

EVALUATING INVESTMENT MERITS OF OIL AND GAS DRILLING PROGRAMS

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"Sitting Ducks: Many physicians prove to be inept in investment matters," says a recent article in the Wall Street Journal (August 17, 1970). It goes on to cite examples of poor investments they have made in real estate, tax shelter schemes, business ventures, commodities, and common stocks. An official of the S.E.C. says doctors are invariably among the victims of stock fraud cases and they are particularly prone to making bad investments in schemes offering tax shelter. Their penchant for bad investments is not surprising. It arises generally from two companion factors: high income and long busy workdays. According to an official of the American Medical Association, doctors average about \$32,000 a year, with incomes of \$100,000 from lucrative big city practices not uncommon. After long days at their practice, and time for family and social life, most doctors have little time left to study investments.

Although the comments above were made about physicians, they apply equally well to dentists, other professional people, and business executives who work long hours and have high incomes. An investment area where they frequently bungle is tax shelter schemes. Many are "snowed" or dazzled by glowing statements from oil drilling program representatives about deductibility, tax savings, leverage of investment dollars, and the prospect of multiple return. They get so carried away with this sort of appeal that study of the prospectus, inherent risk, and intrinsic value of the investment are overlooked.

Oil and gas drilling programs are now offered publicly by over 150 different companies. Of the \$1.70 billion total for programs filed with the S.E.C. in '69, approximately \$.50 billion was sold. There are no figures as to what part of this was bought by doctors, dentists, and others in the professions, but several program sponsors contacted on this point said it was about half.

What are Drilling Programs?

Reference and illustrations at end of paper.

An oil drilling program is a joint venture or partnership formed by a management company (sponsor) for a joint effort with investors in the exploration, drilling and development of oil and gas. Also called oil drilling or exploration funds, the word "program" is preferred to "fund" to avoid possible confusion with mutual funds, which invest in ordinary securities. As a rule, prospects to be drilled are not specifically defined at the time the program is formed. The management company furnishes the organization and know-how; investors supply all or most of the capital. Costs and revenues are allocated between management and investors according to a specified sharing arrangement.

The first phase is for the sponsor to form the program vehicle and register the program with the S.E.C. for public offering. The sponsor, whose function is to manage program activities, may be an oil operator or a managing agent. On receiving registration clearance, participation units in the program are offered and sold to investors. Next, program funds are invested in line with program objectives. Subsequently, results are reported to investors, including drilling activity reports during the development phase; year-end financial statements for income tax reporting; and periodic statements of reserves, cash liquidation value, etc., as specified. Finally, investors receive credit for oil and gas sold, are charged with expenses, and the difference, net operating income, is credited or distributed periodically per the program agreement. At some future time, investors may be offered an opportunity to sell their interests for cash or exchange them for stock, or the program may be dissolved and its assets distributed.

Securities as defined in the Securities Act of 1933 include fractional interests in oil and gas rights, and participations in joint ventures, limited partnerships, and other groups organized for the acquisition and development of oil and gas properties. Offers and sales of such securities to the public must be registered under appropriate federal and state laws unless otherwise exempted. Offering prospectuses of drilling programs follow a special

format designed to provide consistent and thorough disclosure.

Types of Drilling Programs

Oil drilling programs are complex and there are numerous differences between programs. First there are several legal forms of program organization, but most are either joint ventures or limited partnerships.

In the joint venture the investor is literally a co-venturer with the sponsor in the ownership, development and operation of program properties. The operator manages the program under a contract agreement. The investor as a co-owner is exposed to personal liability from operations, but is normally protected by insurance. He may transfer, sell, or pledge his interest subject to restrictions in the agreement.

The limited partnership is formed with the sponsor as general partner and investors as limited partners. An investor's liability is limited to his capital contributions. Tax rules permit pass through to the limited partners of intangible deductions, depletion, depreciation, and operating and other expenses on the one hand, and revenue from oil and gas sales on the other. Limited partners have no voice in management of the business. There is little liquidity or transferability of interests and no access to net operating income except as provided in the agreement. Of 101 programs studied by the Resource Programs Institute, Inc., earlier this year, about two-thirds were limited partnerships and one-third were joint ventures.

