

Progress in Off-site Environmental Remediation in Japan

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Progress of Decontamination

Full-scale decontamination was completed in 100 municipalities of 8 prefectures both in the Special Decontamination Areas (SDA), and the Intensive Contamination Survey Areas (ICSA), by March 19, 2018, except for the Restricted Areas. In the Restricted Areas, decontamination still continues (e.g. in the Specified Reconstruction and Revitalization Base Areas).





Based on the plan, decontamination and demolition of houses, etc. have been implemented in the SRRBA, and all evacuation orders in the SRRBA were lifted by May 2023 (Katsurao Village: June 12, 2022, Okuma Town: June 30, 2022, Futaba Town: August 30, 2022, Namie Town: March 31, 2023, Tomioka Town: April 1, 2023, litate Village: May 1, 2023), except for some part of roads.



Evacuation order was lifted on August 30, 2022



Evacuation order was lifted on March 31, 2023



Evacuation order was lifted on June 30, 2022







Evacuation order was lifted on Jun 12, 2022



Evacuation order was lifted on May 1, 2023





Transportation to the Interim Storage Facility

- Transportation of removed soil and waste to the Interim Storage Facility (ISF) has been implemented from FY2015, and almost all of the removed soil and waste have been transported to the ISF, by March 2022, other than the Restricted Areas.
- Approximately 13.46 million m³ of removed soil and waste (including those in the Restricted area) have been transported to the ISF (as of the end of Mar. 2023).



Overview of the Interim Storage Facility

- The Interim Storage Facility (ISF) was built to manage and store removed soil and waste arising from decontamination activities in Fukushima Prefecture and incinerated ash (>100,000 Bq/kg), safely and in an integrated manner, until final disposal outside Fukushima Prefecture, which is stipulated in the Japanese law, to be completed within 30 years (by March 2045) from the start of transportation to the ISF.
- The ISF occupies around 1,600 ha (almost same area with Shibuya City in Tokyo). Okuma Town and Futaba Town accepted the ISF, by making very difficult decisions. The MOE will continue to work on the ISF project by placing first priority on its safety.



The Interim Storage Facility (1)





Source: Interim Storage Facility Information Center (<u>https://www.jesconet.co.jp/interim_infocenter/index.html</u>)

The Interim Storage Facility (2)

環境省



Source: Interim Storage Facility Information Center (<u>https://www.jesconet.co.jp/interim_infocenter/index.html</u>)

The Interim Storage Facility (3)

環境省



Source: Interim Storage Facility Information Center (https://www.jesconet.co.jp/interim_infocenter/index.html)

Necessity for Recycling of Removed Soil





Amount of removed soil and waste transported to the Interim Storage Facility:

Equivalents to volume of 11 Tokyo Domes (Baseball park)

Toward final disposal outside the Fukushima Prefecture: Volume Reduction before the final disposal is a key measure



Technology Development Strategy for Volume Reduction and Recycling



- To promote volume reduction and recycling, significant efforts have been made in accordance with the "<u>Technology Development Strategy for Volume Reduction</u> <u>& Recycling of the Removed Soil and Waste under Interim Storage</u>" and the "Process Chart," formulated in 2016 and reviewed in 2019.
- In particular, with regard to the recycling, the MOE has been implementing demonstration projects based on the Basic Concept for Safe Use of Removed Soil Processed into Recycled Materials compiled in 2016 as a guideline, as well as efforts to build nationwide understanding.
- Setting FY2024 as the strategic target, the development of basic technology has been promoted, and several feasible options will be presented, for the required area and structure of the final disposal site. After FY2025, it will proceed to processes for studies and coordination related to the selection of final disposal site.



Demonstration Projects for Recycling in Fukushima Prefecture



(Overview)

- The following demonstration projects using removed soil as a basis of farmlands has been implemented in Nagadoro District, litate Village.
 (1) Agricultural land development: In April 2021, large-scale agricultural land development (approx. 22 ha) using removed soil (approx. 230,000 m³) started.
 (2) Paddy field tests: Since FY2021, tests have been conducted on the functions required for paddy fields (e.g. permeability, soil strength) and it was confirmed that the results generally fell in within the range of acceptable values.
- (3) Demonstrative flower cultivation with local residents

(Results)

- > The radioactivity in cultivated foods was well below the criterion of 100 Bq/kg (0.1 2.3 Bq/kg).
- > The monitoring results to date have shown no increase in air dose rates, etc. caused by the recycled materials and its safety was confirmed.



Efforts to Build Understanding toward Final Disposal and Recycling (inside Japan)



Nationwide Dialogue Forum



Nine meetings have been totally held. All of the dialogues were recorded and available online.

Site Visits



Site tours were held for the Soil Storage Sites in the Interim Storage Facility and the demonstration project area in the Nagadoro district of litate Village.



Installation of Potted Plants using Removed Soil

In FY2022, potted plants using removed soil were installed at METI, MLIT and other relevant ministries and agencies (17 facilities outside Fukushima Prefecture as of the end of January 2023).

