

# THE ROLE OF BLM IN OIL AND GAS MEASUREMENT

Richard Estabrook

Bureau of Land Management, California State Office

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## Abstract

BLM manages about 700 million acres of Federal and Indian mineral estate, which contributes a significant portion of domestic oil and gas production. BLM's role in oil and gas measurement is to ensure that volumes and qualities are accurately measured and properly reported, as Federal and Indian royalty is derived from these measurements. BLM's measurement requirements are dictated by Federal laws, from which BLM develops regulations, Onshore Orders, and Notices to Lessees. Most oil and gas measurement functions are carried out at the Field Office level through the approval of permits and variance requests. BLM inspects Federal and Indian measurement facilities to ensure compliance with regulations, Onshore Orders, and Notices to Lessees, as well as permit Conditions of Approval. BLM inspectors have various enforcement tools to ensure compliance. The public has the opportunity to comment on all proposed rulemaking, and parties adversely affected by specific decisions have several avenues of appeal.

In order to help meet mandated oil and gas measurement responsibilities, BLM has engaged in specific activities such as involvement in the development of industry measurement standards through American Petroleum Institute, the writing and implementation of new Onshore Orders and Notices to Lessees, the development of a gas measurement uncertainty calculator, an approval process for new measurement technology, and industry outreach.

## Background and History

Although the Bureau of Land Management was not established until 1946, public land history in the United States goes back to the founding of the nation. Shortly after achieving independence in 1783, a westward expansion began which included the Louisiana Purchase in 1803, acquisition of the Oregon Territory in 1846, and the Mexican Cession in 1848. Land acquired through these acquisitions and others became public land, owned by the citizens of the United States.

By the mid-1800's, a concerted effort to transfer land from public to private ownership began as a way of settling and colonizing the new frontier. In 1862, President Lincoln signed two significant pieces of legislation to this effect: The Pacific Railroad Act and The Homestead Act. The Pacific Railroad Act granted the Union Pacific Railroad and the Central Pacific Railroad 175 million acres of land in alternating sections as an incentive to build the first transcontinental railway. The Homestead Act granted 160 acres of land to any person<sup>1</sup> who improved the land through farming. In 1909 the Enlarged Homestead Act increased the land grant to 320 acres, and in 1916, the Stock Raising Homestead Act increased the land grant to 640 acres, but retained mineral rights to the United States. Other land grant legislation included the General Mining Act of 1872 and the various Statehood Acts.

The 258 million acres of public land that exists today is essentially what was left over from the various land grants - the land that nobody wanted. When the BLM was formed, the focus shifted from the transfer of public land to the management of public land. BLM originally had the responsibility of managing public surface estate for activities such as grazing, mining, timber harvesting, wildlife preservation, and recreation.

Prior to 1982, all Federal leasable mineral estate, including oil and gas, was managed by the Department of Interior, United States Geological Survey (USGS). This included the 258 million

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<sup>1</sup> Any party who had taken up arms against the United States was not eligible for the land grant.

acres of public land, 325 million acres of Forest Service and military land, and 57 million acres of "split estate" land created through the Stock Raising Homestead Act. In addition, USGS had Indian Trust responsibilities for managing the oil and gas resources on Indian and Tribal Lands (60 million acres).

In 1982, an alleged oil theft on the Wind River Indian Reservation in Wyoming, and the ensuing investigation, resulted in significant changes to the way leasable minerals were managed. The management responsibilities were taken away from the USGS and were given to a new agency - the Minerals Management Service (MMS). In 1983, the onshore leasing, permitting, and inspection responsibilities were taken from the MMS and given to BLM.

Another significant event in 1982 was the passage of the Federal Oil and Gas Royalty Management Act (FOGRMA), also as a result of the Wind River oil theft. FOGRMA mandated that BLM and MMS (offshore) develop an inspection and enforcement program to ensure that oil and gas removed from Federal and Indian leases is accurately measured and properly reported. FOGRMA also mandated numerous record keeping requirements on Federal and Indian oil and gas operators.

In response to the Gulf oil spill in April, 2010, the royalty collection function of the MMS was moved to a new agency called the Office of Natural Resource Revenue (ONRR) and the offshore functions of the MMS were moved to a new agency called the Bureau of Offshore Energy Management, Regulation, and Enforcement (BOEMRE).

