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An Introduction to decontamination support using GIS

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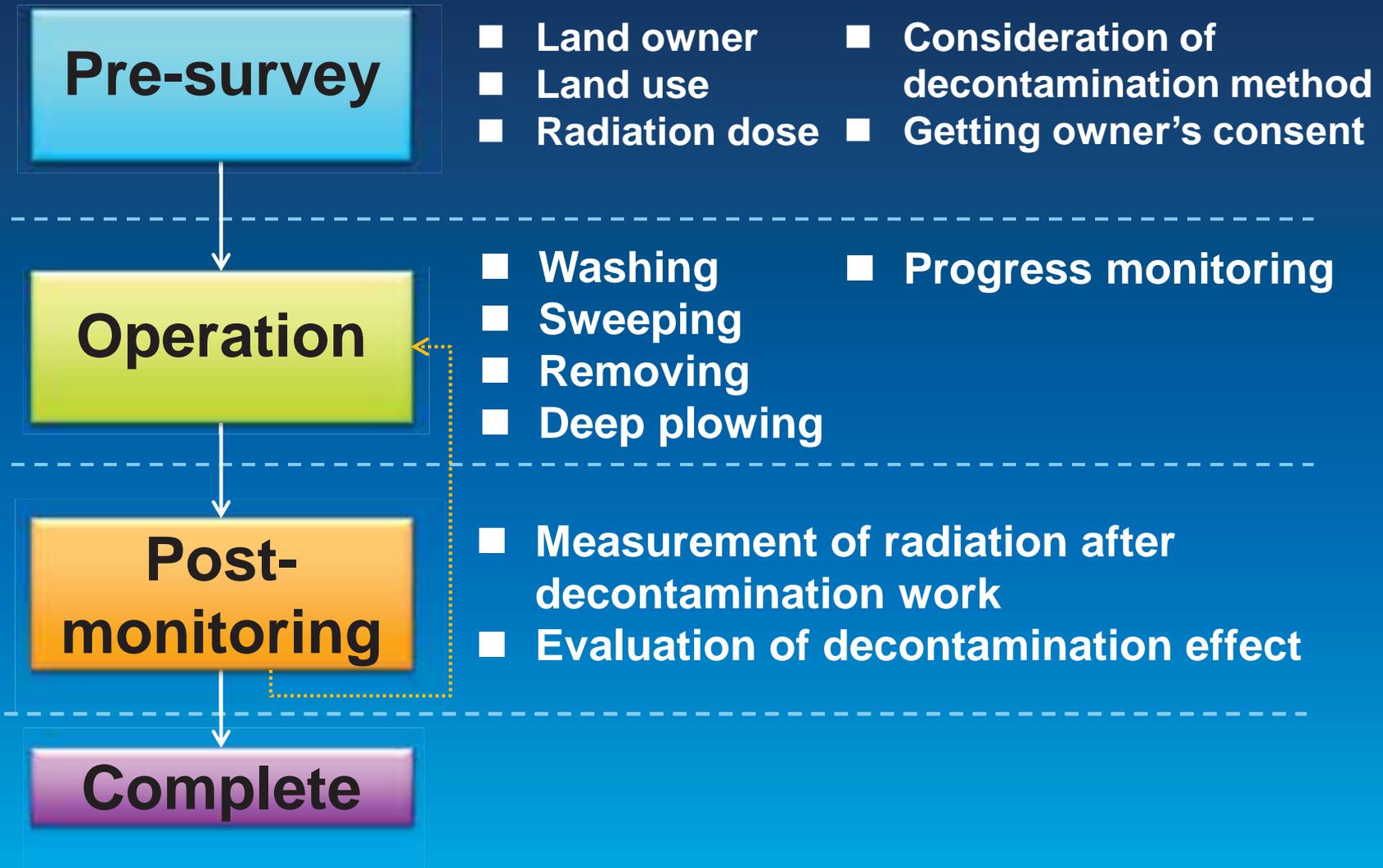
Background

The accident at the Fukushima Dai-ichi NPP led to the radioactive contamination in wide areas of eastern Japan.

