Information (12:00), July 10, 2024

To All Missions (Embassies, Consulates 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 May 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/mp202405.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 30 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 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 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

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 * The trial retrieval will commence in around October 2024 at the latest.

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

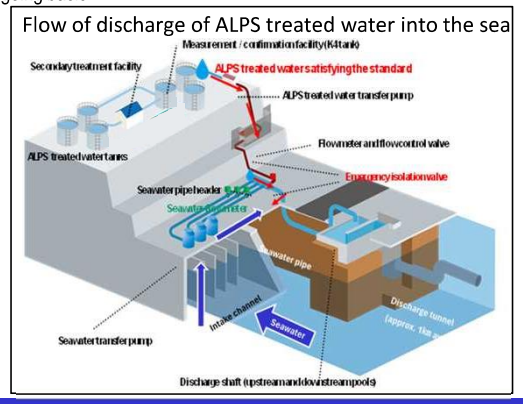
Dismantling Facilities: Scenario development & technology consideration → Design and manufacturing of devices/equipment → Dismantling

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.

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

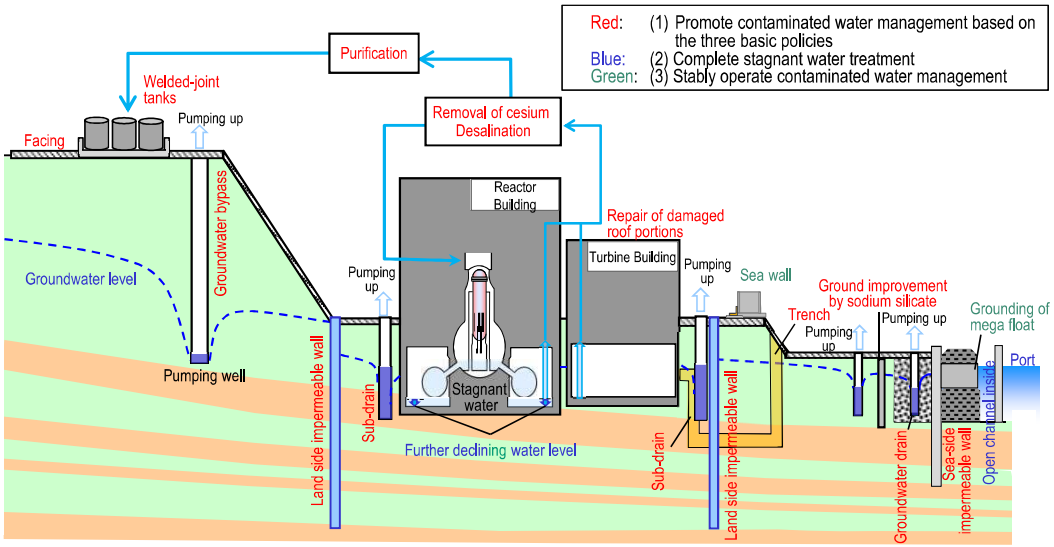
- Strontium-reduced water from other equipment is being re-treated in the Advanced Liquid Processing System (ALPS: multi-nuclide removal equipment) and stored in welded-joint tanks.
- Multi-layered contaminated water management measures, including land-side impermeable walls and sub-drains, have stabilized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

◆ 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.

Discharge of ALPS treated water into the sea

In preparation for the 2nd discharge of ALPS treated water in FY2024, Tank Group A of the measurement/confirmation facility was analyzed and TEPCO and an external institute confirmed that the analytical results satisfied the discharge requirement.

Following the confirmation, discharge of ALPS treated water of Tank Group C of the measurement/confirmation facility into the sea commenced from May 17.

Regarding tritium in seawater, TEPCO will continue to confirm that discharge is conducted safely as planned while satisfying the discharge requirement through the results of daily quick analyses conducted by TEPCO and others.

< Measurement status of the 2nd discharge of ALPS treated water inFY2024 >
* Detailed information described on the right on Page 5

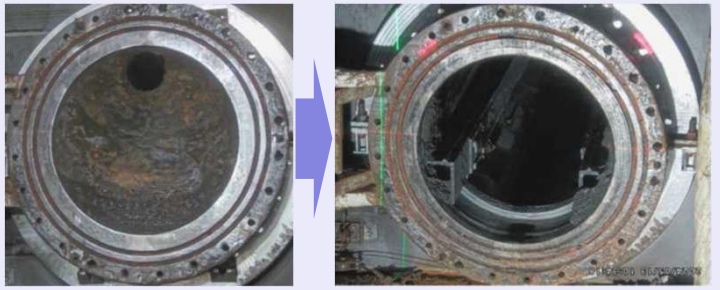
Measurement status	Compliance with requirement
[TEPCO] Attributes of the treated water from Tank Group C (Concentration of the 29 types of radionuclides within the measurement / evaluation scope and regulatory requirements) (Sampled on March 25)	○
[TEPCO] Downstream of discharge shaft and seawater pipe header (Sampled on May 28)	○
[TEPCO] Results of sea area monitoring at 8 points within 3km of the Power Station (Sampled on May 28)	○
[Fisheries Agency] Tritium concentration in marine products (Flounder and others, sampled on May 24)	○
[Fukushima Prefecture] Tritium concentration in seawater off the coast of Fukushima Prefecture (9 points, sampled on May 20)	○

