Information (16:00), February 3, 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 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/mp202212.pdf

2. Sub-drain and Groundwater Drain Systems

In December 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 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 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 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 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

December 22, 2022
Secretariat of the Team for Countermeasures for Decommissioning, Contaminated Water and Treated Water

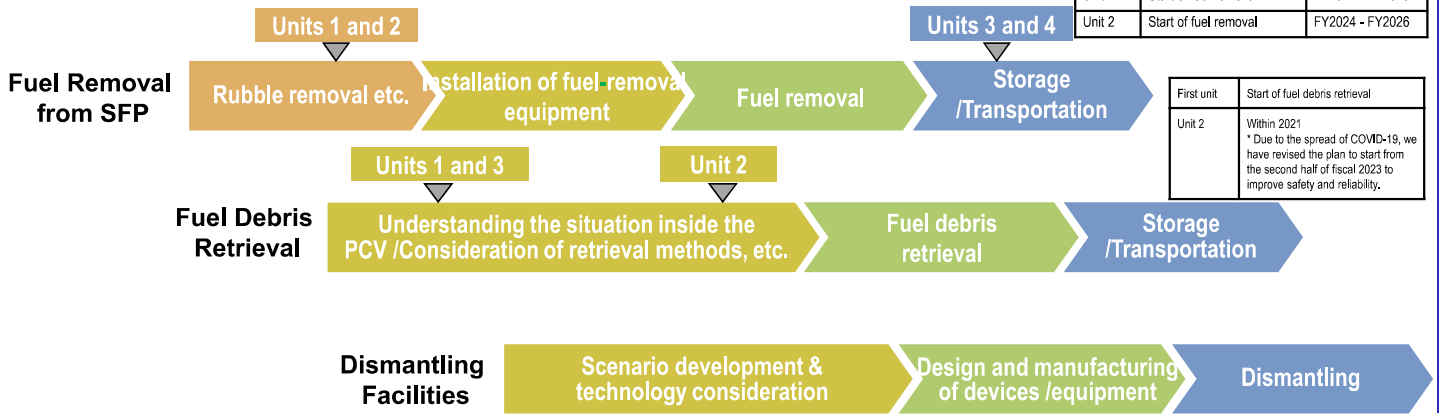
Main decommissioning work and steps

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



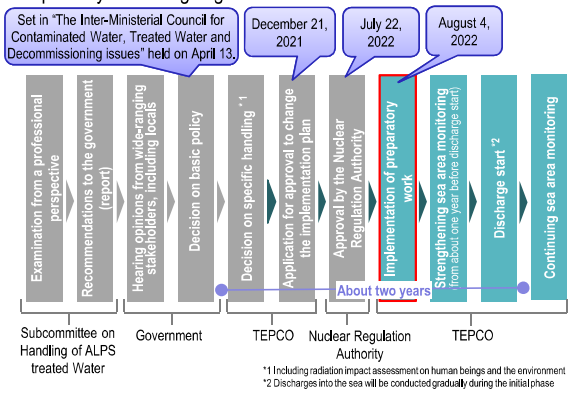
First unit	Start of fuel debris retrieval
Unit 2	Within 2021 * Due to the spread of COVID-19, we have revised the plan to start from the second half of fiscal 2023 to improve safety and reliability.

