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Science & Technology Department
A.M. NATKIN – Manager
Office of Environmental Affairs

October 17, 1983

Mr. R. L. Preston
Esso Eastern
Houston, Texas

Dear Dick:

Following your recent review of the Natuna Project with the Management Committee, I promised to send you my thoughts on the additional studies which should be considered to help resolve, or at least put in proper perspective, our concerns about the environmental aspects of the project.

The following are some initial thoughts on the subject and hopefully, they may be useful in stimulating our collective thinking on the subject. We will be getting together with other interested New York groups to discuss the subject and other views and ideas will be passed along to you at that time.

I think we generally agree that we are seeking a method of disposing of the off gases in a manner which will minimize the risk of environmental damage. We must also have the data which will be convincing not only to ourselves but also to the international environmental community that the method selected is environmentally sound. Of course one may never have enough data to completely satisfy the latter especially where the science itself is controversial such as with "acid rain" and the CO_2 "Greenhouse" Effect. The alternate disposal methods you have studied do have various levels of environmental risks associated with them as well as probabilities of being challenged by the environmental community. We think some additional work is justified in order to better understand the environmental impact and potential risks.

The only completely acceptable and defensible method of disposal appears to be reinjection of the off-gases into the formation as this eliminates the discharge of both CO_2 and H_2S/SO_2 into the atmosphere or ocean. It is expensive and creates an opportunity for recycling within the producing formation. We understand you are going to reassess the cost and the possibility of reinjection into nearby formations which would preclude or minimize the recycling problem.

The work done so far indicates that the subsea disposal option is technically feasible; removes the H_2S but creates a zone around the underwater sparger which may be more toxic to marine life, and may only temporarily remove the CO_2. To resolve some of these issues, we think:

a. Bioassay data should be obtained to define the potential toxicity in the affected area due to the reaction products, i.e. complete the Phase II studies.

b. Appropriate studies should be initiated to resolve whether and to what extent shellfish would be affected in the area by higher carbonate concentrations.

c. Studies should be made of the marine biology in the affected area to go along with the above "effects" studies, i.e. to what extent is there marine life in the surrounding area which might be affected.

d. Further studies should be initiated to define the ultimate fate of the CO_2 injected at the ocean floor. These studies should not only consider the solubility of CO_2 in the ocean water and current, temperature, and upwelling effects but also the extent to which the CO_2 would be consumed by aquatic plant life or converted to inorganic carbonates. We believe we need to determine as convincingly as possible whether or not the subsea option would provide a permanent solution to all or some portion of the CO_2 discharge by retaining it in a benign way within the ocean environment. Perhaps our scientists can suggest some way of helping to insure that it does.

We can say something about this

We understand you are also reviewing the economics of installing a sulfur plant to deal with the H_2S. Unfortunately, this option does not deal with the CO_2 release.

The incineration and atmospheric release case has been fairly well defined. We feel it will be the most difficult to "sell" given the rising level of conern in North America and Europe over the "acid" rain issue and the emergence of the CO_2 "Greenhouse Effect" as a global environmental issue. We do think you should consider whether the fallout of SO_2 or "acid" rain in the surrounding ocean is going to create any more or less of an environmental impact on marine life versus the subsea disposal option. In addition, we think you should further evaluate the potential fallout on land masses recognizing that comparisons with current fallout levels in the Northeast United States are probably not valid given the rising level of concern that environmental damage is being caused at current levels and therefore must be reduced.

We recognize that there are many uncertainties over the timing and extent to which pressures will be felt to reduce these types of atmospheric emissions in Southeast Asia. Therefore, it may be desirable to screen the economics of the appropriate cases on both a retrofit basis off an "atmospheric release" base case as well as viewing them on an "initial installation" basis.

I have also attached a guideline or checklist document which was prepared to assist affiliates in making environmental impact assessments. I thought it might be of interest to you.

Sincerely,

AMN/ef
Att.
cc: Messrs. G. R. Gervasi (w/att.)
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