The Current Situation of Off-site Clean-up in Japan

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Off-site Clean-up in Fukushima – Workflow

Decontamination

Contaminated Soil

Temporary Storage Sites (TSS)

Transportation

Incinerated Ash
(>100,000Bq/kg)

Contaminated Soil etc.

Interim Storage Facility (ISF)
*under construction

Contaminated Soil

Final Disposal
*under consideration

History of Off-site Cleanup in Fukushima

March 2011	TEPCO Fukushima Daiichi Nuclear Power Plant accident
August 2011	Act on Special Measures concerning the Handling of Radioactive Pollution (Act on Special Measures) enacted
October 2011	IAEA Mission on remediation of large contaminated areas off-site the Fukushima Dai-ichi NPP
January 2012	Act on Special Measures enforced (start of whole area decontamination)
October 2013	Follow-up IAEA International Mission
Sep 2014 – Jan 2015	Fukushima Prefecture, Okuma and Futaba Towns accepted the construction of the Interim Storage Facility (ISF)
March 2015	Transportation of removed soil to the ISF started
November 2016	Construction of the ISF started
March 2017	Whole area decontamination completed within the Special Decontamination Area (excl. Areas where Returning is difficult)
June 2017	Trial Run of the ISF started

1. Off-site Decontamination

2. Interim Storage Facility

Decontamination based on the “Act on Special Measures”

1) Special Decontamination Area

Designation of SDA
by the Minister

↓

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

↓

Implementation of decontamination
by the national government

2) Intensive Contamination Survey Area

Designation of ICSA by the Minister
（Areas where air dose rate is 0.23μSv/h or more)
※0.23μSv/h is a criterion for designation of ICSA and not a decontamination target

↓

Survey measurement by the mayors

↓

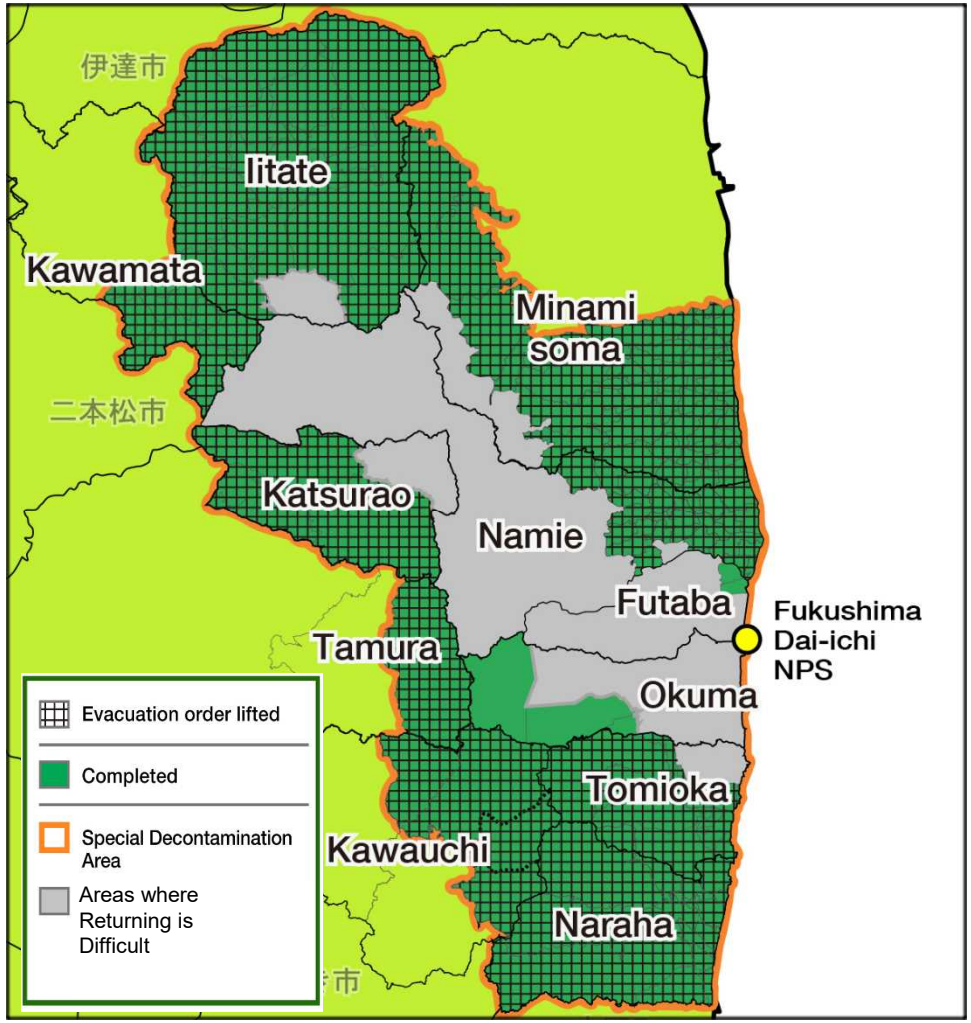
Development of the decontamination implementation plan by the mayors

↓

Implementation of decontamination
by the municipalities, etc.
(The national government allocates budgets.)

