

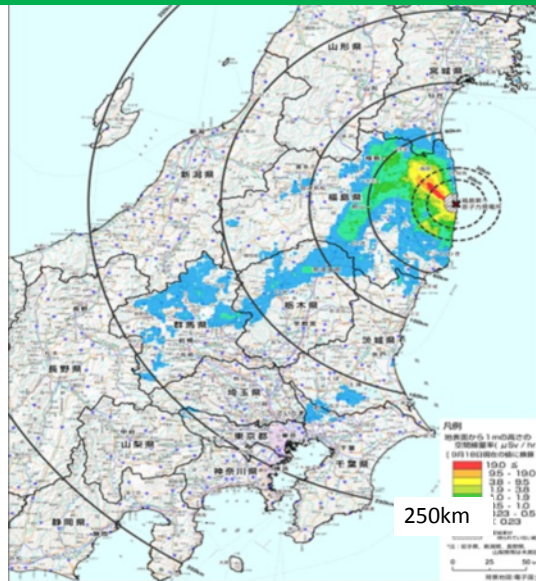


# Progress on Offsite Cleanup Efforts in Japan

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Ministry of the Environment, Japan

Side Event by Government of Japan  
at 56th IAEA General Conference, Sep 17, 2012

## Radioactive Pollution caused by the accident at Fukushima Dai-ichi NPP



## Framework of Decontamination

### New legislation for promoting decontamination

- ◆ The Act on Special Measures Concerning the Handling of Radioactive Pollution came into force on January 1, 2012.
- ◆ Based on this Act the followings are carried out:
  - Planning and implementation of decontamination work
  - Collection, transfer, temporary storage, and final disposal

### Special Decontamination Area

- ◆ 11 municipalities in (former) restricted zone or planned evacuation zone (<20km from the NPP, or annual cumulative dose is >20mSv )
- ◆ Decontamination is implemented by the national government

(\*) Entire area of Naraha, Tomioka, Okuma, Futaba, Namie, Katsurao, and Iitate.  
Some area of Tamura, Minami Soma, Kawamata, and Kawachi.

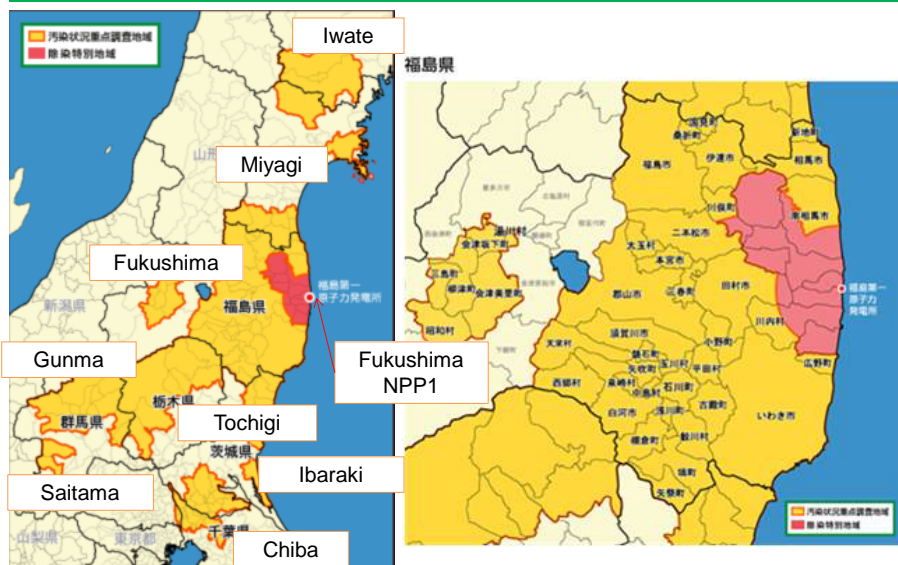
### Intensive Contamination Survey Area

- ◆ 104 municipalities in 8 prefectures (\*), in which over 0.23 mSv/hour of air dose rate (equivalent to over 1 mSv/Year) is observed, were designated.
- ◆ Decontamination is implemented by each municipality. The national government will take financial and technical measures.

