

Geothermal Payor Handbook—Class 1 Leases Royalty Valuation Procedures

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Office of Natural Resources Revenue (ONRR)
Royalty Valuation



Table of Contents

Geothermal Payor.....	1
Handbook—Class 1 Leases.....	1
Royalty Valuation Procedures.....	1
Release 2.0.....	1
Chapter 1.....	7
About This Handbook.....	7
1.1 Introduction.....	7
1.2 Introduction to New Geothermal Rules and Handbook.....	7
Class 1 Leases.....	8
Class 2 Leases.....	9
Class 3 Leases.....	9
1.3 Using the Geothermal Payor Handbook, Class 1 Leases.....	10
1.4 Nomenclature and Terminology.....	11
1.5 Supplementary Payor Handbooks.....	11
1.6 Handbook Distribution.....	12
Chapter 2.....	13
Valuation Overview.....	13
2.1 New Royalty Provisions Under the 2007 Regulations.....	13
2.2 Applicability of Valuation Standards.....	14
2.3 Geothermal Production Requiring Royalty Valuation.....	15
2.4 Timing of Valuation and Royalty Payments.....	16
2.5 Minimum Royalty.....	16
2.6 Reporting Codes.....	16
2.6.1 Product Codes.....	16
2.6.2 Sales Type Codes.....	17
2.6.3 Transaction Codes.....	17
2.7 Units of Measurement.....	18
2.7.1 Units of Measurement for Electrical Generation.....	18
2.7.2 Units of Measurement for Direct Use.....	19
2.7.3 Units of Measurement for Byproducts.....	19
2.7.4 Units of Measurement for Commercially De-mineralized Water.....	19
2.8 Quality Measurements.....	19

2.9 General Valuation Principles.....	20
2.9.1 Arm’s-Length Contracts	20
2.9.2 Gross Proceeds.....	21
2.9.3 Exceptions to Acceptance of Arm’s-Length Gross Proceeds.....	22
2.9.4 Marketable Condition and Marketing.....	22
Example 2-1	23
2.10 Audits and Record Keeping.....	23
2.10.1 Approvals	24
Chapter 3.....	25
Valuation Standards for Electrical Generation.....	25
3.1 If You Sell Geothermal Resources at Arm’s- Length that the Purchaser Uses to Generate Electricity.....	25
Example 3-1 Valuing Geothermal Resources Sold Under an Arm’s-Length Contract to a Power Plant.....	26
3.2 If You Use the Geothermal Resources in Your Own Power Plant for the Generation and Sale of Electricity- Netback Method	26
3.2.1 Electricity Value	27
3.2.2 Cost Reimbursements	27
3.3 Credit for “in-kind” delivery of electricity to states or counties.....	27
3.4 Near Term Production Incentives	28
3.5 Improper Valuations	28
3.6 How Do I Request a Value Determination or Gross Proceeds Determination?	28
3.7 Recordkeeping and Availability.....	29
3.8 Dismantlement Cost Refunds	29
Chapter 4.....	30
Gross Proceeds Less Applicable Deductions or Netback Valuation for Electrical Generation (Not Arm’s Length Sales of the Geothermal Resource).....	30
4.1 General Concepts.....	31
4.1.1 Electricity Value	31
4.1.2 Netback Valuations When Electricity Payments Are Not Made on a Calendar Month	32
4.1.3 Deduction Periods	32
4.1.4 Deduction Limits.....	33
4.1.5 Requisite Electricity Measurements.....	33

Figure 4-1.....	34
4.2 Step 1—Annual Cost Rate for Transmission Deduction.....	35
4.2.1 Step 1A—Transmission Line O&M Cost	35
4.2.2 Step 1B—Transmission-line Capital Investments.....	37
4.2.3 Step 1C—Determine the Method of Handling Capital-related Cost.....	38
4.2.4 Step 1D—Calculate Transmission-line Cost Rates by the Depreciation Method Plus the Return on Undepreciated Capital Method.....	39
Example 4-1 Calculating Transmission-Line Cost Rates by Depreciation Method .	40
4.2.5 Step 1E—Calculate Transmission-line Cost Rates by the Return-on-Investment Method.....	40
Example 4-2 Calculating a Transmission-Line Cost Rate by the Return-on- Investment Method	41
Example 4-3 Calculating a Transmission-Line Cost Rate When the Transmission Line Serves More Than One Power Plant.....	41
4.3 Step 2—Calculate Your Transmission Deduction.....	43
4.3.1 Arm’s-Length Wheeling Charges.....	44
4.4 Step 3A—Generation Cost Rates and Deductions	44
4.5 Step 3B—Determine Power Plant Costs	46
4.5.1 Power Plant Capital Investments	46
4.5.2 Real Estate Costs.....	49
4.6 Step 3C—Determine Your Method of Handling Capital Cost	49
4.7 Step 3C(1)—Calculate Generating Cost Rates by the Depreciation Method	49
4.7.1 Depreciation	49
4.7.2 Return on Undepreciated Capital Investment.....	50
Example 4-4 Calculating a Generating Cost Rate by the Depreciation Method.....	50
4.8 Step 3 C (2) Calculating Generating Cost Rates by the Return-on-Investment Method.....	51
4.9 Step 4 Calculating your Monthly Generation Deduction.....	52
4.10 Step 5 Calculating the Monthly Value of the Geothermal Resource	52
4.11 Step 6 Allocating Value to Leases	53
4.12 Step 7 Reporting Netback Values on Form ONRR-2014	53
4.13 Step 8 Recalculated Netback Values: Underpayments and Overpayments.....	53
4.14 Netback Calculation Examples	54
Example 4-6 Calculating a Netback Value When Production Is from a Single Lease	

Example 4-7	Calculating a Netback Value When Production Is from Multiple Leases	55
Example 4-8	Calculating a Netback Value When Production Is from Multiple Leases	56
Example 4-9	Calculating a Netback Value When a Transmission Line Serves Two Power Plants	58
Example 4-10	Calculating a Netback Value When Deductions Exceed 99 Percent of Electricity Sales Value	59
Example 4-11	Recouping Royalty Payments When You Adjust Netback Values	60
Chapter 5		62
Valuation Standards for Direct-Use		62
5.1	Arm's-Length Sales	62
Example 5-1:	Arm's Length Sales	63
5.2	If you use the Geothermal Resource for your own Direct- Use purpose	64
5.2.1	First non-arm's-length valuation benchmark: Weighted Average of Gross Proceeds in Arm's-Length Contracts	64
Example 5-2:	Valuing Direct-Use Resources under the First No-Sales Benchmark	64
5.2.2	Second Valuation Method for Direct-Use : Alternative Fuel Valuation	65
Example 5-3:	Converting a Heating Oil Price from \$/Gallon to \$/MMBtu	66
Example 5-4:	Converting a Natural Gas Price from \$/Therm to \$/MMBtu, with Monthly Service Charges	67
5.2.3	Third valuation method for direct use- other valuation methods	68
5.3	Resource Measurements	69
5.4	Allocation to Leases	69
5.5	Reporting on Form ONRR-2014	70
5.6	Example Valuations Using the Alternative Fuel Method	70
Example 5-5	Calculating Value under the Alternative Fuel Method When Production Is from a Single Lease	70
Example 5-6	Calculating Value under the Alternative Fuel Method When Production Is from More Than One Lease	71
Chapter 6		73
Byproduct Valuation		73
6.1	Byproduct Royalty Rates	73
Abbreviations		74
Appendix A- Class 1		75

Definition of Terms	75
Appendix B- Important Addresses.....	81

Chapter 1

About This Handbook

1.1 Introduction

The Office of Natural Resources Revenue (ONRR), within the Department of the Interior, is responsible for ensuring the proper collection, accounting for, and disbursement of all revenues from Federal geothermal leases to the appropriate recipients. The Bureau of Land Management (BLM) administers 245 million acres or one-tenth of America's land base and 700 million acres of subsurface mineral estate. Other Federal agencies such as the Forest Service and Fish and Wildlife Service also manage some surface lands, while the BLM manages the Federal onshore subsurface. BLM sets the lease terms such as royalties and rentals while ONRR collects these payments and disburses them to the U.S. Treasury, states, and counties.

Geothermal revenues that ONRR collects include the following:

- Rentals for leases.
- Minimum royalties for producing Class 1 leases that do not meet their minimum royalty obligation from actual production royalties or for nonproducing leases that have a well capable of producing geothermal resources in commercial quantities, as the BLM determines¹.
- Production royalties for producing leases.
- Compensatory royalties for geothermal resources that are avoidably lost, wasted, or drained (BLM-determined).

This handbook describes the regulatory methods of valuing Federal geothermal resources to determine production royalties.¹ These same methods determine compensatory royalties as well. Royalty is due on the value of geothermal resources (including certain byproducts) produced, processed, removed, sold, or utilized from the lease, or reasonably susceptible to sale or utilization by the lessee or designated operator.

1.2 Introduction to New Geothermal Rules and Handbook

On May 2, 2007, ONRR issued new regulations (Title 30, Code of Federal Regulations (CFR) Parts 1202, 1206, 1210, 1217 and 1218) to implement the geothermal provisions of the Energy Policy Act of 2005 (EPAAct) governing the payment of royalty on geothermal resources produced from Federal leases and the payment of direct-use fees in lieu of royalties. The EPAAct provisions amend the Geothermal Steam Act of 1970 (GSA). Those regulations became effective on June 1, 2007.

¹ This handbook does not apply to valuation of Indian geothermal resources unless the Indian geothermal lease otherwise provides for it.

This handbook supplements the geothermal regulations in 30 CFR Parts 1202, 1206, 1210, 1217, and 1218 (2007 forward). If there are inconsistencies between the regulations and this handbook, the regulations always take precedence. The 2007 regulations have the following new geothermal provisions from EAct 2005 which:

1. Identify when credits against royalties are and are not allowable;
2. Explain how and when to pay advanced royalties;
3. Provide royalty reduction for existing leases that qualify for near term production incentives;
4. Provide new Product Codes for reporting with the direct use fee schedule;
5. Provide new Transaction Codes for in-kind deliveries of electricity to states or counties
6. Identify allowable deductions from royalty payments and how to calculate them;
7. Amend, streamline and re-write the existing sections of the regulations, promulgated in 1991, in plain English;
8. Explain the new percent of gross proceeds royalty calculation method for electrical generation lessees and the new direct use fee schedule for direct use lessees.
9. Gave current lessees the option of staying on the current royalty calculation method (usually netback) or converting to the new percentage of gross proceeds method within 18 months of the effective date of the new regulations. (June 1, 2007)

This handbook does not replace the regulations. You are responsible for the proper valuation, for royalty purposes, of Federal geothermal production. Accordingly, you should have a working knowledge of all governing regulations. Concurrent with the publication of the ONRR Geothermal Valuation Rule in 2007, the BLM also published a final rule revising the BLM's existing geothermal resource leasing, operations, and unit agreement regulations to implement provisions of the Energy Policy Act.

The BLM 2007 geothermal rule is found at: 43 CFR Parts 3000, 3200, and 3280. ONRR collects royalties on three types of geothermal leases. ONRR defined these names to describe BLM leases from the BLM 2007 geothermal regulations, however, BLM does not use these terms for the different leases in their geothermal regulations, only ONRR does. ONRR wanted to make clear that there were differences in lease terms between pre and post-EAct leases as follows:

Class 1 Leases

Class 1 lease means: (1) A lease that BLM issued before August 8, 2005, for which the lessee has not converted the royalty rate terms under 43 CFR 3212.25; or (2) A lease that BLM issued in response to an application that was pending on August 8, 2005, for which the lessee has not made an election under 43 CFR 3200.8(b).

Class 1 leases contain all the royalty provisions for existing leases: minimum royalty, rentals, byproduct royalty rates. The only new provisions that apply are the production

incentives for new or qualified expansion production and credits for in kind delivery of electricity

Class 2 Leases

Class 2 lease means: A lease that BLM issued after August 8, 2005, but also includes leases issued in response to an application that was pending on August 8, 2005, and for which the lessee does not make an election under 43 CFR 3200.8(b).

Class 2 leases contain all new royalty rates, direct use fees, new rental rates, rental credits to royalties, new byproduct royalty rates, credit for in-kind delivery of electricity, and advanced royalties

Class 3 Leases

Class 3 leases are broken into **Parts A and B**. These parts are based on definitions found in ONRR regulations at 30 CFR 1206.351 and two options provided for in the BLM regulations at 43 CFR 3212.25, 3200.7, and 3200.8(b).

The ONRR regulations at 30 CFR 1206.351 define a *Class 3 lease* as: A lease that BLM issued before August 8, 2005 for which the lessee has converted to the royalty rate or direct use fee terms under 43 CFR 3212.25.

Under Class 3 as defined by ONRR, BLM allows for lessees to convert lease terms using either of two options.

Part A provides for the first option: Class 1 leases may be converted to modify lease terms to accept only the royalty rate or direct use fee terms provided for by EPAct under 43 CFR 3212.25.

Class 1 leases that only convert to the new royalty terms, i.e., royalty on electricity (% of gross proceeds, the royalty rate on electricity, which is determined on a case by case basis for existing producing leases. If not producing, then they will have the 1.75% royalty rate.), direct use fees. Does NOT affect byproduct royalty rates, i.e., the old rates apply like in Class 1 leases.

Part B provides for the second option: Class 1 leases may be converted to modify lease terms by electing to accept all terms provided for at 43 CFR 3200.7 and 3200.8.

In effect, these are identical to Class 2 leases except for the royalty rate on electricity, which is determined on a case by case basis for existing producing leases. If not producing, then they will have the 1.75% royalty rate. See BLM regulations at 43 CFR 3212.25 and 3200.7(a)(2).

This handbook covers Class 1 leases. The next geothermal handbook will cover Class 2 and 3 leases.

NOTE

*Report geothermal royalties to ONRR using the monthly **Report of Sales and Royalty Remittance** (Form ONRR-2014). Once a geothermal lease begins commercial production, you must submit a Form ONRR-2014 for each month that your lease produces. Do not submit a Form ONRR-2014 for those months that your lease does not produce. You must, however, submit production and facility reports to BLM which will verify your production volumes and forward them to ONRR.*

For detailed geothermal royalty and other lease obligation payments reporting instructions and examples, see ONRR's *Mineral Revenue Reporter Handbook, Chapter 7-Geothermal*.

1.3 Using the Geothermal Payor Handbook, Class 1 Leases

We divided this handbook into the following chapters:

- **Chapter 2: Valuation Overview**
This chapter identifies geothermal resources that are subject to royalty and addresses minimum royalty requirements. It describes measurement standards for royalty reporting, reviews general valuation principles, defines terms crucial to valuation, and discusses housekeeping subjects that we could not easily accommodate in other chapters.
- **Chapter 3: Valuation Standards for Electrical Generation**
This chapter describes the requirements for valuing geothermal resources used to generate electricity.
- **Chapter 4: Gross Proceeds Less Applicable Deductions or Netback Valuation for Electrical Generation**
This chapter explains in detail the netback procedure used to value certain electrical generation resources, and how deductions from gross proceeds are calculated.
- **Chapter 5: Valuation Standards for Direct Use**
This chapter describes the requirements for valuing geothermal resources used in direct-use processes.
- **Chapter 6: Byproduct Valuation**
This chapter describes the requirements for valuing byproducts and for determining byproduct transportation allowances.
- **Appendix A: Definition of Terms**
- **Appendix B: Important Addresses**
This section contains important ONRR addresses.

The first two chapters cover general concepts and are designed to be used in conjunction with the other chapters of the handbook. For example, if you are using gross proceeds less applicable deductions (netback) to value your production, you need to be familiar with the information in Chapters 1, 2, 3, and 4. If you are valuing direct use, you need to be familiar with Chapters 1, 2, and 5. If you are valuing byproducts, you need to be familiar with Chapters 1, 2, and 6.

We cite pertinent regulations and authorizing statutes throughout the text for legal cross-reference. For example, “30 CFR 1206.352 (b)(1)(i)” refers to the regulation in Title 30 of the Code of Federal Regulations, Part 1206, section 352, paragraph (b)(1)(i) that governs the valuation of electrical generation resources sold under arm’s-length contracts; likewise “30 U.S.C. 1001 et seq.” refers to the codification of the Geothermal Steam Act in Title 30 of the United States Code, section 1001 and following.

1.4 Nomenclature and Terminology

We use the following conventions throughout this handbook:

- **You:** The geothermal lessee, operator, royalty payor, or affiliate. Although a royalty payor may not be the lessee for a particular lease, a royalty payor has the same reporting and valuation obligations as the lessee (see the definition of lessee at 30 CFR 1206.351). The lessee is ultimately responsible for ensuring the proper reporting and paying of royalties.
- **We:** The Office of Natural Resources Revenue.

We use several specialized terms throughout this handbook; for example, *Arm’s-length Contract*, *Gross Proceeds*, *Byproduct*, and *Direct use*. In the new regulations, terms have been changed to reflect current valuation methods. For example, “netback” and “gross proceeds less deductions” are interchangeable in Chapter 4. You must be familiar with the definitions of all these types of terms in order to fully understand and properly use the valuation principles presented here. Definitions can be found in Appendix A or 30 CFR 1206.351.

1.5 Supplementary Payor Handbooks

The *Geothermal Payor Handbook—Product Valuation Class 1* and *The Geothermal Payor Handbook Class 2 and 3* are part of a series of ONRR handbooks containing information on Federal and Indian mineral valuation and royalty reporting requirements. Follow the instructions in the *Minerals Revenue Reporter Handbook*, Chapter 7, in order to establish your account with ONRR. Chapter 7 also contains detailed instructions for completing Form ONRR-2014 to report your geothermal royalties. As previously mentioned, you must submit a Form ONRR-2014, together with your royalty payment, each month, by the end of the month following production that you have commercial geothermal production.

1.6 Handbook Distribution

This handbook is available on the web at

<http://www.onrr.gov/ReportPay/PDFdocs/geopayor.pdf>.

Chapter 2

Valuation Overview

Royalty valuation of Federal geothermal resources draws its authority from the Geothermal Steam Act of 1970 (30 U.S.C. 1001 *et seq.*) as amended by The Energy Policy Act of 2005 (EPAAct 2005, Sections 221 through 237). The acts provide for payment of royalties to the U.S. Government on the amount, or value, of geothermal resources derived from production under the lease and sold or used, or reasonably susceptible to sale or use, as determined by the BLM. For practical reasons, and unless otherwise permitted by lease arrangements, you pay royalties on the value of produced geothermal resources as follows:

$$\text{Royalty} = \text{Royalty Rate} \times \text{Value of Production}$$

NOTE

For Class 1 leases, the royalty rate provided in the lease term is reduced by 50% for four years on any new production or qualified expansion projects for current leases that do not modify their lease terms to the new calculation method. (See BLM regulations at 43 CFR 3212.18-3212.24.)

