Information（12:00）, June 16, 2025

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 December

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 December at Fukushima Daiichi Nuclear Power Station (NPS).

1. Summary of decommissioning and contaminated water management

In December 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/mp202412.pdf

2. Sub-drain and Groundwater Drain Systems

In December purified groundwater pumped from the sub-drain and groundwater drain systems was discharged of 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 December 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 December, the pumped bypassing groundwater was discharged on the dates shown in Appendix 5. Prior to every discharge, an analysis of 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 December 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 of 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 has been 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. The 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

December 26 2024
Secretariat of the Team for Countermeasures for Decommissioning, Contaminated Water and Treated Water

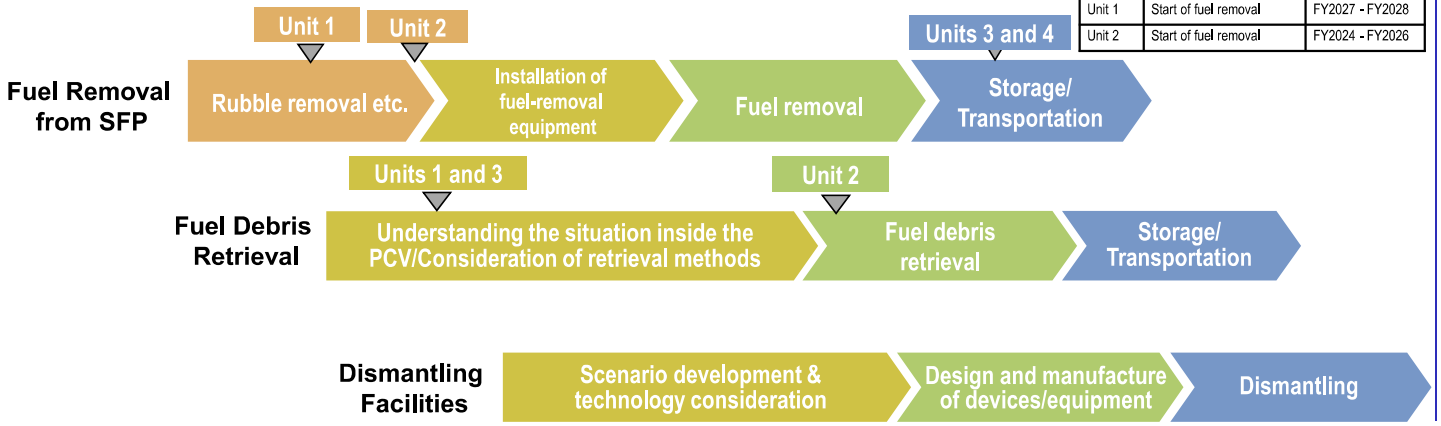
Main decommissioning work and steps

Fuel removal from the spent fuel pool was completed on December 22 2014 at Unit 4 and February 28 2021 at Unit 3.
Trial fuel debris retrieval at Unit 2 commenced from September 10 2024 and a milestone of the Mid-and-Long-Term Roadmap "Commencing fuel debris retrieval at the first Unit" was achieved.
Work continues sequentially toward the start of fuel removal from Units 1 and 2 and fuel debris (Note 1) retrieval from Units 1-3.

(Note 1) Fuel assemblies having melted through in the accident with nearby metal materials etc.

<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



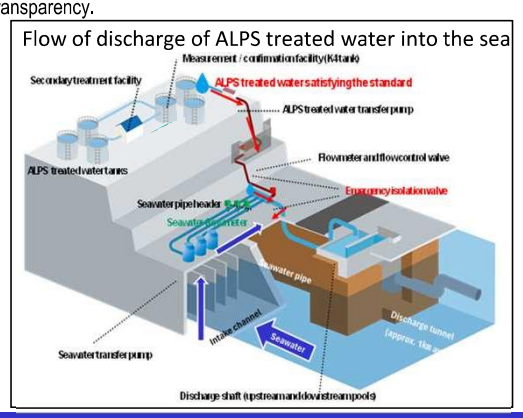
Measures for treated water

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, efforts including enhanced monitoring, ensuring objectivity and transparency by engaging with third-party experts and having safety checked by the IAEA, will continue. Moreover, accurate information will be disseminated with full transparency.