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

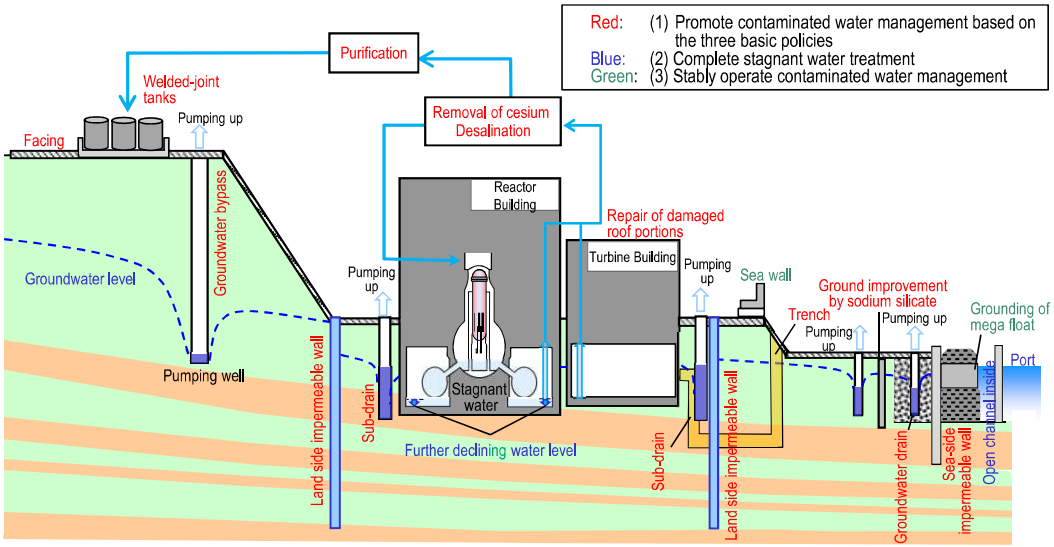
- Strontium-reduced water from other equipment is being re-treated in the Advanced Liquid Processing System (ALPS: multi-nuclide removal equipment) and stored in welded-joint tanks.
- Multi-layered contaminated water management measures, including land-side impermeable walls and sub-drains, have stabilized 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. At present, the floor surface exposure condition can be maintained except for the Unit 1-3 Reactor Buildings, Process Main Building and the High-Temperature Incinerator Building.
- 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. For Reactor Buildings, the amount of stagnant water there will be reduced to about half the amount at the end of 2020 during the period FY2022-2024.
- 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 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 condition had been maintained.

Substantiation of measures to further reduce contaminated water generated

On December 21st, the 26th Committee on Countermeasures for Contaminated Water Treatment (Chairperson: Dr. Yuzo Onishi) was held and discussed the substantiation of measures to further reduce contaminated water generated.

In FY2022, as well as the effects of existing multi-layered measures, facing and other measures further progressed. In conjunction with low rainfall, the average contaminated water generated during April – November remained constant at about 100 m^3/day.

TEPCO presented the outlook that by 2025, through measures including completing 50% of facing and installing the roof cover over the Unit 1 Reactor Building, the target of the Mid-and-Long-Term Roadmap, namely to suppress contaminated water generated to 100 m^3/day or lower, would be achieved and that by 2028, by measures including completing 80% of facing and locally stopping water in buildings, the volume of contaminated water generated would be reduced to about 50-70 m^3/day.

In response, as the Committee, opinions such as requesting, as well as providing accurate and transparent information at home and abroad and striving as far as possible to implement measures steadily without delay were concluded. As mid- and long-term issues, an examination of drastic water stoppage in buildings, while striving for consistency with the progress of the overall decommissioning process, such as fuel debris retrieval, was requested.

Unit 1 Status of the Primary Containment Vessel (PCV) internal investigation (the latter half)