In 2010, royalties from Federal and Indian leases, both onshore and offshore, amounted to about \$6.3 billion, the second largest source of revenue for the US Government. 14% of all gas and 6% of all oil produced in the US comes from onshore Federal or Indian leases. BLM currently manages about 77,000 wells on 23,000 producing leases which cover 12.3 million acres, primarily in the Western United States.

### **BLM Responsibility and Authority**

The Department of Interior has been delegated the responsibility to ensure that the public is fully reimbursed for the extraction and use of publicly-owned oil and gas resources. The BLM and ONRR also have Indian trust responsibilities to ensure that Indian Tribes and Allottees are fully reimbursed for the royalty value of the oil and gas that is extracted and sold from Trust land.

Where ONRR has the responsibility of placing a monetary value on the oil and gas removed from public and Indian leases, BLM has the responsibility of ensuring that the volumes and qualities of onshore oil and gas, which are used to calculate royalty, are accurately measured and properly reported.

BLM's function, authority, and responsibility come directly from statutes passed by Congress and signed into law by the President. For oil and gas measurement, BLM's authority is granted primarily through FOGRMA. Statutes typically enact overall intent and purpose rather than specific implementation measures. Most statutes, including FOGRMA, authorize the promulgation of regulations to implement the statute in more specific terms. For oil and gas measurement, the regulations implementing FOGRMA are 43 CFR<sup>2</sup> 3162.7-2 (oil measurement) and 43 CFR 3162.7-3 (gas measurement).

However, these regulations are also somewhat general; the gas measurement regulations only require that, unless otherwise approved, gas be measured by orifice meter, that volumes be reported at base conditions of 14.73 psi and 60°F, and that gas be measured on the lease. Similarly, the oil measurement regulations require that oil be measured on the lease by tank gauging or positive displacement methods, unless otherwise approved.

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<sup>2</sup> CFR = Code of Federal Regulations

These regulations authorize the preparation of Onshore Orders to further implement the regulations. Hence, the following Onshore Oil and Gas Orders have been established as shown in Table 1:

Order Number	Subject	Year of last revision
1	Approval of Operations	2007
2	Drilling	1988
3	Site Security	1989
4	Measurement of Oil	1989
5	Measurement of Gas	1989
6	Hydrogen Sulfide Operations	1991
7	Disposal of Produced Water	1993

Table 1 – Onshore Orders

The regulations also authorize the issuance of Notices to Lessees (NTLs - see Table 2), which are intended to address specific issues on a regional basis, whereas the Onshore Orders are national in scope. Finally, site-specific authority including the issuance of permits, variances, other approvals (such as commingling and off-lease measurement), Incidents of Noncompliance, and Written Orders are authorized by the regulations. All of the above instruments carry the full force and effect of law, and are enforceable by BLM.

NTL	State or Region	Subject	Year Issued
3A	National	Spills, accidents, blowouts	1979
4A	National	Venting, flaring, beneficial use	1980
AK-2009-1	Alaska	Electronic Flow Computers	2009
CA-2007-1	California	Electronic Flow Computers	2007
CO-2007-1	Colorado	Electronic Flow Computers	2007
ES-2008-1	Eastern States	Electronic Flow Computers	2008
MT-2007-1	Montana	Electronic Flow Computers	2007
NM-92-5	New Mexico	Low and marginal producers	1992
NM 2008-1	New Mexico	Electronic Flow Computers	2008
UT-2008-1	Utah	Electronic Flow Computers	2008
WY-2004-1	Wyoming	Electronic Flow Computers	2004

Table 2 – Measurement Related Notices to Lessees (NTL)

BLM also uses Instruction Memoranda, Manuals, and Handbooks. Because these instruments have not undergone public review and comment, they cannot be enforced and are only for establishing policy and internal guidance. Instruction Memoranda, for example, may set policy on workload priority and internal procedures for BLM Offices to follow.

### **BLM Structure and Decision Making Authority**

BLM has four levels of hierarchy: the Washington Office, State Offices, District Offices, and Field Offices. At each level there is one person with decision making authority (although this can be delegated) and support staff. Figure 1 shows the hierarchy of the various offices and the position with decision making authority at each level.

