OIL SHALE UPDATE

National Oil Shale Association

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July 2014

Enefit project moves toward commercialization

Development of Enefit American Oil's (Enefit) private property "Enefit South" project and its BLM RD&D lease is progressing, as is engineering and test work to optimize the retorting technology and overall project to the specific Utah shale and environmental conditions.

On the permitting front, Enefit has completed environmental, archeological, paleontological and socioeconomic baseline data collection, which is needed to further advance the permitting process. While Enefit's project will be located on private land, the company requires a right-of-way from the BLM for a 19-mile utility corridor across federal land. Enefit submitted the right-of-way application at the end of 2012, the BLM conducted scoping meetings in mid-July of 2013, Enefit has submitted a detailed Plan of Development, and the BLM is currently evaluating that information and preparing a draft EIS.

A comprehensive project-wide prefeasibility study covering the surface mining, retorting, upgrading, utilities and reclamation operations was completed by Fluor in 2013. The study confirmed the overall project design and met anticipated economic thresholds. Multiple bench and pilot retorting campaigns, as well as related process concept tests have been carried out. Through 2014, EAO will carry out a new class 4 (-20%+30% cost accuracy) project prefeasibility study with its technology partner Enefit Outotec Technology and Fluor.

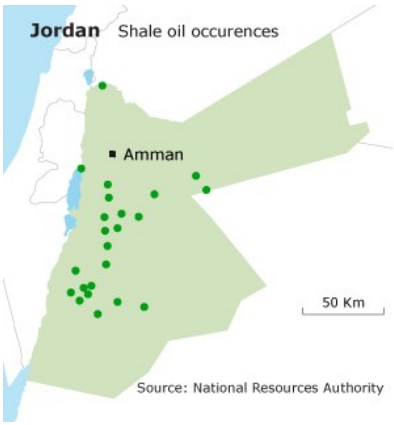
Finally, Enefit has been closely involved with a variety of government agencies and others to create a conservation plan for two species of penstemon, a flowering plant proposed as threatened or endangered. The plant lives on or near oil shale outcrops in and around the Uintah Basin, and listing could significantly impact the development of oil shale and other energy and mineral resources in the Basin and beyond. Enefit has surveyed to determine the location and number of plants on its property and is working with several groups to craft a feasible and effective plan for conservation zones in an effort to prevent the plant from being placed on the endangered species list.

Jordanian Oil Shale Symposium 2014

Jordan hosted an international oil shale symposium in April 2014 that gathered leading experts from around the world to discuss oil shale development in Jordan, and projects around the globe.

Jordan's large oil shale resource, the world's fourth largest after the United States, China and Russia, with an estimated 100 billion barrels of shale oil; and its welcoming government, has garnered interest from international shale development interests.

Corporations currently involved include Karak International Oil [KIO], a subsidiary of Jordan Energy and Mines Limited [JEML] (UK); Jordan Oil Shale Company [JOSCO], a subsidiary of Royal Dutch Shell (UK); Eesti Energia (Estonia); TOTAL (France); and Petrobras (Brazil).



Inside this issue:

Special points of interest:

Oil Shale Symposium and NOSA Annual Meeting to be held in October at Colorado School of Mines

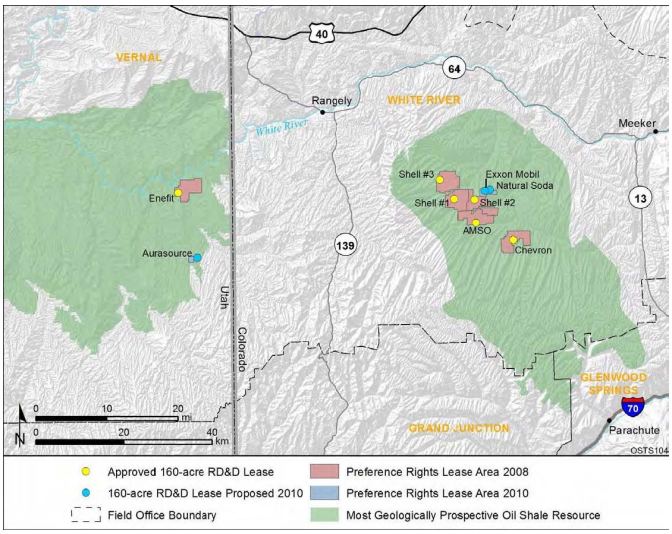
Updated Educational Video

OIL SHALE—A VITAL DOMESTIC ENERGY SOURCE

available via YouTube on NOSA Web Site

www.oilshaleassoc.org

R,D&D oil shale lease activities



Shell R,D&D Lease July 2013

STI Paraho™ Pilot Plant Rifle, CO

Paraho II ™ demo plant in Australia

(2013 Photos courtesy of QER)