Note: The air dose rate 0.23μSv/h corresponds to a cautiously estimated individual exposure dose of 1mSv/y assuming that people spend
① 8 hours outside ② 16 hours in a wooden house with a low shielding rate in a day

Progress in the Special Decontamination Area (as of April 1, 2017)



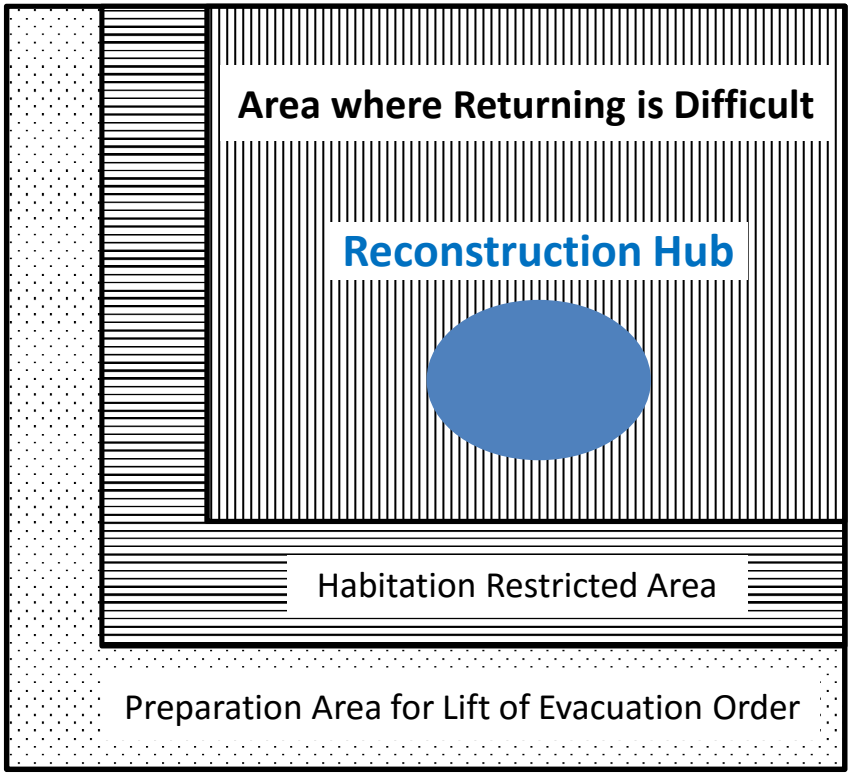
The whole area decontamination in the SDA completed in March 2017, excluding “Areas where Returning is Difficult”.

Evacuation orders have been lifted in 9 municipalities below.

Municipality	Evacuation order was lifted on
Tamura city	April 1, 2014
Kawauchi village	October 1, 2014 June 14, 2016
Naraha town	September 5, 2015
Katsurao village	June 12, 2016
Minamisoma city	July 12, 2016
Iitate village	March 31, 2017
Kawamata village	March 31, 2017
Namie town	March 31, 2017
Tomioka town	April 1, 2017

Recovery of “Areas where Returning is Difficult”

“Reconstruction Hubs” will be set within the Areas where Returning is difficult, where the evacuation orders will be lifted in about 5 years after the radiation dose reduction and the preparation will be made for habitation.



1. Planned by municipalities
2. Authorized by national gov’t
3. Reconstruction in accordance with the plan
4. Reconstruction completed and evacuation order lifted
(5 years after the authorization)

* Reprinted by courtesy of Reconstruction Agency

Progress in the Intensive Contamination Survey Area

◇ Number of municipalities designated as the Intensive Contamination Survey Area:
104 (at the start) → 92 (at present)
The designation was lifted in 12 municipalities due to the radiation dose decrease, etc.