(\*) Iwate, Miyagi, Fukushima, Ibaraki, Tochigi, Gunma, Saitama, and Chiba

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## Special Decontamination Area and Intensive Contamination Survey Area



## Basic Principles under the Act Targets of the Decontamination

### Additional \* exposures over 20mSv/y

- Aim at stepwise and rapid reduction of those areas based on the ICRP Recommendation (2007).
  - \* 'additional' means beyond natural background and medical exposure

### Additional exposures < 20mSv/y

- As a long term goal, aim at reducing to 1 mSv/y or less
  - Reduce estimated annual exposure of the general public **by 50 % in 2 years** (by Aug 2013) by radioactive decay, decay by natural factors and by decontamination
  - Reduce estimated annual exposure of children **by 60 % in 2 years** (by Aug 2013) by thorough decontamination of their living environment. by radioactive decay, decay by natural factors and by decontamination
- The goals will be reviewed periodically

**General Public**

**Children**

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## Guidelines -Helping understanding regulations under the Act-

- **Waste-related guidelines:** storage, maintenance and management standards and disposal standards
- **Decontamination-related guidelines:** methods for the investigation and measurement of the status of pollution, decontamination and other measures, collection, transfer and storage of the removed soil
- **Guidelines for decontamination workers:** exposure dose management methods, preventive measures against internal exposure, safety and health management systems



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## IAEA International Mission on Remediation

The IAEA organized a fact-finding Mission to support the remediation on 7-15 October, 2011.

### **Highlight of Progress**

- Legal, economic and technological resources allocated
- Arrangement to coordinate and share information with relevant organization
- Use of demonstration sites to test and assess various remediation methods
- Impressive monitoring and mapping effort , etc.

### **Advice**

- ✓ Balance, Justification, Optimization
- ✓ Strengthening Coordination of the National and Local Government
- ✓ Stakeholders Involvement
- ✓ Sv rather than Bq/m<sup>2</sup> or m<sup>3</sup>
- ✓ Utilize existing Waste Infrastructure
- ✓ Analyze the benefit in reducing Doses
- ✓ Cooperate between National and Local Government for Waste facilities, etc.

(Source: Final Report of the International Mission on Remediation of Large Contaminated Areas Off-site the Fukushima Daiichi NPP, IAEA)

Progress  
in Special Decontamination Area

## Decontamination Policy for Special Decontamination Area

### Policy in FY 2012 and 2013

Decontamination should be implemented taking into account the level of air dose rate.

- ◆ **Area less than 20mSv/year**: Aiming for reducing additional exposure dose less than 1mSv/year as long-term goal.
- ◆ **Area from 20~50mSv/year**: Aiming for reducing exposure dose in residential and farmland area less than 20mSv/year by the end of FY 2013.
- ◆ **Area more than 50mSv/year**: Demonstration projects will be implemented. Lessons learnt will be reflected into future decontamination policy.

### Policy After FY 2014

- ◆ Aiming for reducing additional exposure dose less than 1mSv/Y as long-term goal
- ◆ Check and evaluate two-year decontamination results, consider proper actions, and revise implementation plans as needed.

