



Ouchijuku, Fukushima

# Environmental Remediation in Affected Areas in Japan May, 2019



Ministry of the Environment, Japan

## < Topic of the Month >

### “Fukushima Environmental Regeneration” is published!

- MOE has published a leaflet, “Fukushima Environmental Regeneration” (only available in Japanese) to show the residents how MOE has been tackling on the regeneration of Fukushima Prefecture.
- This leaflet will be issued on a monthly basis. In the first edition, the regeneration of Okuma Town (newly-built town hall) and Tomioka Town (Cherry Blossom Festival) are reported.

**大熊町の避難指示一部解除、大熊町役場新庁舎開庁**  
東京電力福島第一原子力発電所の事故により大熊町内全域に出されていた避難指示のうち、東部避難区域の大川原地区、避難指示解除準備区域の中屋敷地区の避難指示が4月10日午前8時に解除されました。また、大熊町役場の新庁舎が大川原地区に完成し、4月14日に新庁舎開庁式が行われ、5月7日から本格的に業務が開始されます。新庁舎も町の復興拠点として、防災教育施設などの整備が進められ、4月には関係公営住宅への入居が始まりました。

**大熊町除染検証委員会による検証結果について**  
大熊町除染検証委員会は、2018年11月8日以降、大川原地区と中屋敷地区における除染効果等について検証を行いました。大熊町除染検証委員会の町長選出委員は、周辺町長選出委員と連携し、大川原・中屋敷地区の除染効果について、総合的に検証するうえにおいて、環境放射能は十分に低減化していると考えられる」との最終的な評価を公表されました。事後モニタリングの結果から、長期的な除染効果が確認されていることが確認できます。詳しくは除染情報サイトをご覧ください。

**富岡町夜の森地区 校並木周辺の除染について**  
富岡町で避難指示が出されている福島県内区域のうち、特定復興再生拠点として整備が進められている夜の森地区において、校並木周辺の除染が完了しました。この校並木は約2.5kmにもおよび、富岡町のシンボルとして人々に愛されています。1年度（2017年度）では、この夜の森地区の校並木の除染が完了しました。環境省では、特定復興再生拠点と特定復興再生拠点区域の除染と建物解体に取組んでいます。

**除染等の状況**  
環境省が除染を進める特定復興再生拠点（特定復興再生拠点）をめぐっては2017年3月までに、市町村が除染を実施する対象となる特定復興再生拠点は2018年3月までに除染が完了しています。福島、宮城県にある特定復興再生拠点の除染状況は、環境省のウェブサイト（特定復興再生拠点）に掲載されています。

富岡と大熊のいま 2019.5月

## ふくしま環境再生 Vol.1

「ふくしま環境再生」では、環境省が実施する福島県内区域の除染や復興支援の進捗状況を定期的に公開しています。

環境省 福島地方環境事務所

# **Result and Effect of the Whole Area Decontamination**

Interim Storage Facility

Disposal of the Specified Waste

Communication to the Public and  
International Societies



# Decontamination and Waste Treatment based on the “Act on Special Measures”

## Measures on decontamination of soil contaminated by radioactive materials

### ① Special Decontamination Areas (SDA)

Designation of SDA by the Minister of the Environment

Development of the decontamination implementation plan in the SDA by the Minister of the Environment

Decontamination implementation by the National Government



### ② Intensive Contamination Survey Areas (ICSA)

Designation of the ICSA by the Minister of the Environment

(The areas with more than  $0.23\mu\text{Sv/h}$ )

※ $0.23\mu\text{Sv/h}$  is not the decontamination target, but designation criteria for the ICSA

If the area is more than  $0.23\mu\text{Sv/h}$ , after the monitoring survey by municipality mayors

Development of Decontamination Implementation Plan by the municipality mayors

Implementation of decontamination by municipality mayors based on the plan (the national government allocates the budget)

※Removed soil generated by decontamination work inside NPS, is implemented by the relevant nuclear producer, TEPCO

## Management of waste contaminated by radioactive materials

### Specified waste

#### ① Waste within the countermeasure area

Designation of contaminated waste management area※ by the Minister of the Environment  
※ Designated areas which meet requirements to be contaminated by radioactive materials at certain level necessary to manage waste under special management

A management plan for waste within the countermeasure area is formulated by the Minister of the Environment

Implemented by the national government pursuant to the treatment plan for waste

Prohibition on unauthorized actions (ex. unauthorized dumping)

Survey on sewerage sludge, incinerated ash, etc. (obligatory)

Report to the Minister of the Environment

Survey on waste other than that specified in the left box (voluntary basis)

Application

#### ② Designated waste

Designated as “designated waste” by the Minister of the Environment  
※ Contaminated waste above certain level ( $8,000\text{Bq/kg}$ )

Implemented by the national government

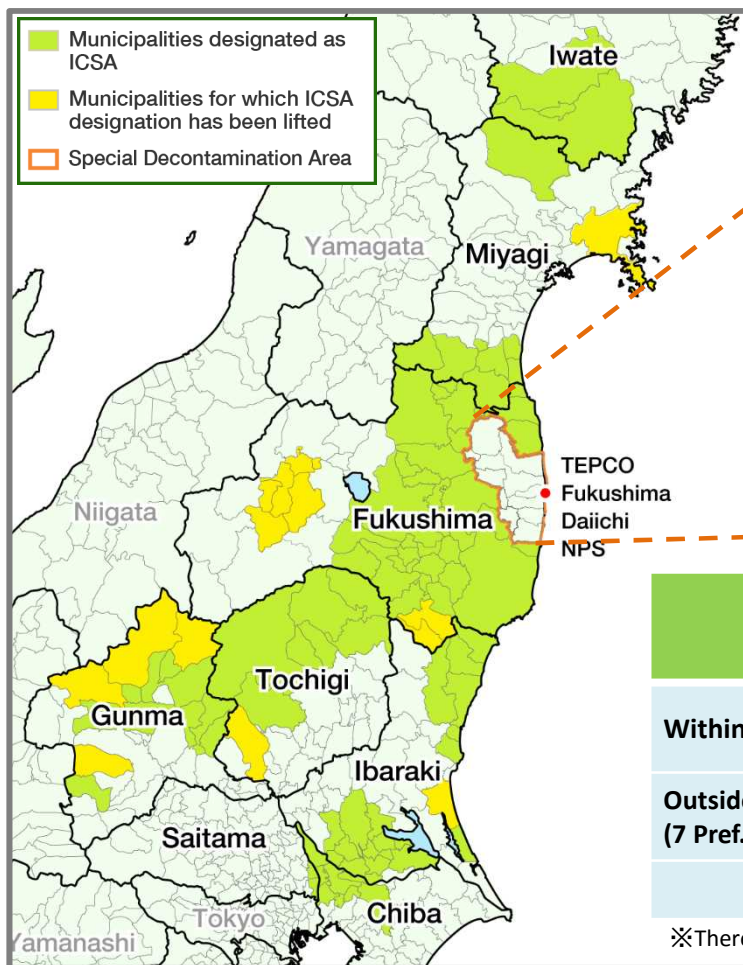
### Specified domestic waste and specified industrial waste

- It is stipulated by MOE’s ordinance that the waste applied for waste treatment law, but might be contaminated by radioactive materials diffused from the NPS accident. It is managed based on treatment criteria of the waste treatment law and special treatment criteria on the Act on Special Measures

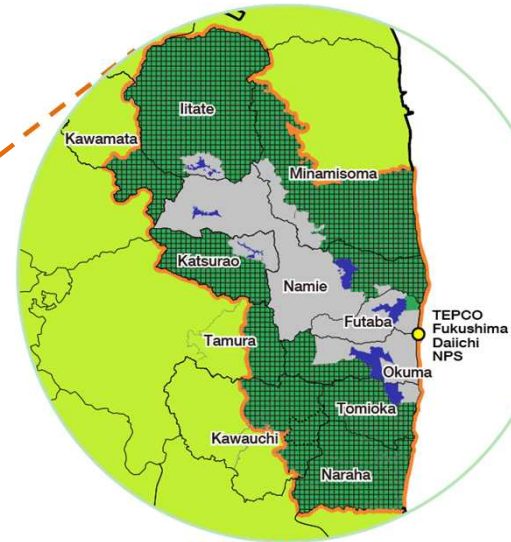
# Result of Whole Area Decontamination

Whole area decontamination based on the Act on Special Measures was completed on March 19, 2018, excluding the Difficult-to-Return Zones (DRZ)

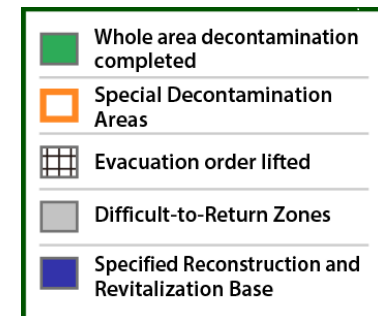
<Intensive Contamination Survey Areas (ICSA)>