Programs also differ as to their objective or planned utilization of funds. Programs may do exploratory (wildcat) drilling; development drilling on proved or semi-proved properties; purchase producing properties; conduct secondary or thermal oil recovery operations; or do a combination of these.

Exploration oriented programs are relatively high risk. Their concept is that relatively low cost dollars provided by tax savings incentives should be used for exploration in the hope of finding large reserves yielding a high return. However, successful wells have to pay for dry holes; consequently, return to investors on any one program can vary from nothing to several fold.

The concept of development programs is that the tax-savings leverage makes it feasible to drill close-in proved and semi-proved locations with the expectation of only a modest

return, apart from tax effects, and relatively low risk of capital.

Many investors seek primarily a tax shelter with relatively low risk, and to them development programs make sense. Others like the attraction of greater possible return offered by exploratory programs, even though this means greater risk. Still others prefer a balanced program having some exploration but enough development drilling or property purchases to lower the risk and provide prospect of payout even if exploration be unsuccessful. Of the 101 programs in our study, 41 were exploration oriented (70 per cent or more of funds slated for exploration); 17 were development; and 41 were balanced between exploration, development and property purchases.

Sharing Arrangements and Management Compensation

Another important area where programs differ is the sharing arrangement, the allocation of costs and revenue between program management and investors. Management compensation always includes an interest in the oil and gas properties or revenue developed by the program. This interest is partly or entirely "carried" (financed) by the investors. Sharing arrangements may be classified as follows according to the extent of carry:

Full Carry: Investors pay all exploration and development costs, both tangibles and intangibles. (Sponsor may pay lease acquisition costs, sales commissions, etc.)

Functional Carry: Investors pay all non-capital costs, ie. intangible drilling and dry hole costs. Sponsor pays all capital costs, ie., equipment and lease acquisition costs for productive leases.

Exploration Carry: Investors pay all exploration costs; development costs are shared between investors and sponsor.

Casing Point Carry: Investors pay all costs except completion costs, which are shared.

Disproportionate Carry: Investors and sponsor share all costs.

The principal form of management compensation is an interest in the properties explored and developed by the program as provided by the sharing arrangement. This interest may be an overriding royalty interest, working interest, reversionary working interest, net operating profits interest, net profits interest, or percent of cash liquidating value. (For definitions see RPI's Glossary of Oil Terms for Investors). Management also receives one or more of the

following other forms of compensation:

- Management Fee - a front-end charge, being a percentage of either capital contributions or intangible drilling and exploration costs as incurred. The fee ranges from 0 to 15 percent, averaging about 10 percent. Organization and offering expenses, sales commissions, and or overhead costs may be paid by the sponsor or charged to the program. Management may realize a profit to the extent the fee exceeds such costs absorbed.
- Sales of oil and gas leases or properties to the program.
- Rental or sale of tangible equipment to the program.
- Charges for technical services.
- Retention of dry hole or bottom hole contributions.
- Charge for reinvestment of operating income in subsequent programs.
- Monthly supervision charge for each drilling and or producing well.
- Allocated district and overhead costs.
- Turnkey arrangements, under which all work and materials as specified for drilling a well or installing a project are furnished for a stipulated amount.

Appeal of Programs to Investors

The attraction of drilling programs for investors are several:

- (1) Shelter of income from taxation.
- (2) Leverage of investment through income tax savings.
- (3) Glamour of oil drilling; cocktail éclat.
- (4) Gambling urge; the hope of a big discovery.
- (5) "Paper profits" from exchange of program interests for stock.

The basic and most important factor to the investor is the option to treat intangible drilling costs as an expense for income tax purposes. Such costs may be used to offset income from other sources. Intangibles include practically all exploratory, drilling and completion costs except lease acquisition costs and costs of tangible equipment having salvage value. The drilling program investor is able to leverage his investment to the extent of his income tax savings. Such savings depend on (1) deductibility, ie., the percentage of capital contributions that are deductible for income tax purposes, and (2) the tax bracket of the income sheltered. Deductibility for various programs varies from 60 to 100 percent. The leverage afforded by tax savings is illustrated by Table 1 which gives

the net after-tax or "hard-dollar" cost for each dollar invested.