Because BLM was originally created to work with ranchers and miners directly, the majority of on-the-ground decision making authority was given to the Field Offices. Field Offices have considerable autonomy and independence when making land-use decisions. District Offices were implemented in 2009 in an attempt to consolidate some administrative functions and to provide assistance and administrative oversight to the Field Offices. While District Offices typically oversee 3 to 5 Field Offices, their decision making and oversight role for land-use issues is limited.

State Offices provide oversight and guidance to the District and Field Offices, but do not generally get involved in the day-to-day functions of either. Some state offices provide “scarce skills” technical assistance to the Field Offices. For oil and gas decisions, State Offices also serve as the first level of appeal for decisions made at the Field Office level. While State Offices generally follow state boundaries, some State Offices have jurisdiction over multiple states (see Figure 2). The Washington Office provides oversight and guidance at a national level but does not generally get involved in specific land-use decisions.

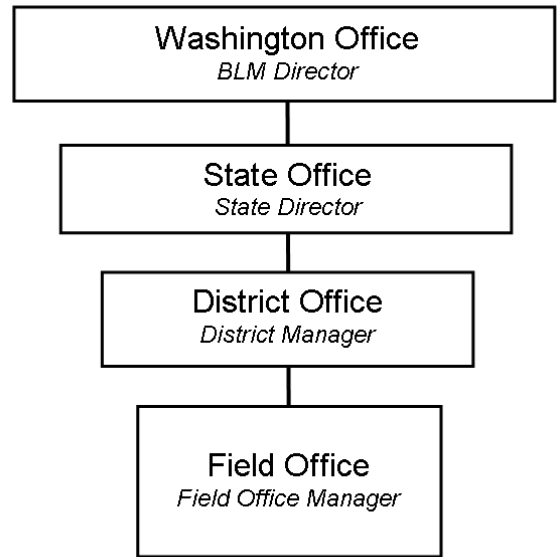


Figure 1 – BLM Hierarchy

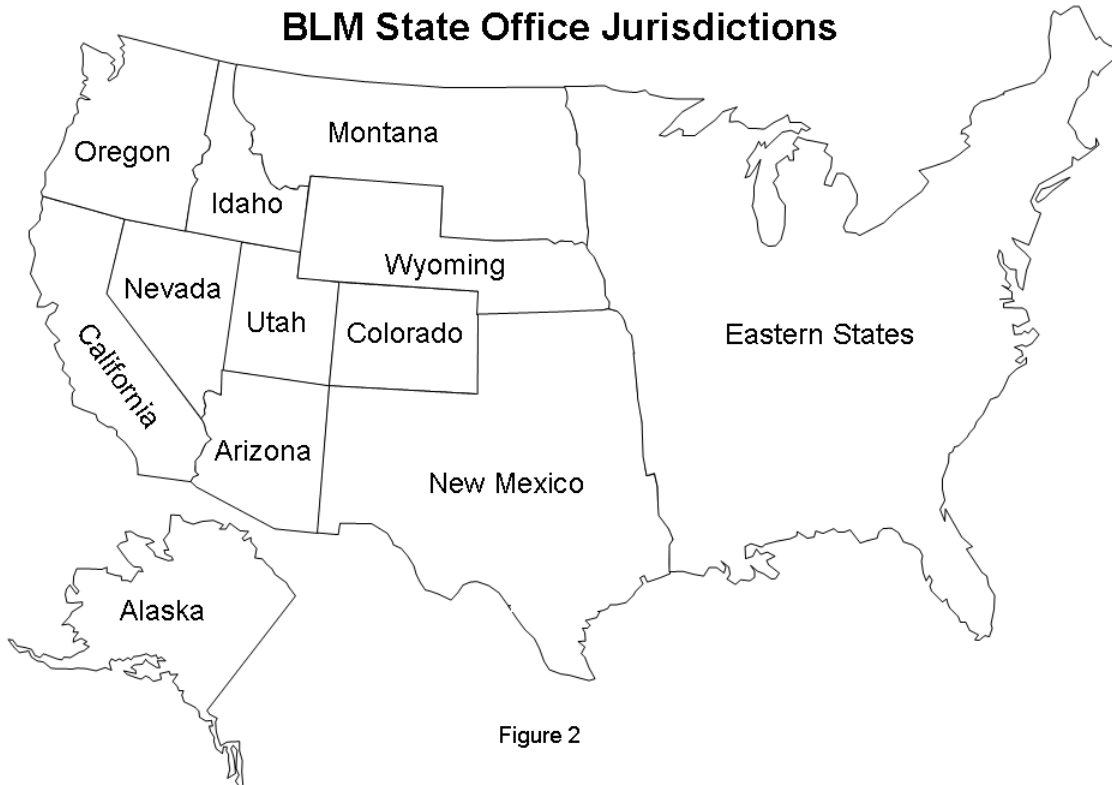


Figure 2

Most of BLM's oil and gas responsibility is carried out at the Field Office level. A typical Field Office consists of a Field Office Manager with decision making authority. Field Offices with large oil and gas programs may have an Assistant Field Office Manager or Branch Chief overseeing