<Special Decontamination Areas (SDA)>



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



	Municipalities where whole area decontamination was completed		
		SDA (11)	ICSA (93)
Within Fukushima Pref.	43※	11	36
Outside Fukushima Pref. (7 Pref.)	57	—	57
<b>Total</b>	<b>100</b>	<b>Completed in March 2017</b>	<b>Completed in March 2018</b>

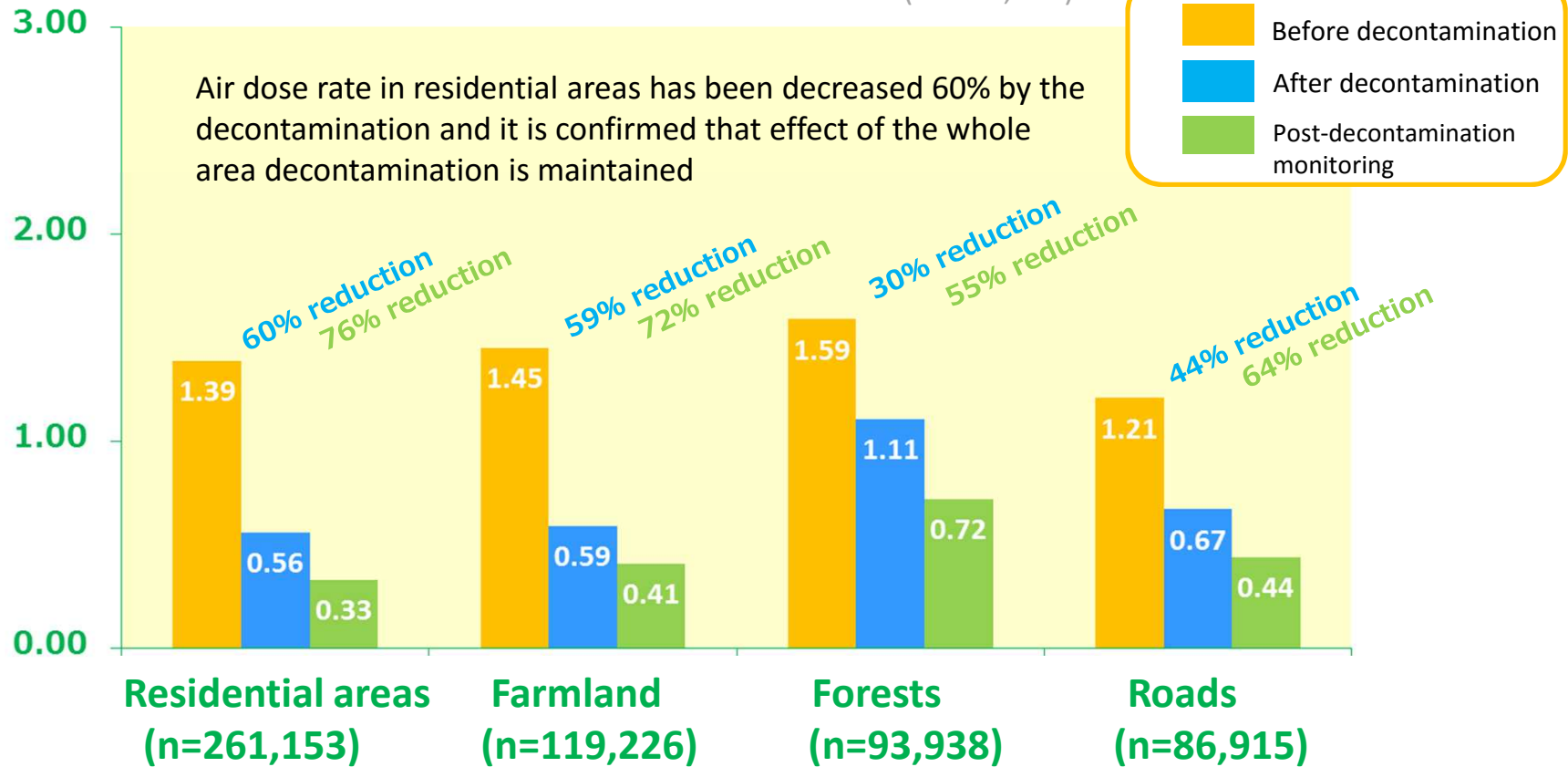
※There are both SDA and ICSA in Minamisoma, Tamura, Kawamata, and Kawauchi

# Effects of Decontamination in SDA

<Air dose rate measured at the height of 1m from the ground / Transition according to land category>

[Air dose rate ( $\mu\text{Sv/h}$ )]

(N=561,232)



NOTE: The chart shows the air dose rate average in each category (aggregated data of measuring points).

Residential areas include schools, parks, cemeteries, and large-sized facilities, farmland includes orchard, and forests include slopes, grassland and lawn.

Post-decontamination monitoring was implemented after 6 months to a year after the decontamination work. The latest result of post decontamination monitoring in municipalities were summarized

[Implementation period] • Monitoring before decontamination

Nov.2011 - Nov. 2016

• Monitoring after decontamination

Dec. 2011 - Dec. 2017

• Post decontamination monitoring

Oct. 2014 - Aug. 2018

# Scale of Whole Area Decontamination Project

- ◆ The MOE has budgeted approx. JPY 2.9 trillion (= USD 27 billion) for decontamination until FY2018.
- ◆ 17mil. m<sup>3</sup> (among which approx. 16.5mil. m<sup>3</sup> were from Fukushima Prefecture) of contaminated soil and wastes were removed until the end of FY2017.
- ◆ MOE published "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. 13,700,000 workers  
※as of the end of March 2018
- Budget: approx. JPY 1.5 trillion  
※ MOE's budget until FY2018
- Volume of the generated soil:  
approx. 9,100,000 m<sup>3</sup>  
※Estimation as of the end of March 2018
- Transported volume of soil from TSS\*:  
approx. 1,900,000 m<sup>3</sup>  
(ISF: approx. 280,000 m<sup>3</sup>, Volume Reduction Facility: approx. 1,620,000 m<sup>3</sup>) ※Estimation as of the end of 2018

※Considered 1US\$ =JPY107

## Decontamination in ICSA

- Total number of labor:  
approx. over 18,400,000 workers  
※ estimated from interviews with relevant municipalities as of the end of March 2018
- Budget: approx. JPY 1.4 trillion  
(within Fukushima Pref. : approx. JPY 1.4 trillion,  
outside Fukushima Pref. : approx. JPY 40 billion  
※MOE's budget until FY2018)
- Volume of the generated soil:  
approx. 7,900,000 m<sup>3</sup> (estimation)  
(within Fukushima Pref.: approx. 7,400,000 m<sup>3</sup>, outside Fukushima Pref.: approx. 500,000 m<sup>3</sup>, both are estimation as of March 2018)
- Transported volume of soil from TSS:  
approx. 1,700,000 m<sup>3</sup>  
(ISF: approx. 500,000 m<sup>3</sup>, Volume Reduction Facility: approx. 1,200,000 m<sup>3</sup>) ※Estimation as of the end of March 2018

# Prospects on Export of Removed Soil and Restoration of Land in Temporary Storage Sites (TSS) <Estimation>

By early 2020, max. 60% of the removed soil from approx. 1,300 TSS\*<sup>1</sup> will be transported to the ISF, and up to 40% of land restoration will be completed, according to estimation based on prospect\* of the transportation to the ISF and continuously aim to proceed transportation and land restoration at an early stage

\*FY2018: Approx. 1.8 mil. m<sup>3</sup>  
FY2019: Approx. 4 mil. m<sup>3</sup> are planned