2.1 New Royalty Provisions Under the 2007 Regulations

The new regulations in 2007 changed to a new “percentage of gross proceeds from the sale of electricity” royalty method. (43 CFR 3211.17)

- Class 2 and converted non-producing Class 3 leases royalty rates are 1.75% of gross proceeds for the first 10 years, and 3.5% thereafter.
- Current lessees at the time had the option of staying on the current royalty calculation method or converting to the new percentage of gross proceeds method within 18 months of the effective date of the new regulations. This election has expired.
- BLM assigned a lease royalty rate to producing converted Class 3 leases.
- The new lease royalty rate for converted Class 3 producing leases was calculated by BLM such that the royalty revenues received by ONRR should be the same as what would have been received under the former regulations’ valuation methods for 10 years as mandated by the EPAAct 2005.
- Allow all classes of lessees a credit against royalties owed on geothermal resources for delivery of electricity “in-kind” to states and counties that receive a portion of royalty revenues rather than full payment in monies. (30 CFR 1218.306)
- For Class 2 and Class 3 leases that converted their royalty terms, allow credits against royalty payments for annual rentals paid before the first day of the year for which the rental is due. Rentals always due. (30 CFR 218.303) There is no minimum royalty for Class 2 and 3 leases. (43 CFR § 3211.21)
- For Class 2 and Class 3 leases that converted their royalty terms, require payment of advanced royalties for cessation of production. These payments will be credited against royalties owed once production starts again. (30 CFR 218.305)
- For Class 1 lessees only, provide for a 50 percent reduction in royalty, for four years, on any new production or qualified expansion projects for current lessees

that do not modify their lease terms to the new calculation method. (30 CFR 1218.307)

- For Class 2 and Class 3 leases that converted their royalty terms, establish a fee schedule, in lieu of royalties, for lessees that do not sell the geothermal resource and use it for a purpose other than the commercial generation of electricity (direct use lessees). (30 CFR 206.356)
- Lessees have the option to stay on the current royalty method or convert their lease terms to the fee schedule method within 18 months of the effective date of the fee schedule. (43 CFR 3212.25)

You determine the value of production by the regulations in 30 CFR 1206.350–1206.366 and the instructions in this handbook. As used in this handbook, *value of production*, *royalty value*, or simply *value* all have the same meaning and always refer to the value on which you pay royalties.

2.2 Applicability of Valuation Standards

The valuation standards and procedures we describe in this handbook apply to the following:

Geothermal resources that you produce from Federal leases that the Bureau of Land Management (BLM) issued under the Geothermal Steam Act.²

- Indian minerals agreements that you entered into under the Indian Mineral Development Act of 1982 (25 U.S.C. 2101-2108), by default unless otherwise addressed in the agreement. (See 25 CFR Part 225).

Use these standards and procedures to determine the royalty value of all geothermal production.

“Geothermal Resources,” which the Geothermal Steam Act calls “geothermal steam and associated geothermal resources,” are as follows:

- All products of geothermal processes, including indigenous steam, hot water, and hot brines.
- Steam and other gases, hot water, and hot brines resulting from water, gas, or other fluids artificially introduced into geothermal formations.
- Heat or other associated energy found in geothermal formations.
- Byproducts: Minerals (exclusive of oil, hydrocarbon gas, and helium), found in solution or in association with geothermal steam, that no person would extract and produce by themselves because they are worth less than 75 percent of the value of the geothermal steam or because extraction and production would be too difficult.

² The Geothermal Steam Act authorizes the Department of the Interior to issue geothermal leases only on certain Federal lands, namely public domain lands, acquired lands, and lands with minerals reserved to the Federal Government; the act excludes issuance of geothermal leases on Indian lands.

2.3 Geothermal Production Requiring Royalty Valuation

You must determine the value of, and pay royalties on, all geothermal resources—including byproducts—that are either: a) produced from a Federal geothermal lease and sold or used, or reasonably susceptible to sale or use, (see 30 CFR 1202.351) as determined by the BLM or b) avoidably lost, wasted, or drained from a lease.

You also must determine the royalty value of geothermal resources that you avoidably lost, wasted or drained from a lease in the same manner as if you sold or used them, using the valuation standards in 30 CFR 1206.350-1206.366.

You must also pay royalty on insurance or other compensation received for geothermal resources that are unavoidably lost.

You don't determine the value or pay royalty on geothermal resources that are as follows:

- Unavoidably lost, as BLM determines (unless you receive insurance or other compensation as indicated above).
- Reinjecting, as BLM approves.
- Used to generate electricity for internal operations (parasitic electricity) in your own or your affiliate's power plant, or to generate electricity returned to the lease for lease operations; however, if a power plant uses geothermal resources from more than one lease, or uses unitized or communitized production, you may use only that proportionate share of each lease's production—either actual or allocated—royalty free.
- Commercially de-mineralized water used for power plant operations or for lease or unit operations.
- Byproducts placed in stockpiles, added to inventories, or otherwise disposed of without financial benefit to you; byproducts disposed of without financial benefit to you generally include those that are not reasonably susceptible to sale or utilization and those classified as hazardous waste.

NOTE

You have an implied obligation to market or use geothermal resources, including byproducts, to the mutual benefit of yourself—as the lessee—and the Federal Government—as the lessor. Disposal of geothermal resources without financial gain to you will incur a royalty obligation when they are reasonably susceptible to sale or utilization. Thus, if you give away geothermal resources for the convenience of disposal, and the recipient secures financial gain or benefit from the disposed resource, you must pay royalty on the value of that disposed resource. Contact ONRR at the address given in Appendix A for a royalty determination if you encounter this circumstance.

Regulations covering royalty-bearing production appear at 30 CFR 1202.351.

2.4 Timing of Valuation and Royalty Payments

Once you place a lease into production, you must report and pay royalties on Form ONRR-2014 for each month's production. Except as described in the following note, this means that you determine value for each calendar month's cumulative production attributable to each sales type code reported on Form ONRR-2014. You must pay royalties by the end of the month following the month of production (30 CFR 1210.353); see Chapter 7 of the *Minerals Revenue Reporter Handbook* for further details.

You do not have to submit a Form ONRR-2014 for months during which you do not produce.

2.5 Minimum Royalty

You must satisfy the minimum royalty requirement that the geothermal lease established (usually \$2.00 per acre) each lease year (30 CFR 1202.352). If the royalties paid on monthly production during the lease year are less than the minimum royalty, you must pay the difference to ONRR on or before the expiration date of the lease year (see Geothermal Resources Lease at Sec. 2 and BLM regulations at 43 CFR 3211.21). We allow a grace period only to the last day of the month of the lease year. Report minimum royalty payments on Form ONRR-2014 using transaction code 02.

If near the end of the lease year your projected royalties are less than the minimum royalty you may make an estimated minimum royalty payment to ONRR, and you may recoup any overpayment resulting from the estimated minimum royalty payment. Contact your designated ONRR representative at 1-800-525-0309 for further information regarding minimum royalties and recoupments.

2.6 Reporting Codes

When reporting geothermal royalties on ONRR Form 2014, there are product codes, sales type codes, and transaction codes that you must use. Refer to The Mineral Revenue Reporter Handbook, Chapter 7 (Geothermal) for detailed reporting instructions.

2.6.1 Product Codes

Use the following product codes to report geothermal fluids used to generate electricity (electrical generation resources).

Product code	Description
31	Electrical generation, kWh
32	Electrical generation, thousands of pounds (generally applicable only to dry steam resources)
33	Electrical generation, MMBtu
34	Electrical generation, other measurement unit approved by ONRR

35	Direct use, MMBtu
36	Direct use, hundreds of gallons
37	Direct use, other
38	Commercially demineralized water, reported in hundreds of gallons
41	Sulfur, reported in long tons (replaces product code 19 for geothermal sulfur)
42	Carbon dioxide, reported in thousands of cubic feet (Mcf)
43	Silica, reported in pounds
44	Other geothermal byproduct not listed above; contact MMS for unit of measure
45	Direct use, millions of gallons
46	Direct use, millions of pounds

2.6.2 Sales Type Codes

Use the following sales type codes to report royalties on geothermal production

Sales type code	Description
ARMS	Geothermal resources sold under an arm's-length sales contract
NARM	Geothermal resources not sold under an arm's-length contract

You can use sales type codes singularly or in combination, depending on the resource's disposition. Report different sales type codes on separate lines.

2.6.3 Transaction Codes

Use the following transaction codes to report geothermal royalties on the value of production or on proceeds associated with production:

Transaction Code	Description
01	Royalty on value of production
02	Minimum royalty payment
03	Estimated royalty payment
04	Rental
05	Recoupable rent
10	Compensatory royalty on value of drained, avoidably lost, or wasted production
11	Byproduct transportation allowances
14	Royalty on severance tax and other production tax reimbursements
16	Direct use fees

32	Advanced royalty payment
33	Advanced royalty recoupment
C1	100% Federal Credit Burden
C2	Shared Credit Burden
C3	State in Lieu Of
C4	County in Lieu Of
53	Royalty on payments or reimbursements for effluent and other fluid injection
54	Royalty on payments or reimbursements for geothermal field operations, other than effluent and other fluid injection

2.7 Units of Measurement

The units of measurement used to report royalties are dependent on how the resource is used.

2.7.1 Units of Measurement for Electrical Generation

For geothermal resources used to generate electricity and valued under an arm's-length contract, you report production quantities on Form ONRR-2014 in the following units (30 CFR 1202.353(a)):

Contract-Specified Unit of Measurement	Quantity Measured	Sales Volume Reported to ONRR
Thousands of Pounds (Mlb)(PC 32)	1,192,573(lbs)	1,192.57(1000's lbs)
Millions of Btu (MMBtu)(PC33)	34,197,054(Btu)	34.1974(MMBtu)

Sales Volume Reported to ONRR is in thousands of pounds (Mlb) of steam to the nearest whole thousand pounds, if the contract specifies payment in terms of mass or weight.

If you use the geothermal resources in your own power plant to generate electricity, you report production quantities on Form ONRR-2014 in the following units (30 CFR 1202.353(b)):

Contract-Specified Unit of Measurement	Quantity Measured	Sales Volume Reported to ONRR
kilowatt-hours(kWh)(PC 31)	38,755.257(mWh)	38,755,257 (kWh)

Kilowatt-hour (kWh) to the nearest whole kilowatt-hour if the contract specifies payment in terms of the generated electricity.

2.7.2 Units of Measurement for Direct Use

For geothermal resources used in direct-use processes, you use the following units of measurement to report production quantities on Form ONRR-2014 (30 CFR 1202.353(b)):

Contract-Specified Unit of Measurement	Quantity Measured	Sales Volume Reported to ONRR
Millions of Btu (MMBtu)(PC 35)	34,197,053 (MMBtu)	34,197,053 (MMBtu)
Hundreds of Gallons (PC 36)	57,892,345 (gal)	58 (MMgal)
Geothermal Direct Use Other (PC 37)	None	None

- *Millions of Btu (MMBtu) to the nearest whole million Btu if valuation is in terms of thermal energy used or displaced; this includes the amount of thermal energy displaced for valuation under the alternative fuels method.*
- *Hundreds of gallons to the nearest whole hundred gallons of geothermal fluid if valuation is in terms of volume.*
- *Other measurement units sales contracts might identify or that alternative valuation methods may use; however, you must contact ONRR at the address given in Appendix A for approval of other measurement units.*

2.7.3 Units of Measurement for Byproducts

For byproduct minerals **except** sulfur, you use the units of measurement (such as ounces, pounds, or tons) given in ONRR's *Minerals Revenue Reporter Handbook* (30 CFR 1202.353(c)). You report sulfur on Form ONRR-2014 in long tons (2,240 lb.) using product code (PC) 41, carbon dioxide in thousands of cubic feet (Mcf) PC 42, silica reported in pounds (lbs) PC 43, other geothermal byproducts PC44.

2.7.4 Units of Measurement for Commercially De-mineralized Water

You report the quantity of commercially de-mineralized water, on which royalty is due, on Form ONRR-2014 in hundreds of gallons to the nearest hundred gallons (PC 38) 30 CFR 1202.353(d).

2.8 Quality Measurements

Quality refers to the physical and chemical properties of the resource. You do not report quality measurements to ONRR for geothermal resources or byproducts (30 CFR 1202.353(e)). However, you must maintain quality measurements for audit and valuation purposes, particularly if valuing alternative fuels for direct use resources. Quality measurements include—but are not limited to—temperatures, pressures, enthalpies, and chemical analyses of geothermal fluids or chemical analyses, weight percent, or other purity measurements of byproducts.

2.9 General Valuation Principles

Royalty valuation's basis comes from the concept that the best determination of value is the gross proceeds that you generate under an arm's-length contract for the sale or purchase of the resource in marketable condition. Because prevailing market forces determine prices in arm's-length contracts, we view arm's-length prices as the best measure of market value. As a general rule, the prices that you establish in your arm's-length sales contracts—and the gross proceeds that you derive from them—are acceptable for royalty valuation.

If you cannot sell either electricity or the geothermal resource through an arm's length contract you must refer to 30 CFR 1206.352 for the sale of electricity, or 30 CFR 1206.357(b)(2 or 3) for byproduct materials.

If you cannot calculate royalties using gross proceeds from arm's length sales, you can calculate royalties using several methods. For most not-arm's length sales situations in geothermal energy on Federal leases, you will use the netback method, which is explained in detail in Chapter 4. If your situation does not fit into the arm's length or netback category, you may request a valuation determination from ONRR regarding any geothermal resource produced from a federal lease.

NOTE

When you sell the resource under a contract, value for royalty purposes can never be less than your gross proceeds accruing under that contract, regardless of the value you compute.

2.9.1 Arm's-Length Contracts

An "arm's-length contract" is a contract or agreement arrived at in the marketplace between independent, non-affiliated persons with opposing economic interests regarding that contract. To be considered arm's length for any production month, a contract must satisfy this definition for that month, as well as when that contract was executed. (30 CFR 1206.351). An Affiliate means a person who controls, is controlled by, or is under common control with another person. Persons who are related either by blood or by marriage are also affiliated. The determination of the term "control" comes from the percentage of ownership of the entity's voting securities or other forms of ownership, as follows:

1. Ownership or common ownership in excess of 50% of the voting securities, or instruments of ownership, or other forms of ownership constitutes control.
2. Ownership of 10-50% of the voting securities, instruments of ownership, or other forms of ownership of another person. ONRR will use the following factors to determine whether there is control under the circumstance of a case:
 - a) The extent of common officers or directors
 - b) With respect to voting securities, or instruments of ownership, or other forms of ownership:, the percentage of ownership in common or common ownership, the relative percentage of ownership or common ownership compared to the percentage(s) of ownership by other persons, whether the person is the

- greatest single owner, or whether there is an opposing voting block of greater ownership
- c) Operation of a lease, plant, pipeline or other facility
 - d) The extent of participation by other owners and day-to-day management of a lease, plant, pipeline, or other facility
 - e) Other evidence of power to exercise control over a common control with another person
3. Ownership of less than 10% creates a presumption of non-control, which ONRR may rebut.
 4. Persons who are related either by blood or by marriage are also affiliated.

If the sales contract fails the arm's-length criteria, then it is "not-arm's-length." You have the burden of demonstrating that your contract is arm's-length. ONRR may require you to certify that the provisions of your arm's-length contract include all of the consideration that your buyer will pay, either directly or indirectly, for the geothermal resource (30 CFR 1206.361(d)).

If you have questions about whether your sales contract is arm's length, contact the ONRR royalty valuation mailbox at royaltyvaluation@onrr.gov.

2.9.2 Gross Proceeds

"Gross Proceeds" is the total monies or other consideration that you receive for any disposition of the geothermal resource (30 CFR 1206.351). Gross proceeds includes not only the revenue received under your sales contract, but also non-cash benefits (consideration) accruing both within and outside the sales contract. Thus, gross proceeds includes—but is not limited to—the following:

- Payments to the lessee for certain services such as effluent injection, field operations and maintenance, drilling or workover of wells, or field gathering to the extent that the lessee is obligated to perform such functions at no cost to the Federal Government;
- Reimbursements for production taxes and other taxes. Tax reimbursements are part of gross proceeds accruing to a lessee even though the Federal royalty interest may be exempt from taxation; and
- Any monies and other consideration, including the forms of consideration identified in this paragraph, to which the lessee is contractually or legally entitled but which it does not seek to collect through reasonable efforts.

"Gross Proceeds" can have multiple meanings depending on its context. In most cases, gross proceeds is the product of contract price and quantity (that is, your revenue), as follows:

$$\text{Gross Proceeds} = \text{Contract Price} \times \text{Quantity}$$

In some cases, gross proceeds may refer to a contract price, such as dollars or mills per kilowatt-hour (a mill is one-thousandth of a dollar, or \$0.001). Gross proceeds can also refer to a computed, weighted average price. When you receive other consideration

which would normally be the responsibility of the producer, gross proceeds includes the other consideration; for example:

$$\text{Gross Proceeds} = \text{Contract Price} \times \text{Quantity} + \text{Other Considerations provided to you}$$

You may agree to a reduced price in your sales contract in exchange for the purchaser's maintenance of lease facilities negotiated in a separate agreement. In this situation, your gross proceeds determined from your contract price would be adjusted upwards to reflect the services provided by the purchaser.

If you are aware of any additional consideration occurring outside the sales contract, or you have questions regarding reimbursements or other consideration received under your sales contract, please contact the Royalty Valuation mailbox at royaltyvaluation@onrr.gov. Explain the circumstances under which the consideration occurs, and either propose a valuation procedure or request guidance.

2.9.3 Exceptions to Acceptance of Arm's-Length Gross Proceeds

You are obligated to negotiate contracts in a prudent manner and receive the best possible price to the mutual benefit of yourself and the Federal Government. Although a contract may be arm's-length, two exceptions may negate the acceptance of gross proceeds as value:

1. The contract does not reflect the total consideration passing between the buyer and seller.
2. The gross proceeds does not reflect the reasonable value of the resource because of misconduct by or between you and your purchaser, or because you have otherwise breached your duty to market the production to the mutual benefit of yourself and the Federal Government. Misconduct or breach of duty may include, but is not limited to, collusion between you and your purchaser, negligence in negotiating contracts, or pricing practices found by a court or regulatory authority to be incorrect or fraudulently manipulated.

We may direct you to use other valuation methods if we encounter either of these exceptions. Regulations addressing the acceptability of arm's-length gross proceeds appear at 30 CFR 1206.361 (b)-(f)

2.9.4 Marketable Condition and Marketing

You must place geothermal production in marketable condition at no cost to the Federal Government. *Marketable condition* means lease products that are sufficiently free from impurities and otherwise in a condition acceptable to a purchaser under a sales contract typical for the disposition from the field or area of such lease products.

Placing production in marketable condition includes, but is not limited to:

- Measuring
- Gathering

- Delivery to a power plant, direct use facility, or purchase point
- Liquid-vapor phase separation
- Condensate or moisture removal
- Purification
- Any other physical handling and treatment of the resource necessary to meet the delivery specifications of the contract.

You cannot deduct the costs of placing production in marketable condition.

A sales contract may require you to deliver steam to the inlet of the purchaser’s power plant with specified minimum moisture content. To meet the contract specifications, you construct pipelines to gather and deliver the steam and install moisture separators to purify the steam. Because you are placing the produced geothermal resource in a (marketable) condition acceptable to the purchaser, you cannot deduct the costs of these services from the value.

If your purchaser or another party performs services for you and reduces your gross proceeds accordingly, either through a lower sales price or some other mechanism, you must adjust your gross proceeds upward to offset the reduction.

Example 2-1

Your contract establishes the following prices and fees per Mlb:

Sales price of steam delivered to the inlet of the purchaser’s power plant	\$ 1.500
Less fees for condensate removal	– 0.050
Less fees for metering and well-control services	– 0.005
<u>Less fees for gathering to the power plant</u>	<u>– 0.150</u>
Net price per Mlb delivered	\$1.295

Although net price (\$1.295) determines your sales revenues, the purchaser’s fees are not allowable deductions in determining your gross proceeds. Thus, the unit value of production for royalty purposes in this example is the full contract sales price of \$1.500/Mlb. Calculate your gross proceeds as follows:

$$\text{Gross Proceeds} = \$1.50/\text{Mlb} \times \text{Mlb Delivered}$$

You cannot deduct the costs of brokering or marketing your geothermal resources from royalty value, whether you perform these services yourself or pay someone else to do them for you.

2.10 Audits and Record Keeping

All royalty payments and the information on which you calculate them are subject to audit, review, reconciliation, and monitoring (30 CFR 1206.361). You must maintain

sufficient, verifiable records and data to support your value determinations and royalty payments (30 CFR 1212.351).