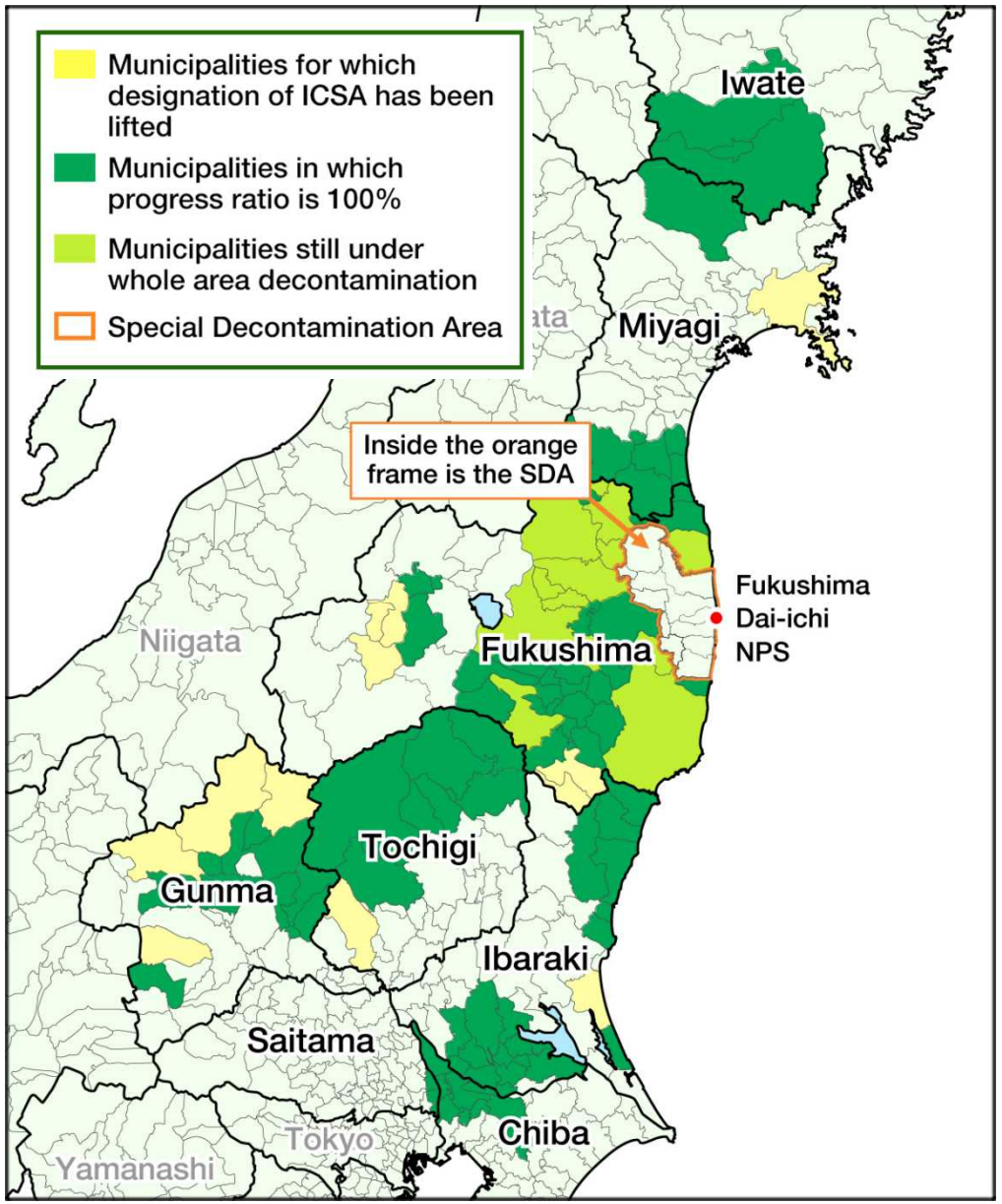
◇ Municipalities in which the progress is 100%:
80 municipalities

◇ Municipalities in process of implementing decontamination based on the plans:
12 municipalities

◇ The progress of decontamination

•In Fukushima Pref. :
(as of the end of April 2017)
Residential houses / Public facilities / farmland & meadows: almost completed
Roads : approx. 90%
Forests in living area: approx. 80%

