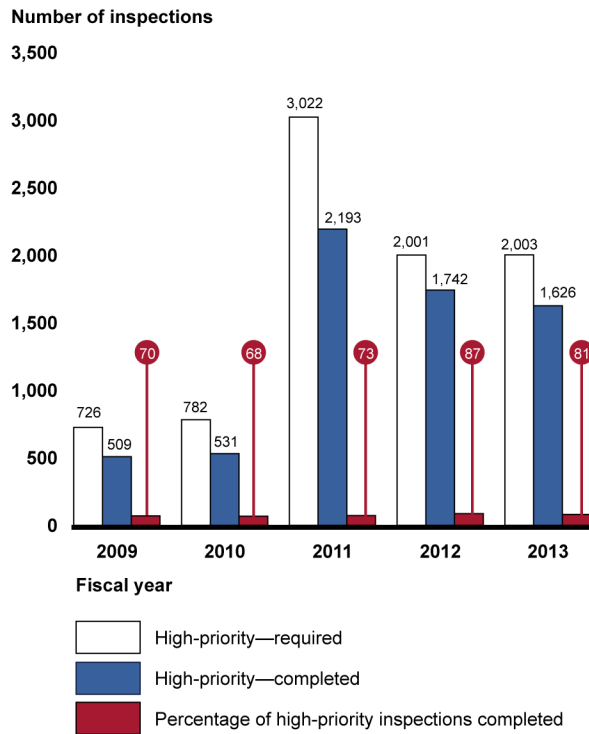
recommendation, BLM considered, and subsequently developed a risk-based inspection strategy, which was first employed in fiscal year 2011.

BLM's new risk-based inspection strategy for production inspections includes developing a composite risk score based on multiple factors of various weightings to identify high- and low-risk cases, and has gone through several iterations since fiscal year 2011. For the fiscal year 2011 inspection strategy, BLM developed a composite risk score based on seven weighted factors; four factors based on BLM data, and three based on ONRR data.⁵³ BLM officials stated they had challenges importing data from ONRR for the three ONRR weighted factors in a format compatible with its IT system, and has since eliminated them. Additionally, for fiscal year 2011 BLM determined that a composite risk score of 4 would be considered high risk, meaning that cases with a score of 4 or more required an inspection. For fiscal year 2013, BLM increased the composite risk score needed to be considered high risk and require an inspection to 5 in order to reduce the number of required inspections because it determined that the workload in the 2 preceding years was too high for some field offices. For fiscal year 2014, BLM lowered the composite risk score to 4 again.

Since BLM's new risk-based inspection strategy has gone through multiple iterations since fiscal year 2011, and it employs different criteria than BLM used when we last reviewed their inspection program, it is difficult to compare BLM's performance over time. However, BLM's data show that, regardless of the factors or composite risk score used for identifying high-risk inspections, it did not meet its annual inspection goals for both high- and low-priority cases for fiscal years 2009 through 2013. For high-priority production cases, BLM achieved from 68 to 87 percent of its goal for fiscal years 2009 through 2013. See figure 3 for more detailed information on BLM's ability to meet its goals for high-priority inspections.

⁵³The four BLM factors were: (1) the monthly oil and gas production volumes, (2) the number of missing production reports, (3) BLM-issued violations, and (4) the time since the case was last inspected. The three ONRR factors were based on: (1) production report error rates, (2) production variance rating, and (3) ONRR audit findings.

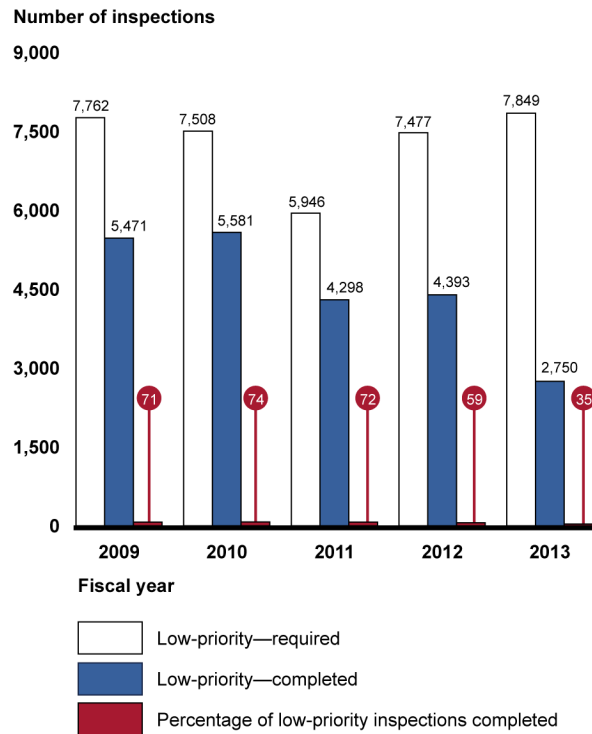
Figure 3: Nationwide BLM Oil and Gas High-Priority Production Inspections, Fiscal Years 2009-2013



Source: GAO analysis of Bureau of Land Management (BLM) data. | GAO-15-39

For low-priority production cases, BLM achieved from 35 to 74 percent of its goal for fiscal years 2009 through 2013. See figure 4 for more detailed information on BLM's ability to meet its goals for low-priority inspections.

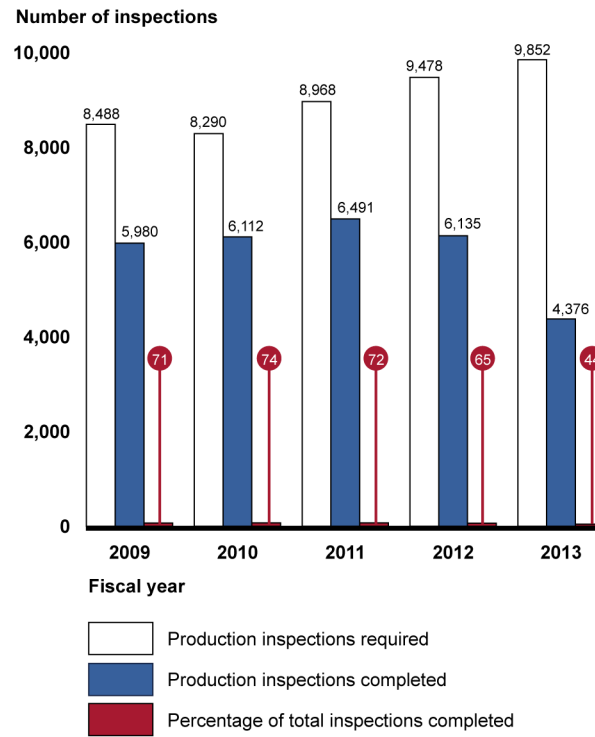
Figure 4: Nationwide BLM Oil and Gas Low-Priority Production Inspections, Fiscal Years 2009-2013



Source: GAO analysis of Bureau of Land Management (BLM) data. | GAO-15-39

Our analysis of production inspections nationwide found an overall decline in both the number and percentage of required production inspections completed. In fiscal year 2009, BLM had a total of 8,488 required inspections and completed 5,980 inspections, or 71 percent of required inspections, whereas in fiscal year 2013, it had 9,852 required inspections and completed 4,376 inspections, or 44 percent of required inspections. Figure 5 depicts BLM’s nationwide required and completed oil and gas production inspections from fiscal year 2009 through fiscal year 2013.

Figure 5: Nationwide BLM Oil and Gas Production Inspections, Fiscal Years 2009-2013



Source: GAO analysis of Bureau of Land Management (BLM) data. | GAO-15-39

According to BLM officials, some field offices may not be meeting the production inspection goals because inspectors are conducting other types of inspections, such as drilling or well plugging, both of which can require more time to conduct and are a higher priority for BLM than production inspections. Additionally, agency officials stated that the agency is not meeting its production inspection goals because it does not have enough trained inspectors and does not have funding to hire and retain these inspectors. According to BLM officials, BLM incurred significant budget cuts in fiscal year 2012.

