

Part III

Guidelines for
Designated Waste
(Tentative Translation)

Mar 2013, 2nd Edition

Table of Contents

Chapter 1	Summary	1
1.1	Definition of Terms	1
1.2	Purpose of the Guideline	2
1.3	Standards for Designation of Waste which was Contaminated by Radioactive Materials Discharged by the Accident to a Level Requiring Special Controls	2
1.4	Summary of Collection, Transportation, Storage of Designated Waste (the Act, Article 20)	4
1.4.1	Summary of Standards for Storage of Designated Waste	4
1.4.2	Summary of Collection and Transportation of Designated Waste	6
Chapter 2	Storage Standards for Designated Waste	8
2.1	Requirements for Storage Site	8
2.2	Prevention of Dispersion and Outflow of Designated Waste	11
2.3	Prevention of Contamination of Public Water Area and Groundwater	16
2.6	Prevention of Emergence of Harmful Insects	22
2.7	Prevention of Mixing of Designated Waste with other Materials	23
2.8	Prevention of Mixing of the Asbestos-Containing Designated Waste	24
2.9	Storage Method of Perishable Designated Waste	27
2.11	Measurement, Record and Retention of Amount of Radiation	36
2.12	Filing of Change of Storage Site	37
Chapter 3	Standards for Collection and Transportation of Designated Waste	40
3.1	Prevention of Health Damage and Damage related to the Living Environment	41
3.2	Measures Required to Prevent Dispersion, Outflow and Leaks of Designated Waste	41
3.3	Prevention of Infiltration of Rainwater	47
3.4	Prevention of Impairment of Conservation of the Living Environment by Foul Odors, Noises or Vibrations	48
3.5	Separation from other Materials	48
3.6	Conservation of the Living Environment at the Time of Establishment of Facilities	50
3.7	Prevention of Scattering, Outflow and Foul Odors from Transportation Vehicles and Transportation Containers	50
3.8	Indication & Keeping Documents in Transportation Vehicles	51
3.9	Prevention of Radiation Hazards	56
3.10	Carrying Equipment and Devices, etc., Necessary for Response to Accidents	58
3.11	Collection and Transportation of Asbestos-Containing Designated Waste, Designated Waste Asbestos, etc., and Designated Soot and Dust upon Separation	60
3.12	Matters of Note about Asbestos-Containing Designated Waste and Designated Waste Asbestos, etc.	61
3.13	Preparation and Retention of Records	62
Chapter 4	Others	64
Chapter 5	Prohibitions and Penal Provisions	65
5.1	Prohibition on the Dumping of Designated Waste, etc.	65
5.2	Prohibition on the Incineration of Designated Waste	65
5.3	Prohibition on the Treatment of Designated Waste, etc., on a Commercial Basis	65
5.4	Orders, etc., in case of Storage, etc., Nonconforming to the Standards	66

Chapter 1 Summary

1.1 Definition of Terms

Definition of terms used herein is indicated below.

Term	Explanation
Act	Act on Special Measures concerning the Handling of Environment Pollution by Radioactive Materials Discharged by the Nuclear Power Station Accident Associated with the Tohoku District - Off the Pacific Ocean Earthquake that Occurred on March 11, 2011 (Act No. 110 of 2011)
Ordinance	Ordinance for Enforcement of the Act on Special Measures concerning the Handling of Environment Pollution by Radioactive Materials Discharged by the Nuclear Power Station Accident Associated with the Tohoku District - Off the Pacific Ocean Earthquake that Occurred on March 11, 2011 (Ordinance of the Ministry of the Environment No. 33 of 2011)
Countermeasure Area	The areas which are designated by the Minister of the Environment as requiring management of the waste in the areas due to contamination of the waste in the areas by radioactive materials discharged by the accident at a level requiring special controls (the Act, Article 11, paragraph (1))
Waste in the Countermeasure Area	Waste in the countermeasure area (if the waste was carried out of the countermeasure area, including the waste carried out and excluding those determined by the Ordinance of Ministry of the Environment (the Act, Article 13, paragraph (1)))
Designated Waste	Waste generated from water facilities, public sewerage, basin sewerage, industrial water facilities, incineration facilities, which are specified municipal solid waste disposal facilities or specified industrial waste disposal facilities and community effluent treatment systems, designated by the Minister of the Environment as not conforming to the requirements provided for in the Ordinance of Ministry of the Environment based on the survey of the administrators, etc., of the facilities with regard to the pollution state by radioactive materials discharged by the accident. For waste other than that, if waste is regarded as not conforming to the requirements provided for in the Ordinance of Ministry of the Environment as a result of a survey by the possessor of the waste, waste may be applied to the Minister of the Environment to be designated to designated waste (Act, Article 16 ~ Article 18)
Specified Waste	Waste in the countermeasure area or designated waste (Act, Article 20)
Debris	In the Guidelines, it refers to the waste generated from the East Japan Great Earthquake (wreckage of buildings collapsed by the Earthquake and tsunami and cars and ships, etc., damaged by tsunami)
Contaminated Waste, etc.	Waste in the countermeasure area, designated waste or removed soil (Act, Article 46)
Measures including Decontamination of Soil, etc.	Removal of soil, fallen leaves and twigs, sludge piled up in waterways related to the contamination, prevention of spread of the contamination and any other measures, which are carried out for the soil, plants and structures, etc., contaminated by radioactive materials discharged by the accident (Act, Article 2, paragraph (3))
Removed Soil	Soil generated from measures for decontamination of the soil in the specific area for decontamination or decontamination zone (Act, Article 2, paragraph (4))
Removed Soil, etc.	Removed soil and waste generated from measures for decontamination of the soil, etc. (Act, Article 31, paragraph (1))
Measures for Decontamination, etc.	Measures for decontamination of the soil, etc., and collection, transportation, storage and disposal of the removed soil (Act, Article 25, paragraph (1))
Specific Area for Decontamination	The area designated by the Minister of the Environment as it is necessary for the national government to conduct measures for decontamination, etc., due to significant environmental contamination by radioactive materials discharged by the accident in the area and for any other reasons (Act, Article 25, paragraph (1))
Intensive Contamination Survey Area	Area designated by the Minister of the Environment as it is necessary to conduct a focused survey of the contamination state of the environment by radioactive materials discharged by the accident in the area (the Act, Article 32, paragraph (1))
Decontamination	Plan of implementation of measures for decontamination, etc., with respect to the area in

Plan	the intensive contamination survey area, whose status of environmental contamination by radioactive materials discharged by the accident is recognized as not satisfying the requirements provided for in the Ordinance of the Ministry of the Environment as a result of a survey under the Act. The plan shall be developed by governors of prefectures or mayors of municipalities (the Act, Article 36, paragraph (1)).
Decontamination Zone	Zone covered by the decontamination plan (Act, Article 35, paragraph (1))
Specified Waste, etc.	Specified waste and wastewater generated from specified waste
WDS Guidelines	Guidelines for Provision of Waste Information (March 2006, the Ministry of the Environment, Minister's Secretariat, Waste and Recycling Measures Department)
Designation Standards	Standards for designation of waste contaminated with radioactive materials discharged by the accident to a level requiring special controls. It means the radiation concentration of the radioactive cesium exceeds 8,000Bq/kg.
Waste Management Act	The Waste Management and Public Cleansing Act
Primary Entrustee	A person who was commissioned to collect or transport specified waste by the national government (Ordinance, Article 23, paragraph (1))
Asbestos-Containing Specified Waste	Specified waste containing asbestos, designated by the Minister of the Environment (except for Specified waste asbestos, etc.) (Ordinance, Article 23, paragraph (1))
Specified Waste Asbestos, etc.	Waste asbestos (only limited to specified waste) and Asbestos-containing specified waste or to which asbestos is attached, designated by the Minister of the Environment as these might disperse (Ordinance, Article 23, paragraph (1))
Specified Soot and Dust	Soot and dust (only limited to specified waste) (Ordinance, Article 23, paragraph (1))

1.2 Purpose of the Guideline

This guideline aims to provide an explanation of the collection and transportation standards for designated waste under the Act Article 20 and the storage standards for designated waste as prescribed under the Act Article 17 Paragraph (2) in the treatment of waste contaminated by radioactive substances discharged by the accident based on the Act, and to highlight matters to note during the operation, so as to ensure smooth and correct operations.

1.3 Standards for Designation of Waste which was Contaminated by Radioactive Materials Discharged by the Accident to a Level Requiring Special Controls

(Survey on Waste at Water Facilities, etc.)

Act, Article 16, paragraph (1)

A person or entity listed in any of the following items shall, pursuant to the provisions of an Ordinance of the Ministry of the Environment, conduct a survey on the status of the pollution from radioactive materials discharged by the accident with respect to waste specified in the corresponding items in accordance with a method set forth in an Ordinance of the Ministry of the Environment and make a report on the results to the Minister of the Environment.

- (i) A water supplier or water wholesaler who manages water facilities that meet the requirements set forth in the relevant Ordinance of the Ministry of the Environment; deposition substances such as sludge and other waste specified by the relevant Ordinance of the Ministry of the Environment that were generated from the said water facilities;
- (ii) A public sewerage manager who manages a public sewerage that meets the requirements set forth in the relevant Ordinance of the Ministry of the Environment or a basin sewerage manager who manages basin sewerage that meets the requirements set forth in the relevant Ordinance of the Ministry of the Environment; sludge, etc., generated with respect to the said public sewerage or basin sewerage;

- (iii) An industrial water supplier who manages industrial water facilities that meet the requirements set forth in the relevant Ordinance of the Ministry of the Environment; deposition substances such as sludge and other waste specified by the relevant Ordinance of the Ministry of the Environment that were generated from the said industrial water facilities;
- (iv) A builder of incineration facilities functioning as specified municipal solid waste disposal facilities prescribed in Article 24, paragraph 1 (in the case of incineration facilities functioning as specified municipal solid waste disposal facilities prescribed in Article 24, paragraph 1 and built by a municipality to dispose of municipal solid waste in accordance with the provision of Article 6-2, paragraph 1 of the Waste Management Act, the manager of the facilities) or a builder of incineration facilities functioning as specified industrial waste disposal facilities prescribed in paragraph 2 of the same Article; soot and dust, incineration ash and other burnt residues generated from the said incineration facilities; and
- (v) A manager of a rural community sewerage system that meets the requirements set forth in the relevant Ordinance of the Ministry of the Environment; deposition substances such as sludge and other waste specified by the relevant Ordinance of the Ministry of the Environment that were generated from the said rural community sewerage system.

(Designation, etc. of Waste Contaminated with Radioactive Materials Discharged by the Accident at a Level Requiring Special Controls)

Act, Article 17, paragraph (1)

The Minister of the Environment shall, when it is determined that, based on the results of the survey prescribed in paragraph 1 of the preceding Article, the status of the pollution from radioactive materials discharged by the accident with respect to the waste specified in the items of the same paragraph does not meet the standards set forth in the relevant Ordinance of the Ministry of the Environment, designate such waste as waste contaminated with radioactive materials discharged by the accident at a level requiring special controls.

(Application for the Designation of Waste Contaminated with Radioactive Materials Discharged by the Accident at a Level Requiring Special Controls)

Act, Article 18, paragraph (1)

A person or entity (excluding the relevant nuclear operator) considering, as a result of a survey on the status of pollution from radioactive materials discharged by the accident with respect to waste that they possess, that the status of pollution from radioactive materials discharged by the accident with respect to the said waste does not meet the standards set forth in the relevant Ordinance of the Ministry of the Environment may apply to the Minister of the Environment for the designation of the said waste in accordance with the provision of paragraph 1 of the preceding Article pursuant to the provisions of this Ordinance of the Ministry of the Environment.

(Treatment of Designated Waste by the Country)

Act, Article 19

The national government shall be responsible for the collection, transfer, storage and disposal of waste designated under the provision of Article 17, paragraph 1 (hereinafter referred to as “designated waste”); provided, however, that storage under the provision of paragraph 2 of the same Article shall be excluded (including its application mutatis mutandis under paragraph 5 of the preceding Article) and the same shall apply to Article 20, Article 48, paragraph 1, Article 49, paragraph 3, Article 50, paragraph 3, Article 51, paragraph 2, and Article 60, paragraph 1, item (iii).

(Standards Pertaining to the Designation of Waste Contaminated by Radioactive Substances Discharged by

the Accident to the Extent Special Controls are Required)**Ordinance, Article 14**

The standard prescribed by the Ordinance of the Ministry of the Environment as under the Act, Article 17, paragraph (1) is that, as a result of a survey of radioactive concentration of radioactive materials discharged by the accident by the method prescribed under Article 5, the radioactive concentration of cesium-134 that is a radioactive material discharged by the accident and the radioactive concentration of cesium-137 that is a radioactive material discharged by the accident shall be 8,000 Becquerel per kilogram or less in total.

[Purpose of Measures]

Under the Act, Article 16, paragraph (1), it is provided that administrators, etc., of water facilities, sewerage systems and waste disposal facilities falling under certain requirements, shall be required to survey* the contamination state of such waste as sludge and incineration ash generated from these facilities and report to the Minister of the Environment the results of a survey. Under the Act, Article 18, it is provided that a person who believes that the contamination status by radioactive materials discharged by the accident does not conform to the designation standards as a result of the survey of contamination state by radioactive materials discharged by the accident of the waste possessed by the person may apply to the Minister of the Environment for designation as the designated waste.

It is provided that the Minister of the Environment shall designate the waste recognized as whose contamination status by radioactive materials discharged by the accident does not conform to the certain standards (designation standards) as a result of the survey under the Act, Article 16 or Article 18 as the waste contaminated with radioactive materials discharged by the accident to a level requiring special controls.

Furthermore, under the Act, Article 19, it is provided that the designated waste (hereinafter referred to as the “designated waste”) shall be collected, transported, stored and disposed of by the national government.

*The survey method shall be based on “Part I: Guidelines for Survey on Pollution Status”.

1.4 Summary of Collection, Transportation, Storage of Designated Waste (the Act, Article 20)**(Standards on the Treatment of Designated Waste)****Act, Article 20**

The collection, transport, storage or disposal of specified waste must be carried out in compliance with the standards provided for under the Ministry of Environment Ordinance by those who are involved in the collection, transport, storage or disposal of waste in the countermeasure area or designated waste (hereinafter known as “specified waste”).

1.4.1 Summary of Standards for Storage of Designated Waste**Act, Article 17 paragraph (2)**

Parties listed in each item under paragraph (1) in the preceding article must store the waste defined in the various items concerned and those designated under the provisions prescribed in the preceding paragraph in compliance with the standards provided for under the Ministry of Environment Ordinance until such time when the waste is handed over to the national government or parties entrusted by the national government to collect, transport, store or dispose the waste concerned as defined under Article 48 paragraph (1) of the Ministry of the

Environment Ordinance.

[Purpose of Measures]

When storing designated waste on-site, it is necessary to take appropriate measures, including prevention of scattering of waste, prevention of contamination of public water areas and groundwater by contaminated water generated by the storage of the waste, prevention of radiation hazards, etc., in order to prevent the radioactive cesium from affecting the environment around the storage site.

[Examples of Measures]

Specific measures are shown in **Chapter 2**.

Summary of storage standards is shown in **Table 1-1**.

Table 1-1: Summary of Storage Standards

	Content of Storage Standards		1. Storage Standards for Designated Waste (Site, etc.)	Storage Standards for Specified Waste (Other than Site)		Storage Standards for Decontaminated Waste (Site, etc.)
			Over 8,000Bq/kg (Ordinance, Article 15)	Over 8,000Bq/kg (Ordinance, Article, 24, paragraph (1))	Under 8,000Bq/kg (Ordinance, Article 24, paragraph (2))	Under 8,000Bq/kg (Ordinance, Article 60)
1	Requirements for Storage Site (installation of fence and notice board)		Applied	Applied (there are requirements for notice board)	Applied (there are requirements for notice board)	Applied
2	Prevention of Scattering and Outflow of Waste		Applied (storage in containers and packaging, etc., are required)	Applied (storage in containers and packaging, etc., are required)	Applied	Applied
3	Prevention of contamination of Public Water Area and Groundwater		Applied	Applied	Applied	Applied
4	Prevention of Infiltration of Rainwater or Groundwater* ¹		Applied	Applied	Not applied *2	Not applied *2
5	Prevention of Emission of Foul Odor		Applied	Applied	Applied	Applied
6	Prevention of Emergence of Harmful Insects		Applied	Applied	Applied	Applied
7	Prevention of mixing of Specified Waste etc. with Other Materials		Applied	Applied	Applied	Not applied
8	Prevention of mixing with Waste, etc., Containing Asbestos		Applied	Applied	Applied	Applied
9	Storage Method of Perishable Waste		Applied	Applied	Applied	Applied
10	Prevention of Radiation Hazard		Applied	Applied	Not applied *3	Not applied *3
11	Measurement and Record of Amount of Radiation		Applied (before and after start of storage)	Applied (at least once every seven (7) days)	Applied (at least once every seven (7) days)	Applied (before and after start of storage)
		Water Quality Inspection of Surrounding Groundwater	Not applied	Applied	Applied	Not applied
12	Retention of Records of Measurement of Amount of Radiation (until the storage site is abolished)		Applied	Applied	Applied	Applied
13	Retention of Records of Storage		Not applied	Applied	Applied	Not applied

*1 Measures for reducing contact with water. For treatment of waste exceeding 8,000Bq/kg, in order to secure greater safety, measures shall be taken at every stage to reduce contact with water as much as possible, from transportation to final disposal, for the purpose of prevention of elution of radioactive cesium from the waste.

*2 In this regard, for treatment of waste under 8,000Bq/kg, if waste, which might outflow or wastewater might be generated by rainwater, are stored outdoors, provisions of prevention of scattering and outflow (Storage Standards 2) and provision of prevention of contamination of public water area and groundwater (Storage Standards 3) are applied and outflow of waste in suspension with water by rainwater and outflow and permeating into the ground of wastewater from the waste shall be regulated.

*3 For the waste below 8,000Bq/kg, as it is not necessary to take particular isolation measures, such isolation measures as cover soil, etc., are not provided.

1.4.2 Summary of Collection and Transportation of Designated Waste

It is provided that a person who collects, transports, stores or disposes of the designated waste shall be required to carry out collection, transportation, storage or disposal of the designated waste in accordance with the Standards for Collection and Transportation of Specified Waste (Ordinance, Article 23) (Act, Article 20). (Refer to Chapter 3 for details on the standards).

Examples of sources of the designated waste covered by the Ordinance and presumed waste are shown in **Table 1-2**.

In this regard, collection and transportation of removed soil are not covered by the Guidelines.

Table 1-2: Examples of Sources of Waste generated as Designated Waste and Presumed Waste

Sources, etc.	Presumed Waste
Water facilities, etc.	Sediments, including sludge, etc., generated sludge, soot and dust, incineration ash and any other cinder, etc.
Waste Disposal Facilities	Soot and dust, incineration ash and any other cinder, etc.
Ordinary operators, citizens, etc.	Rice straw, plants, excretion of cattle, composts, etc.
Land where decontamination is carried out	Plants, sludge, etc.

Chapter 2 Storage Standards for Designated Waste

2.1 Requirements for Storage Site

Ordinance, Article 15, item (i)

Storage shall be carried out at a place that meets the following requirements:

- (a) An enclosure shall be set up surrounding the place (if it is of a structure where the designated waste stored is loaded directly against such enclosure, then it shall be restricted to an enclosure which is safe enough from the point of view of structural strength);
- (b) A notice board shall be set up at a clearly viewable location to display the following matters:
 - 1 That it is a storage site of designated waste;
 - 2 The kind of designated waste stored
(if such designated waste includes any of the following designated waste, such fact shall be included);
 - a. Designated waste that includes asbestos (excluding designated waste asbestos, etc., provided under b.) and is prescribed by the Minister of the Environment (hereinafter referred to as “asbestos-containing designated waste”);
 - b. Designated waste that contains waste asbestos (limited to those which are designated waste) and asbestos, and is prescribed by the Minister of the Environment as posing a risk to scatter (hereinafter referred to as “designated waste asbestos, etc.”);
 - c. Designated waste that has putrefied or poses a risk to become putrefied (hereinafter referred to as “perishable designated waste”);
 - d. Soot and dust (limited to those which are designated waste; hereinafter referred to as “designated soot and dust.”)
 - 3 Contact information in case of emergency
 - 4 In cases where the designated waste is stored outdoors without using a container, the maximum prescribed under Article 15 item (ii) (b).