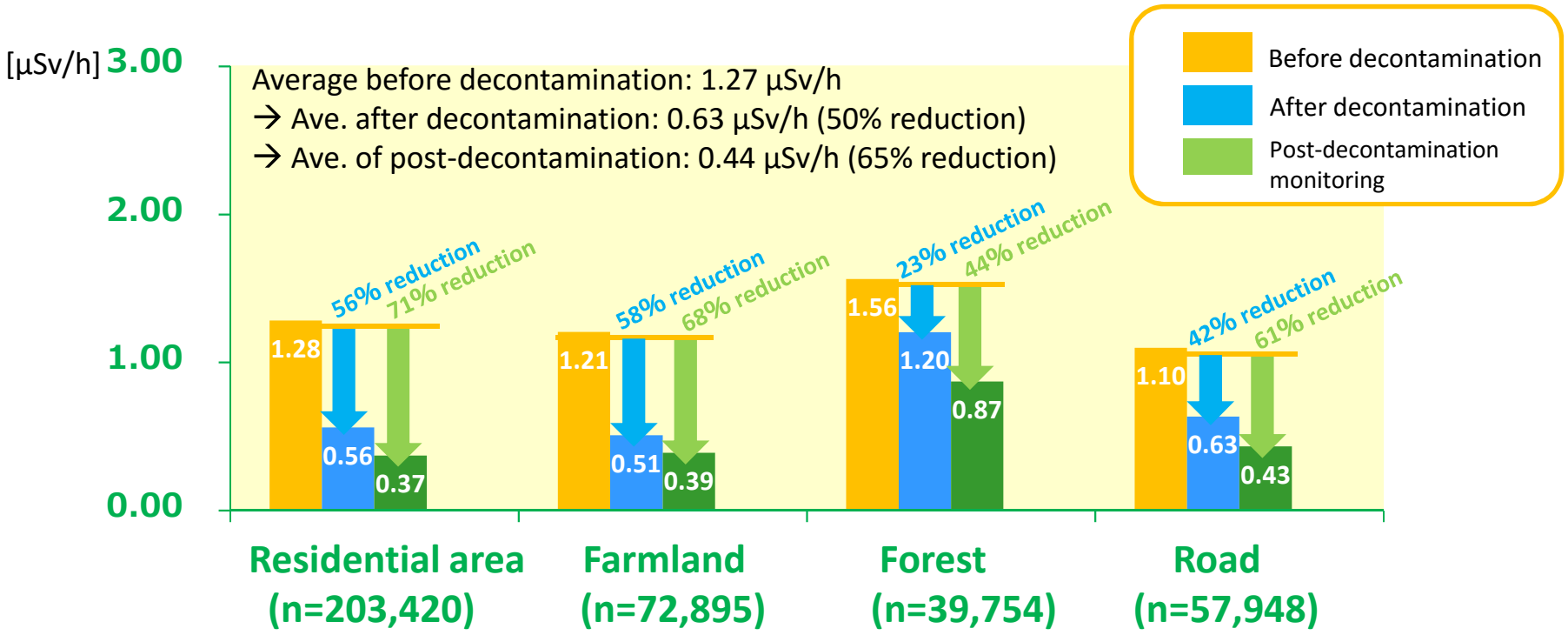
•Outside Fukushima Pref. :
(as of the end of March 2017)
Residential houses / Schools & nurseries/ parks, sports facilities / Roads / Farmland & meadows/ forests in living area: completed in all categories



※Progress of the whole area decontamination as of the end of April 2017

Effects of Decontamination

【Air dose rate at the height of 1m from the ground / Transition according to land category】



Whole SDA

※Only in areas with the data, excluding Areas where Returning is Difficult

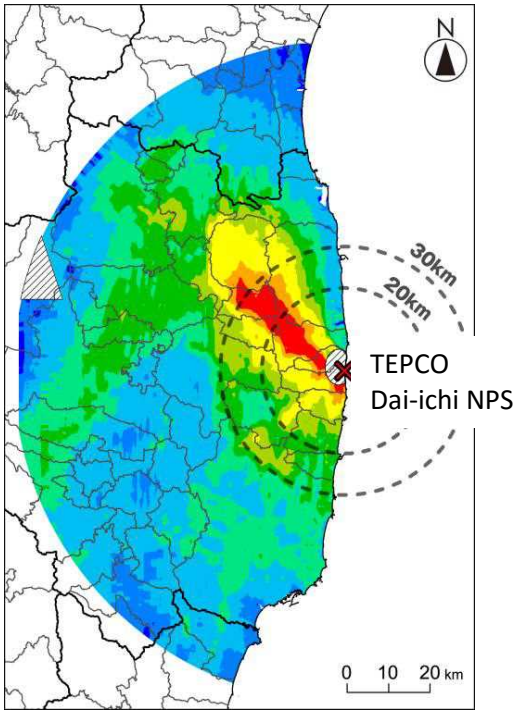
The chart shows air dose rate average in each category (aggregated data of measuring points).
Post-decontamination monitoring was implemented after 6 months to a year after the decontamination work. The latest result of post-decontamination monitoring in municipalities were summarized (the first or the second)

[Implementation period]
- Monitoring before decontamination: Nov.2011 - July 2016
- Monitoring after decontamination: Dec. 2011 - Sep. 2016
- Post decontamination monitoring: Oct. 2014 - Dec. 2016

