

Regarding the earthquake occurring in the mid-eastern part of Iburi Region, Hokkaido on  
February 21<sup>st</sup>, 2019

(English translation of notice on Japanese website of February 26<sup>th</sup>, 2019)

Japan CCS Co., Ltd.

Japan CCS (hereinafter JCCS) expresses its deepest condolences and sympathies to those affected by the recent earthquake in Iburi Region, Hokkaido, and sincerely hopes for the early restoration of the stricken area.

According to the Japan Meteorological Agency, the epicenter of the earthquake occurring at 21:22 p.m. on February 21<sup>st</sup>, 2019 (M5.8), was at a depth of 33km in the mid-eastern part of Iburi Region, Hokkaido, and tremors equivalent to 4 in seismic intensity were recorded at our Tomakomai CCS Demonstration Center.

CO<sub>2</sub> was being injected when the earthquake occurred, but no damage or abnormalities of the facilities of the Tomakomai CCS Demonstration Project were found. Operations were not stopped, and are presently continuing safely.

#### (1) Regarding the CO<sub>2</sub> Storage Situation

In the Tomakomai CCS Demonstration Project, CO<sub>2</sub> is being injected via two separate injection wells, one for the Moebetsu Formation and the other for the Takinoue Formation, and in order to monitor the storage condition on a 24-hour basis, the temperature and pressure of the formations into which CO<sub>2</sub> is injected is measured continuously.

Since CO<sub>2</sub> injection for the Moebetsu Formation was resumed on December 27<sup>th</sup>, 2018, operations have been continuing smoothly. Injection was temporarily suspended for 11 days from February 8<sup>th</sup> to February 19<sup>th</sup> for inspection and maintenance of the Tomakomai plant facilities. On February 19<sup>th</sup>, CO<sub>2</sub> injection was resumed, and the temperature and pressure of the reservoir are returning to levels prior to suspension of operations (Fig. 1).

The temperature and pressure follows the same trend observed in past instances of suspension and resumption of injection, there is no change in the data indicating an anomaly before and after the earthquake on February 21<sup>st</sup>, and no phenomena suggesting the leakage of CO<sub>2</sub> have been found. As for the Takinoue Formation, CO<sub>2</sub> has not been injected since September 1<sup>st</sup>, 2018, and the temperature and pressure of the reservoir has remained largely

constant (Fig. 2).

(2) Regarding the Tomakomai CCS Demonstration Project and the recent earthquakes

In the Tomakomai CCS demonstration Project, CO<sub>2</sub> is stored mainly in the Moebetsu Formation located approximately 1,000m below the seabed, 3km offshore of Tomakomai West Port, and the stored CO<sub>2</sub> exists in the reservoir within an approximately 500m horizontal distance around the injection point.

According to the Japan Meteorological Agency, the epicenter of the earthquake occurring on February 21<sup>st</sup> was at a depth of 33km in the mid-eastern part of Iburi Region, and “is believed to be part of a series of seismic activity associated with the 2018 Hokkaido Eastern Iburi Earthquake”. The epicenter is about 36km in horizontal distance from the CO<sub>2</sub> storage point at a depth of 33km (the direct distance between the storage point and the epicenter is about 49km).

With regard to the 2018 Hokkaido Eastern Iburi Earthquake on September 6<sup>th</sup>, 2018 (M6.7), JCCS organized a review meeting including seismology experts to assess the relationship (if any) of CCS and the earthquake. The meeting confirmed a common understanding among the experts that there was no data suggesting a relationship between the subsurface storage of CO<sub>2</sub> and the earthquake occurring at a horizontal distance of about 30km from the storage point.

(Reference①: “Report on the analysis of the effect of the Hokkaido Eastern Iburi Earthquake on the CO<sub>2</sub> reservoir (English translation in preparation)

[http://www.japanccs.com/wp/wp-content/uploads/2019/02/190226\\_oshirase.pdf](http://www.japanccs.com/wp/wp-content/uploads/2019/02/190226_oshirase.pdf)

With regard to the earthquake on February 21<sup>st</sup>, a number of experts who participated in the review meeting last year have commented that there is no continuity between the formation where the CO<sub>2</sub> is actually being injected and the formation where the epicenter is located, and that as the recent earthquake occurred at the distance about 10km north of the epicenter of the 2018 Hokkaido Eastern Iburi Earthquake, there is nothing suggesting any effect of the CO<sub>2</sub> injection extending to the epicenter of either earthquake.

JCCS will continue its efforts to keep close watch over the CO<sub>2</sub> behavior utilizing the monitoring system of the Tomakomai CCS Demonstration Project, and disclose information in a timely manner.