## Image of transportation and land restoration

### Transportation to the ISF / Land restoration



Storage situation

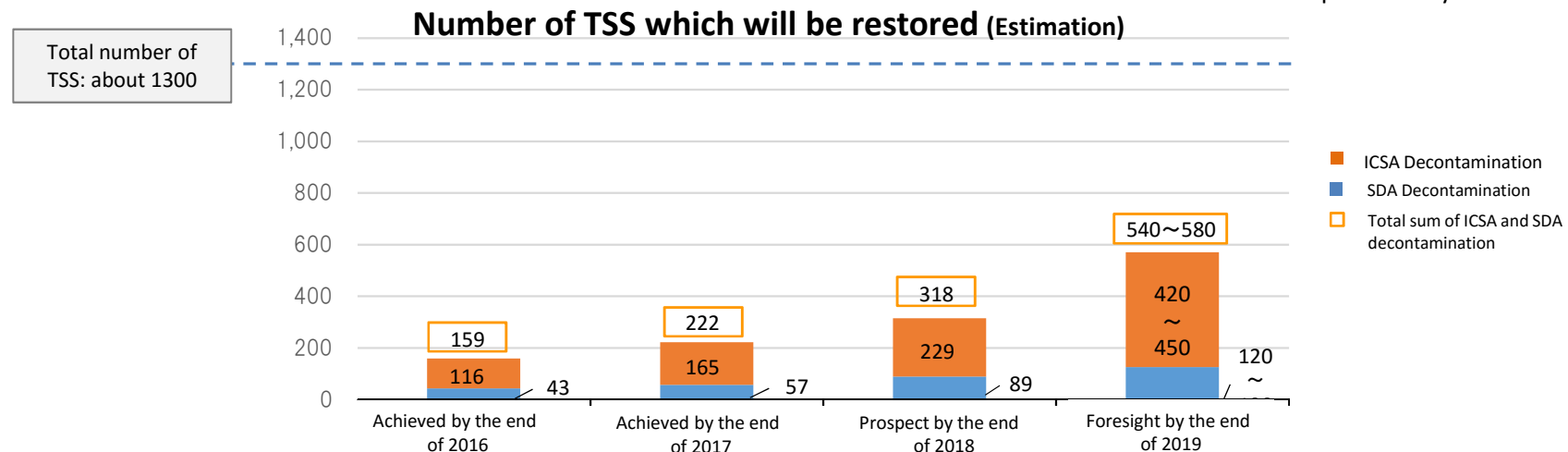


After land restoration

### Restart farming by the land owner



Photos provided by Nihonmatsu City





# Progress in Specified Reconstruction and Revitalization Base (SRRB)

- ◆ By revised “Act on Special Measures for the Reconstruction and Revitalization of Fukushima in 2017, 6 municipalities could make plans to construct “Special Reconstruction and Revitalization Base(SRRB)”, aiming at lifting evacuation orders and allowing the residents to return homes.
- ◆ The dismantling and decontamination works started in 6 municipalities.

## Examples

Before  
decontamination

Decontamination work

After decontamination

Tomioka



Okuma



Before dismantling

Dismantling work

After dismantling

Futaba



Result and Effect of the Whole Area  
Decontamination

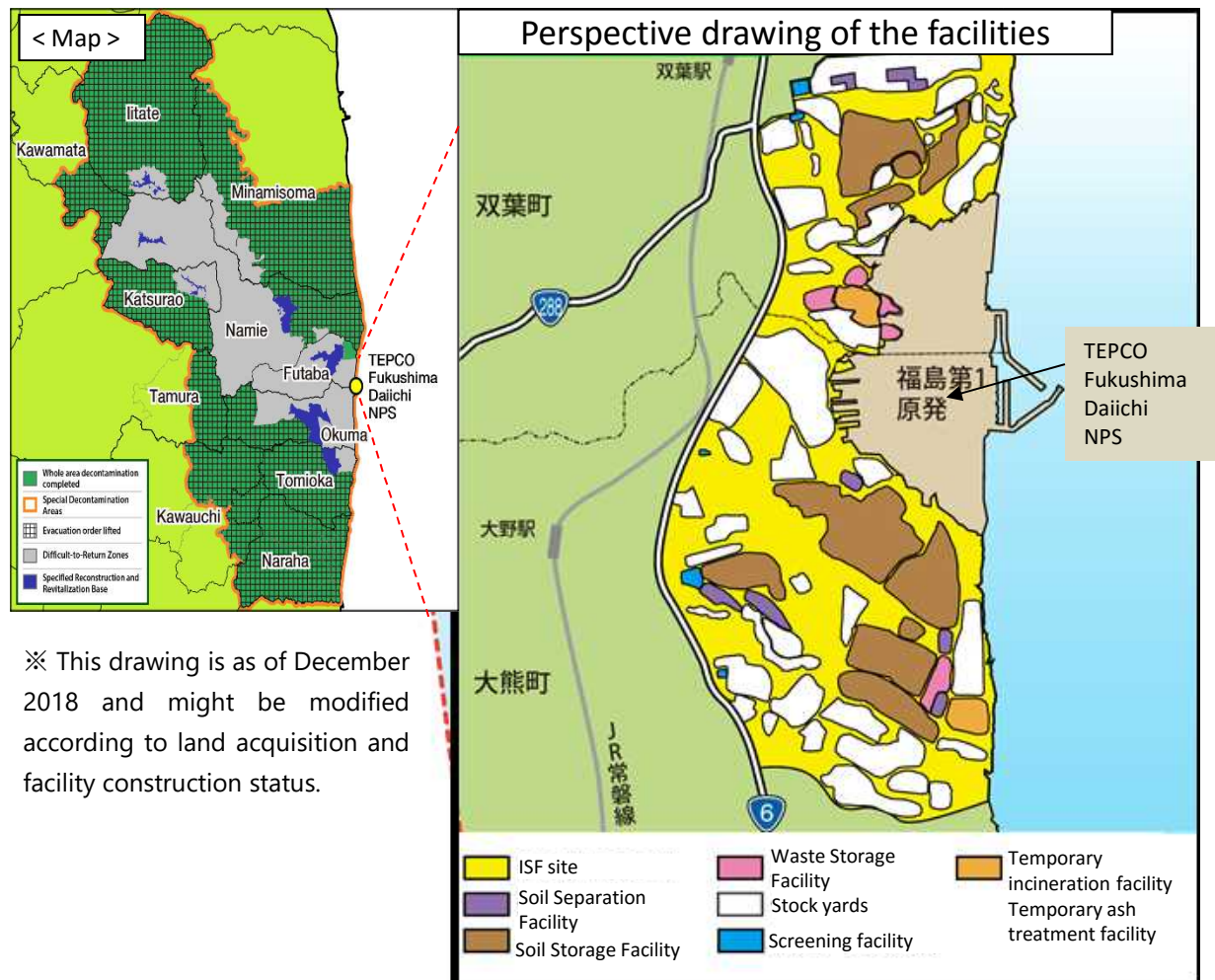
## **Interim Storage Facility**

Disposal of the Specified Waste

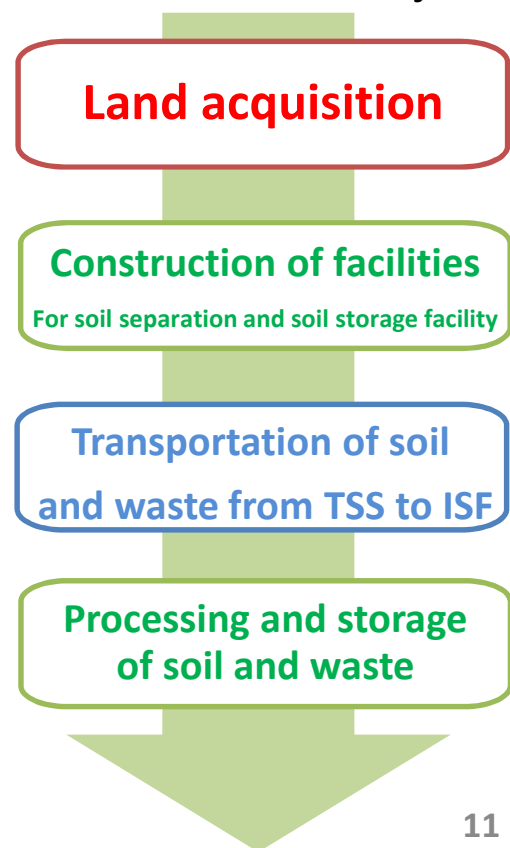
Communication to the Public and  
International Societies

# Interim Storage Facility (ISF)

- In Fukushima Prefecture, large quantities of removed soil and waste have been generated from decontamination works.
- **The Interim Storage Facility is necessary to safely and intensively manage and store the soil and waste until the final disposal.**
- Removed soil and waste derived of decontamination works, and specified wastes (> 100,000 Bq/kg) are stored.
- The total volume is currently estimated at around 14 mil. m<sup>3</sup>, with the further review reflecting the actual circumstances.