If the program develops oil and gas production, investors get additional tax benefits from the depletion allowance. Presuming the investor expenses intangibles on his tax report, he has little cost basis left for tax purposes in his producing properties and would therefore take percentage depletion, which is 22 percent of gross revenue, limited to 50 percent of net operating income. Equipment costs are capitalized and recovered through depreciation.

Other features of drilling programs include assessments, if any, in order to maintain position in the program; provision for liquidity of the investment, either to sell at the "cash liquidating value" over the shorter term, or to exchange interests for common stock over the longer term; provision for loans to investors using program interests as collateral; the furnishing of equipment (which must be capitalized) by the sponsor for an interest in the program or on lease to the program.

Suitability of Programs as an Investment

A potential investor should first consider whether a drilling program investment is suitable for him. Recognizing that such investments are considered risky, the potential investor should review his financial situation to determine whether adequate provision has been made for future financial needs, such as home equity and mortgage, insurance, a liquid reserve including savings, adequate securities portfolio, business requirements, miscellaneous debt, etc. Until such prior items have been funded, income should be devoted to strengthening the financial picture.

If the provisions for future financial needs are judged sufficient, then a drilling program investment may be considered if (a) the level of current income is ample enough to cover living expenses and maintain living standards, with allowance for future financial needs, taxes, and a safe margin for contingencies; (b) income will be stable for the next several years, or if it fluctuates the low year of the cycle should be the basis; and (c) income to be sheltered is in a high tax bracket; ie., over 50 percent. Ignoring these guidelines is a mistake that usually leads to financial problems.

Evaluation of Program Features and Management

Evaluation of a particular drilling program as

a potential investment involves a study of three basic areas: structure and features of the program, program management, and the results of prior programs.

Most commonly, investment counselors study and compare programs on the basis of program structure factors directly affecting potential economic return. An attempt is made to compute and compare the net effect of these factors. Of course, the actual or probable results of drilling itself would have to be added to complete a more meaningful study.

As a first step, the fraction of the investor's dollar that will be used for acquisition, exploration and development of oil and gas properties is estimated. This is often called the fraction of the dollar "that goes into the ground". It is the part of the dollar left after deducting front-end costs charged to investors. In many cases this still doesn't give a true picture of "money going into the ground". There may be "hidden costs", such as mark-ups on turnkey drilling arrangements and drilling prospects; reimbursement of organization, offering and overhead expense; fractional interests in oil and gas properties retained by or assigned to third parties; and excessive profits on equipment sold or leased to the program.

Next, sharing arrangement, deductibility and income taxes are taken into account. The object is to estimate the investor's share of each revenue dollar per dollar invested, after taxes. This part of the analysis requires some assumptions, is difficult to make and is too complex to use for all but the most sophisticated.

Miscellaneous program features include diversification, deductibility, liability, assessability, liquidity, equipment leasing, and loans to participants. These along with possible conflicts of interest should be reviewed to determine whether desired features are included.

In evaluating management the important thing is whether they have found and produced oil and gas profitably, and next whether they have conducted program operations of the type and magnitude being undertaken. The operator should not only be experienced in oil and gas operations but have a good reputation among both the oil industry and the financial community.

Evaluation of Prior Programs

Most important is the study of the results

of prior programs to determine how investors have fared in the past. The preference is to obtain a reasonable estimate of the ultimate future net revenue returned to the investor for each dollar invested; or better yet, the net revenue year by year so that the discounted present worth both before and after taxes may be computed. However, this requires an estimate of reserves and a forecast of future revenue and expense. Such estimates usually are not available to investors.

Programs can be analyzed extensively from the standpoint of potential economic return based on program structure factors as discussed above. The various economic structure factors do affect what the investor ends up with. But it's similar to analyzing a large corporation as an investment based on overhead, management and other fixed costs. Although such charges may be large, they include incentives to management which may have an important impact on earnings. The drilling program business is no different in this respect.

