Efforts towards Environmental Regeneration in the Disaster Areas <Outline>

Ministry of the Environment

April 6 , 2018

Status of Efforts towards Environmental Regeneration

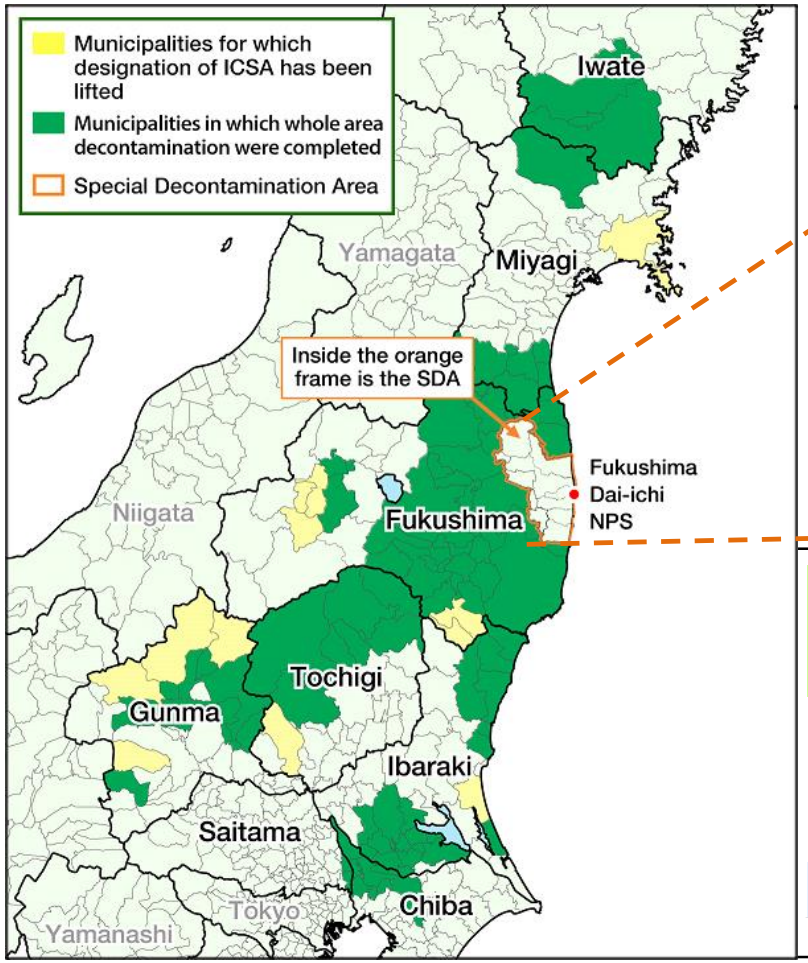
- The whole area decontamination was completed in all areas on March19, 2018 except for Areas where Returning is Difficult (P.2～3)
- Interim Storage Facility (ISF) is under construction in order to store the removed soil generated from the decontamination activities (hereinafter referred to as “removed soil”) in Fukushima Prefecture (P.4～5)
- The Ministry of the Environment (MOE) proceeds to transport the removed soil to the ISF to clear the Temporary Storage Sites (TSS) quickly, and also promotes recycling and reuse of the soil (P.6～9)
- MOE also has been treating the contaminated waste safely (P.10～12)
- MOE started the project to demolish the buildings and implement decontamination work for the reconstruction of Zones Designated for Reconstruction and Recovery (Reconstruction Hubs) in the Areas where Returning is Difficult (P.13)
- In addition to the efforts above, forward-looking efforts such as town development with low-carbonization will be conducted for regeneration of Fukushima (P.14)

Progress of Decontamination

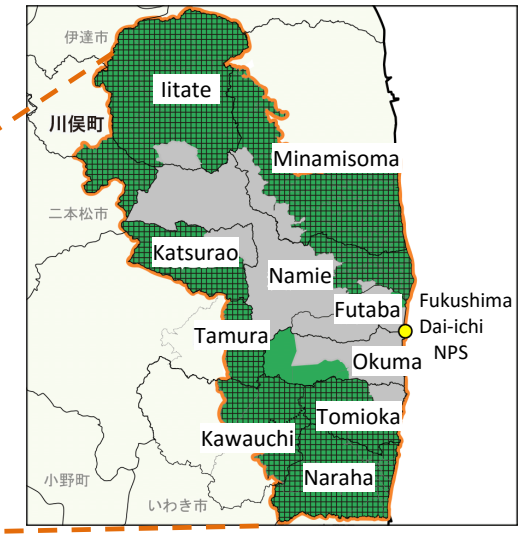
Whole area decontamination based on the Act on Special Measures was completed on March 19, 2018, excluding the Areas where Returning is Difficult (ARD)

* In ARD, “Reconstruction Hubs” will be set in each municipality, where decontamination and infrastructure construction will be implemented in an integrated way.