◆ The "Act on Special Measures concerning the Handling of Pollution by Radioactive Materials" was promulgated in August, 2011

◆ About 100 municipalities are required to implement decontamination project

Decontamination project by national government.

Decontamination project by municipalities.

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Workflow of decontamination

Pre-survey
- Land owner
- Land use
- Radiation dose
- Consideration of decontamination method
- Getting owner's consent

Operation
- Washing
- Sweeping
- Removing
- Deep plowing
- Progress monitoring

Post-monitoring
- Measurement of radiation after decontamination work
- Evaluation of decontamination effect

Complete

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Land use mapping Using aerial photo

Digital Mapping Camera

Gulfstream Commander

Digital Mapping

Digital photogrammetric workstation

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Land use mapping Detail interpretation

- Entering feature attributes to GIS data
- Checking for construction detail by 360° view camera

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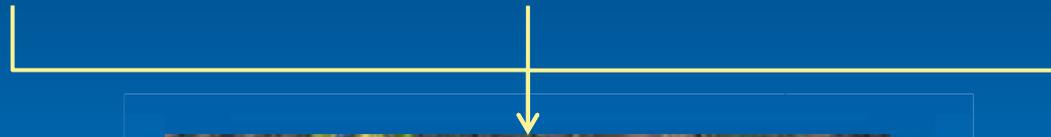
GIS data Integration

Cadastral map   Line and point data   Polygon data

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Making document for decontamination
This document is used to estimate work volume and budget of decontamination

| No. | 00 | – | △△字 | | Address | | xx□□○○ |

Summary sheet

Legend:
- Road
- Forest
- Farmland
- Building
- Property boundary
- Fence
- Shrub
- Lawn
- Gravel
- Bare ground
- Asphalt
- Play equipment

		項目		単位	数量
A	1.	屋根・屋上	コンクリート以外	m2	78.34
	2.	外壁	外壁(1F)	m2	110.02
	3.	雨樋	軒樋	m	18.34
	4.	雨樋	竪樋	m	6.00
B	1.	屋根・屋上	コンクリート以外	m2	90.12
	2.	外壁	外壁(1F)	m2	117.84
	3.	雨樋	軒樋	m	19.64
	4.	雨樋	竪樋	m	6.00
C	1.	屋根・屋上	コンクリート以外	m2	19.33
	2.	外壁	外壁(1F)	m2	62.41
	3.	雨樋	竪樋	m	6.00
D	1.	屋根・屋上	コンクリート以外	m2	155.37
	2.	外壁	外壁(1F)	m2	151.62
	3.	雨樋	軒樋	m	25.27
	4.	雨樋	竪樋	m	6.00
土地	1.	グラウンド等	植栽	m2	94.02
	2.	グラウンド等	草・芝	m2	905.68
	3.	グラウンド等	砂利	m2	409.45
	4.	グラウンド等	土壌	m2	849.90
	5.	グラウンド等	舗装面	m2	495.83
	6.	塀		m2	32.38
	7.	遊具等		基	15.00

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Radiation monitoring

NaI scintillation survey meter

Equipment checking
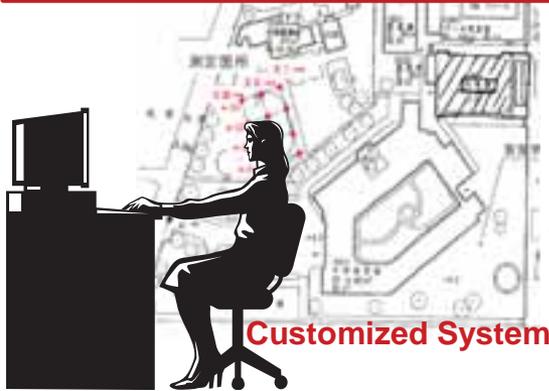

Morning meeting

Field survey

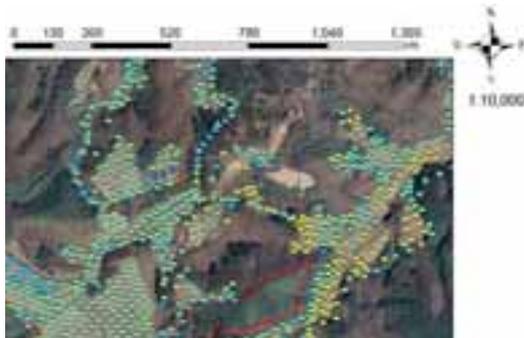ASIA AIR SURVEY CO.,LTD.

