Information (16:00), July 13, 2023

To All Missions (Embassies, Consular posts and International Organizations in Japan)

Report on the discharge record and the seawater monitoring results at Fukushima Daiichi Nuclear Power Station during May

The Ministry of Foreign Affairs wishes to provide all international Missions in Japan with a report on the discharge record and seawater monitoring results with regard to groundwater pumped from the sub-drain and groundwater drain systems, as well as, bypassing groundwater pumped during the month of May at Fukushima Daiichi Nuclear Power Station (NPS).

1. Summary of decommissioning and contaminated water management

In April the summary of monthly progress on decommissioning and contaminated water management of Fukushima Daiichi NPS was issued shown in Appendix 1. For more information, please see the following URL:
https://www.meti.go.jp/english/earthquake/nuclear/decommissioning/pdf/mp202305.pdf

2. Sub-drain and Groundwater Drain Systems

In May purified groundwater pumped from the sub-drain and groundwater drain systems was discharged on the dates shown in Appendix 2. Prior to every discharge, an analysis on the quality of the purified groundwater to be discharged was conducted by Tokyo Electric Power Company (TEPCO) and the results were announced.

All the test results during the month of May have confirmed that the radiation levels of sampled water were substantially below the operational targets set by TEPCO (these operational targets are well below the density limit specified by the Reactor Regulation). The results of these analyses were also confirmed by third-party organization (Tohoku Ryokka Kankyohozen Co.).

In addition, TEPCO and Japan Atomic Energy Agency (JAEA), at the request of the Government of Japan, regularly conduct more detailed analyses on the purified groundwater. The results of JAEA's latest analyses confirmed that TEPCO's analyses were accurate and verified that the radiation levels of sampled groundwater was substantially below the operational target (see Appendix 3).

Moreover, TEPCO publishes the results of analyses conducted on seawater

sampled during the discharge operation at the nearest seawater sampling post from the discharge point (see Appendix 4). The results show that the radiation levels of seawater remain lower than the density limit specified by the Reactor Regulation and significant change in the radioactivity has not been observed.

3. Groundwater Bypassing

In May, the pumped bypassing groundwater was discharged on the dates shown in Appendix 5. Prior to every discharge, an analysis on the quality of the groundwater to be discharged was conducted by TEPCO and the results were announced.

All the test results during the month of May have confirmed that the radiation levels of sampled water were substantially below the operational targets set by TEPCO (these operational targets are well below the density limit specified by the Reactor Regulation). The results of these analyses were also confirmed by Japan Chemical Analysis Center.

In addition, TEPCO and JAEA, at the request of the Government of Japan, regularly conduct more detailed analyses on the groundwater. The results of JAEA's latest analyses confirmed that TEPCO's analyses were accurate and verified that the radiation levels of the sampled groundwater were substantially below the operational target (see Appendix 6).

Moreover, TEPCO publishes analysis results on seawater sampled during the discharge operation at the nearest seawater sampling post from the discharge point (see Appendix 7). The result shows that the radiation levels in seawater remain lower than the density limit specified by the Reactor Regulation and significant change in the radioactivity has not been observed. The analysis had been conducted once a month until March 2017. Since April 2017, it is conducted four times a year because there has been no significant fluctuation in the concentration of radioactive materials in the sea water, and no influence on the surrounding environment has been confirmed.

The sampling process for analyses conducted this month is the same as the one conducted in the information disseminated last month. Results of the analyses are shown in the attached appendices:

(For further information, please contact TEPCO at (Tel: 03-6373-1111) or refer to the TEPCO's website:
http://www.tepco.co.jp/en/nu/fukushima-np/handouts/index-e.html)
Contact: International Nuclear Energy Cooperation Division,
Ministry of Foreign Affairs, Tel 03-5501-8227

Outline of Decommissioning, Contaminated Water and Treated Water Management

May 25, 2023
Secretariat of the Team for Countermeasures for Decommissioning, Contaminated Water and Treated Water