We previously identified human capital challenges at Interior in March 2010,⁵⁴ when we found that Interior’s production verification program staff

⁵⁴GAO-10-313.

did not have critical skills because of challenges in hiring experienced staff and a high turnover in key production verification positions, among other things. At the time, we recommended that Interior determine what additional policies and incentives, if any, were necessary to attract and retain qualified measurement staff at sufficient levels to ensure an effective production verification program. Since that time, both BLM and BSEE have identified policies to address hiring and retention. Nonetheless, in January 2014,⁵⁵ we found that that Interior had not fully used its existing authorities to supplement salaries and recommended that the Secretary of Interior should explore the expanded use of existing authorities, including recruitment, relocation, and retention incentives to help bridge the salary gap for key oil and gas oversight positions. Interior stated that it generally agreed with our recommendation and planned to implement it in fiscal year 2015.

Conclusions

Interior has made considerable progress in addressing challenges we have identified in our related reports and has taken significant steps to implement the majority of the recommendations we have made in these areas. However, several of our recommendations are only partially implemented, including many related to venting and flaring and, in some cases, it is not clear that Interior's current efforts provide the necessary assurance that oil and gas are being accurately measured and verified and that the federal government receives accurate royalty payments when these assets are sold.

In particular, BLM has not issued updated regulations for onshore oil and gas measurement and site security in over 25 years. As a result, Interior continues to rely on measurement regulations that do not reflect current measurement technologies or standards, and site security regulations that do not include, for example, requirements for designating official royalty measurement points. Interior's development of draft regulations and an establishment of a time frame for issuing updated regulations are positive steps; however, Interior has twice before unsuccessfully attempted to update these regulations and has not routinely notified Congress as to the reasons for the delays. Without updated onshore measurement regulations, Interior cannot provide reasonable assurance that companies have a consistent and sound basis from which to

⁵⁵[GAO-14-205](#).

measure the production of oil and gas. Without updated onshore site security regulations, Interior's ability to consistently verify the locations where oil and gas are measured for determination of royalties due, among other things, will be limited. As such, until Interior updates these onshore regulations, its ability to have reasonable assurance that oil and gas are being accurately measured and verified continues to be hampered.

Moreover, Interior's Gas and Oil Measurement Team is no longer consistently meeting, and the entity it was to advise is no longer active. By not meeting, and without an entity to report to within Interior, it will be difficult for the team to complete ongoing responsibilities outlined in our prior recommendations, such as annually reviewing changes in industry measurement technologies and standards and determining whether any of Interior's related regulations should be updated. Increasing communication among the bureau's staff with specialized knowledge on these issues could also allow Interior to better study and inform its policies and regulations and improve the consistency and efficiency in both onshore and offshore measurement issues.

Additionally, by not scheduling and completing a review of the effectiveness of the new commingling guidance after its implementation, BLM does not have reasonable assurance that its staff are consistently applying the new guidance and that staff are able to verify production. Furthermore, without such a review, BLM does not know if the guidance is effective and has corrected deficiencies or produced improvements. Until it schedules and completes this review, BLM may continue to approve commingling agreement requests that are difficult to verify, reducing Interior's ability to ensure that oil and gas are measured accurately and that that Interior is collecting all royalties due.

Recommendations for Executive Action

To further improve its production verification efforts, we recommend that the Secretary of the Interior take the following seven actions.

To help ensure that BLM no longer relies on outdated regulations, the Secretary of the Interior should direct BLM to

- meet its established time frame for issuing final regulations for oil measurement,
- meet its established time frame for issuing final regulations for gas measurement,

-
- meet its established time frame for issuing final regulations for site security, and
 - include an explanation for its delay in its annual budget submission to Congress for each year until the regulations are updated if it is unable to meet this time frame.

To increase communication among the bureau's staff with specialized knowledge on oil and gas measurement issues, improve the consistency and efficiency in both onshore and offshore measurement issues, and ensure that Interior continues the ongoing responsibilities outlined in our prior recommendations, the Secretary of the Interior should

- revise the Gas and Oil Measurement Team's charter to ensure that the team has an appropriate entity to which to provide policy recommendations, and
- ensure the team meets in accordance with the provisions in the revised charter.

To provide greater assurance that BLM staff are consistently applying the new guidance to commingling agreement requests and determine whether the guidance corrected deficiencies and produced improvements, the Secretary should

- direct BLM to schedule and complete the internal review as expeditiously as possible.

Agency Comments and Our Evaluation

We provided a draft of this report to the Department of the Interior for review and comment. In its written comments, reproduced in appendix III, Interior generally concurred with our recommendations. Interior also provided technical comments that were incorporated, as appropriate.

As agreed with your offices, 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 members 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 IV.

A handwritten signature in black ink that reads "Frank Rusco". The signature is written in a cursive style with a long, sweeping horizontal line extending to the right from the end of the name.

Frank Rusco
Director, Natural Resources and Environment

Appendix I: Recommendation Status

Tables 3 through 6 present information on the recommendations and Interior's actions for the four related GAO reports.

Table 3: Mineral Revenues: Data Management Problems and Reliance on Self-Reported Data for Compliance Efforts Put MMS Royalty Collections at Risk, [GAO-08-893R](#) (Washington, D.C.: Sept. 12, 2008)

Number of recommendations: 7			
Status of report's recommendations: Interior has implemented 7 of 7 recommendations.			
Agency affected	Specific recommendations:	Status:	Comments:
Department of the Interior	Recommendation 1: The Secretary of the Interior should report to Congress any year in which Offshore Energy and Minerals Management (OEMM) and Bureau of Land Management (BLM) have not met their legal and agency requirements for completing production inspections, along with the cause and a plan for achieving compliance.	Implemented	
Department of the Interior	Recommendation 2: The Secretary of the Interior should define the terms "lease sites producing or expected to produce significant quantities of oil or gas in any year" and "lease sites which have a history of noncompliance with applicable provisions of law or regulations" for offshore oil and natural gas leases.	Implemented	
Department of the Interior	Recommendation 3: The Secretary of the Interior should direct BLM and OEMM to evaluate both the accuracy and completeness of production inspection data in their databases, including the timeliness of data entry, and amend relevant policies and procedures as necessary.	Implemented	

Appendix I: Recommendation Status

Number of recommendations: 7

Status of report's recommendations:

Interior has implemented 7 of 7 recommendations.

Agency affected	Specific recommendations:	Status:	Comments:
Department of the Interior	<p>Recommendation 4: The Secretary of the Interior should direct Minerals Management Service (MMS) to conduct a study on the Federal Oil and Gas Royalty Simplification and Fairness Act's effect on MMS's capacity to efficiently and accurately collect federal royalties due by analyzing both the (1) 6-year time frame for allowing companies to make adjustments to their federal royalty data and (2) MMS's 7-year time frame for issuing monetary demands for additional royalties. This study should identify an appropriate time period cutoff for allowing companies to make adjustments without MMS's prior approval to their royalty and production data and related payments, address the need for clarification on when the 7-year time period begins for issuing a monetary demand, and report the findings to Congress to improve its royalty information technology (IT) system and royalty collection and verification processes.</p>	Implemented	
Department of the Interior	<p>Recommendation 5: The Secretary of the Interior should direct MMS to finalize the adjustment line monitoring specifications for modifying its royalty IT system and fully implement the IT system so that MMS can monitor adjustments made outside the legal 6-year time frame, and ensure that any adjustments made to production and royalty data after compliance work has been completed are reviewed by appropriate staff to improve its royalty IT system and royalty collection and verification processes.</p>	Implemented	
Department of the Interior	<p>Recommendation 6: The Secretary of the Interior should direct MMS to develop processes and procedures by which MMS can automatically identify when an expected royalty report has not been filed in a timely manner, and contact the company to ensure it is complying with both applicable laws and agency policies to improve its royalty IT system and royalty collection and verification processes.</p>	Implemented	

Appendix I: Recommendation Status

Number of recommendations: 7

Status of report's recommendations:

Interior has implemented 7 of 7 recommendations.

