

country; prevention of speculation and windfall profits from commercial development of the resource; encouragement of competition in the development of oil shale and associated minerals; and assurance that Government, at appropriate levels, would share properly in any revenues that resulted. I continue to believe that these, along with the development of the oil shale for future use of the American people, are the essence of the public interest in the resource. Therefore, I was pleased to note that the Secretary of the Interior reiterated these points in his release of January 27, this year, announcing the five-point program.

The difficult and undoubtedly the most controversial part of the Secretary's program, I believe, is his third point dealing with contracts and lease arrangements for research and development and for subsequent commercial-scale development of oil shale. I want to spend my few minutes talking about this third point. This is the point that Senator Allott went so quickly to in the hearings yesterday as the most difficult part.

This was also the matter over which the Oil Shale Advisory Board split and on which its several members expressed their individual opinions in the interim report issued 2 years ago. Generally speaking, the Board members were arrayed across a spectrum from those who wished to get on rapidly with commercial development of the industry to those who wished to postpone that until much more could be learned through research and development activities rather closely supervised by the Federal Government. My own position has been characterized as being somewhere near the middle and I think this is a reasonably accurate statement.

Throughout I have thought that we should move toward an active development of the oil shale industry, with careful safeguards for conservation and other elements of the public interest, so that this great resource could make its contribution to the American economy and the well-being of all Americans. I still envisage two stages: first, a period of imaginative and intensive research and pilot plant experimentation in the mining, handling, and retorting of the shale; and second, a controlled entry into commercial scale development of the industry under private auspices. This seems to be rather closely in line with what the Secretary has now proposed in his third point.

The first research and development phase can be undertaken through contractual arrangements between the Government and private companies or it might be done by granting the private companies permits or research and development leases on small tracts of public land for limited periods of time for specific research and development work, and certain types of research might be done advantageously by the Government or jointly by Government and private companies.

There should be, of course, performance requirements and, even in the small scale research and development phase, careful protection from the conservation and local community viewpoints. The primary object this research and development phase should be to open up the possibilities for development. Underground *in situ* techniques should be given special attention because of the inherent advantages of doing the crushing and retorting underground without disturbing the topography. Use of nuclear explosions to fracture the rock under-