Intensive Contamination Survey Areas (ICSA)



Special Decontamination Areas (SDA)



→Whole area decontamination in the SDA was completed at the end of March 2017

Evacuation order lifted
Completed
Special Decontamination Area
Areas where Returning is Difficult

	Municipalities which completed whole area decontamination		
		SDA	ICSA
Within Fukushima Pref.	43※	11	36
Outside Fukushima Pref. (7prefs)	57	-	57
Total	100	Completed in March 2017	Completed in March 2018

※There are both SDA and ICSA areas in Minamisoma, Tamura, Kawamata, and Kawauchi

Scale of Whole Area Decontamination Project

◆The MOE has budgeted approx. JPY 2.9 trillion (= USD 27 billion) until FY2017 for decontamination.
◆16,5mil.㎥ (among which approx. 16mil. ㎥ of contaminated soil and wastes were estimated to have been removed until now *Estimation total number of SDA decontamination (as of January 2018) and ICSA decontamination (as of September 2017) .
◆MOE is also working on "Decontamination Project Report“ to leave a record behind of the experiences, knowledge and lessons learned through decontamination works.

Decontamination in SDA

・Total number of labor:
approx. 13,600,000 workers
※as of the end of January 2018

・Budget: approx. JPY 1.5 trillion
※ MOE's budget until FY2017 (excluding unnecessary cost)

・Volume of the generated soil:
approx. 9,000,000㎥

From the above volume of soil already transported from TSS*: approx. 1,700,000㎥ (estimation as of the end of January 2018)

* Volume transported either to the ISF or to Temporary incineration facilities (TIFs)

Decontamination in ICSA

・Total number of labor:
approx. over 18,000,000 workers
※ estimated from interviews with relevant municipalities

・Budget: approx. JPY 1.4 trillion
(within Fukushima Pref. : approx. JPY 1.3 trillion,
outside Fukushima Pref. : approx. JPY 5 billion
※MOE's budget until FY2017 (excluding unnecessary cost)

・Volume of the generated soil:
approx. 7,500,000㎥ (estimation)
(within Fukushima 7,000,000㎥,
outside Fukushima 500,000㎥, both are estimation)

From the above volume of soil already transported from TSS*: approx. 1,300,000㎥ (as of the end of January 2017)

※Considered 1US$ =JPY107

Prospects and Progress of the ISF

◆Interim Storage Facility project is on progress according to the maximum case of "5year ad-hoc policy on ISF" publicly announced in March 2016
◆Aiming to transport accumulative total of ca. 6.5mil. ㎥ of removed soil from Temporary Storage Site (TSS) to ISF by FY2019 and to close the TSS near living environment by 2020

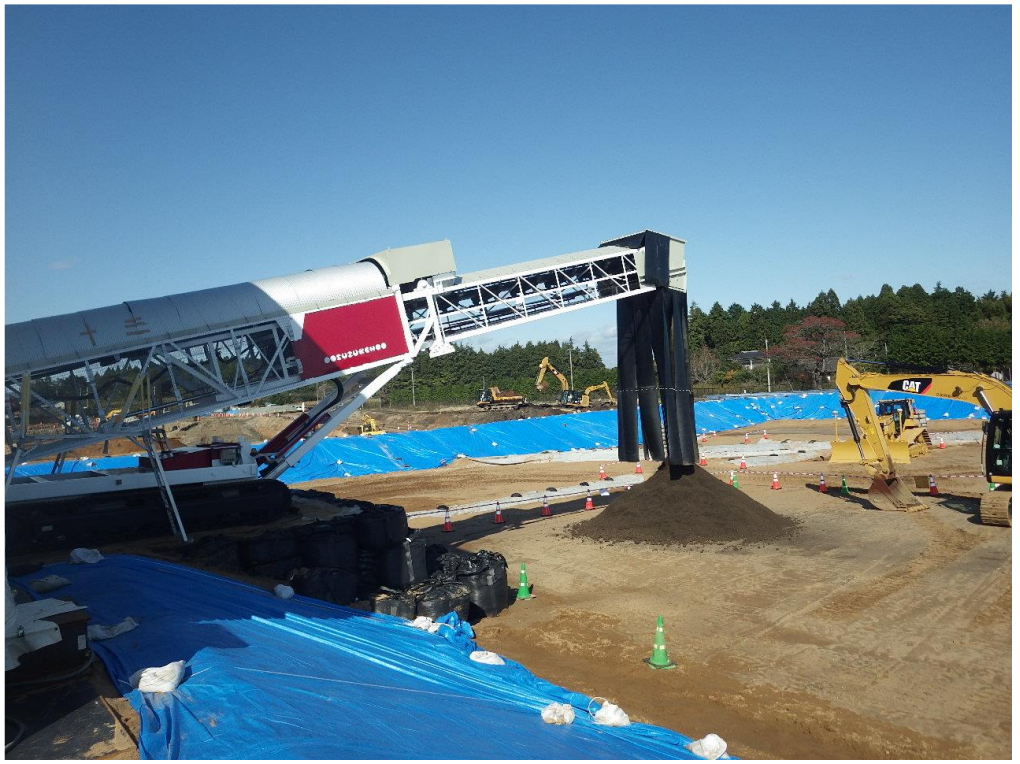
FY	Land Acquisition (accumulated total)		Volume of the transportation		Facility construction
	Prospects	Achievement	Prospects	Achievement	
2015	Ca. 22ha (as of March 25, 2016)	Ca. 22ha	Ca. 50,000㎥	Ca. 45,000㎥	• Construct stock yards in the ISF Even after FY2016, necessary stock yards will be sequentially constructed
2016	Ca.140 - 370ha	Ca. 376ha	Ca. 150,000㎥ • Additionally, to transport decontamination soil, etc. stored in schools, to stock yards using town-owned property cooperated by Okuma and Futaba town	Ca. 184,000㎥ (Total 230,000㎥)	• September: Temporary incineration facility (Okuma town) started to construct • November: Soil storage facility, reception & separation facility started to construct
2017	Ca. 376 - 830ha	Ca. 844ha (as of the end of Feb.) ※52.8% of the whole land of ISF	Ca. 300,000 – 500,000㎥ → Ca. 500,000㎥	Ca. 485,000㎥ (as of the end of Feb.) (Total 710,000㎥)	• June: Started a trial run of reception & separation facility • Oct.: started to operate soil storage facility • Dec.: Igniting ceremony at temporary incineration facility in Okuma town • Start to construct temporary incineration facility and incinerated ash treatment facility (starting operation in FY2019) • Starting to construct waste storage facility (starting operation in FY2019)
2018	Ca. 400 - 940ha		Ca. 900,000 - 1,800,000㎥ → Ca. 1.8mil. ㎥		
2019	Ca. 520 – 1,040ha		Ca. 1,600,000 - 4,000,000㎥→To aim Ca. 4mil. ㎥		• Plan to start operating temporary incineration facility and incinerated ash treatment facility in Futaba town • Plan to start operating waste storage facility
2020	Ca. 640 – 1,150ha (whole land of ISF 1,600ha)		Ca. 2,000,000 - 6,000,000㎥ (Maximum accumulated total of Ca. 12.5mil.㎥)		

