Information (16:00), October 11, 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 July

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 July at Fukushima Daiichi Nuclear Power Station (NPS).

1. Summary of decommissioning and contaminated water management

In July 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/mp202307.pdf

2. Sub-drain and Groundwater Drain Systems

In July 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 July 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 July, 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 July 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

July 27, 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

Fuel Removal from SFP

Units 1 and 2: Rubble removal etc. → Installation of fuel-removal equipment → Fuel removal

Units 3 and 4: Storage/Transportation

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.

Fuel Debris Retrieval

Units 1 and 3 / Unit 2: Understanding the situation inside the PCV/Consideration of retrieval methods, etc. → Fuel debris retrieval → Storage/Transportation

Dismantling Facilities

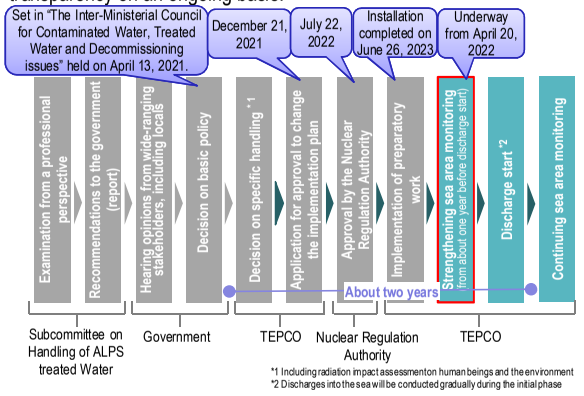
Scenario development & technology consideration → Design and manufacturing of devices/equipment → Dismantling

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

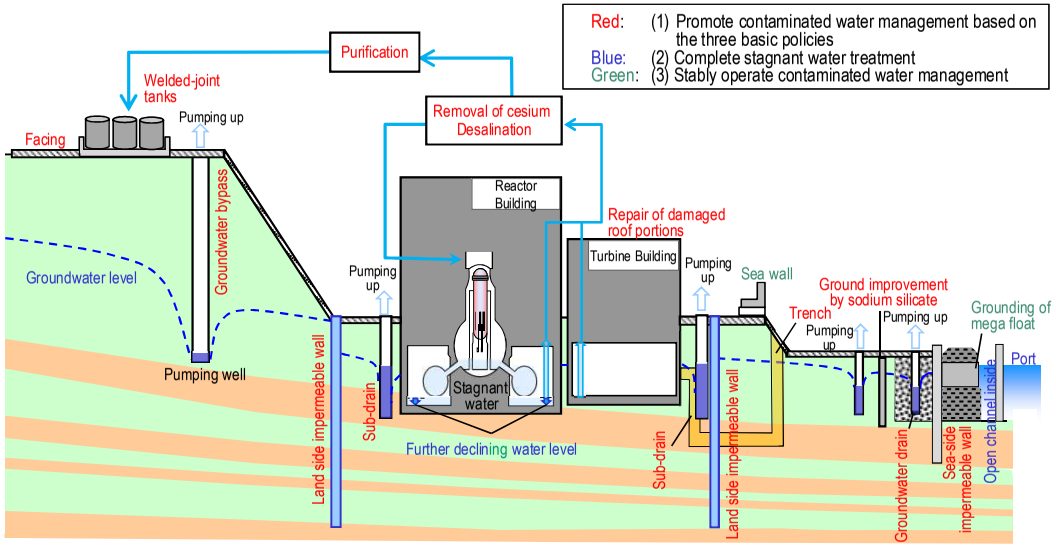
- Strontium-reduced water from other equipment is being re-treated in the Advanced Liquid Processing System (ALPS: multi-nuclide removal equipment) and stored in welded-joint tanks.
- Multi-layered contaminated water management measures, including land side impermeable walls and sub-drains, have stabilized 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. As of countermeasures 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 are 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.

Progress status related to the response to ALPS treated water (completion of the pre-service inspections and publication of the Comprehensive Report of the IAEA safety review)

Regarding ALPS treated Water Dilution/Discharge Facility and Related Facilities, installation of the facilities was completed on June 26, TEPCO underwent the pre-service inspection by the Nuclear Regulatory Authority (NRA) for the period June 28-30 and received a certificate of completion on July 7.