Agency affected	Specific recommendations:	Status:	Comments:
Department of the Interior	Recommendation 7: To improve its compliance program, the Secretary of the Interior should direct MMS to require that the onshore compliance review process include the review of a sample of third-party documentation in instances when BLM has not already collected this information to provide additional assurance that self-reported data are correct.	Implemented	

Source: GAO. | GAO-15-39

Table 4: Mineral Revenues: MMS Could Do More to Improve the Accuracy of Key Data Used to Collect and Verify Oil and Gas Royalties, GAO-09-549 (Washington, D.C.: Sept. 15, 2009)

Number of recommendations: 5			
Status of report's recommendations: Interior has implemented 5 of 5 recommendations.			
Agency affected	Specific recommendations:	Status:	Comments:
Department of the Interior	Recommendation 1: In order to improve the accuracy of royalty data and to help provide a greater assurance that federal oil and gas royalties are being accurately reported, to improve the efficiency of audit and compliance activities, to increase the likelihood of collecting additional royalties in a timely manner, and to better prevent the submission of erroneous data into Minerals Management Service's (MMS) database, the Secretary of the Interior should direct MMS to share with payors that submit their data through the Electronic Data Interchange (EDI), MMS's recent edit check that prevents payors from submitting data claiming processing allowances for gas that is not processed, including coalbed methane.	Implemented	
Department of the Interior	Recommendation 2: In order to improve the accuracy of royalty data and to help provide a greater assurance that federal oil and gas royalties are being accurately reported, to improve the efficiency of audit and compliance activities, to increase the likelihood of collecting additional royalties in a timely manner, and to improve the quality of data that has been accepted by MMS's database, MMS should design and implement additional edit checks to evaluate the net impact of all adjustments on original entries for critical royalty variables, including sales values, royalty values, sales volumes, transportation allowances, and processing allowances, by summing each month all entries for the variable submitted by each payor for each lease and each commodity and highlight potentially erroneous submissions to payors and appropriate MMS staff.	Implemented	

Appendix I: Recommendation Status

Number of recommendations: 5

Status of report's recommendations:

Interior has implemented 5 of 5 recommendations.

Agency affected	Specific recommendations:	Status:	Comments:
Department of the Interior	Recommendation 3: In order to improve the accuracy of royalty data and to help provide a greater assurance that federal oil and gas royalties are being accurately reported, to improve the efficiency of audit and compliance activities, to increase the likelihood of collecting additional royalties in a timely manner, and to improve the quality of data that has been accepted by MMS's database, MMS should use the monthly sums of original and adjusting entries for royalty values, sales values, and sales volumes to ensure that calculated royalty rates and unit prices for each payor on each lease for each commodity fall within expected ranges and highlight potentially erroneous submissions to payors and appropriate MMS staff.	Implemented	
Department of the Interior	Recommendation 4: In order to improve the accuracy of royalty data and to help provide a greater assurance that federal oil and gas royalties are being accurately reported, to improve the efficiency of audit and compliance activities, to increase the likelihood of collecting additional royalties in a timely manner, and to simplify the auditing of leases and compliance work, MMS should enforce current MMS requirements to populate the agreement field with the correct agreement number and to populate the agreement field for leases outside of agreements with a single unique code that is easily identifiable.	Implemented	
Department of the Interior	Recommendation 5: In order to improve the accuracy of royalty data and to help provide a greater assurance that federal oil and gas royalties are being accurately reported, to improve the efficiency of audit and compliance activities, to increase the likelihood of collecting additional royalties in a timely manner, and to simplify the auditing of leases and compliance work, MMS should collaborate with state and tribal auditors on the possibility of adding more specific adjustment reason codes that describe why payors made corrections to royalty data on the Form MMS-2014.	Implemented	

Source: GAO. | GAO-15-39

Table 5: Oil and Gas Management: Interior’s Oil and Gas Production Verification Efforts Do Not Provide Reasonable Assurance of Accurate Measurement of Production Volumes, GAO-10-313 (Washington, D.C.: Mar. 15, 2010)

Number of recommendations: 19

Status of report’s recommendations:

Interior has implemented 16 of 19 recommendations. Interior has partially implemented the remaining 3 recommendations.

Agency affected	Specific recommendations:	Status:	Comments:
Department of the Interior	Recommendation 1: To increase Interior’s assurance that it is accurately measuring oil and gas produced on federal lands and waters, and to improve the consistency and efficiency of Interior’s oil and gas measurement regulations and policies, the Secretary of the Interior should empower a centralized panel consisting of staff with measurement expertise from the Bureau of Land Management (BLM) and the Offshore Energy and Minerals Management (OEMM) to increase consistency between offshore and onshore measurement regulations, as appropriate.	Implemented	
Department of the Interior	Recommendation 2: To increase Interior’s assurance that it is accurately measuring oil and gas produced on federal lands and waters, and to improve the consistency and efficiency of Interior’s oil and gas measurement regulations and policies, the Secretary of the Interior should empower a centralized panel consisting of staff with measurement expertise from BLM and OEMM to annually review changes in the industry measurement technologies and standards that Interior’s regulations reference to determine whether the related regulations should be updated.	Implemented	
Department of the Interior	Recommendation 3: To increase Interior’s assurance that it is accurately measuring oil and gas produced on federal lands and waters, and to improve the consistency and efficiency of Interior’s oil and gas measurement regulations and policies, the Secretary of the Interior should empower a centralized panel consisting of staff with measurement expertise from BLM and OEMM to provide departmentwide guidance on measurement technologies not addressed in current regulations and approve variances for measurement technologies in instances when such technologies are not addressed in current regulations or departmentwide guidance.	Implemented	

Appendix I: Recommendation Status

Number of recommendations: 19

Status of report's recommendations:

Interior has implemented 16 of 19 recommendations. Interior has partially implemented the remaining 3 recommendations.

Agency affected	Specific recommendations:	Status:	Comments:
Department of the Interior	Recommendation 4: To increase Interior's assurance that it is accurately measuring oil and gas produced on federal lands and waters, and to improve the consistency and efficiency of Interior's oil and gas measurement regulations and policies, the Secretary of the Interior should empower a centralized panel consisting of staff with measurement expertise from BLM and OEMM to develop guidance clarifying when federal oil and gas may be commingled and establish standardized measurement methods in such a way that production can be adequately measured and verified.	Implemented	
Department of the Interior	Recommendation 5: To increase Interior's assurance that it is accurately measuring oil and gas produced on federal lands and waters, and to provide greater assurance that key elements in the oil and gas production infrastructure are adequately overseen, the Secretary of the Interior should determine the extent to which Interior has authority regarding pipelines, including meters that pipeline companies own, as well as other methods transportation companies use to ship and measure oil and gas produced from federal leases.	Implemented	
Department of the Interior	Recommendation 6: To increase Interior's assurance that it is accurately measuring oil and gas produced on federal lands and waters, and to provide greater assurance that key elements in the oil and gas production infrastructure are adequately overseen, the Secretary of the Interior should determine the extent to which Interior has authority regarding gas plants that process gas from federal leases, including the requirements and responsibilities for approving gas plant meters, and conducting inspections of them.	Implemented	
Department of the Interior	Recommendation 7: To increase Interior's assurance that it is accurately measuring oil and gas produced on federal lands and waters, and to help ensure that Interior is consistently tracking where and how oil and gas are measured, the Secretary of the Interior should require that BLM track all onshore meters, including information about meter location, identification number, and owner.	Partially implemented	In March 2014, Interior officials told us that assigning meter numbers to all onshore meters is under consideration as part of the ongoing efforts to update its site security regulations to be included in Onshore Order Number 3. Interior officials set a time frame of 2016 to complete this action.

