



UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
MONTANA STATE OFFICE SUPPLEMENT
MANUAL TRANSMITTAL SHEET

Release
3-16

Date
January 15, 1992

Subject

H-3160-12 - EVALUATION OF INDIAN OIL AND GAS TRACTS

1. Explanation of Material Transmitted: This release provides a guide for the preparation of allottee mineral appraisals and for oil and gas evaluations of Indian lands offered for competitive leasing.
2. Reports Required: None.
3. Materials Superseded: None.
4. Filing Instructions: File as directed below:

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Robert H. Lawton
State Director

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I. Evaluation of Indian Oil and Gas Tracts.

A. Introduction.

1. The Federal government assures that fair market value (FMV) is received when Indian lands and/or their resources are leased, sold, exchanged, gifted, changed to fee patent title, or otherwise disposed, unless differently provided by statute. Conducting activities on Indian lands pursuant to an oil and gas lease constitutes a use of those lands. The Department of the Interior Board of Land Appeals (IBLA) defines FMV for the use of lands as:

"The amount in cash, or in terms reasonably equivalent to cash, for which a knowledgeable owner would grant to a knowledgeable user the right to use the land where both parties are willing but not obligated to engage in the transaction (Ronald C. Agel. IBLA 84-21 at 83 IBLA 80)."

2. To assure that FMV is obtained for oil and gas tracts offered in competitive lease sales or mineral transactions, the BLM prepares appraisals. For competitive lease sales, the BLM reviews the adequacy of the bonus offer, and forwards a recommendation to accept or reject the bonus offer to the Bureau of Indian Affairs (BIA). The ultimate acceptance or rejection of the bonus offer rests with the allottee or the tribal council. However, for mineral transactions, the allottee may not sell his mineral rights for less than the appraised FMV [25 CFR 152.25 (a)].

3. The Montana State Office of the BLM utilizes two tract evaluation procedures: 1) the comparable sales or market method (based on prices paid for similar tracts), and 2) the income evaluation or discounted cash flow (DCF) method (based on the estimated future net income of a tract).

B. Purpose

1. This handbook provides a guide for the preparation of allottee mineral appraisals and for oil and gas evaluations of Indian lands offered for competitive leasing.

C. Objective

1. The objective is to provide a consistent and uniform approach to the evaluation of Indian minerals.

D. Confidentiality of Data

1. The presale estimate of value (PEV) is confidential; and it, plus any data used in the estimation of FMV, must be properly safeguarded. Only those persons with a "need to know" shall have access to the lease sale/mineral sale information. Indian mineral appraisals and estimates of lease tract values remain confidential after the sale and shall not be released.

a. All draft and final reports relating to presale estimates and appraisals shall be treated as confidential information.

b. The data shall not be discussed outside of the official BLM/BIA meetings or telephone conversations. Estimates of value shall not be discussed over the telephone prior to both parties having a copy of the written appraisal.

c. Meetings in which the data are discussed shall be held in a secure office and in such a manner that non-BLM personnel and BLM personnel without a "need to know" are prohibited from attending the meetings and from having access to confidential data.

d. All confidential data shall be locked in a secure government-approved filing cabinet or vault when the data are not required for analysis and discussion purposes.

e. All mineral appraisals and oil and gas lease sale evaluations are mailed in a blue confidential envelope to the attention of the realty officer and placed inside a standard mailing envelope addressed to the superintendent.

E. Evaluation Approach

1. Examine each tract to be either leased or sold to determine if it is in an area that is producing or has formerly produced. If it is in a field, then use the income approach to determine tract value. Undertake a comparable sales study if data is available. If so, then use the value derived by the best documented and/or defensible approach as the PEV for the tract.

2. If there is insufficient well control to use the income approach, then conduct only a comparable sales study.

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3. Identify as "nominal" tracts with little or no hydrocarbon potential and tracts in areas where bonus bids are usually less than \$25 per acre. Among the tracts likely to have low development potential are tracts with dry holes or depleted wells that tested the lowest known productive horizon in the field and tracts/spacing units that are outside the interpreted reservoir limits of all known productive horizons. If an administrative minimum bid per acre is specified in the Notice of Sale, the minimum bid defines the PEV for nominal tracts. Perhaps after consultation with the BLM State Office, the agency offices establish the administrative minimum bid, expressed in dollars per acre. Recommend accepting the highest bid submitted for nominal tracts, if the bid equals or exceeds the specified administrative minimum bid per acre.