## 【Process of the ISF Project】





# Current Status of Interim Storage Facility

## Photo of the ISF taken by drone



Source : [http://www.jesconet.co.jp/interim\\_infocenter/index.html](http://www.jesconet.co.jp/interim_infocenter/index.html)



# Progress of Land Acquisition of the ISF

As of the end of  
April 2019

Whole Area Ca. 1,600ha	Item		Ratio to the whole area	Ratio and the number of people registered to whole registration record (2,360 pers.※1)
	Landowners with contact information		Ca. 1,560ha ※1 97.5%	Ca. 1,950 pers. ※1 82.6%
Private land Ca.1,270ha (Ca.79%)	Contracted	Private land out of contracted land Ca. 1,075ha	Ca. 1,114ha (69.6%)	<b>1,692 pers. ※2</b> <b>71.7%</b> <div>                     The ratio to 1,950 pers. landowners with contact information: 86.8%                 </div>
		Public land out of contracted land Ca. 39ha		
National/ Municipality land Ca.330ha (Ca. 21%)	Other public land		Ca. 291ha (18.2%)	<Reference> Ca. 1,405ha (87.8%)

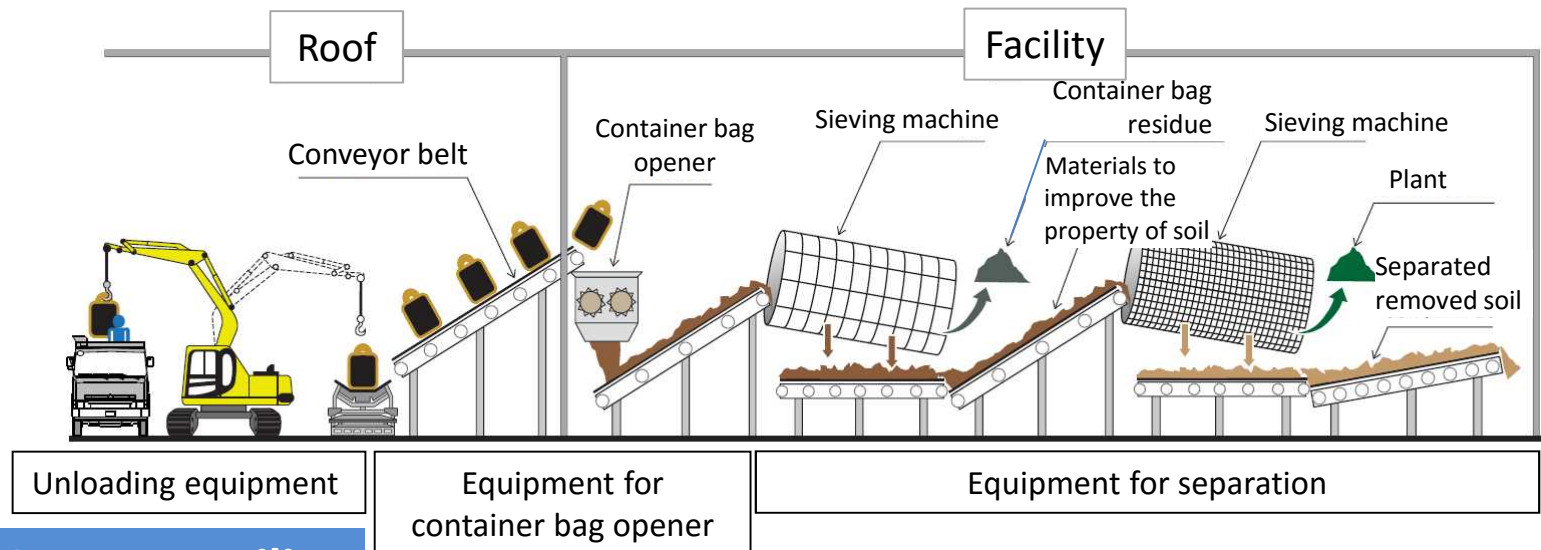
※1 Including National/Municipality  
institutions

※2 Private landowner: 1,690 pers.  
Public land: 2pers.

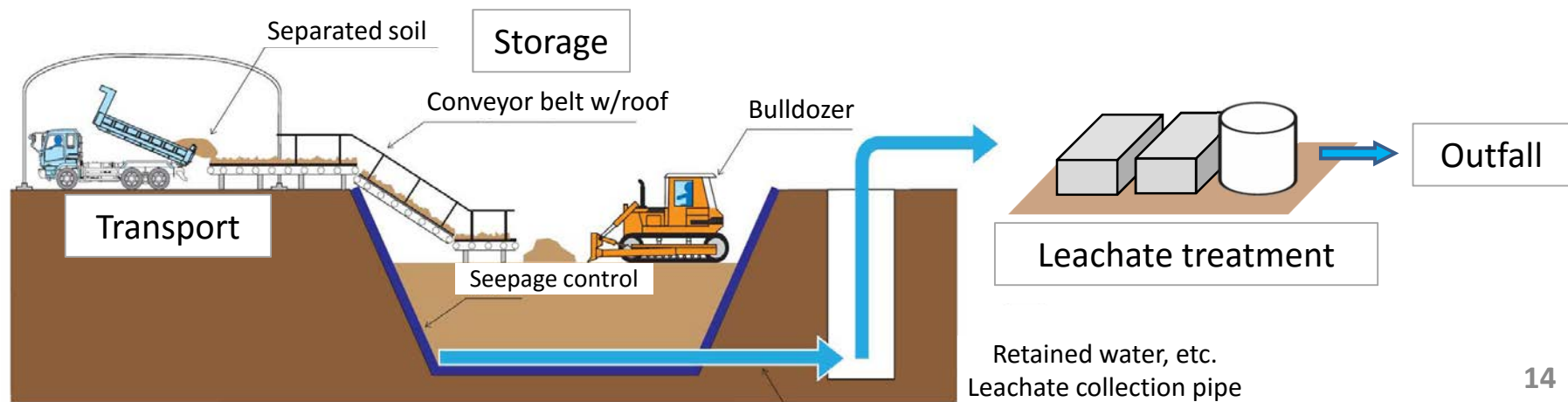
# Soil Separation / Storage Facility

- ◆ Soil Storage Facility started the operation in October 2017 in Okuma and in December 2017 in Futaba

## Soil Separation Facility



## Soil Storage Facility



# Operational Status of the ISF

- ◆ Construction of the facility started in November 2016
- ◆ The operation of Soil 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



Soil Separation Facility (in Futaba)



Soil Storage Facility (in Okuma)

# Transportation to the ISF

- ◆ In FY2018, approx. 1,800,000m<sup>3</sup> of the removed soil was already transported to the ISF
- ◆ In FY2019, approx. 4,000,000 m<sup>3</sup> of the soil is planned to be transported
- ◆ Safe and secure transportation will be sequentially conducted managing whole numbers of transport objects, managing traffic of trucks, and implementing environmental monitoring, and etc.

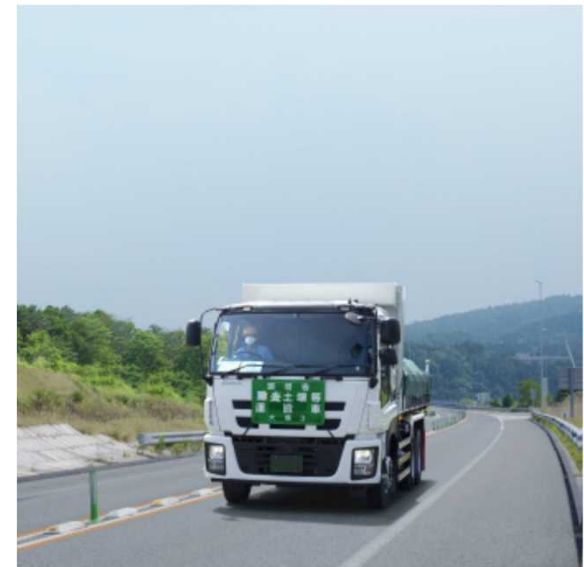
## Actual achievement (As of April 23, 2019)

- ◆ Stored volume: 1,839,054 m<sup>3</sup> in FY2018  
180,135 m<sup>3</sup> in FY2019  
(2,804,564 m<sup>3</sup> in TTL)

\* Calculated on the assumption that the volume of a large bag is 1 m<sup>3</sup>

- ◆ Total number of trucks used: 270,135 in FY2018  
26,365 in FY2019  
(422,176 in TTL)