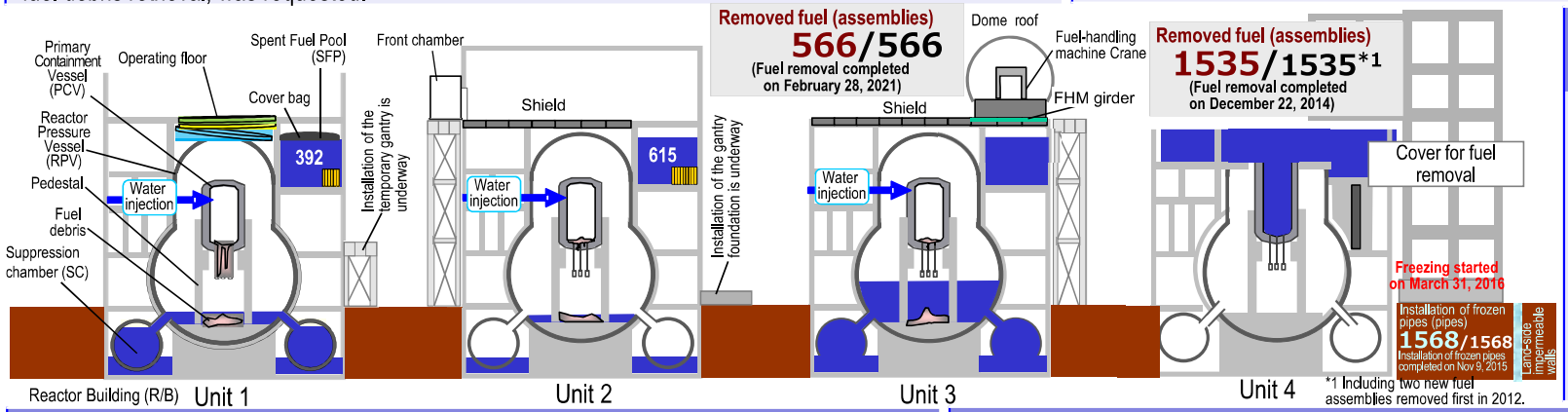
In the Unit 1 PCV internal investigation, regarding the deposit debris detection (gamma-ray nuclide analysis) by ROV-D, all eight points were measured during the period December 6-9.

At present, assessment such as gamma-ray nuclide analysis was completed for two of the eight points, from which data showing a high likelihood of debris was acquired. By assessing the remaining six points on an ongoing basis, debris distribution will also be assessed.

Moreover, from December 12, the preliminary work for deposit sampling investigation by ROV-E was conducted and the investigation will start from mid-January.

Since all images acquired in the first-half investigation conducted during the period February-June 2022, as preparation for publishment were completed, they are being provided at the Nuclear Information Corner at the Head Office of the Tokyo Electric Power Company Holdings, Inc. from December 12.

Nuclear Information Corner
https://www.tepco.co.jp/electricity/mechanism_and_facilities/power_generation/nuclear_power/info-j.html



*1 Including two new fuel assemblies removed first in 2012.

Unit 2 Investigation of the basement floor of the Reactor Building

It is considered that in Unit 2, the Reactor Core Isolation Cooling System (RCIC) operated for about three days, even after the tsunami arrival. To clarify why the RCIC stopped, an investigation inside the RCIC room, which is located on the basement, is being examined.

Given the present difficulty in accessing the RCIC room, as the preliminary investigation, the status of the basement floor is being investigated from December to check any equipment damage that could be hindering access.

Status regarding the rearing test of marine organisms

To eliminate concerns and reassure those in society, a rearing test for flounder and abalones in seawater with ALPS treated water added and normal seawater for comparison is underway.

Regarding the test of flounder, in the case of seawater with ALPS treated water (tritium concentration: less than 1,500 Bq/L), as with the previous insight, it was confirmed that the tritium concentration in the body did not exceed that in the growing environment and that following the transfer to normal seawater, the tritium concentration in the body declined. In the next, the same verification will be conducted for abalones.

In addition, from November 30, a rearing test of flounder in seawater, adjusted to a tritium concentration of about 30 Bq/L, also started.

The status of the rearing test continues to be clearly conveyed through the website, live camera, rearing diary and others.

Marine organism rearing test live camera
https://www.youtube.com/channel/UCLEn8NHHX2WrMvn6ZYfAjJA

Enhancement of the analysis scheme for decommissioning and others of the TEPCO Fukushima Daiichi Nuclear Power Station

On December 19, the Commission on Supervision and Evaluation of the Specified Nuclear Facilities was held and discussed enhancement of the analysis scheme for decommissioning and others of the Fukushima Daiichi Nuclear Power Station.

To “store and manage” a large amount of generated waste and subsequently “treat and dispose of that,” TEPCO proceeds with work to clarify the analysis needs along the decommissioning timeline; based on the analysis needs, formulate the analysis plan; identify substantial proficiencies for human resources with high technical capability and skills; and quantify the amount of human resources and the time it will be required.