F. Geologic/Engineering Assessment Procedures

1. The geologic/engineering assessment process is the principal technical step in assessing the oil and gas reserves for the spacing unit in which the tract is located. Illustration 1 shows the data and data format that may be utilized in the geologic/engineering assessment process. Key activities in the process are as follows:

- a. Plot the lease tract on a base map (minimum 9 square miles).
 - (1) Use standard symbols for well status.
 - (2) Indicate productive horizon(s) and target horizons for locating wells.
- c. Gather geologic and engineering data including:
 - (1) Existing geologic maps and cross-sections.
 - (2) Field studies and maps.
 - (3) Drill stem tests/production tests.
 - (4) Wellsite geologists' reports.
 - (5) Well logs.

(6) Core analyses.

d. Determine potentially productive horizons for tracts.

e. Construct subsurface geologic maps.

(1) Prepare structure contour maps for each potentially productive horizon including derived oil/water, gas/water, or gas/oil contacts (note the source for these determinations).

(2) Prepare isopach maps of net pay.

(3) Map faults, porosity or permeability pinchouts, lithology changes, geologic trends, etc.

f. Determine the probability of oil and gas accumulations occurring within the subject lease tract.

g. Estimate the amount of primary recoverable hydrocarbon reserves in the tract, assuming that a reservoir extends into the tract.

h. Estimate dry hole geologic risk. The risk factor accounts for the uncertainty of the extent of the reservoir (whether an oil/water or gas/water contact, or a porosity or permeability barrier limits the reservoir within the tract).

2. Data Sources

a. Place the following information, used to evaluate the tract, adjacent to the appropriate wells either on a base map or record on a summary sheet: completion date, the previous year's production, cumulative production, and the reservoir name(s) and depth(s). For dry holes, record the abandonment date, total depth, and lowest formation penetrated. Acquire this and additional information relating to well and lease production from Dwight's Energydata, Inc., Petroleum Information (PI), completion reports, individual well records, unit files, state oil and gas commissions, and operators. Sources for information on economic conditions, exploration and development costs, and product prices include: lessees, other operating oil companies, professional and trade journals, oil refinery posted prices, lease brokerage firms and mineral owners.

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G. Income Approach - DCF Method

1. The income approach is preferable in the following instances:

- a. When there is sufficient well and production data available so that oil and/or gas reserves may be estimated with reasonable confidence.
- b. When relevant well completions and/or dry holes have been completed subsequent to the comparable sales data; i.e., the comparables are made invalid by a changing geologic interpretation.
- c. When the tract is included or will be included in an existing communitization agreement.
- d. When the tract is in a secondary unit or a participating area (PA) of an exploratory unit. In this instance, remaining recoverable reserves for the unit or PA are estimated, along with the remaining life of the agreement. Product prices and costs are estimated, and a DCF, present worth is determined for the tract, based upon its allocation within the unit or PA.

2. The income approach is based on the estimated annual revenue, expenditures, and net income of a well. Make estimates of the well's recoverable reserves; costs, including exploration, development, and operating; and taxes, excluding Federal income tax. Use actual current product prices. To account for the time value of money, discount annual cash flow to a present value using an interest (discount) rate.

3. Use the discount rate in DCF analysis in calculating the present value of the front-end investment and the net cash flow from operations. Use alternative rates or calculate rates for specific conditions such as for development of offset wells.

4. Where the tract's production potential and cash flow are uncertain, estimate an appropriate dry-hole risk factor; i.e., the probability that the well will not be commercially productive. The appraiser may also prepare multiple evaluations of the same tract, risk-weighting the recoverable reserves (Illustration 2). Select the value that represents the best judgment of the appraising personnel based on the current interpretation of the limits of the reservoir(s).

5. DCF Procedures

a. Review all data gathered as part of the geologic/engineering assessment.

b. Base estimated production, decline rate, and reserves on nearby model well(s). Select representative well(s) and record the primary producing horizon, depth, and cumulative production. Estimate oil and gas reserves for a producing well or spacing unit. Estimate the oil reserves from the production data of the reference well by plotting a production decline curve (production versus time), determining the decline rate, and extrapolating the curve to an estimated abandonment value. Recoverable reserves are the sum of production to date plus the estimated remaining recoverable reserves. You may also employ the volumetric method for computing oil and gas reserves.

c. Estimate recoverable gas reserves by plotting production versus time and extrapolating to an abandonment rate or, if pressure data are available, by plotting BHP/Z (bottom-hole pressure over the gas compressibility factor) versus cumulative gas production and extrapolating the curve to abandonment pressure.

d. Estimate recoverable reserves and annual oil and gas production rates for the tract or spacing unit using:

(1) Decline rate method:

(a) Estimate decline rates for the well(s) modeled.

(b) Base reserves on decline curve analysis.

(c) Adjust reserve figures to consider the geologic relationship of the well(s) modeled to the subject tract.

(2) Volumetric method:

(a) Gather information on reservoir parameters including:

i. Net thickness (h) (from isopach maps).