\* 6 m<sup>3</sup> (6 bags) of removed soil is loaded on each truck



A truck transporting removed soil



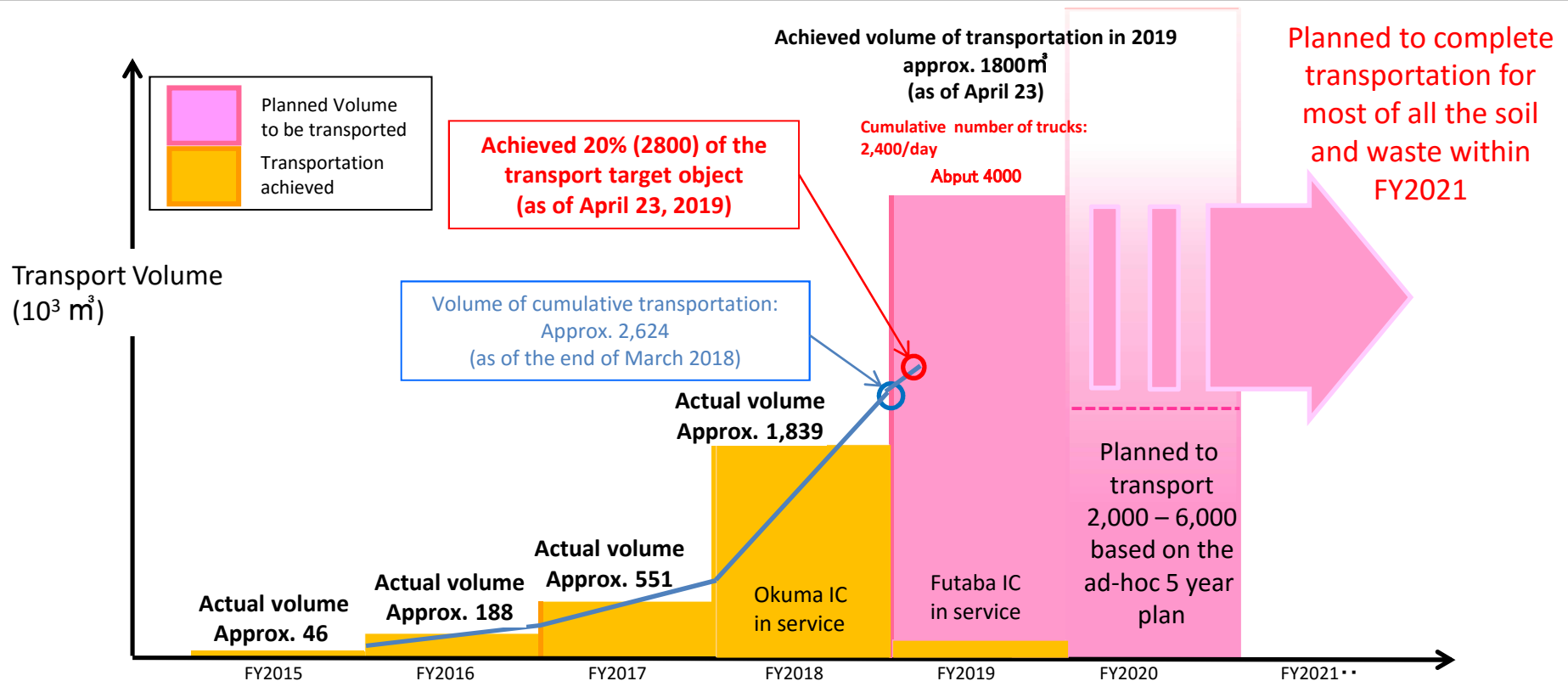
# Prospect for Ad-hoc Policy on Interim Storage Facility

- ◆ Towards the delivery to the ISF of 14 mil.  $\text{m}^3$  (\*) of transport target objects, transportation volume will be sequentially increasing in the light of land acquisition and facility construction situation

\*As of January 2019

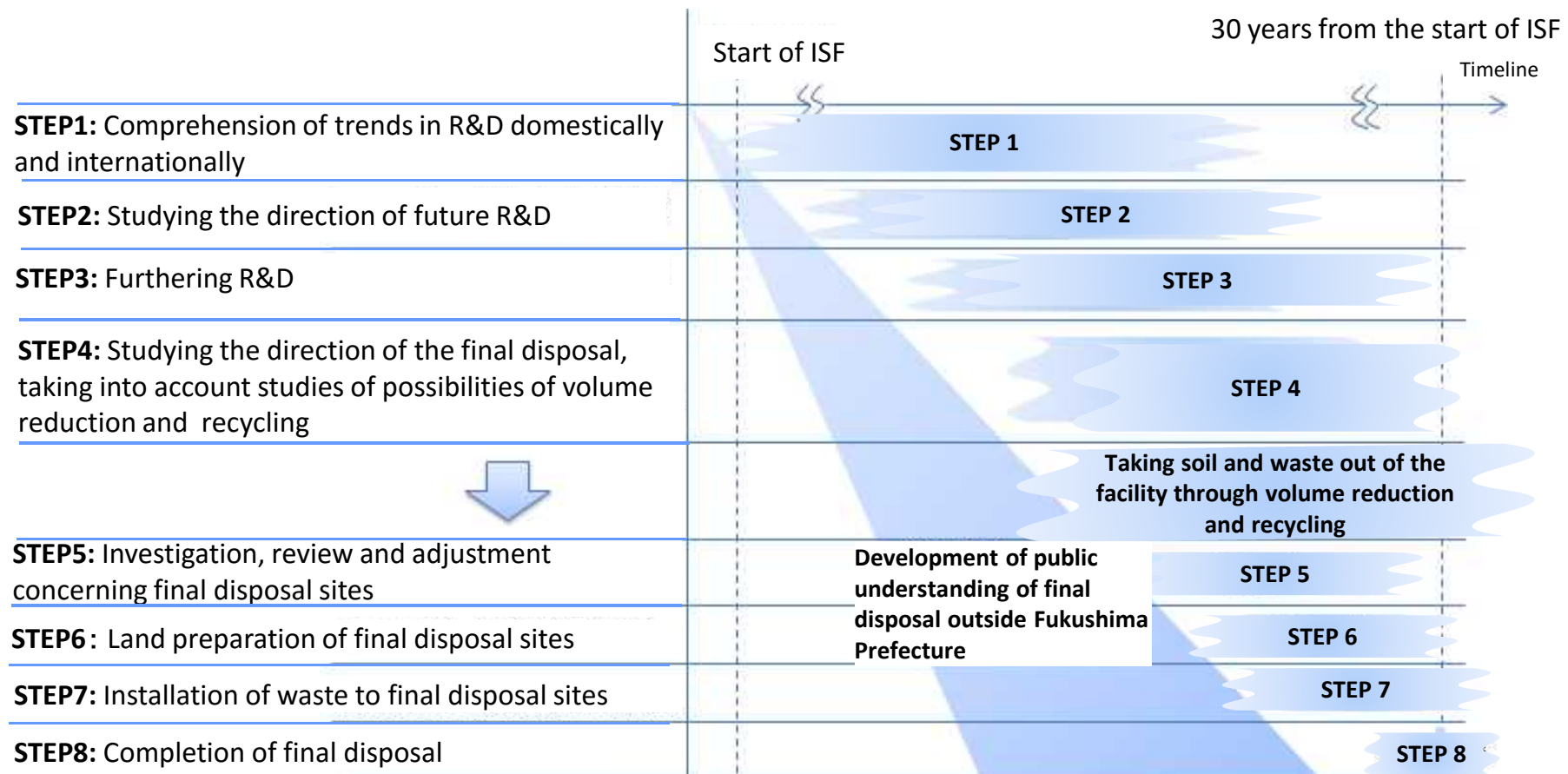
< Announcement of “Policy on Interim Storage Facility Project in FY2019” on December 6, 2018 >

- In FY2019, 4mil.  $\text{m}^3$  will be transported aiming to reduce a number of TSS close to the residential areas
- By FY2021, MOE aims to complete transportation of most of the removed soil and waste (except DRZ) which temporarily stored in Fukushima Prefecture.