2.10.1 Approvals

In situations where you use your own geothermal resources from your lease in your power plant, ONRR must approve any changes you make to depreciation methods and depreciation periods, which are part of your generation and/or transmission deductions under the gross proceeds less deductions royalty calculation method. More information about this method can be found in Chapter 4. You may also request value determinations regarding geothermal resources produced (30 CFR 1206.364), please contact the Royalty Valuation mailbox at royaltyvaluation@onrr.gov.

Chapter 3

Valuation Standards for Electrical Generation

This chapter describes the standards in 30 CFR 1206.352 for valuing geothermal resources used to generate electricity. These resources generally consist of steam, hot water, and hot brines. ONRR valuation standards classify contracts for the sale according to the resource's disposition:

- You sell geothermal resources under an arm's-length contract.
- You do not sell your geothermal resources but use them to generate electricity in your own power plant.

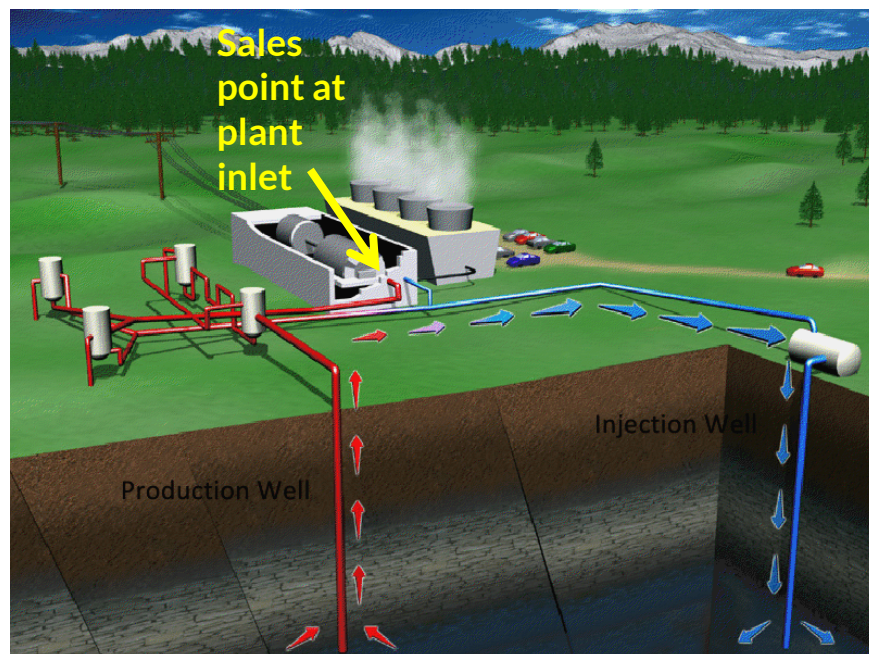
Valuation standards for resources sold under an arm's-length contract focus on the contract's gross proceeds, with the conditions that the gross proceeds reflect total consideration and reasonable value. (See "Exceptions to acceptance of arm's-length gross proceeds" on page 2-10.)

3.1 If You Sell Geothermal Resources at Arm's- Length that the Purchaser Uses to Generate Electricity

As a general rule, you determine the value of the electrical generation resources sold under an arm's-length contract as the gross proceeds accruing under that contract and the regulations at 30 CFR 1206.352. After gross proceeds are determined you calculate the royalty on the resource one of two separate ways.

- You multiply the gross proceeds times the lease royalty rate,
- or multiply gross proceeds times the royalty rate BLM prescribes.

Figure 3.1



Example 3-1 Valuing Geothermal Resources Sold Under an Arm’s-Length Contract to a Power Plant.

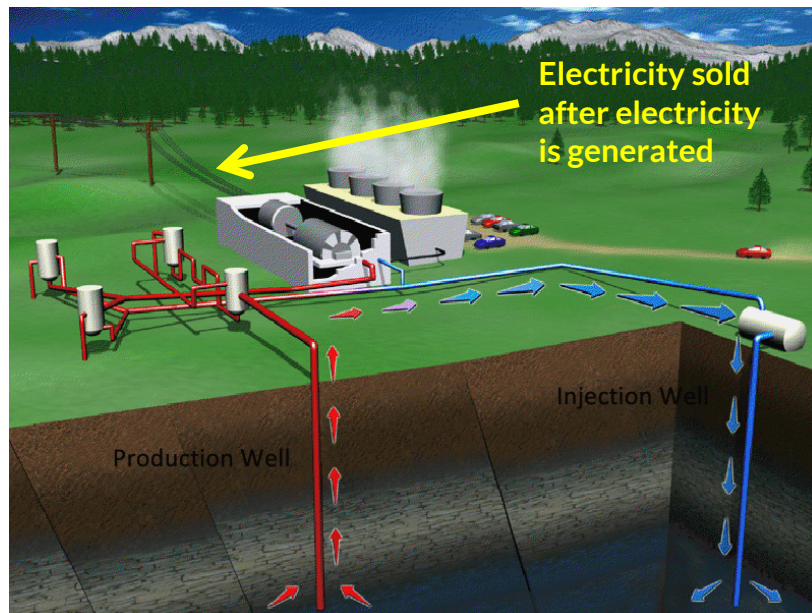
As a lessee of a Federal lease, you sell geothermal production to a non-affiliated power plant operator. Your lease royalty rate is 12.5%.

Lease	Sales Contract	Contract Type	Production (thousands of lbs)	Price (\$/thousand lbs)	Gross Proceeds Revenue (\$/thousand lbs)
Federal	Green Power Utility	Arm’s length (AL)	1,402	\$1.80	\$2,523.60

Sales Volume 1,402 lbs
 Sales Value..... \$2,523.60
 Royalty Value Prior to Allowances $\$2,523.60 * 0.125 = \315.45

3.2 If You Use the Geothermal Resources in Your Own Power Plant for the Generation and Sale of Electricity- Netback Method

Figure 3.2



When there is no arm’s length sale of geothermal resources to a non-affiliated purchaser, in general you will use “the netback method,” or gross proceeds from electricity sales less applicable deductions. See Chapter 2, Section 2.9.1 for detailed information on what ONRR regards as arm’s-length sales for royalty purposes.

As a general rule, you determine the value of geothermal resources used to generate electricity in your own power plant as the gross proceeds accruing to you from the arm’s-length sale of electricity less applicable generation and transmission deductions (30 CFR

1206.352). However, you must satisfy the following two conditions to justify the contract gross proceeds (or contract prices) as value:

1. The sales contract must reflect the total consideration actually transferred, either directly or indirectly, from the buyer to the seller (30 CFR 1206.361(b)). Total consideration is synonymous with the full definition and intent of gross proceeds as discussed in section 2.7.2 *Gross Proceeds*. However, the value can never be less than the gross proceeds, including any additional consideration you receive. We may require you through audit to certify that your arm's-length contract includes all of the consideration paid to you by the buyer, either directly or indirectly, for the geothermal resource.
2. The gross proceeds received under the contract must reflect reasonable value (30 CFR 1206.361(b)). If ONRR determines through audit that the gross proceeds do not reflect the reasonable value of the resource because of misconduct by or between the contracting parties, or because you have otherwise breached your duty to market the production to the mutual benefit of yourself and the Federal Government, ONRR may require you to increase the gross proceeds to reflect any additional consideration. ONRR may require you to use another valuation method in the regulations applicable to dispositions other than under an arm's-length contract.
3. See Chapter 4 in this handbook for more detailed information and examples on the netback method.

3.2.1 Electricity Value

The *electricity value* is the total amount of revenues (gross proceeds) that you receive under your sales contract for the delivery of electricity during your accounting month. In most cases this amount includes your energy payment, capacity payment, and bonus capacity payment. Any other monies or consideration exchanged for the delivery of electricity may also affect the electricity value; the principles of total consideration and reasonable value apply to electricity sales as they do to the sales of geothermal fluids.

3.2.2 Cost Reimbursements

Any *cost reimbursements* that you receive for the construction and/or operation of your power plant and/or transmission line offset the corresponding costs. For example, if your electricity purchaser reimburses you for operating the power plant, that reimbursement offsets your annual operation and maintenance (O&M) costs. If your purchaser or some other entity gives you a non-recoupable grant to build the transmission line, that grant offsets your transmission-line capital investment. Cost reimbursements include manufacturer's rebates, insurance payments, and court awards (generally principal amounts exclusive of interest) where the awards relate to recovered damages for capital and O&M costs, including downtime awards.

3.3 Credit for "in-kind" delivery of electricity to states or counties

All lessees may take a credit against royalties owed on geothermal resources for delivery of electricity "in-kind" to states and counties that receive a portion of royalty revenues rather than full payment in monies.

Please contact ONRR Royalty Valuation at royaltyvaluation@onrr.gov if you have any questions on how to do these calculations.

3.4 Near Term Production Incentives

ONRR will provide for a 50 percent reduction in royalty, for four years, on any new production or qualified expansion projects for Class 1 lessees that did not modify their lease terms to the new royalty calculation method. New or expanded production must have begun by August 7, 2011. See BLM regulations at 43CFR subpart 3212 for more information.

3.5 Improper Valuations

If during an audit or compliance review ONRR finds that you improperly determined value, we will direct you to correct your value or prescribe a different valuation procedure (30 CFR 1206.361(a)). You will be liable for any difference between the royalties paid and the royalties due under the value that ONRR determines, plus late payment interest on underpaid amounts pursuant to 30 CFR 1218.302. If the corrected value or prescribed valuation procedure results in an overpayment, ONRR will give you instructions for taking a credit. You are not entitled to interest on royalty overpayments.

A value determination by ONRR is not an appealable decision or order under 30 CFR part 1290. If you received an order requiring you to pay royalty on the same basis as the value determination, you may appeal that order under 30 CFR part 1290.

3.6 How Do I Request a Value Determination or Gross Proceeds Determination?

If you are unsure of your valuation procedure, you may request a value determination from ONRR (30 CFR 1206.364). Send your valuation requests to us at the address given in Appendix A. Include a description of your operation, copies of sales contracts, and any other information pertinent to the valuation of your geothermal production. You must continue to pay royalties on production while we make our value or gross proceeds determination.

If you request an alternative valuation method, you must propose the valuation method you intend to use and include all information supporting your proposal. Remember, you must receive our approval to use an alternative valuation method and explain why the first method (netback) is unworkable. You may use your proposed valuation method for royalty calculations until we issue a decision. If we approve your proposed valuation method, you must use that method until one of the following occurs:

- The circumstances of your production and/or utilization change, at which time you must notify us with a new valuation request.
- ONRR instructs you to use a different valuation method.
- ONRR issues new valuation regulations.

If ONRR disapproves your proposed valuation method, we will prescribe a method to you. You must then adjust all your past royalty reports to reflect the prescribed method (30 CFR 1206.364). If our prescribed method results in additional royalty due, you must pay the additional royalty plus interest. If our prescribed method results in royalty overpayments, we will give you instructions for taking a credit against future royalty payments. You are not entitled to interest on royalty overpayments.

3.7 Recordkeeping and Availability

You must save all data and records relevant to your royalty valuation (30 CFR 1206.360) Therefore, keep the following documents:

- All contracts related to the sale or purchase of geothermal resources.
- All contracts related to the sale, purchase, generation, and transmission of electricity generated from the geothermal resource.
- Any other contracts or other items that may bear on the valuation of the resource or are necessary to support your valuation.
- All ONRR valuation decisions and other written communications relevant to your valuation.
- Records of capitalized costs and equipment to support netback calculations.

For Federal geothermal leases, you must keep records relevant to your monthly royalty calculations for six years after the records are generated, unless we instruct otherwise. For Indian geothermal leases, records must be kept without a time limit as there is no statute of limitation for these leases unlike Federal leases.

These records include, but are not limited to, quantities produced and/or sold and prices received for sales of the resource. For netback valuation, keep your value calculations and all source documents supporting your claimed costs. You must make all records, contracts, and other documents supporting your valuations available to authorized ONRR personnel or ONRR-designated agents upon request (30 CFR 1206.360). See also 30 CFR 1212.351.

3.8 Dismantlement Cost Refunds

At the end of your project's life, and upon completion of dismantlement and salvage operations, you may take a one-time annual *dismantlement cost refund* of royalties equal to the royalty amount of actual power plant and transmission line dismantlement costs that exceed your salvage income (30 CFR 1206.353(o) and 1206.354(o)). Calculate the refund as follows:

Dismantlement Cost Refund = Royalty Rate × (Dismantlement Costs – Salvage Income)
Contact your ONRR payor representative for instructions on taking the refund.

Chapter 4

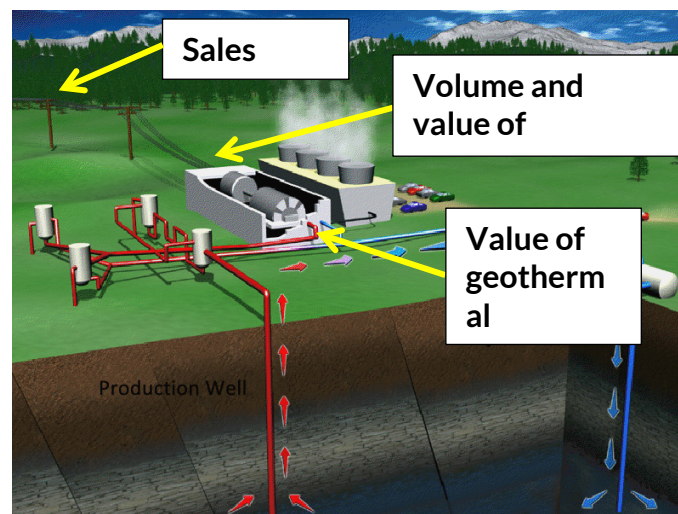
Gross Proceeds Less Applicable Deductions or Netback Valuation for Electrical Generation (Not Arm's Length Sales of the Geothermal Resource)

This chapter explains how you calculate royalties on Federal geothermal resources used to generate electricity in your own power plant using the netback procedure.

Unlike arm's length sales of geothermal resources to an unaffiliated purchaser, such as the lessee selling geothermal resources to a nearby power plant owned by someone else, ONRR refers to this situation as "not arm's length" (NARM) as opposed to an arm's length transaction. Please refer to Chapter 2, section 2.9.1 for a detailed explanation of ONRR's definition of arm's length transactions and how to distinguish arm's length versus not arm's length.

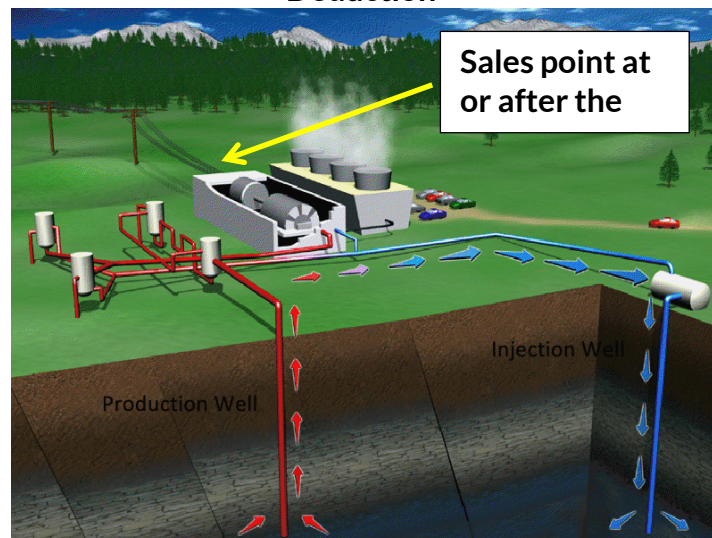
A value for the geothermal resource cannot be directly determined when you use your resource in your own power plant. Since there is no sale of the geothermal resource in such a case, that is, the lessee owns the geothermal resources as well as the power plant, the first sale of anything of value derived from the geothermal resources is electricity generated by the lessee's own (or affiliated) power plant. There is then an arm's length sale of electricity from the power plant to an unaffiliated utility. To derive a value of the geothermal resources, the gross proceeds from the arm's length sale of electricity is used as a value from which applicable generation and transmission costs may be deducted to arrive at a geothermal value back at the lease.

This chapter identifies which costs are allowed to be deducted and how to deduct them. It also identifies certain unallowable costs and explains why they are not allowed. ONRR is using this procedure to arrive at a value of the resource before it enters the plant based on the sale of electricity produced from your geothermal resources.



Under the netback procedure, you derive the value of the geothermal resource by subtracting your costs of generating and transmitting electricity from your gross proceeds from the sale of electricity, as follows:

$$\text{Netback Geothermal Value} = \text{Electricity Value} - \text{Transmission Deduction} - \text{Generating Deduction}$$



The following three conditions are necessary in order to use the netback valuation:

1. You or your power-generating affiliate uses the leased geothermal resource to generate and sell electricity.
2. There is an arm's length contractual sale of the electricity.
3. You have a volume of electricity measured at the net out meter.

The second condition is paramount because the sales contract establishes the value of the electricity, which forms the basis for netback valuation. If you do not sell the electricity you or your affiliate generates to an unaffiliated third party, you cannot use this netback method. The netback procedure is unworkable if the above conditions are not met. If the netback method is not workable because of any of the above conditions, the regulations at 30 CFR 1206.352 (b)(1)(ii) allow "A royalty determined by any other reasonable method approved by ONRR". Please contact the ONRR royalty valuation mailbox at royaltyvaluation@onrr.gov for guidance.

4.1 General Concepts

This section refers to general concepts that help with understanding the Netback procedure.

4.1.1 Electricity Value

The electricity value is the total amount of revenues (gross proceeds) that you receive under your sales contract for the delivery of electricity during your accounting month. In most current cases, this amount includes your energy payment, capacity payment, and bonus capacity payment. Any other monies or consideration exchanged for your delivery

of electricity may also affect the electricity value. The principles of total consideration and reasonable value, discussed in “Arm’s-Length Sales” in Chapter 3, apply to electricity sales as they do to sales of geothermal resources.

4.1.2 Netback Valuations When Electricity Payments Are Not Made on a Calendar Month

We recognize that electricity purchasers do not always close their monthly accounts on the last day of the month; that is, they do not voucher their monthly payments for a calendar month’s delivery. When this happens, use the date of your purchaser’s monthly statement to calculate your deductions for that month (see also “Timing of Valuation and Royalty Payments” in section 2.3). This does not affect the calculation or application of your annual cost rates; they remain calculated on the 12-month deduction period you select. For more detailed explanation of netback deductions and cost rates, please see Chapter 4.

For example, if you receive payment for electricity delivered on December 20, and your annual deduction period ends on December 31, you would use the cost rates calculated for the full 12-month period (January through December) in order to determine your December deductions. Likewise, if you receive payment for electricity delivered on January 20, and your annual deduction period begins January 1, you would use the cost rates calculated for the full forthcoming year to determine your January deductions. Of course, for months without production, no royalty is due.

4.1.3 Deduction Periods

Deduction periods, also called “Reporting Periods,” are the 12 months during which your annual cost rates are effective. Deduction periods must begin with the month that:

- Your power plant entered into service.
- Your annual corporate accounting period begins.

You may choose your deduction period based on the above criteria. However, both transmission- and generating-deduction periods must coincide; that is, the time periods for both deductions must be the same. Once you have selected a deduction period, you cannot later choose a different period without ONRR approval.

If you have allowable deductible costs, they must be prorated to monthly costs in order to pay royalties which are due on a monthly basis. Royalties are due each month that you are producing geothermal resources. This is explained more below.

You start at the last place a volume of electricity attributable to resource removed from a lease can be determined. Following is an outline of the steps to follow to construct netback valuation. We will cover these steps in greater detail in subsequent sections.

- Step 1** Calculate your annual cost rate for transmission deductions (if you have transmission costs).
- Step 2** Calculate your monthly transmission deduction (if you have transmission costs).