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- ii. Porosity (\emptyset).
- iii. Water saturation (S_w).
- iv. Oil and/or gas saturation.
- v. Reservoir area, spacing area or reservoir limit (A).
- vi. Formation volume factor (FVF).

(b) Estimate original oil in-place (OOIP) for the spacing unit using the equation:

$$OOIP = \frac{7758 \times A \times h \times \emptyset \times (1-S_w)}{FVF}$$

(c) Estimate original gas in-place (OGIP) for the spacing unit using the equation:

$$OGIP = 43560 \times A \times h \times \emptyset \times (1-S_w) \times B_g$$

- i. T_{sc} = Temperature at Standard Conditions = 520R
 - ii. P_i = Initial Bottom Hole Pressure
 - iii. P_{sc} = Pressure at Standard Conditions = 14.73 psia
 - iv. Z = Gas Compressibility Factor
 - v. T = Temperature of the Formation in degrees Rankine ($^{\circ}R$)
 - vi. Solving for Area (A); acres, when $B_g = \frac{T_{sc} \times P}{P_{sc} \times Z \times T}$
- $$A = \frac{OGIP}{43560 \times \emptyset \times (1-S_w) \times h \times \frac{T_{sc} \times P_i}{P_{sc} \times Z \times T}}$$

(d) Calculate net recoverable reserves based on an estimated recovery factor.

(e) The DCF model predicts annual production based on the estimated recoverable reserves, the years of constant production (if any), the decline rate, and the economic limit.

e. Estimate the costs of drilling, completing, and equipping the well. Estimate dry hole costs also. Assume well(s) is drilled in first year of lease.

(1) Sources include:

- (a) Drilling contractors.
- (b) Oil and gas companies.
- (c) Oil and gas journal.
- (d) American Petroleum Institute (API) joint associated survey on drilling costs (adjusted for current conditions).

f. Estimate annual operating costs.

(1) Sources include:

- (a) Operators.
- (b) Oil and gas companies.
- (c) Locality specific (appropriate) operating cost formulas.

g. Compute the economic limit.

h. Use current crude oil and natural gas prices for the predicted producing life of the well(s). Prices are held constant.

i. Determine the tax burden. Taxes may include state severance, ad valorem, and conservation taxes. Individual Indian reservations may apply additional use or business taxes.

j. Determine the net revenue interest (NRI) or working interest for the lease by subtracting the royalty rate from 100 percent; i.e., a 12.5 percent royalty lease would have an 87.5 percent NRI.

k. Enter inputs into model, run the program, and obtain the unrisksed DCF value.

l. Determine the dry hole risk. This is the probability that the well would not be commercially productive; i.e., a 30 percent dry hole risk implies a 70 percent probability of success.

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m. "Risk-weight" the DCF value by multiplying the probability of success by the DCF, and the dry hole probability by the dry hole costs, and subtract. The equation is: Risk weighted DCF = (DCF x success probability) - (Dry hole cost x dry hole probability).

n. If the risk-weighted DCF is negative, then the tract is of nominal value.

o. Convert the DCF value to dollars per acre by dividing the risk-weighted DCF by the spacing unit acreage.

p. Compare this DCF value, a candidate for the PEV for the tract, to the value derived from the comparable sales study.

H. Comparable Sales Method

1. This method is based upon a comparison of recent lease bonus bids or purchase prices to the subject property. Comparison factors may include the date of the comparable lease, location relative to the tract being evaluated, and similarity in geological/engineering attributes. The key steps in the comparable sales method follow:

a. Review data compiled during the geologic assessment phase.

b. Review current well activity reports to determine who is active in the area of study.

(1) Review first report summary for locating wells and review first production/completion reports from PI regional reports.

(2) Review file of requests from industry for leasing of Indian and Federal lands.

(3) Review recent over-the-counter (OTC) leases by getting an M Eleven report from the adjudication leasing unit, or by reviewing the oil and gas plats in the public room.

c. Compile all relevant past sales data and prepare summaries and maps.

(1) Always consult sources of past sale data including:

(a) Previous BIA, Federal, and state sales.

(b) Landmen.

(c) Lease brokerage firms.

(2) Sources of past sale data that may be used include:

(a) National and state oil and gas journals and publications.

(b) Oil and gas companies.

(c) Courthouse records.

(d) Mineral owners.

(e) U.S. Lease Price Report.

(3) Record terms of past sales including:

(a) Lease terms (royalty, rental, primary lease term, and bonus bid).

(b) Special lease stipulations.