1st round RD&D leases

BLM issued five first round 160-acre R,D&D leases in 2007 after the lessees had completed Development Plans and BLM had conducted Environmental Assessments for each lease (see BLM map above). Leases were awarded to Shell, AMSO, Chevron and OSEC (now Enefit).

Leases are for 10-years with an option to extend for an additional 5-years. Lessees may expand the leases to 5,120 acres if BLM's technical, economic and environmental requirements are met. Chevron discontinued operations on its RD&D lease.

American Shale Oil (AMSO)

American Shale Oil (AMSO), a partnership of Total and Genie Energy, is preparing a pilot demonstration on its RD&D leasehold in Western Colorado. The pilot test facility is substantially complete and has conducted preliminary commissioning operations which uncovered reliability issues with the in-situ heater. As early as 2015 and before proceeding to full pilot test operations, AMSO will test and qualify an alternative heating system for deployment in the pilot demonstration.

Shell Mahogany Project

As most are aware, Shell has extricated itself from development of its three R,D&D leases, and from oil shale development in Colorado.

Reclamation activities are underway for the areas disturbed by it initial R,D&D activities on one of the three leases.

Reclamation is essentially complete on the freeze wall demonstration area where surface facilities have been removed.

Shell's estimate of reduced water needs for its insitu technology were presented at the last Oil Shale Symposium.

Enefit American Oil

(See Enefit update on page 1)

2nd round RD&D leases

In 2012 Colorado BLM signed two more RD&D leases to encourage industry to develop and test technologies aimed at developing oil shale resources on a commercial scale. The leases went into effect on December 1, 2012. The approved leases were awarded to ExxonMobil Exploration Company and Natural Soda Holdings, Inc., each of whom submitted proposals for the in-situ development of oil shale, on adjacent 160-acre parcels in Rio Blanco County, Colorado.

2nd Round RD&D leases may be expanded to 640 acres if BLM requirements are met. The term of each lease is 10-years.

An Environmental Assessment covering both companies activities was completed by BLM, and BLM made a Finding of No Significant Impact. Operation Plans have been completed by both firms.

Both Natural Soda and ExxonMobil are continuing their geotechnical and other studies of the sites and preparing detailed plans for the research, development and demonstration work to follow.

ExxonMobil plans to first conduct an appraisal phase involving drilling one or more test wells to determine oil shale resources within the lease, along with groundwater monitoring wells to test water quality before work continues.

The BLM has not moved in a direction of offering another round of R,D&D leases.

There is no activity on the AuraSource lease in Utah.

STI Advances Paraho II™ and Paraho® Technologies

Shale Tech International Services (STIS) is an independent technology developer with facilities based in Rifle, Colorado. The company was founded in 2006 and owns rights to the original Paraho®Technology. STI is focused on advancing and licensing the original Paraho® Technology and recent advancements to the technology incorporated in the Paraho II™ Technology.

The Paraho® Technology consists of a proprietary surface retort design that lies at the heart of a multi-step process designed to recover liquid and gaseous hydrocarbons from oil shale rock. The process has been successfully demonstrated on a wide range of oil shale types and has produced well over 100,000 barrels of high quality, low-sulfur, petroleum feed stock.

The original Paraho® Technology was developed by some of the world's largest integrated oil, mining and engineering companies with support from the U.S. Federal Government at a cost of over $200 million. The result was a proven technology that produced high quality transportation fuels tested and certified by the U.S. Navy. Recent advancements to the original technology have led to the Paraho II™ Technology.

The Paraho® and Paraho II™ processes incorporate a gravity fed, vertical shaft retort. Crushed, sized ore moves through the retort in plug fashion by force of gravity. The ore is progressively heated as it descends through the retort until it reaches retorting temperatures, at which time the ore releases product oil and gas along with water.