* "5year ad-hoc policy on ISF" was publicly announced in March 2016, but it might be revised according to progress status of the projects.
** Removed soil generated in Fukushima Pref. amounts to be approx.16mil. m3 (before the incineration) as of the end of March, 2018.

Operational Status of the ISF

- Construction of the facility started in November 2016
- Trial operation of Reception/Separation Facilities started in June 2017 in Futaba, and in August 2017 in Okuma
- The storage of the removed soil started in October 2017 in Okuma and in December 2017 in Futaba after the completion of the soil storage facilities

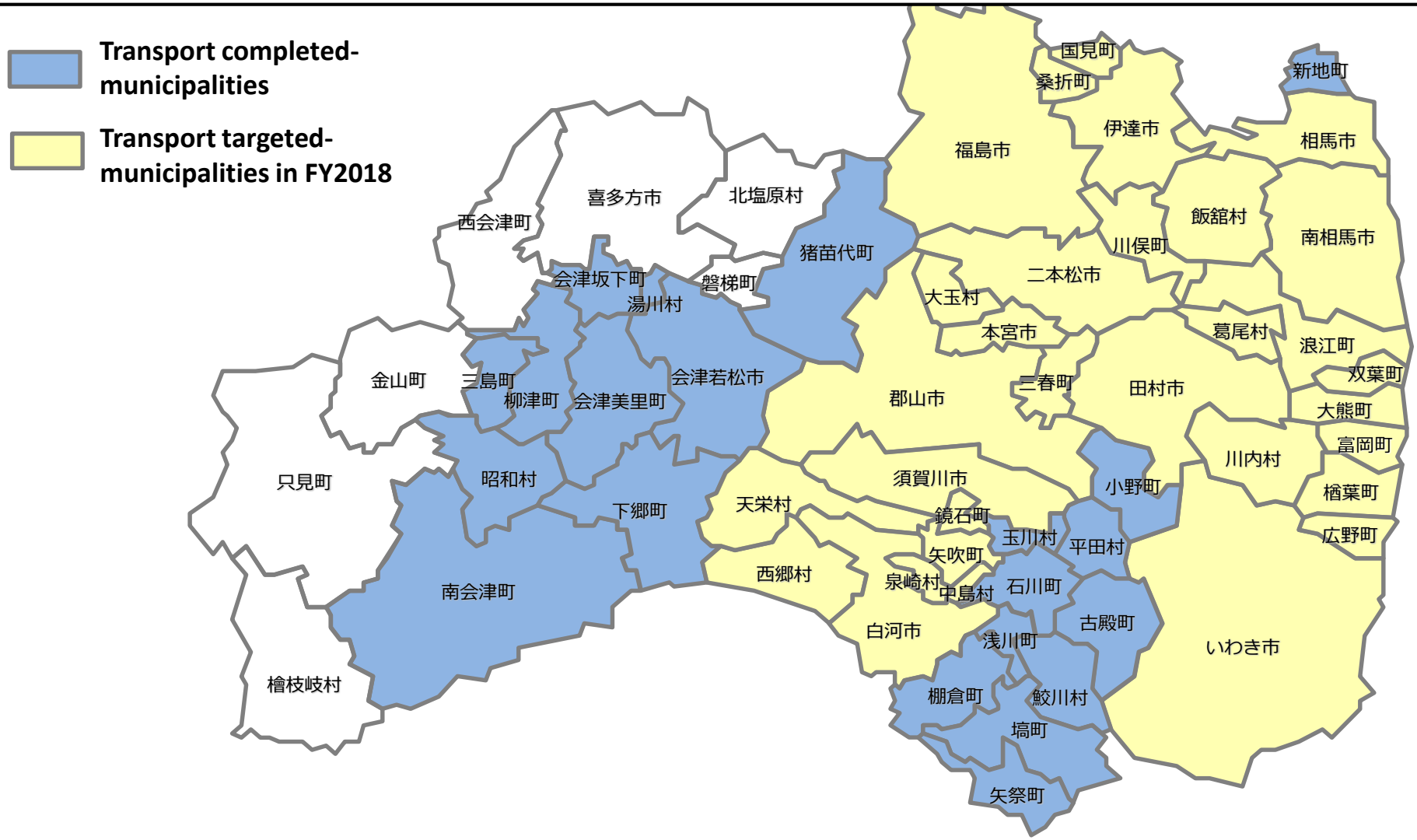
Reception/Separation Facility
(First period in Futaba)
(Processing capacity 140t/h)