Moreover, to steadily implement analysis for decommissioning, analysis and assessment methods are being developed by JAEA and others, analysis institutes are being secured and human resources are being developed and secured.

Regarding the development and securing of human resources in particular, the “analysis support team” integrating researchers and engineers with abundant experience and insight into analytical practices in Japan is organized and a curriculum is formulated with the aim of fostering analysis workers who will be engaged in solid waste analysis in the Fukushima Institute for Research, Education and Innovation (F-REI) to be established, to prepare for training.

These measures and examinations will steadily be realized and stakeholders will be united to proceed with decommissioning.

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, 2022 *Discharged on January 1st	Cs-134	ND (0.78)	ND (0.55)
	Cs-137	ND (0.69)	ND (0.66)
	Gross β	ND (1.6)	ND (0.29)
	H-3	810	860
December 25th, 2022 *Discharged on December 30th	Cs-134	ND (0.78)	ND (0.71)
	Cs-137	ND (0.65)	ND (0.64)
	Gross β	ND (1.9)	ND (0.31)
	H-3	730	810
December 24th, 2022 *Discharged on December 29th	Cs-134	ND (0.55)	ND (0.64)
	Cs-137	ND (0.65)	ND (0.67)
	Gross β	ND (1.9)	ND (0.34)
	H-3	800	860
December 23rd, 2022 *Discharged on December 28th	Cs-134	ND (0.88)	ND (0.68)
	Cs-137	ND (0.54)	ND (0.61)
	Gross β	ND (0.66)	ND (0.37)
	H-3	760	830
December 21st, 2022 *Discharged on December 26th	Cs-134	ND (0.64)	ND (0.55)
	Cs-137	ND (0.73)	ND (0.66)
	Gross β	ND (2.2)	ND (0.39)
	H-3	760	820
December 19th, 2022 *Discharged on December 25th	Cs-134	ND (0.80)	ND (0.64)
	Cs-137	ND (0.65)	ND (0.61)
	Gross β	ND (1.8)	ND (0.33)
	H-3	790	850
December 16th, 2022 *Discharged on December 21st	Cs-134	ND (0.44)	ND (0.51)
	Cs-137	ND (0.77)	ND (0.54)
	Gross β	ND (0.61)	ND (0.42)
	H-3	730	800
December 14th, 2022	Cs-134	ND (0.76)	ND (0.74)

*Discharged on December 20th	Cs-137	ND (0.60)	ND (0.58)
	Gross β	ND (2.0)	ND (0.35)
	H-3	730	800
December 12th, 2022 *Discharged on December 17th	Cs-134	ND (0.45)	ND (0.43)
	Cs-137	ND (0.65)	ND (0.63)
	Gross β	ND (2.1)	ND (0.35)
	H-3	750	790
December 10th, 2022 *Discharged on December 15th	Cs-134	ND (0.69)	ND (0.75)
	Cs-137	ND (0.69)	ND (0.57)
	Gross β	ND (1.9)	ND (0.32)
	H-3	760	810
December 8th, 2022 *Discharged on December 13th	Cs-134	ND (0.76)	ND (0.66)
	Cs-137	ND (0.77)	ND (0.72)
	Gross β	ND (0.65)	ND (0.33)
	H-3	730	780
December 7th, 2022 *Discharged on December 12th	Cs-134	ND (0.73)	ND (0.64)
	Cs-137	ND (0.75)	ND (0.63)
	Gross β	ND (1.8)	ND (0.30)
	H-3	750	820
December 6th, 2022 *Discharged on December 11th	Cs-134	ND (0.75)	ND (0.44)
	Cs-137	ND (0.65)	ND (0.64)
	Gross β	ND (1.7)	ND (0.34)
	H-3	750	820
December 5th, 2022 *Discharged on December 10th	Cs-134	ND (0.66)	ND (0.64)
	Cs-137	ND (0.65)	ND (0.57)
	Gross β	ND (2.0)	ND (0.32)
	H-3	820	870
December 3rd, 2022 *Discharged on December 8th	Cs-134	ND (0.78)	ND (0.56)
	Cs-137	ND (0.65)	ND (0.54)
	Gross β	ND (2.0)	ND (0.32)
	H-3	760	790
December 2nd, 2022 *Discharged on December 7th	Cs-134	ND (0.70)	ND (0.58)
	Cs-137	ND (0.65)	ND (0.55)
	Gross β	ND (1.8)	ND (0.31)
	H-3	700	750
December 1st, 2022 *Discharged on December 6th	Cs-134	ND (0.50)	ND (0.70)
	Cs-137	ND (0.77)	ND (0.74)
	Gross β	ND (0.73)	ND (0.32)
	H-3	660	720
November 30th, 2022 *Discharged on	Cs-134	ND (0.53)	ND (0.55)
	Cs-137	ND (0.87)	ND (0.61)