- Step 3** Calculate your annual generation cost rate.
- Step 4** Calculate your monthly generation deduction.
- Step 5** Calculate the monthly value of geothermal resources used in the power plant by subtracting the transmission and generating deductions from your gross proceeds received for the month's sale of electricity (that is, the electricity value). This step derives the gross proceeds less deduction value of all geothermal resources, regardless of source, at the power plant inlet.
- Step 6** Allocate the monthly value to Federal leases, as necessary.
- Step 7** Report monthly delivered electricity and values allocated to each lease on Form ONRR-2014.
- Step 8** At the beginning of the next deduction period, which is the annual period you have chosen for depreciation (see below), recalculate the previous deduction period's estimated annual cost rates, deductions, and netback values based on your actual, known costs for that period. Submit corrected Form ONRR-2014's, adjusting the royalty lines for each month using adjustment reason code 25.

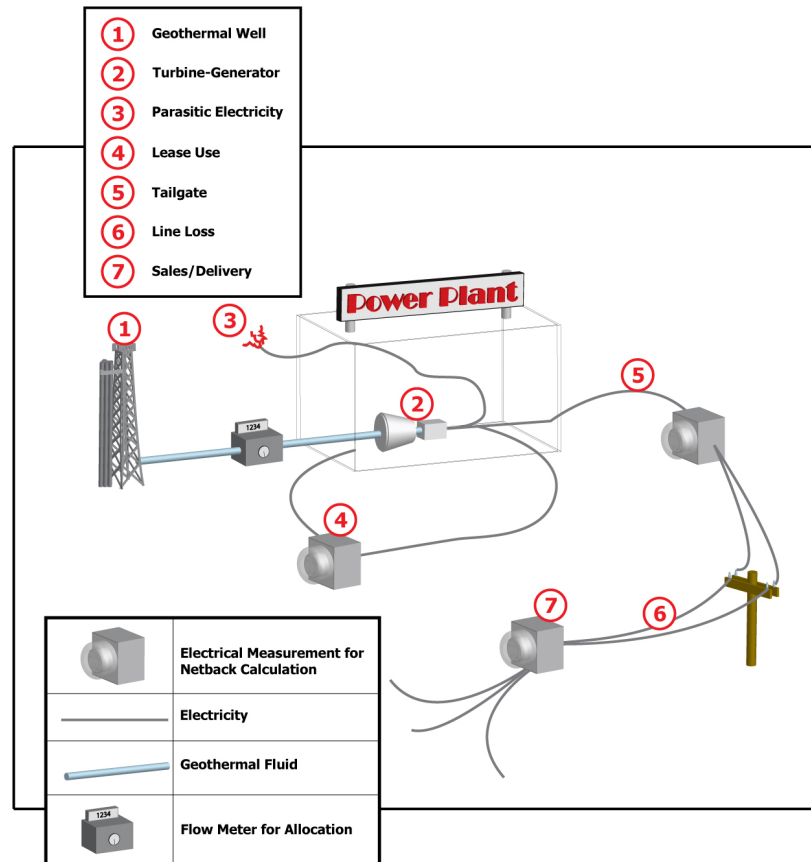
4.1.4 Deduction Limits

You must limit the sum of your transmission and generating deductions to 99 percent of your electricity sales gross proceeds. Although deductions have no regulatory threshold limits, they cannot reduce the value of the resource to zero (30 CFR 1206.352(b)(1)(i)). Our administrative policy does not allow the combined transmission and generating deductions to exceed 99 percent of the electricity value; that is, the resource value cannot be less than 1 percent of your gross electricity sales proceeds.

4.1.5 Requisite Electricity Measurements

Figure 4-1 shows the electricity measurements needed to determine your deductions. For the transmission-line deduction, you must determine the amount of delivered electricity or the amount of interconnect electricity (if your transmission line interconnects with another transmission line to wheel the electricity to the sales point). For the generating deduction, you must determine the sum of electricity entering the transmission line, usually the net-out electricity, and any electricity returned to the lease for lease operations; these measurements, combined, are your plant tailgate electricity. All electricity measurements must be in kilowatt hours and must be prorated based on the Federal versus non-Federal percent allocation. Be sure to separately measure parasitic electricity (see below Section 4.1.4.5 for definition) and electricity returned to the lease.

Figure 4-1



4.1.5.1 Delivered Electricity

“Delivered electricity” means the amount of electricity in kilowatt-hours delivered to the purchaser.

Note: Line loss should not be included in delivered electricity.

4.1.5.2 Electricity Returned to the Lease

Electricity returned to the lease means any electricity returned for use on the lease. If you have downhole pump costs please see the discussion in the Generation Deduction section on Operation and Maintenance Costs (O & M).

4.1.5.3 Interconnected Electricity

In cases where your transmission line interconnects with another, third-party transmission line over which you wheel the electricity to the final sales point, you must use the amount of interconnected electricity (the amount of electricity delivered at the interconnect) to calculate your transmission-line cost rates and deductions. (The remainder of your transmission costs will then be in the form of wheeling charges.) See the example in section 4-3 that illustrates the use of interconnected electricity in netback deductions calculation.

4.1.5.4 Net Out Electricity

Net Out Electricity should be measured at, or calculated for, the high voltage side of the transformer in the plant switchyard.

4.1.5.5 Plant Parasitic Electricity

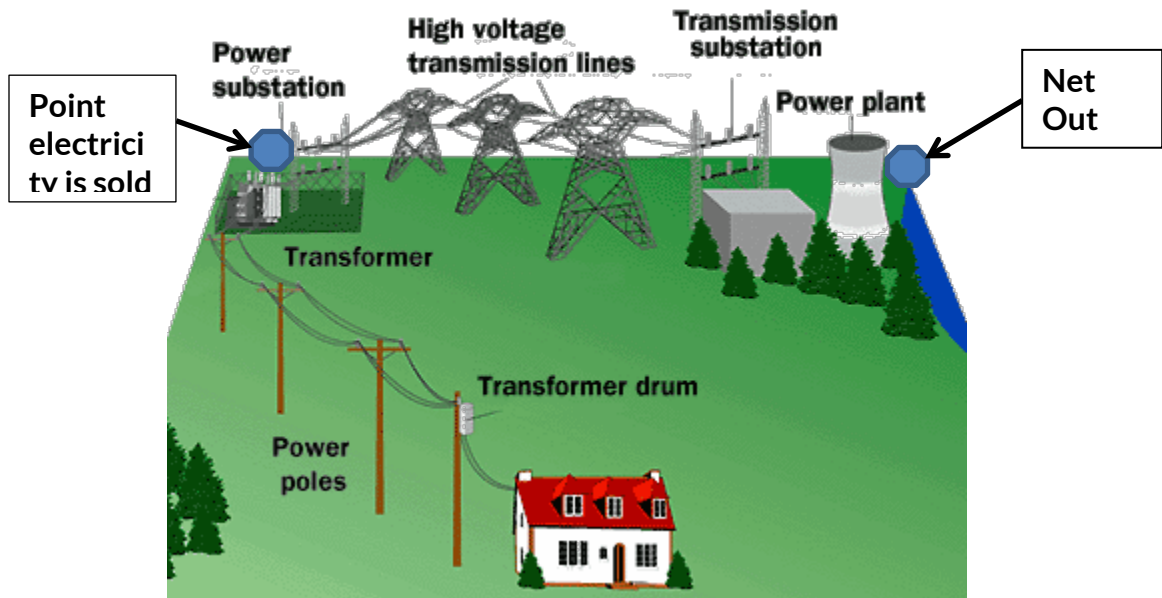
“Plant parasitic electricity” means electricity used to operate a power plant that is used for commercial production or generation of electricity.

4.1.5.6 Plant Tailgate Electricity

“Plant tailgate electricity” means the amount of electricity in kilowatt-hours generated by a power plant exclusive of plant parasitic electricity, but inclusive of any electricity generated by the power plant and returned to the lease for lease operations. Plant tailgate electricity should be measured at, or calculated for, the high voltage side of the transformer in the plant switchyard.

Note: Plant tailgate electricity should not include non-royalty bearing electricity measurements, (e.g. any portion of electricity generated by fee or state leases).

4.2 Step 1—Annual Cost Rate for Transmission Deduction



Cost rates for transmission deductions center around cost incurred between the net out meter and the point of sale. The last point where you can reasonably measure the volume of electricity attributable to the geothermal resource is the point where other energy producers transfer electricity to a shared electrical grid. You calculate annual cost rates in terms of dollars per kilowatt hour (\$/kWh) and then apply these cost rates to monthly electricity measurements to determine your monthly deductions.

The first step is to determine what operating and maintenance costs can be included in your cost rates (see tables of allowed and non-allowed costs in Section 4.2.1 below)

4.2.1 Step 1A—Transmission Line O&M Cost

The first step in determining your cost rate for transmission deductions is to determine your operating and maintenance cost associated with transmitting your electricity from the net out meter to the point where the electricity is sold.

The table below shows allowed and non-allowed operating and maintenance costs.

Allowed Operating and Maintenance (O&M) Costs		
Direct wages and employee benefits (such as medical and retirement) paid to employees and supervisors while engaged in the routine operation, maintenance, or repair of the transmission line, including training, recruiting, and employee moving expenses	Payments to consultants or service companies for routine operation, maintenance, or repair of the transmission line	Expenditures for tools, supplies, and miscellaneous replacement parts associated with normal operation, maintenance, and repair (as a rule of thumb, if the cost of a replacement part is 10 percent or more of the transmission line's un-depreciated capital balance and the part benefits future deduction periods (that is, the part is not replaced annually), you should capitalize the part's cost; otherwise, expense the part as O&M)
Rents and leasing costs for transmission-line rights-of-way off Federal geothermal leases, if held by periodic payments (see also "Rights-of-Way Costs" below)	Insurance, ad valorem property taxes (limited to the property occupied by the transmission line), and payroll taxes	General administrative and corporate overhead costs (such as telephone service, office supplies, salary apportionment, accounting and legal functions, and utilities) that you can directly attribute and allocate to the transmission-line operation
Other directly attributable and allocable O&M expenses you can document		

Non-Allowed Operating and Maintenance (O&M) Costs		
State and Federal income taxes	Severance taxed	Royalty payments, including overriding royalty
Financial fees or costs paid after commission of the transmission line, such as loan and equity payments, including principal and interest; loan brokerage fees; bank costs for backup lines of credit; operational consulting services and financial analyses required by the lender; dealer costs for commercial paper programs; and rating agency expenses; these costs are accounted for by your return on capital investment and, as such, are not allowable O&M expensed	Late payment fees for failure to make timely loan payments	Other corporate or project expenses not directly attributable and allocable to the routing operation, maintenance, and repair of the transmission line

4.2.2 Step 1B—Transmission-line Capital Investments

The second step in determining your cost rate is to determine what allowable capital investments you have to depreciate. Allowed capital investments are your actual costs for the design, purchase, delivery, and installation of the transmission line and related equipment (that is, costs incurred prior to operation of your transmission line). The table below shows allowed capital investments and non-allowed capital investments.

Allowable Capital Investments (in green) and Non-Allowable Capital Investments (in red)		
Costs for tangible, depreciable assets (such as poles, towers, wires, and insulators)	Engineering design, environmental studies, and legal and permitting fees to the extent they directly relate to the installation of the transmission line	Loan service fees, loan interest paid during construction, and service payments on equity investments; these costs apply only to the actual amounts that are clearly attributable and allocable to the transmission line for which you borrowed the money.
Lump-sum payments for transmission-line rights-of-way off Federal geothermal leases (see “Rights-of-Way costs” below)	Real estate costs, if ONRR approves them see section XXX below.	Administrative costs that directly attribute and allocate to construction of the transmission line
Other costs for the design, purchase, delivery, and installation of the transmission line and related equipment that you can document.	Socioeconomic costs (such as hospitals, schools, roads, or other civic improvements) that local government agencies impose as a condition of doing business	Payments on borrowed principal made during the design and construction phase of the transmission line (only the interest portion of loan payments made prior to placing the transmission line in service is an allowable capital cost)
Late payment fees for failure to make loan payments in a timely manner during the design and construction phase of the transmission line	Construction contract termination fees or penalties	Any other corporate or business costs that do not directly relate to construction of the transmission line

Remember to adjust your depreciation and investment schedules when you replace or retire capital equipment.

4.2.2.1 Real Estate Costs

Real estate costs, including recording fees and other costs incidental to the purchase of lands, may be eligible for a return on investment **if all of the following apply:**

- You can demonstrate the necessity for the land purchase.

- The purchased land is not on a Federal geothermal lease.
- ONRR approves the costs.

You can include only that portion of real estate costs necessary for the transmission corridor. If your real estate purchase includes land outside the normal transmission corridor, you must allocate the cost between the corridor and the other land.

If you are using the depreciation method to calculate your transmission-line cost rate, add the allowable real estate costs to the annual undepreciated capital balance to compute the return on un-depreciated capital investment. If you are using the return-on-investment method, include the allowable real estate costs as part of the gross capital investment.

4.2.2.2 Transmission Lines Serving More Than One Power Plant

If your transmission line serves more than one power plant, you must allocate the transmission costs in proportion to the amount of electricity that each power plant contributes to determine your transmission-line cost rates. Thus, if a transmission line initially serves two power plants and one is decommissioned, you cannot transfer the remaining transmission-line capital balance to the surviving power plant; you must continue to allocate capital costs and, if necessary, O&M costs.

An allocation based on power plant capacity ratios is the simplest and preferred method to allot transmission-line costs. However, you must allocate the delivered electricity (variable “F” in the cost rate equation see section 4.2.4) based on the proportional amount of electricity that each power plant contributes to transmission.

4.2.3 Step 1C—Determine the Method of Handling Capital-related Cost

You have the option of choosing to handle capital related cost by one of the two methods:

1. Depreciation and a return on undepreciated capital investment, or
2. A return on capital investment.

How you handle the capital-related costs determines your method of computing the cost rate.

Once you have chosen a calculation method, you cannot later use the other method without ONRR’s approval. **You must calculate all cost rates to six decimal places.**

You recalculate the previously estimated cost rates at the beginning of each annual deduction period using the previous period’s actual, cumulated costs. You use these new cost rates to calculate the new period’s deductions and royalty values and to recalculate the past period’s actual deductions and royalty values. For your first deduction period, you must use estimates of O&M costs to calculate your cost rates. For subsequent deduction periods, use the previous period’s actual O&M costs, adjusted for any anticipated differences.

4.2.4 Step 1D—Calculate Transmission-line Cost Rates by the Depreciation Method Plus the Return on Undepreciated Capital Method

If you use the depreciation method, calculate your annual transmission-line cost rates from the following equation:

$$\text{Cost Rate (\$/kWh)} = \frac{E + D + I}{F}$$

where:

- D = Annual depreciation of gross capital investments (see “Depreciation” below).
- E = Annual O&M expenses, estimated for the first deduction period.
- F = Annual kWh of delivered (on interconnect) electricity, estimated for the first deduction period (see “Delivered and Interconnect Electricity” above). When actual costs are known later, use them to true-up your calculations and re-report.
- I = Annual return on undepreciated capital investment (see “Return on Undepreciated Capital Investment” below).

4.2.4.1 Depreciation

Follow these rules to determine depreciation (D):

- Depreciate only the allowable capital investment.
- Calculate depreciation on your gross capital investments; do not deduct salvage value for any of the capital equipment.
- Use straight-line depreciation.
- Use a depreciation period equal to the term of your electricity sales contract or the normal, useful life of individual equipment if less than the term of the sales contract. Thus, you may have different depreciation schedules for different equipment, but you cannot use different depreciation periods outside of those described in the previous sentence without our approval. You do not need approval for depreciation periods based on the term of the electricity sales contract or the lives of individual equipment.
- Adjust your depreciation schedule(s) for retired or replaced capital items using generally accepted accounting principles.
- Depreciate the transmission line and related equipment only once. A change in ownership does not alter the depreciation schedule(s) that the original owner established, except for addition or replacement of capital equipment.

4.2.4.2 Return on Undepreciated Capital Investments

The return on undepreciated capital investment (I) is the product of the return rate and the undepreciated capital investment balance at the beginning of the annual deduction period:

$$I = \text{Return Rate} \times \text{Undepreciated Investment Balance}$$

The return rate is two times the Standard and Poor’s monthly average 15-year industrial BBB bond rate, as published in Standard and Poor’s Bond Guide, for the first month of the annual deduction period. You re-determine the return rate at the beginning of each deduction period.

Example 4-1 Calculating Transmission-Line Cost Rates by Depreciation Method

The example is for the first and fifth years of operation.

Given :

Schedule of Capital Costs

- Capital investment = \$3,000,000
- Depreciation period = 30 years
- Annual depreciation (D) = \$100,000
- Depreciation schedule:

Year	Beginning-of-Year Undepreciated Investment Balance
1	\$3,000,000
2	\$2,900,000
3	\$2,800,000
4	\$2,700,000
5	\$2,600,000

- **First Year of Operation (First Deduction Period)**

- Estimated O&M expenses (E) = \$1,000
- Undepreciated capital investment balance = \$3,000,000
- Standard and Poor's monthly average 15-year industrial BBB bond rate for the month beginning the first deduction period = 8.96 percent
- Return on undepreciated capital investment (I):
 $(2 \times 0.0896) \times \$3,000,000 = \$537,600$
- Estimated annual delivered electricity (F) = 610,500,000 kWh

– Cost rate:

$$\frac{E + D + I}{F} = \frac{\$1,000 + \$100,000 + \$537,600}{610,500,000 \text{ kWh}} = \$0.001046/\text{kWh}$$

- **Fifth Year of Operation (Fifth Deduction Period)**

- Previous deduction period's O&M expenses (E), adjusted for anticipated differences = \$1,800
- Undepreciated capital investment balance = \$2,600,000
- Standard and Poor's monthly average 15-year industrial BBB bond rate for the month beginning the fifth deduction period = 9.76 percent
- Return on undepreciated capital investment (I):
 $(2 \times 0.0976) \times \$2,600,000 = \$507,520$
- Annual delivered electricity (F) = 607,945,260 kWh

– Cost rate:

$$\frac{E + D + I}{F} = \frac{\$1,800 + \$100,000 + \$507,520}{607,945,260 \text{ kWh}} = \$0.001002/\text{kWh}$$

4.2.5 Step 1E—Calculate Transmission-line Cost Rates by the Return-on-Investment Method

If you use the return-on-investment method, calculate your annual transmission-line cost rates from the following equation:

$$\text{Cost Rate } (\$/\text{kWh}) = \frac{E + R}{F}$$

where:

- E = Annual O&M expenses, estimated for the first deduction period.
- F = Annual kWh of delivered (on interconnect) electricity, estimated for the first deduction period (see “Delivered and Interconnect Electricity” above).
- R = Annual return on allowable gross capital investments, adjusted for retired or replaced capital items.

Calculate the cost rate to six decimal places.

The annual return (R) is the product of the return rate and the transmission-line capital investment:

$$R = \text{Return Rate} \times \text{Capital Investment}$$

The return rate is two times the Standard and Poor’s monthly average 15-year industrial BBB bond rate, as published in Standard and Poor’s Bond Guide, for the first month of the annual deduction period. This rate remains constant during the deduction period; you re-determine the return rate at the beginning of each deduction period.