Soil Storage Facility (First period in Okuma)
(Planned storage volume approx. 210,000m^3)

Planned Transport of the Removed Soil etc. to the ISF in FY2018

- 21 municipalities completed the transport
- 31 municipalities remain for the transport



Prospects on Export of Removed Soil and Restoration of Land in TSS (Estimation)

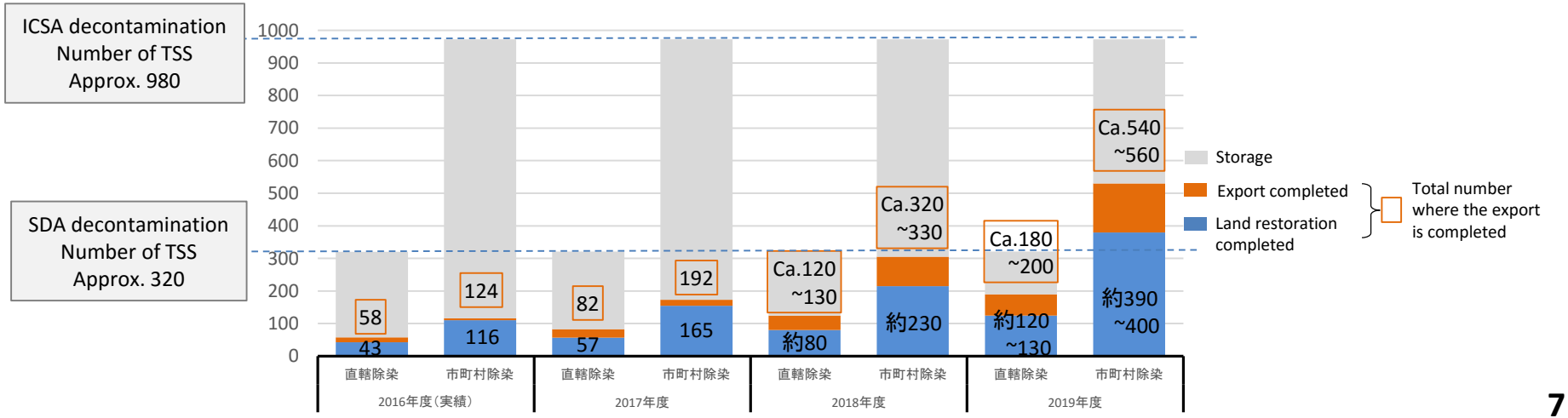
By early 2020, removed soil will be transported to ISF from up to 60% of approx. 1,300 TSS, and the land restoration of up to 40% will be completed, according to estimation based on prospect*1 of the transportation to the ISF and achievement in the land restoration*2.

*1 Aiming to transport 1.8mil. ㎥ in FY2018, and 4mil. ㎥ in FY2019
*2 The number as of the end of 2016

Image of export and land restoration

Export/ Land restoration

Number of TSS where export and restoration will be completed (Estimation)



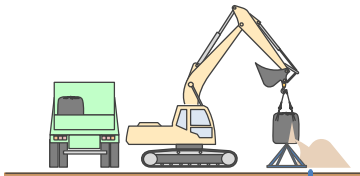
Demonstration Project for Recycling in Minamisoma City

Demonstration project is currently being implemented in Minamisoma City, studying specifically on handling radiation during the procedure of recycling and ensure the quality of the recycled soil as construction material in order to promote safe recycling and reuse of the removed soil in a step by step manner.

1. Preliminary treatment / quality control process (April 2017-)

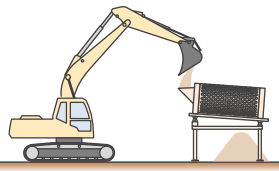
1. Open sandbags and remove large stones and debris

Open large sandbags and remove large foreign materials



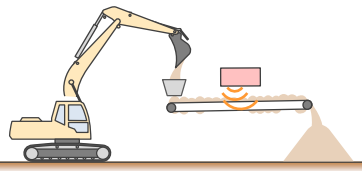
2. Further eliminate smaller debris

Eliminate small foreign materials through sieves



3. Classify soil by concentration

Measure radiation and classify soil



4. Control quality

Control quality of soil to be used for embankment (such as water content and grain sizes)

vegetation

stones

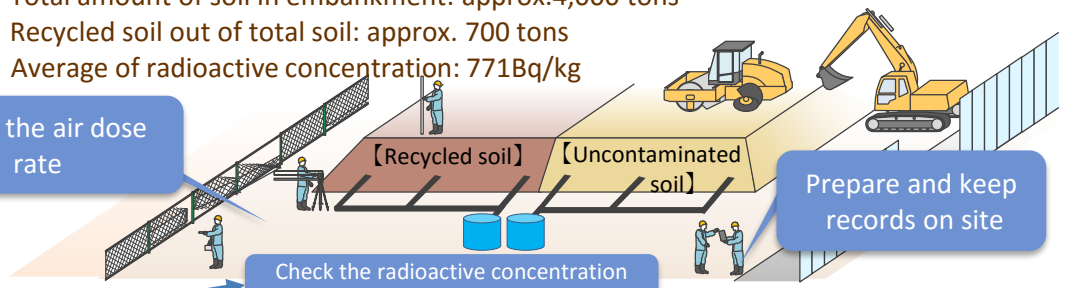
pebbles

2. Test embankment process (May 2017-)

5. Construct test embankment / Monitoring

- Construct a test embankment (covered with uncontaminated soil by 50cm)
- Continue to measure the air dose rate and other indicators

