The escalating rates proposed reportedly are similar in their effect to the royalty rates established in recent Outer Continental Shelf Leasing practice. We will assume for purposes of these Comments that that relationship does exist. However, while such a relationship seems to assure the fairness of the proposed rates, in fact it does the opposite. Any formula of rates created for production from conventional sources necessarily leaves out of account the large risks and costs associated with the creation of new processing techniques and novel sources of petroleum. In this case, what is left out of account is that the research lessee could have expended as many as ten years of research funds and effort before it even commences production development; and when it commences production development, the Regulations apparently require that it apply only its own newly developed, unproved techniques with the accompanying risks of capital and other resources. Rates appropriate to establish production with established techniques are inappropriate in such an experimental contest.

As a result, these provisions appear inconsistent with the intention of Section 21 of the Mineral Leasing Act, under which authority these Regulations are proposed. Under Section 21 the Secretary is granted discretion to suspend all royalties for up to five years so as to encourage development of this resource. We do not believe that such an incentive is in fact required at this time. But the purpose of the Section to encourage development is inconsistent with the imposition of very large royalty burdens which discourage it.

The minimum royalty should either be eliminated or made the exclusive royalty to be paid under these initial experimental leases. If it is eliminated, and the net profit royalty system is retained, then rates under that system should be revised. All will comment on some specific revisions in the course of the following analysis of the mechanics of determination of the actual royalty.

Several ambiguities in the royalty provisions make it difficult to determine what effective royalty rate is proposed. For example, both as to the minimum royalty and the "net income" royalty, the income to which the royalty rate is to be applied is determined by the value of mineral products at "the point of shipment to market." While that standard seems at first glance a definable one, it is not.

One example should suffice to make this point clear. Crude shale oil, as it is first extracted from the rock matrix by heating, and recovered by condensation, contains substantial quantities of nitrogen and significant amounts of sulphur. In addition, it tends to have a pour point which, without additional treatment, would prevent conventional transportation of it. Accordingly, the producer has several options available to him for further treatment. He may, as this Corporation can under its patented process, reduce the pour point and so transport the raw oil to market. He may, however, prefer to remove the contained sulphur and nitrogen at the production site so as to offer for sale a high quality sweet premium crude oil. Such processing would ordinarily entail coking of the bottom portion of the oil and up-grading of the remainder by hydrogen treatment with attendant recovery of sulphur and ammonia as by-products.

These well established processing techniques, though economically viable because they substantially increase the value of the products, entail substantial capital investment and operating costs.

In short, one producer under this experimental program may have a raw crude shale oil "at the point of shipment to market" while another may, by virtue of substantial additional investments and costs, have a high quality premium product of substantially greater value. It is evident that without further refinement the Regulations would penalize the second producer severely.

We doubt that such penalties are intended, and assume therefore that a suitable method will be included for ascertaining the value of first raw crude oil (and related or other mineral products) produced by each producer so that the royalty may be payable only in respect of that value.

Another significant ambiguity arises out of the mechanism for determining the "net annual income royalty." For that purpose, the Regulations require determination of "investment," which is defined as "the original cost less depreciation of capital assets used in the aforesaid production and processing of oil shale."

It is not clear whether "investment" includes only the original "cost" of "capital assets," or even how that cost is to be determined. For example, this Corporation estimates that the installed equipment cost for a plant to process 66,000 tons per day of oil shale and produce 52,000 barrels per calendar day of