December 5th	Gross β	ND (2.1)	ND (0.34)
	H-3	710	780
November 29th, 2022 *Discharged on December 4th	Cs-134	ND (0.41)	ND (0.67)
	Cs-137	ND (0.65)	ND (0.61)
	Gross β	ND (2.0)	ND (0.32)
	H-3	740	790
November 28th, 2022 *Discharged on December 3rd	Cs-134	ND (0.45)	ND (0.68)
	Cs-137	ND (0.54)	ND (0.74)
	Gross β	ND (1.9)	ND (0.33)
	H-3	730	790
November 27th, 2022 *Discharged on December 2nd	Cs-134	ND (0.79)	ND (0.70)
	Cs-137	ND (0.65)	ND (0.60)
	Gross β	ND (1.8)	ND (0.36)
	H-3	820	880

* * 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
November 1st,2022	Cs-134	ND (0.0034)	ND (0.0046)	ND (0.0071)
	Cs-137	0.0029	0.0068	ND (0.0047)
	Gross α	ND (0.56)	ND (3.2)	ND (1.8)
	Gross β	ND (0.49)	ND (0.69)	ND (0.55)
	H-3	790	780	800
	Sr-90	ND (0.0077)	0.0049	0.0081

* 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 8th, 2022 *Sampled before discharge of purified groundwater.	Cs-134	ND (0.66)
	Cs-137	ND (0.79)
	Gross β	11
	H-3	ND (0.30)

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
November 24th, 2022 *Discharged on December 29th	Cs-134	ND (0.65)	ND (0.64)
	Cs-137	ND (0.73)	ND (0.64)
	Gross β	ND (0.67)	ND (0.35)
	H-3	54	59
December 19th, 2022 *Discharged on December 27th	Cs-134	ND (0.68)	ND (0.60)
	Cs-137	ND (0.60)	ND (0.61)
	Gross β	ND (0.65)	ND (0.30)
	H-3	52	56
December 14th, 2022 *Discharged on December 22nd	Cs-134	ND (0.56)	ND (0.53)
	Cs-137	ND (0.60)	ND (0.66)
	Gross β	ND (0.57)	ND (0.34)
	H-3	83	84
December 3rd, 2022 *Discharged on December 8th	Cs-134	ND (0.61)	ND (0.44)
	Cs-137	ND (0.54)	ND (0.72)
	Gross β	ND (0.69)	ND (0.29)
	H-3	64	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
November 2nd, 2022	Cs-134	ND (0.0033)	ND (0.0046)	ND (0.0072)
	Cs-137	ND (0.0022)	ND (0.0040)	ND (0.0041)
	Gross α	ND (0.64)	ND (3.4)	ND (1.8)
	Gross β	ND (0.46)	ND (0.60)	ND (0.58)
	H-3	53	53	54
	Sr-90	ND (0.0013)	ND (0.0013)	ND (0.0049)

* 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 8th, 2022	Cs-134	ND (0.60)
	Cs-137	ND (0.54)
	Gross β	12
	H-3	ND (0.30)