The performance of previous programs, particularly those of a similar size, structure, and objective, are a better guide to the probable success of a sponsor's new program than the economic structure factors. It's the operator's ability to find, develop and produce oil and gas profitably that actually pays off the investor. No one year's results, whether good or bad, may be indicative of the operator's capability; three years or more are more meaningful. Similarly, programs of recent years are more significant than older programs. Just as single past program may not represent the average of past programs, prior programs may not be a reliable guide to results for any one future program. Nevertheless, performance of previous programs is generally the best lead to forecasting results of future programs.

Sources of information on the performance of prior drilling programs are limited. Prospective investors generally have just two sources: prospectuses on new programs being offered and sales talk and literature from program representatives. The prospectus gives important factual data on prior programs. On the other hand, it is generally imprudent to take as reliable and complete the presentations of sales personnel on performance of their own programs. Those who have previously invested in drilling programs get periodic reports on those programs containing data on gross and net revenue. In some cases they may also receive estimates of reserves, future net revenue and cash liquidating value prepared by or for the sponsor.

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Determining Program Pay-Out Status

The latest drilling program prospectus contains data as of a certain date on the sponsor's prior programs. This is in table form and includes the following applicable to investors:

- (1) Cumulative capital contributions, i.e., cash subscriptions and assessments.
- (2) Cumulative expenditures, including operating as well as exploratory and drilling costs.
- (3) Cumulative receipts, i.e., gross revenue from sales of oil and gas, before deducting operating expenses.
- (4) Cumulative net cash receipts, i.e., operating income paid or credited to investors, being gross revenue from sales of oil and gas less operating expenses.
- (5) Receipts (gross revenue) last 3 months.
- (6) Net cash receipts (operating income) last 3 months.
- (7) Number of oil wells, gas wells, and dry holes completed.

Dividing cumulative net cash receipts by capital contributions gives the fraction of each dollar invested that has been recouped so far. In percent, this is the percent payout to date. Net cash receipts last 3 months gives an idea of the current rate at which the investment is being returned.

Table 2 captioned 'Prior Activities' from a recent prospectus is used as an example. From this information Table 3 is computed.

As can be seen, one can get a fair idea of the better programs compared to the poor from this type of analysis. However, serious qualifications apply. It is not reasonable to assume that operating income will continue at the current rate indefinitely. Reserves of oil and gas under a particular set of properties are depleted (exhausted) gradually by production, and the rate of production must inevitably decline until abandonment. The average life of oil and gas properties from time of discovery to abandonment is about 20 years, but varies from less than a year to perhaps 40 or so. There is the assumption, too, that the last 3 months as reported are representative. This may not be so; the yearly rate may turn out to be higher or lower for numerous reasons -- all wells may not be connected to a pipeline for production; some new wells produce at a high flush production rate when newly completed, but decline rapidly after a few months; some unusual expenditure may be included in operating expenses; etc.

The statistics on oil wells, gas wells, and

dry holes are informative but may be misleading. Some completed wells never return the cost of drilling. This can occur for example when management has erroneously over estimated the oil and gas reserves of an area. Consequently, an investor who is unsophisticated in oil and gas should place little weight on well statistics alone.

Projecting Program Payout

Information as to the status of payout and rate of income at a particular time is contained in each prospectus. Therefore, by getting such data from several prospectuses filed over successive years, a table and graph of progressive payout and income with time may be prepared. This however takes a great deal of work and know-how. The trend of payout vs. time for each program may be projected. However, several years production history is usually needed before extrapolation to complete payout can be reasonably made. If a trend is apparent, such projections are usually "in the ball park" and much more accurate than the single point analysis derived from one prospectus. Not only can years to payout (if it will occur) be determined, but the order of magnitude of the overall return to the investor can be approximated.

As mentioned before, obtaining and interpreting such data is costly and tedious. The author's firm has assembled performance data and plotted payout graphs on all programs. These are reproduced in Profile, a continuing study of drilling programs, available on a yearly subscription basis.