- Total amount of soil in embankment: approx.4,000 tons
- Recycled soil out of total soil: approx. 700 tons
- Average of radioactive concentration: 771Bq/kg



Air dose rate was not much changed before and after opening of sandbags of the removed soil

During period of May - Sep. Not detectable for all radioactive materials in leachate

【Result of council of advisers】
- ◆ Confirmed safety in this method for recycling demonstration
- ◆ To accumulate data continuously conducting demonstration project

Outline of Demonstration Projects for Recycling in Iitate Village and Nihonmatsu City

◆ In addition to Minamisoma City, demonstration projects for recycling of the removed soil are planned in the following municipalities. MOE will implement the projects carefully, explaining the projects kindly to the residents.

In Iitate Village

In November 2017, MOE, Iitate Village and Nagadoro District confirmed the following points on requests from Iitate Village.

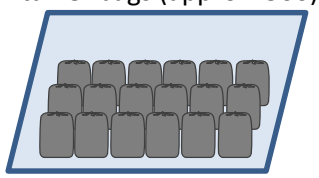
- MOE and Iitate Village should contribute to reconstruction of not only Nagadoro District but also Iitate Village and Fukushima Prefecture through the environmental regeneration project including recycling and reuse of the removed soil generated in Nagadoro District.
- MOE, Iitate Village and Nagadoro District will work together on the demonstration project with consideration for safety and security of the residents, listening to the experts' advice.

Specific contents will be discussed according to Iitate Village's requests such as cultivation of flowers and energy crops.

In Nihonmatsu City

- On municipal road (approx. 200m), in Nihonmatsu City, test construction will be implemented using the removed soil stored in TSS (approx. 500 large container bags) as subgrade and use the road after paving.
- During the demonstration project, environmental measures such as radiation monitoring, control of scattering and leakage should be conducted
- After preparation of recycled soil, recycling facility within TSS will be removed, and radiation monitoring around the road using the recycled soil will be conducted for a certain period of time. Also the project, especially about the safety, will be explained kindly to the residents
- The knowledge through the project will be reflected in "Guidelines for Recycling"(tentative)

TSS
Large container bags (approx. 500)



Recycled soil

Test construction of road

※Radiation monitoring will be conducted during the project

Progress on Disposal of waste in the Countermeasure Areas (Fukushima Prefecture)

- ◆ Transportation of disaster waste to the TSS has completed 1.85mil. tons as of the end of December (of which 330,000 tons were incinerated and 97,000 tons were recycled)
- ◆ Transported disaster waste is recycling to the extent possible
- ◆ In Temporary Incineration Facilities (TIFs) which are currently under operation, environmental monitoring is conducted and confirmed that radioactive concentration level in dispersed gas has not been detected

< Status of disaster waste by category>

(1) Disaster waste disposal generated by Tsunami

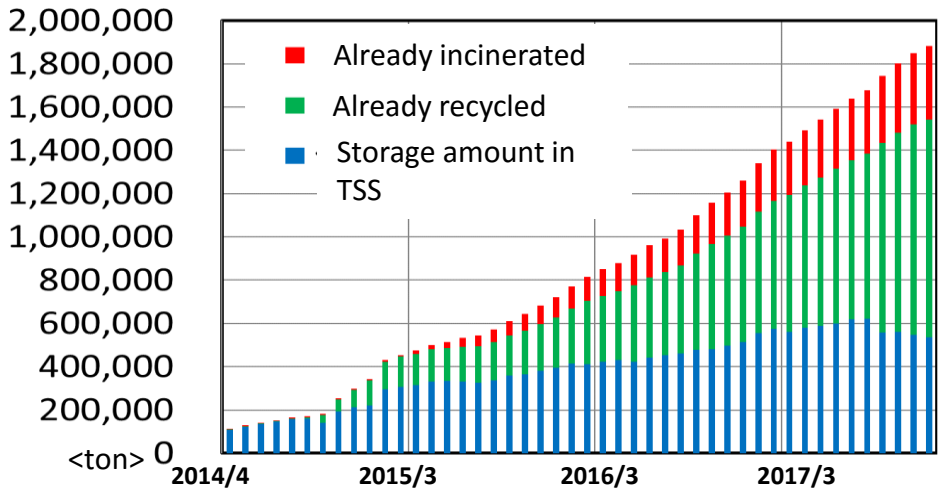
- ◆ All the debris excluding that from Areas where Returning is Difficult (ARD) has been removed and transported to the TSS as of March 2016

(2) Demolition and removal of collapsed houses

- ◆ It is under operation to take application for demolition and investigation, then conduct demolition and removal
- ◆ Application for demolition and removal of which 12,400cases were registered, already announced demolish work, 10,500cases, among which 9,700cases were removed.

(3) Treatment of household waste

- ◆ Pick-up service at garbage stations or door-to-door visit
- ◆ Door-to-door retrieval is conducted after adjusting the schedule of the owner



Transported amount of disaster waste already transported to the TSS in the countermeasure area (t)

※ Including the treated amount without transporting to the TSS

Demolition of a collapsed house

TIF in Okuma

Implementation Situation of Waste Disposal across Municipalities

◆ To promote 'Waste disposal across municipalities' accepting waste disposal outside of the town at the TIF.
◆ Katsurao village and Nihonmatsu city will start 'Waste disposal across municipalities' at the TIF in FY2018.