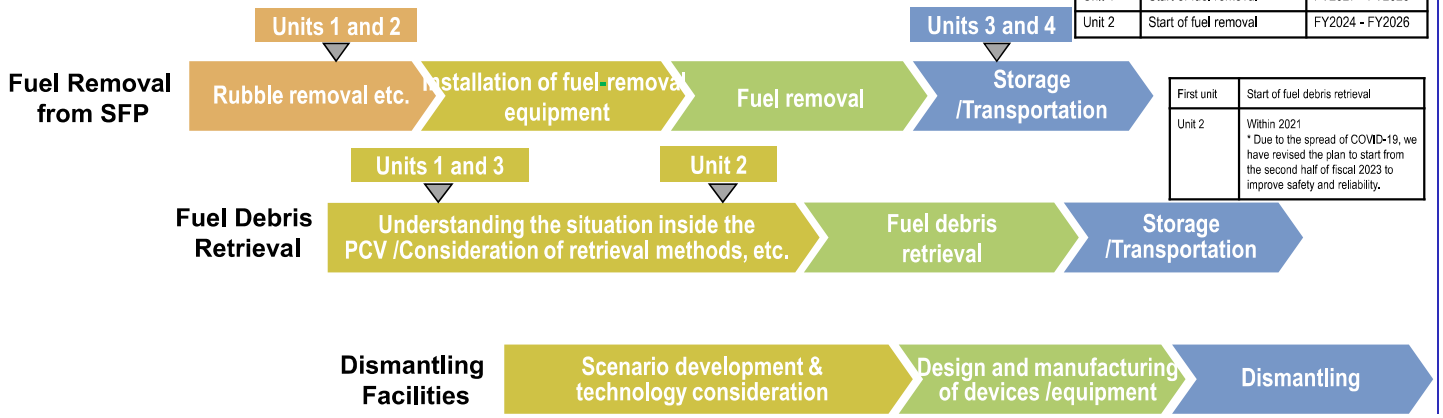
Main decommissioning work and steps

Fuel removal from the spent fuel pool was completed in December 2014 at Unit 4 and on February 28, 2021 at Unit 3.
Work continues sequentially toward the start of fuel removal from Units 1 and 2 and debris (Note 1) retrieval from Units 1-3.

(Note 1) Fuel assemblies having melted through in the accident.

<Milestones in the Mid-and-Long-Term Roadmap>

Units 1-6	Completion of fuel removal	Within 2031
Unit 1	Start of fuel removal	FY2027 - FY2028
Unit 2	Start of fuel removal	FY2024 - FY2026

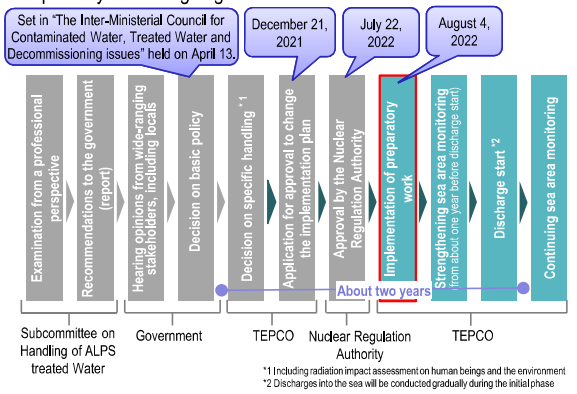


First unit	Start of fuel debris retrieval
Unit 2	Within 2021 * Due to the spread of COVID-19, we have revised the plan to start from the second half of fiscal 2023 to improve safety and reliability.

Measures for treated water Appendix 1

Handling of ALPS treated water

Regarding the discharge of ALPS treated water into the sea, TEPCO must comply with regulatory and other safety standards to safeguard the public, the surrounding environment and agricultural, forestry and fishery products. To minimize adverse impacts on reputation, monitoring will be further enhanced and objectivity and transparency ensured by engaging with third-party experts and having safety checked by the IAEA. Moreover, accurate information will be disseminated with full transparency on an ongoing basis.



Contaminated water management - triple-pronged efforts -

(1) Efforts to promote contaminated water management based on the three basic policies

① "Remove" the source of water contamination ② "Redirect" fresh water from contaminated areas
③ "Retain" contaminated water from leakage