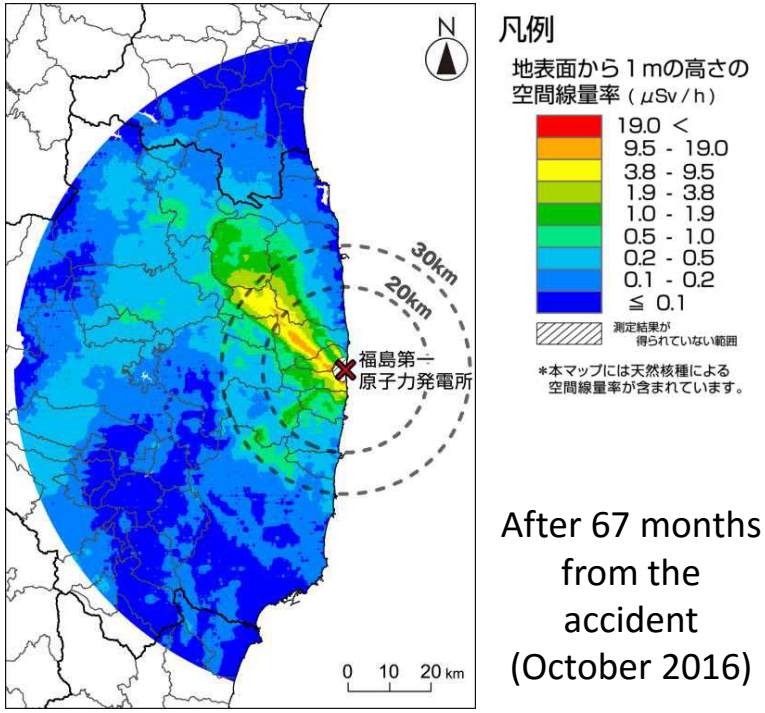
Transition of the Air Dose Rates

Compared air dose rate of 7months after the accident (as of Nov. 5, 2011) with that of 67months after the accident (as of Oct. 15, 2016), 71% decrease was found. This figure showed the decrease was faster than natural decay

Distribution map showing transition of the air dose rate within 80 km radius



After a month from the accident (April 2011)



After 67 months from the accident (October 2016)

“Result of airborne monitoring in and around Fukushima Prefecture (as of February 13, 2017, NSR)

Scale of Whole Area Decontamination Project

The MOE has budgeted approx. 2.6 trillion yen (= USD 24 billion) until FY2016 for decontamination of both the SDA and the ICSA. 16,000,000㎥ of contaminated soil and wastes is estimated to have been removed.

Decontamination in SDA

- Total number of labor:
  approx. 13,000,000 workers
- Budget: approx. USD 12billion
  ※ MOE's budget until FY2016 (excluding unnecessary cost)
- Volume of the generated soil:
  approx. 8,400,000㎥

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

* Volume transported either to the ISF or to Temporary incineration facility

Decontamination in ICSA

- Total number of labor:
  approx. over 17,000,000 workers
  ※ estimated from interviews with relevant municipalities
- Budget: approx. USD 12billion
  (within Fukushima Pref. : approx. JPY 1.2trillion,
  outside Fukushima Pref. : approx. JPY 0.5trillion
  ※MOE's budget until FY2016 (excluding unnecessary cost)
- Volume of the generated soil:
  approx. 7,200,000㎥ (estimation)
  (within Fukushima 6,800,000㎥,
  outside Fukushima 400,000㎥, both are estimation)

  From the above volume of soil already transported from TSS*: approx. 1,100,000㎥
  (as of the end of January 2017)

1. Off-site Decontamination

2. Interim Storage Facility

What is an Interim Storage Facility (ISF)?

♦In Fukushima Prefecture, large quantities of contaminated soil and waste have been generated from decontamination activities.
♦Currently, it is difficult to clarify methods of final disposal of such soil and waste.
♦Until final disposal becomes available, it is necessary to establish an Interim Storage Facility (ISF) in order to manage and store soil and waste safely.