Date city (130t/day)【operating】

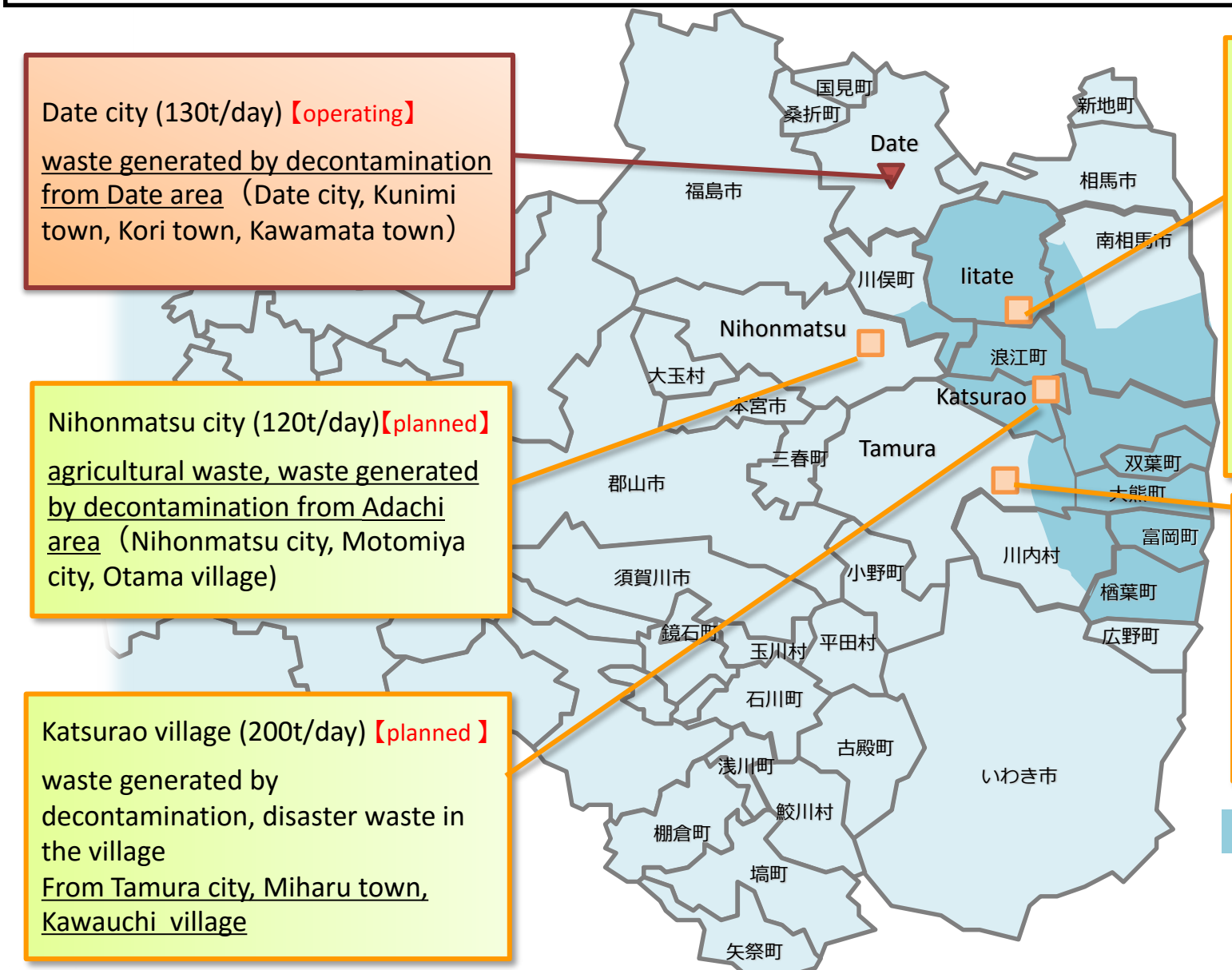
waste generated by decontamination from Date area (Date city, Kunimi town, Kori town, Kawamata town)

Nihonmatsu city (120t/day)【planned】

agricultural waste, waste generated by decontamination from Adachi area (Nihonmatsu city, Motomiya city, Otama village)

Katsurao village (200t/day)【planned】

waste generated by decontamination, disaster waste in the village
From Tamura city, Miharu town, Kawauchi village



Iitate village (Warabidaira district) (240t/day)【operating】
Waste generated by decontamination, disaster waste in the village
Sewage sludge, agricultural waste from outside village (Fukushima city, Date city, Kunimi town, Kawamata town, Minamisoma city)

Tamura city, Kawauch village (60t/day)【operating】

Agricultural waste from 24municipalities, such as Kenchu, Kennan, Iwaki, kawauchi village, Aizu Kennan

Countermeasure area
TIFs by MOE
TIF by municipalities in Date district

Disposal Project utilizing Controlled Landfill Site

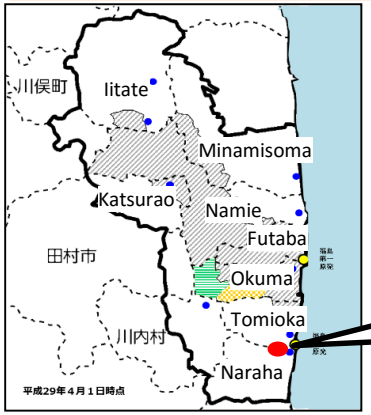
◆As for Landfill disposal project for specified waste using existing controlled landfill site (formerly Fukushima Eco Tech Clean Center) in Fukushima Prefecture, specified waste has started to be transported on Nov. 17, 2017.