Radiation monitoring System for field survey
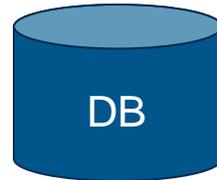
① Planning measurement points

Customized System

③ Data management

Monitoring Database

DB

- ID:
- Measurement position
- Measurement Height
- Photo
- Weather
- Target surface condition
  ⁚

Export

Import

② Field survey

Group 1 2 3 4 5

High accuracy GNSS handheld

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Radiation monitoring Radiation measurement

①Example of position for radiation dose measurement at representative point

②Example of radiation dose measurement at hotspot

Number of radiation measurement point

Residential zone
 ①：5 pts. / 1 facility
 ②：10pts. / 1 facility

Road
 ①②：1 pt./ 20m

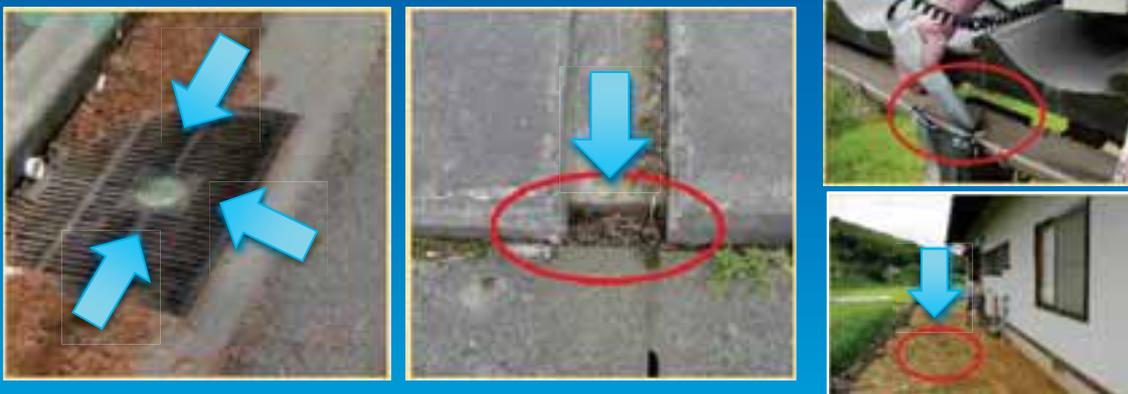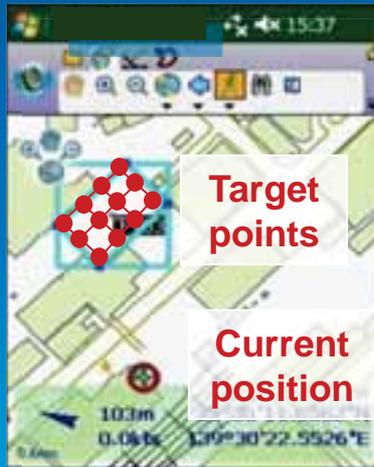**Farmland**
 ①：1 pt. / 30m grid

Forest
 ①：1 pt. / 30m grid

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Radiation monitoring Survey flow

| Navigation by GNSS | Taking photos | Radiation dose measurement | Entering Information |

Target points

Current position

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Radiation monitoring Data management system

Monitoring result viewer

Data search function

Survey Sheet

Management record

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Progress monitoring Using server GIS

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Conclusion

1. By using GIS, it becomes possible to improve efficiency of decontamination process.

2. It is necessary to enhance a compatibility of each GIS platform (Desktop, Mobile , Server) for this type of project.

3. We should accumulate GIS data with high accuracy in order to immediately address in an emergency.

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Thank you for your attention!

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