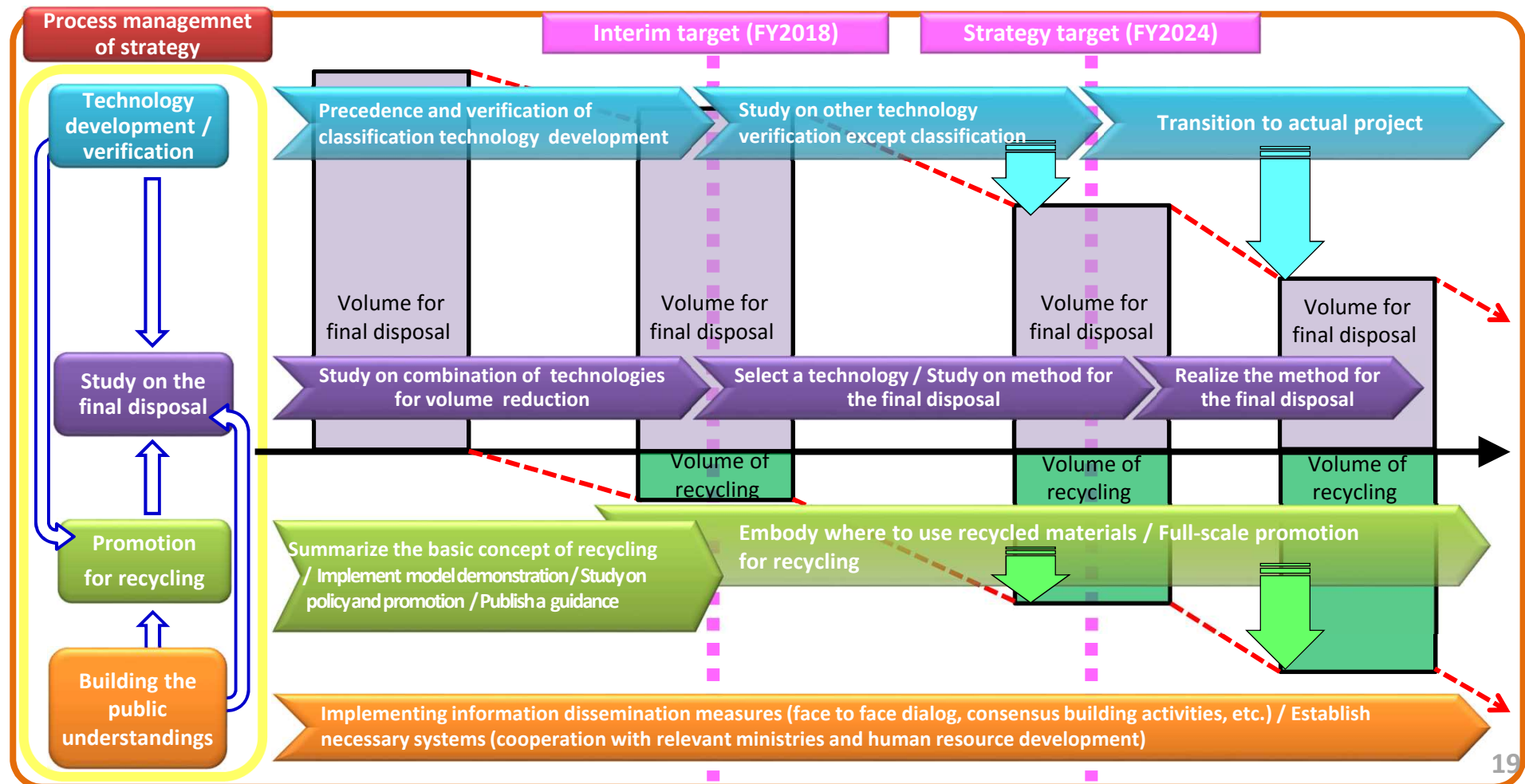
# 8 Steps towards the Final Disposal outside Fukushima Prefecture within 30 years from the Start of the ISF

- MOE conducts R&D to examine how the final disposal to be implemented taking into account the effect of radioactive decay and the potential of volume reduction and recycling
- MOE shares the information with the public to build the consensus for recycling of lower contaminated soil and the final disposal outside Fukushima Prefecture



# Technology Development Strategy for Volume Reduction & Recycling of the Removed Soil

- Towards the final disposal of the removed soil outside Fukushima Pref., MOE will promote recycling of the soil after volume reduction technology as much as possible, which consequently would lead to reduce the volume of soil for the final disposal
- After clarifying the objectives and priority of technology development and volume reduction & recycling, basic technology development is planned to be completed within 10 years, then move onto a phase of treatment
- On the premise of securing safety, MOE will try to realize the recycling in the possible field, building public understandings for the safety
- Based on technology development and prospect of recycling in the future, MOE would propose some options for structure and necessary dimension of the final disposal



# Concepts on Safe Use of the Removed Soil after Recycling (June 2016)

## 【Basic Concept】

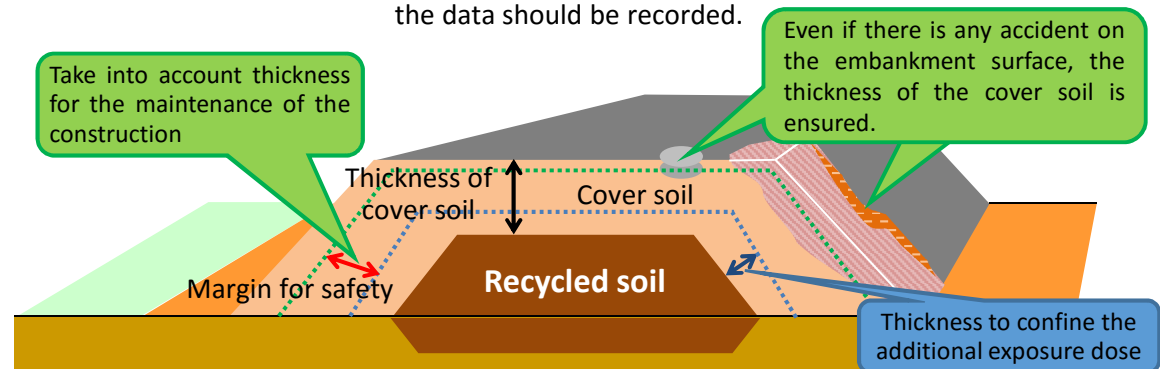
The removed soil should be used mainly for public projects with a responsible management system for the controlled materials (with a radioactivity level below 8,000Bq/kg in principle and set according to purpose) after necessary treatment, e.g. removal of debris, classification treatment. The use will be limited, such as the basic structure material of an embankment which is not assumed to change shape artificially, and be managed appropriately.

### Limited use

- The use will be limited to the material which is not assumed to change shape artificially for a long time period, e.g. basic structure material of banking for coastal levees or seaside protection forests, embankment materials for roads, cover soil for waste disposal sites, landfill materials and basic structure for farms of flowers and energy crops.

### Appropriate management

- The projects will be mainly public projects with a responsible management system.
- The radioactive cesium concentration in the removed soil should be limited in order to confine the additional exposure dose. The additional exposure dose should be below 1mSv/y during the construction and below 0.01mSv/y at the time of service.
- Covering soil should be installed, scatter and leakage should be prevented, ground form change should be observed, and the data should be recorded.



The thickness of cover soil should be designed to ensure the necessary thickness to confine the additional exposure dose, even when the general maintenance for the construction is conducted.

### How to proceed recycling

As the environmental improvement towards the practical recycling of the removed soil, demonstration projects and model projects based on the above concepts should be implemented keeping the safety against radiation, studying specific verification of the management method and building stakeholders' and public understanding.



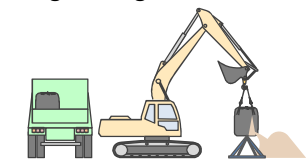
# Demonstration Project for Recycling in Minamisoma City

Demonstration project is currently being implemented in Minamisoma City, studying specifically on handling radiation during the procedure of recycling and ensuring 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-)

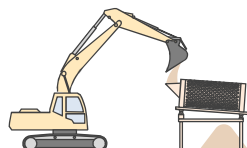
1. Open sandbags and remove large stones and debris

Open large sandbags and remove large foreign materials



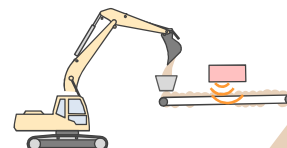
2. Further eliminate smaller debris

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 an embankment (such as water content and grain sizes)



vegetation



stones



pebbles

## 2. Test embankment process (May 2017-)

5. Construct test embankment / Monitoring

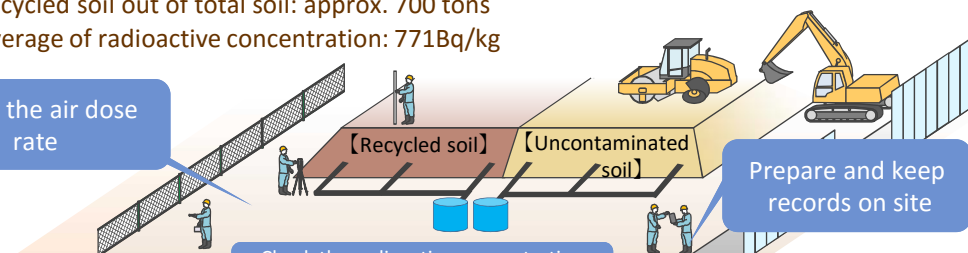
- Construct a test embankment (covered with uncontaminated soil by 50cm)
- Continue to measure the air dose rate and other indicators

- 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

Check the air dose rate

Check the radioactive concentration of leachate

Prepare and keep records on site



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

Since the test embankment was constructed, **radioactive materials have not been detected in the leachate**



【Result of council of advisers】

- ◆ **Confirmed safety in this method** for recycling demonstration
- ◆ To accumulate data continuously conducting demonstration project