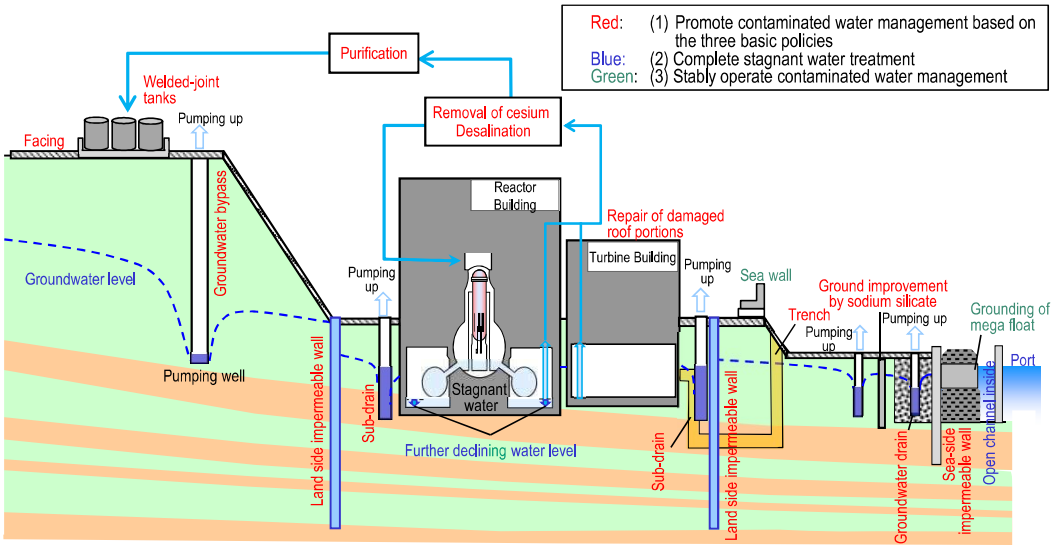
- Strontium-reduced water from other equipment is being re-treated in the Advanced Liquid Processing System (ALPS: multi-nuclide removal equipment) and stored in welded-joint tanks.
- Multi-layered contaminated water management measures, including land-side impermeable walls and sub-drains, have stabilized the groundwater at a low level and the increased contaminated water generated during rainfall is being suppressed by repairing damaged portions of building roofs facing onsite, etc. Through these measures, the generation of contaminated water was reduced from approx. 540 m^3/day (in May 2014) to approx. 130 m^3/day (in FY2021).
- Measures continue to further suppress the generation of contaminated water to 100 m^3/day or less within 2025.

(2) Efforts to complete stagnant water treatment

- To reduce the stagnant water levels in buildings as planned, work to install additional stagnant water transfer equipment is underway.
- In 2020, treatment of stagnant water in buildings was completed, except for the Unit 1-3 Reactor Buildings, Process Main Building and High-Temperature Incinerator Building.
- While conducting the dust impact assessment, measures to reduce the stagnant water level were implemented. In March 2023, the target water level in each building was achieved. For the Units 1-3 Reactor Buildings, "reducing stagnant water in the Reactor Buildings to about half the amount at the end of 2020 during the period FY2022-2024" was achieved.
- For zeolite sandbags on the basement floors of the Process Main Building and High-Temperature Incinerator Building, measures to reduce the radiation dose are being examined with stabilization in mind.

(3) Efforts to stably operate contaminated water management

- Various measures are underway to prepare for tsunamis. For heavy rain, sandbags are being installed to suppress direct inflow into buildings while work to close openings in buildings and install sea walls to enhance drainage channels and other measures is being implemented as planned.



Progress status

◆ The temperatures of the Reactor and the Primary Containment Vessel of Units 1-3 have been maintained stable.
There was no significant change in the concentration of radioactive materials newly released from Reactor Buildings into the air. It was concluded that the comprehensive cold shutdown condition had been maintained.

Receipt of the implementation plan approval concerning selection and organization change of nuclides subject to measurement and evaluation when discharging ALPS treated water to the sea

To reflect the organization for operation, maintenance and others of the ALPS treated water dilution and discharge facilities, nuclides subject to measurement and evaluation which are conducted to confirm satisfaction of the discharge criteria, the results of the radiation impact assessment based on the review of nuclides subject to measurement and evaluation, and others, TEPCO submitted the application for approval to change the implementation plan concerning the handling of ALPS treated water to the Nuclear Regulation Authority (NRA) in November 2022 and received the approval from NRA on May 10, 2023.

TEPCO will continue to proceed with installation of the ALPS treated water dilution and discharge facilities and related facilities with safety first as well as sincerely responding to the review of the International Atomic Energy Agency (IAEA), and others to ensure objectivity, transparency and reliability.

Progress status of the rearing test of marine organisms

Measurement results of tritium concentration were acquired for gulfweed reared in diluted ALPS treated water to less than 1500 Bq/L in May 2023 and flounder reared in diluted ALPS treated water to approx. 30 Bq/L from November 2022. The results revealed that, as previously, insight and measurement results of flounder and abalones (tritium concentration of less than 1500 Bq/L), tritium concentration inside the body did not exceed the growing environment and after being transferred to normal seawater, the concentration declined.