the oil and gas staff. Applications for Permits to Drill, variance requests, and requests for such approvals as off-lease measurement and commingling are reviewed by petroleum engineers who will make recommendations to management on whether or not to approve the request. Typically the petroleum engineer will develop Conditions of Approval that the engineer deems necessary to cover any shortcomings in the proposal.

Field measurement and production accounting inspections are done by Petroleum Engineering Technicians (PET) who, once certified, have the delegated authority to issue Incidents of Noncompliance (INC) and Written Orders to correct violations discovered in the field. Some offices also utilize Production Accounting Technicians (PAT) to perform production audits and other production-related activities.

### **Enforcement Actions**

Federal regulations (43 CFR 3163) provide enforcement mechanisms to BLM in cases of non-compliance with federal regulations, permits, variances, and written orders. The first level of enforcement is the issuance of an Incident of Noncompliance (INC) that also includes a time frame for correction. If corrective action is not taken within the timeframe an assessment of \$500 per day may be levied for a major violation and \$250 for a minor violation. A major violation is one that is deemed to result, or have the potential to result in immediate, substantial, and adverse impacts to public health and safety, the environment, or production accounting and royalty income.

Although rarely used, additional enforcement tools include immediate assessments for removing federal seals, shut down of operations, BLM entering a lease and performing the work (at the expense of the operator), attachment of the bond, lease termination, and civil penalties.

### **Public Comment and Appeals**

The public has the opportunity to either comment on or appeal decisions made by BLM, depending on the type and scope of decision being made. For the development of regulations, which includes Onshore Orders and Notices to Lessees, BLM is required to follow the procedures mandated in the Administrative Procedures Act (APA). The APA requires that the public be given an opportunity to review and comment on all proposed regulations and that the agency respond to all the comments submitted.

For case specific decisions such as permits, variances, approvals, INCs, and Written Orders, any party adversely affected by the decision has the right of appeal. For decisions made at the Field Office level, the first level of appeal is to the State Director, and is called a "State Director Review" (SDR). If the appellant is not satisfied with the decision of the State Director, another appeal may be filed with the Interior Board of Land Appeals (IBLA). Both the SDR and the IBLA act as independent appeals bodies and will review the facts of the cases submitted by the appellant and the BLM and make a decision based on the facts and the applicable laws and regulations. The three most common outcomes of an appeal are that the original BLM decision can be "overturned", "upheld", or "remanded", where BLM is ordered to do further work.

The appellant can also take the case to Federal Court if they are still not satisfied with the outcome of the appeals process.

### **Oversight Agencies: GAO and OIG**

All federal government agencies are subject to oversight by two outside agencies: the Government Accountability Office (GAO) and the Office of Inspector General (OIG). The GAO, whose mission is to oversee government agencies, reports directly to Congress and is independent of the administration in charge. Each Department of the Federal Government has an

OIG, who reports directly to the Secretary on how well the agencies within the Department are functioning.

Because of the large amount of revenue generated by oil and gas, BLM, BOEMRE, and ONRR are under constant scrutiny by both agencies.

### **Measurement Activities**

In an effort to better accomplish its program goals, the BLM has undertaken a number of measurement-related activities.