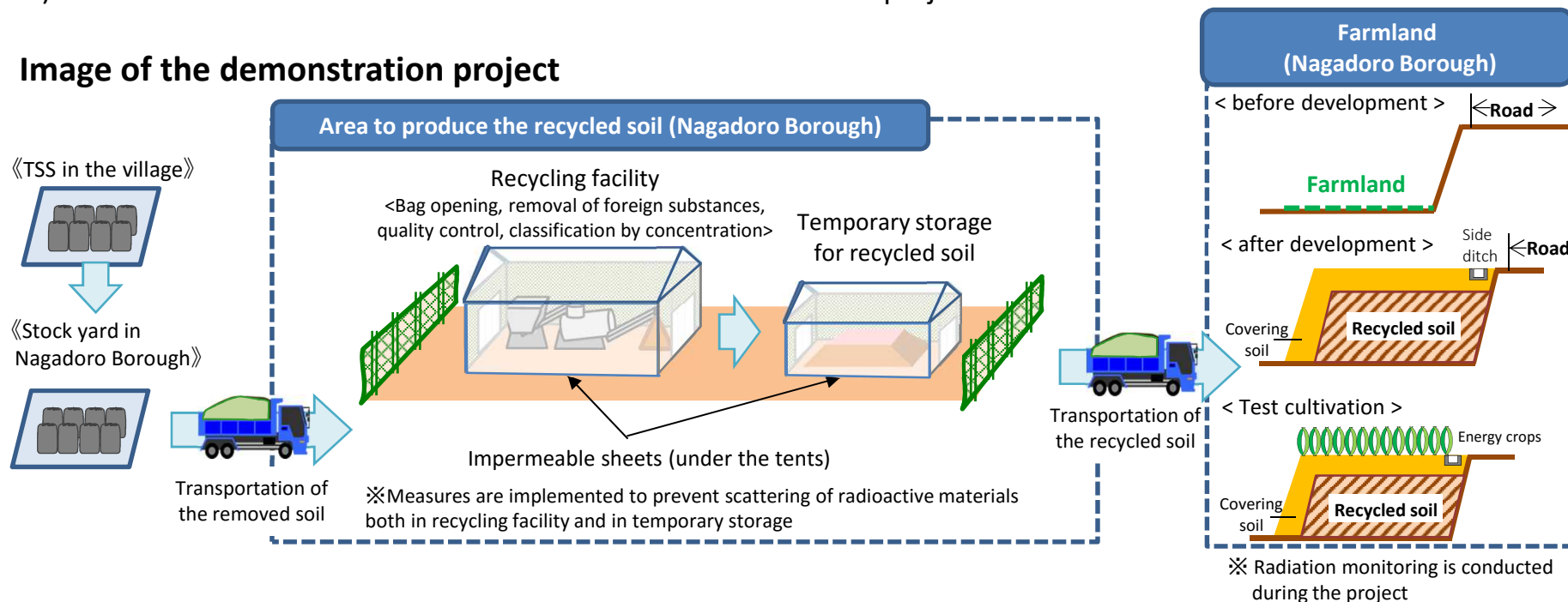
# Demonstration Project for Recycling in Iitate Village

Another demonstration project is planned in Iitate Village. In response to the request from Iitate Village, the removed soil stored at TSS in Iitate Village will be recycled, and experimented in cultivation of flowers and energy crops in Nagadoro Borough of the village.

## Contents of the demonstration project

- 1) Transport the removed soil from TSS in Iitate Village to the stock yard in Nagadoro Borough
- 2) Produce the recycled soil by separating foreign materials from the removed soil, classifying upon the radioactive concentration, and controlling the quality after construction of the recycling facility
- 3) At the demonstration project site, develop the basement of the farmland with the recycled soil covering the surface with uncontaminated soil
- 4) Conduct test cultivation at the farmland in the demonstration project site

## Image of the demonstration project



Result and Effect of the Whole Area  
Decontamination

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**Disposal of the Specified Waste**

Communication to the Public and  
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# Progress on Disposal of waste in the Countermeasure Areas (Fukushima Prefecture)

As of April 26, 2019

- ◆ Transportation of disaster waste to the TSS has completed 2.26mil. tons as of the end of March 2019 (of which 400,000 tons were incinerated, 1,440,000 tons were recycled and 28,500 tons were landfilled)
- ◆ Transported disaster waste has been recycling as large as possible

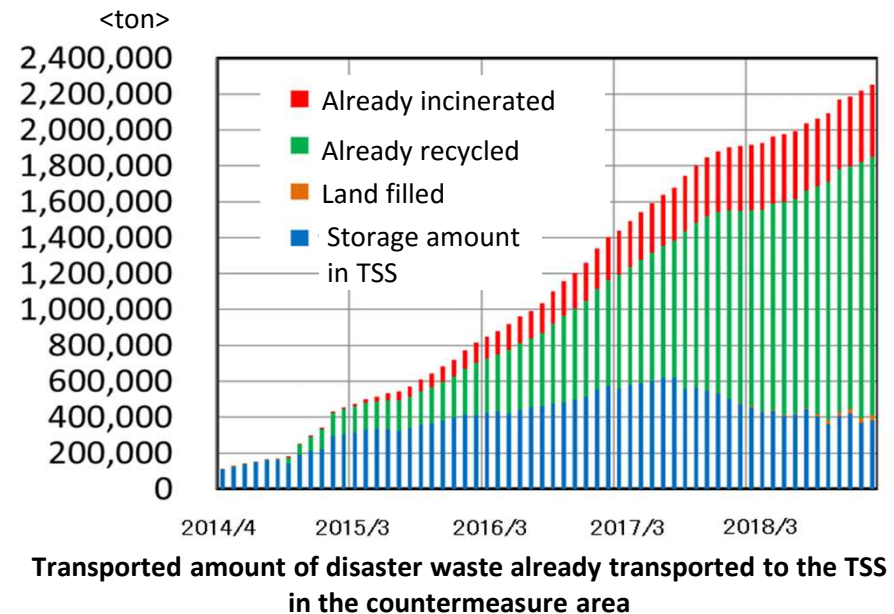
## < Status of disaster waste by category >

### (1) Disaster waste disposal generated by Tsunami

- ◆ All the debris excluding that from Difficult-to-Return Zones (DRZ) has completed to remove and transport to the TSS as of March 2016
- (2) Dismantling and removal of collapsed houses
  - ◆ It is under operation to take application for dismantling and investigation, then conduct dismantling and removal
  - ◆ Application for dismantling and removal of which 15,800 cases were registered, already announced dismantling work, 14,300cases, among which 12,500cases 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