2. Selection of Comparable Leases

a. Estimate the tract value by comparing its physical characteristics, income potential, and sale timing with those of the most comparable Indian, Federal, state, or private leases awarded under competitive bidding.

b. In the vicinity of the tract being appraised, assess leases previously sold using three tests to determine which, if any, of the leases are most equivalent to the tract under appraisal. These tests are (1) proximity in time, (2) proximity in location, and (3) similarity in physical, geologic, geographic, engineering, and economic characteristics.

c. Adjustments are usually required to compensate for the differences in the characteristics likely to affect relative value between the subject tract and the comparables. These characteristics include: distinctive geologic features; tract size; dry hole risk; recoverable resource potential; exploration, development, and operating costs; oil and gas prices; timing of sales; changes in the market conditions, and restrictive stipulations.

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3. Assessment Procedures

a. When appraising oil and gas rights for sale in an area where there is no production, no seismic data, very little known about the geology (perhaps a few dry holes per township), and no recent mineral sales, many area landmen and lease brokers appraise minerals as having a value of two to three times the current bonus bid paid for leases in the vicinity. Their explanation for using that multiplier is that, on average, minerals will be leased two or three times before being drilled, thus allowing the investor to recover his investment. In general, during periods of high leasing activity, use a multiplier of four or five. During periods of low oil prices and scaled-down domestic leasing and exploration activity, the multiplier may approach one.

b. Each situation is unique and there is no one universal multiplier. Besides using the prevailing bonus bid, one must consider who is acquiring the leases (speculator or developer), how likely it is that the subject minerals will get a lease offer and how soon, whether the minerals are leased or unleased, etc. When oil prices and market conditions change substantially, re-examine this approach.

I. Presale Estimate of Value and Sale Attendance

1. Prepare a report describing the geologic attributes and the comparable sales information, along with the PEV for each lease sale tract. The PEV is our estimate of FMV, and it is our recommendation that each tract not be leased at any price lower than the PEV. The tribe and allottees are free to accept or reject this advise. The report is signed by the geologist. The Chief, Reservoir Management and Operations Section also signs to concur, after making a technical review of the report. The report is then forwarded to the superintendent and the tribal chairman, via a memorandum signed by the Deputy State Director (DSD), Division of Mineral Resources (Minerals).

2. A BLM representative normally attends all Indian lease sales.

J. Postsale Review and Recommendations

1. Within 10 days of receiving the lease sale

results, the BLM reviews the bids received. As a first step of that review process, verify that no consequential data existed prior to the sale that was not available to the BLM at the time the appraisals were completed. If this data does become available (i.e., from operator reports, articles) a new PEV should be calculated and then compared to the high bid received. Through the DSD for Minerals, recommendations are made to the superintendent and to the tribal chairman to accept those high bids that are equal to or greater than the PEV. High bids that are less than the PEV are recommended to be rejected and offered at the next sale.

K. Tract Evaluation Files

1. Retain all data relating to each tract in a lease sale in files or store as computerized records including:

- a. Lease sale notice.
- b. Lease sale results.
- c. Geologic and comparable sales narrative.

d. Presale and postsale tract valuations and supporting documentation including recommendations relating to acceptance or rejection of high bids.

2. File the lease sale data together in this manner to make the lease sale data easy to reference for subsequent lease sales or for possible Interior Board of Indian Appeals hearings.

L. Mineral Appraisals

1. Prepare a report describing the geologic characteristics and the comparable sales information for each tract, including the appraised value of the mineral rights, and the effective date of the appraisal. The allottee may not accept any offers for less than the appraisal when minerals are sold, according to 25 CFR 152.25(a). In addition to the BLM geologist signing the appraisal, the Chief, Reservoir Management and Operations Section also signs to concur, after making a technical review of the appraisal. The report is then forwarded to the superintendent via a memorandum signed by the DSD, Minerals.

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GLOSSARY OF TERMS

-A-

Administrative minimum bid: a specified lowest bid, usually at least \$1/acre, that the BIA agency office will accept on a tract offered for lease.

Allottee: an individual Indian who has some mineral ownership.

API: American Petroleum Institute.

-B-

BHP/Z: bottom-hole pressure divided by the gas compressibility factor, used to estimate recoverable gas reserves.

-C-

CDM: U.S. Geological Survey Conservation Division Manual (Conservation Division was abolished in 1983, but many of its policies still apply).

Comparable sales: an evaluation procedure based on prices paid for similar tracts.

-D-

DCF: an evaluation procedure based on the estimated future net income of a tract.

Discount rate: used in discount cash flow analysis to calculate the present value of a front-end investment and the net cash flow from future operations.

Dry-hole risk factor: the probability that the well will not be commercially productive.

DSD: Deputy State Director of the BLM.

-F-

Fair market value: the amount in cash, or in terms reasonably equivalent to cash, for which a knowledgeable owner would grant to a knowledgeable user the right to use the land where both parties are willing but not obligated to engage in the transaction.

FMV: fair market value.

FVF: formation volume factor.
Glossary, Page 2

-I-

IBLA: Department of Interior Board of Land Appeals

-M-

M eleven report: a case management audit report that shows lease status including pending action.