Appendix I: Recommendation Status

Number of recommendations: 19

Status of report's recommendations:

Interior has implemented 16 of 19 recommendations. Interior has partially implemented the remaining 3 recommendations.

Agency affected	Specific recommendations:	Status:	Comments:
Department of the Interior	Recommendation 8: To increase Interior's assurance that it is accurately measuring oil and gas produced on federal lands and waters, and to help ensure that Interior is consistently tracking where and how oil and gas are measured, the Secretary of the Interior should require that Minerals Management Service (MMS) require onshore operators to report meter identification numbers in the required monthly production reports.	Implemented	
Department of the Interior	Recommendation 9: To increase Interior's assurance that it is accurately measuring oil and gas produced on federal lands and waters, and to help ensure that Interior is consistently tracking where and how oil and gas are measured, the Secretary of the Interior should require that BLM petroleum engineers work with BLM staff conducting production verification to confirm that commingling agreements are (1) consistent with Interior guidance on such agreements and (2) are adequately structured to facilitate key production verification activities before such agreements are approved.	Implemented	
Department of the Interior	Recommendation 10: To increase Interior's assurance that it is accurately measuring oil and gas produced on federal lands and waters, and to help ensure that Interior's production accountability inspection program consistently addresses key areas affecting measurement accuracy and that BLM meets its inspection goals, the Secretary of the Interior should establish goals for (1) witnessing onshore oil and gas meter calibrations, (2) witnessing onshore and offshore gas sample collections, (3) comparing onshore reported British thermal unit (BTU) values with gas analyses, and (4) inspecting onshore and offshore orifice plates and meter tubes.	Partially implemented	As of August 2014, BLM had not established goals for witnessing oil meter provings or gas meter calibrations. Officials stated that it would be too challenging to coordinate, as BLM inspectors would have to meet oil and gas company officials on-site to witness the gas sample collection. BLM has also not established goals for comparing BTU analyses with gas analyses, though an official stated that comparisons do occur during an in office records review. For witnessing inspections of orifice plates and meter tubes, BLM officials again stated that coordinating these activities with companies would be cumbersome. Officials stated that inspectors do typically inspect the orifice plate when it is pulled for inspection by a company official during a gas meter calibration. For meter tubes, BLM has not taken any actions. BLM officials stated that, in updating its oil and gas measurement regulations, it may address some of these issues. Interior officials set a time frame of 2016 to complete this effort.

Appendix I: Recommendation Status

Number of recommendations: 19

Status of report's recommendations:

Interior has implemented 16 of 19 recommendations. Interior has partially implemented the remaining 3 recommendations.

Agency affected	Specific recommendations:	Status:	Comments:
Department of the Interior	Recommendation 11: To increase Interior's assurance that it is accurately measuring oil and gas produced on federal lands and waters, and to help ensure that Interior's production accountability inspection program consistently addresses key areas affecting measurement accuracy and that BLM meets its inspection goals, the Secretary of the Interior should consider an alternative onshore production inspection strategy that enables BLM to inspect all wells within a reasonable time frame, given available resources.	Implemented	
Department of the Interior	Recommendation 12: To increase Interior's assurance that it is accurately measuring oil and gas produced on federal lands and waters, and to improve the consistency of Interior's management of its onshore production and inspection program, the Secretary of the Interior should direct BLM to review and revise, as appropriate, its oversight of field and state offices and train managers involved in BLM's inspection and enforcement program to ensure adequate and appropriate review of personnel, processes, and production, consistent with standards for internal controls.	Partially implemented	In December 2014, Interior officials stated it had a completion rate of 96 percent for its two-part training class called Oil and Gas Field Managers Training. Interior officials have not taken any steps to review and revise, as appropriate, its oversight of field and state offices and did not provide a time frame for when they might take any actions.
Department of the Interior	Recommendation 13: To increase Interior's assurance that it is accurately measuring oil and gas produced on federal lands and waters, and to improve the consistency of Interior's management of its onshore production and inspection program, the Secretary of the Interior should direct BLM to conduct reviews of the quality and completeness of the hard copy production inspection program files across field offices periodically and ensure that the data in these files are accurately entered into its database.	Implemented	
Department of the Interior	Recommendation 14: To increase Interior's assurance that it is accurately measuring oil and gas produced on federal lands and waters, and to address gaps in critical oil and gas measurement abilities, the Secretary of the Interior should direct BLM and OEMM to ensure that key onshore and offshore production verification staff have received initial standardized training necessary to effectively carry out their job functions and receive ongoing measurement training as needed.	Implemented	

Appendix I: Recommendation Status

Number of recommendations: 19

Status of report's recommendations:

Interior has implemented 16 of 19 recommendations. Interior has partially implemented the remaining 3 recommendations.

Agency affected	Specific recommendations:	Status:	Comments:
Department of the Interior	Recommendation 15: To increase Interior's assurance that it is accurately measuring oil and gas produced on federal lands and waters, and to address gaps in critical oil and gas measurement abilities, the Secretary of the Interior should determine what additional policies or incentives are necessary, if any, to attract and retain qualified measurement staff at sufficient levels to ensure an effective production verification program.	Implemented	
Department of the Interior	Recommendation 16: To increase Interior's assurance that it is accurately measuring oil and gas produced on federal lands and waters, and to improve the tools available to Interior's production inspection staff, the Secretary of the Interior should direct BLM to evaluate its commitment to further develop its in-house software, in light of the functionality, cost, and ease of adoption by Interior and industry of commercially available software, and present the results of this evaluation to Congress.	Implemented	
Department of the Interior	Recommendation 17: To increase Interior's assurance that it is accurately measuring oil and gas produced on federal lands and waters, and to improve the tools available to Interior's production inspection staff, the Secretary of the Interior should require all companies purchasing federal leases to immediately provide Interior access to oil and gas production data generated by electronic flow computers to leave open a range of future options for electronic data exchanges with operators.	Implemented	
Department of the Interior	Recommendation 18: To increase Interior's assurance that it is accurately measuring oil and gas produced on federal lands and waters, and to improve the tools available to Interior's production inspection staff, the Secretary of the Interior should direct BLM to implement a mobile computing solution for its inspection and enforcement program to allow staff to spend more time in the field conducting inspections and to improve the reliability of the inspection data.	Implemented	

Appendix I: Recommendation Status

Number of recommendations: 19

Status of report's recommendations:

Interior has implemented 16 of 19 recommendations. Interior has partially implemented the remaining 3 recommendations.

Agency affected	Specific recommendations:	Status:	Comments:
Department of the Interior	Recommendation 19: To increase Interior's assurance that it is accurately measuring oil and gas produced on federal lands and waters, and to improve the tools available to Interior's production inspection staff, the Secretary of the Interior should coordinate onshore and offshore inspection staffs' efforts to design and implement a mobile computing solution for inspectors in the field, while taking into account any unique or specific needs associated with onshore versus offshore inspections.	Implemented	

Source: GAO. | GAO-15-39

Table 6: Federal Oil and Gas Leases: Opportunities Exist to Capture Vented and Flared Natural Gas, Which Would Increase Royalty Payments and Reduce Greenhouse Gases, GAO-11-34 (Washington, D.C.: Oct. 29, 2010).