Flow of discharge of ALPS treated water into the sea



Contaminated water management - triple-pronged efforts -

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

① "Removing" the contamination source ② " Redirecting" groundwater from the contamination source ③ "Preventing leakage" of contaminated water

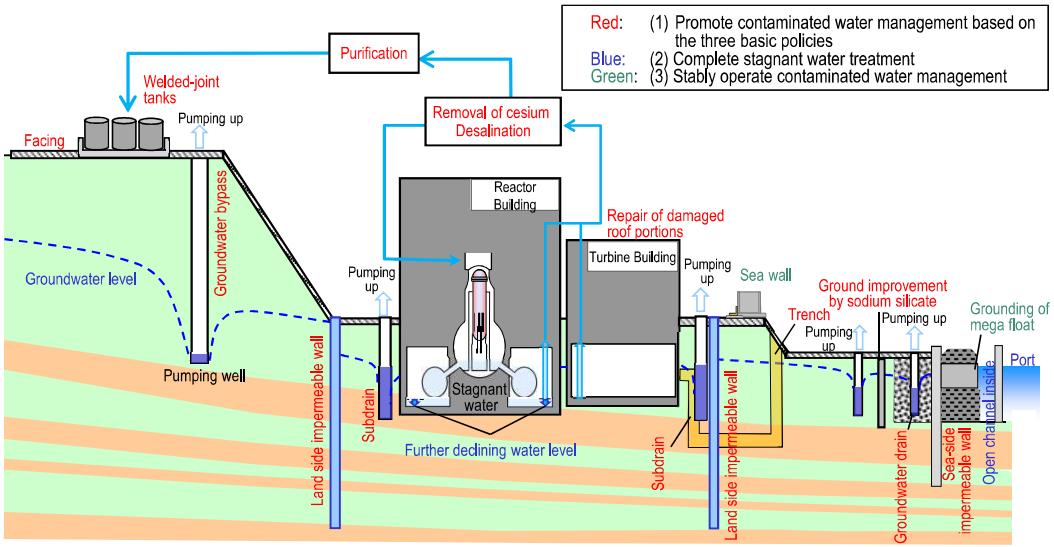
- Strontium-reduced water from other equipment is being re-treated in the Advanced Liquid Processing System (ALPS: multi-nuclide removal system) and stored in welded-joint tanks.
- Multi-layered contaminated water management measures, including land-side impermeable walls and subdrains, have stabilized the groundwater at a low level and the increased contaminated water generated during rainfall is being suppressed by repairing damaged portions of the building roofs facing onsite. Through these measures, the generation of contaminated water has been suppressed and reduced, from approx. 540 m^3/day (in May 2014) before implementing measures to approx. 80 m^3/day (in FY2023), achieving the milestone of "suppressing the amount of contaminated water generated to 100 m^3/day or less during average rainfall within FY2025."
- Measures will proceed to further reduce the amount of contaminated water generated and suppress it to approx. 50-70 m^3/day by FY2028.

(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 Units 1-3 Reactor Buildings, Process Main Building and High-Temperature Incinerator Building.
- While assessing the dust impact, 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

- As part of the tsunami countermeasures, openings in buildings were closed and work to install sea walls was completed. As countermeasures for heavy rain, sandbags are being installed to suppress direct inflow into buildings while work to enhance drainage channels and other measures is being implemented as planned.