※ Including the treated amount without transporting to the TSS



Dismantling of a collapsed house

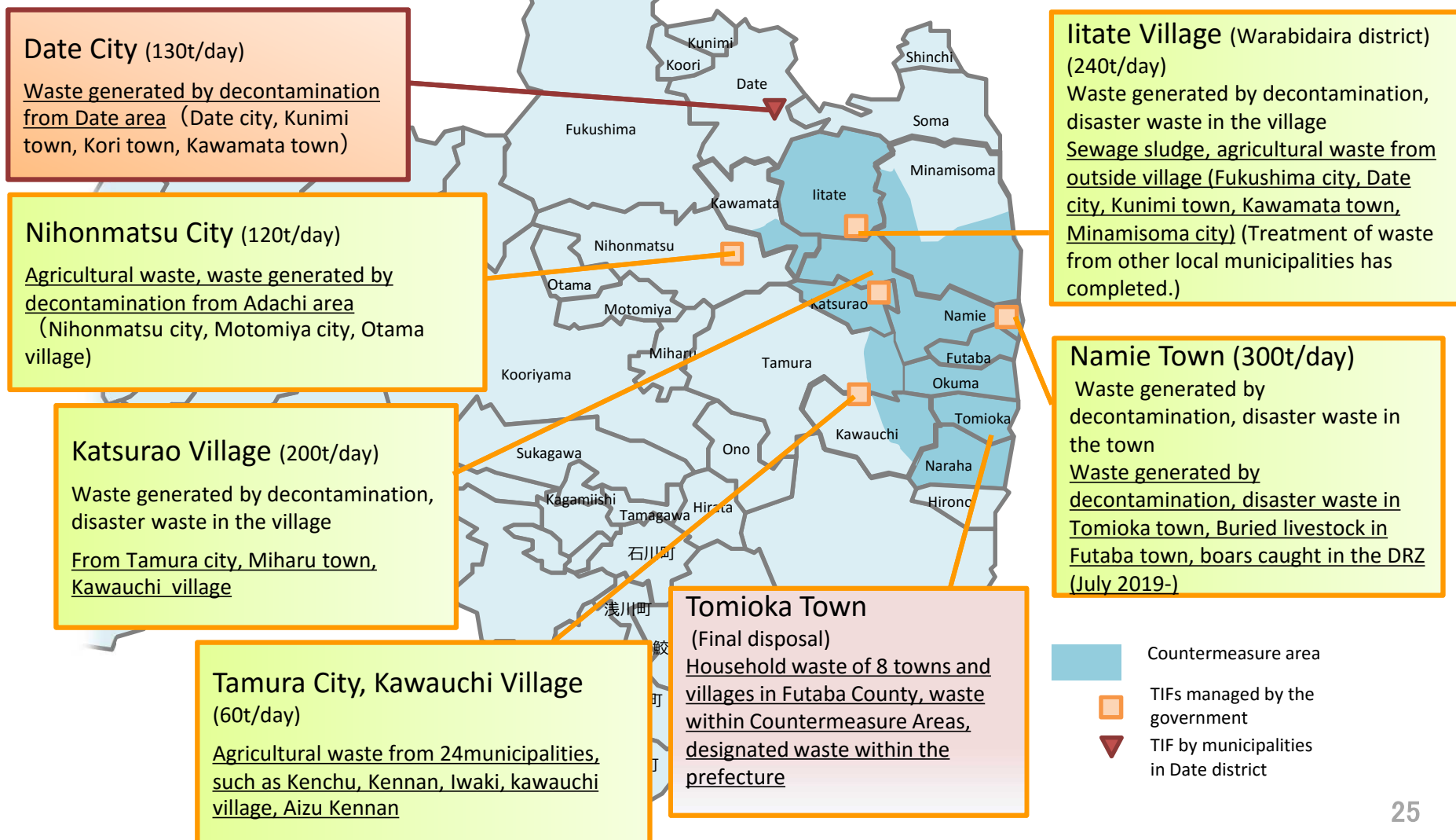


TIF in Okuma



# Implementation Situation of Waste Disposal across Municipalities

- To promote 'Waste disposal across municipalities': city/town/village hosting TIFs accept waste from other cities.
- Currently, Namie Town decided to accept boars' disposal caught at DRZ in Futaba County.
- Nihonmatsu City will start 'Waste disposal across municipalities' at the TIFs in April.2019.



# Disposal Project utilizing Existing Controlled Landfill Site

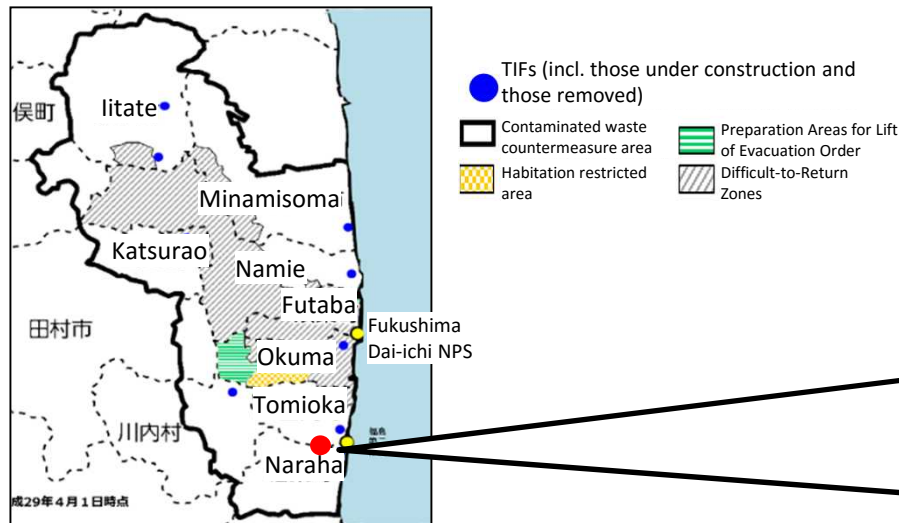
- ◆ As for Landfill disposal project for specified waste, the transportation to the site started on Nov. 17, 2017
- ◆ 68,873 container bags of waste mostly from Tomioka and Naraha Towns were transported (as of the end of April. 2019)
- ◆ Monitoring survey result before and after transportation shows no significant increase of air dose rate

## Outline of the facility

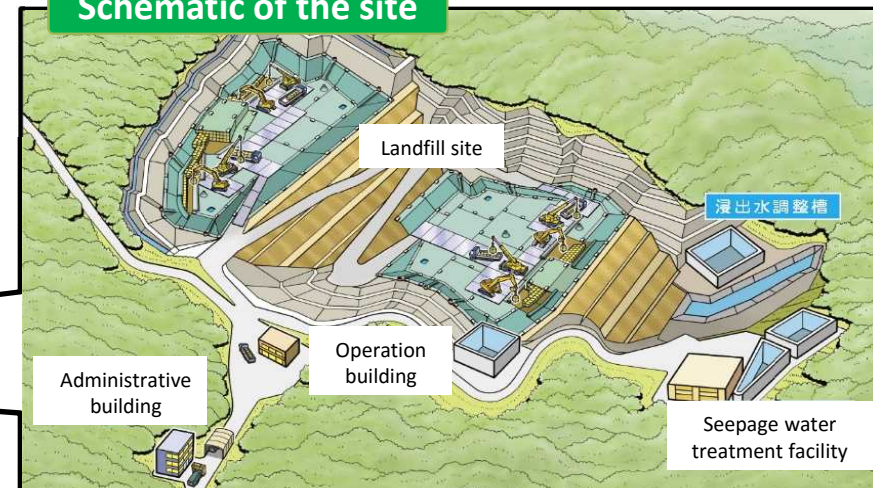
- ◆ To use **existing controlled landfill site** (formerly Fukushima Eco Tech Clean Center)
- ◆ To locate it in **Tomioka** (access from **Naraha**)
- ◆ The facility has been **nationalized** after local coordination
- ◆ Positioning as **the final disposal site**

## Target object for landfill / Transport period

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



## Schematic of the site



Result and Effect of the Whole Area  
Decontamination

Interim Storage Facility

Disposal of the Specified Waste

**Communication to the Public and  
International Societies**

# Information Exchange with Local Communities

MOE has been making efforts to share the information with local communities;

- ◆ “Environmental Regeneration Plaza” provides seminars and dispatches experts to town meetings and schools with the cooperation of Fukushima Prefecture
- ◆ “Reprun” helps you to understand specified waste landfill project.
- ◆ “Interim Storage Facility(ISF) Information Center” provides you the progress of ISF and radiation monitoring data.

Fukushima Regeneration Plaza  
at Fukushima City



Reprun at  
Tomioka Town

ISF Information Center  
at Okuma Town



# Current PR Activities by MOEJ

Ministry of the Environment, Japan (MOEJ) released an English booklet in August 2017. English web-site, “Environmental Remediation” was also renewed and two TV shows are now available on MOE’s web site.

## English booklet



A comic style booklet, “Nasubi no Gimon” was released in August 2017, explaining radiation measures for food, etc.

## Renewal of the MOE web-site



MOE renewed the web-site, adding more updated information  
<http://josen.env.go.jp/en/>

## TV programs

**“Fukushima Diaries” by Discovery Channel:** In this 30-minitues show, three famous bloggers from overseas visited different destinations in Fukushima Pref. with their own interests. They showed the viewers what is really going on in Fukushima  
[http://josen.env.go.jp/en/movie\\_publication/cooperation\\_index.html](http://josen.env.go.jp/en/movie_publication/cooperation_index.html)



**Channel Japan/CNBC ASIA:** CNBC broadcasted 15-minitues program 4times in a row. Each program showed you the key persons in Fukushima how hard they work to fight against misconceptions and to revitalize Fukushima. Each content is as follows;



#1 The story of Mr. McMichael, who tries to help widely communicate correct information on Fukushima to international communities



#2 The story of two young people who are eager to revitalize their hometown, Fukushima



- #3 The story of small factories that tackle on the development of robots for decommission.  
#4 The story of Dr. Hayano, who teaches what is radiation from academic point of views.



# Cooperation with International Societies

## **Dec. 5, 2016**

The 4th Meeting of Japan-Ukraine Joint Committee for the cooperation to advance aftermath response to accidents at nuclear power stations (@Tokyo)

## **Apr. 17-21, 2017**

The 3rd IAEA-MOE Experts Meeting on Environment Remediation of Off-Site areas after the Fukushima Dai-ichi Nuclear Power Station Accident (@Tokyo)

## **Oct. 26-27, 2017**

The 6<sup>th</sup> Annual Japan-UK Nuclear Dialogue (@London)

## **Nov. 6-10, 2017**

The 4<sup>th</sup> IAEA-MOE Experts Meeting on Environment Remediation of Off-Site areas after the Fukushima Dai-ichi Nuclear Power Station Accident (@Tokyo)

## **Nov. 21, 2017**

The 7<sup>th</sup> Meeting of the Japan-France Nuclear Cooperation Committee (@Tokyo)

## **Nov. 27, 2017**

The 5<sup>th</sup> Meeting of Japan-Ukraine Joint Committee for the cooperation to advance aftermath response to accidents at nuclear power stations (@Kiev)

## **Aug. 8, 2018**

The 5<sup>th</sup> Meeting of US-Japan Bilateral Commission on Civil Nuclear Cooperation (@Tokyo)

## **Oct. 25, 2018**

The 7<sup>th</sup> Annual Japan-UK Nuclear Dialogue (@Tokyo)

## **Nov. 21, 2018**

The 8<sup>th</sup> meeting of the Japan-France Nuclear Cooperation Committee (@Paris)