-N-

Nominal: tracts of little known value, i.e., tracts with little or no hydrocarbon potential or tracts in areas where bonus bids are usually less than \$25 per acre.

NRI: net revenue interest determined by subtracting the royalty rate from 100 percent.

-O-

OTC: over-the-counter.

-P-

PEV: presale estimate of value.

Present value: the current monetary value.

-R-

Risk-weighted DCF: (DCF x success probability) - (dry-hole cost x dry-hole probability)

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Tract Summary

IDENTIFICATION

Reservation _____ Field Name _____
 Sale Date _____ Lease No. _____
 Tract Number _____ In CA or Unit? _____ Agreement No. _____
 Acreage _____ Unit and/or PA Name _____
 Well Spacing _____ Exploratory Unit? _____ Secondary Unit? _____

Legal Description:

T. _____, R. _____, sec. _____, Sub. _____, County _____, St. _____

GEOLOGIC ANALYSIS

Primary Producing Horizon(s) _____ Depth _____

Type of Trap _____ Drive Mechanism _____

Other Producing or Potential Formations _____

Reservoir Characteristics (include maps if possible)

Reservoir Net Pay (h) _____ Water Saturation (Sw) _____

Reservoir Porosity (Ø) _____ Oil Saturation (So) _____

Reservoir Permeability (K) _____

Pertinent Geologic Well Data (See also Well Data Compilation Map)

Summary of Productive Wells _____

Summary of Dry Holes _____

Geologic Adjustment to Risk _____

Rate the strength of the Presale Geological Analysis considering the quality of data, assumptions made, and results.

Excellent _____ Good _____ Fair _____ Poor _____

Geologic Analysis by _____

Position Title _____

Date _____

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ENGINEERING ANALYSIS

Pertinent Well Data (see also Well Data Compilation Map)

Summary of Productive Wells _____

Summary of Dry Holes _____

New Locations or APDs _____

Stipulations _____
Tract Access _____ Sales Point _____
Is Parcel Subject to Potential Drainage? _____ If so, explain _____

DCF ANALYSIS

Most Probable Reserves _____ Initial Production _____
Well Cost _____ Decline Rate _____
Operating Cost _____ Discount Rate _____
Ave. Prod. Price _____
Risk Factor _____ Explain _____

Rate the strength of the DCF Analysis considering the quality of data, the assumptions made, and the results obtained.

Excellent _____ Good _____ Fair _____ Poor _____

Explain strengths and weaknesses of DCF results and tract quality.

Strengths:

Weaknesses:

DCF Value _____

Engineering Analysis by _____
Position Title _____
Date _____

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TRACT NO 115
VALLEY COUNTY, MONTANA
MADISON FORMATION
BLUSTER FIELD

DATE: 12/17/91
TIME: 19:55:37
DBS : SPOTTED
FILE: BLUSTER
SEQ : 4

INPUT DATA

CALCULATED DATA

ITEM	SCHEDULING RATES		SCHEDULE UNTIL		PROCEDURE	ULTIMATE	LAST	EFF. DECL	INIT. RATE	FINAL RATE
401 START	12/91									
406 OIL	84.00	5.00 B/D	100000.00	BBL	EXP	25.00	100.000	9/01	25.05	2555. 152.
411 OPC/T	10000.00	X \$/Y	TO	LIFE	\$E	500.00		9/01		833.330 5708.327
416 STX/OIL	5.00	5.00 %	TO	LIFE	PC	.00		11/91		.050 .050
421 ATX	6.50	6.50 %	TO	LIFE	PC	.00		11/91		.065 .065
426 PRI/OIL	25.00	25.00 \$/B	TO	LIFE	PC	.00		11/91		25.000 25.000
431 LSE/WI	100.00	100.00 %	TO	LIFE	FLAT	.00		9/01		1.000 1.000
436 LSE/RIC	20.00	20.00 %	TO	LIFE	FLAT	.00		9/01		.200 .200
441 LSE/RIG	20.00	20.00 %	TO	LIFE	FLAT	.00		9/01		.200 .200

INVESTMENT	TANGIBLES & INTANGIBLES		TIME		PROCEDURE	TOTAL T&I	MONTH	RISK INV.	TOT. T&I&R	ESC. T&I&R
801 LEASE	.00	.00 MSG	12/91	AD	PC	.00	12/91	.	.0	.0
802 DRYHL	.00	.00 MSG	12/91	AD	PC	.00	12/91	.	.0	.0
803 COMPL	800.00	.00 MSG	12/91	AD	PC	.00	12/91	.	800.0	800.0
804 FACIL	.00	.00 MSG	12/91	AD	PC	.00	12/91	.	.0	.0
805 MARKT	.00	.00 MSG	12/91	AD	PC	.00	12/91	.	.0	.0
806 PLANT	.00	.00 MSG	12/91	AD	PC	.00	12/91	.	.0	.0
807 INVST	.00	.00 MSG	12/91	AD	PC	.00	12/91	.	.0	.0