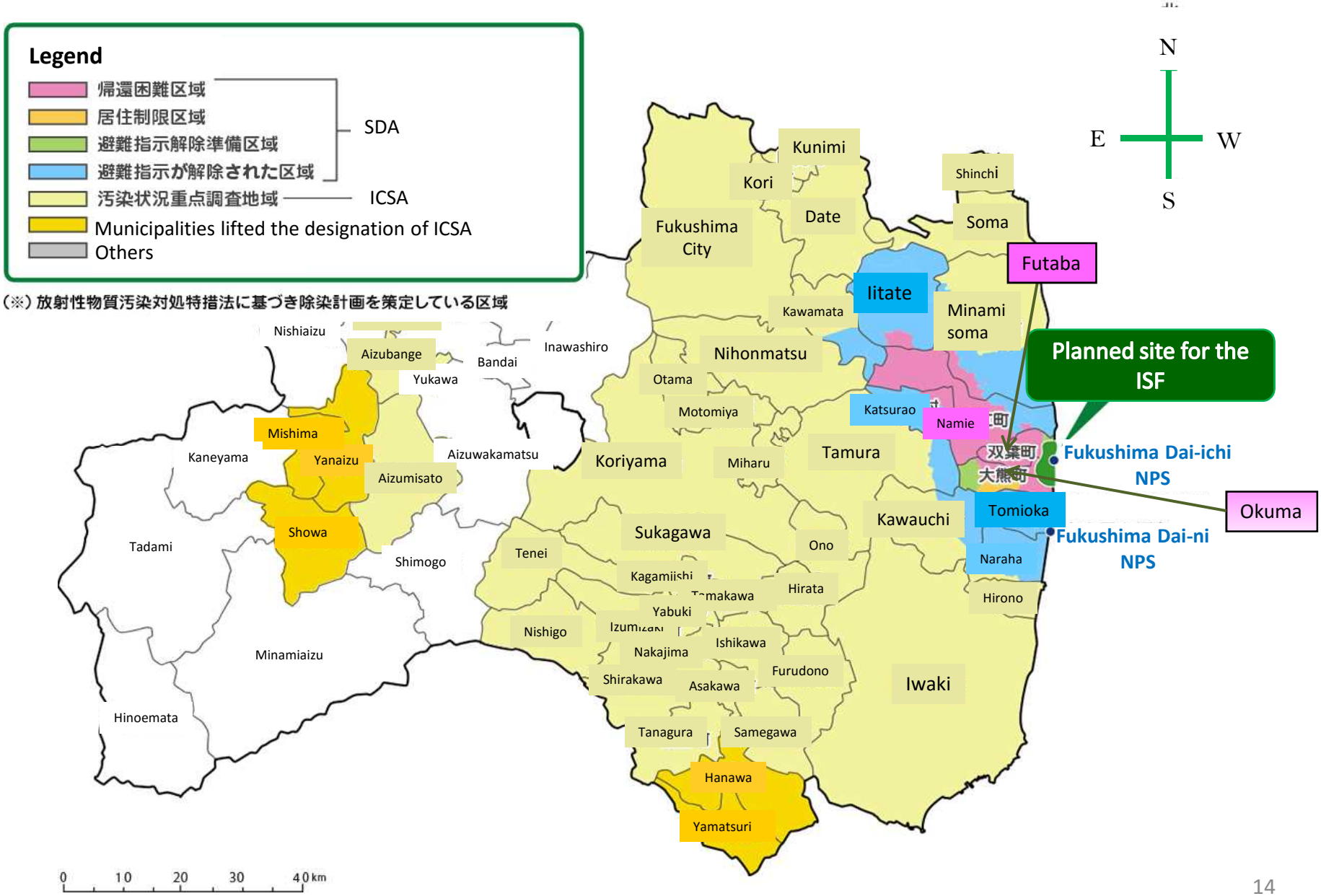
The following materials generated in Fukushima Prefecture will be stored in the ISF.

1. Soil and waste (such as fallen leaves and branches) generated from decontamination activities, which have been stored at the Temporary Storage Sites.

* In principle, combustible materials will be incinerated, and incinerated ash will be stored.

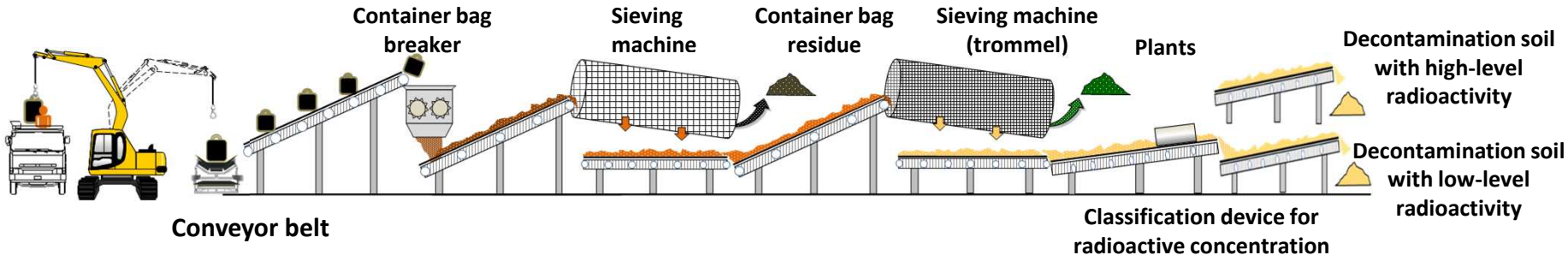
2. Incineration ash with radioactive concentration more than 100,000 Bq/kg.