[Purpose of Measures]

In order to clearly distinguish the designated waste storage site from any other sites, the storage site shall be surrounded by fences and a notice board shall be put up to indicate that it is the designated waste storage site.

[Example of Measures]

Fences shall be in accordance with the following.

When storing in warehouses, tents, pipe houses, etc. fences do not need to be erected once again.

(In case of storage at the place where no persons other than the related persons enter, such as on the premises of facilities, etc.)

In order to indicate the scope of the storage site, such measures shall be taken as laying out road cones (**Figure 2-1**) or extending rope (**Figure 2-2**), etc.

In areas exposed to rain and wind, measures need to be taken to ensure that the fences do not get blown away.

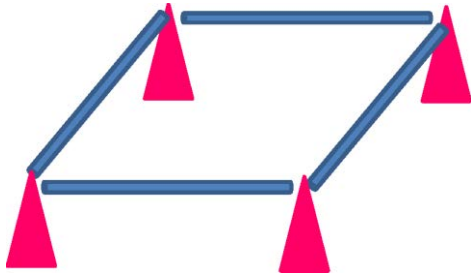


Figure 2-1 Fence using road cones (Example)

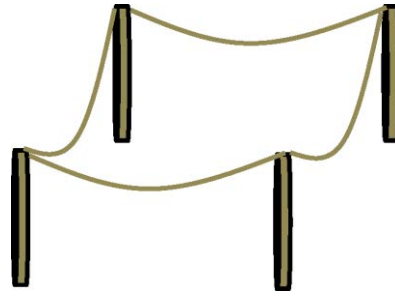


Figure 2-2 Fence using rope (Example)

(In case of storage at the place where persons other than the related persons enter, such as outside of the premises of facilities, etc.)

- Fences made of iron wire (**Figure 2-3**), net fences or metal fences (**Figure 2-4**), etc., shall be installed in order to prevent unauthorized entry.
- If the weight of the designated waste under storage is applied directly onto the fence, etc., it is necessary to select a fence that has the necessary structural strength to withstand the load.
- It is necessary to carry out the construction work so that the fence will not collapse due to wind or rain, etc.
- If a fence, etc., is installed, it is desirable to lock up the fenced area in order to prevent unauthorized entry into the surrounding areas of the storage site.
- Refer to “**2.10 Prevention of Radiation Hazards**” stated below on how to prevent radiation hazards during storage.

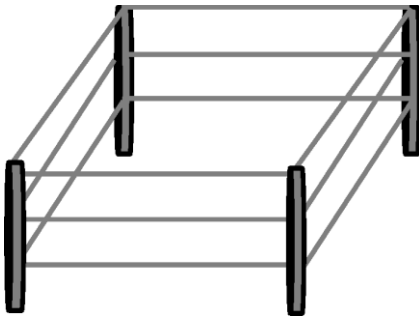


Figure 2-3: Iron Wire Fence (Example)

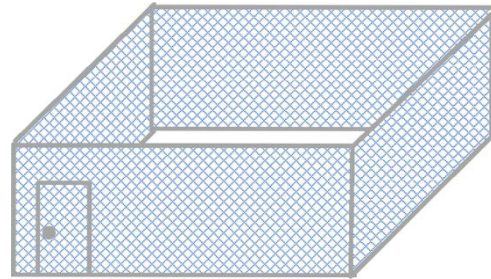


Figure 2-4: Fence (Example)

- The notice board shall be in accordance with **Figure 2-5**.

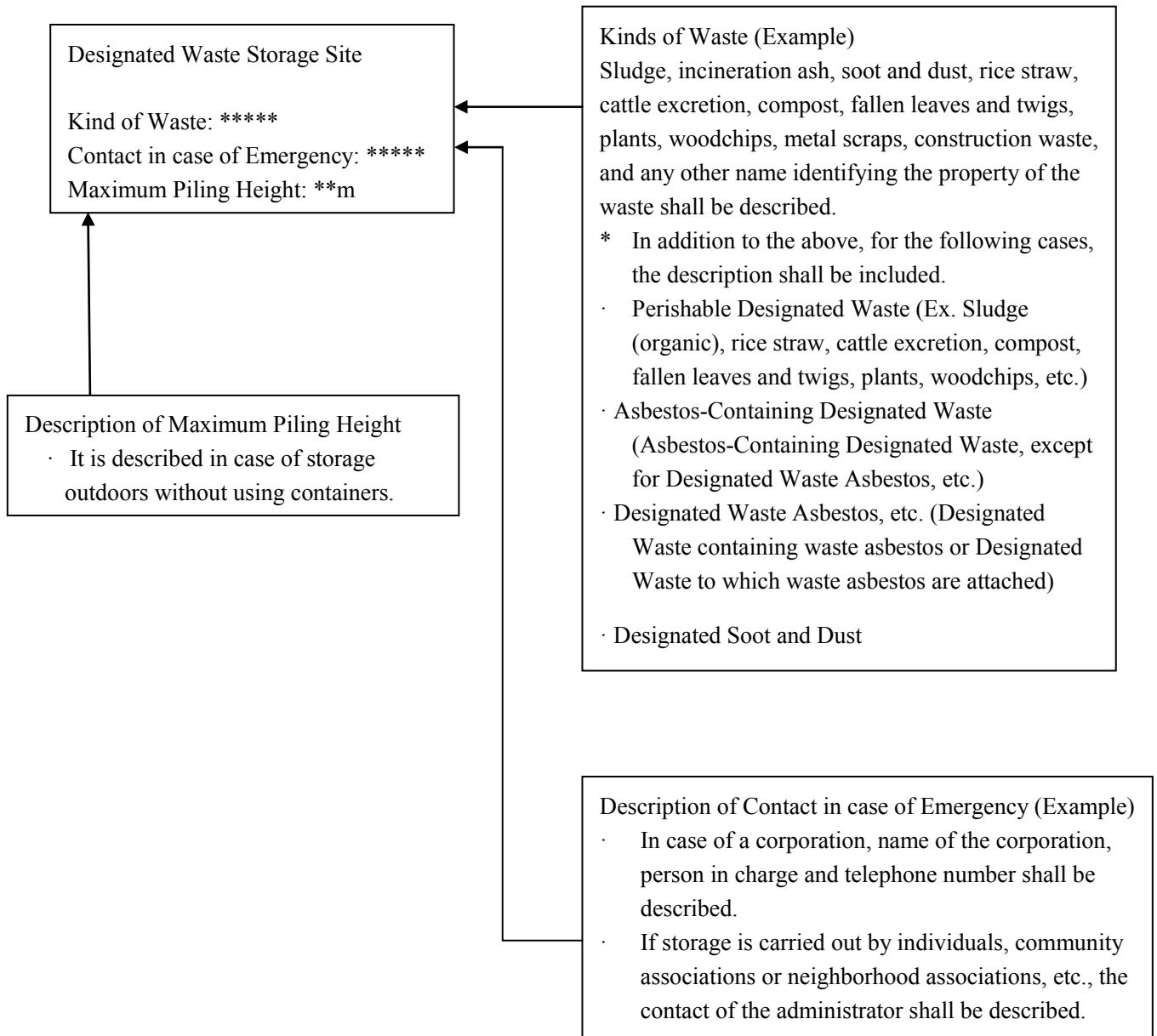


Figure 2-5: Notice Board (Example)

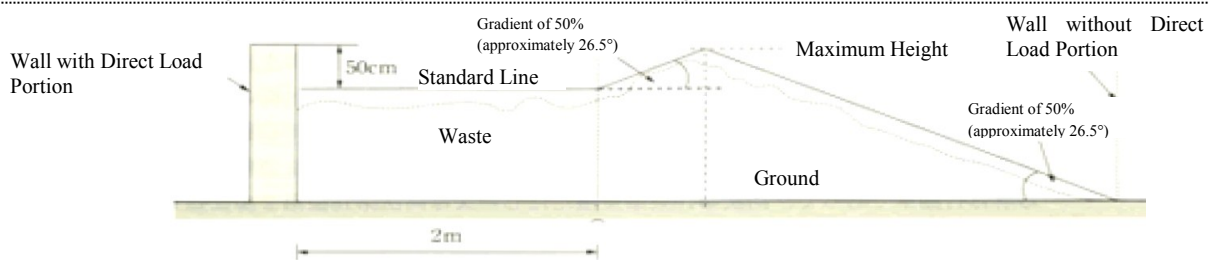
2.2 Prevention of Dispersion and Outflow of Designated Waste

Ordinance, Article 15, paragraph (2)

In order to ensure that no designated waste will scatter or flow out of the storage site, the following measures shall be taken:

- (a) Necessary measures shall be taken such as putting the designated waste in a container or in a package, etc.
- (b) In cases where the designated waste is stored outdoors without using a container, the height of such designated waste piled up shall not exceed such height prescribed in the following 1., or 2., depending on the situation as classified under such 1., or 2.:
 - 1. If it is without a structure which has an area where the designated waste stored is loaded directly against the enclosure of the storage site (hereinafter referred to as “Directly Loaded Area”), for any given point of such storage site, the height from the ground to the intersecting point of a vertical line that goes through such given point and a surface that goes through the bottom of that enclosure (if the bottom is not touching the ground, the intersecting line of the surface that is vertically extended from that bottom and the ground) and has a gradient of 50% upward from a level surface (if there are 2 or more intersecting points, it shall be the one nearest to the ground).
 - 2. If it is with a Directly Loaded Area against the enclosure of the storage site, the height as prescribed under the following a., and b., for the areas specified under such a., and b.:
 - a. For the area within 2 meters horizontally to such storage site side from the vertical downward line of 50 cm from the top of the Directly Loaded Area (if the height of such enclosure of the Directly Loaded Area is less than 50 cm, this shall be its bottom) (hereinafter referred to as “Base Line”): for any given point of such area within 2 meters, the height prescribed under the following i., (If the enclosure of such storage site includes any area which is not a Directly Loaded Area, the lower of the heights prescribed under i., and ii.):
 - i. The height from the ground to the intersecting point of the vertical line which goes through such given point and the horizontal surface which goes through the Base Line with a minimum horizontal distance to such vertical line
 - ii. The height prescribed under 1.
 - b. For the area beyond 2 meters horizontally to such storage site side from the Base Line: for any given point in such area beyond 2 meters, the height prescribed under the following i., (If the enclosure of such storage site includes any area which is not a Directly Loaded Area, the lower of the heights prescribed under i., and ii.):
 - i. The height from such given point to the intersecting point of a vertical line which goes through such point and a surface which goes through the line that is 2 meters horizontally to the storage site side from the Base Line and has a gradient of 50% upward from a level surface (if there are 2 or more intersecting points, it shall be the one nearest to the ground)
 - ii. The height prescribed under 1.

Note) Loading height of designated waste when storing outdoors without using a container



- If the waste does not contact the fence, less than gradient of 50% from the bottom of the fence
- If the waste contacts the fence (load is directly put on the fence), within 2m inside of the fence shall be 50cm lower than the height of fence and the inside more distant than 2m from the fence shall have gradient of 50% or less. (gradient of 50% is the gradient at ratio of bottom : height = 2: 1 which is approximately 26.5°) (Source: Website of Japan Industrial Waste Technology Center)

[Purpose of Measures]

In order to avoid impairments to the conservation of the living environment caused by the scattering and outflow of designated waste from the storage location, it is necessary to store and pile up the waste to an appropriate height.

When there is a risk of scattering or outflow of the designated waste due to the infiltration of rainwater or groundwater, it is necessary to take measures to prevent such infiltration by rainwater or groundwater.

[Examples of Measures]

- Depending on the type and shape of the designated waste, storing the waste in containers is effective for preventing the scattering and outflow if there is a risk of scatter or outflow occurring.
- When there is a risk of scatter or outflow of the designated waste due to infiltration of rainwater, storing the waste in watertight containers, covering it with a waterproof sheet, and storing it at a height higher than the surroundings are effective ways of preventing scatter or outflow.

(Storage in Flexible Containers)

- The types of flexible containers are as shown in **Table 2-1**. It is necessary to select the type taking into consideration the properties of the stored waste and storage period, etc. When storing relatively lighter designated waste, generally the cross-type (**Figure 2-6**) can be used but when storing for a fixed period of time over several years, or when storing relatively heavier designated waste or designated waste containing a lot of water, highly durable cross or running-types (**Figure 2-7**) fitted with durable bags inside are more effective for storing the waste.
- When storing designated waste containing a lot of water such as sludge etc. in flexible containers, if there is a lot of water such as snow etc. mixed within the designated waste, it is important to avoid piling up the waste where possible as there is a risk of contaminated water flowing out due to gravity when the waste is piled up. However, this shall not be limited to storage locations where the contaminated water will not flow out, e.g. when stored indoors in which receptacles for water affluent have been installed.
- When storing designated waste in flexible containers that are piled up to prevent collapse and damage, a pilling height up to 2~3m (2 or 3 layers) shall be effective. However, refer to “**2.9 Storage Method of Perishable Designated Waste**” for perishable waste.

Table 2-1 Type of Flexible Containers

Type of Flexible Container	Features, etc.
Cross-type*	<ul style="list-style-type: none"> · One-way use presumed. · Lower weather resistance and waterproof performance compared to the running-type. · Some types are fitted with inner bags and inner coatings or have higher weather resistance through UV processing.
Running-type*	<ul style="list-style-type: none"> · Repeated storage and discharge is presumed. · Superior weather resistance and waterproof performance

* According to JIS Z 1651

* In addition to the above, bags similar to sandbags whose conformity to JIS has not been confirmed are also available commercially. Select for use after confirming that it meets the storage conditions.

**Figure 2-6: Cross-type (Example)****Figure 2-7: Running-type (Example)**

(Source: A pamphlet of a manufacturer)

***Things to note when storing waste in flexible containers**

When storing designated waste that is highly likely to scatter such as designated soot and dust from incineration facilities etc. in flexible containers, it is important to use a hopper etc. to prevent scatter in the surrounding areas and to prevent workers involved in removing the ash from being exposed to radiation.

(Storage in Drum Cans)

- If contaminated water may flow out to the surrounding environment due to the storage of designated waste containing a lot of water such as sludge, it is effective to select drum cans.
- For perishable designated waste, including organic sludge, cattle excretion, compost, plants, fallen leaves and twigs, etc., if it is highly likely that perish will occur, it is desirable to store the waste in containers with good heat resistance, including drum cans (with cover) and avoid storing the waste in flexible containers since it is likely that heat would accumulate due to fermentation.
- Since drum cans are mainly made of metals, using chemical drum cans, etc. is effective in combating corrosion.

(Storage in Plastic Bags)

- When storing a small amount of plants and fallen leaves and twigs, etc., plastic bags having a certain strength can be used (home garbage bags shall be avoided due to durability considerations).
- During storage, adopt measures such as double packaging to ensure that the plastic bags will not break.

(Storage in Packaging Net)

- For waste on farmland, including rice straw, it is desirable to prevent scattering of waste by storing waste in packaging nets, etc., and the waste shall be stored indoors such as a warehouse or plastic greenhouse.

- During storage, it is necessary to store the waste by covering the entire waste so that the waste will not scatter or flow out from gaps in the packaging materials.

(Storage in Removable Containers)

Considering the subsequent transportability, if the waste is going to be stored in a removable container such as a detachable truck, covering the ceiling section with a waterproof sheet and raising the top end of the sheet to incline it and prevent rainwater from collecting is an effective means to prevent dispersion and outflow as well as infiltration by rainwater.

(Storage Outdoors without using Containers)

- If waste is stored outdoors without using containers, in order to prevent the sheet used to cover the waste from shifting or turning inside out due to wind or rain, secure it firmly to the ground or waste. Besides this, storing the waste on a location higher than the surrounding areas and measures to prevent contact with rainwater by the waste and infiltration of rainwater through the gaps in the sheet are also effective measures (Figure 2-8, Figure 2-9).
- If the seams of the cover sheets are joined together, take note of any damage in the seams when a load is applied on the sheets due to the storage mound settling down or changing shape etc.
- Raising the top of the sheet to create a slope is effective in preventing rainwater from collecting on the cover sheet.
- If infiltration of water (surface runoff etc.) from the surroundings area is a concern, e.g. when the storage site is near a slope etc., it is effective to set up draining channels around the storage site.
- If infiltration by rainwater into the bottom of the storage site is a concern, it is effective to lay pallets used for logistics transport on the bottom first before storing the designated waste on top.

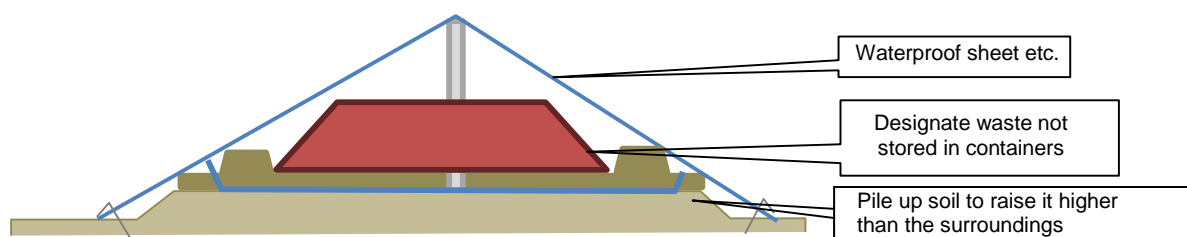


Figure 2-8 Prevention of scatter and outflow of designated waste not stored in containers (Example 1)

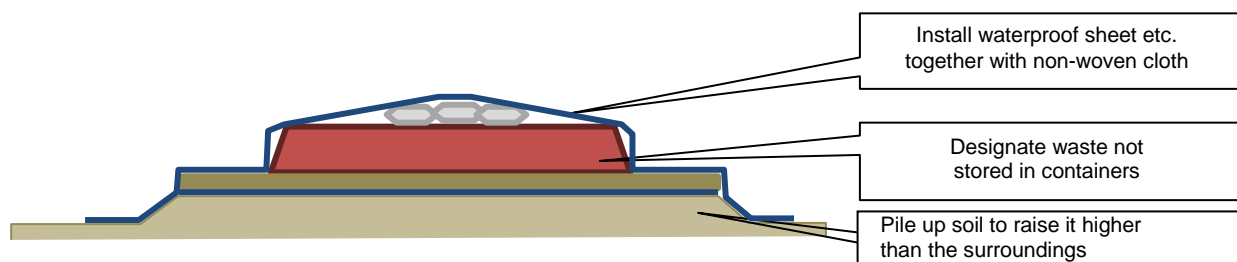


Figure 2-9 Prevention of scatter and outflow of designated waste not stored in containers (Example 2)

* If damage is observed in the seepage control sheet that has been laid out, repairs need to be carried out promptly to prevent infiltration by rainwater etc.

(Storage on a Slope)

- When establishing a storage site on a slope, measures to prevent the waste from collapsing are necessary in particular.
- Specifically, installing a retaining wall or dam on the lower slope, making cut earth or embankment depending on the gradient of the slope, etc. are effective in preventing this. **(Figure 2-10).**
- The strength of the foundation and the groundwater level needs to be checked in advance during construction and measures to strengthen the foundation and to deal with surface runoff are necessary.

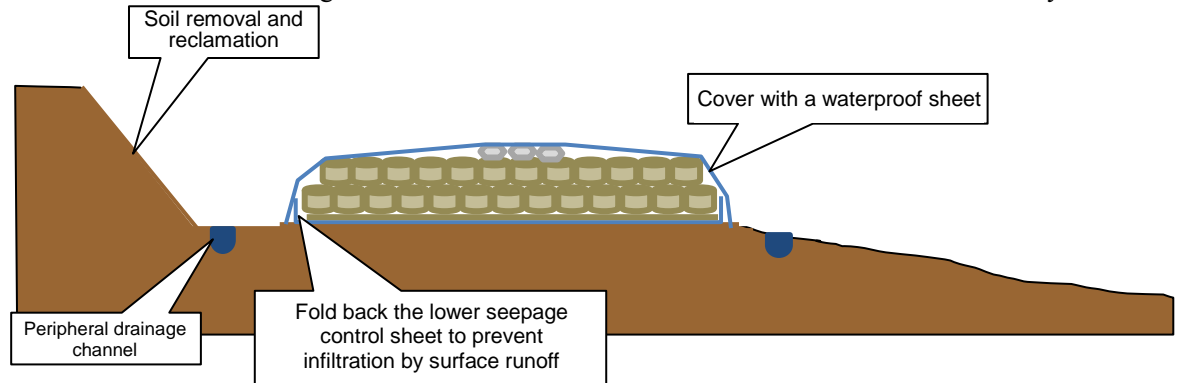


Figure 2-10 Establishment of storage site on a slope

(Storage in Buildings without Using Containers)

- When storing designated waste in buildings without using containers, take care to prevent the waste from scattering or flowing outside the building.