Number of recommendations: 5			
Status of report's recommendations: Interior has partially implemented 5 of 5 recommendations.			
Agency affected	Specific recommendations:	Status:	Comments:
Department of the Interior	Recommendation 1: To ensure that Interior has a complete picture of venting and flaring on federal leases and takes steps to reduce this lost gas where economic to do so, and to ensure that Interior's data are complete and accurate, the Secretary of the Interior should direct Bureau of Land Management (BLM) and Bureau of Ocean Energy Management, Regulation, and Enforcement (BOEMRE) to take additional steps to ensure that each agency has a complete and accurate picture of vented and flared gas, for both onshore and offshore leases, by (1) BLM developing more complete data on lost gas by taking into consideration additional large onshore sources and ways to estimate them not currently addressed in regulations—sources that Environmental Protection Agency's newly proposed greenhouse gas reporting rule addresses—and (2) BOEMRE reconciling differences in reported offshore venting and flaring volumes in OGOR and GOADS data systems and making adjustments to ensure the accuracy of these systems.	Partially implemented	BLM is developing Onshore Order Number 9, which according to Interior officials, is to establish standards to limit the waste of vented and flared gas and, among other things, establish standards for determining avoidable versus unavoidable losses. BLM officials set a time frame of 2016 to complete this order. In addition, BOEM officials told us that they had completed a reconciliation of Gulfwide Offshore Activities Data System (GOADS) and Oil and Gas Operations Report (OGOR) data in July 2013 by following up with all 86 companies operating platforms in the Gulf of Mexico and inquiring about the differences between GOADS and OGOR data on venting and flaring.

Appendix I: Recommendation Status

Number of recommendations: 5

Status of report's recommendations:

Interior has partially implemented 5 of 5 recommendations.

Agency affected	Specific recommendations:	Status:	Comments:
Department of the Interior	<p>Recommendation 2: To ensure that Interior has a complete picture of venting and flaring on federal leases and takes steps to reduce this lost gas, where economic to do so, and to help reduce venting and flaring of gas by addressing limitations in their regulations, the Secretary of the Interior should direct BLM and BOEMRE to revise their guidance to operators to make it clear that technologies should be used where they can economically capture sources of vented and flared gas, including gas from liquid unloading, well completions, pneumatic valves, and glycol dehydrators. BOEMRE should consider extending its requirement that gas be captured where economical to "lease-use" sources of gas.</p>	Partially implemented	<p>BLM is developing Onshore Order Number 9, which, according to Interior officials, will delineate which activities qualify for beneficial use, minimize the amount of venting and flaring that takes place on oil and gas production facilities on federal and Indian lands, and establish standards for determining avoidable versus unavoidable losses. BLM officials set a time frame of 2016 to complete this order. In addition, officials told us that Bureau of Safety and Environmental Enforcement's (BSEE) Notice to Lessees (NTL) 2012-NO4, which provides updated guidance for requesting approval to flare or vent natural gas and clarification of the discretionary authority of BSEE for approving such requests, has led to a significant reduction in approvals for venting and flaring. Furthermore, according to officials, this issue is also being addressed by an ongoing joint study conducted by BOEM and BSEE that is looking at the costs and benefits of efforts to further reduce venting and flaring. Interior officials stated that this study is expected to be completed in 2015.</p>
Department of the Interior	<p>Recommendation 3: To ensure that Interior has a complete picture of venting and flaring on federal leases and takes steps to reduce this lost gas where economic to do so, and to help reduce venting and flaring of gas by addressing limitations in their regulations, the Secretary of the Interior should direct BLM and BOEMRE to assess the potential use of venting and flaring reduction technologies to minimize the waste of natural gas in advance of production where applicable, and not solely for purposes of air quality.</p>	Partially implemented	<p>Interior officials stated that this issue is being addressed by an ongoing joint study conducted by BOEM and BSEE that is looking at the costs and benefits of efforts to further reducing venting and flaring. Interior officials stated that this study is expected to be completed in 2015.</p>

Appendix I: Recommendation Status

Number of recommendations: 5

Status of report's recommendations:

Interior has partially implemented 5 of 5 recommendations.

Agency affected	Specific recommendations:	Status:	Comments:
Department of the Interior	<p>Recommendation 4: To ensure that Interior has a complete picture of venting and flaring on federal leases and takes steps to reduce this lost gas, where economic to do so, and to help reduce venting and flaring of gas by addressing limitations in their regulations, the Secretary of the Interior should direct BLM and BOEMRE to consider the expanded use of infrared cameras, where economical, to improve reporting of emission sources and to identify opportunities to minimize lost gas.</p>	Partially implemented	<p>Onshore, BLM conducted a study in May 2013 of infrared camera use at two pilot locations, which found limitations in the usefulness of these cameras. Although the study recommended against full implementation of cameras across BLM at that time, BLM officials told us that Onshore Order Number 9 is expected to further address the use of infrared cameras, and BLM is considering a performance-based approach to inspecting leaks. BLM officials set a time frame of fiscal year 2016 to complete this order. Offshore, although there are no formal policies at BSEE on future infrared camera use, BSEE has acquired two additional cameras and is hoping to hire additional staff to expand offshore camera use. A report on the use of infrared cameras offshore is nearing completion. When completed, BSEE officials stated that it will allow them to decide the need and economic justification, if any, for expanding use of the camera program and/or if formal policies should be developed for implementation by BSEE or for industry compliance under future regulatory oversight.</p>
Department of the Interior	<p>Recommendation 5: To ensure that Interior has a complete picture of venting and flaring on federal leases and takes steps to reduce this lost gas where economic to do so, and to help reduce venting and flaring of gas by addressing limitations in their regulations, the Secretary of the Interior should direct BLM and BOEMRE to collect information on the extent that larger operators use venting and flaring reduction technology and periodically review this information to identify potential opportunities for oil and gas operators to reduce their emissions, and BOEMRE should use existing information in its GOADS data system for this same purpose, to the extent possible.</p>	Partially implemented	<p>BLM officials told us that, due to limited available staff and agency resources, they have been unable to begin collecting information on this issue. Interior officials told us that its ongoing joint study conducted by BOEM and BSEE is looking at the costs and benefits of efforts to further reduce venting and flaring. Interior officials stated that this study is expected to be completed in 2015. As part of this study, BOEM and BSEE are using GOADS data to analyze potential methane emission reduction opportunities in the following categories: cold vent, pneumatic pumps, pressure/level controllers, and flashing losses, in its ongoing cost-benefit study.</p>

Source: GAO. | GAO-15-39

Appendix II: Completeness and Reasonableness of Interior's Royalty Data

Interior's Office of Natural Resources Revenue (ONRR) is responsible for ensuring that the federal government receives proper payment from the private companies that extract oil and gas from federal leases. In September 2008 and July 2009, we issued reports that identified shortcomings in Interior's ability to ensure that royalty payment data were reasonable and complete.^{1,2} These reports raised questions about whether the government was collecting all the revenue it was due and included multiple recommendations intended to provide greater assurance that royalties were properly reported. See appendix I, tables 3 and 4, for additional details on these recommendations and their status.

Interior's royalty data are more complete and appear more reasonable since we last reported.³ Specifically, when compared with our July 2009 report,⁴ (1) fiscal year 2013 royalty data appear more complete, (2) fiscal year 2013 royalty data appear more reasonable, and (3) implicit royalty rates for fiscal year 2013 appeared more reasonable.⁵ Interior has also taken steps to better ensure that implicit oil and gas sales prices are reasonable.⁶

¹The data we examined had been accepted by ONRR's information technology (IT) system, but had not yet gone through ONRR's compliance process which occurs several years after the data have been accepted by the system, where additional errors may be identified.

²[GAO-08-893R](#) and [GAO-09-549](#).

³The methodology we used to examine ONRR's royalty data in our July 2009 report, and in this report, was not intended to assess the accuracy of individual royalty transactions; rather, it allowed us to assess whether royalty transactions aggregated by the month fell within parameters we established for expected values. We established these parameters based on ONRR's reporting, regulatory, and other requirements. For example, we examined whether royalties paid fell within the range of allowed royalty rates. We determined that data that were within those parameters appeared reasonable, and that data outside those parameters were potentially, or appeared, erroneous.

⁴[GAO-09-549](#).

⁵ONRR does not require payors to report royalty rates but can calculate implicit royalty rates from payor-reported data. ONRR can calculate implicit royalty rates by dividing the amount of royalties that payors report (royalty value) by the total value of the oil or gas that payors report (sales value).

