

MONITORING FRONTAL MOVEMENTS IN THERMAL RECOVERY

IMPLEMENTING AGREEMENT IV
UNDER THE
MEMORANDUM OF UNDERSTANDING

FOR COOPERATION IN THE RESEARCH AND DEVELOPMENT
OF TAR SANDS (OIL SANDS) AND HEAVY OIL

BETWEEN

The Alberta Oil Sands Technology
Research Authority of the Province of Alberta

The Department of Energy, Mines and
Resources of Canada

The Department of Energy and Mines of
the Province of Saskatchewan
for Canada

AND

The Department of Energy of the United States
for the United States

Hereinafter called the "Participants"

Having agreed in the Memorandum of Understanding of Cooperation in the Research and Development of Tar Sands (Oil Sands) and Heavy Oil dated June 4, 1979, and extended to December 4, 1989 (hereinafter the "MOU") and the Amendments concerning Intellectual Property and Exchanges of Staff dated December 4, 1979, (hereinafter the "Amendments") to undertake specific projects in pursuit of the MOU's objectives, the Participants hereby agree to the terms and conditions of the project described in this Implementing Agreement.

ARTICLE 1 - OBJECTIVE

The primary objective of the Implementing Agreement is to conduct coordinated programs of laboratory and field experimentation to evaluate selected

geophysical techniques for determining spatial shape and location of thermal fronts in steamflooding, in-situ combustion and in-situ steam processes enhanced by various additives (solvents, surfactants, emulsifiers, gases, etc.) for recovery of oil from Canadian and U.S. tar (oil) sands and heavy oils. The experiments conducted in the U.S. and Canada shall be coordinated so that results from these tests will be complimentary, beneficial and available to all parties.

ARTICLE 2- INCORPORATION BY REFERENCE

Articles 6, 7, and 8 of the MOU and Article 4 of the Amendments are hereby incorporated by reference.

ARTICLE 3 - MANAGEMENT

Policy direction and general project management shall be provided by the Coordinating Committee established in Article 4 of the MOU. Each Country may identify one of its Coordinating Committee members as its representative for the Tasks described in Article 4 of this Implementing Agreement. The designated representatives shall be the liaison between the Project Managers and the Coordinating Committee and in that capacity shall report to the Coordinating Committee on the progress of the Tasks.

Each Country shall identify an individual (one from Canada and one from the United States) to serve as Project Manager. The Project Managers shall jointly

arrange for and shall be responsible for performing the Tasks as described in this Implementing Agreement.

ARTICLE 4 - DUTIES OF PARTICIPANTS

The Participants shall cooperate by collecting and exchanging information derived from the laboratory experiments and field tests. Research shall be conducted in U.S. and Canadian laboratories and field sites in the geophysical areas to be jointly identified by Project Managers and approved by the Coordinating Committee.

Task 1. The U.S. Participants and the Canadian Participants shall each continuously review results of recent research in their respective countries on monitoring frontal movements in thermal recovery operations and exchange such information.

Task 2. The U.S. Participant and the Canadian Participants shall cooperatively prepare the research plan outlined in Task 3 and submit it to the Coordinating Committee for its approval, comment, and such modification as the Committee deems appropriate.

Task 3. Based on the Task 1 reviews, before and after signing of this Implementing Agreement, the Participants shall jointly select specific laboratory experiments and field tests and shall prescribe the conditions and schedule for implementation.

- Task 4. The Participants shall jointly specify, and the Canadian Participants shall arrange for the Gregoire Lake In-Situ Steam Pilot (GLISP) project to conduct the agreed upon laboratory and field experiments within the budget limitations of Article 5 of this Implementing Agreement.
- Task 5. The Participants shall jointly specify, and the U.S. Participants shall conduct sonic and electromagnetic remote probing for the detection of thermal fronts through its Lawrence Livermore National Laboratory and U.S. Army Corp of Engineers' Waterways Experimental Station and within the budget limitations of Article 5 of this Implementing Agreement.
- Task 6. Each Participant shall periodically evaluate results of the experiments it is conducting and with the concurrence of the Coordinating Committee shall modify subsequent experiments so as to incorporate the results of completed experiments.
- Task 7. The U.S. and Canadian Participants shall each prepare appropriate interim, annual and final technical reports and budget reports at their own expense. All such reports shall be exchanged between the participants.
- Task 8. Upon completion of all major Tasks, a joint U.S. - Canada team shall analyze the results achieved with emphasis on conclusions and recommendations.