RESERVE PARAMETERS

	ITEM	ITEM
201 LOSS	NO	
203 WELLS	1.00	.00
206 CUMO, MB	.00	CUMG, MMF .00
		CUML, MB .00

PROJECT ASSUMPTIONS

BASE DATE : 12/91 P.W. DATE : 12/91 REPORT DATE : 12/91
QUALIFIERS : PROD : OWNER : OTHER :

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TRACT NO 115
 VALLEY COUNTY, MONTANA
 MADISON FORMATION
 BLUSTER FIELD

DATE: 12/17/91
 TIME: 19:55:37
 DBS : SPOTTED
 FILE: BLUSTER
 SEQ : 4

RESERVES AND ECONOMICS

AS OF DATE: 12/1/1991

MO-YR	GROSS PRODUCTION -MB-	OIL PRODUCTION -MMF-	GAS TO NET INTEREST -MB-	OIL TO NET INTEREST -MMF-	GROSS PRICES-		REVENUE TO NET OPER NET		TOTAL NET INVESTMENT -M\$-	NET INCOME BEFORE FIT -M\$-	CUMULATIVE NET INCOME -M\$-	DISC NET INCOME -M\$-
					OIL -\$/B-	GAS -\$/M-	INTEREST -M\$-	EXPENSES -M\$-				
11-92	26.636	.000	21.308	.000	25.00	.000	506.076	45.645	800.000	-339.569	-339.569	-361.839
11-93	19.963	.000	15.971	.000	25.00	.000	379.304	43.405	.000	335.899	-3.670	-72.602
11-94	14.963	.000	11.970	.000	25.00	.000	284.288	43.229	.000	241.059	237.389	115.220
11-95	11.214	.000	8.972	.000	25.00	.000	213.074	44.600	.000	168.474	405.863	233.996
11-96	8.405	.000	6.724	.000	25.00	.000	159.699	47.130	.000	112.568	518.431	305.807
11-97	6.300	.000	5.040	.000	25.00	.000	119.694	50.530	.000	69.164	587.595	345.731
11-98	4.722	.000	3.777	.000	25.00	.000	89.711	54.581	.000	35.129	622.724	364.079
11-99	3.018	.000	2.414	.000	25.00	.000	57.334	48.935	.000	8.399	631.123	368.082
11-00												
11-01												
11-02												
11-03												
11-04												
11-05												
11-06												
S TOT	95.220	.000	76.176	.000	25.00	.000	1809.178	378.055	800.000	631.123	631.123	368.082
AFTER	.000	.000	.000	.000	.00	.000	.000	.000	.000	.000	631.123	368.082
TOTAL	95.220	.000	76.176	.000	25.00	.000	1809.178	378.055	800.000	631.123	631.123	368.082

	OIL	GAS		P.W. %	P.W., M\$
GROSS WELLS	1.0	.0	LIFE, YRS.	5.00	488.595
GROSS ULT., MB & MMF	95.220	.000	DISCOUNT %	10.00	368.081
GROSS CUM., MB & MMF	.000	.000	UNDISCOUNTED PAYOUT, YRS.	15.00	265.414
GROSS RES., MB & MMF	95.220	.000	DISCOUNTED PAYOUT, YRS.	20.00	177.311
NET RES., MB & MMF	76.176	.000	UNDISCOUNTED NET/INVEST.	25.00	101.176
NET REVENUE, M\$	1904.398	.000	DISCOUNTED NET/INVEST.	30.00	34.943
INITIAL PRICE, \$	25.000	.000	RATE-OF-RETURN, PCT.	40.00	-74.123
INITIAL N.I., PCT.	80.000	00.000	INITIAL W.I., PCT.	60.00	-228.208
				80.00	-330.532
				100.00	-402.837