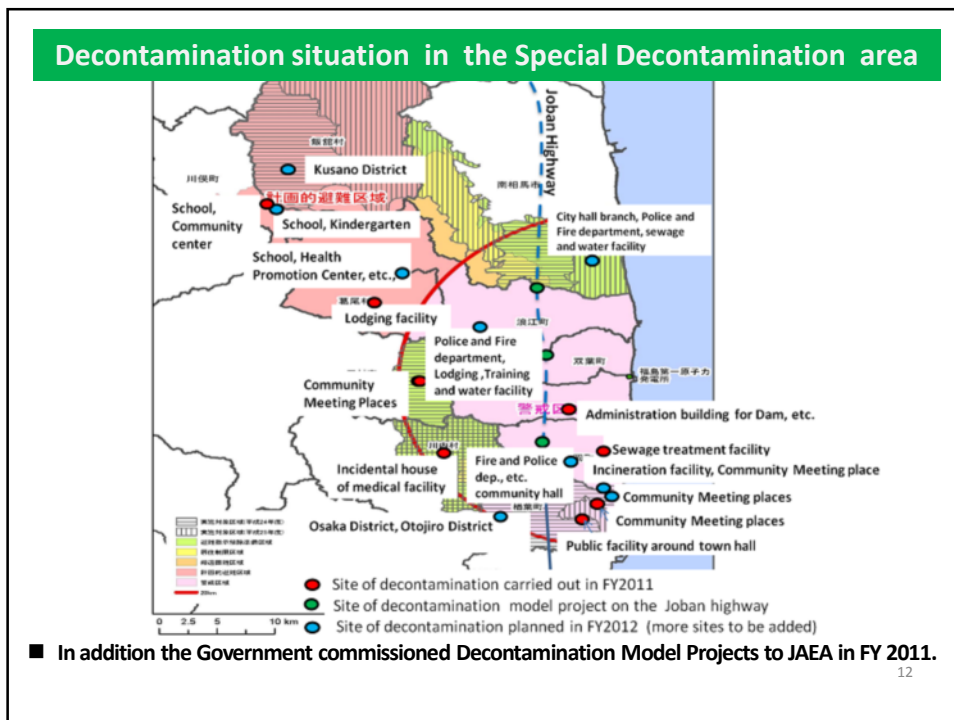
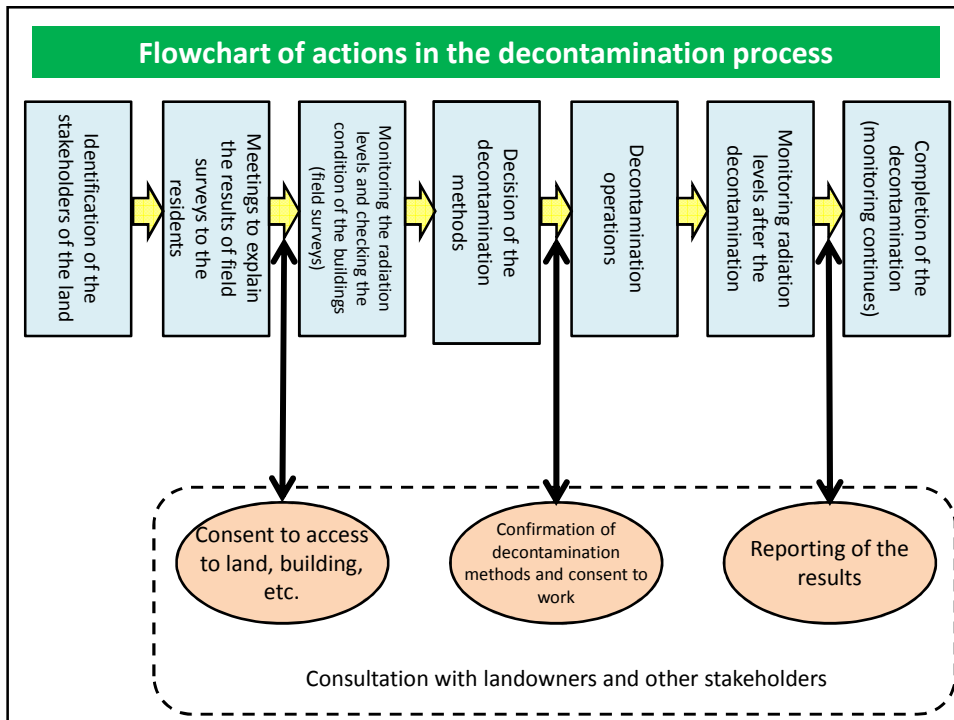
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## Progress of work in the Special Decontamination Area

	Advance Decontamination (base facilities, etc.)	Identification of owners of houses, etc.	Decontamination plan	Full scale Decontamination Works	Securing temporary storage sites
Tamura city	✓	✓	✓ (Apr 13)	in operation (June 25)	✓
Naraha town	✓	✓	✓ (Apr 13)	in preparation	✓
Kawauchi village	✓	✓	✓ (Apr 13)	In preparation	✓
litate village	✓	✓	✓ (May 24)	in preparation	✓
Minami-Soma city	✓	✓	✓ (Apr 18)		local coordination process
Katsurao village	✓	✓	local coordination process		✓
Kawamata town	✓	✓	✓ (Aug 10)		local coordination process
Namie town	✓	✓	local coordination process		local coordination process
Ookuma town	✓	✓	local coordination process		local coordination process
Tomioaka town	✓	✓	local coordination process		local coordination process
Futaba town					

\*Decontamination works in a municipality are to be implemented on the premises of formulation of the decontamination implementation plan and securing of temporary storage sites.