Example 4-2 Calculating a Transmission-Line Cost Rate by the Return-on-Investment Method

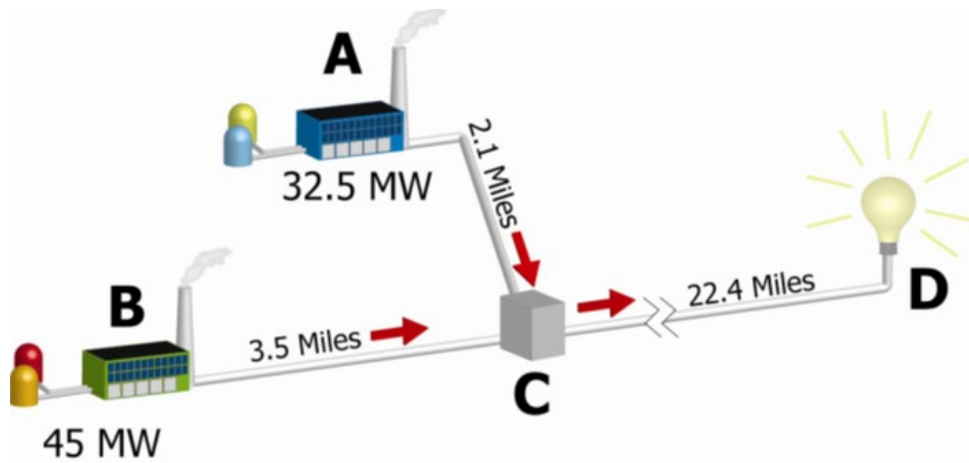
The example is for the third year of operation (third deduction period).

- Previous deduction period’s O&M expenses (E), adjusted for anticipated differences = \$1,500
- Capital investment = \$4,500,000
- Depreciation: Not applicable
- Standard and Poor’s monthly average 15-year industrial BBB bond rate for the month beginning the third deduction period = 10.21 percent
- Return on capital investment (R):
 $(2 \times 0.1021) \times \$4,500,000 = \$918,900$
- Annual delivered electricity (F) = 424,056,985 kWh
- Cost rate:

$$\frac{E + R}{F} = \frac{\$1,500 + \$981,900}{424,056,985 \text{ kWh}} = \$0.002170/\text{kWh}$$

Example 4-3 Calculating a Transmission-Line Cost Rate When the Transmission Line Serves More Than One Power Plant

This example starts by calculating the cost rate for electricity transmitted from Power Plant A. Power plant A generates electricity from a federal lease. Power plant B generates electricity from a fee lease. Calculation is by the depreciation method for the second year of operation; the depreciation period is 30 years.



- **Capital Costs**

- Let's say that all transmission facilities commissioned on the same date at a capital investment (cost) of \$8,795,640

- Calculate the average cost per mile:

$$\frac{\$8,795,640}{28 \text{ miles}} = \$314,130$$

- Allocate the full capital cost of tie line A-C to Power Plant A:

$$2.1 \text{ miles} \times \$314,130/\text{mile} = \$659,673$$

- Calculate the capital cost of transmission C-D and allocate to Power Plant A using the power plant capacity ratio.

- Capital cost of transmission line C-D:

$$22.4 \text{ miles} \times \$314,130/\text{mile} = \$7,036,512$$

- Capacity ratio for Power Plant A:

$$\frac{32.5 \text{ MW}}{32.5 \text{ MW} + 45 \text{ MW}} = 0.419355$$

- Capital cost of transmission line C-D allocated to Power Plant A:

$$0.419355 \times \$7,036,512 = \$2,950,796$$

- Calculate the total transmission-line capital costs for Power Plant A:

$$\$659,673 + \$2,950,796 = \$3,610,469$$

- Calculate depreciation (D) for transmission lines connecting with Power Plant A:

$$D = \frac{\$3,610,469}{30 \text{ years}} = \$120,349$$

Note: If segments of the transmission facilities enter into service at different times, you must depreciate each segment individually over its expected life.

Calculate the return on undepreciated capital investment (I) for the second deduction period. For this example, we use a Standard and Poor's monthly average 15-year industrial BBB bond rate of 9.64%. The undepreciated capital investment balance at the beginning of the second deduction period is \$3,490,120:

$$I = (2 \times 0.0964) \times \$3,490,120 = \$672,895$$

- **O&M Expenses**

- Let’s say that the annual O&M expenses for tie line A–C are \$100, for tie line B–C are \$800, and for transmission line C–D are \$1,000.
- Allocate O&M expenses to transmission line C–D for Power Plant A using Power Plant A capacity ratio:

$$\$1,000 \times 0.419355 = \$419$$

- Calculate transmission-line O&M Expenses (E) for electricity transmitted from Power Plant A (tie line A–C expenses + allocated transmission line C–D expenses):

$$E - \$100 + \$419 = \$519$$

- **Delivered Electricity**

Calculate the delivered electricity allocable to Power Plant A from the fraction of electricity placed into transmission. Assume that the annual delivered electricity for both power plants is 729,454,765 kWh, with Power Plant A placing 311,054,674 kWh into transmission and Power Plant B placing 429,341,913 kWh into transmission. (The difference between the amount of delivered electricity and electricity placed into transmission is due to line loss during transmission (10,941,822 kWh).)

- Fraction of electricity placed into transmission by Power Plant A:

$$\frac{311,054,674 \text{ kWh}}{311,054,674 \text{ kWh} + 429,341,913 \text{ kWh}} = 0.420119$$

$$311,054,674 \text{ kWh} + 429,341,913 \text{ kWh} = 0.420119$$

- Annual delivered electricity (F) allocable to Power Plant A:

$$F = 729,454,765 \text{ kWh} \times 0.420119 = 306,457,806 \text{ kWh}$$

- **Cost Rate**

Calculate the transmission-line cost rate for Power Plant A:

$$\frac{E + D + I}{F} = \frac{\$519 + \$120,349 + \$672,895}{306,457,806 \text{ kWh}} = \$0.002590/\text{kWh}$$

4.3 Step 2—Calculate Your Transmission Deduction

Transmission deductions recognize your reasonable, actual costs of transmitting electricity from the power plant tailgate (high voltage side of the power plant transformer) to the sales or delivery point. Transmission deductions consist of either or both of the following: arm’s-length wheeling charges and/or transmission-line deductions.

Transmission lines include all transmission-related equipment that you install between the high voltage side of the power plant transformer and the point of electricity sales or delivery. **The transmission line must directly serve the power plant using Federal geothermal production.**

Apply the cost rate calculated to monthly delivered electricity measurements to determine your monthly transmission deductions as follows:

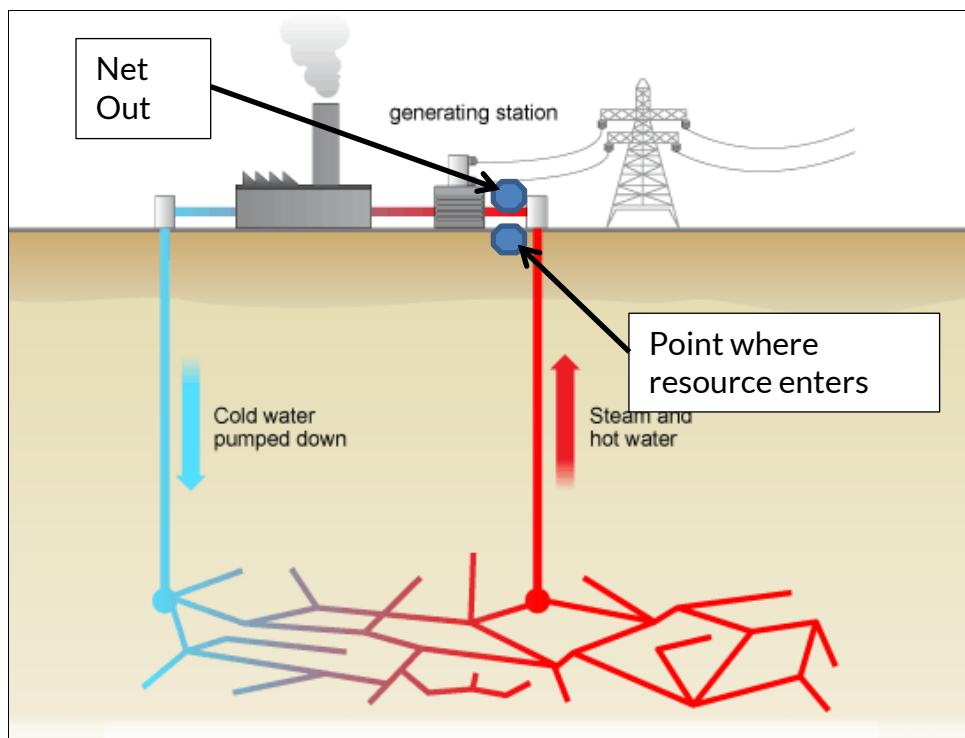
$$\text{Deduction (\$)} = \text{Annual Cost Rate (\$/kWh)} \times \text{Delivered Electricity (kWh)}$$

Annual cost rates are based on estimated costs projected for the coming year. When these costs are known, you must use actual costs to recalculate deductions, which ONRR calls the annual) true-up.

4.3.1 Arm's-Length Wheeling Charges

Arm's-length wheeling charges are those contractual fees that a third party, generally a utility, charges to transmit your electricity to your purchaser's receipt point. If you transmit commingled electricity generated from different power plants, you must allocate the wheeling charges in proportion to the amount of electricity transmitted by each power plant.

4.4 Step 3A—Generation Cost Rates and Deductions



Generation cost rates and generation deductions focus on the cost between the point where the resource is delivered to the plant and where electricity leaves the plant. You calculate annual cost rates in terms of dollars per kilowatt hour (\$/kWh) and then apply these cost rates to monthly electricity measurements to determine your monthly deductions.

The first step is to determine the O&M Cost for the generating plant.

Allowed Operating and Maintenance (O&M) Costs for Power Plants

Direct wages and employee benefits (such as medical and retirement) that you pay to employees and supervisors while engaged in the routine operation, maintenance, or repair of the power plant, including training, recruiting, and employee moving expenses	Payments to consultants or service companies for routine operation, maintenance, or repair of the power plant	Expenditures for supplies and miscellaneous replacement parts associated with normal operation, maintenance, and repair(see further detail below)
That portion of O&M expenditures for downhole well pumps, including costs of purchased electricity to run downhole pumps, necessary for the specific design requirements of the power conversion process (see further detail below)	Expenditures for lubricants used in power plant equipment, such as the turbine-generator and cooling-water pumps, but not effluent/condensate reinjection pumps	Expenditures for chemicals used in the power-generation process, including chemicals used in abating hydrogen sulfide and chemicals used for preventing or treating scale or corrosion upstream of the turbine or heat exchanger
Shop tools necessary for the repair and maintenance of power conversion equipment	Costs of purchased electricity to operate the power plant	Fuel and other expenses for auxiliary generators
Rents and leasing costs for power plant sites off Federal geothermal leases	Insurance, ad valorem property taxes (limited to the property that the power plant occupies), and payroll taxes	Automotive equipment (cars, trucks, etc., and permanent equipment mounted thereon) incident and allocable to power plant operation, including maintenance and repair.
Office furniture and equipment (such as desks, chairs, file cabinets, telephones, typewriters, and computers)	General administrative and corporate overhead costs (such as telephone service, office supplies, salary apportionment, accounting functions, legal functions, and utilities) that you can directly attribute and allocate to the power plant operation	Other directly attributable and allocable O&M expenses you can document

For high-cost items, such as automotive equipment, you can either fully expense them in the year of acquisition or depreciate them over their ordinary depreciable life (include the annual depreciation in your O&M expenses).

Downhole pump costs are mostly applicable to binary-type conversion processes that require increased operating pressures to keep the geothermal fluid in the liquid phase. Some flash plants may also require pressurization of the geothermal fluid to maintain a liquid phase into the first separator.

ONRR does not require a specific method to allocate downhole pump costs. Whatever method you use must be technically reasonable and verifiable. One method is to calculate the ratio of the horsepower needed to maintain a certain inlet pressure versus the total pump horsepower. Other methods may also apply. Certain costs are not allowed because they are not directly applicable and allocable to the generation of electricity.

NON-allowable Operating and Maintenance (O&M) Costs for Power Plants		
State and Federal income taxes	Severance taxes	Royalty payments, including overriding royalty
O&M expenses associated with effluent/condensate reinjection	Other corporate or project expenses not directly attributable and allocable to the routine operation, maintenance, and repair of the power plant, including, but not limited to, costs of preparing and filing production reports, royalty payments, and tax statements; audit costs; and costs of litigation against the Federal Government or other parties	Financial fees or costs paid after commission of the power plant, such as loan and equity payments, including principal and interest; loan brokerage fees; bank costs for backup lines of credit; consulting services and financial analyses that the lender requires; dealer costs for commercial paper programs; and rating agency expenses (see below)
Late payment fees for failure to make timely loan payments	Penalties for environmental violations	O&M expenses associated with geothermal production (see discussion of downhole pumps in this chapter)

Your return on capital investment accounts for these costs. As such, they are not allowable O&M expenses. See the table below that outlines these costs.

4.5 Step 3B—Determine Power Plant Costs

4.5.1 Power Plant Capital Investments

Allowed power plant capital investments are your actual costs for the design, purchase, delivery, and installation of the power plant and related power-generating equipment. Power plant capital investments include costs for the following items.

Allowable Power Plant Capital Investments

Earth work and foundation preparation	Tangible, depreciable assets (see details below)	Engineering design, environmental studies, and legal and permitting fees to the extent they directly relate to installation of the power plant
Loan service fees, loan interest paid during construction, and service payments on equity investments(see note below)	Real estate costs, if ONRR-approved (see “Real Estate Costs” below)	Administrative costs that directly attribute and allocate to construction of the power plant
Other costs for the design, purchase, delivery, and installation of the power plant and related power-generating equipment you can document		

Tangible, depreciable assets may include the following:

- Plant structure
- Flash tanks and separators, including wellhead and field separators
- Turbines, generators, condensers, cooling towers, non-condensable gas ejectors, demisters, and associated pipes, fittings, valves, pumps (including condensate pumps between the condensers and cooling towers to the extent the condensate is used in cooling, but exclusive of condensate pumps used for reinjection), and electrical controls
- Hydrogen sulfide abatement facilities
- Fresh water supply wells and systems used for cooling, fire protection, and domestic purposes
- Transformers, switchyard equipment, and electricity dispatching and control systems
- Auxiliary generators
- Sidewalks, fences, and pavement within the confines of the plant site, and plant roads, provided the roads serve only the power plant
- Onsite control, shop, and administrative buildings
- Fire protection equipment
- Downhole well pumps to the extent the downhole pumps serve a design requirement of the power conversion process; you must accurately allocate only that part of downhole pump investments that contribute to the power conversion process³; you cannot claim downhole pump investments related to

³ Downhole pump costs are mostly applicable to binary-type conversion processes where increased operating pressures are required to keep the geothermal fluid in the liquid phase. Some flash plants may also require pressurization of the geothermal fluid to maintain a liquid phase into the first separator.

extraction or lift of geothermal fluids.⁴

- Major spare parts unique to the power plant and maintained for immediate use, such as turbine rotors and diaphragms.

Costs associated with loan service fees apply only to the actual amounts that clearly attribute and allocate to the power plant for which you borrowed the money; you must have incurred the costs during the design and construction phases of the power plant, and you must be able to document them upon audit.

Don't forget to adjust your depreciation and investment schedules when you replace or retire capital equipment.

The following are non-allowed capital costs because they are not directly related to the construction of the power plant and installation of power-generating equipment. It should be noted that no costs related to the well-field are allowed, including reinjection of geothermal fluids, except for a portion of the downhole pump costs mentioned in the above two footnotes.

NON-Allowable Capital Costs		
Production wells, well control systems, and any other production-related equipment	Pipelines (including drip pots) between the wellhead and power plant, including pipelines both upstream and downstream of wellhead or field separators	Effluent/condensate reinjection pumps, boxes, pipelines, wells, and controls
Lease acquisition costs	Lease restoration costs	Costs of acquiring, negotiating, or administering electricity sales contracts
Socioeconomic costs, such as hospitals, schools, roads, or other civic improvements, that local government agencies impose as a condition of doing business	Payments on borrowed principal made during the design and construction phase of the power plant (only the interest portion of loan payments made prior to placing the power plant in service is an allowable capital cost)	Late payment fees for failure to make timely loan payments during the design and construction phase of the power plant
Construction contract termination fees or penalties	Any other corporate or business costs not directly related to construction of the power plant and installation of power-generating equipment	

⁴ ONRR does not require a specific method to allocate downhole pump costs. Whatever method you use must be technically reasonable and verifiable. One method is to calculate the ratio of the horsepower needed to maintain a certain inlet pressure versus the total pump horsepower. Other methods may also apply

4.5.2 Real Estate Costs

Real estate costs, including recording fees and other costs incident to the purchase of lands, may be eligible for a return on investment if all of the following apply:

- You can demonstrate the necessity for the land purchase.
- The purchased land is not on a Federal geothermal lease.
- ONRR approves the costs.

You can include only that portion of real estate costs necessary for the power plant site. If your real estate purchase includes land outside the power plant site, you must allocate the cost between the plant site and the other land.

If you are using the depreciation method to calculate your generating cost rate, add the allowable real estate costs to the annual undepreciated capital balance to compute the return on undepreciated capital investment. If you are using the return-on-investment method, include the allowable real estate costs as part of the gross capital investment.

4.6 Step 3C—Determine Your Method of Handling Capital Cost

You may choose between using:

1. Depreciation and a return on undepreciated capital investment, or
2. A return on capital investment.

NOTE

Unlike transmission lines serving more than one power plant, you do not allocate generating costs if your power plant uses geothermal resources from more than one lease. Rather, you use total costs in determining your generating cost rate. If you believe a situation necessitates allocating (or using partial) generating costs in your cost rate calculation, contact ONRR for approval.

4.7 Step 3C(1)—Calculate Generating Cost Rates by the Depreciation Method

If you use the depreciation method, calculate your annual generating cost rates from the following equation:

$$\text{Cost Rate (\$/kWh)} = \frac{E + D + I}{F}$$

where:

- D = Annual depreciation of gross capital investments (see “Depreciation” below)
- E = Annual O&M expenses, estimated for the first deduction period
- F = Annual kWh of plant tailgate electricity, estimated for the first deduction period
- I = Annual return on undepreciated capital investment (see “Return on Undepreciated Capital Investment” below)

Calculate the cost rate to six decimal places.

4.7.1 Depreciation

Follow these rules to determine depreciation.

- Depreciate only the allowable capital investment.

- Calculate your depreciation on your gross capital investments; do not deduct salvage value for any of the capital equipment.
- Use straight-line depreciation.
- Use a depreciation period equal to the term of the electricity sales contract (for major items such as plant structure, cooling tower, turbine-generator, and condenser) or the normal, useful life of individual equipment if it is less than the term of the sales contract. Thus, you may have different depreciation schedules for different equipment, but you cannot use different depreciation periods outside those described in the previous sentence without ONRR's approval. You do not need approval for depreciation periods based on the term of the electricity sales contract or lives of individual equipment.
- Adjust your depreciation schedule(s) for retired or replaced capital items using generally accepted accounting principles.
- Depreciate the power plant and associated power-conversion equipment only once. A change in ownership does not alter the depreciation schedule that the original owner established, except for addition or replacement of capital items.

4.7.2 Return on Undepreciated Capital Investment

The return on un-depreciated capital Investment (I) is the product of the return rate and the un-depreciated capital investment balance at the beginning of the annual deduction period:

$$I = \text{Return Rate} \times \text{Undepreciated Investment Balance}$$

The return rate is two times the Standard and Poor's monthly average 15-year industrial BBB bond rate, as published in Standard and Poor's Bond Guide, for the first month of the annual deduction period. This rate remains constant during the deduction period; you re-determine the return rate at the beginning of each deduction period.

Example 4-4 Calculating a Generating Cost Rate by the Depreciation Method

Cost rates are for the first and fifth years of operation.

