"The DOE Oil Shale Task Force - A Progress Report"

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INTRODUCTION

The DOE Oil Shale Task Force was formed in response to a letter from Governor Lamm to Secretary Schlesinger on May 8, 1978. The Governor asked the Department of Energy "to assist Colorado by working with us in developing additional research and analyses of current and future efforts." The Department created the Task Force, initially called the DOE/EV Modified *In-Situ* Task Force, to plan, implement, and coordinate a comprehensive, integrated research program on the environmental and health impacts of modified *in-situ* (MIS) processes. Later, the charge was broadened to cover surface processes as well as *in-situ* processes. In the context of the DOE Oil Shale R.D. and D. Management Plan[1] the Task Force plays the role of coordinating the work being done in the Data Base Development and Risk Analysis subactivities. Some of the past activities of the Task Force have been:

- The development and implementation of research programs at OXY's Logan Wash site, at Tract C-a in connection with Retort 0, and at Geokinetics.
- Public meetings in Grand Junction and Denver in April, 1980.
- An environmental symposium, "Oil Shale: The Environmental Challenges," held in Vail in August, 1980.*

Future activities now being planned include research programs at C-a on Retort 1 and at Logan Wash on Retorts 7 and 8. The second environmental symposium is being planned for August, 1981. In addition, the Task Force has served as a focal point for interaction with industry, state government, and public interest groups. These activities and some of the results of the research are discussed in the following sections.

ORGANIZATION

The Task Force was originally organized under the auspices of the Assistant Secretary for Environment of DOE. Later, the program became a joint effort between the Offices of Environment (EV) and Fossil Energy (FE) as a part of the Oil Shale RD&D Program. Recently, because of organizational changes in DOE, the programs coordinated by the Task Force involve funding from the Offices of Energy Research; Fossil Energy; and Environmental Protection, Safety, and Emergency Preparedness (EP). The present membership of the Task Force is shown in Table 1. It includes representatives from the various national laboratories and universities funded by DOE. It also includes Chips Barry from the Colorado Department of Natural Resources, and Dr. Lawrence Gratt of IWG Corp. who is the Principal Investigator on the recently initiated Risk Analysis Project.

Recently, an Executive Committee was formed to facilitate the work of the Task Force. The members of the committee are shown in Table 2, with their areas of responsibility.

In order to further interaction with outside groups, there is an Advisory Group to the Chairman which consists of individuals representing a wide range of interests. The membership of this group is shown in Table 3.

TABLE 1

The Oil Shale Task Force Members

Willard R. Chappell (Chairman)
University of Colorado, Denver

David Sheesley
Laramie Energy Tech. Center

Jon Fruchter
Battelle-Pacific Northwest Labs

Richard Pelroy
Battelle-Pacific Northwest Labs

Raymond Wildung
Battelle-Pacific Northwest Labs

Larry Gratt
IWG Corporation

Chips Barry
Colorado Dept. of Natural Resources

L.M. Holland
Los Alamos National Laboratory

Marvin Tillery
Los Alamos National Laboratory

George Voelz
Los Alamos National Laboratory

* Symposium Proceedings for 1980 available from Colorado School of Mines Press. Publication date: July 1981. ISBN 0-918062-43-8, 382p., cloth, $19.

TABLE 1 (cont'd.)

Paul Wagner
Los Alamos National Laboratory

Marvin Dickerson
Lawrence Livermore National Laboratory

Richard Ragaini
Lawrence Livermore National Laboratory

Hector Timourian
Lawrence Livermore National Laboratory

Ed Redente
Colorado State University

DOE Project Managers

Ralph Franklin
Ecological Research and R&D Coordinator

Joseph Blair
Human Health Assessments

Gerald Goldstein
Pollutant Characterization and Safety Research

Charles Grua
Environmental Control Technology

David Smith
Health Effects Research

DOE Liasons

Arnold Harak
Laramie Energy Technology Center

Arthur Hartstein
Office of Fossil Energy

Jack O'Brien
Denver Project Office

Professional Staff - University of Colorado, Denver

Kathy Petersen
Associate Chairwoman

John Lanning
Asst. Professor, Dept. of Chemistry

Eleanor Werbe
Staff Scientist

Dona Janousek
Staff Assistant

TABLE 2

Executive Committee
The Oil Shale Task Force

Marv Dickerson; Air
Lawrence Livermore National Laboratory

Paul Wagner; Water, Retort Abandonment
Los Alamos National Laboratory

Larry Gratt; Risk
IWG Corporation

Marty Holland; Health
Los Alamos National Laboratory

Edward Redente; Reclamation
Colorado State University

David Sheesley; Control Technology
Laramie Energy Technology Center

TABLE 2 (cont'd.)