ARTICLE 5 - COSTS

Except as otherwise provided herein, all costs attributable to this Implementing Agreement, including but not limited to research, reports, travel, salaries, and associated expenses, shall be borne by the Participants incurring the expenses. The cost of the Canadian laboratory experiments and field tests shall approximate U.S. \$700,000 and the cost of the U.S. laboratory experiments and field tests shall approximate U.S. \$700,000 over the course of this Implementing Agreement; and the costs of complementary programs contributing relevant data shall also be in approximate balance.

ARTICLE 6 - INFORMATION AND PATENTS

1. The Participants shall exchange pre-existing information necessary to carry out this Implementing Agreement.
2. All information arising from this Implementing Agreement shall be promptly exchanged among the Participants.
3. The application or use of any information exchanged under or arising from this Implementing Agreement shall be the responsibility of the Participant receiving it, and the sending Participant does not warrant the suitability of such information for any particular use or application.
4. The information exchanged under and arising from this Implementing Agreement may be given wide distribution, subject to paragraphs 6 and 7

below. Such information may be made available to the public through customary channels and in accordance with the normal procedures of such Participant.

5. Copyrights of any Participant or of cooperating organizations or persons shall be accorded treatment consistent with internationally recognized standards of protection.
6. It shall be the responsibility of the Participant supplying proprietary information to identify the information as such and to ensure that it is appropriately marked in accordance with Article 1 of the Amendments to the MOU.
7. For purposes of this Implementing Agreement, proprietary information shall mean pre-existing information of a confidential nature such as trade secrets and know-how (for example, computer programs, design procedures and techniques, manufacturing methods, processes, or treatments) which is appropriately marked, provided such information:
 - A. Is not generally known or publicly available from other sources;
 - B. Has not previously been made available by the owners to others without obligation concerning its confidentiality; and
 - C. Is not already in the possession of the recipient without obligation concerning its confidentiality.

8. Inventions made or conceived in the course of or under this Implementing Agreement (hereinafter referred to as "arising inventions") shall be identified and reported promptly by the inventing Participant to all Participants. Information regarding inventions on which patent protection is to be obtained shall not be published or publicly disclosed by the Participants until a patent application has been filed in either country of the Participants; provided, however, that this restriction on publication or disclosure shall not extend beyond six months from the date of reporting the invention. It shall be the responsibility of the Participant reporting the invention to appropriately mark reports which disclose inventions that have not been appropriately protected by the filing of a patent application.
9. Arising inventions shall be owned by the inventing Participant in all countries. The inventing Participant shall grant licenses to the other Participant, and its nationals designated by it, to the arising inventions of the inventing Participant on the following basis:
 - A. A nonexclusive, royalty-free, irrevocable license in the country of the other Participant and in all third countries; and
 - B. A nonexclusive, irrevocable license in the country of the inventing Participant on a nondiscriminatory basis, including terms and conditions no less favorable than those provided to the nationals of the inventing Participant.

For the purpose of this paragraph, the three Canadian Participants shall be considered as a single Participant representing the Country of Canada.

10. Each Participant shall assume the responsibility to pay awards or compensation required to be paid to its own nationals according to its own laws:

ARTICLE 7 - ENTRY INTO FORCE AND DURATION

This implementing Agreement shall enter into force upon signature and shall remain in force until December 31, 1987. It may be amended or extended by written agreement of the Participants. Any Participant may withdraw from this Implementing Agreement at any time, upon six month's advance written notification. All joint efforts and experiments begun but not completed at the expiration or termination of this Implementing Agreement may be continued until their completion under the terms of this Implementing Agreement.

Done this twenty-eight day of February, 1986

at Washington, D.C.; Ottawa, Ontario; Edmonton, Alberta; and Regina, Saskatchewan
in respective sequence.

FOR THE UNITED STATES OF AMERICA:

DEPARTMENT OF ENERGY OF
UNITED STATES OF AMERICA

Signature: Keith N. Frye

Name: Keith N. Frye
Deputy Assistant Secretary
 Title: for Oil, Gas, Shale and
Coal Liquids

FOR CANADA:

DEPARTMENT OF ENERGY, MINES AND
RESOURCES OF CANADA

Signature: Kenneth Whitham

Name: Kenneth Whitham
 Title: ADM, Research & Technology

ALBERTA OIL SANDS TECHNOLOGY AND
RESEARCH AUTHORITY

Signature: R. S. Humphreys
M. A. Humphreys

Name: _____

Title: _____

DEPARTMENT OF ENERGY AND MINES OF
THE PROVINCE OF SASKATCHEWAN

Signature: Bob Reid

Name: Bob Reid

Title: Deputy Minister