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## Decontamination Activities by Self-Defense Force

### Iitate Village Office

• Operation completed on Dec. 19



Average air dose rate  
(1m,  $\mu\text{Sv/h}$ )  
**【asphalt】**  
 2.94 → 1.96 (33% decreased)  
**【Lawn】**  
 4.39 → 0.96 (78% decreased)  
 ※promulgated on Dec. 22 by the  
 Ministry of the Environment

### Namie Village Office

• Operation completed on Dec. 15



Average air dose rate  
(1m,  $\mu\text{Sv/h}$ )  
**【asphalt】**  
 0.50 → 0.33 (34% decreased)  
**【Stone pavement】**  
 0.53 → 0.39 (26% decreased)  
 ※Promulgated on Dec. 22 by the  
 Ministry of the Environment

## Decontamination Activities by Model Projects (Example1)

〈Residential land〉

roof: water cleaning,  
cleaning with brush



wall: wiping



Gutter (vertical): high-pressure  
water cleaning



Concrete floor:  
High-pressure  
water cleaning



Concrete floor:  
Shot blast



Concrete floor:  
Surface grinding  
machine



Garden: removal  
of topsoil



Reference: Decontamination model project (JAEA)



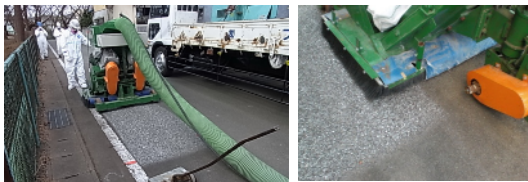
## Decontamination Activities by Model Projects (Example2)

### 〈Street Surface〉

High-pressure water cleaning by vehicle for recovering functions of water drainage pavement



Surface grinding by shot blast



### 〈Roadside tree〉

Cleaning of trunk (with water and brush)



Removal of topsoil



Reference: Decontamination model project (JAEA)

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## Decontamination Model Work in the Joban Expressway

### ■ Objective

To test and evaluate various decontamination methods taking into account different road paving conditions and air dose rates.

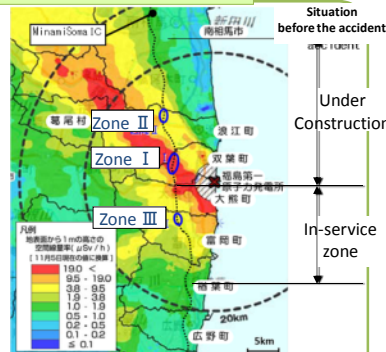
### ■ Outline

Period: March - July, 2012

Results:

In Zone I (most highly contaminated zone) it is confirmed that air dose rate could be reduced to less than  $9.5 \mu\text{Sv/h}$ , or equiv. to  $50 \text{ mSv/y}$ .

In zone II and III, it is confirmed that air dose rate could be reduced to approximate  $3.8 \mu\text{Sv/h}$ , or equiv. to  $20 \text{ mSv/y}$ .



Decontamination Zone	Air dose rate	Situation before the accident	Road shape	Air dose rate at the center of expressway ( $\mu\text{Sv/h}$ )			
				Before	→	After	Decreasing rate
Zone I	More than $9.5 \mu\text{Sv/h}$ (equivalent to more than $50 \text{ mSv/y}$ )	Under Construction	Cutting interval	43.1	→	8.3	▲81%
			Landfill interval	11.6	→	4.2	▲64%
			Bridge interval	10.3	→	5.9	▲43%
Zone II	$3.8 \sim 9.5 \mu\text{Sv/h}$ (Annually equivalent to $20 \sim 50 \text{ mSv}$ )	Under Construction	Cutting interval	5.8	→	2.3	▲60%
			Landfill interval	5.4	→	2.5	▲54%
Zone III	$3.8 \sim 9.5 \mu\text{Sv/h}$ (Annually equivalent to $20 \sim 50 \text{ mSv}$ )	Opened	Cutting interval	5.1	→	4.1	▲20%