Going forward, TEPCO will do its utmost to maintain and manage ALPS treated water dilution/discharge facility and related facilities while also proactively engaging in initiatives to improve safety in the field, such as implementing operational training, so as to operate these facilities with precision.

The Comprehensive Report on the safety review concerning handling of ALPS -treated water was also published by the IAEA on July 4.

In the Executive Summary of the IAEA Comprehensive Report, the IAEA concluded the following:

- Based on its comprehensive assessment, the IAEA has concluded that the approach to the discharge of ALPS treated water into the sea and the associated activities by TEPCO, NRA and the Government of Japan, are consistent with relevant international safety standards.
- The IAEA has concluded, based on its comprehensive assessment, that the discharge of the ALPS treated water, as currently planned by TEPCO, will have a negligible radiological impact on people and the environment.

We will continue to share necessary information with the IAEA, while striving to foster further understanding of the international community about the discharge of ALPS treated water into the sea.

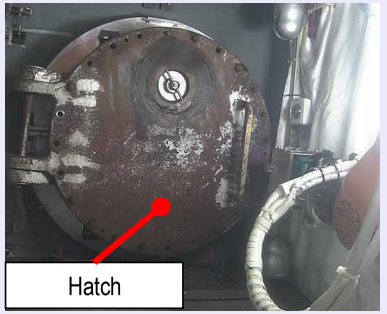
Unit 2 Progress status of PCV internal investigation and trial retrieval

To open the X-6 penetration hatch before retrieving trial debris, removal of 24 hatch bolts is underway.

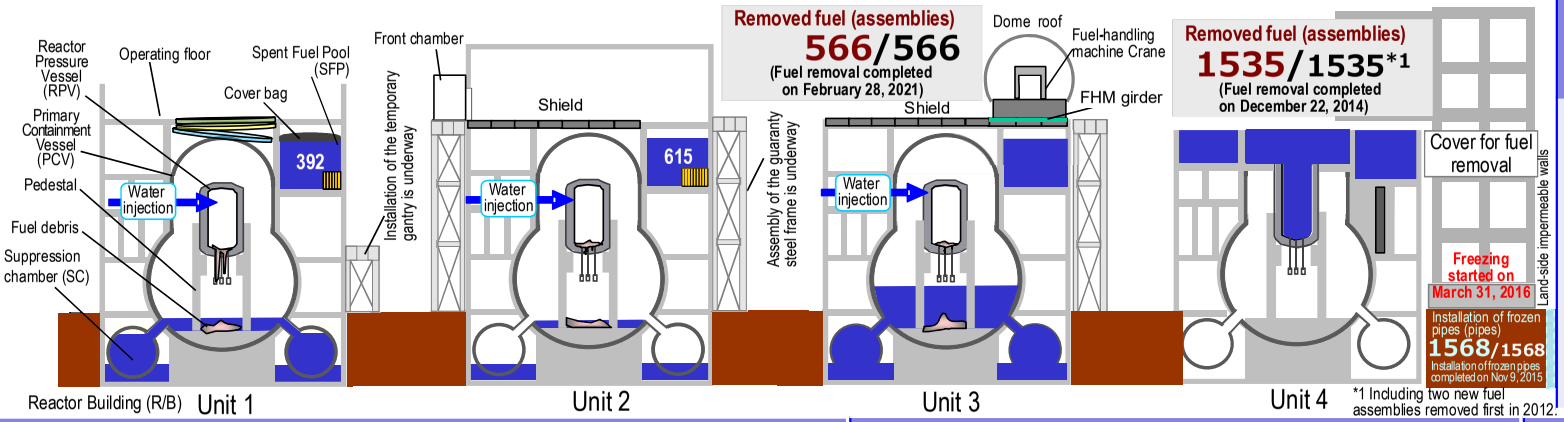
As of July 26, nine of 20 bolts, for which connections with nuts were cut, had been removed.

After cutting the remaining bolt-nut connections, bolts will be pushed in and removed and the hatch will be opened.

No significant variation was detected in the indicated values of dust monitors and monitoring posts, nor any abnormality in plant parameters.



< Status of removal of bolts >
(July 19, 2023)



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

Unit 2 Work to reduce the radiation dose of reactor system instrumentation pipes toward investigation inside the RPV

The internal structure of the Unit 2 Reactor Pressure Vessel (RPV) will be investigated by a fiber scope using the existing instrumentation pipes.