H-3160-12 - EVALUATION OF INDIAN OIL AND GAS TRACTS

TRACT NO 116
 VALLEY COUNTY, MONTANA
 MADISON FORMATION
 BLUSTER FIELD

DATE: 12/17/91
 TIME: 19:56:54
 DBS : SPOTTED
 FILE: BLUSTER
 SEQ : 5

INPUT DATA

CALCULATED DATA

ITEM	SCHEDULING RATES		SCHEDULE UNTIL		PROCEDURE	ULTIMATE	LAST	EFF. DECL	INIT. RATE	FINAL RATE
401 START	12/91									
406 OIL	44.00	5.00 B/D	50000.00	BBL	EXP	25.00	50.000	7/99	24.78	1338. 152.
411 OPC/T	10000.00	X \$/Y	TO	LIFE	\$E	500.00		7/99		833.330 4624.998
416 STX/OIL	5.00	5.00 %	TO	LIFE	PC	.00		11/91		.050 .050
421 ATX	6.50	6.50 %	TO	LIFE	PC	.00		11/91		.065 .065
426 PRI/OIL	25.00	25.00 \$/B	TO	LIFE	PC	.00		11/91		25.000 25.000
431 LSE/WI	100.00	100.00 %	TO	LIFE	FLAT	.00		7/99		1.000 1.000
436 LSE/RIC	20.00	20.00 %	TO	LIFE	FLAT	.00		7/99		.200 .200
441 LSE/RIG	20.00	20.00 %	TO	LIFE	FLAT	.00		7/99		.200 .200

INVESTMENT	TANGIBLES & INTANGIBLES		TIME		PROCEDURE	TOTAL T&I	MONTH	RISK INV.	TOT. T&I&R	ESC. T&I&R
801 LEASE	.00	.00 M\$G	12/91	AD	PC	.00	.000	12/91	.0	.0
802 DRYHL	.00	.00 M\$G	12/91	AD	PC	.00	.000	12/91	.0	.0
803 COMPL	800.00	.00 M\$G	12/91	AD	PC	.00	800.000	12/91	800.0	800.0
804 FACIL	.00	.00 M\$G	12/91	AD	PC	.00	.000	12/91	.0	.0
805 MARKT	.00	.00 M\$G	12/91	AD	PC	.00	.000	12/91	.0	.0
806 PLANT	.00	.00 M\$G	12/91	AD	PC	.00	.000	12/91	.0	.0
807 INVST	.00	.00 M\$G	12/91	AD	PC	.00	.000	12/91	.0	.0

RESERVE PARAMETERS		ITEM	ITEM
201 LOSS	NO		
203 WELLS	1.00	.00	
206 CUMD, MB	.00	CUMG, MMF .00	CUML, MB .00

PROJECT ASSUMPTIONS

BASE DATE : 12/91 P.W. DATE : 12/91 REPORT DATE : 12/91
 QUALIFIERS - PROD : OWNER : OTHER :

H-3160-12 - EVALUATION OF INDIAN OIL AND GAS TRACTS

TRACT NO 116
 VALLEY COUNTY, MONTANA
 MADISON FORMATION
 BLUSTER FIELD

DATE: 12/17/91
 TIME: 19:56:54
 DBS : SPOTTED
 FILE: BLUSTER
 SEQ : 5

RESERVES AND ECONOMICS

AS OF DATE: 12/1/1991

MO-YR	GROSS PRODUCTION	OIL PRODUCTION	GROSS GAS PRODUCTION	OIL TO NET INTEREST	GAS TO NET INTEREST	GROSS PRICES		REVENUE TO NET OPER		NET INVESTMENT	TOTAL NET INCOME BEFORE FIT	CUMULATIVE NET INCOME	DISC NET INCOME
-----	-----	-----	-----	-----	-----	---\$ / B---	---\$ / M---	-----	-----	-----	-----	-----	-----
	MB	MMF	MB	MMF				M\$	M\$	M\$	M\$	M\$	M\$
11-92	13.976	.000	11.181	.000	25.00	.000	265.548	30.011	800.000	-564.463	-564.463	-575.855	
11-93	10.513	.000	8.411	.000	25.00	.000	199.754	31.734	.000	168.020	-396.443	-431.176	
11-94	7.909	.000	6.327	.000	25.00	.000	150.262	34.517	.000	115.745	-280.697	-340.993	
11-95	5.949	.000	4.759	.000	25.00	.000	113.033	38.097	.000	74.935	-205.762	-288.162	
11-96	4.475	.000	3.580	.000	25.00	.000	85.027	42.277	.000	42.750	-163.012	-260.890	
11-97	3.366	.000	2.693	.000	25.00	.000	63.960	46.907	.000	17.053	-145.959	-251.047	
11-98	.925	.000	.740	.000	25.00	.000	17.582	16.726	.000	.855	-145.103	-250.585	
11-99													
11-00													
11-01													
11-02													
11-03													
11-04													
11-05													
11-06													
S TOT	47.114	.000	37.691	.000	25.00	.000	895.166	240.269	800.000	-145.103	-145.103	-250.585	
AFTER	.000	.000	.000	.000	.00	.000	.000	.000	.000	.000	-145.103	-250.585	
TOTAL	47.114	.000	37.691	.000	25.00	.000	895.166	240.269	800.000	-145.103	-145.103	-250.585	