*American Petroleum Institute (API) involvement* – Since 2004, BLM has had a consistent presence at the API-Committee on Petroleum Measurement (COPM) Spring and Fall meetings and participates in numerous working groups including:

- Chapter 14, Section 1 (Collecting and Handling of Natural Gas Samples for Custody Transfer)
- Chapter 14, Section 3 (Natural Gas Fluids Measurement – Concentric Square Edged Orifice Meters)
- Chapter 20 (Allocation Measurement)
- Chapter 21, Section 1 (Flow Measurement Using Electronic Metering Systems – Electronic Gas Measurement)
- Chapter 22, Section 1 (General Guideline for Developing Testing Protocols for Devices Used in the Measurement of Hydrocarbon Fluids)
- Chapter 22, Section 2 (Testing Protocol – Differential Pressure Flow Measurement Devices)
- Chapter 22, Section 4 (Testing Protocol – Pressure, Differential Pressure, and Temperature Measuring Devices)
- Chapter 22, Section 5 (Testing Protocol – Electronic Flow Computers Used For Gas Flow)

BLM participation in API standards development helps ensure that industry standards adopted by BLM through a rulemaking process address BLM concerns in order to protect the public interest.

*Notice to Lessees for Electronic Flow Computers (EFC)* – Because of the difficulties of developing and implementing new regulations at the national level, BLM undertook a method to develop standard requirements for EFCs on a state-by-state basis. Between 2007 and 2009, each BLM State Office now has consistent standards for EFCs<sup>3</sup>. These standards include the incorporation of several API and American Gas Association (AGA) standards, on-site informational requirements, transducer verification requirements, and uncertainty requirements.

*Uncertainty Calculator* – In order to enforce the uncertainty requirements in the new EFC NTLs, BLM developed an objective and simple-to-use PC-based calculator. BLM contracted with the Colorado Engineering Experiment Station, Inc., (CEESI) to research and provide much of the technical information used in the calculator. The calculator is free and is available at the CEESI website: [www.ceesi.com](http://www.ceesi.com). Comments on the calculator can be submitted at any time ([restabro@blm.gov](mailto:restabro@blm.gov)), including the identification of software bugs, new equipment, better calculation procedures, and ideas to make the calculator more useful or easier to use. New versions of the calculator are released periodically based on comments received.

*Alternate meters* – Current regulations establish that gas is to be measured by an orifice meter unless otherwise approved by BLM. To address alternate measurement devices, BLM has

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<sup>3</sup> The Wyoming NTL was the prototype for the standard NTL used by all the other State Offices and , as such, is slightly different in its current form.

initiated an informal process through which differential metering devices can be approved. The approval process includes the following components:

- The manufacturer must demonstrate that the device will serve the public interest compared to an orifice plate and that there is significant industry interest in using the device;
- The device must be tested by an independent lab in general accordance with API 22.2 (2005). Some modifications to the API testing protocol are required by BLM (these additions should be addressed in the next revision of API 22.2);
- While API 22.2 is a testing protocol and does not include pass/fail criteria, BLM has established such criteria. For example, the device must be free of statistically significant bias when comparing the predicted discharge coefficient with the discharge coefficient found from the API 22.2 testing. In addition, upstream and downstream pipe lengths must be long enough to eliminate statistically significant bias between the baseline and all installation effects testing.
- When the API 22.2 test report is received by BLM, a review process will ensure that all required testing has been done and that no statistically significant bias exists. A device uncertainty will be determined by BLM and installation and operational conditions will be developed. These conditions may differ from the manufacturer specifications.
- When the review process is complete, BLM will issue policy from the Washington Office directing field offices to approve the device with any appropriate Conditions of Approval

*Onshore Orders* – Initiated in mid-2009, BLM is in the process of rewriting Onshore Order 3 (Site Security), Onshore Order 4 (Liquid Measurement), Onshore Order 5 (Gas Measurement), and developing Onshore Order 9 (Beneficial Use, Flaring/Venting, Avoidably/Unavoidably Lost Production). It is anticipated that the new Onshore Orders will incorporate current API standards, address new technology, fill numerous gaps in existing Orders, and help ensure consistency between offices.

*Industry Outreach* – Most BLM Field Offices hold numerous operator forums/workshops as a way of informing industry of BLM regulations, issues, and responsibilities, and as a way of getting feedback from industry on areas of concern. In addition, BLM has also made presentations at various industry-sponsored workshops including:

- CEESI Ultrasonic Meter Workshop (2005)
- Totalflow Global Technical Conference (2008)
- International School of Hydrocarbon Measurement (various years)
- XTO Energy sponsored BLM gas measurement workshop (2008)
- Devon Energy sponsored BLM gas measurement workshop (2009)

BLM encourages open communication with industry and will participate in workshops or forums in response to industry interest and requests and as staff time and funding allow.