Planned Site for the Interim Storage Facility



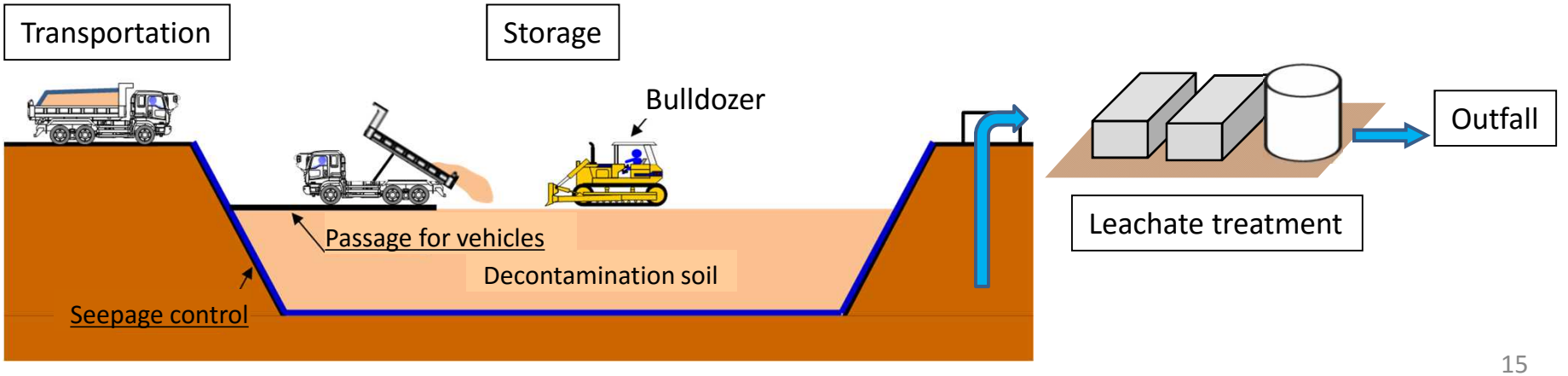
Reception / Classification / Soil Storage Facility

Reception / Classification Facility



Unloading equipment	Equipment for container bag breaker	Equipment for primary classification	Equipment for secondary classification	Equipment for classification of radioactive concentration

Soil Storage Facility



Reception / Classification and Soil Storage Facilities in Okuma

- The construction started on November 15,2016.
- MOE is now constructing the building of Reception / Classification Facility and implementing site preparation for the Soil Storage Facility
- After the construction of Reception / Classification Facility, trial operation will start and Soil Storage Facility is planned to be stored in fall this year.

Building construction in the reception / classification facility

Site preparation in a planned area of soil storage facility

Reception / Classification Facility and Soil Storage Facilities in Futaba

- The construction started November 15, 2016
- MOE is preparing trial operation of the Reception / Classification Facility and implementing site preparation for the Soil Storage Facility.
- After the construction of Reception / Classification Facility, trial operation will start and Soil Storage Facility is planned to be stored in fall this year.

Construction of the Reception / Classification Facility

Tree trimming and site preparation in a planned area of soil storage facility

Trial Run of the Reception / Classification Facility (1st term) in Futaba

< Overview and objectives of the trial run >

- ◆ Trial run of the Reception / Classification Facility in Futaba started on June 7, 2017.
- ◆ MOE will make sure whether classification, other treatment of the soil and waste, and monitoring survey in and around the site work as planned.

Interior of a tent in the Reception / Classification Facility

Soil after classification

Status of Planned Site for the ISF

As of the end of June 2017

Whole Area approx. 1,600ha	Item	Whole area	Ratio to the whole area	Registration record detail (2,360pers.)
Private Land **approx. 1,270 ha** (approx. 79%)	Landowners with contact information	approx. 1,210ha	approx. 76% ※Areas with owners' contact information occupies approx. 96% to the total area	1,780 pers.
	Property investigations accepted	approx. 1,150ha	approx. 72%	1,550 pers.
	Property already investigated	approx. 1,120ha	approx. 70%	approx. 1,550 pers.
	Contracted	approx. 521ha	approx. 32.6%	966 pers.
National/ Municipality Land etc. **approx. 330ha** (approx. 21%)	Town owned -land	approx. 165ha	approx. 10.3%	
	National/ Municipality land/ Land without address	approx. 165ha	approx. 10.3%	

Transportation to the ISF

◆By the end of FY2016, approx. 230,000㎥ of the contaminated soil was transported to the ISF

◆In FY2017, approx. 500,000㎥ of decontamination soil is targeted to be transported

◆Safe and secure transportation will be sequentially conducted managing whole number of transport object, managing traffic of trucks, and implementing environmental monitoring, and etc.