(Storage of Designated Waste Containing Asbestos)

- For designated waste containing asbestos, storing it in double plastic bags with sufficient strength (those with a thickness of more than 0.15mm are recommended) after coating the waste beforehand with water or an anti-dispersion agent, or in robust containers (sealed containers such as drum cans etc.) is effective in preventing scatter.
- Designated waste containing asbestos shall also be covered by sheets or packed in bags, etc., to prevent scatter.

“(Manual of Treatment of Waste containing Asbestos, 2nd Edition” (March 2011, the Ministry of the Environment))

(Reference) If the waste stored in a container is stored indoors or in a cargo container, etc.

- Storing waste indoors in a flexible container and drum can is effective in preventing scatter and outflow.

(Matters of Note)

(Creation of records)

- Concerning the method of managing containers including designated waste, the type of designated waste being stored (if designated waste asbestos are in the containers, such fact shall be included) and the concentration of radioactive cesium shall be indicated on the containers used for storing designated waste for management purposes (for example, attach a tag or label to the container or put up a notice board on the container side when storing waste of the same type). This information on the designated waste shall also be recorded in a separate list together with an overview of other information such as the location and time that the waste was generated.

2.3 Prevention of Contamination of Public Water Area and Groundwater

Ordinance, Article 15, item (iii)

In order to prevent contamination of public water area and groundwater by the sewage water generated from the storage of designated waste, necessary measures shall be taken such as covering the bottom surface of the storage site with a seepage control sheet, etc.

[Purpose of Measures]

In order to prevent contamination of public water area and groundwater surrounding area of the storage site, it is necessary to prevent outflow of contaminated water resulting from the storage of designated waste outside of the storage site and permeating into the underground.

It is necessary to reduce the water content in the designated waste as much as possible since there is a risk that the water may be contaminated and discharged when a large amount of water such as melted snow etc. is mixed with the designated waste.

[Examples of Measures]

- If it is possible that wastewater would flow out to the surrounding environment by storage of designated waste containing much water such as sludge, it is effective to select airtight containers, including drum cans.
- If there is a risk that contaminated water resulting from the storage of designated waste may flow out or permeate into the underground, in addition to installing drainage ditches and establishing drainage paths, carrying out sedimentation separation and using adsorbents are effective ways to treat the contaminated water before the water is discharged to public water areas.
- If any damage is confirmed in the installed seepage control sheets or high airtight containers, the landowner etc. shall carry out appropriate replacement and repair. Consult the administrative agency if replacement or repair of the sheets or containers is difficult.

(Installation of seepage control sheets, etc.)

- Where wastewater might leak and permeate into the underground, measures such as the installation of seepage control sheets shall be taken.
- In selecting the structure and material of the seepage control sheet, the following standards expected of seepage control sheets that are used in final disposal sites may be used as a reference material.
- In general, storage shall not be carried out in situations where there is a risk of damaging the seepage control sheets. When there is a risk of damaging the seepage control sheets due to protruding objects in the stored waste etc., measures such as installing a layer of protective soil or laying “protection mat (non-woven cloth, etc.)” between the seepage control sheet and ground and waste are effective means of protection.
- In addition, if there is a risk that the seepage control sheet may be damaged by operating heavy machinery in the waste, a protective layer of soil or iron plates may be installed to protect the sheet from the heavy machinery.

(Reference)

Matters of Note in connection with Operation of the Order determining the Technical Standards for Final Disposal Site of Municipal Solid Waste and Final Disposal Site of Industrial Waste (July 16, 1998, Kansuiki No. 301, Eikan No. 63)

(6) Seepage Control Sheet

It is common to use seepage control sheets as the seepage control material of surface seepage control work and for the materials, synthetic rubber, synthetic resin and asphalt are commonly used.

The thickness of a seepage control sheet shall be more than 1.5mm for seepage control sheets other than

asphalt and seepage control sheet of asphalt shall be more than 3mm, considering that it shall ensure sufficient strength and seepage control even after the surface is damaged or the quality is deteriorated and the possibility of repair, etc.

Seepage control sheet having effect of seepage control, strength and durability necessary for prevention of infiltration of retained water provided for in the Order, Article 1, paragraph (1), item (v), (a), (1) shall be the seepage control sheet having the following properties. In this regard, it is necessary that the joint parts of seepage control sheets shall have similar properties and capacities.

[1] Effect of Seepage Control

For the material of seepage control sheet, it shall have sufficient seepage control property in which the retained water, etc., in the landfill site would not seep. There shall be no hole or crack, etc. found on the surface of seepage control sheet.

[2] Strength

It shall have the capacity to respond by strength and extension to the load presumed by waste or retained water, etc., the impact power by vehicles of landfill work, etc., changes in base ground which might arise from them and tolerable in stable computation and presumed temperature stress.

[3] Durability

a. Weather Resistance

As the quality of seepage control sheet might deteriorate by the impact of ultraviolet rays, it shall have the property in which the strength and extension rate of seepage control sheet would not deteriorate significantly even after long time exposure to ultraviolet rays compared with the status before exposure to ultraviolet rays.

b. Heat Stability

The surface temperature of seepage control sheet might increase to approximately 60°C through 70°C in summer by direct sunshine, while the temperature might decrease to approximately —20°C in winter. Also the inside temperature of a landfill site might increase due to decomposing reaction of waste, seepage control sheet shall have resistance to such temperature fluctuations.

c. Acid resistance and alkaline resistance, etc.

Presuming the hydrogen ion concentration of retained water, etc., of a landfill site, seepage control sheet shall have the property resistant to acid and alkaline.

In addition, seepage control sheet shall have resistance to oil and other chemical status of reclaimed waste.

d. Other

Seepage control sheet shall have resistance to the quality deterioration by the impact of ozone in the air and cracks emerging in case of continued stress by bent.

[4] Other

Seepage control sheet shall have good workability so that defect shall not occur in laying and jointing, etc., of seepage control sheets.

(Reference) Take note of the following points in the installation of the seepage control sheets.

- Install the seepage control sheet larger than the scope of placing the designated waste so that the designated waste to be stored shall not protrude out of the sheet.
- If the ground surface is uneven, prevent damage to the sheet by leveling the land.
- Seepage control sheet shall generally be single, however, if storage continues for a certain period, double laying shall be considered.
- The appropriate thickness of the seepage control sheet shall be selected, considering the conditions of the storage site and presumed storage period. While there are such different thicknesses of 0.5mm, 1.0mm and 1.5mm in seepage control sheets, and the thickness required for seepage control work of a final landfill site should be 1.5mm, however, depending on the conditions of the storage site, a thinner sheet may also be appropriate.
- In order to prevent stagnant wastewater leaked from the designated waste on the seepage control sheet, the following measures shall be taken.
 - ◆ Soil (with certain clayish property. Fine fractions are 15~50%) shall be laid on the seepage control sheet and containers shall be placed on it. When using mixed soil, it is also effective to use cesium-absorptive substances as bentonite and zeolite.

- ◆ Build a slope etc. to prevent wastewater from stagnating.

(Laying of Clayish Soil Layer, etc.)

Instead of a liner sheet, a layer of clayish soil or bentonite can also be laid. When storing designated waste containing a lot of water over a certain period of time in particular, installing a layer of clayish soil such as soil mixed with bentonite is effective in absorbing cesium.

(Storage in Containers)

- If wastewater may flow out to the surrounding environment due to the storage of designated waste containing a lot of water including sludge, etc., it is desirable to select airtight containers such as drum cans. However, seepage control sheets may also be used at the same time since corrosion of the drum cans is a concern if chemical drum cans cannot be used during the storage period (**Figure 2-11**).
- If waste containing water is stored in flexible containers, outflow of wastewater shall be prevented by selecting appropriate cross-type flexible containers with a double structure and interior coating or running-type flexible containers in consideration of the expected storage period (**Figure 2-12**).

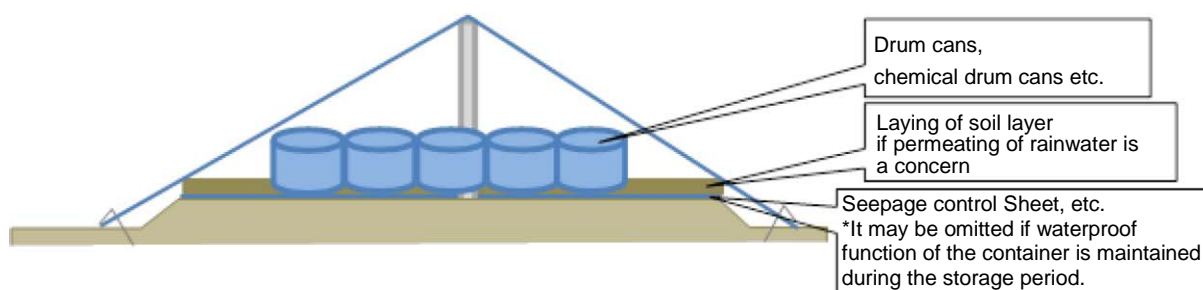


Figure 2-11: Prevention of leakage of wastewater when designated waste containing a lot of water is stored in airtight containers (Example)

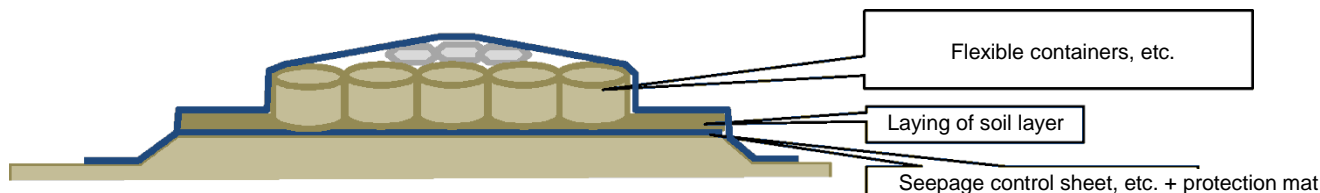


Figure 2-12: Prevention of leakage of wastewater when waste containing water is stored in flexible containers (Example)

(When storing waste without using containers)

- When storing designated waste containing water without using containers, installing a layer of soil or laying a seepage control sheet is effective in preventing contamination of groundwater and public water areas by the contaminated water (**Figure 2-13**).

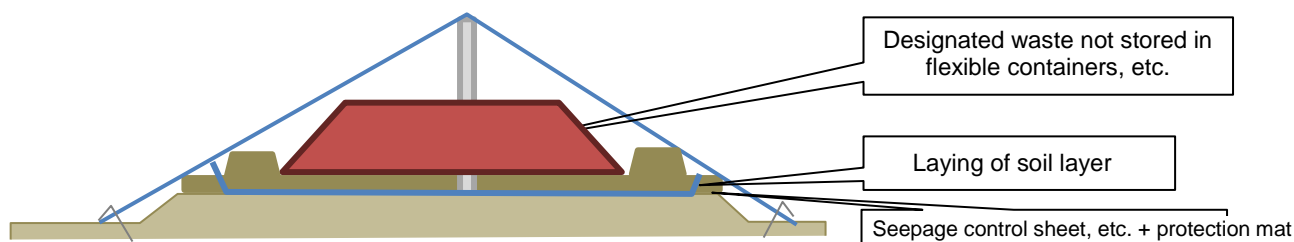


Figure 2-13: Prevention of leakage of wastewater where designated waste containing water is not stored in containers (Example)

(When storing waste in an excavated ground)

- When storing designated waste semi-underground by excavating the ground surface, it is necessary to prevent the designated waste from collapsing or flowing out due to the infiltration of surface runoff (Figure 2-14).
- The strength of the foundation and the groundwater level needs to be checked in advance during construction and measures to strengthen the foundation and to deal with surface runoff are necessary.
- Avoid storing designated waste in areas where the groundwater level is high and there is a risk of the groundwater infiltrating the storage site.
- If there is a risk that infiltrated water may flow out from the designated waste, it is important to lay collection and discharge pipes in the lower soil layer and pump the water to a catchment container laid above ground using a pump.
- In order to prevent the designated waste from being submerged in water even if surface runoff from the surface were to infiltrate the storage site, it is effective to fold the sheet at the bottom to wrap around the waste.

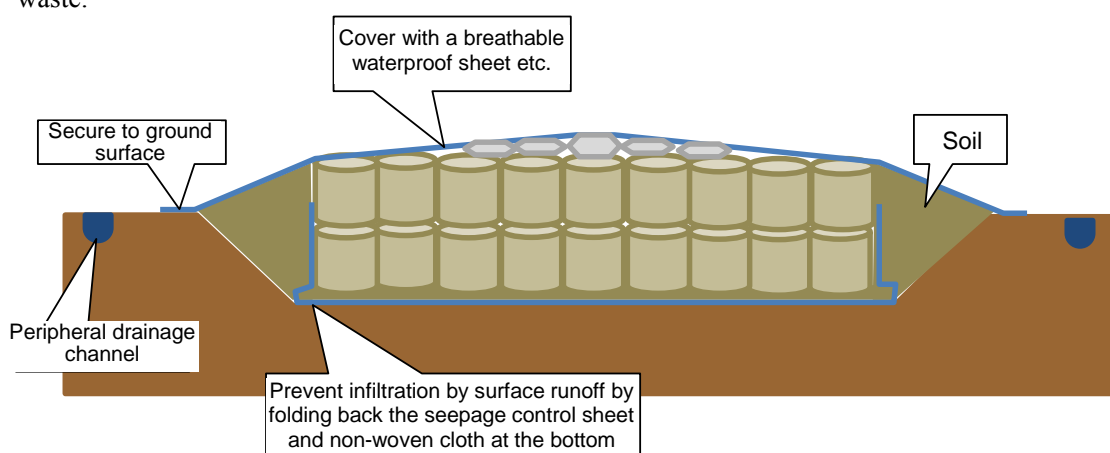


Figure 2-14: Measures to prevent infiltration by rainwater, scattering and outflow when storing waste in an excavated ground (example)

(When storing indoors)

- In case of storing designated waste not containing much water indoors (concrete floor structure), etc., if prevention of outflow of wastewater can be secured to the same extent as installation of seepage control sheets and clayish soil layers, etc., according to the nature of the designated waste and status of the site, it is possible to store without installing seepage control sheets, etc., provided that since radioactive materials permeated into the concrete are difficult to remove (it is necessary to tear off together with the concrete), it is effective to protect the floor by coating.
- In order to prevent contaminated water from flowing out from a building storing designated waste, it is effective to install a cesspool container to collect contaminated water that has seeped out from the designated waste in addition to preventing rain and wind from entering the building.

2.4 Prevention of Infiltration of Rainwater or Groundwater

Ordinance, Article 15, item (iv)

In order that no rainwater or groundwater infiltrates into the designated waste, necessary measures shall be taken such as covering the surface of the designated waste with a seepage control sheet, etc.

[Purpose of Measures]

When storing designated waste, there is a risk of radioactive cesium flowing out into the surrounding areas from the designated waste due to the infiltration of rainwater caused by wind and rain and infiltration of groundwater caused by a rise in the groundwater level. As such, it is necessary to take measures to prevent such infiltration of rainwater or groundwater into the designated waste.

[Examples of Measures]

- Avoid areas with a high groundwater level and pits where rainwater collects easily in selecting a storage site.
- If infiltration of water from the surrounding areas is a concern, e.g. when the storage site is close to a slope, it is necessary to adopt measures such as laying drainage paths around the storage site.
- In prevention of infiltration of rainwater or groundwater, where the designated waste is stored outdoors, appropriate infiltration prevention measures need to be selected depending on the status of the storage site and waterproof capacity, etc., of the container storing the waste.
- Since radioactive cesium may elute easily from soot and dust, it is important to adopt measures to prevent infiltration by rainwater or groundwater such as wrapping the waste with a seepage control sheet or storing the waste in a sheltered location like a building or tent.

(Storage indoors or in the place having roofs)

- Storing indoors is an effective means of preventing infiltration by rainwater (**Figure 2-15**).
- When storing designated waste in a provisional tent or under a roof covered by a waterproof sheet that may be damaged by wind and rain, a container with a certain level of waterproof performance needs to be selected as the storage container (e.g. a drum can, running-type flexible container etc.) (**Figure 2-16**)

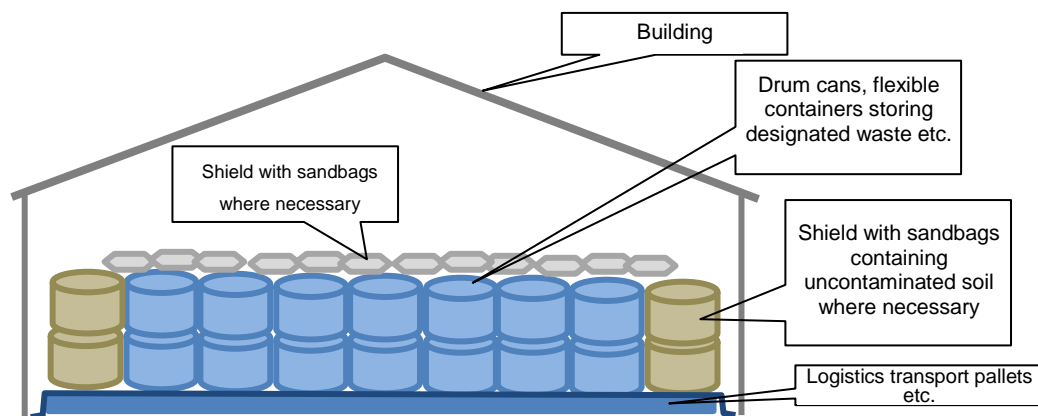


Figure 2-15 Storing inside a building (example)

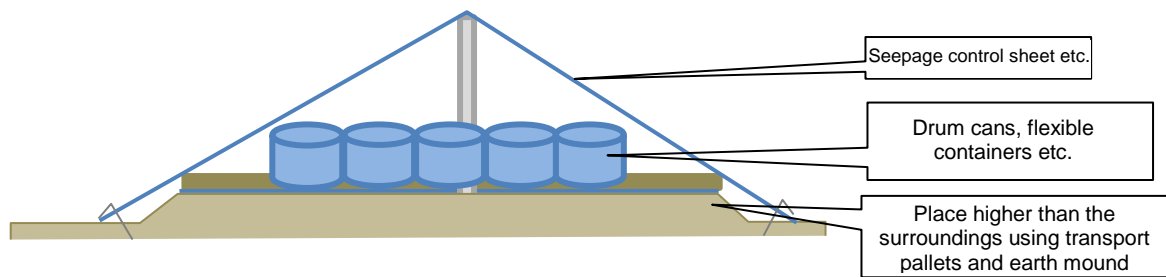


Figure 2-16 Storage in a location installed with a waterproof sheet overhead (example)

(Outdoor Storage)

- It is necessary to prevent infiltration by rainwater or groundwater by covering the entire surface of the designated waste with a seepage control sheet (**Figure 2-17**).
- Refer to “**2.3 Prevention of Contamination in Public Water Areas and Groundwater**” for the structure and material of the seepage control sheets.
- It is important to securely fasten the ends of the seepage control sheet to prevent them from turning inside out due to strong winds etc.
- Raising the center part of the seepage control sheet a little to create a slope is effective in preventing rainwater from collecting on the seepage control sheet.
- Refer to “**2.9 Storage Method of Perishable Designated Waste**” on how to store perishable designated waste.

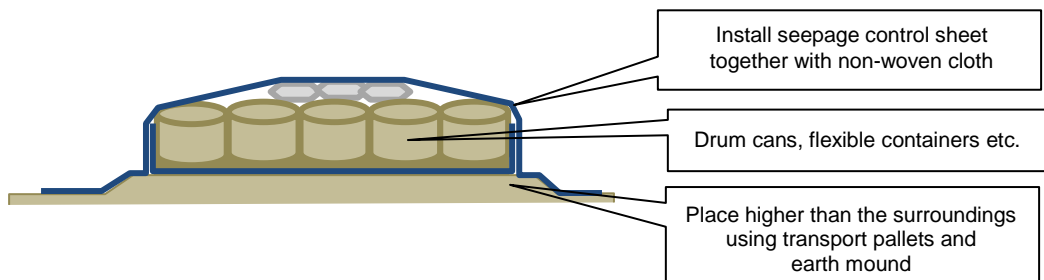


Figure 2-17 Outdoor storage (example)

2.5 Prevention of Foul Odors

Ordinance, Article 15, item (v)

Necessary measures shall be taken to prevent any foul odors from emitting from the storage site.