⁶As with royalty rates, ONRR does not require payors to report their sales prices but can calculate an implicit sales price by dividing the total value of the oil or gas that payors report (sales value) by the volume that payors report as having sold (sales volume).

Process for Making Royalty Calculations and Payments

When an operator begins producing oil or gas under a federal lease, the royalty interest owners—or payors—pay royalties on the oil or gas produced monthly according to the following equation:

$$\text{Royalty payment} = (\text{sales volume} \times \text{sales price} - \text{deductions}) \times \text{the royalty rate}^7$$

Royalty rates for leases issued in 2014 were 12.5 percent for oil and gas produced from onshore leases, 18.75 percent for oil and gas produced from offshore leases, and 12.5 percent or 16.67 percent for oil and gas produced in the National Petroleum Reserve Alaska.

Interior's ONRR requires both the operators—the company responsible for developing the lease—and the payors—royalty interest holders of the lease—to submit monthly reports. Operators are required each month to submit a production report to ONRR including the amount of oil and gas produced from each well on each lease.⁸ In addition, all the companies that share the proceeds from the sale of oil and gas from federal lands and waters are required each month to submit a royalty report to ONRR about the oil and gas they sold.⁹ The data on each royalty report are then stored in ONRR's information technology (IT) system as a number of records, each of which consists of many variables, such as the name of the payor, the lease number, the amount of oil and gas sold (sales volume), the value of this oil and gas (sales value), allowable deductions for transportation and processing, and the amount of royalties owed (royalty value). Typically, according to ONRR officials, payors submit this

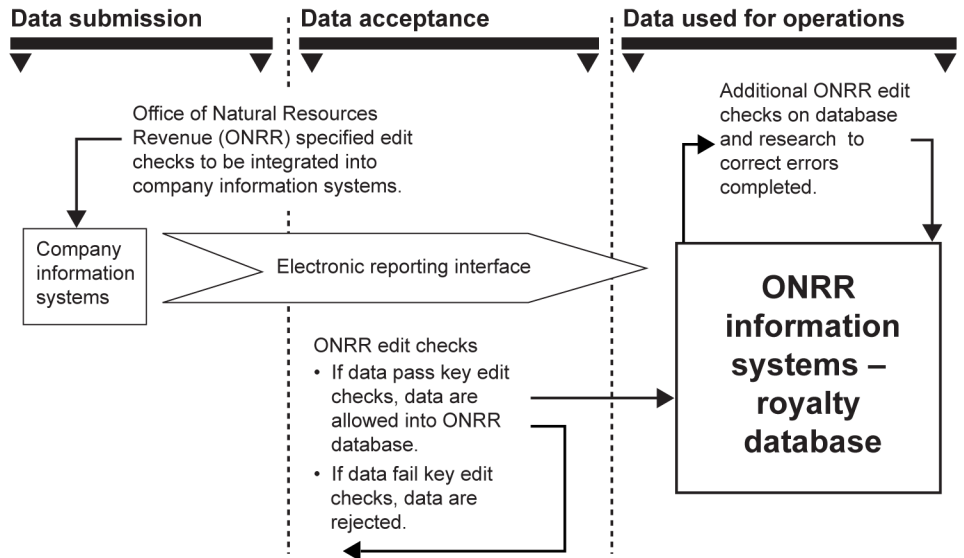
⁷Deductions can be taken for costs related to transporting oil and natural gas or processing natural gas.

⁸This report is known as the Oil and Gas Operations Report (OGOR).

⁹This report is known as ONRR Form 2014.

data through ONRR's electronic reporting website.¹⁰ There are numerous edit checks intended to prevent potentially erroneous data from entering the databases and offer advantages over efforts to continually clean up erroneous data allowed into the system. See figure 6 for an explanation of ONRR's process for submitting, checking, and accepting royalty data.

Figure 6: The Department of the Interior's Office of Natural Resources Revenue's (ONRR) Process for Submitting, Checking, and Accepting Royalty Data



Source: GAO. | GAO-15-39

In addition to filing the royalty report with ONRR, payors typically make their royalty payments via electronic fund transfers to an account at the Department of the Treasury. Once ONRR reconciles the self-reported

¹⁰According to ONRR officials, until February 2011, payors typically submitted these data through either ONRR's electronic reporting interface—a website-based portal, or its Electronic Data Interchange (EDI)—a standardized method of transferring data electronically between computer systems, such as a payor's system and ONRR's system. Previously, there had been some edit checks built into the EDI software, but ONRR's goal, had been for EDI reporters to implement most edits on their individual computer systems before they submit the data through EDI. If they did not, then payors were to use ONRR's other system for submitting data—the electronic reporting interface—which accepts fewer royalty records at a time, but already has these up-front edit checks built into its system. ONRR replaced the EDI process in February 2011 with a revised Electronic Reporting Interface system, though it functions in a similar manner to the EDI process.

royalty payment data from the monthly royalty reports with the payments submitted to Treasury, ONRR disburses the royalties from the Treasury account to the appropriate federal, state, tribal, and allotted accounts.¹¹ All of these transactions are recorded and stored in ONRR's IT system. As an additional check on the accuracy of both the company-reported production and royalty data, ONRR has a compliance group that is to conduct audits or compliance reviews on a portion of these data, typically beginning within 2 to 3 years of their submission.

Since Fiscal Year 2009 Payor-Reported Royalty Data Are More Complete

Our review of Interior's fiscal year 2013 payor-reported royalty data found that the data are more complete than when we examined this issue in September 2008.¹² In our September 2008 report,¹³ we found that ONRR's IT system was unable to automatically detect instances when a royalty payor failed to submit the required royalty report in a timely manner. As a result, cases in which a company stopped filing royalty reports and stopped paying royalties may not have been detected until more than 2 years after the initial reporting date, when ONRR's IT system completed a reconciliation of the volumes reported on the production reports with the volumes on their associated royalty reports. Additionally, in July 2009,¹⁴ we found that 5.5 percent of royalty reports from producing gas leases in the Gulf of Mexico were missing for the period from January 2006 through September 2007. These missing production reports represented potentially about \$117 million in royalties that may not have been collected, though it was possible that, instead of reporting royalties on the appropriate reports, payors may have misreported these royalties on reports for other leases and, as such, additional royalties were not due.

Our current review of royalty reports from producing gas leases in the Gulf of Mexico suggests that ONRR's new process is more effective than its former process in ensuring royalty reports are submitted in a timely manner. Specifically, we replicated our July 2009 royalty report analysis

¹¹An allotted account is an account set up to receive royalties for any land held in trust or restricted status by the Secretary of the Interior, on behalf of one or more Indians.

¹²[GAO-08-893R](#).

¹³[GAO-08-893R](#).

¹⁴[GAO-09-549](#).

using fiscal year 2013 data that indicated that 3.2 percent of royalty reports were missing, an improvement over the 5.5 percent we found for data from January 2006 through September 2007 for our July 2009 report.¹⁵

Payor-Reported Royalty Data Appear More Reasonable

Our review of fiscal year 2013 royalty data for obvious errors in key reported royalty variables—including volumes of oil and gas sold, the value of this oil and gas, and royalties paid—found that possible error rates were lower when compared with the possible error rates we found in July 2009.¹⁶ In July 2009, we found the error rate for these variables for fiscal year 2006 and fiscal year 2007 data ranged from 0 percent to about 2.29 percent, with the highest levels of errors being found in claiming processing allowances for unprocessed gas or coalbed methane.

Our analysis of fiscal year 2013 royalty data found the data generally appeared more reasonable when compared with our analysis for fiscal years 2006 and fiscal year 2007 data for our July 2009 report. Specifically, all analyses had lower apparent error rates in fiscal year 2013 when compared with the fiscal year 2006 and fiscal year 2007 data. Table 7 presents a comparison of the results of our analyses of the selected apparent error rates and the percent of times they occurred.