# Progress in Intensive Contamination Survey Area

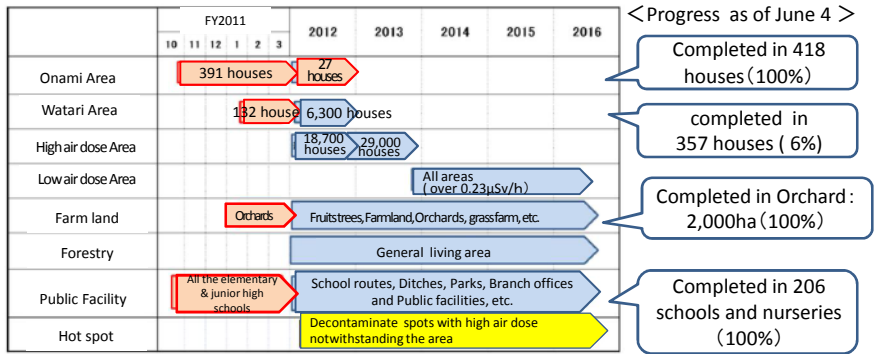
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## Decontamination Progress in Intensive Contamination Survey Area

◆ 78 out of 104 municipalities finalized their decontamination implementation under the Act ( as of Aug 10, 2012 )

<Example of Fukushima City>

- ◆ Planning term : 5 years until Sep. 2016 ( 2 years as an intensive term)
- ◆ Priority: Houses in high air dose areas, public facilities, especially for children.



  : Decontamination completed

Reference: Fukushima Furusato Decontamination Implementation Plan

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## Efforts to secure Interim Storage Facility

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### Efforts to secure Interim Storage Facility

Oct., 2011 Ministry of the Environment officially announced and explained the **Basic Principles for Interim Storage Facility (the roadmap)** to the heads of relevant municipalities

#### Main Contents

- The National Government shall secure, maintain and manage the facility
- The National Government shall make utmost efforts **to start operation of the facility by January 2015.** Location sites would be selected within FY 2012
- Target materials for storage is limited to soil and waste generated in Fukushima pref.
- **Final disposal will be carried out outside Fukushima Pref. within about 30 years** from the start of the interim storage.

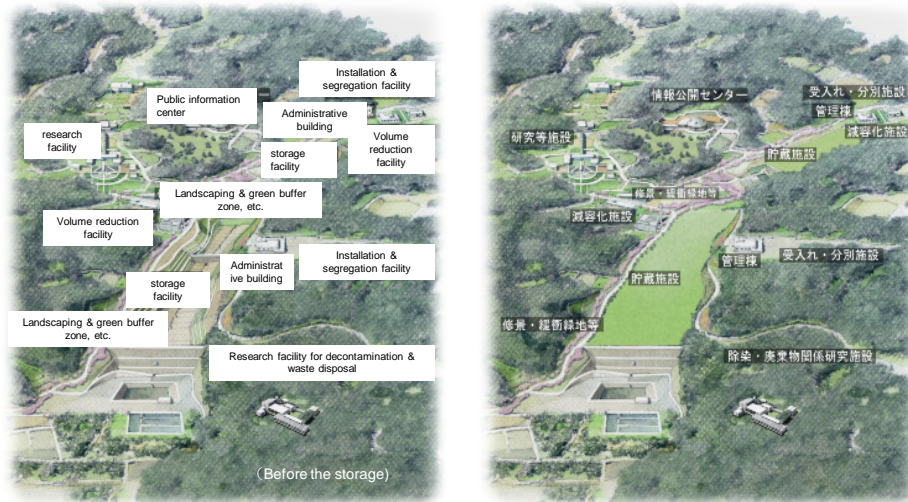
Dec., 2011 The Ministry requested 8 towns in Futaba County and Fukushima Pref. to examine location sites in Futaba county

Mar., 2012 The Ministry explained the 8 towns and Fukushima Pref. that the facilities may be located separately in 3 towns ( Futaba, Okuma and Naraha)

Aug., 2012 The Ministry proposed the sites for investigation to 8 towns and Fukushima Pref.

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## Overview of the Interim Storage Facility



※ This picture illustrates envisaged facilities and structures at this moment, and is subject to change in the future.

## Tackling the Challenges

## Tackling the Challenges

1. Seeking for more efficient/effective technology for decontamination from the perspective of cost, time, etc. through demonstration project and R&D (incl. Soil/ Waste minimization and volume reduction)
2. Promotion of Public communication for securing temporary storage sites, interim storage facilities, etc.
3. Research on the behavior and environmental fate of Cesium, including the development of transport models