Suppose you are an investor in a particular drilling program and want to know just how you are doing. Generally, the investor gets periodic (monthly or quarterly) "run statements". If not, he at least gets an annual financial statement for preparing his tax report. The run statements accompany checks in payment for oil and gas produced and sold. Operating expenses and production taxes are usually deducted by the program operator, so that the check is for the net value or operating income to the investor's interest. Specific information on the run statement includes: gross value, the dollar amount of oil and gas sold during the period for account of the program; net value, the net operating income to the program after deducting operating expenses, production taxes, etc; and net value due the investor, which is program net value multiplied by the investor's decimal ownership.

Such information received monthly, quarterly, or annually can be tabulated. Gross revenue and net operating revenue can be plotted versus time. Net revenue to the investor can be accumulated and also plotted versus time. With sufficient history, the trend of this latter line may be projected to predict whether payout will be reached and when. Generally, two or three years history is needed to provide a trend which can be projected reasonably well. From such a trend, it should be evident whether the investor is apt to get his capital back, get it back and quite a bit more, or get only a fraction of it back. Of course, the investor, or his accountant, knows what his original income tax savings were, so return on after-tax dollars can also be gauged. This type analysis is something that any investor or his advisor can do if run statements and financial statements received from time to time are saved.

Program Appraisals

Another type analysis of program performance is from an actual appraisal of program properties. Investors may receive one or more of the following:

- (1) Estimate of reserves;
- (2) Estimate of future net revenue (FNR);
- (3) Estimate of present worth of FNR discounted at a specified interest rate;
- (4) Cash liquidating or redemption value (CLV);
- or an
- (5) Appraisal containing the first three.

These estimates may be prepared by the company's own staff, by others drilling or operating properties for the sponsor, or by an independent consultant. The source of the estimate is very important. Obviously, estimates prepared by capable technical personnel of proven ability who are free from pressure and prejudice are much preferred. It is hardly prudent for an investor, unknowledgeable in petroleum property evaluation, to depend to any great extent on estimates prepared by personnel directly or indirectly connected with the sponsoring company. Unbiased estimates prepared by an independent petroleum consulting firm with a good reputation are much preferred.

A word of caution: even if estimates are prepared by an outside consultant, it makes a great difference whether or not that consultant has a staff of proven ability with a reputation for reliability and integrity.

Estimates of reserves on individual properties

made by several different evaluators frequently do not closely agree, i.e., within a few per cent. Reserves are difficult to estimate with accuracy in the early history of a "tight" reservoir, and it is not unusual for estimates to be off 50 per cent or more. With time and the availability of production history, the range of estimates should narrow. After several years history, it would be expected that estimates by competent consultants would be within about 15 percent of each other, particularly if several fields were included.

The preceding paragraph applies really to proved reserves. In the case of a new discovery, where only the discovery well and perhaps an offset have been drilled, there may be little idea as to how large the field may turn out to be. If proved undeveloped and semi-proved or probable reserves are to be included in the estimates, they may be off even more.

Another word of caution: neither future net revenue nor the present worth of FNR discounted at a bank rate of interest is synonymous with fair market value or cash liquidating value. This should be obvious. No one, for example, would expect to pay 100 percent of the future projected operating income for a manufacturing plant.

There is much uncertainty on the part of investors and securities houses as to the profitability of programs to investors. R.P.I. has analyzed the past performance of most public drilling programs. As might be expected, the results of some programs are reasonably good, some mediocre, and some poor. A pre-tax return (net operating income ultimately returned to the investor divided by paid-in capital) of 1.0 to 2.0 is considered acceptable. After taking into account tax effects, the return for that range is more on the order of 1.25 to 3.5, assuming deductibility of 80 per cent or more and a tax bracket of 50 percent or higher.

Conclusions

Before investing in drilling programs, prospective investors should review their financial status, future financial needs, income level and tax bracket to determine their suitability for a high risk investment. Assuming suitability tests are passed, the prospective investor must select from the numerous programs available. Busy professional people and executives have little time to analyze such an investment themselves, and unfortunately there are as yet very few investment advisors who are really knowledgeable in this area.