Outline of the facility

- To use existing controlled landfill site (formerly Fukushima Eco Tech Clean Center)
- To locate it in Tomioka (access from Naraha)
- The facility has been nationalized after local coordination
- Potential landfill capacity: about 650,000㎥ (9.4ha)
- Positioning as the final disposal site

Target object for landfill / Transport period

- Waste within the countermeasure areas (less than 100,000Bq/kg of radioactive concentration) [about 440,000m^3] – about 6 years
- Designated waste (less than 100,000Bq/kg of radioactive concentration) [about 180,000m^3] – about 6 years
- General waste from houses [about 30,000m^3] – about 10 years in 8 municipalities in Iitate county
- Waste with more than 100,000Bq/kg of radioactive concentration will be delivered to the ISF



TIFs (incl. those under construction and those removed)

Contaminated waste countermeasure area

Habitation restricted area

Preparation Areas for Lift of Evacuation Order

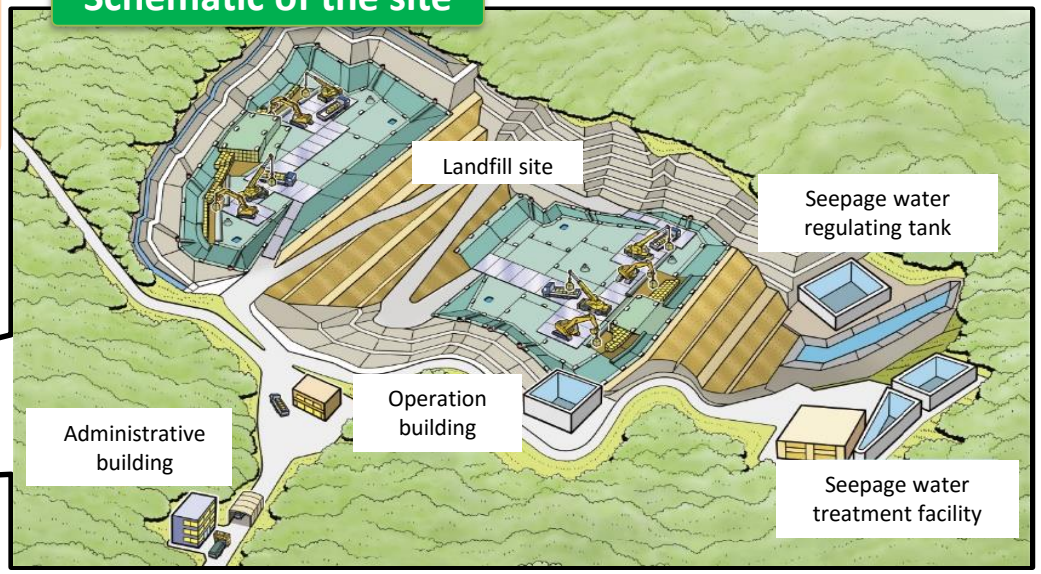
Areas where returning is difficult

History

- Dec. 2013: The National Government offered Fukushima Prefecture, Tomioka, and Naraha to accept the project
- Dec. 2015: Fukushima Prefecture and the two towns conveyed the acceptance of the project to the government
- April 2016: Controlled landfill sites were nationalized
- June 2016: Safety agreement was signed between the Government, Fukushima Prefecture and the two towns
- Nov. 2017: The government started the transportation on November 17.

7,842 bags have been transported as of the end of Feb. 2018.

Schematic of the site



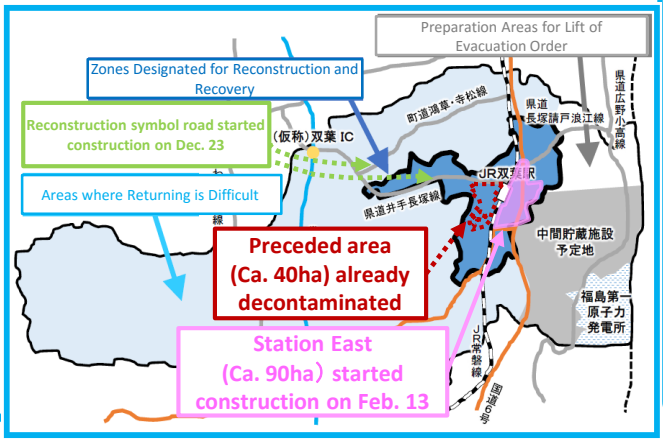
Reconstruction in the Areas where Returning is Difficult (Reconstruction Hubs)

※As of Feb. 2018 (Source: hearing from the Reconstruction Agency)

◆Based on the approved plans for reconstruction of Zones Designated for Reconstruction and Recovery (Reconstruction Hubs), demolition and decontamination work has been sequentially started in Futaba, Okuma and Namie towns.
◆Tomioka applied for approval of the plan in February 2018, while Iitate and Katsurao are formulating the plans.

