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The Tight Oil Initiative
at the Onnagawa Formation in Akita Prefecture

(Commencement of demonstration experiment at Fukomezawa oil field,
and start of commercial production of shale oil at Ayukawa oil and gas field)

Japan Petroleum Exploration Co., Ltd. (“JAPEX”) has been preparing for Japan’s first demonstration experiment of tight formation multistage fracturing at the Onnagawa formation (shale oil formation), which is distributed in Fukomezawa oil field (one of the Sarukawa oil fields in Oga City, Akita Prefecture, Japan). JAPEX is pleased to announce on its start of horizontal well drilling in this late May as a part of the said experiment.

JAPEX is also pleased to announce that it has started full-scale commercial production of shale oil this April at the Onnagawa tight formation in Ayukawa oil and gas field (Yurihonjo City, Akita Prefecture), where it had been conducting demonstration experiment (acid treatment tests) and several flow tests since 2012 by utilizing an existing well of Kurosawa AK-1.

1. Commencement of demonstration experiment at the Onnagawa tight oil formation of Fukomezawa oil field

JAPEX has been preparing for the demonstration experiment of multistage fracturing, which is widely applied for shale gas / oil formation development in North America, to perform it at the Onnagawa tight formation in its Fukomezawa oil field. In late May this year, JAPEX will start a part of the operations (horizontal well drilling) of the demonstration experiment.

In preparing for the demonstration experiment, JAPEX particularly strived to take all possible environmental measures. For this purpose, JAPEX internally established the Investigative Commission on Environmental Measures at Fukomezawa by inviting third-party experts and has been seeking to ensure and improve the measures’ reliability and transparency. It was resultantly concluded that every possible environmental risk likely to be caused by the multistage fracturing would be kept at an extremely low level if the series of environmental measures planned by JAPEX was assuredly implemented.

Meanwhile, as JAPEX explained the operation plan to the Ministry of Economy, Trade and Industry (METI) as the regulatory agency, JAPEX had its environmental measures

intensively reviewed. It resultantly has received an approval from METI Tohoku in accordance with the Mining Act of Japan. JAPEX has also been given several opportunities to explain on the experiment and the environmental measures to residents of relevant areas and local municipalities, and has received their understanding and cooperation.

Specific contents of operations for the demonstration experiment at Fukumezawa oil field are as follows.

First, a pilot well for acquiring additional data on geological conditions and oil formation will be drilled. Then, a horizontal well, as a side-track well, will be drilled from the pilot well hole. The planned depth of the horizontal well is 2,300 m (with vertical depth of 1,330 m), and the length of the well's horizontal section is planned at 650 m. These drilling operations are scheduled for completion by late June this year.

Next, data obtained from the pilot and horizontal wells will be analyzed to suggest a detailed plan of the fracturing operations. Based on this plan, Japan's first multistage fracturing operations in a tight formation will be conducted at the above-mentioned horizontal section this November-December. The detailed plan of the fracturing operations will be reviewed anew by METI Tohoku.

Depending on the results of the demonstration experiment, the amount of production of crude oil and natural gas, which is currently being produced at Fukumezawa oil field, is highly likely to increase. The results are also expected to contribute greatly to acquisition of knowledge about development of tight oil at the Onnagawa Formation, which is distributed widely in Akita Prefecture.

For this part of the operations for this demonstration experiment, JAPEX receives support from Japan Oil, Gas and Metals National Corporation ("JOGMEC") in the same way as before. The general outline of the agreement with JOGMEC over the demonstration experiment is as follows.

<Joint study agreement concerning FY2014 (April 2013-March 2014) project for supporting operations>

1. Project name: "Technical research concerning tight oil development at the Onnagawa Formation (pilot test)"
2. Period: August 12, 2013 - August 31, 2014
3. Contents:
 - 1) Operations for acquiring data related to fracturing from the pilot hole
 - 2) Operations for designing fracturing based on the acquired data

JAPEX will continue to advance the series of operations by taking every possible environmental measure. Continued understanding and support of related parties would be highly appreciated.

2. Start of commercial production of shale oil at Onnagawa tight formation in Ayukawa oil and gas field

In October 2012, JAPEX performed Japan's first acid treatment tests at the Onnagawa tight formation by utilizing an existing well of Kurosawa AK-1 ("AK-1 well") in the Ayukawa oil and gas field (Yurihonjo City, Akita Prefecture). JAPEX later obtained favorable test results. For example, it was confirmed in the second flow test that the treatment increased crude oil production by a factor of more than 20 compared with level before the treatment (about 1.5 kl/day). (For details, please refer our news release dated July 25, 2013.)

After the second flow test JAPEX began installing ground facilities toward the start of commercial production of shale oil at AK-1 well. At the same time, JAPEX conducted flow tests as necessary. As a result, it has started full-scale commercial production this April.

<Progress of demonstration experiment related to AK-1 well>

- March 2012: Start of a joint study with JOGMEC on tight oil development at the Onnagawa Formation
- October 2012: Acid treatment tests and flowback conducted as the demonstration experiment
Total of 31.1 kl crude oil (equivalent to around 6 kl/day) produced during October 1-8
- November 2012: First flow test
A total of 71.2 kl crude oil (equivalent to around 6 kl/day) produced during November 21 - December 13
- May 2013: Second flow test
A total of 1,419.0 kl crude oil (equivalent to around 40 kl/day) produced during May 13 - July 10
- April 2014: Full-scale commercial production of shale oil started at around 35 kl/day

JAPEX will continue to pursue further opportunities to develop the Onnagawa tight formation in Ayukawa oil and gas field by acquiring data on commercial production of AK-1 well, including on its production behavior, and striving to obtain knowledge about the tight formation.

【Schedule of operations for demonstration experiment at Fukumezawa oil field】

Time	Contents of operations
Late May 2014 (plan)	Start of drilling of pilot well and horizontal well
Late Jun. 2014 (plan)	End of above operations (start of detailed designing of fracturing)
Nov.-Dec. 2014 (plan)	Multistage fracturing to be conducted at horizontal section

【Location of Fukumezawa Oil Field and Ayukawa Oil & Gas Field】