Progress Status and Future Challenges of the Mid-and-Long-Term Roadmap toward Decommissioning of TEPCO Holdings Fukushima Daiichi Nuclear Power Station (Outline)

Progress status

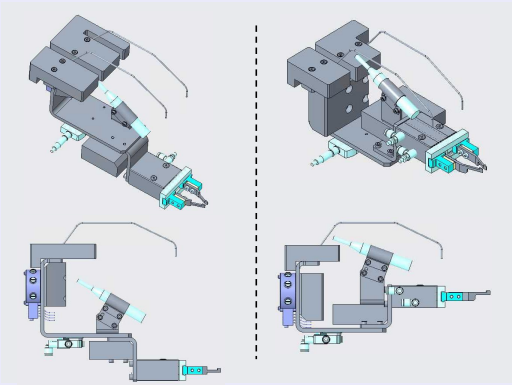
◆ The temperatures of the Reactor and the Primary Containment Vessel of Units 1-3 have been maintained stable.
There was no significant change in the concentration of radioactive materials newly released from Reactor Buildings into the air. It was concluded that the comprehensive cold shutdown state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

Unit 2 Progress of trial fuel debris retrieval

To increase samples of fuel debris and enhance knowledge, additional sampling is planned.

The telescopic device, which has proven results in fuel debris collection, will be used. Work to replace the camera at the end of the device, improve the tip jig, upskill and other preparation will proceed and examination is underway to commence in around spring 2025.

To conduct trial retrieval safety and carefully, details, including future process, will be refined.



< Current tip jig > < Tip jig after change >

Results of the non-destructive analysis of the fuel debris sample

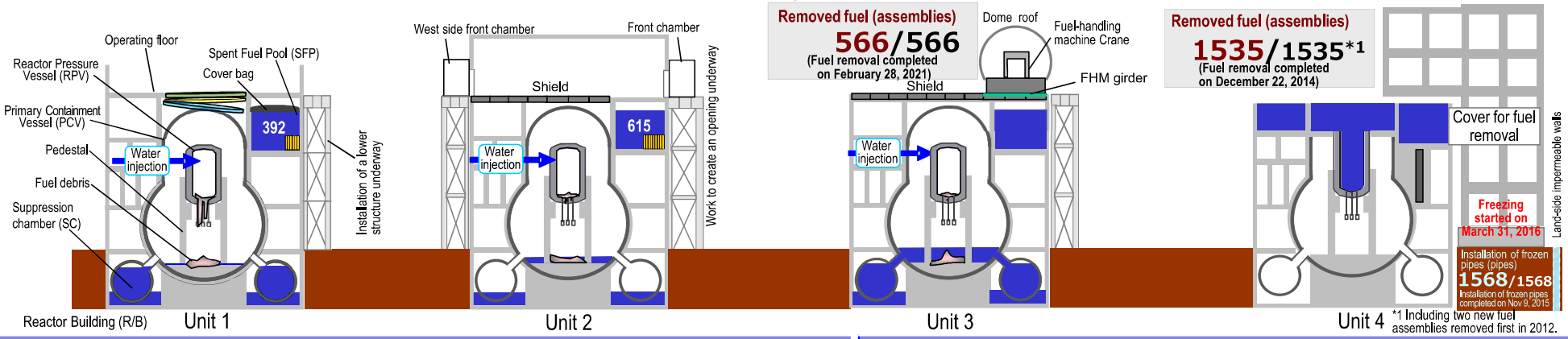
Regarding the fuel debris sample collected in the Unit 2 trial retrieval, analysis is underway to determine the state of the area where the sample was acquired and estimate the process of fuel debris generation.

Analysis commenced on November 14 at the Fuels Monitoring Facility at the Oarai Nuclear Engineering Institute of the Japan Atomic Energy Agency (JAEA) and was completed up to the point of non-destructive analysis.

Americium and others were detected in the gamma-ray spectrometry measurement and a portion with uranium spreading on the surface was also detected in the SEM-WDX measurement, which showed that fuel components were included.

The next phase will involve conducting a detailed analysis (solid and liquid) over six months to a year period.

< External appearance of fuel debris sample (approx. 9 × 7 mm) >



Discharge of ALPS treated water into the sea

The facility to discharge ALPS treated water into the sea is currently being inspected based on the conservation plan.