[Purpose of Measures]

From the viewpoint of conserving the living environment around the storage site, it is necessary to ensure that foul odors are not emitted into the surrounding areas by the designated waste being stored.

[Example of Measures]

- When storing designated waste where the emission of foul odors such as sludge is a concern, select containers such as drum cans and running-type flexible containers etc., and then improve airtightness by covering with a sheet for example.
- Since heat accumulation and fire outbreaks are concerns when airtightness is raised, e.g. for designated waste that is likely to decompose, take the surrounding situation into consideration and maintain adequate distance with the surrounding areas.

2.6 Prevention of Emergence of Harmful Insects

Ordinance, Article 15, item (vi)

It shall be ensured that neither any rodents will live nor any mosquitoes or flies or any other harmful insects will break out at the storage site.

[Purpose of Measures]

In terms of conserving the living environment around the storage site, it is necessary to ensure that rats do not inhabit and mosquitoes, flies and any other harmful insects do not breed in the areas.

[Examples of Measures]

(Measures for Prevention of Infestation, etc.)

- In order to monitor and control the breeding of rats and sanitary insects, it is effective to use insecticide and rat poison depending on the situation in addition to performing periodic visual inspections of the areas around the storage site.
- To make it easier to perform anti-infestation measures, consolidate all perishable designated waste by type in a single location as far as possible to prevent it from scattering.
- To prevent mosquitoes from breeding in places such as waste tires and waste bathtubs where water collects easily, remove the water first and make it difficult for rainwater etc. to collect during the storage period when storing waste (waste tires and waste bathtubs etc.) in which water can easily collect inside.
- To prevent flies from being attracted by the heat and smell, it is effective to pack perishable designated waste in containers. Also, when storing perishable designated waste without using containers, a sheet or layer of soil may be used to cover it.
- Measures such as cover sheets are effective in preventing rats from infiltrating perishable designated waste.

(Reference: Possibility of infestation by rats and sanitary insects)

- For perishable designated waste (organic sludge, livestock excreta, compost etc.), flies may breed in large quantities even in winter due to the high temperature that is maintained by heat generated through fermentation.

- For rats, the same thing can be said due to the availability of food and the high temperature.
- Mosquitoes may breed in places where water can collect such as the surrounding drainage channels.

2.7 Prevention of Mixing of Designated Waste with other Materials

Ordinance, Article 15, item (vii)

In order that the designated waste will not be mixed with any other materials, take necessary measures such as setting up partitions, etc., at the storage site.

[Purpose of Measures]

When storing designated waste, partitioning measures to prevent the designated waste from getting mixed up with other materials shall be taken.

[Examples of Measures]

- When storing designated waste, depending on the situation, measures to ensure that the waste is not mixed up with other specified waste (including specified municipal solid waste and specified industrial waste) by using cover sheets or soil layers for partitioning purposes, or by partitioning the storage site, are necessary.
- Using concrete blocks or soil for shielding is an effective way of segregating the storage site for designated waste from other waste and removed soil.

(In case of Storage at a Controlled Final Disposal Site)

- In order to prevent mixing with other waste, when storing designated waste on top of other reclaimed waste, it is important to classify the waste properly by installing a final (or interim) layer of soil (50 cm) on top of the waste concerned before storing the designated waste on top and also to record down the locations of the storage sites (**Figure 2-18**).
- Waste has to be stored on top of a layer of soil that is at least 50 cm thick and piling of waste directly on top of the seepage control surface at the bottom should be avoided (**Figure 2-19**).
- After finishing carrying-in of the day, the storage site shall be covered by seepage control sheets, etc., or covered by soil as appropriate to prevent scatter and outflow to other landfill lots.

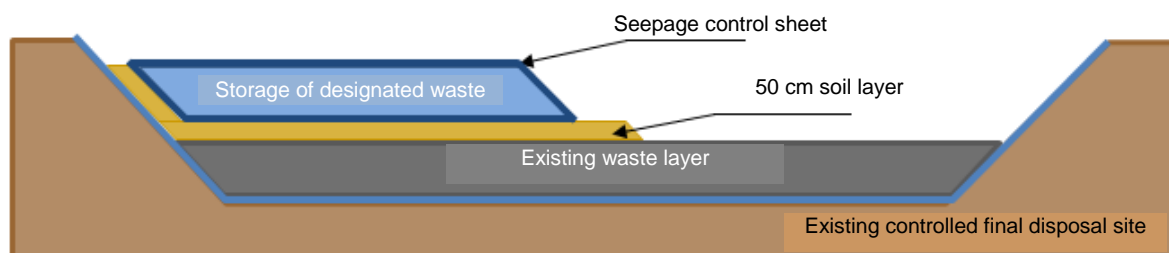


Figure 2-18 Storage in Controlled Disposal Sites (Example 1)

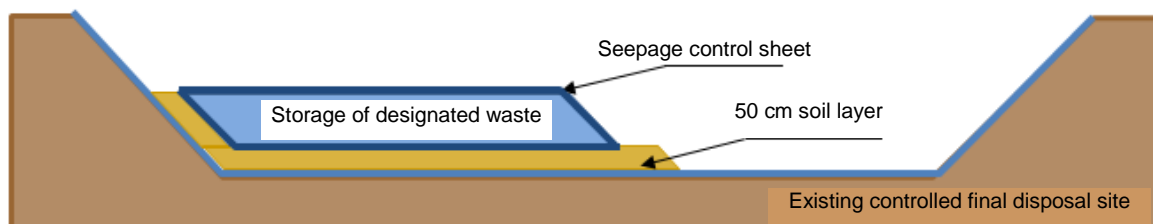


Figure 2-19 Storage in Controlled Disposal Sites (Example 2)

2.8 Prevention of Mixing of the Asbestos-Containing Designated Waste

Ordinance, Article 15, item (viii)

In the event that the designated waste prescribed under item (i), (b), 2., a., b., and d., is stored, necessary measures shall be taken such as setting up partitions, etc., so that such designated waste will pose no risk of mixing with any designated waste other than such designated waste.

[Purpose of Measures]

- Under the Waste Management Act, treatment standards have been established for waste containing asbestos (waste containing asbestos, waste asbestos, etc.) that may impair human health and the living environment.
- As described above, for designated waste containing asbestos that require treatment under the special treatment standards, it is necessary to store the waste separately from other designated waste so that transfer for subsequent treatment will be easier.
- Designated waste that contains asbestos is defined as follows (Ministry of the Environment Bulletin No. 10 dated Feb 13, 2012).

“Designated waste containing asbestos”: Waste that is generated by construction of new structures, reconstruction or demolition, waste that contains more than 0.1% of its weight in asbestos (limited to designated waste only, excluding designated waste asbestos).

“Designated waste asbestos”: Designated waste corresponding to those listed under the Waste Management Act Enforcement Ordinance paragraph (1) (2), paragraph (7) item (i) to item (vii).

(Reference: Waste Management Act Enforcement Ordinance paragraph (1) (2), paragraph (7))

- 1 Materials with sprayed asbestos and asbestos removed from such materials by asbestos removal operators that are used as construction materials in buildings and other structures (hereinafter known as “buildings etc.” in the next item)
- 2 Materials listed below containing asbestos used in buildings etc. that are removed by asbestos removal operators
 - (a) Asbestos insulation material
 - (b) Diatomaceous earth insulating material
 - (c) Perlite insulation material
 - (d) Insulation materials, lagging materials and heat resistant covering materials that may scatter the same or higher amount of asbestos as those listed in (a) through (c) above due to contact with humans, air currents and vibration etc.
- 3 Waste plastic sheets, anti-dust masks, overalls and other tools and implements used by asbestos removal operators that may have asbestos attached to them
- 4 Asbestos generated in work sites that are installed with facilities that generate specified soot and dust prescribed under Article 2 paragraph (11) of the Air Pollution Control Act, and that collected by dust collection facilities (excluding imported materials)
- 5 Anti-dust masks, dust collection filters and other tools and implements used in factories or work sites that are installed with facilities listed in the preceding item that generates and collects specified soot and dust, and that may have asbestos attached to them (excluding imported materials)
- 6 Asbestos collected by dust collection facilities (limited to imported materials that are generated from business activities)
- 7 Used anti-dust masks, dust collection filters and other tools and implements that may have asbestos

attached to them (limited to imported materials that are generated from business activities)

[Examples of Measures]

- When storing designated waste containing asbestos, it is effective to establish a dedicated storage site so as not to mix up the waste with other designated waste.
- In addition, when storing designated waste containing asbestos in containers etc., measures such as tags and labels may be used on the containers to avoid mixing up the waste with other designated waste.

(Treatment of Asbestos-Containing Designated Waste, etc.)

- Take note of the following points when handling designated waste containing asbestos.
 - The asbestos-containing designated waste shall be separated into “designated waste asbestos, etc.” and “asbestos-containing designated waste” and properly stored (Refer to **Table 2-2** and **Table 2-3**).
 - If dismantling work of damaged houses, etc., is carried out, check whether building materials containing asbestos are used in advance and collect waste by separating into the asbestos-containing waste and others and such measures shall be taken as storing in containers so that asbestos-containing waste will not be mixed with other waste.
 - Separation of asbestos-containing designated waste is presumed to be done before carrying in the storage site, but screening shall be made at the time of carrying in the site or the storage site by checking whether building materials containing asbestos are mixed. The waste, which is difficult to determine whether these are building materials containing asbestos, etc., or not, shall be treated as asbestos-containing designated waste.
 - For prevention of scattering of asbestos during the storage period, refer to the “Manual of Treatment related to Prevention of Scattering of Asbestos at the Time of Disaster” (August, 2007, Ministry of the Environment), “Manual of Treatment of Waste containing Asbestos, etc. (2nd Edition)” (March 2011, Ministry of the Environment).

<Reference>

Table 2-2: Specific Examples of Asbestos Building Materials Falling under Waste Asbestos, etc.

Category	Specific Examples of Asbestos Building Materials
Blowing asbestos	Blowing Asbestos
	Blowing rock wool containing asbestos (dry and wet)
	Vermiculite blowing materials containing asbestos
	Pearlite blowing materials containing asbestos
Lagging material	Asbestos lagging material
	Diatomite lagging material
	Pearlite lagging material
	Calcium silicate lagging material
	Heat insulating cement
Insulating material	Asbestos insulating material of shingle back-stone for roof
	Chimney asbestos insulating material
Fire resistant coating material	Fire resistant coating plate containing asbestos
	2 nd Class calcium silicate board containing asbestos
	Fire resistant coating paint material containing asbestos

Excerpt from “Manual of Treatment of Waste containing Asbestos, etc. (2nd Edition)” (March 2011, Ministry of the Environment)

Table 2-3: Specific Examples of Asbestos Building Materials falling under Asbestos-Containing Waste

Category	Specific Examples of Asbestos Building Materials
Interior material (wall, ceiling)	Slate board containing asbestos
	Pearlite board containing asbestos
	Slag plaster board containing asbestos
	Pulp cement containing asbestos
	1 st Class calcium silicate board containing asbestos
	Plaster board containing asbestos
	Wall paper containing asbestos
Fire resistant partition	1 st Class calcium silicate board containing asbestos
Floor material	Plastic floor tile containing asbestos
	Plastic floor sheet containing asbestos
Exterior material (outer wall, eave)	Nitrogen siding containing asbestos
	1 st Class calcium silicate board containing asbestos
	Slate corrugated plate containing asbestos
	Extruding cement board containing asbestos
Roof material	Decoration slate for housing roof containing asbestos
	Roofing containing asbestos
Chimney material	Asbestos cement cylinder
Facility pipe	Asbestos cement pipe
Facility and equipment parts	Asbestos foam

Excerpt from Visual Asbestos Building Materials (2nd Edition) (2008, Ministry of Land, Infrastructure, Transport and Tourism)

2.9 Storage Method of Perishable Designated Waste

Ordinance, Article 15, item (ix)

Storage of any Perishable Designated Waste shall be carried out in accordance as follows.

- (a) In order to eliminate the gas that is generated from the Perishable Designated Waste, necessary measures shall be taken such as installing a vent, etc.
- (b) Necessary measures shall be taken to prevent fire from breaking out, as well as fire extinguishers and other firefighting equipment shall be installed.

[Purpose of Measures]

At the waste storage site including perishable organic substances, since fires broke out which were caused by heat generation and generation of methane gas, etc., based on biological and chemical reactions in the piled up waste layers, it is necessary to properly manage to prevent diffusion of radioactive materials to the surrounding environment by fire by establishing gas venting outlets in storing perishable designated waste.

[Examples of Measures]

(In case of Storage in Flexible Containers, etc.)

- If designated waste which might perish is stored in flexible containers, avoid piling up the waste to prevent fermentation heat from accumulating and fires from occurring, in addition to preventing the waste from collapsing.
- If waste is piled up, the height shall generally be up to approximately 2m (two layers of flexible containers) and one pile of waste shall be made as small as possible with a length of approximately 5m (5 flexible containers) and a width of less than 20m (**Figure 2-20**). After piling up, it is necessary to check the status of the waste periodically (about once a month as a guide) to ensure that the pile does not collapse.

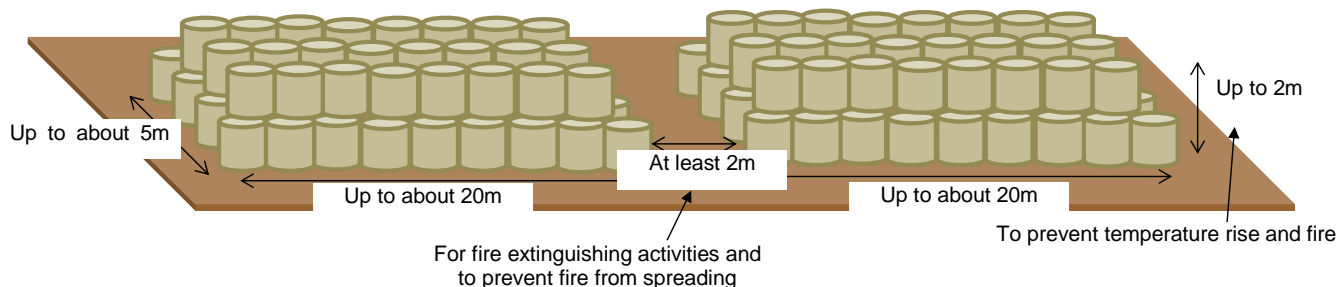


Figure 2-20: Image diagram of the piling and storage of perishable waste in temporary storage sites

Created based on Fire Prevention in Flammable Waste Stored in Temporary Sites (2nd Edition) Earthquake Disaster Response Network (waste, excreta fields) National Institute for Environmental Studies dated 201109019

(When storing in sealed containers such as drum cans)

When storing perishable designated waste in an airtight container such as a drum can, measures need to be taken to vent the gas inside depending on the condition during the periodic inspections.

(When storing in cargo containers or indoors)

In order to constrain the temperature rise within the perishable designated waste when stored indoor so to prevent fires from occurring, it is necessary to take ventilation measures depending on the condition during the periodic inspection.

(In Case of Storage outdoors without using Containers)

- When storing perishable designated waste outdoors without using containers, it is important to limit the piling height to no more than 2m and the surface area per mound to no more than 200m² for fire prevention reasons. In addition, the distance between piled mounds shall be at least 2m in order to prevent heat from accumulating and the fire from spreading and also for fire extinguishing purposes (**Figure 2-20**).
- If a sheet is used to cover perishable designated waste to prevent it from scattering, a breathable sheet must be used(**Figure 2-21**).

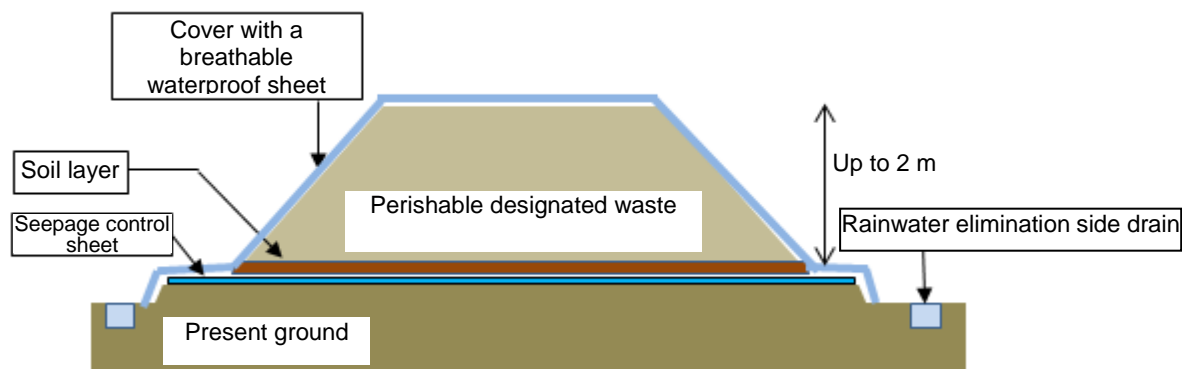


Figure 2-21: Image diagram of the storage of perishable designated waste

- Take note of the following points when installing gas venting pipes in storage sites for perishable designated waste (**Figure 2-22**).
 - Set up a U-shaped tube or umbrella etc., so that rainwater does not enter the gas venting pipe.
 - Decide on the number and bore of the gas venting pipes to be installed depending on the scale of the storage site (use a bore of at least 150 mm when the scale is large).
- It is also effective to cover the waterproof sheet with a layer of soil on top to protect the waterproof sheet.

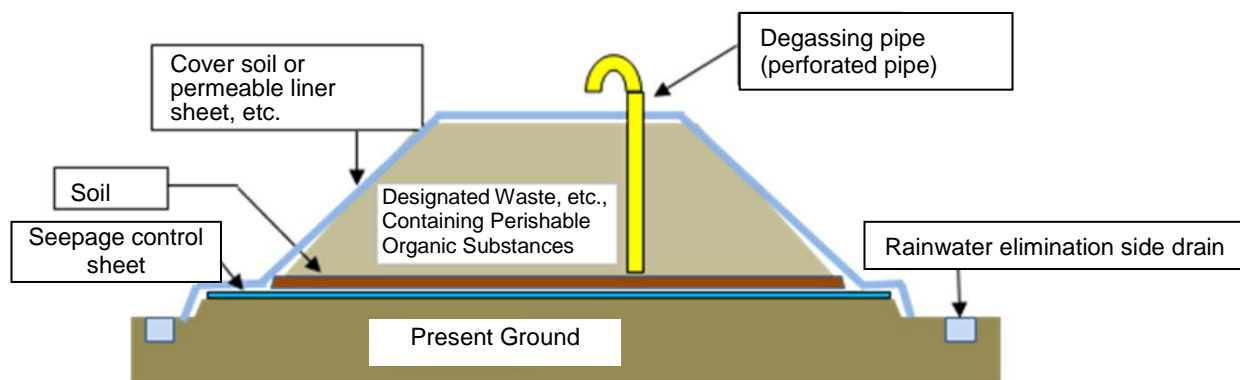


Figure 2-22: Image Figure of Storage of Perishable Designated Waste

- As the ground near the installation location of the gas venting pipe sinks easily, take pre-emptive measures to prevent rainwater infiltration such as using a 2-layer structure consisting of a sheath pipe and the main pipe for the joint of the gas venting pipe (**Figure 2-23**).