- **Schedule of Capital Costs**
 - Capital investment = \$126,930,000
 - Depreciation period = 30 years
 - Annual depreciation (D) = \$4,231,000
 - Depreciation schedule:

Year	Beginning-of-Year Undepreciated Investment Balance
1	\$126,930,000
2	\$122,699,000
3	\$118,468,000
4	\$114,237,000
5	\$110,006,000

- **First Year of Operation (First Deduction Period)**

- Estimated O&M Expenses (E) = \$6,500,000
- Undepreciated capital investment balance = \$126,930,000
- Standard and Poor’s monthly average 15-year industrial BBB bond rate for the month beginning the first deduction period = 8.96%
- Return on undepreciated capital Investment (I):

$$(2 \times 0.0896) \times \$126,930,000 = \$22,745,856$$

- Estimated annual plant tailgate electricity (F) = 619,710,438 kWh
- Cost rate:

$$\frac{E + D + I}{F} = \frac{\$6,500,000 + \$4,231,000 + \$22,745,856}{619,710,438 \text{ kWh}} = \$0.054020/\text{kWh}$$

- **Fifth Year of Operation (Fifth Deduction Period)**

- Previous deduction period’s O&M expenses (E), adjusted for anticipated differences = \$7,255,315
- Undepreciated capital investment = \$110,006,000
- Standard and Poor’s monthly average 15-year industrial BBB bond rate for the month beginning the fifth deduction period = 9.76%
- Return on undepreciated capital Investment (I):

$$(2 \times 0.0976) \times \$110,006,000 = \$21,473,171$$

- Estimated annual plant tailgate electricity (F) = 620,104,165 kWh
- Cost rate:

$$\frac{E + D + I}{F} = \frac{\$7,255,315 + \$4,231,000 + \$21,473,171}{620,104,165 \text{ kWh}} = \$0.053152/\text{kWh}$$

4.8 Step 3 C (2) Calculating Generating Cost Rates by the Return-on-Investment Method

Is you use the return-on-investment method, calculate your annual generating cost rates from the following equation:

$$\text{Cost Rate } (\$/\text{kWh}) = \frac{E + R}{F}$$

where:

E = Annual O&M expenses, estimated for the first deduction period

F = Annual kWh of plant tailgate electricity, estimated for the first deduction period

R = Annual return on allowable gross capital investments, adjusted for retired or replaced capital items

Note : You can use the return-on-investment method only for power plants that you first placed into service on or after March 1, 1988.

The annual Return (R) is the product of the return rate and the power plant capital investment:

$$R = \text{Return Rate} \times \text{Capital Investment}$$

The return rate is two times the Standard and Poor's monthly average 15-year industrial BBB bond rate, as published in Standard and Poor's Bond Guide, for the first month of the annual deduction period. This rate remains constant during the deduction period; you re-determine the return rate at the beginning of each deduction period.

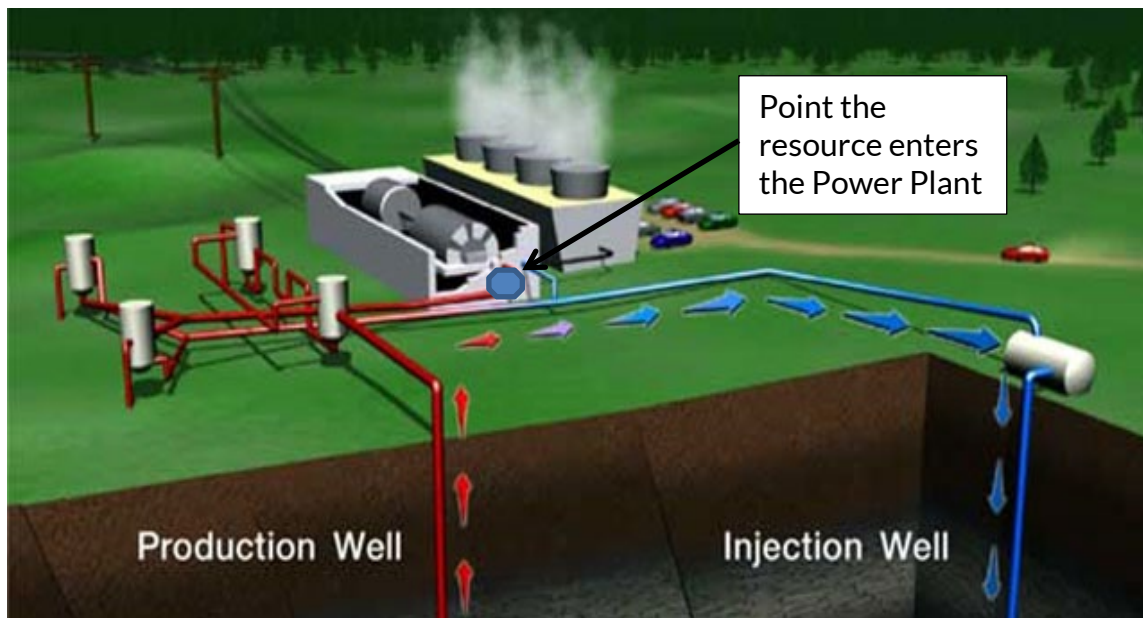
4.9 Step 4 Calculating your Monthly Generation Deduction

Generating deductions recognize your reasonable, actual costs of constructing and operating your geothermal power plant; that is, your costs of generating electricity. Generating deductions are the product of the annual generating cost rate and monthly plant tailgate electricity (adjusted for non-royalty bearing portions of electricity) as follows:

$$\text{Generating Deduction (\$)} = \text{Annual Cost Rate (\$/kWh)} \times \text{Monthly Plant Tailgate Electricity (kWh)}$$

Plant tailgate electricity is the amount of electricity that the power plant generates exclusive of plant parasitic electricity but inclusive of any generated electricity returned to your lease for lease operations (30 CFR 1206.351). In general, you will determine plant tailgate electricity by adding any electricity returned to the lease to the amount of electricity that the power plant's net-out meter measures (net-out electricity is the electricity entering the transmission line). You must either measure the power plant's net-out electricity at, or calculate it for, the high-voltage side of the transformer in the power plant switchyard before adding electricity returned to the lease.

4.10 Step 5 Calculating the Monthly Value of the Geothermal Resource



This step nets the deductions from the value of the electricity sold to arrive at the value of the geothermal resource. You apply the previously calculated values, as follows:

Netback Geothermal Value = Electricity Value – Transmission Deduction – Generating Deduction

4.11 Step 6 Allocating Value to Leases

The netback procedure derives the dollar value, at the plant inlet, of all geothermal resources that a power plant uses regardless of resource origin. If you use geothermal resources from more than one lease, you must allocate the value to each lease based on one of the following:

- The proportion of measured wellhead or lease production, as the Bureau of Land Management (BLM) approves.
- The allocation schedule in your unitization or communitization agreement, as BLM approves.

Any other measurement or allocation method that BLM approves.

4.12 Step 7 Reporting Netback Values on Form ONRR-2014

Report netback quantities and values on Form ONRR-2014 as follows:

Sales Volume	Sales Value	Royalty Value
Amount of delivered electricity allocated to the lease	Netback value of geothermal production allocated to the lease	Product of sales value and lease royalty rate

4.13 Step 8 Recalculated Netback Values: Underpayments and Overpayments

As indicated in throughout this chapter, you recalculate your cost rates at the beginning of each annual deduction period, using your actual costs from the prior period, to re-determine the prior period's actual deductions and royalty values (you also use the new cost rates, adjusted for anticipated cost differences, for the new deduction period). You must then submit corrected Form ONRR-2014s to show each month's adjusted royalty values, using adjustment reason code 10. You have 90 days from the end of the deduction period to file the corrected Form ONRR-2014. ONRR refers to this annual as-needed recalculation as the "true-up".

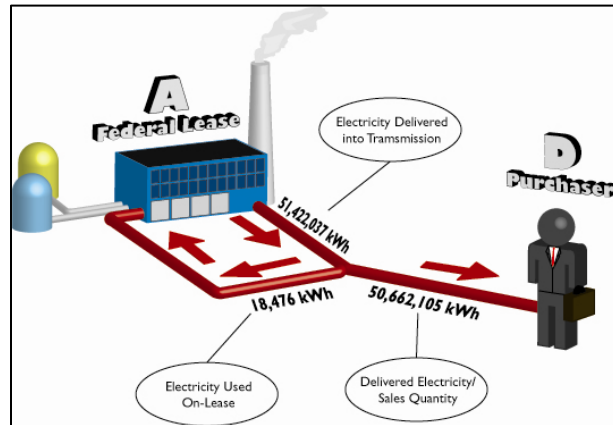
If your adjusted royalty values are greater than those originally reported for any month (meaning you underpaid royalties for that month), you must pay the additional royalties plus interest from the date the additional royalty was due (30 CFR 1218.302). You cannot offset an underpayment for one month against an overpayment for another month. If your adjusted royalty values are less than those originally reported (meaning you overpaid royalties), you may recoup the overpayment by taking a credit against future royalties until the overpayment is exhausted (see Example 4-10 below).

However, you cannot offset an overpayment for one month against an underpayment for another month.

Remember that, independent of your deduction period, you must satisfy the lease's annual minimum royalty requirement on or before the expiration date of the lease year (see "Minimum Royalty" in [Chapter 2](#)) (usually \$2.00 per acre) each lease year (30 CFR 1202.352). If the royalties paid on monthly production during the lease year are less than the minimum royalty, you must pay the difference to ONRR on or before the expiration date of the lease year.

4.14 Netback Calculation Examples

Example 4-6 Calculating a Netback Value When Production Is from a Single Lease



Power Plant A uses geothermal production from only the Federal lease. The lessee transmits electricity across its own transmission line to the purchaser at point D. You use some electricity on-lease to operate well valves and run effluent reinjection pumps. The lease royalty rate is 12.5% value of geothermal production.

- Annual cost rates
 - Transmission-line cost rate = \$0.001002/kWh
 - Generating Cost Rate = \$0.053152/kWh
- Electricity measurements for reporting month
 - Delivered electricity: 50,662,105 kWh
 - Tailgate electricity:
- Electricity delivered into transmission; 51,422,037 kWh
- Electricity used on-lease: 18,476 kWh
- Total: 51,440,513 kWh
 - Electricity sales revenue (gross proceeds): \$4,078,299.45
 - Transmission deduction
 - Transmission line:
 - $\$0.001002/\text{kWh} \times 50,662,105 \text{ kWh} = -\$50,763.43$
- Generating deduction
 - $\$0.053152/\text{kWh} \times 51,440,513 \text{ kWh} = -\$2,734,160.15$
- Value of geothermal production: \$1,293,375.87
- Value as percentage of revenue: 31.71%
- Report on Form ONRR-2014 (Royalty rate = 12.5%)

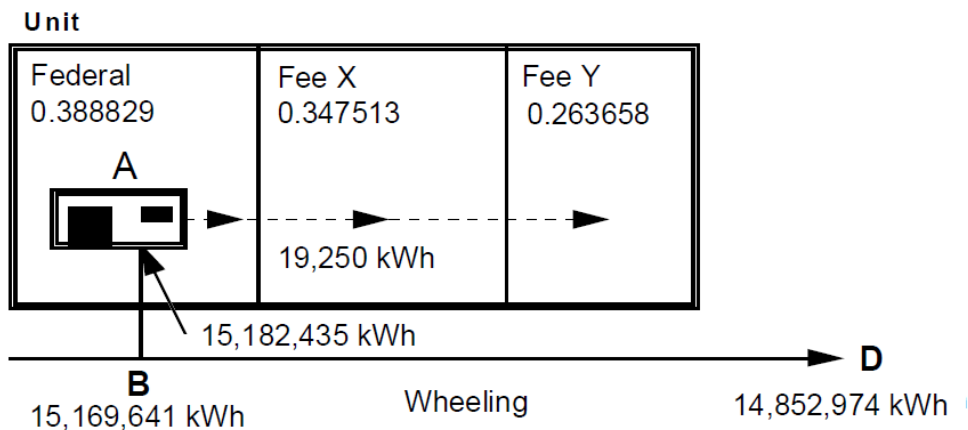
Sales Volume	Sales Value	Royalty Value
50,662,105 kWh	\$1,293,375.87	\$161,671.98

Example 4-7 Calculating a Netback Value When Production Is from Multiple Leases

Power Plant A uses geothermal production from three unitized leases with the following allocation schedule:

Lease Allocation Factor		
Federal	Fee X	Fee Y
0.388829	0.347513	0.263658

The lessee transmits electricity across its own transmission line to an interconnect with a third-party transmission line at point B, then wheels the electricity to the purchaser at point D. They use some electricity on the unit to regulate well production and run effluent reinjection pumps. The royalty rate for the Federal lease is 10%.



- Annual Cost Rates
 - Transmission-line cost rate = \$0.002167/kWh
 - Generating cost rate = \$0.063653/kWh
- Electricity Measurements for Reporting Month
 - Delivered electricity, point D: 14,852,974 kWh
 - Interconnect electricity at point B: 15,169,641 kWh
 - Tailgate electricity:
 - Electricity delivered into transmission: 15,182,435 kWh
 - Electricity used on-unit: 19,250 kWh
 - Total: 15,201,685 kWh
- Electricity Sales Revenue (Gross Proceeds): \$1,448,164.97
- Transmission Deduction
 - Transmission line:
 - \$0.002167/kWh x 15,169,641 kWh = \$32,872.61
 - Wheeling charges: \$29,736.00
 - Total transmission deduction: -\$62,608.61

- Generating Deduction
 $\$0.063653/\text{kWh} \times 15,201,685 \text{ kWh} = -\$967,632.86$
- Value of Geothermal Production \$417,923.50
 - Value as a percentage of revenue = 28.86%
 - Value allocated to Federal lease:
 $0.388829 \times \$417,923.50 = \$162,500.78$
- Report on Form ONRR-2014 (Royalty Rate = 10%):
 - Sales volume, allocated to lease:
 $0.3888239 \times 14,852,974 \text{ kWh} = 5,577,267$
 - Sales value: \$162,500.78
 - Royalty value: \$16,250.08

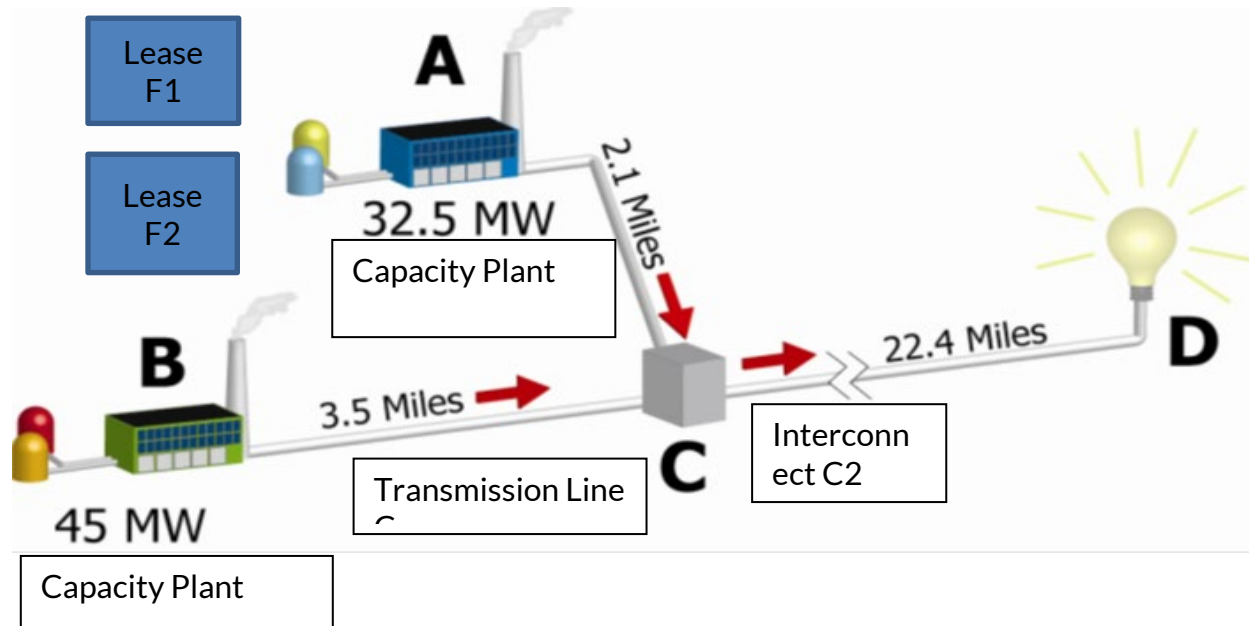
Example 4-8 Calculating a Netback Value When Production Is from Multiple Leases

Given:

1. Power plant A uses geothermal production from unitized Federal leases with the following allocation schedule:

Lease	Allocation Factor
F1	0.550000
F2	0.450000

2. Power plant B uses geothermal production from non-Federal leases
3. Power plant A & B are under common ownership
4. Operator transmits comingled electricity across its own transmission lines(c) to an interconnect with a third party transmission line at (C₂)
5. Electricity is wheeled on the third party line from (C₂) to a purchaser at a delivery point (D)
6. Wheeling charge = \$.00250/ kWh
7. Royalty rate for F1 & F2 is 10%
8. Line loss from C to C₂ =342,865 kWh and the line loss from C₂ to D = 678,873 kWh
9. Electrical Value = 11 ¢/ kWh
10. Total revenue for reporting month \$3,659,123.82
11. Transmission cost from C to C₂ + \$.002167/ kWh and Wheeling charge from C₂ to D = \$.000250/ kWh
12. Generating Cost (power plant A): \$.043683 kWh



Electrical measurements for reporting month

Power plant A:	Power plant B:
Metered to tie line: 20,508,539 kWh	Metered to tie line: 13,777,961 kWh
+ lease operations 32,821 kWh	
Total 20,541,360 kWh	

Electricity delivered for transmission (metered to tie line)
 $20,508,539 \text{ kWh} + 13,777,961 \text{ kWh} = 34,286,500 \text{ kWh}$

Line Loss is 342,865 kWh

Delivered electricity to Wheeling Pt = $34,286,500 - 342,865 = 33,943,635 \text{ kWh}$

Fraction of delivered electricity allocated to power plant A:
 $\frac{20,508,539 \text{ kWh}}{34,286,500 \text{ kWh}} = 0.598152$

$33,943,635 \text{ kWh} * 0.598152 = 20,303,453 \text{ kWh}$

Revenue Allocated to Power plant A
 $\$3,659,123.82 * 0.598152 = \$2,188,712.23$

Transmission Deductions:
 C-C₂: $20,303,453 * \$0.002167/\text{kWh} = \$43,997.58$
 C₂-D: $20,303,453 \text{ kWh} * \$0.000250 /\text{kWh} = \$5,075.86$

Total Transmission Deductions
 $\$43,997.58 + \$5,075.86 = \$49,073.44$

Generating Deductions

$$20,541,360 \text{ kWh} * \$0.043683 / \text{kWh} = 897,308.23$$

Revenue for power plant A - Transmission deduction - Generation deduction =

Net Value to power plant A

$$\$2,188,712.23 - \$49,073.44 - \$897,308.23 = \$1,242,330.56$$

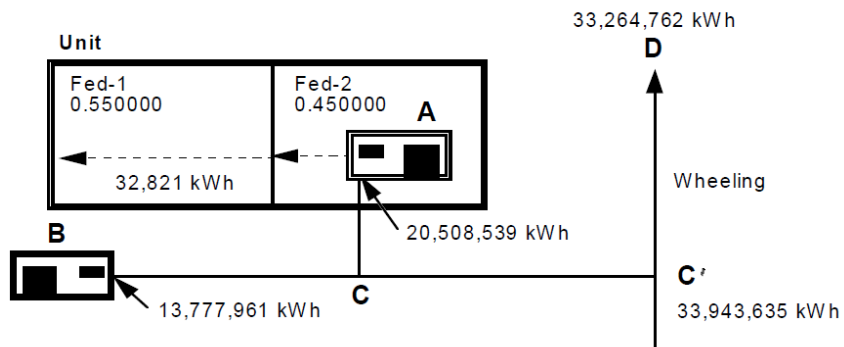
Example 4-9 Calculating a Netback Value When a Transmission Line Serves Two Power Plants

Power Plant A uses geothermal production from two unitized Federal leases with the following allocation schedule:

Lease Allocation Factor

Federal 1	Federal 2
0.550000	0.450000

Power Plant B uses geothermal production from non-Federal leases. Both power plants are under common ownership. The operator transmits commingled electricity across its own transmission line to an interconnect with a third-party transmission line at point C1 then wheels the electricity to the purchaser at point D; the wheeling charge on line C1-D is \$0.000250/kWh. The royalty rate for each Federal lease is 10 percent. Calculate netback values for Leases Fed-1 and Fed-2.