The inspection inside Tank Group A confirmed that there was no impact on the soundness of tanks. Paint peeling and slight rust was detected in the lower part of the body, but it was confirmed that they would have no impact on the soundness of tanks. Accordingly, repair painting was applied.

Pressure and leak testing conducted before internally inspecting the upstream pool confirmed structural soundness. Although the internal inspection detected paint peeling and other damage, no cracking and tearing were visible. Regarding the seawater transfer pipe, it was confirmed that it would have no impact on the dilution of ALPS treated water by seawater. However, corrosion was detected at the vent pipe flange, which will be repaired accordingly.

In preparation for the 7th discharge of ALPS treated water in FY2024, transfer to Tank Group C was completed on December 19. With the FY2025 discharge in mind, transfer to Tank Group A will commence from January 6, 2025.

Regarding tritium in seawater, TEPCO will continue confirming that it is being discharged safely as planned, while meeting the discharge requirement based on quick analyses.

Unit 3 Results of investigation on X-6 penetration

During the Unit 2 fuel debris retrieval, X-6 penetration was utilized. At Unit 3, the penetration is also expected to be effectively utilized as an access route for investigations inside the Primary Containment Vessel (PCV) and fuel debris retrieval. Before examining future utilization, to confirm the present state, the inside of the front room of the Unit 3 X-6 penetration was investigated.

Regarding the flange of X-6 penetration, no molten material adhering was detected as in Unit 2 and the external appearance broadly resembled that before the earthquake. The maximum air dose rate in the front room was 124mSv/h, which was lower compared with in Unit 2 and no molten material deposit was detected on the floor.

Based on these investigative results, methods to reduce the dose rate in the front room and remove shielding walls will be examined.

< Photo of X-6 penetration >

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
December 27th, 2024 *Discharged on January 1st,2025	Cs-134	ND (0.65)	ND (0.62)
	Cs-137	ND (0.69)	ND (0.66)
	Gross β	ND (0.67)	ND (0.35)
	H-3	790	870
December 24th, 2024 *Discharged on December 29th	Cs-134	ND (0.65)	ND (0.57)
	Cs-137	ND (0.75)	ND (0.60)
	Gross β	ND (0.70)	ND (0.32)
	H-3	850	910
December 22nd, 2024 *Discharged on December 27th	Cs-134	ND (0.66)	ND (0.50)
	Cs-137	ND (0.55)	ND (0.73)
	Gross β	ND (1.9)	ND (0.30)
	H-3	850	890
December 20th, 2024 *Discharged on December 25th	Cs-134	ND (0.68)	ND (0.47)
	Cs-137	ND (0.74)	ND (0.66)
	Gross β	ND (2.0)	0.42
	H-3	870	900
December 18th, 2024 *Discharged on December 23rd	Cs-134	ND (0.68)	ND (0.51)
	Cs-137	ND (0.78)	ND (0.63)
	Gross β	ND (0.63)	ND (0.34)
	H-3	850	890
December 16th, 2024 *Discharged on December 21st	Cs-134	ND (0.62)	ND (0.55)
	Cs-137	ND (0.73)	ND (0.66)
	Gross β	ND (1.8)	ND (0.33)
	H-3	800	830
December 15th, 2024 *Discharged on December 20th	Cs-134	ND (0.82)	ND (0.82)
	Cs-137	ND (0.68)	ND (0.60)
	Gross β	ND (1.6)	ND (0.33)
	H-3	870	910
December 13th, 2024 *Discharged on December 18th	Cs-134	ND (0.75)	ND (0.62)
	Cs-137	ND (0.78)	ND (0.63)
	Gross β	ND (1.9)	ND (0.33)