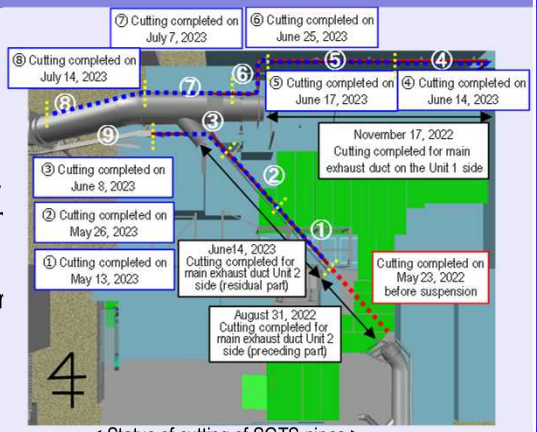
Work to reduce high airborne radiation dose in the work area will be conducted.

Decontamination on the floor and other work has been underway since April 10 and cleaning of the radiation source pipes and other related work will be implemented after August. During work, parameters inside the PCV will be monitored to confirm no significant variation.

Units 1/2 Progress status of removal and other work of SGTS pipes

For pipes of the Units 1/2 Standby Gas Treatment System (SGTS), cutting and removal of 8 sections interfering with installation of the Unit 1 Reactor Building cover were completed on July 14. After removing rubble from the Units 1/2 Radioactive Waste Treatment Building, construction of the large cover south side will commence.

Removed SGTS pipes will be analyzed and stored after shredding.

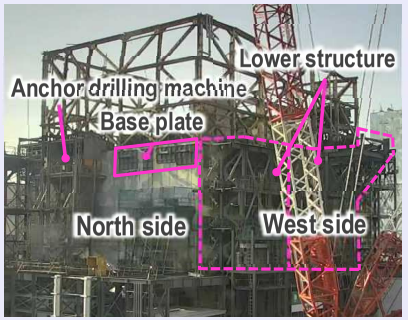


< Status of cutting of SGTS pipes >

Unit 1 Progress status of work toward fuel removal

Toward installing the large cover, anchors are being drilled and base plates are being installed on the east and north sides.

From June, the installation of the lower structure started from the west side. As of July 26, installation of two blocks had been completed (progress rate: approx. 6%).



< Status of work of Unit 1 Reactor Building >
(July 24, 2023)

Units 3/4 Status of on-site investigation toward dismantling the exhaust stack

Toward removing the Units 3/4 exhaust stack, to examine the influence of the radiation dose during dismantling and measures to prevent dust scattering, the radiation dose inside the exhaust stack and SGTS pipes were investigated in June.

Investigative results compiled in July showed that the radiation dose inside the exhaust stack was approx. 0.165-0.352 mSv/h and approx. 0.336-0.650 mSv/h inside the SGTS pipes.

These results were lower than the average airborne 0.650 mSv/h dose around the exhaust stack. Based on the dose results acquired during this investigation, specific cutting methods for the exhaust stack and measures to suppress dust scattering 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
July 27th, 2023 *Discharged on August 1st	Cs-134	ND (0.62)	ND (0.62)
	Cs-137	ND (0.69)	ND (0.64)
	Gross β	ND (1.8)	ND (0.37)
	H-3	700	750
July 26th, 2023 *Discharged on July 31st	Cs-134	ND (0.79)	ND (0.68)
	Cs-137	ND (0.72)	ND (0.75)
	Gross β	ND (1.8)	ND (0.38)
	H-3	660	710
July 25th, 2023 *Discharged on July 30th	Cs-134	ND (0.86)	ND (0.47)
	Cs-137	ND (0.76)	ND (0.59)
	Gross β	ND (1.8)	ND (0.34)
	H-3	610	650
July 24th, 2023 *Discharged on July 29th	Cs-134	ND (0.89)	ND (0.55)
	Cs-137	ND (0.89)	ND (0.48)
	Gross β	ND (1.9)	ND (0.34)
	H-3	660	680
July 23th, 2023 *Discharged on July 28th	Cs-134	ND (0.75)	ND (0.64)
	Cs-137	ND (0.76)	ND (0.62)
	Gross β	ND (1.7)	ND (0.33)
	H-3	630	690
July 22th, 2023 *Discharged on July 27th	Cs-134	ND (0.53)	ND (0.64)
	Cs-137	ND (0.61)	ND (0.57)
	Gross β	ND (1.8)	ND (0.35)
	H-3	660	690
July 21st, 2023 *Discharged on July 26th	Cs-134	ND (0.65)	ND (0.60)
	Cs-137	ND (0.64)	ND (0.51)
	Gross β	ND (0.64)	ND (0.40)
	H-3	660	680
July 20th, 2023 *Discharged on	Cs-134	ND (0.78)	ND (0.66)
	Cs-137	ND (0.73)	ND (0.70)