Efforts to Build Understanding toward Final Disposal and Recycling (international)

- Since shortly after the accident, the MOE has had a number of opportunities to discuss and exchange views on off-site remediation activities through missions, meetings with the IAEA, and bilateral meeting with countries with experience to address similar challenges.
- In 2022 and 2023, tours were held for press of foreign countries to disseminate progress made for decontamination activities and remaining issues to be addressed.
- Taking opportunities of international conferences (e.g. The 27th Conference of the Parties (COP27) to the United Nations Framework Convention on Climate Change (UNFCCC), G7 Summit in Hiroshima), reconstruction efforts following the Great East Japan Earthquake and the accident at TEPCO's Fukushima Daiichi Nuclear Power Station were disseminated.



Tours for foreign press



Source: Foreign Press Center Japan





IAEA-MOE Experts Meeting on Environmental Remediation of Off-Site Area after the Fukushima Daiichi Nuclear Power Station Accident (2016 - 2017)

- After the two IAEA Missions to Japan in 2011 and 2013, the IAEA and the MOE agreed to continuously discuss off-site remediation activities in-depth, and in total four meetings were held from 2016 to 2017.
- The IAEA officials and designated experts from various countries, exchanged views with the MOE and other government and municipal officials in roundtable discussions, and conducted site visits of the Interim Storage Facility, as well as demonstration project site for recycling removed soil in Fukushima Prefecture.
- At the last 4th Experts Meeting, it was agreed to develop a consolidated report summarizing the abstracts and discussions of each meeting, which was posted on the IAEA website in March 2023.
- The consolidated report covers wide range of off-site remediation activities in Japan, consisting the following 9 chapters:
 Chapter 1: Introduction
 Chapter 2: Brief Literature Review
 Chapter 4: Remediation
 Chapter 5: Waste Management
 Chapter 6: Stakeholder Engagement
 Chapter 7 Knowledge Management
 Chapter 8: Reconstruction and Revitalization



Background

- This meeting was held by the International Atomic Energy Agency (IAEA) upon the request of the Ministry of the Environment (MOE), Japan. The meeting was intended to exchange views concerning the measures taken by the MOE Japan on the recycling of removed soil, final disposal in the future, and to conduct the site visits to the Interim Storage Facility and demonstration area for environmental restoration in Nagadoro District, litate Village. Provision of international assessment and advice from technical and social perspectives was expected.
- The final report will be produced by the IAEA after the 3rd Experts Meeting.

Overview of the 1st meeting

• Date / Place

Schedule: Monday, May 8 - Friday, May 12, 2023

May 8: Meeting with the Ministry of the Environment

- May 9-10: Site visit to Fukushima Prefecture (Interim Storage Facility, demonstration area for environmental restoration in Nagadoro District, litate Village, discussions with litate Village Office staff and Nagadoro District residents, courtesy visits to litate Village Mayor, Futaba Town Mayor, and Okuma Town Mayor, etc.)
- 11th-12th: Meeting with the Ministry of the Environment, courtesy visit to the Minister of the Environment

Main agenda

- 1) Status of progress of recycling and final disposal of removed soil, and promotion of public understanding
- 2) Progress made on the Technology Development Strategy for Volume Reduction and Recycling of Removed Soil

Main results of the 1st Meeting

Site visits





Flower and ornament plant cultivation in greenhouses in the demonstration facility of Nagadoro District

Demonstration of paddy fields

Main statements by the IAEA

- We have seen a lot of work already done with a constant commitment to demonstrating safety.
- The demonstration project is really important. Through the demonstration project, important information for interested parties can be provided on the recycling of removed soil.

Note: The summary report of the 1st IAEA-MOE 1st Experts Meeting was published on Sep. 1, 2023 and it is available at: https://www.env.go.jp/en/press/press_01843.html

(Decontamination)

- Full-scale decontamination activities were completed by March 2018, other than the Restricted Area (RA). In conjunction with progress of other reconstruction activities, evacuation orders were lifted by March 2020, other than the RA.
- In the RA, decontamination activities have been still in progress, and the evacuation orders in the Specified Reconstruction and Revitalization Base Areas (SRRBA) in 6 municipalities were lifted by May 2023.

(Transportation, Storage of generated soil and waste)

- Soil and waste arising from the decontamination activities in Fukushima Prefecture have been transported into the Interim Storage Facility (ISF), and almost all of the removed soil and waste had been transported into the ISF by March 2022, other than the RA.
- More than 13 million m³ of soil and waste have been transported into the ISF, and treated soil is stored in the ISF, which are supposed to be transported again out of the ISF, to be finally disposed of outside Fukushima Prefecture by March 2045.

(Promotion of volume reduction and recycling)

- Taking account of the difficulties to find out the place to accommodate all of the removed soil and waste, as well as high occupancy of removed soil with relatively low radioactivity concentration, volume reduction and recycling of removed soil have been promoted.
- Based on the Strategy, technology development and demonstration projects have been simultaneously promoted, aiming at completion of development of necessary basic technologies by March 2025. Efforts to build nationwide public understanding, as well as sharing information with international communities have been also implemented, taking the opportunities of international meetings, conferences and tours for foreign media.

(Cooperation with international society)

The MOE has shared wide range of experience and lessons learned obtained through more than 12-year off-site remediation activities. This effort will be continued through Experts Meeting with the IAEA and bilateral discussion with other countries.

Thank you



For more information: <u>http://josen.env.go.jp/en/</u> yoshitomo_mori@env.go.jp