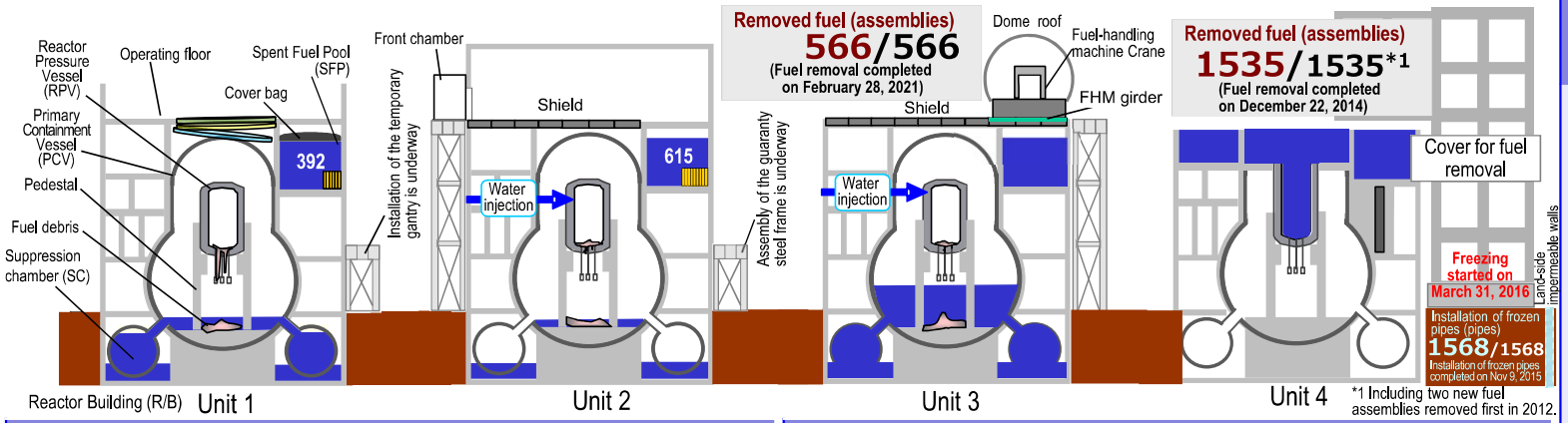
It was assumed that the concentration of organically bonded tritium (OBT) of flounder reached equilibrium as in the past insight, but the concentration will continue to be monitored.

Live video of marine organisms rearing test
https://www.youtube.com/channel/UCLEn8NHHX2WrMvn6ZYfAjJA

Indicators of the sea-area monitoring

Indicators to determine “discharge stop” as facility operation are set as “unusual level” for cases where the surrounding sea area monitoring detects insufficient spreading of discharged water (unusual tritium concentration) and others. The tritium concentration near the discharge outlet (within 3km of the power station) is set to 700 Bq/L and the outside of “near the discharge outlet” (within 10km square of the power station front) is set to 30 Bq/L.

When a value exceeding about a half of the indicator (unusual level) is detected, the facilities, operation status and operation procedures will be checked immediately to confirm no problem, as well as resampling seawater and according to the results, more frequent monitoring will be conducted.

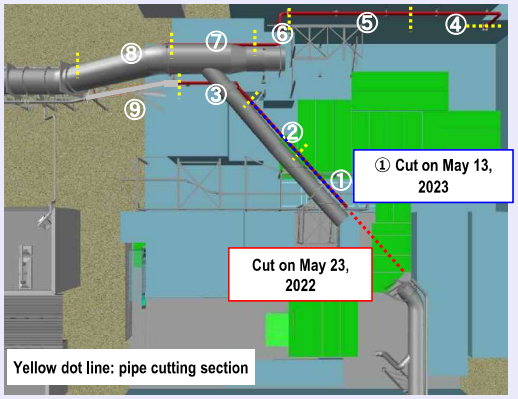


Units 1/2 Progress of pipe cutting for Standby Gas Treatment System

For pipes of the Units 1/2 Standby Gas Treatment System (SGTS), one section was cut in May 2022. Removal is also planned for sections interfering with the installation of the Unit 1 Reactor Building cover and others.