Unit 2 Status of preparation for fuel debris trial retrieval

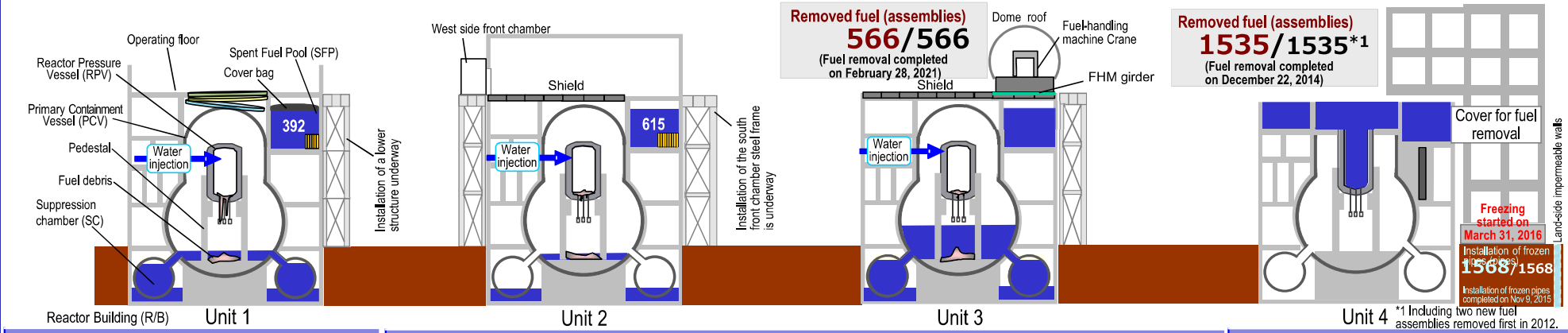
Removal of deposit in the penetration (X-6 penetration) having been conducted since January 10 was completed on May 13 and it was confirmed that there would be no impact on the passage of telescopic-type equipment and the robot arm through X-6 penetration.

Subsequently, installation of the connection structure and pipe to X-6 penetration is underway.

Based on present estimates, trial retrieval will commence in around August to October 2024.



< Before deposit removal > < After deposit removal >



Unit 1 Progress of work toward spent fuel removal

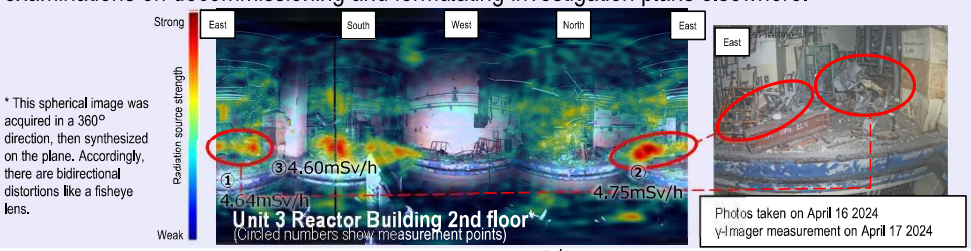
At Unit 1 Reactor Building, removal of overflowing rubble from the south side external wall was completed on April 25. No significant variation was confirmed in the dust concentration during removal work.

Except for the south side and a portion of the west side neighboring the south side, installation of the lower structure was completed. At present, anchor drilling is underway and base plates are being installed sequentially.

Unit 3 Progress of the investigation inside the Reactor Building

Regarding information on space (accessibility and others) and dose rate of Unit 3 inside the Reactor Building (R/B), an investigation is underway from April 16 to around mid-June. This investigation is conducted for the R/B southwest area and a remote control robot is being used to acquire video, point cloud and dose rate data.

The investigation will continue and based on the information acquired, radiation sources in the area will be identified and the dose rate distribution estimated. The information will be utilized in future examinations on decommissioning and formulating investigation plans elsewhere.



* This spherical image was acquired in a 360° direction, then synthesized on the plane. Accordingly, there are bidirectional distortions like a fisheye lens.