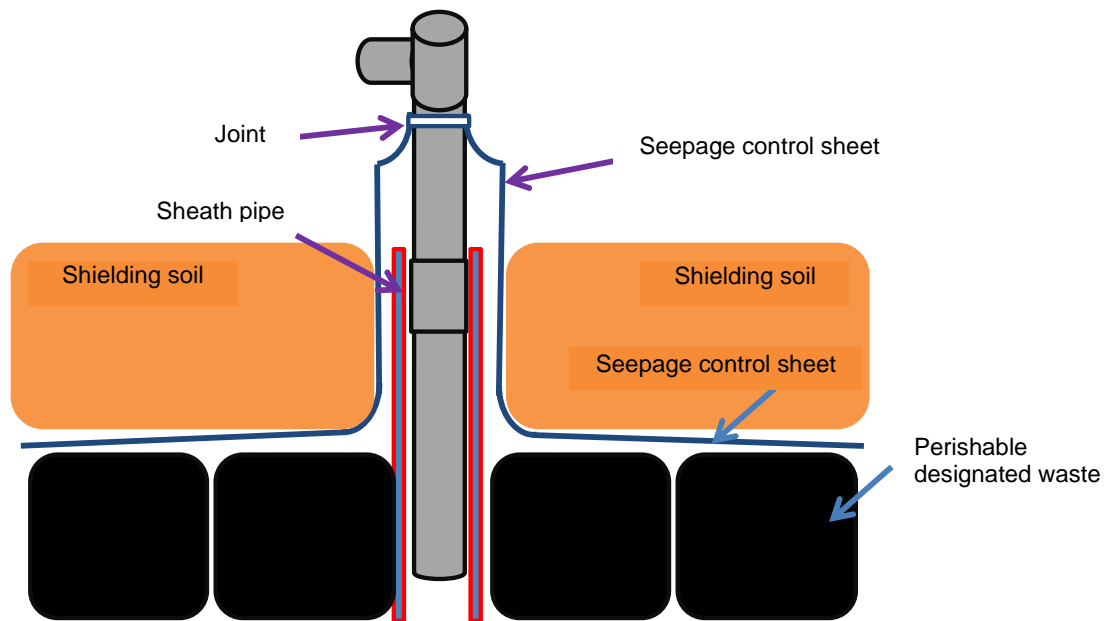


Figure 2-23: Rainwater measure at the joint of the gas venting pipe (construction example)

- When sinking or deformation of the storage mound of the perishable designated waste or an increase in the amount of infiltration water is observed, check if there is no damage or gap in the joint between the gas venting pipe and sheet where necessary. If the risk of infiltration by rainwater is deemed to exist as a result of the inspection, promptly take any measures such as repairs that are required (**figure 2-24**).

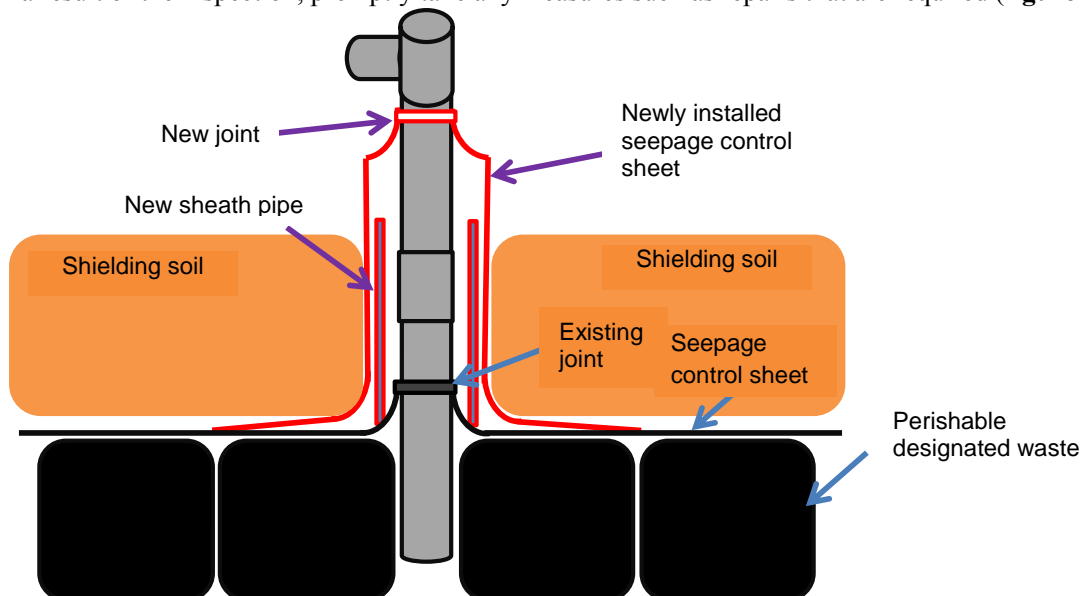


Figure 2-24: Rainwater measure at the joint of the gas venting pipe (repair example)

(When storing rice straw and pasture using wrapping film)

- Bundled rolls of rice straw and pasture that have been wrapped are cut off from the open air and thus pose little risk of generating flammable gas so long as the wrapping is not damaged. Therefore installation of gas pipes is not considered necessary.
- When storing for a long period of time, conduct periodic inspections of the storage site to check if there is any damage in the wrapping, the surface temperature of the wrapping etc., and whether there is any

flammable gas generated. If damage in the wrapping is observed as a result of the inspection, take the necessary measures to repair the damaged areas or do the wrapping again. (Refer to the administrative notice “Storage Methods of Perishable Designated Waste (Provisional Storage of Wrapped Rice Straw and Pasture)” dated Jun 1, 2012.)

(Fire Prevention Measures)

- Take note of the following points to prevent heat accumulation and fire breakout due to the fermentation of perishable designated waste.

- Avoid mixing dangerous substances containing fuel (gas canister, lighter, kerosene can etc.) and waste that scatter sparks (electrical products, batteries, dry cells etc.)
- Prevent the temperature from rising due to heat accumulation by limiting the piling height of perishable designated waste to about 2 m. In addition, do not compress and harden the pile too much as this may generate methane and hydrogen sulphide caused by anaerobic conditions.
- Conduct visual inspections periodically (about once in 10 days*) to check if there are any white fumes or steam from the designated waste or if there is any sinking and deformation. If white fumes or steam or sinking and deformation are observed, there is a high possibility that heat is being accumulated due to fermentation in these locations. Therefore, the temperature in the waste and the concentration of carbon monoxide in the main locations concerned need to be measured to check if there is any risk of fire occurring due to the heat generated, and then controlled based on the results. The temperature may be measured using a thermocouple thermometer at a depth of about 1 m from the surface layer or at the lowermost point. The concentration of the carbon monoxide may be measured using an electrical chemical sensor at a depth of about 1 m from the surface layer or at the lowermost point.

Flammable gases (methane or hydrogen sulphide) may also be measured in place of the internal temperature and CO concentration as a way to check the risk of fire occurring due to the heat generated.

*In particular, in storage sites that are covered with a seepage control sheet which makes it difficult for gas generated from perishable designated waste to escape, it is important to conduct checks about once every 10 days as cases of the temperature rising rapidly when there is an inflow of air have been observed.

- When storing perishable designated waste indoor, ventilate the air at periodic intervals so as to avoid raising the temperature in the building and filling up the building with gas that is generated by the decomposition of organic matter.
- Depending on the scale of the storage site and storage conditions etc., firefighting equipment required (sand, fire extinguisher, fire prevention water tank) etc. shall be prepared in advance in case a fire were to occur.
- Since heat generation may accelerate and result in a higher risk of fire occurring due to the inflow of air when there are gaps at the ends of the covering sheet, check that the ends of the sheet are tightly sealed and repair (seal again) when gaps occur.

<Reference>

Measure the temperature and concentration of carbon monoxide at a depth of 1m from the surface or at the lowest point. If the temperature was over 75~80 °C, it is assumed that heat was accumulated along with chemical reactions and oxidation and underground fire might occur. If the concentration of carbon monoxide exceeds 100ppmv, similar status are assumed. If such status were observed, it is desirable to notify the fire department as a precautionary measure. If the temperature was below 60°C, only microorganism fermentation is assumed and it
--

is considered that the possibility of generation of fire is low.

(Source: Prevention of Fire of Flammable Waste at the Temporary Storage Site (Supplementary 2nd Edition) Network Responding to Earthquake Disaster (Field of Waste and Human Waste, etc.) National Institute for Environmental Studies, December 22, 2011)

(Ensuring safety)

- When storing perishable designated waste such as plants and vegetation etc., to prevent the waste from collapsing and rainwater from collecting, the waste may be piled up by positioning inflammable waste with a relatively lower volume reduction in the supporting areas of the storage mound and perishable waste in the sloping areas so as to maintain the shape of the storage mound even if the perishable waste were to reduce in size or sink to a certain extent (**Figure 2-25**).

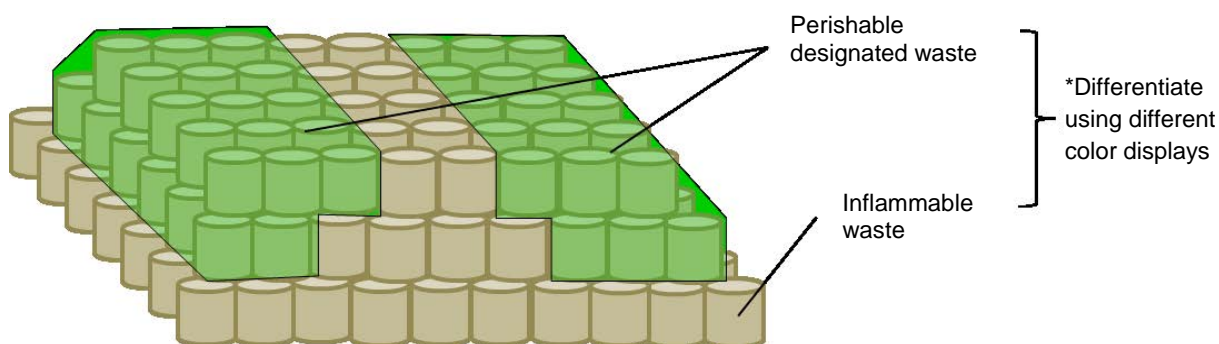


Figure 2-25 Positioning of perishable designated waste, inflammable waste (example)

- In order to minimize the sinking or deformation of the perishable designated waste under storage, the waste may be reduced in volume to a certain extent first before storage so as to store it uniformly in the flexible containers.
- Waste may be reduced in volume to a certain extent first before storage so as to store it uniformly in the flexible containers. The volume of the waste may be reduced using a crusher or compressor. During the volume reduction process, measures to prevent scattering of the perishable designated waste by covering the surrounding area with a sheet etc. are necessary if this is a concern (**Figure 2-26**). As the reduced perishable designated waste may generate heat depending on the storage condition, prevention of heat and fire occurring needs to be noted.
- In addition, alternate piling of inflammable and perishable waste and appropriate filling of the space in between containers are effective means to ensure the safety of the storage mound.



Figure 2-26 Volume reduction using a crusher (chipper) (example)

(taken from the Report on Verification of Decontamination in the Evacuation Zone Pertaining to the Fukushima No. 1 Nuclear Power Plant Accident by JAEA)

- If sinking or deformation of the perishable designated waste were to occur, it is necessary to re-shape the waste mound by piling up the waste again so that scattering, outflow and rainwater collection do not occur as a result of the waste collapsing.

2.10 Prevention of Radiation Hazard

Ordinance, Article 15, item (x)

In order to prevent radiation hazard, ensure that no one will enter the area surrounding the storage site without good reason by means of setting up a fence or signage, etc., at the boundary, or take necessary measures such as blocking radiation by covering the surface of the designated waste with soil, etc.

[Purpose of Measures]

It is necessary to take protective measures to shield against exposure to radiation by preventing entry into storage sites for designated waste, or by covering the surface of the designated waste with soil etc.

[Examples of Measures]

(Prevention of Entry)

Refer to “2.1. Requirements of Storage Sites” on how to set up fences to prevent entry.

(Places of Installation of Fences and Measures for Shielding Radiation)

- It is necessary to set up fencing to prevent unauthorized entry by people into the storage site even during the period when waste is being brought in. The installation location of the fencing shall be as follows.
 - (1) When storing designated waste, use the isolation distance given in **Table 2-4** as a guide to set up the fencing (**Figure 2-27**). Measure the air dose rate and verify that the additional radiation near the fencing is below $0.19\mu\text{Sv/h}^{*1}$ (1mSv / year).
 - (2) If the isolation distance is not sufficient for the radiation to be attenuated in Case (1), take measures to protect against radiation at the sides and on top of the designated waste, and keep the additional radiation at the installation location of the fencing below $0.19\mu\text{Sv/h}$ (1 mSv / year) (**Figure 2-28**). In areas where the surrounding radiation level is relatively higher, maintain the level at the same level as the surrounding air dose rate. In addition, follow these guidelines to reduce the additional radiation by as much as possible.
- Refer to the isolation distance for the installation of fencing given in **Table 2-4** when using earth mounds or soil for shielding purposes.

(Layout Method of Waste)

- If waste of a different concentration is stored, it is effective to lay the waste with a higher concentration inside and those with a lower concentration outside.

^{*1} Assuming a person stays outdoors for 8 hours a day and indoors for 16 hours a day (in a wooden house with a shielding effect of 0.4), when converted to a per hour basis, the additional exposure dose of 1mSv per year translates to an exposure limit of $0.19\mu\text{Sv/h}$ based on the following formula. $0.19\mu\text{Sv/h} \times (8\text{h} + 0.4 \times 16\text{h}) \times 365 \text{ days} = 1\text{mSv/year}$

Table 2-4: Relationship between Shield Measures and Position of Boundary of Premises
Depending on the Radioactive Concentration of Waste and the Form, etc., of Facilities
(Additional Amount of Radiation: below 1mSv/y)^{*1}

Ave. Radioactive Concentration (Cs: Bq/kg)	Size of Waste Mound (L × W × H)	Shielding Measures	Location of site boundary where the additional radiation is less than 1 m Sv a year (distance away from residential zones)						
			0 m	1 m	2 m	4 m	6 m	8 m	10 m
~ 3,000 (Reference) Surface dose rate of a container is 0.7μSv/h or less ^{*2}	2m × 2m × 1m	NIL		●					
	5m × 5m × 2m	NIL				●			
		Shield sides sequentially		●					
	10m × 10m × 1m	Shield sides sequentially		●					
	20m × 20m × 2m	Shield sides sequentially		●					
	50m × 50m × 2m	Shield sides sequentially			●				
3,000~8,000 (Reference) · Surface dose rate of a container is approximately 0.7~1.8μSv/h ^{*2}	All of the above	Cover with soil 30cm thick	●						
	2m × 2m × 1m	NIL			●				
		Shield sides sequentially		●					
	5m × 5m × 2m	NIL					●		
		Shield sides sequentially			●				
	10m × 10m × 1m	Shield sides sequentially				●			
	20m × 20m × 2m	Shield sides sequentially				●			
	50m × 50m × 2m	Shield sides sequentially				●			
8,000~30,000 Surface dose rate of a container is approximately 1.8~7.0μSv/h ^{*2}	All of the above	Cover with soil 30cm thick	●						
	2m × 2m × 1m	NIL				●			
		Shield sides sequentially				●			
		Cover with soil 30cm thick		●					
	5m × 5m × 2m	NIL							●
		Shield sides sequentially				●			
		Cover with soil 30cm thick		●					
	10m × 10m × 1m	Shield sides sequentially					●		
		Cover with soil 30cm thick		●					
	20m × 20m × 2m	Shield sides sequentially						●	
		Shield sides sequentially (when the area not covered with soil does not exceed 10m x 10m)					●		
		Cover with soil 30cm thick		●					
	50m × 50m × 2m	Shield sides sequentially (when the area not covered with soil does not exceed 20m x 20m)						●	
		Shield sides sequentially (when the area not covered with soil does not exceed 10m x 10m)					●		
		Cover with soil 30cm thick		●					

	All of the above	Cover with soil 40cm thick	●						
30,000~100,000 Surface dose rate of a container is 7.0-23μSv/h*2	2m × 2m × 1m	Shield sides sequentially				●			
		Cover with soil 50cm thick	●						
	5m × 5m × 2m	Shield sides sequentially						●	
		Cover with soil 50cm thick	●						
	10m × 10m × 1m	Cover with soil 50cm thick	●						
100,000~250,000 · Surface dose rate of a container is approximately 23~47μSv/h*2	2m × 2m × 1m	Shield sides sequentially					●		
		Cover with soil 50cm thick		●					
	5m × 5m × 2m	Shield sides sequentially							●
		Cover with soil 50cm thick		●					
	10m × 10m × 1m	Cover with soil 50cm thick		●					
250,000~500,000 Surface dose rate of a container is approximately 47~115μSv/h*2	2m × 2m × 1m	Shield sides sequentially						●	
		Cover with soil 50cm thick		●					
	5m × 5m × 2m	Cover with soil 50cm thick		●					
	10m × 10m × 1m	Cover with soil 50cm thick		●					
500,000~1,000,000 Surface dose rate of a container is approximately 115~230μSv/h*2	2m × 2m × 1m	Cover with soil 50cm thick							●
		Cover with soil 50cm thick		●					

*1 **Table 2-4** refers to the sky-shine & direct line assessment result in case of shield of sides and upper part by cover soil (density 1.5g/cm³)(30cm thick) and without shield, etc., For example, where removed soil of 30,000Bq/kg is piled in the mount of 20 m × 20 m × 2 m (on the ground), the isolation distance with which the additional external exposure dose is below 1mSv/y is 8 m when the sides are shielded, and 6 m if the sides are shielded and the space not covered by soil is less than 10m × 10m. The distance will be 1 m upon completion of a soil cover 30 cm thick and 0 m upon completion of a soil cover 40 cm thick. Radionuclide contained in the removed soil is deemed to be only ¹³⁴Cs and ¹³⁷Cs and the radiation ratio is supposed to be 1: 1 (since the decay rate differs between cesium-134 and cesium-137, the radiation ratio of the two is believed to vary with the passage of time. However, as cesium-134 which has a stronger radioactive effect decays faster, changes in the radiation ratio are thus believed to move towards the safer end). The concentration of radioactive cesium in the removed soil is assumed to be either 3,000 Bq/kg, 8,000 Bq/kg, 30,000 Bq/kg or 100,000 Bq/kg on average and ground facilities including piled mounds are assumed as the facility form. For the size of facilities (length × width × height), five sizes namely 2 m x 2 m x 1 m, 5 m x 5 m x 2 m, 20 m x 20 m x 2 m, 50 m x 50 m x 2 m (10 m), 200 m x 200 m x 2 m (10 m) were assumed respectively for the ground facilities. (Cooperation: Incorporated Administrative Agency, Japan Atomic Energy Agency (JAEA), Safety Research Center, Waste Safety Research Group).

If the removed soil is covered, which significantly contains radioactive materials other than cesium-134 and cesium-137, such as the soil contaminated near Fukushima No. 1 Nuclear Power Station Facilities, it is necessary to conduct individual safety assessment as appropriate and to secure necessary shield or isolation distance.

*2 If the removed soils, whose average concentrations of radioactive cesium are 3,000Bq/kg, 8,000Bq/kg, 30,000Bq/kg and 100,000Bq/kg, are filled in a container of φ50cm × height 100cm (soil density: 2.0g/cm³), isolation by the container is not taken into account), air dose rate concentration in the distance of 1cm from the surface at 50cm high of the side of the cylinder are 0.7, 1.8, 6.9 and 23μSv/h respectively (Cooperation: Incorporated Administrative Agency, Japan Atomic Energy Agency).

* This assessment presumes soil, and if the density is the same, translation coefficient of air dose rate concentration of other materials differs little.
Since the density of incineration ash and sludge is lower than the soil density of 2.0g/cm³, it could be the assessment result from the safer side.

