

Since the subject of royalties will no doubt be considered by the Public Land Review Commission, we suggest a more conventional approach to oil shale royalties until the Commission's findings can be invoked generally.

Aside from the question of whether or not a new concept of royalties should be used for oil shale, is the problem of the economic effect of the proposed royalty. The rate of return needed to attract capital for oil shale development is discussed below.

According to Fortune's survey of the 500 largest industrial corporation, the return on investment for all industry in 1966 was 12.7% after income taxes. This ranged from 10.4% for paper and wood products to 18.4% for pharmaceuticals. Mining, at 16.2%, was the second most profitable industry with petroleum at 12.3% just below the median. Statistics on before-tax income were not included in the reference but State and Federal income taxes can be expected to total about 50%, making before-tax income about twice the return after taxes.

The point of these figures is this. To compete successfully for capital funds oil shale must necessarily be as profitable as other industries. Being a new and more speculative business, and presumably an expanding one with a high proportion of profit being retained for expansion, oil shale will need a higher-than-average rate of return. A 30% before-tax profit would not be out of line.

With inter-fuel competition expected to keep prices near present levels, it will be difficult to achieve a 30% before-tax return without royalty. The proposed 50% royalty on income above the 20% level will make this impossible. The result will be no development on the public land.

The Governors of Colorado, Utah and Wyoming have cited other shortcomings of the progressive net profits royalty as applied to oil shale which we will not repeat. We concur with these and join in recommending that this royalty concept be removed from the regulation.

It is our belief that minimal royalties will be required at the present time to encourage development of the Federal lands. We suggest a royalty provision comparable to that for Utah state lands of 5% of the gross value of crude shale oil at the retort, or the well head in the case of *in situ* retorting, for the first 5 years of production with an increase of 1% per year thereafter, up to a maximum of 12½% at the option of the lessor. Other minerals could be treated in the same manner. With experience, an appropriate royalty rate can be established which necessarily may be less than 12½%.

NEEDED—LESS RESTRICTION, MORE ENCOURAGEMENT

In our comments and recommendations we have taken the viewpoint that early development of oil shale is desirable and inclusion of the public lands in such development is in the public interest. Whereas the proposed regulation emphasizes research, we place our emphasis on development under a competitive system that will encourage the needed research.

We see no need to introduce such concepts as government-controlled technology or profits participation to protect the public interest. Provisions to encourage competition in all phases of the endeavor—land acquisition, research and production—will best serve the industry and the public.

While not strictly a comment on the proposed leasing regulation, we believe it germane to point out that oil shale needs encouragement—not restriction. Even the richest of oil shales must be classified as a low-grade mineral. While the resource in Colorado, Utah and Wyoming has enormous potential its values cannot be realized without great effort by both government and industry to remove man-made obstacles and find acceptable solutions to technical and economic problems.

Senator Moss. Dr. Orlo Childs, president of the Colorado School of Mines, will be our next witness. Dr. Childs, we are very appreciative of your being with us and staying through these hearings and bringing to us the great fund of knowledge that you have, and that you bring also from the Colorado School of Mines.

Dr. Childs is a member of the Secretary's Oil Shale Advisory Board, and a former resident of my State, so I am delighted to have him here.