¹⁵Because we did not evaluate all federal and Indian leases, or even random samples of all the various types of leases—onshore and offshore, oil and gas, large and small, for example—the results of this analysis cannot be extrapolated to the entire universe of federal and Indian leases. However, offshore gas leases account for a significant amount of gas production from all federal leases.

¹⁶[GAO-09-549](#).

Table 7: Comparison of GAO Analysis of Key Royalty Variables, Office of Natural Resources Revenue's (ONRR) Oil and Gas Royalty Data

Definition of possible error associated with key royalty variables	Fiscal years 2006 and 2007 apparent error rate (percentage)	Fiscal year 2013 apparent error rate (percentage)
Reporting sales volume when reporting allowances separately from royalties due ^a	0.00	0.00
Exceeding the regulatory limit for processing allowances ^b	0.02	0.00
Exceeding the regulatory limit for transportation allowances ^b	0.06	0.05
Reporting negative sales volume ^c	0.12	0.05
Reporting negative sales value ^c	0.20	0.05
Reporting negative royalty values ^d	0.20	0.05
Reporting positive processing allowances ^e	0.23	0.00
Reporting positive transportation allowances ^e	0.16	0.03
Claiming processing allowance for unprocessed gas or coalbed methane ^f	2.29	0.20

Source: GAO analysis of ONRR data. | GAO-15-39

^aThis is not permitted because the reporting of sales volumes in this situation would lead to reporting the volumes sold twice.

^bPayors cannot exceed the regulatory limit without prior approval from ONRR.

^cThese values should be positive.

^dA negative royalty value implies the royalties that might not be collected if these instances are not detected in future compliance work or audits.

^eThese values should always be negative. Based on input from ONRR officials, we revised the methodology for these analyses from what we used in July 2009 report. The results presented here for the fiscal years 2006 and 2007 data and the fiscal year 2013 data rely on the revised methodology.

^fThese processing allowances were associated with either unprocessed gas, which by definition is not entitled to a processing allowance, or coalbed methane, which is never processed and, therefore, should not receive an allowance.

Implicit Royalty Rates Appear More Reasonable

Our analysis of the variables used to calculate implicit royalty rates show the data appear more reasonable since we examined this in July 2009.^{17, 18} We found in July 2009 that key data reported by royalty payors, including the amount of royalties owed, the value of the oil or gas sold, or

¹⁷[GAO-09-549](#).

¹⁸ONRR does not require payors to report royalty rates but can calculate implicit royalty rates from payor-reported data. ONRR can calculate implicit royalty rates by dividing the amount of royalties that payors report (royalty value) by the total value of the oil and gas that payors report (sales value).

both, appeared erroneous from 2 to 7.4 percent of the time, depending on the group of leases that we examined. We found that either royalty values or sales values, or both, appeared erroneous about 2.2 percent of the time for offshore oil leases and about 2 percent of the time for offshore gas leases when we calculated implicit royalty rates for fiscal years 2006 and 2007 data. Moreover, we found that either royalty values, sales values, or both, appeared erroneous about 7.4 percent of the time for onshore oil leases and about 4.8 percent of the time for onshore gas leases when we calculated implicit royalty rates for fiscal years 2006 and 2007 data.¹⁹

Our analysis of fiscal year 2013 royalty data found that, offshore, implicit royalty rates for oil improved from an apparent error rate of 2.2 to 0.35 percent, and for gas, from 2.0 to 0.53 percent. Onshore, implicit royalty rates for oil improved from an apparent error rate of 7.4 to 1.07 percent, and for gas, from 4.8 to 1.22 percent. Table 8 compares the results of our analysis for fiscal years 2006 and 2007 data with those from our analysis of fiscal year 2013 data.

Table 8: Comparison of Royalty Rate Calculations Outside of Expected Ranges for Federal Oil and Gas leases

Type of lease	Fiscal years 2006 and 2007 percentage apparent error rate	Fiscal year 2013 percentage apparent error rate found
Offshore oil	2.2	0.35
Offshore gas	2.0	0.53
Onshore oil	7.4	1.07
Onshore gas	4.8	1.22

Source: GAO analysis of Office of Natural Resources Revenue data. | GAO-15-39

¹⁹We could not compare our calculated implicit onshore royalty rates with actual royalty rates established in the lease terms because the latter data were not readily available to us. Because of the wide range of onshore royalty rates that we used, we believe that this is a conservative approach. Nevertheless, because of the possibility that a calculated royalty rate that is different from general onshore lease terms can be legitimate, we refer to the royalty values of the sales values for onshore leases in this situation as appearing erroneous, rather than being erroneous.

Additional Controls Added to Examine Potentially Erroneous Implicit Sales Prices

ONRR has added additional controls to examine potentially erroneous implicit sales prices,²⁰ implementing the recommendations we made on this topic in our July 2009 report.²¹ In July 2009, we found that either sales values or sales volumes appeared erroneous about 3.9 to 6.6 percent of the time when we analyzed fiscal years 2006 and 2007 royalty data to calculate implicit sales prices in the Gulf of Mexico.²² As a result of these findings, in July 2009, we recommended that ONRR develop more effective controls to highlight potentially erroneous submissions to payors and appropriate ONRR staff.

In August 2012, Interior officials told us that ONRR had added controls to identify potentially erroneous sales price data—after the data had passed through the initial edit checks, but before they could be selected for an audit. ONRR officials stated that the agency's recently formed Data Mining Services group uses its newly developed Royalty Equation Analysis dashboard to identify potentially erroneous sales price data. If the calculated implicit sales price does not fall within expected ranges, the Data Mining Services group is to analyze these instances and determine the reasonableness of the reported values and volumes and conduct additional investigations, as appropriate. ONRR officials acknowledged that edit checks for implicit sales prices remain relatively wide so as to not reject valid data. These officials explained that there is a wide range of

²⁰ ONRR does not require payors to report their sales prices but can calculate an implicit sales price by dividing the total value of the oil and gas that payors report (sales value) by the volume that payors report as having sold (sales volume).

²¹ [GAO-09-549](#).

²² Specifically, we found that, for offshore oil in the Gulf of Mexico, implicit sales prices fell outside of a wide range of prevailing market prices 3.9 percent of the time during fiscal years 2006 and 2007. At the time, in addition to possible errors in reported sales values or sales volumes, ONRR officials told us that low oil prices may reflect poor marketing, sales of low quantities of poor quality oil that settle in storage tanks, or sales of oil at offshore platforms, where the sales price may be discounted for transportation. ONRR officials also said that royalty payors may also be deducting the cost of transportation from their sales value, which is against ONRR regulations. On the other hand, high oil prices may reflect good marketing. For gas produced offshore in the Gulf of Mexico, we found that our calculated implicit sales prices fell outside of the range of prevailing market prices 6.6 percent of the time for fiscal year 2006 and 2007 data. As with oil prices, being outside of the range does not necessarily mean that the price is erroneous, but we would not expect this to be a common occurrence. Conversely, being within this range means that the sales price is reasonable but not necessarily correct. In addition to possible errors in reported sales values or sales volumes, ONRR officials said that low or high prices can reflect marketing efforts.

sales prices for oil and gas, depending on the geographic area and the conditions of the contracts between companies; however, they told us that the new controls employed by the Data Mining Services group employ a narrower sales price range for identifying potentially erroneous sales prices than the price range included in the initial edit check.

We attempted to replicate our analysis for fiscal year 2013 royalty data using a similar methodology employed in our July 2009 report;²³ however, ONRR officials stated that such an approach was no longer reasonable. Specifically, an ONRR official stated that our prior approach for establishing reasonable ranges for oil prices was no longer reasonable as market conditions had changed, in part due to a glut of light sweet crude oil produced from shale formations. Additionally, the official stated that using a single price for gas across the Gulf of Mexico was not reasonable as there are now price fluctuations. Finally, the official explained that there has been an industry shift toward a different methodology for determining oil prices.