Implementation status of operational safety inspection

Given the troubles that occurred last year, such as bodily contamination of workers, water leaking from the high-temperature incinerator building and the suspension of the on-site electric power system, TEPCO is implementing operational safety inspections for all work from May. As well as striving to prevent any recurrence of these troubles, work safety in the power station needs to be enhanced throughout. After reviewing the field conditions, the risk factors in the field are extracted and work shall recommence as each of the reviews are completed.

Matters to be improved, noted and other aspects detected during the inspection will be reflected appropriately, while continuing such efforts. By accumulating each of the improvements, TEPCO will thoroughly ensure the safety of the surrounding environment and all those engaged in decommissioning work.

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
May 27th, 2024 *Discharged on June 1st	Cs-134	ND (0.73)	ND (0.55)
	Cs-137	ND (0.72)	ND (0.71)
	Gross β	ND (1.9)	ND (0.32)
	H-3	730	760
May 26th, 2024 *Discharged on May 31st	Cs-134	ND (0.57)	ND (0.50)
	Cs-137	ND (0.60)	ND (0.73)
	Gross β	ND (1.8)	ND (0.30)
	H-3	760	770
May 25th, 2024 *Discharged on May 30th	Cs-134	ND (0.69)	ND (0.58)
	Cs-137	ND (0.57)	ND (0.56)
	Gross β	ND (2.0)	ND (0.33)
	H-3	700	790
May 24th, 2024 *Discharged on May 29th	Cs-134	ND (0.68)	ND (0.62)
	Cs-137	ND (0.63)	ND (0.63)
	Gross β	ND (0.62)	ND (0.32)
	H-3	720	740
May 23rd, 2024 *Discharged on May 28th	Cs-134	ND (0.89)	ND (0.55)
	Cs-137	ND (0.72)	ND (0.83)
	Gross β	ND (2.0)	ND (0.37)
	H-3	690	720
May 22nd, 2024 *Discharged on May 27th	Cs-134	ND (0.88)	ND (0.64)
	Cs-137	ND (0.90)	ND (0.51)
	Gross β	ND (1.8)	ND (0.38)
	H-3	680	700
May 21st, 2024 *Discharged on May 26th	Cs-134	ND (0.75)	ND (0.50)
	Cs-137	ND (0.61)	ND (0.66)
	Gross β	ND (1.9)	ND (0.39)
	H-3	650	690
May 20th, 2024 *Discharged on May 25th	Cs-134	ND (0.88)	ND (0.65)
	Cs-137	ND (0.82)	ND (0.52)
	Gross β	ND (2.0)	0.38

	H-3	680	720
May 19th, 2024 *Discharged on May 24th	Cs-134	ND (0.93)	ND (0.50)
	Cs-137	ND (0.63)	ND (0.56)
	Gross β	ND (1.9)	ND (0.36)
	H-3	620	670
May 18th, 2024 *Discharged on May 23rd	Cs-134	ND (0.71)	ND (0.69)
	Cs-137	ND (0.65)	ND (0.73)
	Gross β	ND (2.0)	ND (0.33)
	H-3	670	700
May 17th, 2024 *Discharged on May 22nd	Cs-134	ND (0.69)	ND (0.79)
	Cs-137	ND (0.61)	ND (0.60)
	Gross β	ND (0.63)	ND (0.33)
	H-3	580	640
May 16th, 2024 *Discharged on May 21st	Cs-134	ND (0.68)	ND (0.64)
	Cs-137	ND (0.86)	ND (0.61)
	Gross β	ND (1.9)	ND (0.35)
	H-3	640	690
May 15th, 2024 *Discharged on May 20th	Cs-134	ND (0.77)	ND (0.64)
	Cs-137	ND (0.54)	ND (0.61)
	Gross β	ND (1.7)	ND (0.33)
	H-3	640	680
May 14th, 2024 *Discharged on May 19th	Cs-134	ND (0.56)	ND (0.76)
	Cs-137	ND (0.55)	ND (0.61)
	Gross β	ND (1.8)	ND (0.37)
	H-3	650	680
May 13th, 2024 *Discharged on May 18th	Cs-134	ND (0.81)	ND (0.61)
	Cs-137	ND (0.71)	ND (0.69)
	Gross β	ND (1.9)	ND (0.36)
	H-3	650	670
May 12th, 2024 *Discharged on May 17th	Cs-134	ND (0.71)	ND (0.80)
	Cs-137	ND (0.66)	ND (0.78)
	Gross β	ND (1.7)	ND (0.34)
	H-3	600	620
May 11th, 202 *Discharged on May 16th	Cs-134	ND (0.84)	ND (0.69)
	Cs-137	ND (0.73)	ND (0.51)
	Gross β	ND (1.7)	ND (0.34)
	H-3	580	620
May 9th, 2024 *Discharged on May 14th	Cs-134	ND (0.84)	ND (0.75)
	Cs-137	ND (0.54)	ND (0.70)
	Gross β	ND (0.71)	0.39
	H-3	600	630
May 8th, 2024	Cs-134	ND (0.75)	ND (0.60)