The shale oil product leaving the process can be upgraded into a light, sweet, refinery-ready synthetic crude oil. For more information go to:

http://shaletechinternational.com/

Industry reduces water requirements in new study released by NOSA

The use of water for an oil shale industry is a subject that has received considerable attention throughout the years. The subject is especially important in this era of growing demands for and the potential for reduced supplies of water from the Colorado River and its tributaries. An oil shale industry has been portrayed as a potential large user of water in numerous studies over the past years (e.g. GAO study). Some of the studies prepared by organizations outside the industry have grossly overstated the amount of water needed by a mature oil shale industry in Colorado and Utah. Past water needs estimates by industry have been in the range of 3 barrels of water per barrel of shale oil (Bw/Bo), and were conservatively high based upon outdated assumptions and old technologies. As shown below the current estimate is about 1 Bw/Bo.

Estimates of future oil production from oil shale projects have been reduced from 1.5 million to 500,000 barrels per day for this new study in light of a more pragmatic view of what an industry might look like in 50-years for so. Estimating future levels of production is speculative at best, but decision makers need some idea of the potential for an oil shale industry, should it incrementally develop over the next decades.

For this study the split of assumed shale oil production levels is 45% insitu, 40% exsitu, and 15% modified insitu in the region. The unique water requirements for each technological approach were factored into the table below.

Technology	Shale Oil B/D	Bw/Bo	Acre-Ft/Yr
Insitu	225,000	0.3 – 1.0	3,000 - 11,000
Exsitu	200,000	1.4 – 1.6	13,000 – 15,000
Mod Insitu	75,000	0.0 – 0.9	0 – 3,000
Total	500,000	0.7 – 1.2	16,000 – 29,000

29,000 acre feet per year is less than 1% of the water in the Colorado River. Its use for oil shale projects will result in positive economic benefits, greater economic benefits on a per barrel basis, in fact, than most other users of water.

In summary, water stewardship is one more example of how the emerging oil shale industry is striving to develop oil shale in economically sound and environmentally and socially responsible ways.

Note: Bw/Bo is the barrels of water required from external sources per barrel of shale oil produced.

Mining begins at Red Leaf Resources Utah project

Mining activity began in June with capsule construction slated to begin in late July. This first capsule will be approximately ¾ the size of a full commercial capsule and will produce at least 300,000 barrels of oil. It will serve as a commercial demonstration project, proving out the scalability of engineering, the environmental benefits and the true cost of production which is currently estimated to be very economic. The goal of the project is to continuously produce up to the equivalent of 10,000 barrels per day of shale oil in 2015.

Permits were obtained that assure the public that oil shale can be safely developed in the United States.

In the process, oil shale is mined and placed in an excavation that has been lined with an impermeable liner. Expendable heating pipes are placed throughout the capsule. A liquid drain system for produced oil is included in the bottom of the capsule. Perforated pipes at the top of the capsule collect hydrocarbon vapors. Clean natural gas burners exhaust hot gas that is circulated through the capsule. A gas and water impermeable liner surround the entire capsule.

Red Leaf believes Oil shale can be a sustainable industry providing a secure source of energy for the future from a domestic resource.

Red Leaf Project aerial view (Courtesy of Red Leaf)

Plant species protection debate rages

The Federal governments proposals to protect two flowers, the Graham's and White River beardtongue, have resulted in concern on the part of industry and affected states and communities about the negative affects on energy development if the proposals are fully implemented.

The U.S. Fish and Wildlife Service released a draft economic analysis on the impacts of designating critical habitat for the Graham's beardtongue and White River beardtongue, which are only found in the oil shale formation in Utah and Colorado.

The study notes that a "substantial" portion of the proposed critical habitat for the plant falls within federal lease areas in Utah and Colorado for oil shale and tar sands.

Kathleen Sgamma, vice president of governmental affairs for the Western Energy Alliance, is reported to have said "the federal government is proposing an action that is unwarranted using an analysis that greatly downplays the economic ramifications and has wrongly taken an overall species of plant that widely occurs throughout the area and segregated it into two subgroups to make a case for federal protections.

Enefit and others have offered comments to the Agency recommending species protection under a Penstemon Conservation Agreement.