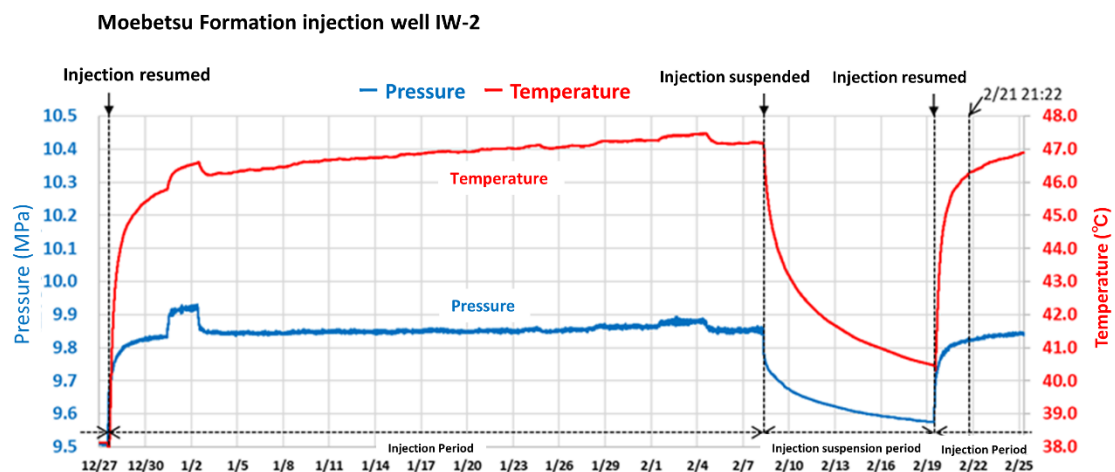
(Reference②): Regarding the situation of CO<sub>2</sub> storage)

\* Storage in the Moebetsu Formation: CO<sub>2</sub> is being stored at a depth of approximately 1,000m below the seabed, 3km offshore of Tomakomai West Port. After resuming CO<sub>2</sub> injection on December 27<sup>th</sup>, 2018, operation has continued smoothly, but was suspended for 11 days from February 8<sup>th</sup> to February 19<sup>th</sup> for inspection and maintenance of the Tomakomai plant facilities, and resumed on February 19<sup>th</sup>.

The temperature and pressure of the reservoir has since returned to levels before suspension, and no abnormalities have been found (Fig. 1).

The cumulative CO<sub>2</sub> injected amount is 219,017 tonnes as of February 25<sup>th</sup>, 2019.

Fig. 1 Bottomhole temperature and pressure of the Moebetsu Formation injection well (December 27<sup>th</sup>, 2018 to February 25<sup>th</sup>, 2019)

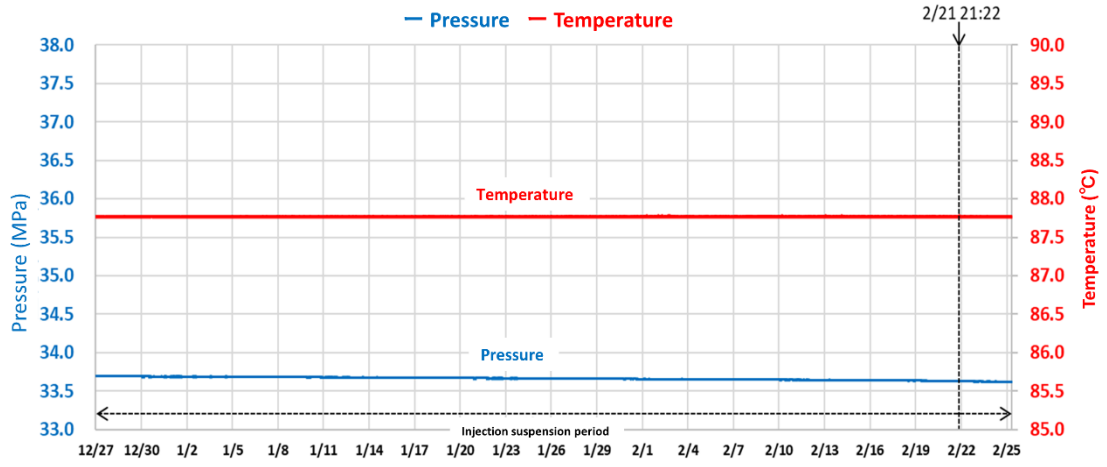


\* Storage in the Takinoue Formation: CO<sub>2</sub> is stored at a depth of about 2,400m below the seabed, 4km offshore of Tomakomai West Port.

CO<sub>2</sub> has not been injected into the Takinoue Formation since September 1<sup>st</sup>, 2018, and the temperature and pressure of the reservoir has remained largely constant. No abnormalities before and after the earthquake have been found (Fig. 2).

Fig. 2 Bottomhole temperature and pressure of the Takinoue Formation injection well (December 27<sup>th</sup>, 2018 to February 25<sup>th</sup>, 2019)

Takinoue Formation injection well IW-1: injection in suspension



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