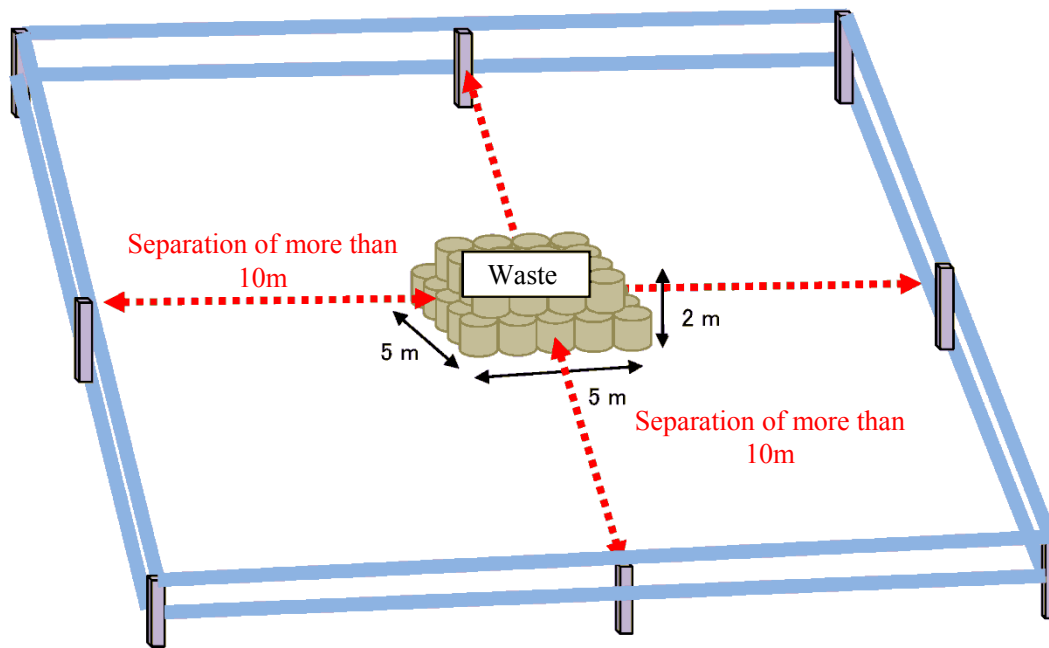


Figure 2-27: Example of Isolation Measure by Sandbags and Position of Premises Boundary
No shield to the Waste of 20,000 Bq/kg (length, width, height: 5m × 5m × 2m)

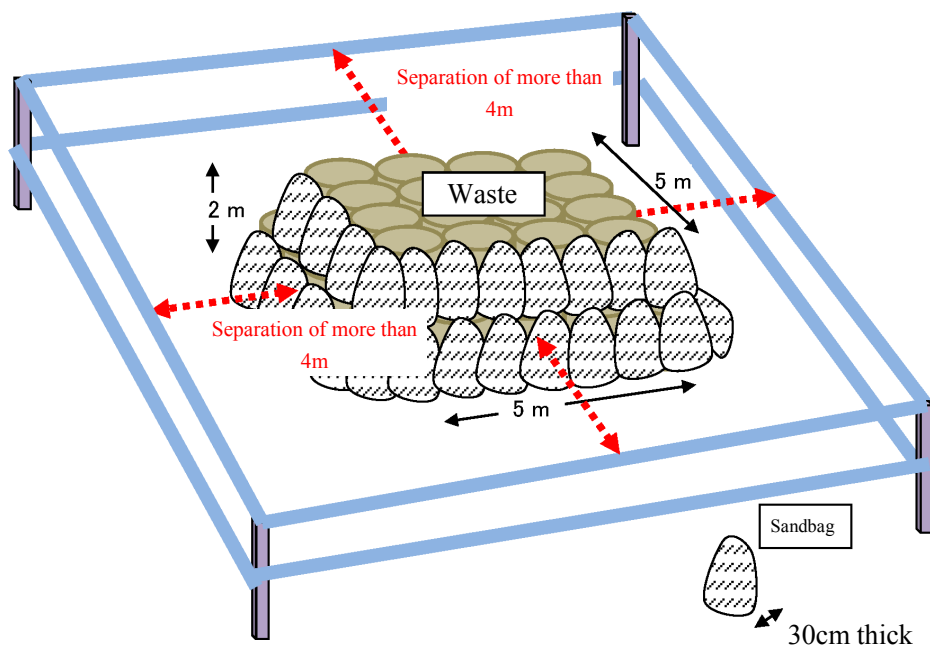


Figure 2-28: Waste of 20,000 Bq/kg (length, width, height: 5m × 5m × 2m) is shielded by sandbags (30cm)

2.11 Measurement, Record and Retention of Amount of Radiation

Ordinance, Article 15, item (xi)

At the boundary of the storage site (if measures have been taken so that no one will enter the zone adjacent to the storage site without good reason, this shall refer to the boundary of such zone; hereinafter referred to as the “Boundary of Storage Site, etc.”), the amount of radiation shall be measured according to the method prescribed by the Minister of the Environment, which shall be recorded in advance of commencement of storage of the designated waste as well as after such commencement without delay.

Ordinance, Article 15, item (xii)

Record of measurement as under the preceding item shall be prepared and retained until the storage of the designated waste is terminated.

*Ministry of the Environment Bulletin No. 110 dated Dec 28 2011

A gamma ray measurement device shall be used to measure the radiation at a height of about 50 cm to 1 m from the ground surface.

[Purpose of Measures]

In order to confirm that the measures for protection of people other than the related persons from radiation are properly taken, at the boundary of a storage site, etc., of designated waste, it is necessary that air dose rates shall be measured before and after storage of the designated waste and the results shall be recorded and managed.

[Example of Measures]

Before and after the start of storage, and after termination of storage (after removal of designated waste), measuring the air dose rate at the vacant lot of the storage site is effective in confirming that there is no significant difference from the air dose rate before the start of storage.

(Measurement of Air Dose Rates)

Measurement of air dose rates shall be conducted in accordance with the method set forth in “Part V: Guidelines for Measurement Method of Radioactive Concentration,” Chapter 2.

(Management of Measurement Results)

- Measure the background radiation at the storage site prior to bringing in the waste. If the air dose rate before the waste is brought in cannot be measured e.g. if storage has already started etc., measure the air dose rate at a point that is located sufficiently away from the waste that is being stored and take this as the background radiation.
- Based on these measurements, check that the additional radiation at the location where the fencing is installed does not exceed 19 μ Sv/h (1mSv/year). However, keep the air dose rate near the fencing at the same level as the surrounding air dose rate in regions where the surrounding air dose rate is relatively higher. Lower the additional radiation as much as possible and comply with this guideline
- When the waste is brought into and stored continuously at the storage site, check that the background radiation is “about the same level”.

(Measures in Case of Confirmation of Abnormal Values in the Measurement Results)

- Measurements of the air dose rate at the boundary of the premises need to be taken when there are changes in the storage conditions of the designated waste due to heavy rain or typhoon.
- In this regard, if any abnormal values were confirmed in the measurement results after a heavy rain or typhoon (clearly high value as compared with the measurement results after the start of storage), the causes shall be surveyed and if the storage site was determined to be the cause, necessary measures shall be taken, including restoration of the storage status and addition of shielding materials, etc.
- If any abnormal values were confirmed in the measurement results of the vacant lot after termination of storage (clearly high value as compared with the measurement results before the start of storage), the causes shall be surveyed and if the storage site was determined to be the cause, necessary measures shall be taken, including decontamination, etc.

(Records)

- Refer to “Measurement Records of Air Dose Rate During Storage” in Chapter 2 of “Part V: Guidelines on Method of Measurement of Radioactive Concentration” for examples on the record format.

2.12 Filing of Change of Storage Site

Ordinance, Article 15, item (xiii)

In the event that the storage site for designated waste is to be changed, a written notice on Form No. 2 stating the following matters shall be submitted to the Minister of the Environment in advance; provided, however, that this shall not apply to cases where the storage site is changed within the same zone of land.

- (a) The name or appellation and address, and in case of a corporation, the name of its representative;
- (b) The kind of the designated waste pertaining to such change (if any of the designated waste prescribed under item (i), (b), 2., is included, such fact shall be included) and the quantity thereof; and
- (c) The names, locations and contact information of the storage sites of the designated waste before and after such change.

[Purpose of Measures]

In order to monitor the location of the designated waste and prevent inappropriate treatment, Form No. 2 needs to be submitted in advance when changing the storage site of the designated waste.

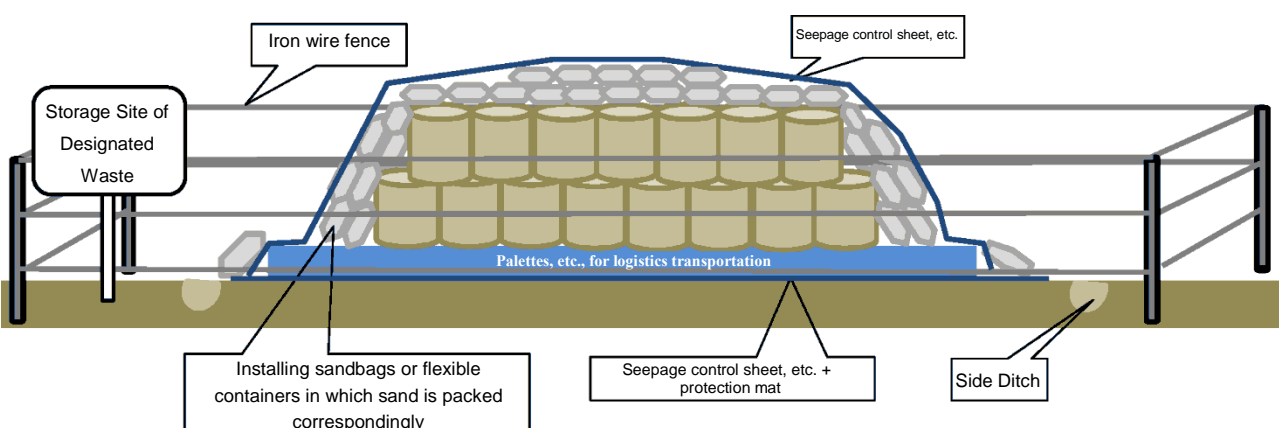
Form No. 2 (Article 15 related)

Filing Form of Change of Storage Site of Designated Waste		
Date:		
To: Minister of the Environment		
Filed by:		
Name:		
Address:		
(In case of a corporation, its name and name of the representative)		
Tel:		
Designation Number:		
Under Ordinance for Enforcement of the Act on Special Measures concerning the Handling of Environment Pollution by Radioactive Materials Discharged by the Nuclear Power Station Accident Associated with the Tohoku District - Off the Pacific Ocean Earthquake that Occurred on March 11, 2011, Article 15, item (xiii), we file as follows.		
Kind and Quantity of designated Waste		
Name, Address and Contact of the Storage Site of Designated Waste	Before Change	After Change

(Japanese Industrial Standards Line A, No. 4)

<Example of Storage of Designated Waste [1]>

When storing sludge of designated waste outside the grounds of water facilities



The diagram illustrates a storage site for designated waste. It features an 'Iron wire fence' surrounding the area. A 'Storage Site of Designated Waste' is marked with a sign. The waste is contained in 'flexible containers' (yellow cylinders) stacked on 'Palettes, etc., for logistics transportation' (blue). A 'Seepage control sheet, etc.' is placed over the containers. 'Installing sandbags or flexible containers in which sand is packed correspondingly' are shown at the base of the waste. A 'Side Ditch' is located to the right of the storage area. The ground is labeled 'Seepage control sheet, etc. + protection mat'.

[1] Fence and Notice board	<ul style="list-style-type: none"> ▪ Lest people other than the related persons should enter the site, the site shall be surrounded by iron wire fence. ▪ The type of waste shall be stated on the notice board.
[2] Prevention of dispersion and outflow	<ul style="list-style-type: none"> ▪ To be stored in flexible containers
[3] Prevention of pollution of groundwater, etc.	<ul style="list-style-type: none"> ▪ Install a seepage control sheet by inserting it between the protection mats
[4] Prevention of infiltration of rainwater, etc.	<ul style="list-style-type: none"> ▪ Cover the container with a flexible seepage control sheet, etc. (if storage continues for a certain period, concurrently use non-woven fabric). ▪ To prevent infiltration of flowing water from the surroundings, it is desirable to store at a place higher than the surroundings or install “palettes” for distribution and transportation. ▪ Raising the center of a seepage control sheet, etc., to make rainwater difficult to collect on the sheet.
[5] Prevention of emission of foul odors	<ul style="list-style-type: none"> ▪ Prevent the dispersion of odors by storing the waste in containers or covering it with a sheet.
[6] Prevention of emergence of sanitary harmful insects	<ul style="list-style-type: none"> ▪ If stagnant rainwater, etc., emerged around the site, remove early.
[7] Prevention of mixing	<ul style="list-style-type: none"> ▪ Do not bring in materials other than the subject of storage
[8] Prevention of mixing of designated waste, etc., containing asbestos, etc.	<ul style="list-style-type: none"> ▪ The same as above
[9] Prevention of generation of fire	—
[10] Protection of people other than the related persons from radiation	<ul style="list-style-type: none"> ▪ Air dose rates around the site before and after storage shall be measured and the doses of the premises boundary shall be the same air dose rates around the site. If the distance from the waste to the premises boundary cannot be secured, shielding shall be made by installing sandbags or flexible containers in which sand is packed by the waste.
Other	<ul style="list-style-type: none"> ▪ Confirm the storage status regularly and if any abnormality is observed, respond quickly.

Figure 2-29: Example of Storage of Designated Waste [1]

<Example of Storage of Designated Waste [2]>

When storing incineration ash of designated waste on the grounds of incineration facilities

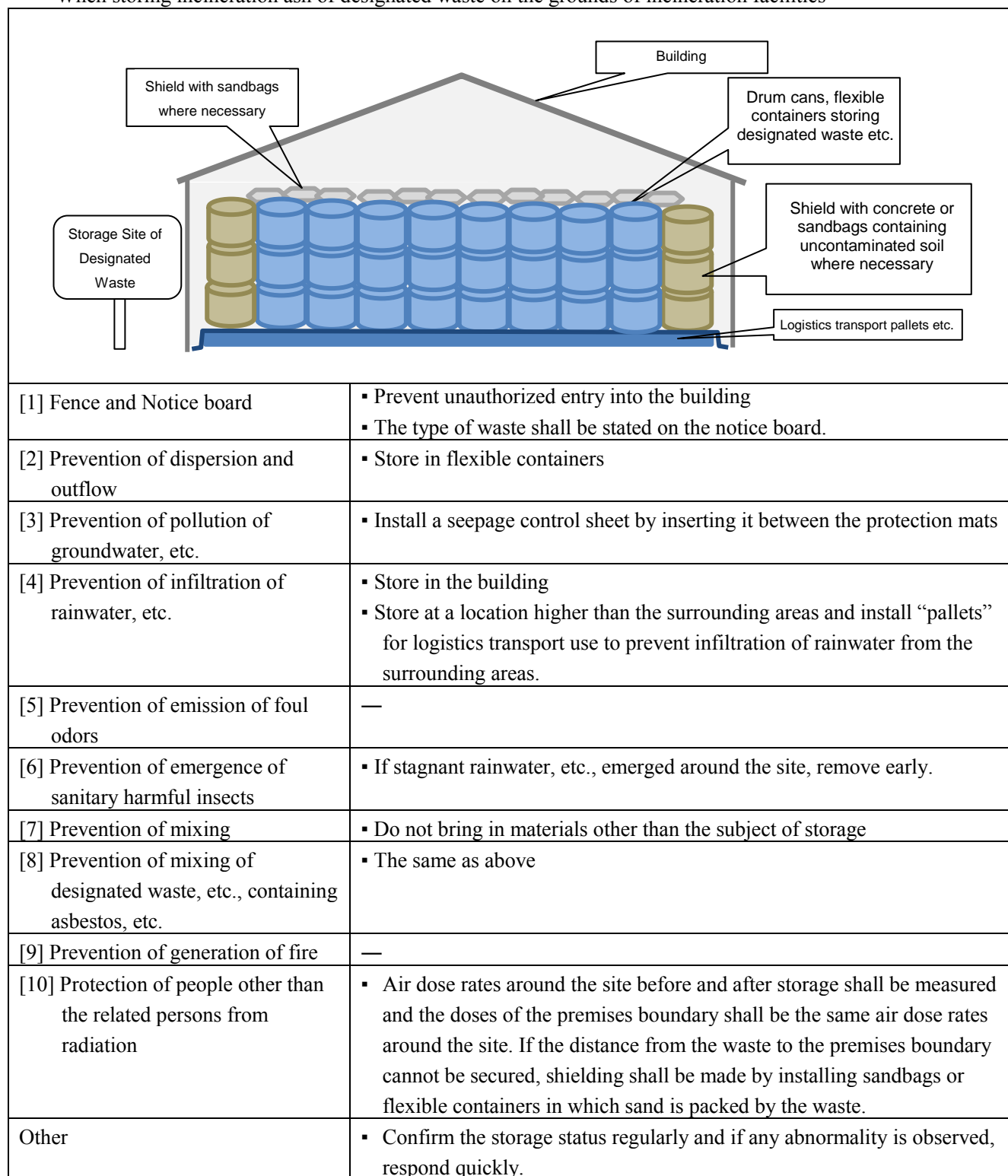


Figure 2-30: Example of Storage of Designated Waste [2]

Standards for Treatment of Specified Waste

Act, Article 20

A person who collects and transports waste in the countermeasure area or designated waste (hereinafter known as “specified waste”) shall collect and transport the specified waste in accordance with the standards for collection and transportation of specified waste under Ordinance, Article 23.

[Purpose of Measures]

The cases to which the standards are applied are the “cases where the national government and its entrustee, etc., transport in delivery vehicles, etc., specified waste to the treatment facilities (interim treatment facilities, interim storage facilities, final disposal sites and storage facilities, etc.) If the storage site of designated waste is to be changed upon filing under Ordinance, Article 15, item (xiii), this transportation standards need to be complied with.

In this regard, it is provided that if the Minister of the Environment recognizes as particularly necessary to ensure proper treatment of specified waste where the standards for collection and transportation of specified waste under the Act, Article 20 are not conformed, the Minister of the Environment may give an order to the person who conducted the collection and transportation to take necessary measures, including the change of method of collection and transportation of the specified waste and the measures for proper treatment of the specified waste within a certain period to the extent necessary (Act, Article 51, paragraph (2)).

In addition, the term “specified waste” shall be replaced by “designated waste” in the descriptions of the various articles under the ordinance.

3.1 Prevention of Health Damage and Damage related to the Living Environment

Ordinance, Article 23, paragraph (1), item (i)

It shall be ensured that no harm pertaining to human health or the living environment will be caused by the designated waste.

[Purpose of Measures]

When collecting and transporting designated waste, it is necessary to ensure that damage to human health and the living environment is not inflicted by radioactive cesium included in designated waste.

[Example of Measures]

Specifically, the following responses, etc., set forth below may be considered.

- In order to prevent scatter and outflow from the storage site during the transportation of designated waste, the tires and bodies of the vehicles and the boots of the workers shall be cleaned.
- In order to reduce the impact on local residents, transportation during peak hours and school commuting hours, and going through the housing areas, shopping streets, school zones and narrow roads shall be avoided as far as possible.
- Where necessary, when transporting waste other than designated waste after transportation of designated waste, wash the transportation vehicles and transportation containers, etc., to prevent pollution.
- Wastewater generated by washing, etc., shall properly be treated.

3.2 Measures Required to Prevent Dispersion, Outflow and Leaks of Designated Waste

Ordinance, Article 23, paragraph (1), item (i)

Necessary measures shall be taken such as putting the designated waste in a container, etc., to prevent the designated waste (including any sewage water from the designated waste) from scattering, flowing or leaking out of the transportation vehicle.

[Purpose of Measures]

In order to prevent contamination by radioactive cesium from spreading during the collection and transport process, measures need to be taken to ensure that designated waste (including sludge generated from designated waste) does not scatter, flow out or leak from the transport vehicle

[Example of Measures]

Specifically, the measures shown in **Table 3-1** may be considered, considering the kinds of designated waste.

Table 3-1: Examples of Measures requiring Transportation in Containers, etc.

Response Method	Examples of Measures
Response by transportation containers	<ul style="list-style-type: none">▪ Drum cans;▪ Flexible containers (running-type);▪ Flexible containers (cross-type with inner bags or inner coating type);▪ Over pack, etc.
Response depending on the structure of transportation vehicles	<ul style="list-style-type: none">▪ Box car;▪ Sludge absorption-discharge vehicle;▪ Delivery car;▪ Wing car, etc.

(Response depending on the Structure of Transportation Vehicles)

In order to prevent designated waste from scattering, flowing out or leaking, it is important to select an appropriate vehicle for transport depending on the properties of the designated waste and loading condition (cargo form etc.)

Hereinafter examples of transportation vehicles are shown.

(Encapsulated Vehicles)

- Box Car

A water tight box car (**Figure 3-1**) can be used as a transport vehicle for sludge etc.



Figure 3-1: Water Tight Box Car (Example)

- Sludge absorption-discharge vehicle

A sludge absorption-discharge vehicle (**Figure 3-2**) can be used as a transport vehicle for fluid sludge and liquids.



Figure 3-2: Sludge Absorption-Discharge Vehicle (Example)

- Delivery Truck

A delivery vehicle (**Figure 3-3**) can be used as a transport vehicle with an encapsulated structure.



Figure 3-3: Delivery Truck (Example)

- Wing Body Truck

A wing body truck has a cargo room which can be fully opened from the side to make loading and unloading easier (**Figure 3-4**). As it is easy to load in rain, and the side part of the loading platform is open, loading and unloading work such as pallet cargo handling by forklifts is easier.



Figure 3-4: Wing Body Truck (Example)

(Open-type Vehicles)

- Special vehicle with detachable container

A special vehicle with a detachable container is a vehicle that can mechanically load and unload a container storing designated waste (**Figure 3-5**).