July 25th	Gross β	ND (1.6)	ND (0.35)
	H-3	680	730
July 19th, 2023 *Discharged on July 24th	Cs-134	ND (0.57)	ND (0.60)
	Cs-137	ND (0.72)	ND (0.79)
	Gross β	ND (1.8)	ND(0.37)
	H-3	660	690
July 18th, 2023 *Discharged on July 23th	Cs-134	ND (0.57)	ND (0.71)
	Cs-137	ND (0.55)	ND (0.58)
	Gross β	ND (1.8)	ND (0.37)
	H-3	620	670
July 17th, 2023 *Discharged on July 22th	Cs-134	ND (0.69)	ND (0.65)
	Cs-137	ND (0.78)	ND (0.70)
	Gross β	ND (1.8)	ND (0.35)
	H-3	580	640
July 16th, 2023 *Discharged on July 21st	Cs-134	ND (0.65)	ND (0.60)
	Cs-137	ND (0.73)	ND (0.58)
	Gross β	ND (1.6)	ND(0.35)
	H-3	640	690
July 15th, 2023 *Discharged on July 20th	Cs-134	ND (0.74)	ND (0.81)
	Cs-137	ND (0.67)	ND (0.67)
	Gross β	ND (1.7)	ND (0.36)
	H-3	710	790
July 14th, 2023 *Discharged on July 19th	Cs-134	ND (0.62)	ND (0.57)
	Cs-137	ND (0.82)	ND (0.58)
	Gross β	ND (0.60)	ND (0.34)
	H-3	760	820
July 13th, 2023 *Discharged on July 18th	Cs-134	ND (0.62)	ND (0.75)
	Cs-137	ND (0.69)	ND (0.67)
	Gross β	ND (2.0)	ND (0.32)
	H-3	840	910
July 12th, 2023 *Discharged on July 17th	Cs-134	ND (0.62)	ND (0.60)
	Cs-137	ND (0.69)	ND (0.61)
	Gross β	ND (1.9)	ND (0.30)
	H-3	940	1000
July 11th, 2023 *Discharged on July 16th	Cs-134	ND (0.79)	ND (0.58)
	Cs-137	ND (0.82)	ND (0.54)
	Gross β	ND (1.8)	ND (0.33)
	H-3	950	1000
July 10th, 2023 *Discharged on July 15th	Cs-134	ND (0.71)	ND (0.68)
	Cs-137	ND (0.82)	ND (0.72)
	Gross β	ND (2.0)	ND (0.35)

	H-3	930	990
July 9th, 2023 *Discharged on July 14th	Cs-134	ND (0.89)	ND (0.53)
	Cs-137	ND (0.69)	ND (0.59)
	Gross β	ND (2.0)	ND (0.33)
	H-3	920	1000
July 8th, 2023 *Discharged on July 13th	Cs-134	ND(0.79)	ND(0.56)
	Cs-137	ND(0.66)	ND(0.57)
	Gross β	ND(1.6)	ND(0.33)
	H-3	970	1100
July 7th, 2023 *Discharged on July 12th	Cs-134	ND (0.66)	ND (0.64)
	Cs-137	ND (0.81)	ND (0.57)
	Gross β	ND (0.59)	ND (0.43)
	H-3	990	990
July 6th, 2023 *Discharged on July 11th	Cs-134	ND (0.74)	ND (0.68)
	Cs-137	ND (0.62)	ND (0.68)
	Gross β	ND (1.9)	ND(0.34)
	H-3	880	960
July 5th, 2023 *Discharged on July 10th	Cs-134	ND (0.55)	ND (0.68)
	Cs-137	ND (0.59)	ND (0.64)
	Gross β	ND (1.7)	ND (0.36)
	H-3	870	910
July 4th, 2023 *Discharged on July 9th	Cs-134	ND (0.74)	ND (0.68)
	Cs-137	ND (0.76)	ND (0.72)
	Gross β	ND (1.7)	ND (0.35)
	H-3	800	890
July 3rd, 2023 *Discharged on July 8th	Cs-134	ND (0.75)	ND (0.62)
	Cs-137	ND (0.86)	ND (0.51)
	Gross β	ND (1.6)	ND (0.31)
	H-3	830	920
July 2nd, 2023 *Discharged on July 7th	Cs-134	ND (0.72)	ND (0.64)
	Cs-137	ND (0.69)	ND (0.54)
	Gross β	ND (2.0)	ND (0.34)
	H-3	840	910
July 1st, 2023 *Discharged on July 6th	Cs-134	ND (0.55)	ND (0.64)
	Cs-137	ND (0.85)	ND (0.62)
	Gross β	ND (0.65)	ND (0.32)
	H-3	820	910
June 30th, 2023 *Discharged on July 5th	Cs-134	ND (0.89)	ND (0.62)
	Cs-137	ND (0.73)	ND (0.54)
	Gross β	ND (1.9)	ND (0.35)
	H-3	780	850
June 29th, 2023	Cs-134	ND (0.77)	ND (0.57)