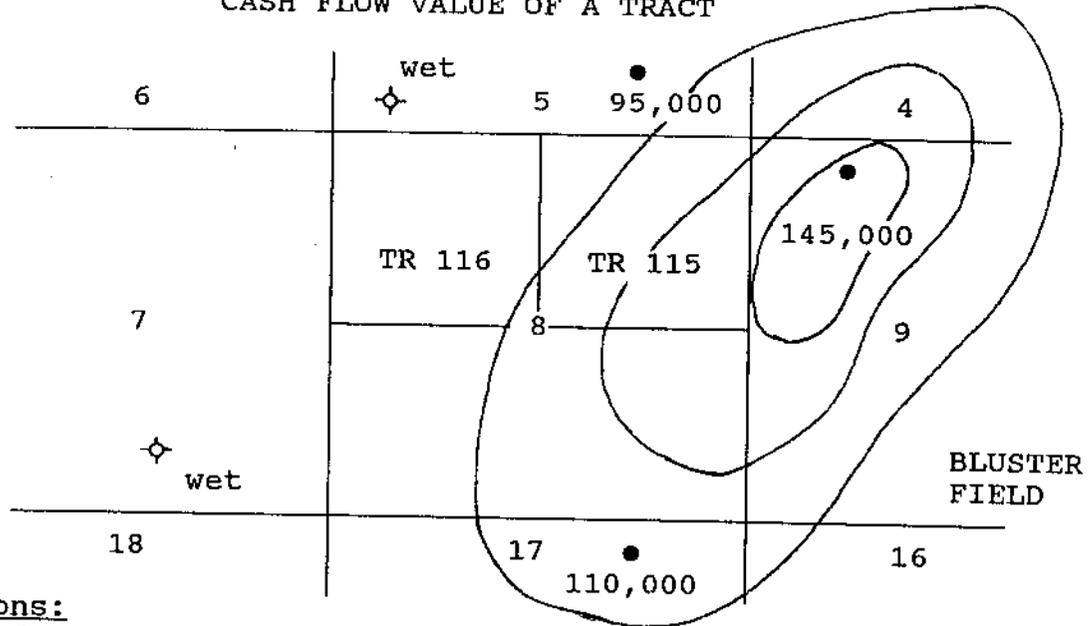
	OIL	GAS		P.W. %	P.W., M\$
	-----	-----		-----	-----
GROSS WELLS	1.0	.0	LIFE, YRS.	5.00	-201.565
GROSS ULT., MB & MMF	47.114	.000	DISCOUNT %	10.00	-250.585
GROSS CUM., MB & MMF	.000	.000	UNDISCOUNTED PAYOUT, YRS.	6.33	15.00
GROSS RES., MB & MMF	47.114	.000	DISCOUNTED PAYOUT, YRS.	6.33	20.00
NET RES., MB & MMF	37.691	.000	UNDISCOUNTED NET/INVEST.	.82	25.00
NET REVENUE, M\$	942.280	.000	DISCOUNTED NET/INVEST.	.69	30.00
INITIAL PRICE, \$	25.000	.000	RATE-OF-RETURN, PCT.	00.00	40.00
INITIAL N.I., PCT.	80.000	00.000	INITIAL W.I., PCT.	100.000	60.00
					80.00
					-563.537
					100.00
					-599.002

BLM MANUAL SUPPLEMENT
 State Office - Montana
 Supersedes Rel. None

Rel. 3-16
 1/15/92

H-3160-12 - EVALUATION OF INDIAN OIL AND GAS TRACTS

RISK-WEIGHING THE DISCOUNTED CASH FLOW VALUE OF A TRACT



Assumptions:

- a) Based on the depth to the Mission Canyon Formation, the well will cost \$800,000 to drill and complete as a producer.
- b) Based on depth, a dry hole will cost \$320,000 to drill and abandon
- c) Royalty rate = 20%

Reserves

Reserves for TR 115 are modeled from nearby wells and volumetrics; nearby wells will produce an estimated 95,000 to 145,000 BO

Reserves for TR 116 are based on volumetrics; the tract is near the oil/water contact.

Economics

TR 115 assuming a 30% dry hole risk
 70% probability of a 100,000 BO well: $0.70 \times \$368,000$ (DCF) = \$257,600
 30% probability of a dry hole: $0.30 \times \$320,000 = -\$96,000$
 risk-weighted discounted cash flow value: = \$161,600
 Tract is 160 acres (same size as spacing unit); tract value: \$1,010/ac

TR 116 assuming a 30% dry hole risk
 70% probability of a 50,000 BO well $0.70 \times -\$251,000 = -\$175,700$
 30% probability of a dry hole: $0.30 \times -\$320,000 = -\$96,000$
 risk-weighted discounted cash flow value: = -\$271,700
 Tract is 160 acres (same size as spacing unit); tract value is less than 0. We would recommend that the Tribe accept any bonus bid.