The top of the container needs to be covered with a sheet to prevent rainwater from infiltrating the container during transport.



Figure 3-5: Special Vehicle with Detachable Container (Example)

- Sand and Earth Dumpster Truck

A sand and earth dumpster truck is often used for the collection and transport of solid waste that can be loaded directly (**Figure 3-6**). When transporting designated waste, the cargo bay needs to be covered with a sheet to ensure that the waste does not fall over or fall down and to prevent rainwater from infiltrating the waste.



Figure 3-6: Sand and Earth Dumpster Truck (Example)

- Flat body truck

A flat body truck is often used as a transport vehicle to carry waste stored in containers (**Figure 3-7**). When transporting designated waste, the cargo bay needs to be covered with a sheet to ensure that the waste does not fall over or fall down and to prevent rainwater from infiltrating the waste.

Some of these are equipped with a lifter or truck crane for loading and unloading waste.



Figure 3-7: Flat Body Car (with a Lifter) (Example)

(Response by Transportation Container)

In order to prevent designated waste from scattering, flowing out or leaking out from the transport containers during transport, it is important to select the right containers depending on the type of designated waste and the loading condition (cargo form etc.).

Hereinafter examples of transportation containers are shown.

- Drum Can

A drum can can be used as a storage and transportation container for liquid waste and powder waste (**Figure 3-8**). Other than metals, there are plastic or compound cans of both metal and plastic.

For open-type drum cans, those with a cap to prevent scattering of designated waste to the outside and prevent mixing of foreign substances may be considered.



Figure 3-8: Drum Can (Open Type) (Example)

- Flexible Container

Flexible containers are used for the storage and transport of waste in powder form. Refer to **Table 2-1** for the types of flexible containers available and **Figure 2-6** and **Figure 2-7** given earlier for examples of these flexible containers. When designated waste with sharp edges is included, the containers may be ripped or torn. Therefore, caution is required when the waste includes large objects or objects with pointed ends.

- Over Pack

An over pack with a considerable level of protection against impact from falls can be used as a container to reduce the risk of waste scattering due to impacts caused by accidents etc. (**Figure 3-9**). It has a structure that allows designated waste with a relatively high radiation concentration to be transported more safely.



Figure 3-9: Over Pack (Example)

3.3 Prevention of Infiltration of Rainwater

Ordinance, Article 23, paragraph (1), item (i)

Necessary measures shall be taken such as covering the surface of the designated waste with a seepage control sheet so that no rainwater will infiltrate into the designated waste;

[Purpose of Measures]

Since there is a risk that radioactive cesium may flow out due to the infiltration of rainwater into the designated waste during the collection and transport process, measures to prevent infiltration by rainwater such as covering the surface of the designated waste with a seepage control sheet etc. are necessary.

[Example of Measures]

Using a truck sheet made of polyester or polypropylene as a waterproof seepage control sheet is effective in preventing seepage.

An example of transportation by combination of flexible containers and seepage control sheet is shown in **Figure 3-10**.

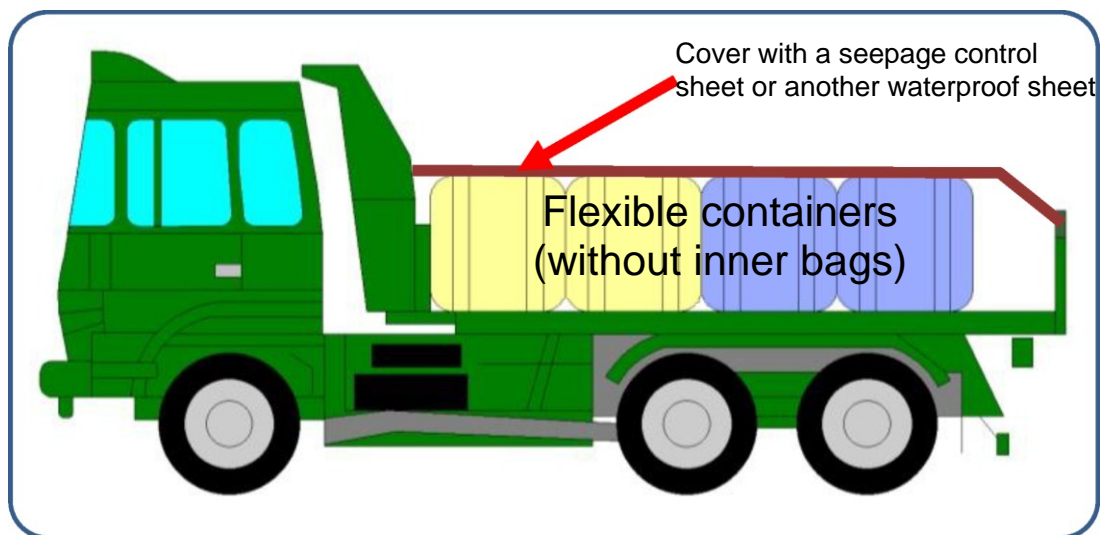


Figure 3-10: Transportation by combination of flexible containers and a seepage control sheet (Example)

3.4 Prevention of Impairment of Conservation of the Living Environment by Foul Odors, Noises or Vibrations

Ordinance, Article 23, paragraph (1), item (i)(d)

Necessary measures shall be taken so that the conservation of the living environment will not be impaired by any foul odors, noise or vibration accompanying the collection or transportation.

[Purpose of Measures]

Measures to prevent impairment to the conservation of the living environment caused by odors, noise or vibration during the collection and transport process are necessary.

[Example of Measures]

Specifically, the following measures set forth below may be considered.

- In loading and unloading designated waste, use machines with low noise and low vibration.
- If storage of designated waste emitting foul odors is conducted in transportation containers, they shall be carried out in the facilities having an isolated structure from the outside by buildings, etc.
- Comply with the legal speed limit and do not overload.
- During transportation, rigidly enforce idling stop and refrain from sudden acceleration, deceleration or engine racing.
- Avoid transporting waste at night as far as possible.

3.5 Separation from other Materials

Ordinance, Article 23, paragraph (1), item (i)(e)

The designated waste shall be separated from other materials to prevent any danger of it being mixed with other materials.

[Purpose of Measures]

In order to prevent secondary pollution by other waste and an increase in the volume of designated waste due to the mixing of designated waste with other materials, designated waste needs to be collected and transported separately from other waste.

[Example of Measures]

Loading designated waste in separate containers is effective in preventing secondary pollution that is caused by the mixing of designated waste with other waste.

When transporting designated waste in a ship or cargo truck, besides mixed loading with other waste, a large quantity of designated waste of multiple varieties is expected to be carried. As such, it is necessary to transport such waste separately in individual transport containers for example. The designated waste may also be transported separately according to the type.

An example of transporting designated waste in separate containers is shown in Figure 3-11.

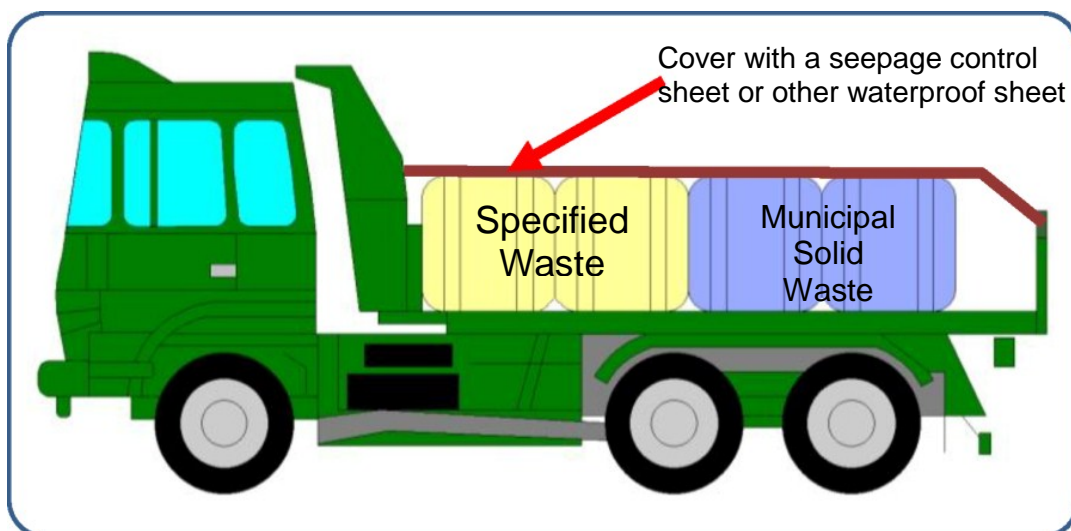


Figure 3-11: Example of transportation separated by containers (flexible containers)

3.6 Conservation of the Living Environment at the Time of Establishment of Facilities

Ordinance, Article 23, paragraph (1), item (ii)

In cases where any facility for collection or transportation of designated waste is established, necessary measures shall be taken to prevent any danger of impairing the conservation of the living environment.

[Purpose of Measures]

When installing facilities for the collection or transport of designated waste, measures need to be taken to ensure that the facility concerned does not result in impairment to the conservation of the living environment around the installation site.

[Example of Measures]

Here, facilities for collection or transportation of designated waste assume garages and parking lots of transportation vehicles and storage facilities of transportation containers.

During the installation and operation of the facility concerned, measures need to be taken to control odors, noise, vibration etc.

3.7 Prevention of Scattering, Outflow and Foul Odors from Transportation Vehicles and Transportation Containers

Ordinance, Article 23, paragraph (1), item (iii)

The transportation vehicle and the containers used for transportation shall be those which pose no risk of scattering or flowing out of the designated waste and of leakage of foul odors.

[Purpose of Measures]

In order to prevent impairment to the conservation of the living environment and environment pollution caused by radioactive cesium due to the scattering and flow out of designated waste during the collection and transport process, it is necessary to use transport vehicles and transport containers that will not result in the scattering and flow out of designated waste and odors leaking from designated waste.

[Example of Measures]**(Prevention of scattering from designated waste)**

- When transporting designated waste, it is necessary to store the designated waste in flexible containers (fitted with inner bags etc.) and cover the containers with a sheet to prevent the designated waste from getting exposed. Caution is required when transporting designated waste that contains a lot of fine particles such as incineration ash or soot and dust.
- Take note of the following when loading and unloading waste.
 - Inspect visually whether there are any cuts, cracks or tears in the transport container when storing designated waste.
 - If incineration ash and soot and dust are stored in transportation containers, work shall be done in a building and proper water spraying, etc., shall be performed so that designated substance shall not scatter.
 - If designated waste is stored in such a transportation container as a flexible container, work shall be done carefully so as not to damage the transportation container.

- Loading and unloading shall be carried out in a manner that will not damage transportation containers such as flexible containers.
- When stored over a period of time, containers used in storage sites for designated waste may be weakened and break apart when designated waste is being transferred, resulting in the waste being scattered. As such, when lifting or moving the container concerned during transportation, besides checking the strength of the container to ensure that the designated waste does not get scattered, check beforehand that the container is not damaged and raise the container slowly to ensure the container is not damaged.

(Prevention of outflow of designated waste)

- When transporting sludge or designated waste in liquid form, transport the waste in watertight encapsulated vehicles, sludge absorption-discharge vehicles or in airtight storage containers.
- Use watertight encapsulated vehicles or airtight containers even for solid waste since there is a risk that the water content may flow out due to vibration during transportation.
- It is necessary to select a transport vehicle or transport container that has the required corrosion resistance, water resistance, fire resistance, heat resistance, penetration resistance, etc., depending on the characteristics of the designated waste.
- When handling designated waste in liquid form, it is necessary to do so in a site that is built with a floor that is difficult to penetrate so that spilled designated waste can be recovered.

(Prevention of foul odors from designated waste)

- Specifically, storage in airtight containers is required for designated waste which might emit foul odors.

3.8 Indication & Keeping Documents in Transportation Vehicles

Ordinance, Article 23, paragraph (1), item (iv)

Any collection or transportation of designated waste using a transportation vehicle shall be carried out as follows:

- (a) The following matters shall be displayed on the outside of the body of the transportation vehicle.
 - (1) That it is a transportation vehicle used for collection or transportation of designated waste.
 - (2) The name or appellation of the person who carries out collection or transportation.
- (b) The matters listed under (a) (1) and (2) shall be displayed in characters in an easily identifiable color, and the matters listed under (a) (1), shall be displayed using characters of the size 140 points or larger prescribed under the Japanese Industrial Standard Z8305, and the matters listed under (a) (2), shall be using characters of the size 90 points or larger prescribed under the Japanese Industrial Standard Z8305.
- (c) Depending on the classification listed in the items (1) to (3) below, the transport vehicle shall carry documents as defined in the relevant items (1) to (3).
 - (1) For parties performing collection and transportation of designated waste under the authorization of the national government, prefectural or municipal authorities, documents certifying to that effect and documents describing the items listed below (hereinafter known as “documents with required matters” in (2) and (3) below).
 - (a) Name or appellation and address of the operator performing the collection and transportation, or the

- name of the representative in the case of a corporation
- (b) Type and quantity of designated waste being collected or transported (including any designated waste containing asbestos, designated waste asbestos, designated soot and dust, etc., contained in the designated waste concerned)
- (c) Start date of collection or transportation
- (d) Name, address and contact of the sites where the designated waste to be collected or transported is loaded and transported to.
- (e) Matters of note when handling designated waste
- (f) Emergency measures during accidents
- (2) For a party or entity that carries out collection or transportation of the designated waste concerned upon entrustment of the party that has been authorized by the national government for the collection and transportation of the designated waste (hereinafter known as the “Primary Entrustee”)
 - (a) Documents certifying that the party stated in the contract between the Primary Entrustee and the national government has been authorized by the Primary Entrustee to perform collection or transportation of the designated waste on its behalf;
 - (b) Documents with required matters
- (3) For a party who carries out storage of designated waste pursuant to the Act, Article 17, paragraph (2) (including cases where the same is applied mutatis mutandis pursuant to the provision of the Act, Article 18, paragraph (5)) and transportation of such designated waste in order to change the storage site.
 - (a) Document certifying that the specified waste collected or transported is designated waste
 - (b) Document certifying that filing under the Ordinance, Article 15, item (xiii) has been made
 - (c) Documents with required matters

(Display)

[Purpose of Measures]

Collection and transportation vehicles are required to display notices on the vehicle bodies stating that they are vehicles used for the collection and transportation of designated waste.

[Example of Measures]

An example of indication is shown in **Figure 3-12**.

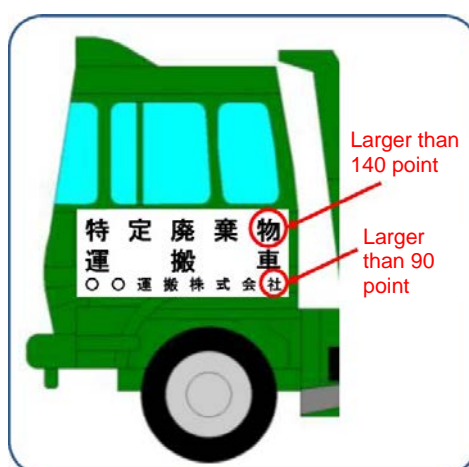


Figure 3-12: Indication (Example)

(Documents to be kept)**[Purpose of Measures]**

In order to clearly show that a collection or transport operator is authorized to collect and transport designated waste, the relevant documentary proof must be carried in the transport vehicle.

[Example of Measures]**(Documents that ought to be kept)**

- When the collection or transportation of designated waste is performed by operators authorized by the national government, prefectural or municipal authorities
 - Photocopy of the authorization certificate etc.
- When the collection or transportation of the designated waste concerned is performed by a party sub-contracted by the Primary Entrustee
 - Original or photocopy of the authorization certificate from the Primary Entrustee etc. (the name of the party to be sub-contracted by the main contractor to collect and transport the designated waste concerned on its behalf shall be stated in the contract between the Primary Entrustee and the national government)
- When the operator storing the designated waste transports the designated waste concerned to change the storage site
 - Original or photocopy of the appointment letter for the designated waste etc.
 - Original or photocopy of the notification letter for the change of the storage site of the designated waste etc.

(Documents with required matters)

- Among the documents with required matters, items (a) – (d) may be stated in the industrial waste control form (manifest). For designated waste, since the concentration of radioactive substances in the designated waste concerned has been measured, this can be stated in the remarks column.
- For (e), the waste data sheet in the WDS guidelines may be used for recording the matters to note when handling designated waste.
- For (f), besides establishing an emergency contact system in advance so that relevant parties may be promptly contacted and measures taken to minimize the damage and impact in an accident, an emergency response manual describing the measures necessary to prevent damage needs to be prepared and carried by the transport workers etc.
- An example of an emergency communication system is shown in **Figure 3-13** and an example of a manual for responding to an emergency is shown in **Table 3-2**.

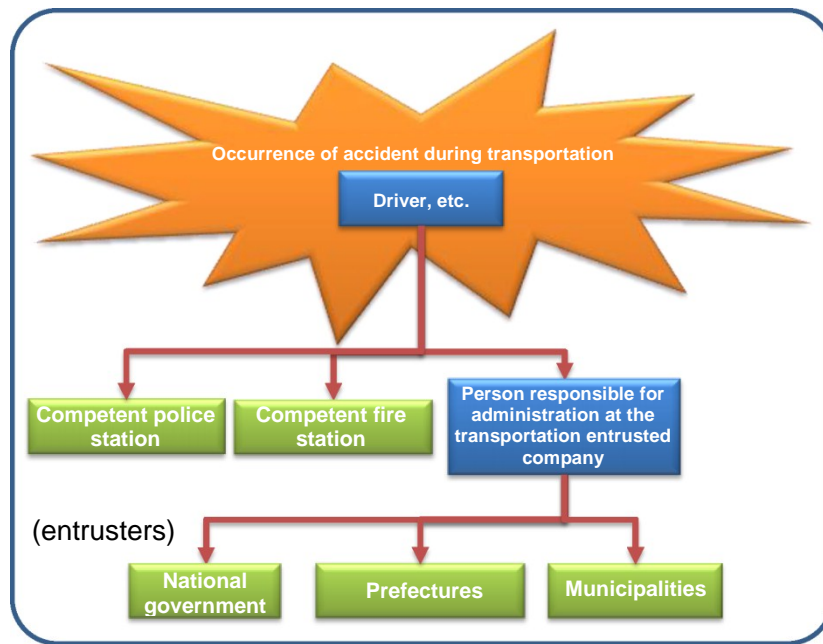


Figure 3-13: Emergency Communication System (Sample)

**Table 3-2: Example of a Manual of Response to Emergency Measures
(In Case of Land Transportation by Car)**

Emergency Measures		<ul style="list-style-type: none"> · Stop engine. · Make emergency report/communication and follow the instructions. · In case of leakage, if it is not dangerous, confirm the safety and prevent outflow by absorption materials, etc. · Measure the radiation concentration of leaked specified waste. · If there is the possibility of passers-by approaching, such measures as extending a rope shall be taken so that they will not approach the designated waste. · Request for support when the transport staff cannot handle the problem alone.
Emergency Report		Police Station (110) <ul style="list-style-type: none"> · When: time · Where: address or road's name · What: specified waste XXX · Result: scattered / flew out · Any injured person: Yes/No · My name is: XXX of YYYY Transportation Corporation
Emergency Communication		<ul style="list-style-type: none"> · Contact: YYYY Transportation Corporation · Person in charge: XXXX · Address: XXXXX · Tel: **_****_****
Protection of Workers		<ul style="list-style-type: none"> · Dust prevention mask · Protective garment, protective gloves · Protective glasses
Leakage	Solid:	<ul style="list-style-type: none"> · Spilt designated waste shall be collected so as not to scatter. · Collect in containers, etc., using scoop, etc.
	Mud:	<ul style="list-style-type: none"> · Stop leakage if not dangerous · Collect using a scoop, etc., after intercepting and the residue shall be removed with absorption material and relocated from the leakage place. · Prevent flowing into the water discharge ditch, sewage outlet, basement or closed place
Emergency measures at the time of exposure and contact	Eyes:	<ul style="list-style-type: none"> · Immediately wash with plenty of flowing water for more than 15 minutes. · Wash eye balls and eyelids by flushing water to every corner by opening eyelids with fingers (remove contact lenses). · Seek medical treatment from an eye doctor. · Never use eye-drops or topical cream without instructions from a doctor.
	Skin:	<ul style="list-style-type: none"> · Immediately wash with plenty of water using a sufficient amount of soap.
	Inhalation:	<ul style="list-style-type: none"> · Move from the inhaled place to a place with fresh air and promptly seek medical treatment from a doctor.
Ex post facto measures		<ul style="list-style-type: none"> · After finishing emergency measures, the person responsible for administration shall report the situation to the Ministry of the Environment, Regional Environmental Office.