Facilitation of bags at Stock Yards

<Actual achievement in FY2017>

As of July 5, 2017

◆**Stored volume: 119,196 ㎥ (348,312㎥ in total)**

* Calculated on the assumption that the volume of a large bag is 1 m^3

◆**Total number of trucks used: 19,887 (57,925 in total)**

Operation of a truck screening

Recycling demonstration project in Minami-soma City

1. Preliminary treatment / quality control process

① Open sandbags and remove large stones and debris

Open large sandbags and remove large foreign materials

② Further eliminate smaller debris

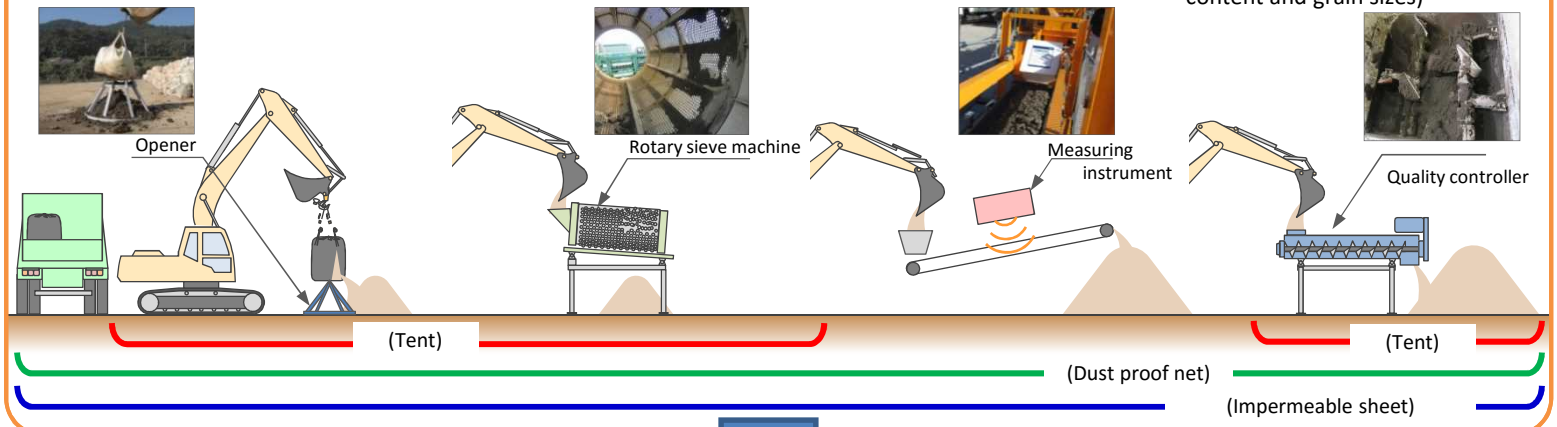
Eliminate small foreign materials through sieves

③ Classify soil by concentration

Measure radiation and classify soil (3,000Bq/kg and less)

④ Control quality

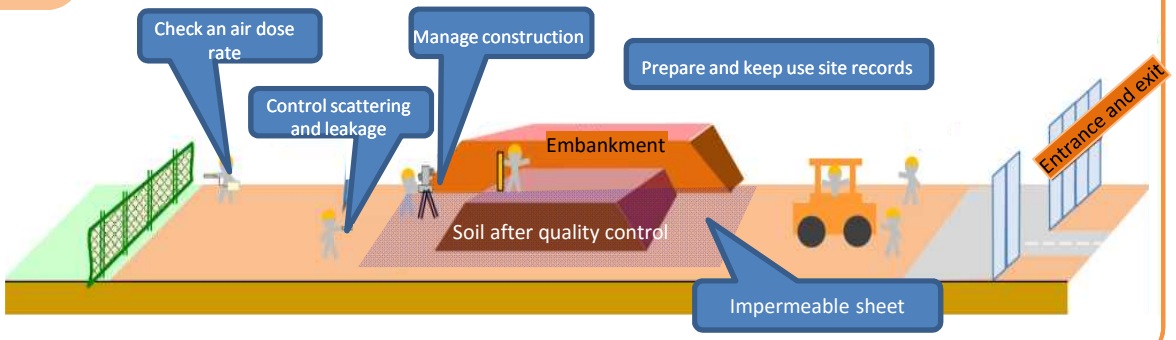
Control quality of soil to be used for embankment (such as water content and grain sizes)



2. Test embankment process

⑤ Construct and monitor test embankment

Construct test embankment (use quality-controlled soil for inside embankment and the soil which is not decontaminated soil for embankment surface)
Continue to measure an air dose rate and other indicators



Updated information is available on the website below:
http://josen.env.go.jp/en/