Analysts usually resort to a review of manage-

ment and study of program structure factors to determine the portion of the investor's dollar that goes "into the ground". This, however, is hardly adequate. A better guide is how investors fared in prior programs. In this respect an investor would do well to insist on having the factual data reported in the prospectuses and in

audited year-end statements on the program, and if available, reserve reports by independent reliable consultants. Analysis of such data may be somewhat complex, but "why fly partly blind". Even then, a favorable return to investors on prior programs is no assurance that future programs will do well.

TABLE 1

Percent Out-of-Pocket Cost of a Drilling Program Participation
(Original Investment Less Tax Savings) / Original Investment).

Deductibility:	60%	70%	80%	90%	100%
Investor's Tax Bracket					
50%	70	65	60	55	50
60%	64	58	52	46	40
70%	58	51	44	36	30

TABLE 3

Program	Payout as of 6/30/70	Rate of Payout based on last three months	Years for Payout at Current Rate Approximate
1968-1	13%	5% per year	21 years
1968-2	14%	7% per year	14 years
1969-1	12%	12% per year	9 years
1969-2	12%	31% per year	4 years
1969-3	6%	170% per year	1 year

TABLE 2

PRIOR ACTIVITIES

Information concerning prior experience cannot be considered indicative of the results to be expected under the present drilling program. However, for purpose of presentation of these experiences, the following is provided as to the results of such investor-financed operations:

PAYOUT TABLE

As of June 30, 1970

Program	Investor Payout			Sponsor Payout			Capital Costs As % of Total Expenditures
	Investor Expenditures, Including Operating Costs	Investor Receipts(1)		Sponsor Expenditures, Including Operating Costs(2)	Sponsor Receipts(1)		
		Aggregate	Last 3 Months		Aggregate	Last 3 Months	
1968 - I	\$365,922	\$ 68,768	\$ 6,590	\$111,113	\$26,451	\$ 2,689	32.13
1968 - II	719,119	132,674	17,415	54,590	21,193	2,788	23.75
1969 - I	495,713	76,028	22,716	137,728	23,346	6,916	30.84
1969 - II	336,376	47,897	29,871	57,905	11,224	6,477	32.43
1969 - III	52,139	33,960	24,375	1,544	2,123	1,523	36.00

INVESTOR NET CASH TABLE

As of June 30, 1970

Program	Cash Subscribed and Assessed	Net Cash Receipts	Net Cash Received Last 3 Months
1968 - I	\$350,861	\$ 46,359	\$ 3,908
1968 - II	694,232	96,076	11,981
1969 - I	500,129	57,820	15,260
1969 - II	331,706	38,658	25,446
1969 - III	51,200	30,154	21,623

WELL STATISTICS

Exploratory Wells

As of June 30, 1970

Program	Gross Wells (2)				Net Wells (3)			
	Oil	Gas	Dry	% Productive	Oil	Gas	Dry	% Productive
1968 - I	2	1	5	37.5	.750	.250	1.500	40.0
1968 - II	2	0	2	50.0	1.000	0	.750	57.1
1969 - I	3	0	5	37.5	1.125	0	1.750	39.1
1969 - II	4	0	0	100.0	2.000	0	0	100.0
1969 - III	0	0	0	-	0	0	0	-

Development Wells

As of June 30, 1970

Program	Gross Wells (2)				Net Wells (3)			
	Oil	Gas	Dry	% Productive	Oil	Gas	Dry	% Productive
1968 - I	8	1	0	100.0	2.625	.500	0	100.0
1968 - II	7	0	0	100.0	4.375	0	0	100.0
1969 - I	19	0	1	95.0	5.500	0	.5	92.0
1969 - II	5	0	0	100.0	1.750	0	0	100.0
1969 - III	2	1	0	100.0	.313	.125	0	100.0

(1) Before deducting Operating Costs, which are included in the Expenditure columns.

(2) A "gross well" is one in which any leasehold interest is owned.

(3) A "net well" equals the actual leasehold interest owned in one gross well divided by one hundred.
Example: A 50% leasehold interest in a well is one gross well but .50 net well.