Ray Wildung; Solid Waste
Battelle-Pacific Northwest Labs

TABLE 3

Advisory Group
The Oil Shale Task Force

Bob Arnott
Colorado Dept. of Health

Dr. R. Merril Coomes
TOSCO Corporation

Carol Edmonds
Grand Junction, Colorado

Dr. Bobby Gunther
U.S. Public Health Services

Glen Miller
U.S. Geological Survey

Rafael Moure
Oil, Chemical and Atomic Workers International Union

Daniel Luecke
Environmental Defense Fund

Ed Piper
Energy Development Consultants, Inc.

Dr. Martin Robbins
Colorado Energy Research Institute

William Davis
Occidental Research Corporation

Anne Vickery
Colorado Mountain Club

RESEARCH ACTIVITIES

The research that is coordinated through the Task Force covers a wide variety of areas:

- Characterization of Products and Effluents
- Health and Environmental Effects
- Environmental Transport and Fate
- Strategies for Mitigating Impacts

In the past two years three major programs have been conducted at Logan Wash, Tract C-a, and Geokinetics. The work at Logan Wash took place during the Retort 6 burn from March to July, 1979. The program at Tract C-a (Retort 0) was conducted in the Fall of 1980, and the work at Geokinetics was started in December, 1980.

Logan Wash

A major sampling effort at Retort 6 was conducted during the week of March 5, 1979 by personnel from Battelle-Pacific Northwest Laboratory (PNL), the DOE Environmental Measurements Laboratory (EML), and Los Alamos National Laboratory

(LANL). During this week, a large number of samples were obtained at various points at the retort (Figure 1). During this period, OXY personnel were trained in various collection techniques so they could continue the sampling during the remainder of the burn on a periodic basis. Many samples were analyzed on site for chemically or physically unstable species. In addition, considerable attention was paid to sample preservation for later analysis. All sampling was coordinated by Jon Fruchter (PNL), who later distributed samples to various investigators for analysis, bioassays, and other research. The types of samples collected are listed in Table 4.

TABLE 4

Sample Collection - Logan Wash

Crude Oil	Ground Water
Light Oil	Water From Old Retorts
Product Water	Retort Gas
Boiler Blowdown	Mine Air
Makeup Water	Mine Dust
Mine Sump Water	Spent Shale Core