	H-3	860	900
December 11th,2024 *Discharged on December 16th	Cs-134	ND (0.74)	ND (0.65)
	Cs-137	ND (0.62)	ND (0.76)
	Gross β	ND (1.9)	ND (0.33)
	H-3	850	850
December 9th, 2024 *Discharged on December 14th	Cs-134	ND (0.74)	ND (0.63)
	Cs-137	ND (0.68)	ND (0.63)
	Gross β	ND (0.70)	ND (0.35)
	H-3	770	810
December 7th, 2024 *Discharged on December 12th	Cs-134	ND (0.80)	ND (0.51)
	Cs-137	ND (0.68)	ND (0.71)
	Gross β	ND (1.8)	ND (0.37)
	H-3	690	730
December 5th, 2024 *Discharged on December 10th	Cs-134	ND (0.86)	ND (0.60)
	Cs-137	ND (0.81)	ND (0.61)
	Gross β	ND (1.8)	ND (0.35)
	H-3	670	670
December 3rd, 2024 *Discharged on December 8th	Cs-134	ND (0.88)	ND (0.60)
	Cs-137	ND (0.74)	ND (0.58)
	Gross β	ND (2.0)	ND (0.33)
	H-3	610	630
December 1st, 2024 *Discharged on December 6th	Cs-134	ND (0.58)	ND (0.58)
	Cs-137	ND (0.69)	ND (0.63)
	Gross β	ND (0.59)	ND (0.33)
	H-3	660	720
November 30th, 2024 *Discharged on December 5th	Cs-134	ND (0.68)	ND (0.52)
	Cs-137	ND (0.82)	ND (0.60)
	Gross β	ND (1.7)	ND (0.33)
	H-3	650	710
November 28th, 2024 *Discharged on December 3rd	Cs-134	ND (0.82)	ND (0.77)
	Cs-137	ND (0.74)	ND (0.46)
	Gross β	ND (0.69)	ND (0.35)
	H-3	690	710

- * 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
October 1st,2024	Cs-134	ND (0.0030)	ND (0.0054)	ND (0.0064)
	Cs-137	ND (0.0019)	ND (0.0039)	ND (0.0049)
	Gross α	ND (0.44)	ND (2.2)	ND (2.1)
	Gross β	ND (0.38)	ND (0.68)	ND (0.60)
	H-3	820 ±1.6	790	820
	Sr-90	ND (0.0013)	ND (0.0012)	ND (0.0073)

* 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)
December 5th, 2024 *Sampled before discharge of purified groundwater.	Cs-134	ND (0.86)
	Cs-137	ND (0.62)
	Gross β	12
	H-3	ND (0.32)

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
December 20th, 2024 *Discharged on December 26th	Cs-134	ND (0.89)	ND (0.57)
	Cs-137	ND (0.75)	ND (0.70)
	Gross β	ND (0.63)	ND (0.31)
	H-3	50	56
December 13th, 2024 *Discharged on December 19th	Cs-134	ND (0.86)	ND (0.65)
	Cs-137	ND (0.67)	ND (0.78)
	Gross β	ND (0.67)	ND (0.33)
	H-3	32	37
December 6th, 2024 *Discharged on December 12th	Cs-134	ND (0.65)	ND (0.63)
	Cs-137	ND (0.69)	ND (0.73)
	Gross β	ND (0.69)	ND (0.34)
	H-3	34	40
November 29th, 2024 *Discharged on December 5th	Cs-134	ND (0.97)	ND (0.65)
	Cs-137	ND (0.63)	ND (0.75)
	Gross β	ND (0.64)	ND (0.34)
	H-3	32	34

- * 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

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
November 2nd, 2024	Cs-134	ND (0.0031)	ND (0.0045)	ND (0.0062)
	Cs-137	ND (0.0018)	ND (0.0040)	ND (0.0048)
	Gross α	ND (0.56)	ND (1.9)	ND (2.1)
	Gross β	ND (0.38)	ND (0.65)	ND (0.62)
	H-3	41 ±0.42	37	39
	Sr-90	ND (0.0012)	ND (0.0015)	ND (0.0060)

* 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)
December 5th, 2024	Cs-134	ND (0.91)
	Cs-137	ND (0.69)
	Gross β	12
	H-3	ND (0.33)