Penstemon flower growing on an oil shale outcrop

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Roger Day, Chairman

Drilling rig in Israel circa 2014

NOSA Celebrates Six Years of Service

- The mission of the National Oil Shale Association (NOSA) is to educate the public about oil shale.
- NOSA is a not-for-profit 501(c)(6) corporation.
- The Association was formed in the 1970's when it actively engaged in oil shale education.
- NOSA was reinstated in 2007 in response to a renewed interest in oil shale.
- There are two classes of membership: Sustaining and Associate Members. Sustaining Members are profit making firms and Associate Members are individuals and not-for-profit groups.
- NOSA's Web Site at www.oilshaleassoc.org provides copies of the bylaws and a membership application.

NOSA UPDATED EDUCATIONAL BROCHURE

OIL SHALE—AMERICA'S UNTAPPED ENERGY SOURCE

On Web Site—Hard Copies available—email request to NOSA

34th Annual Oil Shale Symposium to be held in Golden, CO

October 13-17, 2014 - For details log on to

http://csmspace.com/events/oilshale2014/

The information presented in this document has been prepared by the staff of NOSA and is intended to give a snapshot of the status of oil shale technology and projects, and is not endorsed by the principals of those technologies or projects, or the members of NOSA. NOSA has drawn upon publically available information.

Other oil shale activities

Idaho National Laboratory

INL continued its work on oil shale and other energy resources in the Western U.S. For information on INL oil shale studies go to www.inl.gov .

Projects Outside U.S.

Estonia, China and Brazil continued to produce shale oil in commercial quantities. Estonia is expanding its production. Jordan has become very active in the oil shale arena. Mongolia has become an active newcomer to oil shale.

Jordan

Eesti Energia has two parallel development projects in Jordan: a shale oil plant with the production of 38,000 barrels/day and a 470 MW capacity oil shale fired power plant. The company operates in Jordan via its subsidiaries Attarat Power Company and Jordan Oil Shale Energy Company. A concession agreement grants them the right to utilize part of the Attarat Um Ghudran oil shale deposit in Jordan for a period of 40 years. The $2.4 billion power project has received final approvals to proceed.

The Jordanian Senate endorsed a deal with the Saudi Arabian Oil Shale Company to use Russian technology to produce about 2,560 barrels per day of shale oil over a span of 4-8 years at an estimated cost of up to $1.93 billion.

Israel

The government of Israel has awarded a subsidiary of Genie Oil and Gas (GOGAS) an exclusive petroleum exploration license covering 396.5 square kilometers in the Southern portion of the Golan Heights. Genie is conducting an exploration program and is planning a 2 b/d insitu pilot test in the license area aimed at recovering 500 barrels of shale oil and providing scale-up information.

China

There is little information available about the start-up of the large scale ATP retort in China. Construction has been completed for some time, but quality control issues have been reported. The ATP retort system was earlier demonstrated at a smaller scale at a site in Australia.

Australia

QERL reports that it will continue to work towards securing investment for its next stage - a commercial facility producing around 8,000 barrels of ultra-low sulphur diesel per day.

Mongolia

Several companies are investigating the potential of developing Mongolia's oil shale deposits. Genie Oil Shale Mongolia plans to work over a five-year period to determine whether the country's oil shale deposits are commercially viable.

Brazil

Irati Energy LLC is planning to build a new oil shale plant in Brazil using a modification of the Petrosix design with a capacity of 8,000 b/d.

Morocco

Enefit and its partners are continuing studies of the oil shale deposits in the Tarfaya area. Others are investigating a project at Timhadit.

For more information see www.oilshaleassoc.org and individ-

NOSA Board of Directors

Roger Day was re-elected Chairman of the National Oil Shale Association (NOSA) for 2014 at its Board of Directors meeting in December 2013. Roger is Vice President of American Shale Oil, LLC (AMSO).

The 2014 NOSA Board of Directors: Roger Day, Pierre Allix, Rikki Hrenko, Kevin Biehle, and Tom Fowler representing AMSO, Total, Enefit American Oil, Shale Technology International, and Shell respectively.

Roger, Pierre and Tracy will have served their two year terms ending Dec 31, 2014. Nominations for three directors are being sought from Sustaining Members for 2 year terms that begin Jan 1, 2015. Elections will be held at the Annual Meeting of Members.

MEETING ANNOUNCEMENT

NOSA will hold its 2014 Annual Meeting of Members at 7:00 AM on October 14th in conjunction with the 34th Annual Oil Shale Symposium in Golden, Colorado.

The public is invited to attend.