After completing the response to the problem of the pipe support cutting equipment and confirming the cutting performance using mockup pipes inside the power station, cutting of one of nine sections scheduled was completed on May 13, 2023.

Work continues carefully with safety first.

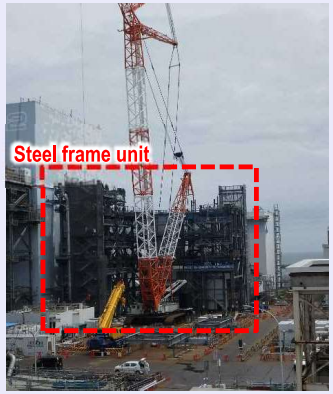


< Plan to cut SGTS pipes >

Unit 2 Status of work toward fuel removal

Inside the building, decontamination to reduce the dose rate on the operating floor is underway. From April 28, suction decontamination started.

Outside the building, the steel frame assembled outside the site was transferred to the inside and assembly of the gantry steel frame for fuel removal is underway on the south side of the Reactor Building. As of May 25, installation of 19 of 45 steel frame units was completed.



< Assembly of steel frame units (as of May 16) >

Unit 1 Results of the deposit 3-D mapping of the PCV internal investigation

During the period March 4-8, 2023, the underwater robot ROV-B was injected at the bottom of the Unit 1 Primary Containment Vessel (PCV) to conduct deposit 3-D mapping outside the pedestal.

When comparing the results of this deposit 3-D mapping and the deposit thickness measurement by ROV-C in June 2022, a correlation was identified between both data of deposit heights from the PCV bottom.

In the deposit thickness measurement by ROV-C, the heights of some deposit were evaluated. In this investigation, data of 34 points was acquired, which provides a wider-range of continuous data offering an insight into deposit height. Implementation of more detailed deposit investigation will be examined.

Appendix 2

Results of analyses on the quality of the purified groundwater pumped from the sub-drain and groundwater drain systems at Fukushima Daiichi NPS (made available by TEPCO prior to discharge)

(Unit: Bq/L)

Date of sampling *Date of discharge	Detected nuclides	Analytical body	
		TEPCO	Third-party organization
May27th, 2023 *Discharged on June 1st	Cs-134	ND (0.57)	ND (0.81)
	Cs-137	ND (0.67)	ND (0.75)
	Gross β	ND (2.0)	ND (0.36)
	H-3	880	940
May 26th, 2023 *Discharged on May 31st	Cs-134	ND (0.86)	ND (0.60)
	Cs-137	ND (0.67)	ND (0.61)
	Gross β	ND (0.63)	ND (0.44)
	H-3	890	940
May24th, 2023 *Discharged on May 29th	Cs-134	ND (0.86)	ND (0.66)
	Cs-137	ND (0.72)	ND (0.48)
	Gross β	ND (1.8)	ND (0.36)
	H-3	910	990
May23th, 2023 *Discharged on May 28th	Cs-134	ND (0.86)	ND (0.45)
	Cs-137	ND (0.60)	ND (0.72)
	Gross β	ND (1.8)	ND (0.37)
	H-3	810	890
May21st, 2023 *Discharged on May 26th	Cs-134	ND (0.87)	ND (0.53)
	Cs-137	ND (0.79)	ND (0.54)
	Gross β	ND (1.9)	ND (0.49)
	H-3	870	900
May20th, 2023 *Discharged on May 25th	Cs-134	ND (0.74)	ND (0.53)
	Cs-137	ND (0.84)	ND (0.61)
	Gross β	ND (1.9)	ND(0.37)
	H-3	880	930
May19th, 2023 *Discharged on May 24th	Cs-134	ND (0.92)	ND (0.75)
	Cs-137	ND (0.79)	ND (0.64)
	Gross β	ND (1.7)	ND (0.40)
	H-3	810	890
May17th, 2023 *Discharged on	Cs-134	ND (0.74)	ND (0.57)
	Cs-137	ND (0.74)	ND (0.54)