²³For our July 2009 report, we used the following methodologies to identify reasonable price ranges for offshore oil and gas. For offshore oil, we used a range of market prices each month for comparison, the low price being the lowest daily spot price that month for Mars oil (rounded down to the nearest dollar)—a low quality, low value oil produced in the offshore Gulf—and the highest daily spot price for light Louisiana sweet (LLS) (rounded up to the nearest dollar)—a high-quality, high-value oil. For offshore gas, we used a range of market prices at the Henry Hub—a major gas trading center in the Gulf of Mexico. To establish a low and high price, we examined three specific prices each month and chose the highest and lowest price from the three (we rounded the lowest price down to the nearest dollar and rounded the highest price up to the nearest dollar). These three prices were the maximum midday spot price during the month, the minimum midday spot price during that month, and the First of the Month price—a price that is published on the first day of the month in the publication entitled *Inside FERC's Gas Marketing Report*. For our current analysis, we used a similar methodology for oil. However, for gas, to create our price ranges, we used the lowest and highest Henry Hub daily closing spot price (we rounded the lowest price down to the nearest dollar and rounded the highest price up to the nearest dollar).

Appendix III: Comments from the Department of the Interior



United States Department of the Interior

OFFICE OF THE SECRETARY
Washington, DC 20240

MAR 20 2015

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

Dear Mr. Rusco:

Thank you for the opportunity to review and comment on the Government Accountability Office (GAO) draft report entitled, *OIL AND GAS RESOURCES: Interior's Production Verification Efforts - Royalty Data Have Improved but Further Actions Needed* (GAO-15-39).

We appreciate GAO's efforts to review the progress made by Interior to improve verification of oil and gas produced from federal leases and the accuracy of royalty data. This review also includes an update of the efforts Interior has taken since fiscal year 2009 and the reasonableness and completeness of Interior's royalty data.

The Department of Interior concurs with the recommendations. Enclosed are responses to the recommendations and general and technical comments on the report.

The Department would like to highlight the BLM's FY 2016 budget that proposes to institute a fee system for its inspection program and authority to collect inspection fees onshore in the same manner that BSEE is authorized to collect such fees offshore. This proposal has been included in BLM's budget request since FY 2011. This authority would provide much needed resources to support BLM's cradle to grave responsibilities for wells.

If you have any questions about this response, please contact Linh Luu at (202) 208-4120 or LaVanna Stevenson at (202) 912-7077.

Sincerely,

David E. Haines II
Deputy Assistant Secretary
Land and Minerals Management

Enclosures

Appendix IV: GAO Contact and Staff Acknowledgments

GAO Contact

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Staff Acknowledgments

In addition to the individual named above, Jon Ludwigson (Assistant Director), Janice Ceperich, Keya Chateaufneuf, Melinda Cordero, Glenn C. Fischer, Cindy Gilbert, Mae Liles, Alison O'Neill, Kiki Theodoropoulos, and Barbara Timmerman made key contributions to this report.

Related GAO Products

Oil and Gas: Updated Guidance, Increased Coordination, and Comprehensive Data Could Improve BLM's Management and Oversight. (Reissued on May 16, 2014) [GAO-14-238](#). Washington D.C.: May 5, 2014.

Oil and Gas Management: Continued Attention To Interior's Human Capital Challenges Is Needed. [GAO-14-394T](#). Washington, D.C.: February 27, 2014.

Oil and Gas: Interior Has Begun to Address Hiring and Retention Challenges but Needs to Do More. [GAO-14-205](#). Washington, D.C.: January 31, 2014.

Oil and Gas Resources: Actions Needed for Interior to Better Ensure a Fair Return. [GAO-14-50](#). Washington, D.C.: December 6, 2013.

Oil and Gas Development: BLM Needs Better Data to Track Permit Processing Times and Prioritize Inspections. [GAO-13-572](#). Washington, D.C.: August 23, 2013.

Oil and Gas Management: Continued Attention to Interior's Revenue Collection and Human Capital Challenges Is Needed. [GAO-13-647T](#). Washington, D.C.: May 16, 2013.

Oil and Gas Management: Interior's Reorganization Complete, but Challenges Remain in Implementing New Requirements. [GAO-12-423](#). Washington, D.C.: July 30, 2012.

High-Risk Series: An Update. [GAO-11-278](#). Washington, D.C.: February 2011.

Federal Oil and Gas Leases: Opportunities Exist to Capture Vented and Flared Natural Gas, Which Would Increase Royalty Payments and Reduce Greenhouse Gases. [GAO-11-34](#). Washington, D.C.: October 29, 2010.

Oil and Gas Management: Interior's Oil and Gas Production Verification Efforts Do Not Provide Reasonable Assurance of Accurate Measurement of Production Volumes. [GAO-10-313](#). Washington, D.C.: March 15, 2010.

Energy Policy Act of 2005: Greater Clarity Needed to Address Concerns with Categorical Exclusions for Oil and Gas Development under Section 390 of the Act. [GAO-09-872](#). Washington, D.C.: September 26, 2009.

Federal Oil And Gas Management: Opportunities Exist to Improve Oversight. [GAO-09-1014T](#). Washington, D.C.: September 16, 2009.

Royalty-In-Kind Program: MMS Does Not Provide Reasonable Assurance It Receives Its Share of Gas; Resulting in Millions in Forgone Revenue. [GAO-09-744](#). Washington, D.C.: August 14, 2009.

Mineral Revenues: MMS Could Do More to Improve the Accuracy of Key Data Used to Collect and Verify Oil and Gas Royalties. [GAO-09-549](#). Washington, D.C.: July 15, 2009.

Strategic Petroleum Reserve: Issues Regarding the Inclusion of Refined Petroleum Products as Part of the Strategic Petroleum Reserve. [GAO-09-695T](#). Washington, D.C.: May 12, 2009.

Oil and Gas Management: Federal Oil and Gas Resource Management and Revenue Collection In Need of Stronger Oversight and Comprehensive Reassessment. [GAO-09-556T](#). Washington, D.C.: April 2, 2009.

Oil and Gas Leasing: Federal Oil and Gas Resource Management and Revenue Collection in Need of Comprehensive Reassessment. [GAO-09-506T](#). Washington, D.C.: March 17, 2009.

Department of the Interior, Minerals Management Service: Royalty Relief for Deepwater Outer Continental Shelf Oil and Gas Leases—Conforming Regulations to Court Decision. [GAO-09-102R](#). Washington, D.C.: October 21, 2008.

Oil and Gas Leasing: Interior Could Do More to Encourage Diligent Development. [GAO-09-74](#). Washington, D.C.: October 3, 2008.

Oil and Gas Royalties: MMS's Oversight of Its Royalty-in-Kind Program Can Be Improved through Additional Use of Production Verification Data and Enhanced Reporting of Financial Benefits and Costs. [GAO-08-942R](#). Washington, D.C.: September 26, 2008.

Mineral Revenues: Data Management Problems and Reliance on Self-Reported Data for Compliance Efforts Put MMS Royalty Collections at Risk. [GAO-08-893R](#). Washington, D.C.: September 12, 2008.

Oil and Gas Royalties: The Federal System for Collecting Oil and Gas Revenues Needs Comprehensive Reassessment. [GAO-08-691](#). Washington, D.C.: September 3, 2008.

Oil and Gas Royalties: Litigation over Royalty Relief Could Cost the Federal Government Billions of Dollars. [GAO-08-792R](#). Washington, D.C.: June 5, 2008.

Strategic Petroleum Reserve: Improving the Cost-Effectiveness of Filling the Reserve. [GAO-08-726T](#). Washington, D.C.: April 24, 2008.

Mineral Revenues: Data Management Problems and Reliance on Self-Reported Data for Compliance Efforts Put MMS Royalty Collections at Risk. [GAO-08-560T](#). Washington, D.C.: March 11, 2008.

Strategic Petroleum Reserve: Options to Improve the Cost-Effectiveness of Filling the Reserve. [GAO-08-521T](#). Washington, D.C.: February 26, 2008.

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