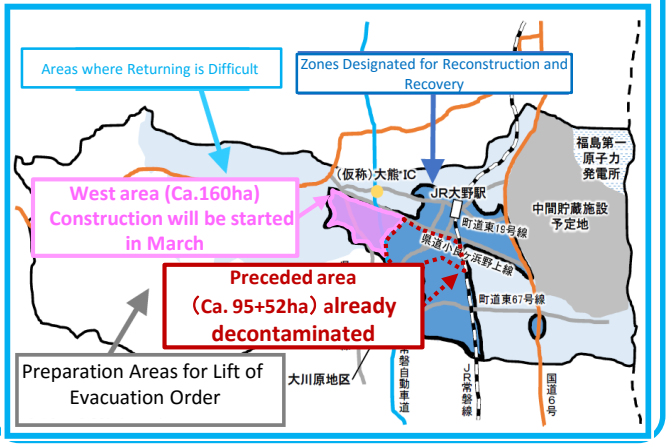
Futaba (approved on Sep. 15, 2017)

【Outline】
・Whole area：Ca. 560 ha
・Target time for returning：Spring 2022
【History】
・"1st Meeting for Reconstruction of Zones Designated for Reconstruction and Recovery in Futaba" was held in Oct. 2017.
【Status】
・"Recovery symbol road" (55 cases demolished, 7 ha decontaminated): started in Dec. 2017.
・East side of station (640 cases demolished, Ca. 90 ha decontaminated): Started in Feb. 2018.



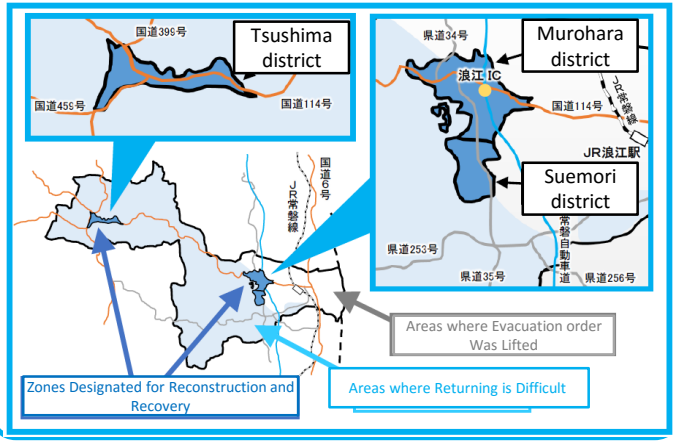
Okuma (approved on Nov. 10, 2017)

【Outline】
・ Whole area: Ca. 860 ha
・Target time for returning：Spring 2022
【History】
・ "1st Meeting for Reconstruction of Zones Designated for Reconstruction and Recovery in Okuma" was held in Nov. 2017.
【Status】
・Demolition and decontamination around western area of Shimonogami (460 cases demolished, Ca. 160 ha decontaminated): Contracted in January 2018, started in March 2018.



Namie (approved on Dec. 22, 2017)

【Outline】
・Whole area: Ca. 660 ha
・Target time for returning： March 2023
【History】
・ "1st Meeting for Reconstruction of Zones Designated for Reconstruction and Recovery in Namie" was held in Feb. 2018.
【Status】
・Demolition and decontamination in 3 districts (60 cases demolished, 30 ha decontaminated): Publicly announced on placement of order and will be started in May 2018.



Forward-looking efforts on reconstruction for the New Stage

◆ Feasibility study will be implemented to promote the efforts towards " whole town reconstruction and low-carbonization" based on the Act on Special Measures for the reconstruction hub.(FY2018 new project)
→ Making use of the environmental remediation projects, describe the image of recovered towns in which the viewpoint of low-carbonization is built in to the extent possible, and evaluate the CO2 reduction effect by various projects and the feasibility of the projects.

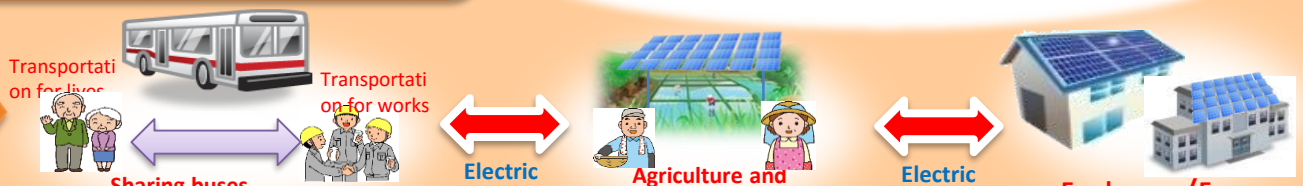
Planned to implement feasibility study towards various project concerning establishment of towns and lives

Low Carbon

MOE will formulate support menu making use of lessons learned along with regional development project by leading low carbon technology that MOE has been dealing with up to now

Innovate various low carbon technology study on reduction of CO2 and its possibility

< Images on development of low carbon technology for mobility, houses and agriculture >



Focus on "Technology innovation", "social system innovation", "Life style innovation" in a win-win situation

Reconstruction

MOE will conduct environmental technology using experience of environmental remediation project, applying knowledge of radiation by observing point of living

Electric supply

Low carbon for whole town

Evaluate and verify carbon reduction effect for whole town implementing various low carbon technology.
Review feasibility of towns and lives by applying low carbon (transportation, electric heat flexibility, AI control)

Waste from regions

Low carbon and material recycle

<Images on low carbon technology and material recycle project>