May 22nd	Gross β	ND (0.69)	ND (0.36)
	H-3	720	760
May16th, 2023 *Discharged on May 21st	Cs-134	ND (0.66)	ND (0.57)
	Cs-137	ND (0.67)	ND (0.58)
	Gross β	ND (1.8)	0.32
	H-3	730	790
May14th, 2023 *Discharged on May 19th	Cs-134	ND (0.98)	ND (0.82)
	Cs-137	ND (0.77)	ND (0.64)
	Gross β	ND (2.0)	ND (0.36)
	H-3	640	700
May13th, 2023 *Discharged on May 18th	Cs-134	ND (0.74)	ND (0.64)
	Cs-137	ND (0.84)	ND (0.72)
	Gross β	ND (1.8)	ND (0.36)
	H-3	530	570
May12th, 2023 *Discharged on May 17th	Cs-134	ND (0.79)	ND (0.66)
	Cs-137	ND (0.51)	ND (0.68)
	Gross β	ND (1.7)	ND (0.38)
	H-3	640	680
May10th, 2023 *Discharged on May15th	Cs-134	ND (0.79)	ND (0.49)
	Cs-137	ND (0.77)	ND (0.67)
	Gross β	ND (0.69)	0.46
	H-3	760	810
May9th, 2023 *Discharged on May14th	Cs-134	ND (0.80)	ND (0.73)
	Cs-137	ND (0.67)	ND (0.70)
	Gross β	ND (1.7)	ND (0.38)
	H-3	760	830
May7th, 2023 *Discharged on May12th	Cs-134	ND (0.77)	ND (0.62)
	Cs-137	ND (0.59)	ND (0.54)
	Gross β	ND (1.8)	ND (0.42)
	H-3	750	800
MAy6th, 2023 *Discharged on May11th	Cs-134	ND (0.66)	ND (0.48)
	Cs-137	ND (0.62)	ND (0.61)
	Gross β	ND (1.7)	0.48
	H-3	770	830
May5th, 2023 *Discharged on May 10th	Cs-134	ND(0.61)	ND(0.58)
	Cs-137	ND(0.82)	ND(0.57)
	Gross β	ND(1.7)	ND(0.33)
	H-3	840	910
May3rd, 2023 *Discharged on	Cs-134	ND (0.79)	ND (0.58)
	Cs-137	ND (0.82)	ND (0.66)

May 8th	Gross β	ND (2.0)	ND (0.35)
	H-3	830	900
May2nd, 2023 *Discharged on May 7th	Cs-134	ND (0.86)	ND (0.73)
	Cs-137	ND (0.86)	ND (0.70)
	Gross β	ND (0.63)	0.42
	H-3	820	880
April30th, 2023 *Discharged on May 5th	Cs-134	ND (0.92)	ND (0.56)
	Cs-137	ND (0.82)	ND (0.64)
	Gross β	ND (1.7)	ND (0.34)
	H-3	850	910
April29th, 2023 *Discharged on May 4th	Cs-134	ND (0.91)	ND (0.68)
	Cs-137	ND (0.76)	ND (0.61)
	Gross β	ND (1.9)	ND (0.34)
	H-3	850	920
April28th, 2023 *Discharged on May 3rd	Cs-134	ND (0.80)	ND (0.59)
	Cs-137	ND (0.67)	ND (0.64)
	Gross β	ND (0.64)	ND(0.32)
	H-3	890	940

* * ND: represents a value below the detection limit; values in ( ) represent the detection limit.
* In order to ensure the results, third-party organizations have also conducted an analysis and verified the radiation level of the sampled water.
* Third-party organization : Tohoku Ryokka Kankyohozen Co., Ltd

Appendix 3

Result of detailed analyses conducted by TEPCO, JAEA, and Japan Chemical Analysis Center (In order to confirm the validity of analysis, the Government of Japan also requests JAEA; and TEPCO requests Japan Chemical Analysis Center to conduct independent analyses)

(Unit: Bq/L)

Date of sampling	Detected nuclides	Analytical body		
		JAEA	TEPCO	Japan Chemical Analysis Center
April1st,2023	Cs-134	ND (0.0029)	ND (0.0045)	ND (0.0064)
	Cs-137	0.0045	ND(0.0050)	ND (0.0048)
	Gross α	ND (0.37)	ND (2.0)	ND (2.6)
	Gross β	ND (0.45)	ND (0.58)	ND (0.54)
	H-3	800	780	810
	Sr-90	0.0022	0.0022	0.0055

* ND: represents a value below the detection limit; values in ( ) represent the detection limit.

(Reference) (Unit: Bq/L)

Radionuclides	Operational Targets	Density Limit specified by the Reactor Regulation	World Health Organization (WHO) Guidelines for Drinking Water Quality
Cs-134	1	60	10
Cs-137	1	90	10
Gross α	—	—	—
Gross β	3 (1) ※	—	—
H-3	1,500	60,000	10,000
Sr-90	—	30	10

※ The operational target of Gross β is 1 Bq/L in the survey which is conducted once every ten days.