*Discharged on July 4th	Cs-137	ND (0.59)	ND (0.79)
	Gross β	ND (1.8)	ND (0.35)
	H-3	780	780
June 28th, 2023 *Discharged on July 3rd	Cs-134	ND (0.77)	ND (0.65)
	Cs-137	ND (0.59)	ND (0.58)
	Gross β	ND (2.0)	ND(0.37)
	H-3	720	790
June 27th, 2023 *Discharged on July 2nd	Cs-134	ND (0.84)	ND (0.60)
	Cs-137	ND (0.73)	ND (0.54)
	Gross β	ND (1.9)	ND(0.38)
	H-3	840	870

* * 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
June 2nd,2023	Cs-134	ND (0.0035)	ND (0.0054)	ND (0.0070)
	Cs-137	ND(0.0029)	ND(0.0040)	ND (0.0057)
	Gross α	ND (0.42)	ND (2.0)	ND (1.9)
	Gross β	ND (0.46)	ND (0.64)	ND (0.53)
	H-3	970	950	980
	Sr-90	ND (0.0042)	ND (0.0044)	ND(0.0057)

* 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)
June 7th, 2023 *Sampled before discharge of purified groundwater.	Cs-134	ND (0.84)
	Cs-137	ND (0.61)
	Gross β	14
	H-3	ND (0.34)

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
July 27th, 2023 *Discharged on August 1st	Cs-134	ND (0.55)	ND (0.62)
	Cs-137	ND (0.67)	ND (0.54)
	Gross β	ND (0.70)	ND (0.30)
	H-3	58	60
July 20th, 2023 *Discharged on July 25th	Cs-134	ND (0.65)	ND (0.60)
	Cs-137	ND (0.69)	ND (0.61)
	Gross β	ND (0.56)	ND (0.33)
	H-3	48	52
July 13th, 2023 *Discharged on July 18th	Cs-134	ND (0.80)	ND (0.59)
	Cs-137	ND (0.61)	ND (0.72)
	Gross β	ND (0.66)	ND (0.28)
	H-3	42	47
July 5th, 2023 *Discharged on July 10th	Cs-134	ND (0.98)	ND (0.60)
	Cs-137	ND (0.72)	ND (0.48)
	Gross β	ND (0.65)	ND (0.32)
	H-3	45	48
June 29th, 2023 *Discharged on July 4th	Cs-134	ND (0.61)	ND (0.64)
	Cs-137	ND (0.90)	ND (0.51)
	Gross β	ND (0.66)	ND (0.28)
	H-3	54	60

- * 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
June 2nd, 2023	Cs-134	ND (0.0035)	ND (0.0051)	ND (0.0073)
	Cs-137	ND (0.0029)	ND (0.0036)	ND (0.0051)
	Gross α	ND (0.28)	ND (2.0)	ND (1.9)
	Gross β	ND (0.44)	ND (0.61)	ND (0.65)
	H-3	51	51	52
	Sr-90	0.0012	ND (0.0013)	ND (0.0070)

* 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)
June 7th, 2023	Cs-134	ND (0.83)
	Cs-137	ND (0.65)
	Gross β	9.5
	H-3	ND (0.31)