- Annual cost rates
 - Transmission line A-C-C1 cost rate 3 = \$0.002167/kWh
 - Power Plant A generating cost rate = \$0.043683/kWh
- Electricity measurements for reporting month
 - Power Plant A tailgate electricity:
 - Metered to tie line: 20,508,539 kWh
 - Lease operations: +32,821 kWh
 - Total: 20,541,360 kWh
 - Electricity delivered for transmission (metered to tie lines):
 - Power Plant A + B:

$$20,508,539 \text{ kWh} + 13,777,961 \text{ kWh} = 34,286,500 \text{ kWh}$$

II. Fraction allocated to Power Plant A:

$$\frac{20,508,539 \text{ kWh}}{34,286,500 \text{ kWh}} = 0.598152$$

- Electricity delivered to wheeling interconnect (point C1):
33,943,635 kWh
 - I. Allocated to Power Plant A:
 $0.598152 \times 33,943,635 \text{ kWh} = 20,303,453 \text{ kWh}$
 - Delivered electricity (point D): 33,264,762 kWh
- Electricity sales revenue (gross proceeds):
 - Total revenue Power Plant A + B: \$3,659,123.82
 - Revenue allocated to Power Plant A:
 $0.598152 \times 3,69,123.82 = \$2,188,712.23$
- Transmission deduction
 - Transmission-line A-C-C1 costs:
 $\$0.002167 \times 20,303,453 \text{ kWh}^5 = \$43,997.58$
 - Wheeling charges allocated to Power Plant A:
 $\$0.000250/\text{kWh} \times 20,303,453 \text{ kWh} = \$5,075.86$
 - Total transmission deduction: = $-\$49,073.44$
- Generating deduction
 $0.043683/\text{kWh} \times 20,541,360 \text{ kWh} = -\$897,308.23$
- Value of geothermal production at Power Plant A: \$1,242,330.56
 - Value as percentage of revenue = 56.76%
 - Value allocated to Lease Fed-1:
 $0.550000 \times \$1,242,330.56 = \$683,281.81$
 - Value allocated to Lease Fed-2:
 $0.450000 \times \$1,242,330.56 = 559,048.75$
- Report on Form ONRR-2014:
 - Lease Fed-1 (royalty rate = 10%)
Sales volume allocated to lease:
 $33,264,762 \text{ kWh} \times 0.598152 \times 0.550000 = 10,943,561 \text{ kWh}$
Sales Value: \$693,281.81
Royalty Value: \$68,328.18
 - Lease Fed-2 (royalty rate = 10%)
Sales volume allocated to lease:
 $33,264,762 \text{ kWh} \times 0.598152 \times 0.450000 = 8,953,823 \text{ kWh}$
Sales Value: \$559,048.75
Royalty Value: \$55,904.88

Example 4-10 Calculating a Netback Value When Deductions Exceed 99 Percent of Electricity Sales Value

Power Plant A uses geothermal production from unitized Federal and fee leases; lease production is the basis for allocation. Assume a Federal lease allocation factor of

⁵ Allocated interconnect electricity

0.834721 for the month. The electricity purchaser takes delivery at the power plant tailgate (point D). The lease royalty rate is 12.5 percent.

- Annual cost rates
 - Transmission = Not applicable
 - Generating cost rate = \$0.055483/kWh
- Electricity measurements for reporting month
 - Delivered electricity: 962,105 kWh
 - Electricity used on -lease: +1,475 kWh
 - Tailgate electricity: 963,580 kWh
- Electricity sales revenue (gross proceeds): \$53,877.88
- Transmission deduction: 0
- Generating deduction:
 $\$0.055483/\text{kWh} \times 963,580 \text{ kWh} = -\$53,462.31$
- Netted back value of geothermal production: \$415.57
 - Value as percentage of revenue= 0.77%
- Minimum value of geothermal production (1.00% of sales value):
 $0.01 \times \$53,877.88 = \538.78
 - Value allocated to Federal lease:
 $0.834721 \times \$538.78 = \449.73
- Report on Form ONRR-2014 (royalty rate = 12.5%):
 - Sales volume allocated to lease:
 $962,105 \text{ kWh} \times 0.834721 = 803,089 \text{ kWh}$
 - Sales Value: \$449.73
 - Royalty Quantity: 100,386 kWh
 - Royalty Value: \$56.22

Example 4-11 Recouping Royalty Payments When You Adjust Netback Values

For a given month, with your lease royalty rate of 10%, you reported a Sales Value of \$200,000 and a Royalty Value less Allowances (deductions) of \$320. Your calculated sales value less deductions of \$3,200 (which is not reported on the Form 2014) equaled 1.6 percent of that month's gross electrical sales proceeds of \$200,000. Upon recalculating your annual cost rates, monthly deductions, and netback values for the deduction period, you find that the corrected Sales Value for that month is \$100,000, which equaled only 0.05 percent of the month's gross electrical sales less deductions. Because the resource value (gross proceeds less deductions) cannot be less than 1 percent of the month's gross proceeds, you report an adjusted Sales Value of \$20,000 and an adjusted Royalty Value of \$2,000 to result in 1percent of gross proceeds using Adjustment Reason Code 15. You may recoup the difference between the reported and adjusted Royalty Values (\$320-\$200 = \$120) by crediting against future royalties.

- Sales value: \$200,000
Royalty value: (not reported on Form-2014) = Sales value less deductions:
\$3200.00
- Sales value less deductions percentage of revenue= $\$3200 / \$200,000 = 1.6 \%$
- Minimum value of geothermal production (1.00% of sales value):

$$\text{---} \times \$200,000 = \$2,000$$

- Recalculated, corrected sales value less deductions: \$1,000
— Value as percentage of revenue= 0.5 %

- Adjusted royalty value less deductions: \$200

Report on Form ONRR-2014 (royalty rate = 10%):

- Sales Value: \$20,000
- Royalty Value less Allowances: \$200

Chapter 5

Valuation Standards for Direct-Use

This chapter describes the standards in 30 CFR 1206.355 and 30 CFR 1206.356 for valuing geothermal resources that you use in direct-use processes for Class 1 leases. For Class 2 and 3 leases, see the Geothermal Payor Handbook- Class 2 & 3 Leases. Direct-use includes commercial and residential space heating; greenhouse heating; industrial and agricultural operations requiring process heat; and other operations where thermal water is the heat source. These resources usually involve warm to hot water and the heat that they produce. Valuation standards group according to the resource's disposition as follows:

- Sales under an arm's-length contract
- Use by the lessee in the lessee's own direct-use facility

Valuation standards for resources that you sell under an arm's-length contract focus on the contract's gross proceeds with the conditions that the gross proceeds reflects total consideration and reasonable value (see "Exceptions to Acceptance of Arm's-Length Gross Proceeds" in Chapter 2).

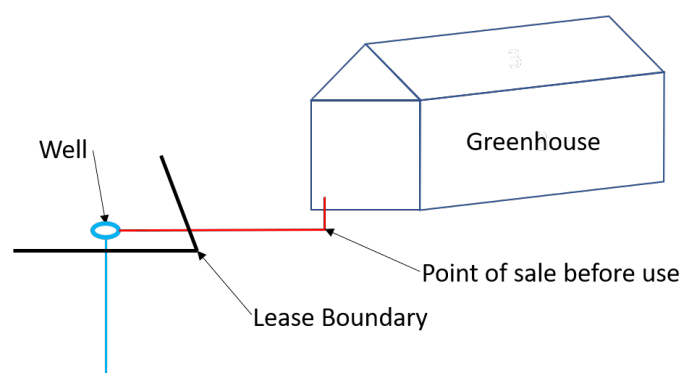
Valuation standards for resources that you use in your own direct-use facility are valued under a sequence of three methods, where you determine value under the first applicable method in descending order of appearance. For example, if the first method is not applicable or not workable, valuation falls to the second method, and so on. We will detail the alternative fuel method, appearing as the second benchmark in the non-arm's-length and no-sales valuation standards, in Chapter 5.2.2.

We refer to geothermal resources that you use in direct-use processes as "Direct-Use Resources."

5.1 Arm's-Length Sales

If you sell geothermal resources produced from Class I, II, or III leases at arm's length to a purchaser for direct use, then the royalty on the geothermal resource is the gross proceeds accruing to you from the sale of the geothermal resource to the arm's-length purchaser multiplied by the royalty rate in your lease or that BLM prescribes under 43CFR 3211.18.

See "General Valuation Principles" in Chapter 2 for additional discussion on arm's-length contracts and gross proceeds.



The sales contract must reflect both a reasonable value and the total consideration that the buyer actually transferred, either directly or indirectly, to the seller (30 CFR 1206.361(b)).

1. ONRR may determine that the gross proceeds do not reflect the reasonable value of the resource because of misconduct by or between the contracting parties, or because you have otherwise breached your duty to market the production to the mutual benefit of yourself and the Federal Government.
2. ONRR may determine that the contract does not reflect that the total consideration is synonymous with the full definition and intent of gross proceeds, as discussed in Chapter 2.

If the contract does not reflect a reasonable value or the total consideration, ONRR may require you to increase the gross proceeds to reflect any additional consideration. Alternatively, for Class I leases, ONRR may require you to use another valuation method in the regulations applicable to dispositions other than under an arm's-length contract. ONRR will notify you to give you an opportunity to provide written information justifying your gross proceeds.

Example 5-1: Arm’s Length Sales

This example shows how to calculate royalties for an arm’s length sale of geothermal resources to a direct use facility.

Assumptions:

- The royalty rate is 10%
- The production sales month is October 2017.
- You sell steam to a nonaffiliated owner of a geothermal greenhouse. The sales contract establishes a price of \$0.015 per thousands of lbs. of steam.
- The pay statement for the month shows 26,140,500 lbs. of steam.

The information reported on Form ONRR-2014 is shown on the following fact sheet.

Form ONRR 2014 Fact Sheet

Product Code	Sales Type Code	Sales MO/YR	Sales Volume	Sales Value	Royalty Value Prior to Allowances
32	ARMS	102017	26140500 lbs. steam	\$392107.50	\$39210.75

How to calculate royalty value prior to allowance:

$$\text{Sales Volume} * \text{Price} * \text{Royalty Rate}$$

$$26140500\text{lbs.} * \$0.015/\text{lb.} * 0.10 = \$39210.75$$

Please contact ONRR Royalty Valuation at royaltyvaluation@onrr.gov if you have any questions on how to do these calculations.

5.2 If you use the Geothermal Resource for your own Direct- Use purpose

If you use a geothermal resource for your own direct-use purpose you use the first of three applicable methods. If the first method does not apply you move onto the second method and so on.

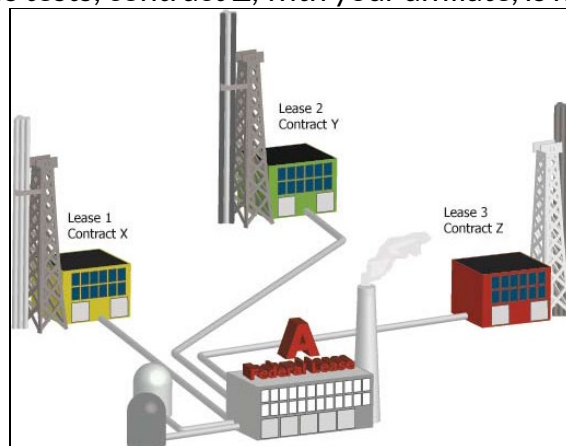
5.2.1 First non-arm’s-length valuation benchmark: Weighted Average of Gross Proceeds in Arm’s-Length Contracts

Method 1 is applicable only when you purchase, under arm’s-length contracts, significant quantities of geothermal resources to operate the same direct-use facility. In this situation, you value the geothermal resource as the weighted average of the gross proceeds that you established in the arm’s-length contracts (see example 5-1 below). “Gross Proceeds,” for the purpose of determining a weighted average, means contract prices. The volumes of resource that you purchased must meet the significant quantities test.

You must judge the acceptability of the arm’s-length contracts by considering their time of execution; duration; terms; quality and volume of resource that you purchased; and other factors that may reflect the value of the resource. If you use only your own production to operate your direct-use facility (that is, you don’t purchase significant quantities of geothermal resources under arm’s-length contracts), valuation falls to the second method (see further discussion in the following sections).

Example 5-2: Valuing Direct-Use Resources under the First No-Sales Benchmark

As lessee of the Federal lease and owner of direct-use facility A, you purchase most of your geothermal fluids from adjacent non-Federal leases 1, 2, and 3 under contracts X, Y, and Z, respectively. Contracts X and Y are arm’s-length, and both meet the comparability and significant quantities tests; contract Z, with your affiliate, is non-arm’s length.



Summary Data

Lease	Contract	Contract Type	Production (MMBtu)	Price (\$/MMBtu)	Revenue (\$)
-------	----------	---------------	--------------------	------------------	--------------

Federal	—	—	8,000	—	—
Lease 1	X	AL	35,000	2.05	71,750.00
Lease 2	Y	AL	30,000	2.12	63,600.00
Lease 3	Z	NAL	12,000	1.85	22,200.00

In this example, you calculate the value of your Federal lease production as the monthly weighted average of prices under your two arm's-length contracts as follows:

$$\frac{(\$2.05 \times 35,000) + (\$2.12 \times 30,000)}{35,000 + 30,000} = \$2.082308/\text{MMBtu}$$

You report and pay royalty on production of 8,000 MMBtu at a value of \$2.082308/MMBtu, or \$16,658.46.

5.2.2 Second Valuation Method for Direct-Use : Alternative Fuel Valuation

Method 2 for direct-use resources is the Alternative Fuel Valuation. You calculate the value of the geothermal production as a product of (1) the least expensive, reasonable alternative fuel that the geothermal resource replaced and (2) the amount of thermal energy that the geothermal resource displaces.

$$\text{Geothermal Value} = \text{Alternative Fuel Value} \times \text{Thermal Energy Displaced}$$

The value of the alternative fuel is its retail price in the local market, converted to dollars per million British thermal units (\$/MMBtu). Thermal energy displaced is the amount of the alternative fuel, in MMBtu, that you would otherwise use in your direct-use process in place of the geothermal resource. You calculate the amount of thermal energy displaced from the equation in Section 5.3 below.

You determine the price of the alternative fuel, the amount of thermal energy displaced, and the geothermal value for each month that you have production. The following steps will guide you through the valuation process.

Step 1: Select the least expensive, reasonable alternative fuel that you would otherwise use in place of the geothermal resource.

Step 2: Obtain the price (value) of your alternative fuel from your local supplier and convert it to \$/MMBtu (see "Valuing Your Alternative Fuel" below).

Step 3: Calculate the amount of thermal energy displaced (see "Calculating Thermal Energy Displaced" below).

Step 4: Calculate the geothermal value and allocate it to leases as necessary (see Example 5-4 below).

Step 5: Report on Form ONRR-2014, for each Federal lease, the allocated thermal energy displaced in MMBtu and allocated dollar value and pay royalties accordingly.

5.2.2.1 *Selecting Your Alternative Fuel*

The alternative fuel is the one that you would reasonably use at your location and in your facility in place of the geothermal resource. Answer the following questions to make your selection.

1. Did you previously use this fuel before converting to geothermal?
2. Is the alternative fuel compatible with and commonly used in processes like yours?
3. Is the alternative fuel available in the local market?

If you answer “yes” to question 1, don’t go any farther: your selected fuel is the one that you are actually replacing and is the reasonable alternative. If you answer “no” to question 1, then you must also consider questions 2 and 3. For example, natural gas may be the most commonly used fuel in processes like yours, but it might not be available at your location. In this case, another fuel, such as diesel or heating oil, might be your reasonable alternative. If you have access to more than one type of fuel in your area, choose the least expensive one that would be compatible with your facility or process.

5.2.2.2 *Valuing Your Alternative Fuel*

The value of your selected alternative fuel is the unit price that others normally pay in the local retail market. Thus, when natural gas is the alternative, value will be the commercial rates—including cost-of-gas, cost-of-service, and other rates normally charged—available from your local distribution company or utility. When diesel, heating oil, propane, coal, or another fuel is the alternative, value will be that fuel’s retail price normally available from distributors or other sources in the local market. You are responsible for obtaining and documenting the value of your alternative fuel for each month that you report production. You must state the value of the alternative fuel in terms of \$/MMBtu. If the price of the alternative fuel is in another unit of measurement, such as cents-per-gallon or dollars-per-therm (100,000 Btu), you must convert to equivalent \$/MMBtu based on the fuel’s gross heating value (heat of combustion or heat content, see Examples 5-1 and 5-2 below). Your local distributor should be able to give you the fuel’s heating value.

The following examples demonstrate how to convert an alternative fuel price, in this case heating oil, to the required units of \$/MMBtu.

Note : Calculate prices to six decimal places when converting to \$/MMBtu

Example 5-3: Converting a Heating Oil Price from \$/Gallon to \$/MMBtu

- Alternative fuel = No. 1 heating oil
- Heating value = 138,800 Btu/gal
- Price = \$0.795/gal

- Unit value of alternative fuel:

$$\frac{\$0.795}{gal} \times \frac{1 gallon}{138,800 Btu} \times \frac{1,000,000 Btu}{1 MMBtu} = \$5.727666/MMBtu$$

The following examples demonstrate how to convert an alternative fuel price, in this case natural gas, to the required units of \$/MMBtu.

Example 5-4: Converting a Natural Gas Price from \$/Therm to \$/MMBtu, with Monthly Service Charges

When natural gas is the alternative fuel, value will be the commercial rates—including cost-of-gas, cost-of-service, and other rates normally charged—available from your local distribution company or utility:

- Alternative fuel = Natural gas
- Cost of gas = \$0.2639/therm (\$2.639/MMBtu)

This is a cost-of-service contract: You must convert therms to MMBtu:

- Basic cost of service = \$0.0844/therm * 10 = (\$0.844/MMBtu) (1 therm= 10 MMBtu)
- Service charge: \$500/month

Thermal energy displaced = 12,000 MMBtu

In this example, use the amount of thermal energy displaced to calculate the component value of the service charge:

$$Unit\ Value\ of\ Service\ Charge = \frac{\$500}{12,000 MMBtu} = \$0.041667/MMBtu$$

The unit value of the alternative fuel is the sum of the price rates:

$$\$2.639 + \$0.844 + \$0.041667 = \$3.524667/MMBtu$$

5.2.2.3 Calculating Thermal Energy Displaced

Thermal energy displaced is the amount of thermal energy that would otherwise be used by the direct use facility in place of the geothermal resource. That amount of thermal energy (in Btu) displaced by the geothermal resource will be determined by the equation (30 CFR 1206.356(a)(2)):

$$Thermal\ Energy\ Displaced = \frac{(h_{in} - h_{out}) \times Density \times 0.133681 \times Volume}{Efficiency\ Factor}$$

where:

- h_{in} = Enthalpy in Btu per pound (Btu/lb) of the geothermal fluid entering the direct-use facility, based on inlet temperature

- h_{out} = Enthalpy in Btu/lb of the spent geothermal fluid leaving the direct-use facility, based on outlet temperature
- **Density** = Density in pounds per cubic foot (lb/ft³) of the geothermal fluid entering the direct-use facility, based on inlet temperature and generally calculated as the reciprocal of the specific volume
- **0.133681** = Constant factor in cubic feet per gallon (ft³/gal) to convert gallons to cubic feet
- **Volume** = Gallons of geothermal fluids produced
- **Efficiency Factor** = The efficiency factor accounts for stack and boiler heat losses that would occur with combustion of the alternative fuel. 0.7 for coal and 0.8 for natural gas, diesel, heating oil, and other refined petroleum produced

Sample calculations of thermal energy displaced are available in Example 5-5 and Example 5-6.