3.9 Prevention of Radiation Hazards

Ordinance, Article 23, paragraph (1), item (iv)(d)

Necessary measures shall be taken such as blocking radiation, etc., so that the maximum value of 1-cm dose equivalent rate at a point 1 meter away from the front, rear and both side surfaces (if the vehicle is of an open type, vertical surfaces having contact with the external outline) of the transportation vehicle loaded with designated waste shall be 100 micro Sievert per hour or less.

[Purpose of Measures]

Radiation shielding measures are necessary to ensure that the air dose rate around a transport vehicle loaded with designated waste does not exceed the standard stipulated in the ordinance from the viewpoint of preventing radiation hazards to the public during the collection and transport process.

[Example of Measures]

- To ensure that the maximum air dose rate at a point 1 m away from the side of the vehicle does not exceed 100 μ Sv/h, it is necessary to adopt measures such as changing the type and quantity of the designated waste that is loaded, adjusting the loading position, using containers with a shielding effect, installing shield materials etc. Specifically, the following shield methods may be considered.
 - In loading, lay out designated waste of a lower concentration of radioactive substances at contour and designated waste with a higher concentration of radioactive substances around the center of the platform
 - Shield the surroundings by sandbags, lead plates, iron plates and concrete walls, etc.
 - Lay out designated waste only in the center of a loading platform to secure distance from the surface of a vehicle body.
 - Shield by containers with inner liner having shield effect.
- The air dose rate shall be measured in accordance with the method set forth in Chapter 2 of “Part V: Guidelines for Methods of Measurement of Radioactive Concentration”.
- The radiation level differs depending on the concentration and quantity of the radioactive substances. For example, if designated waste with a radioactive cesium concentration of 100,000 Bq/kg is loaded onto a relatively large transport vehicle (Case 3), the maximum air dose rate at a point 1 m away from the transport vehicle may be substantially lower than 100 μ Sv/h (**Table 3-3**). When transporting designated waste with a radioactive cesium concentration below 100,000 Bq/kg within the maximum laden weight in general, the air dose rate around the vehicle need not be measured since it is clear that the standard will not be exceeded.

Table 3-3 Preliminary calculation of air dose rate at a location 1 m away from the surface of the vehicle

[Assumptions]

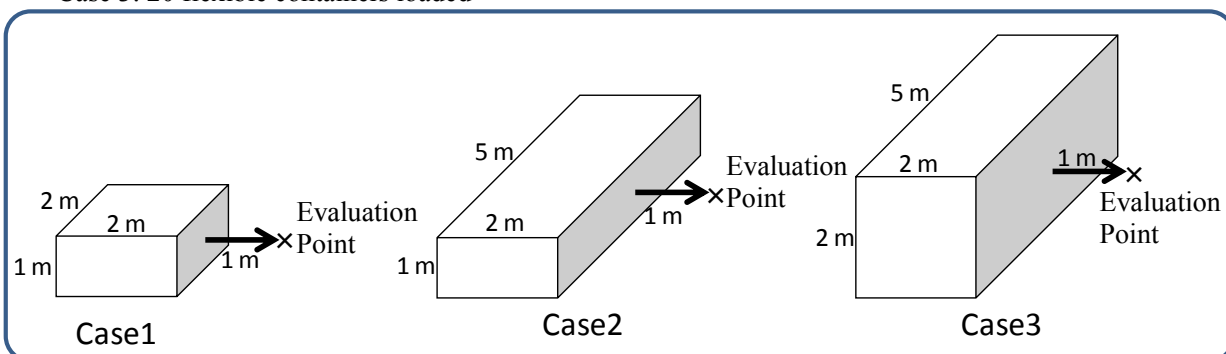
- Flexible containers are loaded with incineration ash (specific weight: 1.6 g/cm^3 , radiation ratio of cesium-134 to cesium-137 is 1 to 1)
- Size of each flexible containers is $1 \text{ m} \times 1 \text{ m} \times 1 \text{ m}$
- Shielding effect of flexible containers is not considered
- Evaluation point is located 1 m away from the center of the loaded sides

[Parameters]

Case 1: 4 flexible containers loaded

Case 2: 10 flexible containers loaded

Case 3: 20 flexible containers loaded



[Preliminary Calculation Results]

		Average Radiation Concentration (Bq/kg)				Air dose rate at a point 1m away from the side of the vehicle as defined under the Ordinance, Article 23, paragraph (1) item (iv)
		8,000	100,000	300,000	500,000	
Air Dose Rate ($\mu\text{Sv/h}$)	Case 1	0.9	11.5	34.5	57.5	100
	Case 2	1.3	16.3	48.9	81.5	
	Case 3	2.2	27.4	82.2	137.0	

3.10 Carrying Equipment and Devices, etc., Necessary for Response to Accidents

Ordinance, Article 23, paragraph (1), item (iv), (e)

Instruments, etc., for taking measures prescribed under Ordinance, Article 23, paragraph (1), item (i), (c) 1. f, shall be carried.

[Purpose of Measures]

Instruments for taking emergency measures during an accident have to be carried during the collection and transport processes.

[Example of Measures]

(Equipment, etc., to be carried)

Specifically, the following equipment may be carried to match the characteristics of the designated waste being transported.

- Collection equipment (scoop, etc.)

It is desirable to carry a scoop, etc. to collect specified waste which has scattered, flew out or leaked.

It is also desirable to carry waste cloth, etc., in transporting designated waste with a high water content.
- Protective Equipment

Protective equipment must be carried to prevent health damage to workers such as drivers during collection work.

Appropriate masks (dust prevention masks etc.) depending on the properties of the designated waste to be transported must be carried.

Protective garments depending on the properties of the designated waste to be transported such as sealed garments for protection from suspended solid dust (Type 5) and sealed garments for protection from liquids (Type 3) must be carried.

Protective gloves and protective glasses depending on the properties of the designated waste to be transported must be carried to prevent designated waste from adhering to the hands of the workers or entering the eyes during collection work. There are also dust prevention masks which combine both dust prevention and eye protection functions.

Examples of protective equipment are shown in **Figure 3-14**.



Figure 3-14: Protective Equipment (Example)

- **Rope/Sign**
Ropes and signs for prohibiting people from entering areas where designated waste has scattered or flowed out must be carried.
- **Fire Extinguisher**
Fire extinguishers for front-line fire-fighting purposes against fires that result from designated waste and transportation vehicles must be carried.
- **Lighting Equipment**
Lighting equipment, including flashlights etc., must be carried during the collection of scattered or flowed out designated waste since it is expected to be dark in the surrounding area.
- **Mobile Phone**
Mobile phones must be carried in order to promptly communicate with relevant personnel in case of an accident.

(Response in Case of Accidents)

If designated waste has scattered, flowed out or permeated into the ground or if foul odors are emitted during collection and transportation of designated waste, it is necessary to immediately park the transportation vehicle in a safe place and take emergency measures in addition to warning people in the surrounding area and promptly communicating with relevant personnel.

In this regard, the following response measures against specific accidents may be taken.

- Rescue of human life
- Fire extinction and prevention of spread of fire, etc., in case of fire

- Confirmation of the status of waste (damage to containers and existence of leakage, etc.)
 - Prohibit entry by people other than relevant personnel using ropes and signs to cordon off the area
 - Collect leaked designated waste
 - Check the surrounding air dose rate (after emergency measures)* etc.
- * If the driver himself needs to measure and check the air dose rate after emergency measures, a dosimeter can be carried in advance.

(Prevention of Accidents, etc.)

In transportation, it is necessary to provide education for prevention of accidents, etc., and education for response in case of accidents, etc., so that the impact on the living environment or health damage to workers, etc., shall not occur as a result of an accident, etc., during loading and unloading work and transportation of waste.

- [1] Standards for collection and transportation
- [2] Compliance with other laws (prohibition of overload, etc.)
- [3] Carrying an emergency communication system chart and a manual for response in case of emergency
- [4] Compliance with transportation routes following the plan
- [5] Impact of cesium on the human body
- [6] Use of appropriate protective equipment, etc.
- [7] Impact exerted on transported objects due to sway and vibration during transportation (dispersion, spill over or leakage).

3.11 Collection and Transportation of Asbestos-Containing Designated Waste, Designated Waste Asbestos, etc., and Designated Soot and Dust upon Separation

Ordinance, Article 23, paragraph (1), item (v)

In cases where any of the following designated waste is collected or transported, such designated waste shall be collected or transported, separating it so that the same will not be mixed with designated waste other than such designated waste.

- (a) Asbestos-Containing Designated Waste
- (b) Designated Waste Asbestos, etc.
- (c) Designated Soot and Dust

[Purpose of Measures]

- Under the Waste Management Act, for waste containing asbestos (including waste asbestos) and soot and dust that contain hazardous substances such as dioxins, treatment standards are established for waste that may impair human health and the living environment. In particular, such waste asbestos and soot and dust are designated as special control waste for which treatment standards stricter than normal waste have been established.
- As such, waste corresponding to designated waste that requires treatment based on the special treatment standards need to be segregated from other designated waste during collection or transport so that the waste can be easily transferred for interim treatment subsequently.

[Example of Measures]

An example of separation by transportation containers is shown in **Figure 3-15**.

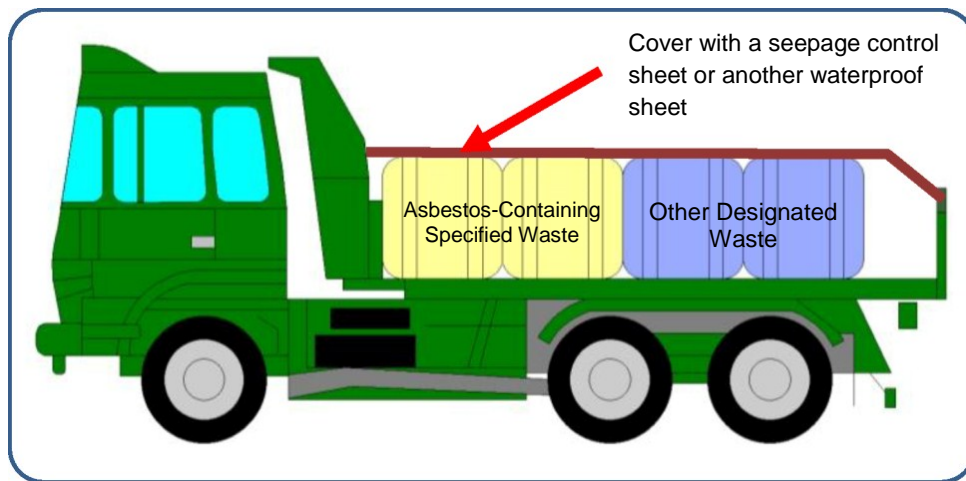


Figure 3-15: Example of Transportation Separating by Containers (Flexible Containers)

3. 12 Matters of Note about Asbestos-Containing Designated Waste and Designated Waste Asbestos, etc.

Ordinance, Article 23, paragraph (1), item (vi)

In cases where asbestos-containing designated waste and designated waste asbestos, etc., are collected or transported, collection or transportation shall be carried out by a method with which such designated waste will not be shredded.

[Purpose of Measures]

This provision is provided because asbestos fibers might scatter due to contact and load during collection and transportation of asbestos-containing designated waste and designated waste asbestos, etc. and thus collection and transport methods that will not crush the designated waste containing asbestos need to be adopted.

[Example of Measures]

(Asbestos-Containing Designated Waste)

- Loading or unloading shall be done in the original form so that asbestos-containing designated waste would not be fractured.
- Such measures as a sheet cover and bag packing shall be taken as a measure for prevention of scattering.
- In collection or transportation of asbestos-containing designated waste, they shall not be put into packer trucks and press packer trucks.

(Designated Waste including Waste Asbestos, etc.)

- A person that collects and transports waste asbestos, etc., shall handle carefully at each process of loading, transportation and unloading so as not to scatter waste asbestos, etc.
- Loading and unloading of plastic bags, etc., shall generally be carried out manually. If a machine is used, use pallets and the machine shall not directly touch the plastic bags, etc.
- If plastic bags, etc., were damaged, take scattering prevention measures by moisturizing through prompt water spraying and newly package the waste by such waterproof materials as double plastic bags, etc.

3.13 Preparation and Retention of Records

Ordinance, Article 23, paragraph (1), item (vii)

Record of the following matters shall be prepared and retained for five years from the date on which collection or transportation is completed.

- (a) The kind of designated waste collected or transported (if such designated waste includes any of the designated waste stipulated under item (v), (a) through (c), such fact shall be included) and its quantity.
- (b) The date on which collection or transportation was commenced and completed per designated waste, the name of the person in charge of transportation, the names and locations of the place where it was loaded and the place of destination of transportation, and, in cases where collection or transportation of designated waste is carried out using a transportation vehicle, the vehicle registration number or vehicle number of such transportation vehicle.

[Purpose of Measures]

In order to manage the status of the collection and transport of designated waste appropriately, records on the collection and transport need to be prepared and retained.

[Example of Measures]

- Examples of the format of records related to the collection and transport of designated waste are given on the next page.
- For records on the collection and transport of designated waste, the format of the industrial waste control form (manifest) can also be used to record the start and end dates of the transport and the vehicle registration number or vehicle number of the transport vehicle.

[Examples of Recording Formats]

Collection and Transport Records

Type of designated waste collected and transported*	Quantity (units)	Start date of collection and transport	End date of collection and transport	Person-in-charge of collection and transport	Name and location of loading venue	Name and location of transported site	Vehicle registration no. or vehicle no. of the transport vehicle

* If waste containing asbestos, specified waste asbestos, or specified soot and dust is included, such fact shall be included, if any. In addition, the lot number must be appended to the waste and the lot number concerned must be recorded.

Collection and Transport Records

Type of designated waste collected and transported*	Quantity (units)	Start date of collection and transport	End date of collection and transport	Person-in-charge of collection and transport	Name and location of loading venue	Name and location of transported site	Vehicle registration no. or vehicle no. of the transport vehicle
Debris (2012-1-1)	Flexible container, XXXX	XXXXX 2012	XXXXX 2012	(Name)	XXX Temporary Storage Site Address:	XXXX Cleaning Center Address:	Fukushima XXXXXXX
Debris (2012-1-2)	Flexible container, XXXX	XXXXX 2012	XXXXX 2012	(Name)	XXX Temporary Storage Site Address:	XXXX Cleaning Center Address:	Fukushima XXXXXXX
Sorted-out waste (2012-2)	Flexible container, XXXX	XXXXX 2012	XXXXX 2012	(Name)	XXX Temporary Storage Site Address:	XXXX Cleaning Center Address:	Fukushima XXXXXXX

* If waste containing asbestos, specified waste asbestos, or specified soot and dust is included, such fact shall be included, if any. In addition, the lot number must be appended to the waste and the lot number concerned must be recorded.

Chapter 4 Others

Safety Management of Operators

[Example of Measures]

Comply with the “Ordinance on the Prevention of Ionizing Radiation Hazards” (Ministry of Labour Ordinance No. 41 dated Sep 30, 1972), “Ordinance on the Prevention of Ionizing Radiation Hazards to Workers Involved in the Decontamination of Soil that has been Contaminated by Radioactive Substances Resulting from the Great East Japan Earthquake” (Ministry of Health, Labour and Welfare Ordinance No. 152 dated Dec 22, 2011) and “Guidelines on the Prevention of Radiation Hazards to Workers Involved in Decontamination Work” (Ministry of Health, Labour and Welfare Ordinance dated Dec 22, 2011) for the prevention of radiation hazards to workers involved in storage work with regards to the prevention of scatter and flow out of designated waste.

[Summary]

- Basic principle: Reduce the amount of ionizing radiation that an operator is exposed to by as much as possible.
- Handling of designated waste that exceeds 10,000Bq/kg in terms of the radioactive concentration of radioactive cesium
- Establishment of a control zone (when there is a risk that the amount of effective radiation may exceed 2.5μSv/h based on Ordinance for the Prevention of Ionizing Radiation Hazards))
- Radiation exposure limit of operators
- Measurement of radiation
- Prevention of contamination etc.

Chapter 5 Prohibitions and Penal Provisions

5.1 Prohibition on the Dumping of Designated Waste, etc.

(Prohibition on the Dumping of Contaminated Waste etc.)

Act, Article 46

No person shall unnecessarily dump specified waste.

Act, Article 60 paragraph (1) item (i)

Dumping of designated waste in breach of the provision under Article 46 shall be punished by imprisonment not exceeding five (5) years or fined not more than ¥10 million or both.

[Purpose of Measures]

A person who dumped designated waste in breach of the provision shall be punished by imprisonment not exceeding five (5) years or fined not more than ¥10 million or both.

5.2 Prohibition on the Incineration of Designated Waste

(Prohibition on the Incineration of Designated Waste)

Act, Article 47

No person shall incinerate designated waste. However, this shall not apply to the incineration of designated waste carried out in accordance with the standards set forth in the Ordinance of the Ministry of the Environment referred to in Article 20 by the national government, a person or entity entrusted with such incineration by the national government, or any other person or entity as provided for in the relevant Ordinance of the Ministry of the Environment.

Act, Article 60 paragraph (1) item (ii)

A person who incinerated designated waste in breach of the provision under Article 47 shall be punished by imprisonment not exceeding five (5) years or fined not more than ¥10 million or both.

[Purpose of Measures]

No person or entity other than the national government or those entrusted with such incineration by the national government or any other person or entity as provided for in the relevant Ordinance of the Ministry of the Environment shall incinerate designated waste. A person who incinerated designated waste in breach of this provision shall be punished by imprisonment not exceeding five (5) years or fined not more than ¥10 million or both.

5.3 Prohibition on the Treatment of Designated Waste, etc., on a Commercial Basis

(Prohibition on the Treatment of Designated Waste, etc., on a Commercial Basis)

Act, Article 48 paragraph (1)

No person other than the national government, a person or entity entrusted with the collection, transportation, storage or disposal of designated waste by the national government, or any other person or

entity as provided for in the Ordinance, Article 62 shall engage in the collection, transportation, storage or disposal of designated waste on a commercial basis.

Act, Article 60 paragraph (1) item (iii)

A person who conducted collection, transportation, storage or disposal of designated waste on a commercial basis in breach of the provision under Article 48 paragraph (1) shall be punished by imprisonment not exceeding five (5) years or fined not more than ¥10 million or both.

[Purpose of Measures]

No person other than the national government, a person or entity entrusted with the collection, transportation, storage or disposal of designated waste by the national government, or any other person or entity as provided for in the Ordinance, Article 62 shall engage in the collection, transportation, storage or disposal of designated waste on a commercial basis. A person who conducted collection, transportation, storage or disposal of specified waste on a commercial basis in breach of this provision shall be punished by imprisonment not more than five (5) years or fined not more than ¥10 million or both.

5.4 Orders, etc., in case of Storage, etc., Nonconforming to the Standards

(Orders to Take Measures)

Act Article 51

The Minister of the Environment may, when designated waste has not been stored in accordance with the standards provided for in the Ordinance, Article 17 paragraph (2) (including those cases where Article 18 paragraph (5) is applied mutatis mutandis), and it is determined to be necessary to ensure proper storage of the designated waste, order the person or entity that has executed the storage, within the limits necessary, to take measures for the proper storage of the designated waste or any other necessary measures, by specifying a time limit for compliance.

2 The Minister of the Environment may, when designated waste has not been collected, transported, stored or disposed in accordance with the standards provided for in the Ordinance, Article 20, and it is determined to be necessary to ensure proper treatment of the designated waste, order the person or entity that has executed the collection, transportation, storage or disposal (excluding a person or entity who has carried out the collection, transportation, storage or disposal concerned in accordance with the provision under Article 15 or Article 19), within the limits necessary, to take measures for the proper treatment of the designated waste or any other necessary measures, by specifying a time limit for compliance.

3-6 Omitted

Article 60 paragraph (1) item (v)

A person who breached these orders shall be punished by imprisonment not exceeding five (5) years or fined not more than ¥10 million or both.

[Purpose of Measures]

The Minister of the Environment may, when designated waste has not been stored in accordance with the standards stipulated for designated waste, within the limits necessary, order measures to be taken for the proper

storage of the designated waste or any other measures deemed necessary. A person who breached these orders shall be punished by imprisonment not exceeding five (5) years or fined not more than ¥10 million or both.