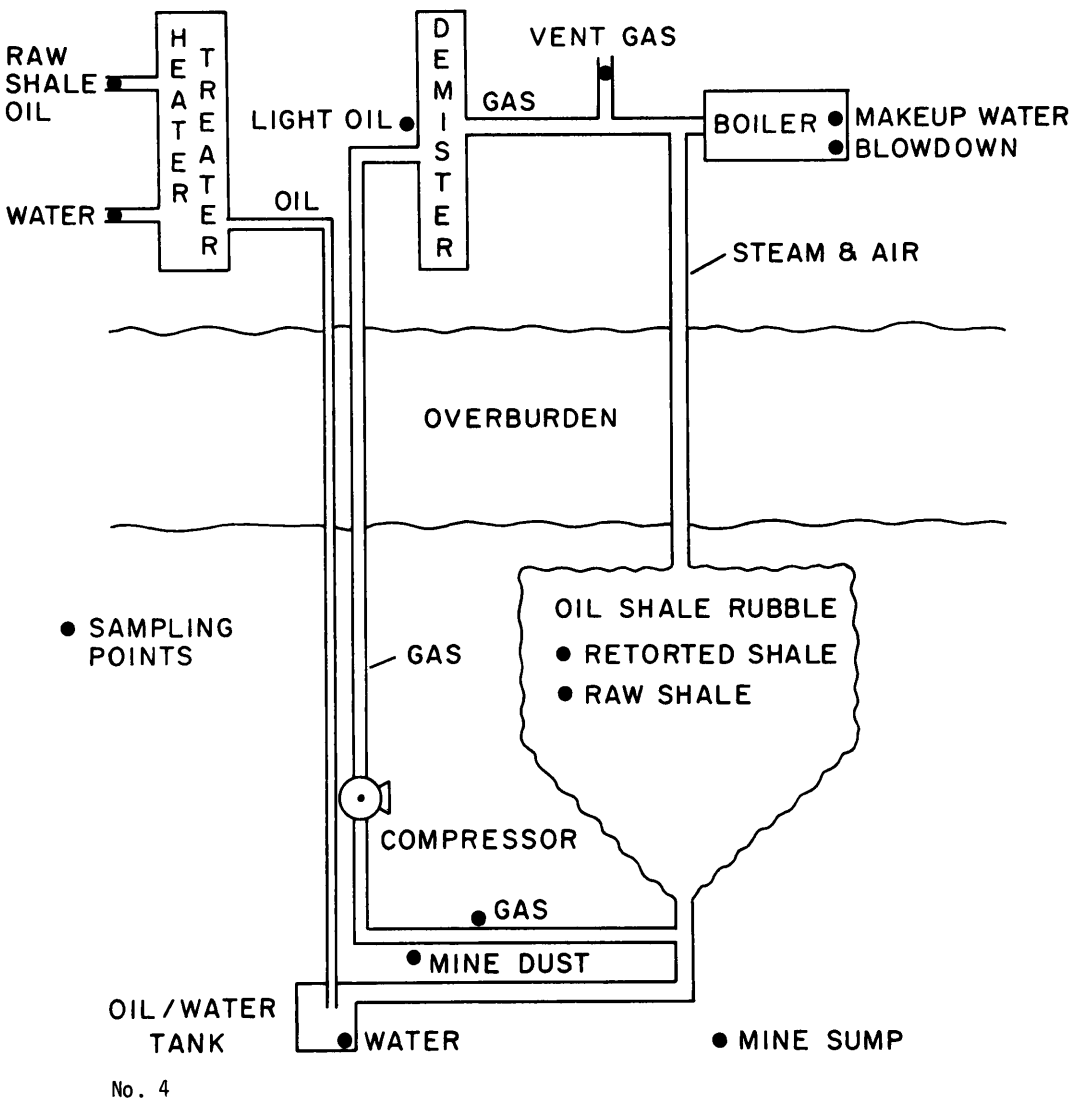

FIGURE 1: Simplified flow diagram and sampling points for Oxy Retort 6 (not to scale).

Some of the results of the work on these samples were reported in a progress report which has been published as a DOE document.[2] This report describes research in the areas of characterization, leaching, and health. Some of the principal conclusions were:

- The crude oil tends to have lower concentrations of As and Se and higher concentrations of V, Co, Ni, and Zn than oils from surface retorts.
- Hg was above detection limits in all samples of offgas. Very little As was detected in the offgas--most of it was in the form of arsenic trioxide.
- Although the Retort 3E shale was exposed to a high retorting temperature, a water soluble fraction exists containing significant levels of Al, As, B, F, Mo, Se and V. The water soluble fraction is rapidly leached out.
- The samples of spent shale from Retort 3E can be divided into zones. This implies that retorting conditions (e.g., temperature) and/or the character of the initial raw shale may play a significant role in determining the character of the leachate.
- The OXY crude oil and several associated by-products were found to contain a very low order mutagenic activity or none at all. Skin painting tests on animals reveal a lower carcinogenic potency than some surface-retorted crudes.[3]

Several studies are still in progress, including mineralogical assays of both raw and spent shale cores. The results from these studies will be reported in the future.

Retort 0

In the fall of 1980, an extensive sampling program was carried out at Tract C-a in conjunction with the Retort 0 burn. Pre- and post-ignition sampling of the mine environment was conducted. Samples were taken of oil, retort waters, offgases, and mine water. Extensive sulfur speciation was performed on offgas samples. Several sulfur species were identified in the offgas, including CH_2S, COS, CS_2, and CH_3SH.

A progress report on the results to date will be available shortly. It will be some time, of course, before da a from animal experiments will be available.

Geokinetics

In December, 1980, a program was initiated at Geokinetics in conjunction with the Retort 24 burn. Industrial hygiene samples were collected from around the retort. In March, 1981, a medical program was initiated by LANL and the University of Utah. Medical examinations were performed on most of the workers and some members of their families. The results of this study will be reported in future reports. To date, the industrial hygiene samples do not show any significant elevation of dusts and gases.

Future Research Activities

The Task Force is presently preparing for research on Retort 1 at Tract C-a. In addition, research plans are being developed for Retorts 7 and 8 at Logan Wash.

PUBLIC MEETINGS AND SYMPOSIA

In April 1980, the Task Force organized public meetings in Grand Junction and Denver. The purpose was to introduce the public to the research program. Several investigators prepared displays and gave talks on their research.

In August, 1980, a symposium, "Oil Shale: The Environmental Challenges", was held in Vail. The format involved presentations on the research results in various areas followed by panel discussions. The keynote speaker was Fraser Cook from Scotland who was manager of British Petroleum's oil shale facilities in the last years of that industry.

This year another symposium will be held in Vail on August 10 - 13.

Those interested in more information on the Task Force, copies of Task Force reports, or information about the Vail symposium should contact:

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Oil Shale Task Force
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BIBLIOGRAPHY

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2. Environmental Research on a Modified *In-Situ* Oil Shale Process, DOE/EV-0078, May, 1980.
3. The Los Alamos Integrated Oil Shale Health & Environmental Program: A Status Report, Eds. L.M. Holland, C.G. Stafford, LA-8665-SR, LANL.