Enthalpies (h_{in} and h_{out}) are for saturated liquid (water) at the corresponding inlet and outlet temperatures. Determine them from standard steam tables available in engineering and thermodynamic handbooks, such as:

- *Steam Tables: Thermodynamic Properties of Water Including Vapor, Liquid, and Solid Phases (English Units)* (John Wiley and Sons)
- *CRC Handbook of Chemistry and Physics* (CRC Press, Inc.)
- *ASME Steam Tables* (American Society of Mechanical Engineers)
- *Or appropriate online calculators*

Calculate density as the reciprocal of the specific volume of saturated liquid (water) that corresponds to the inlet temperature:

$$Density = \frac{1}{Specific\ Volume}$$

Specific volumes are given in the steam tables.

5.2.3 Third valuation method for direct use- other valuation methods

Select the efficiency factor that corresponds to your alternative fuel. You may propose a different efficiency factor, but you must receive our approval to use it.

Calculate the thermal energy displaced to the nearest whole Btu. For valuation and reporting purposes, convert the Btu to MMBtu by dividing by one million (1,000,000). Maintain six decimal places to calculate your geothermal value, rounding to the nearest whole cent, to report Sales Value on Form ONRR-2014. Round the thermal energy displaced to the nearest whole MMBtu to report Sales Volume on the Form ONRR-2014.

The third method is a royalty determined by any other reasonable method approved by ONRR under 30 CFR 1206.364.

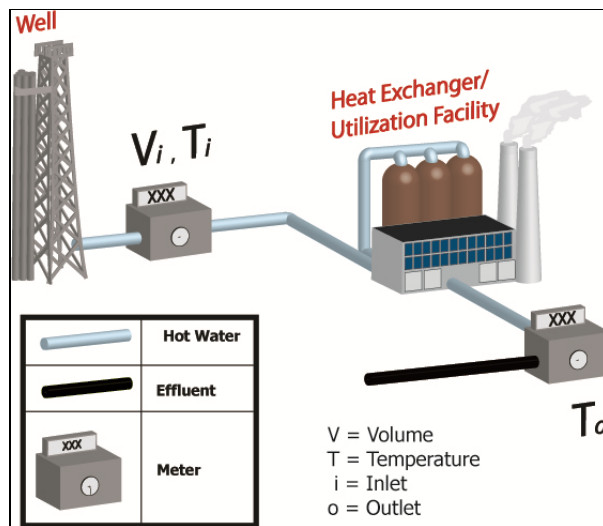
To request guidance or to propose a valuation method, please contact the Royalty valuation mailbox at royalty_valuation@onrr.gov.

5.3 Resource Measurements

You need the following three resource measurements to calculate thermal energy displaced:

1. Volume in gallons of geothermal fluid entering your direct-use facility.
2. Temperature in degrees Fahrenheit (°F) of the geothermal fluid at the inlet to your direct-use facility.
3. Temperature in °F of the spent geothermal fluid at the outlet of your direct-use facility.

Figure 5-1 below shows the general location of measurement points. You may need other measurements if your production is from more than one lease. The Bureau of Land Management (BLM) must approve your metering system and measurement points prior to operation.



5.4 Allocation to Leases

When you use geothermal resources from more than one lease in your direct-use facility and you commingle the production, you must allocate your calculated thermal energy displaced and geothermal value to individual leases.

Allocation must come from:

- The proportion of measured wellhead or lease production.
- The allocation schedule in your unitization or communitization agreement.
- Any other BLM approved measurement or allocation method.

BLM must approve your allocation method before you use it. BLM must also approve any commingling and measurement of non-Federal geothermal fluids you use in your direct-use facility.

5.5 Reporting on Form ONRR-2014

Report volumes and values calculated under the alternative fuel method on Form ONRR-2014 as follows:

- **Sales Volume:** Amount of thermal energy displaced in MMBtu allocated to the lease
- **Sales Value:** The dollar value of geothermal production allocated to the lease as calculated by the alternative fuel method
- **Royalty Value:** Product of Sales Value and lease royalty rate

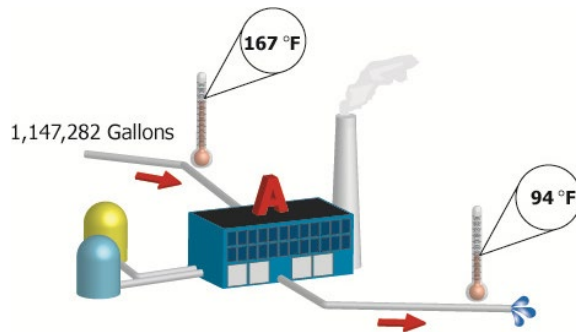
5.6 Example Valuations Using the Alternative Fuel Method

Examples 5-5 and 5-6 below illustrate valuation of geothermal resources using the alternative fuel method. These examples assume hand or online calculation of thermal energies displaced, with inlet and outlet temperatures given as weighted averages of periodic recordings. If your metering system automatically calculates and totals thermal energy displaced, then you need to only download this amount and multiply it by the alternative fuel value (price) to calculate and report your geothermal value.

Example 5-5 Calculating Value under the Alternative Fuel Method When Production Is from a Single Lease

Figure 5.2

In this example, you use only your own Federal lease production in your direct-use facility A. The selected alternative fuel is heating oil (efficiency factor = 0.8) with an equivalent value of \$5.727666/MMBtu. The lease royalty rate is 10%.



- Month's resource measurements
 - Production = 1,147,282 gal
 - Inlet temperature = 167°F
 - Outlet temperature = 94°F
- From steam tables
 - Enthalpy of inlet fluid (h_{in}) = 134.97 Btu/lb
 - Specific volume of inlet fluid = 0.016434 (ft³/lb)
 - Calculated density of inlet fluid

$$\frac{1}{0.016434 \text{ ft}^3/\text{lb}} = 60.849458 \text{ lb}/\text{ft}^3$$

Enthalpy of outlet fluid (h_{out}) = 62.06 Btu/lb

- Thermal energy displaced

$$\frac{(134.97 - 62.06) \text{ Btu/lb} \times 60.849458 \text{ lb/ft}^3 \times 1,147,282 \text{ gal}}{0.8}$$
- Value of geothermal resource

$$\$5.727666/\text{MMBtu} \times 850.537940 \text{ MMBtu} = \$4,871.60$$
- Report on Form ONRR-2014 (royalty rate = 10%)

Sales Volume	851 MMBtu
Sales Value	\$4,871.60
Royalty Value	\$487.16

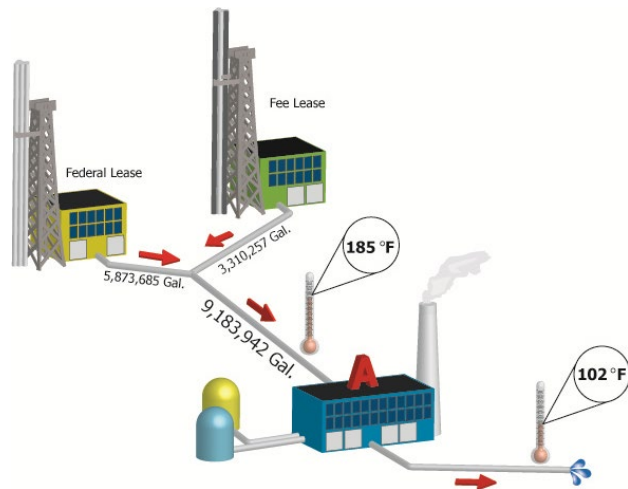
Example 5-6 Calculating Value under the Alternative Fuel Method When Production Is from More Than One Lease

In this example as shown on Figure 5-3 below, you use both your Federal lease production and production from an adjacent private lease, which you also own, to operate direct-use facility A. BLM has approved commingling and has established allocation on the basis of proportionate well production.

Figure 5-3

The alternative fuel is natural gas (efficiency factor = 0.8) with the following rates:

- Cost of gas = \$0.1795/therm (\$1.795/MMBtu)
- Basic cost of service = \$0.0764/therm (\$0.764/MMBtu)
- Service charge = \$750/month



The Federal lease royalty rate is 10%.

- Month's resource measurements
 - Federal lease production = 5,873,685 gal
 - Private lease production = 3,310,257 gal
 - Total production = 9,183,942 gal

Federal lease allocation factor:

$$\frac{5,873,685 \text{ gal}}{9,183,942 \text{ gal}} = 0.639560$$

- Inlet temperature = 185°F
- Outlet temperature = 102°F
- From steam tables
 - Enthalpy of inlet fluid (h_{in}) = 153.01 Btu/lb

– Specific volume of inlet fluid = 0.016539 ft³/lb

Calculated density of inlet fluid:

$$\frac{1}{0.016539 \text{ ft}^3/\text{lb}} = 60.463148 \text{ lb/ft}^3$$

– Enthalpy of outlet fluid (h_{out}) = 70.04 Btu/lb

- Thermal energy displaced

Volume of 1 gallon in cubic feet = 0.133681 ft³/gal

$$\frac{(153.01 - 70.04) \text{ Btu/lb} \times 60.463148 \text{ lb/ft}^3 \times 0.133681 \text{ ft}^3/\text{gal} \times 9,183,942 \text{ gal}}{0.8}$$

- Value of alternative fuel

Unit value of service charge:

$$\frac{\$750}{7,698.758134 \text{ MMBtu}} = \$0.097418/\text{MMBtu}$$

Unit value of alternative fuel:

$$\$1.795 + \$0.764 + \$0.097418 = \$2.656418/\text{MMBtu}$$

Value of geothermal resource

$$\$2.656418/\text{MMBtu} \times 7,698.758134 \text{ MMBtu} = \$20,451.12$$

Value allocated to Federal lease:

$$\$20,451.12 \times 0.639560 = \$13,079.72$$

Report on Form ONRR-2014 (royalty rate = 10%)

Sales Volume, allocated to lease

$$0.639560 \times 7,698.758134 \text{ MMBtu} = 4,924 \text{ MMBtu}$$

Sales Value \$13,079.72

Royalty Value \$1,307.97

If, for some reason, the alternative fuel method is unworkable, valuation falls to the third method: “other reasonable method approved by ONRR” (see section 5.2.3).

Chapter 6

Byproduct Valuation

This chapter describes geothermal byproduct valuation for royalty purposes for Class 1 leases.

All classes of geothermal leases treat byproduct royalty valuation the same, but the royalty rates vary between Class 1 versus Class 2 and Class 3 leases that converted under section 43 CFR 3200.7(a)(2) electing to be subject to all new regulations.

For Class 2&3 leases, see The Geothermal Payor Handbook - Class 2&3 Leases.

Byproducts are minerals (exclusive of oil, hydrocarbon gas, and helium), found in solution or in association with geothermal steam, that no person would extract and produce by themselves because they are worth less than 75 percent of the value of the geothermal steam or because extraction and production would be too difficult.

6.1 Byproduct Royalty Rates

Lease Type	Commodity	Royalty Rate
Class 1	All byproducts	5% (or as in lease terms)
Class 1	Commercially demineralized water	5%
Class 2 and converted Class 3	The royalty rate for byproducts derived from geothermal resource production that are minerals specified in section 1 of the Mineral Leasing Act (MLA), as amended (30 U.S.C. 181), is 5 percent, except for sodium compounds, produced between September 29, 2006 and September 29, 2011 (Pub. L. No. 109-338, §102; note to 30 U.S.C. 362) for which the royalty rate is 2 percent. No royalty is due on byproducts that are not specified in 30 U.S.C. § 181. (43 CFR 3211.19.)	

At the time of this writing, the most commonly recovered geothermal byproduct in the United States is sulfur, and much of that is treated as a hazardous waste. Standard byproduct royalty rates for Class 1 leases are 5 percent of value. No lessees currently are reporting royalties on byproducts or byproduct transportation allowances.

If you do produce any geothermal byproducts, ONRR has the information needed for you to calculate those royalties.

Please contact the ONRR royalty valuation group at royaltyvaluation@onrr.gov for guidance.

Abbreviations

AL	arm's-length
BLM	Bureau of Land Management
Btu	British thermal unit
Btu/lb	Btu per pound
CFR	Code of Federal Regulations
°F	degrees Fahrenheit
f.o.b.	free on board
FR	Federal Register
ft	foot, feet
ft ³	cubic feet
ft ³ /gal	cubic feet per gallon
gal	Gallon
H ₂ S	hydrogen sulfide
kWh	kilowatthour
lb	pound
lb/ft ³	pounds per cubic foot
Mlb	thousands of pounds
MMBtu	million British thermal units
MMS	Minerals Management Service
MWh	megawatthour
NAL	non-arm's-length
O&M	operating and maintenance
ONRR	Office of Natural Resource Revenue
therm	100,000 btu
U.S.C.	United States Code
Wh	watthour

Appendix A- Class 1

Definition of Terms

Affiliate means a person who controls, is controlled by, or is under common control with another person.

Allowance means a deduction in determining value for royalty purposes.

Arm's-length contract means a contract or agreement between independent persons who are not affiliates and who have opposing economic interests regarding that contract. To be considered arm's length for any production month, a contract must satisfy this definition for that month, as well as when the contract was executed.

Audit means a review, conducted in accordance with generally accepted accounting and auditing standards, of royalty or fee payment compliance activities of lessees or other interest holders who pay royalties, fees, rents, or bonuses on Federal geothermal leases.

Byproduct (or mineral) means products or minerals (exclusive of oil, hydrocarbon gas, and helium), found in solution or in association with geothermal steam, that no person would extract and produce by themselves because they are worth less than 75 percent of the value of the geothermal steam or because extraction and production would be too difficult.

Byproduct recovery facility means a facility where byproducts are placed in marketable condition.

Byproduct transportation allowance means an allowance for the reasonable, actual costs of moving byproducts to a point of sale or delivery off the lease, unit area, or communitized area, or away from a byproduct recovery facility. The byproduct transportation allowance does not include gathering costs.

Class I lease means:

- (1) A lease that BLM issued before August 8, 2005, for which the lessee has not converted the royalty rate terms under 43 C.F.R. 3212.25; or
- (2) A lease that BLM issued in response to an application that was pending on August 8, 2005, for which the lessee has not made an election under 43 C.F.R. 3200.8(b).

Class II lease means:

A lease that BLM issued after August 8, 2005, except for a lease issued in response to an application that was pending on August 8, 2005, for which the lessee does not make an election under 43 C.F.R. 3200.8(b).

Class III lease means:

A lease that BLM issued before August 8, 2005, for which the lessee has converted to the royalty rate or direct use fee terms under 43 CFR 3212.25.

Commercial production or generation of electricity means generation of electricity that is sold or is subject to sale, including the electricity or energy that is required to convert geothermal energy into electrical energy for sale.

Contract means any oral or written agreement, including amendments or revisions thereto, between two or more persons and enforceable by law that with due consideration creates an obligation.

Deduction means a subtraction the lessee uses to determine the value of geothermal resources produced from a Class I lease that the lessee uses to generate electricity.

Delivered electricity means the amount of electricity in kilowatt-hours delivered to the purchaser.

Direct use means the utilization of geothermal resources for commercial, residential, agricultural, public facilities, or other energy needs, other than the commercial production or generation of electricity.

Direct use facility means a facility that uses the heat or other energy of the geothermal resource for direct use purposes.

Electrical facility means a powerplant or other facility that uses a geothermal resource to generate electricity.

Field means the land surface vertically projected over a subsurface geothermal reservoir encompassing at least the outermost boundaries of all geothermal accumulations known to be within that reservoir. Geothermal fields are usually given names and their official boundaries are often designated by regulatory agencies in the respective States in which the fields are located.

Gathering means the efficient movement of lease production from the wellhead to the point of utilization.

Generating deduction means a deduction for the lessee's reasonable, actual costs of generating plant tailgate electricity.

Geothermal resources means:

- (1) All products of geothermal processes, including indigenous steam, hot water, and hot brines;
- (2) Steam and other gases, hot water, and hot brines resulting from water, gas, or other fluids artificially introduced into geothermal formations;
- (3) Heat or other associated energy found in geothermal formations; and
- (4) Any byproducts.

Gross proceeds (for royalty payment purposes) means the total monies and other consideration accruing to a geothermal lessee for the sale of electricity or geothermal resource. Gross proceeds includes, but is not limited to:

(1) Payments to the lessee for certain services such as effluent injection, field operation and maintenance, drilling or workover of wells, or field gathering to the extent that the lessee is obligated to perform such functions at no cost to the Federal Government;

(2) Reimbursements for production taxes and other taxes. Tax reimbursements are part of gross proceeds accruing to a lessee even though the Federal royalty interest may be exempt from taxation; and

(3) Any monies and other consideration, including the forms of consideration identified in this paragraph, to which a lessee is contractually or legally entitled but which it does not seek to collect through reasonable efforts.

Lease means a geothermal lease issued under the authority of the GSA, unless the context indicates otherwise.

Lessee (you) means any person to whom the United States issues a geothermal lease, and any person who has been assigned an obligation to make royalty, fee, or other payments required by the lease. This includes any person who has an interest in a geothermal lease as well as an operator or payor who has no interest in the lease but who has assumed the royalty, fee, or other payment responsibility. This also includes any affiliate of the lessee that uses the geothermal resource to generate electricity, in a direct use process, or to recover byproducts, or any affiliate that sells or transports lease production.

Marketable condition means lease products that are sufficiently free from impurities and otherwise in a condition that they will be accepted by a purchaser under a sales contract typical for the disposition from the field or area of such lease products.

Person means any individual, firm, corporation, association, partnership, consortium, or joint venture (when established as a separate entity).

Plant parasitic electricity means electricity used to run a powerplant.

Plant tailgate electricity means the amount of electricity in kilowatt-hours generated by a powerplant exclusive of plant parasitic electricity, but inclusive of any electricity generated by the powerplant and returned to the lease for lease operations. Plant tailgate electricity should be measured at, or calculated for, the high voltage side of the transformer in the plant switchyard.

Point of utilization means the powerplant or direct use facility in which the geothermal resource is utilized.

Public purpose means a program carried out by a State, tribal, or local government for the purpose of providing facilities or services for the benefit of the public in connection with, but not limited to, public health, safety or welfare, other than the commercial generation of electricity. Use of lands or facilities for habitation, cultivation, trade or manufacturing is permissible only when necessary for and integral to (i.e., an essential part of) the public purpose.

Public safety or welfare means a program carried out or promoted by a public agency for public purposes involving, directly or indirectly, protection, safety, and law enforcement activities, and the criminal justice system of a given political area.

Reasonable alternative fuel means a conventional fuel (such as coal, oil, gas, or wood) that would normally be used as a source of heat in direct use operations.

Secretary means the Secretary of the Department of the Interior or any person duly authorized to exercise the powers vested in that office.

Transmission deduction means a deduction for the lessee's reasonable actual costs incurred to wheel or transmit the electricity from the lessee's powerplant to the purchaser's delivery point.

Wheeling means the transmission of electricity from a powerplant to the point of delivery.

Appendix B- Important Addresses

Email requests for valuation guidance to royaltyvaluation@onrr.gov.

Links to ONRR geothermal regulations, handbooks, forms, and other important information at www.onrr.gov.