※ The reference table shows the values of operational targets before discharge. Since the values after discharge contain natural radioactive materials in seawater, there will be differences between the values and the operational targets values.

Appendix 4

Results of analysis on the seawater sampled near the discharge point (North side of Units 5 and 6 discharge channel)

(Unit: Bq/L)

Date of sampling	Detected nuclides	Sampling point (South discharge channel)
March 15th, 2023 *Sampled before discharge of purified groundwater.	Cs-134	ND (0.66)
	Cs-137	ND (0.69)
	Gross β	13
	H-3	ND (0.31)

Appendix 5

Results of analyses on the water quality of the groundwater pumped up for bypassing at Fukushima Daiichi NPS (made available by TEPCO prior to discharge)

(Unit: Bq/L)

Date of sampling *Date of discharge	Detected nuclides	Analytical body	
		TEPCO	Third-party organization
May26th, 2023 *Discharged on May 31st	Cs-134	ND (0.74)	ND (0.57)
	Cs-137	ND (0.67)	ND (0.39)
	Gross β	ND (0.71)	ND (0.31)
	H-3	52	54
May19th, 2023 *Discharged on May 24th	Cs-134	ND (0.86)	ND (0.70)
	Cs-137	ND (0.74)	ND (0.72)
	Gross β	ND (0.62)	ND (0.35)
	H-3	50	54
May12th, 2023 *Discharged on May 17th	Cs-134	ND (0.61)	ND (0.64)
	Cs-137	ND (0.60)	ND (0.57)
	Gross β	ND (0.63)	ND (0.35)
	H-3	59	56
May5th, 2023 *Discharged on May 10th	Cs-134	ND (0.66)	ND (0.70)
	Cs-137	ND (0.80)	ND (0.57)
	Gross β	ND (0.65)	ND (0.35)
	H-3	55	54
April28th, 2023 *Discharged on May 3th	Cs-134	ND (0.91)	ND (0.63)
	Cs-137	ND (0.88)	ND (0.61)
	Gross β	ND (0.68)	ND (0.29)
	H-3	53	64

- * ND: represents a value below the detection limit; values in ( ) represent the detection limit
- In order to ensure the results, third-party organizations have also conducted an analysis and verified the radiation level of the sampled water.
- Third-party organization: Tohoku Ryokka Kankyohozen Co., Ltd

Appendix 6

Result of detailed analyses conducted by TEPCO, JAEA, and Japan Chemical Analysis Center (In order to confirm the validity of analysis, the Government of Japan also requests JAEA; and TEPCO requests Japan Chemical Analysis Center to conduct independent analyses)

(Unit: Bq/L)

Date of sampling	Detected nuclides	Analytical body		
		JAEA	TEPCO	Japan Chemical Analysis Center
April7th, 2023	Cs-134	ND (0.0032)	ND (0.0052)	ND (0.0061)
	Cs-137	ND (0.0020)	ND (0.0044)	ND (0.0046)
	Gross α	ND (0.48)	ND (2.0)	ND (2.6)
	Gross β	ND (0.45)	ND (0.47)	ND (0.52)
	H-3	61	59	62
	Sr-90	ND (0.0011)	ND (0.0013)	ND (0.0054)

* ND: represents a value below the detection limit; values in ( ) represent the detection limit.

(Reference) (Unit: Bq/L)

Radionuclides	Operational Targets	Density Limit specified by the Reactor Regulation	World Health Organization (WHO) Guidelines for Drinking Water Quality
Cs-134	1	60	10
Cs-137	1	90	10
Gross α	—	—	—
Gross β	5 (1) ※	—	—
H-3	1,500	60,000	10,000
Sr-90	—	30	10

※ The operational target of Gross β is 1 Bq/L in the survey which is conducted once every ten days.

※ The reference table shows the values of operational targets before discharge. Since the values after discharge contain natural radioactive materials in seawater, there will be differences between the values and the operational targets values.

Appendix 7

Results of analyses on the seawater sampled near the discharge point (Around South Discharge Channel)

(Unit: Bq/L)

Date of sampling ※conducted four times a year	Detected nuclides	Sampling point (South discharge channel)
March 15th, 2023	Cs-134	ND (0.80)
	Cs-137	ND (0.55)
	Gross β	12
	H-3	ND (0.31)