*Discharged on May 13th	Cs-137	ND (0.78)	ND (0.71)
	Gross β	ND (2.1)	ND (0.34)
	H-3	660	680
May 7th, 2024 *Discharged on May 12nd	Cs-134	ND (0.71)	ND (0.50)
	Cs-137	ND (0.74)	ND (0.71)
	Gross β	ND (1.8)	ND (0.37)
	H-3	650	670
May 6th, 2024 *Discharged on May 11th	Cs-134	ND (0.64)	ND (0.60)
	Cs-137	ND (0.65)	ND (0.61)
	Gross β	ND (1.8)	ND (0.38)
	H-3	630	690
May 5th, 2024 *Discharged on May 10th	Cs-134	ND (0.77)	ND (0.76)
	Cs-137	ND (0.74)	ND (0.58)
	Gross β	ND (1.9)	ND (0.37)
	H-3	680	710
May 4th, 2024 *Discharged on May 9th	Cs-134	ND (0.84)	ND (0.65)
	Cs-137	ND (0.79)	ND (0.71)
	Gross β	ND (2.0)	0.36
	H-3	670	710
May 3rd, 2024 *Discharged on May 8th	Cs-134	ND (0.72)	ND (0.62)
	Cs-137	ND (0.76)	ND (0.66)
	Gross β	ND (1.8)	ND (0.36)
	H-3	710	730
May 2nd, 2024 *Discharged on May 7th	Cs-134	ND (0.79)	ND (0.77)
	Cs-137	ND (0.51)	ND (0.63)
	Gross β	ND (1.9)	ND (0.32)
	H-3	740	780
May1st, 2024 *Discharged on May 6th	Cs-134	ND (0.72)	ND (0.48)
	Cs-137	ND (0.54)	ND (0.63)
	Gross β	ND (0.58)	ND (0.36)
	H-3	720	750
April 30th, 2024 *Discharged on May 5th	Cs-134	ND (0.65)	ND (0.62)
	Cs-137	ND (0.76)	ND (0.58)
	Gross β	ND (1.8)	ND (0.33)
	H-3	730	710
April 29th, 2024 *Discharged on May 4th	Cs-134	ND (0.68)	ND (0.60)
	Cs-137	ND (0.83)	ND (0.71)
	Gross β	ND (1.7)	0.43
	H-3	820	860
April 28th, 2024 *Discharged on May 3rd	Cs-134	ND (0.81)	ND (0.60)
	Cs-137	ND (0.64)	ND (0.78)
	Gross β	ND (1.7)	ND (0.33)
	H-3	800	820
April 27th, 2024	Cs-134	ND (0.76)	ND (0.61)

*Discharged on May 2nd	Cs-137	ND (0.72)	ND (0.60)
	Gross β	ND (1.7)	ND (0.37)
	H-3	790	830

- * 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
April 1st,2024	Cs-134	ND (0.0030)	ND (0.0047)	ND (0.0057)
	Cs-137	0.0063	0.0096	0.0059
	Gross α	ND (0.47)	ND (2.0)	ND (2.3)
	Gross β	ND (0.48)	ND (0.60)	ND (0.52)
	H-3	440	440	450
	Sr-90	0.0015	ND (0.0014)	ND (0.0061)

* 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 25th, 2024 *Sampled before discharge of purified groundwater.	Cs-134	ND (0.75)
	Cs-137	ND (0.86)
	Gross β	9.5
	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
May 24th, 2024 *Discharged on May 29th	Cs-134	ND (0.68)	ND (0.71)
	Cs-137	ND (0.74)	ND (0.73)
	Gross β	ND (0.59)	ND (0.33)
	H-3	46	48
May 17th, 2024 *Discharged on May 22nd	Cs-134	ND (0.81)	ND (0.54)
	Cs-137	ND (0.55)	ND (0.60)
	Gross β	ND (0.65)	ND (0.30)
	H-3	40	46
May 10th, 2024 *Discharged on May 15th	Cs-134	ND (0.69)	ND (0.69)
	Cs-137	ND (0.61)	ND (0.69)
	Gross β	ND (0.56)	ND (0.32)
	H-3	46	48
May 3rd, 2024 *Discharged on May 8th	Cs-134	ND (0.87)	ND (0.73)
	Cs-137	ND (0.79)	ND (0.83)
	Gross β	ND (0.69)	ND (0.32)
	H-3	42	47

- * 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
April 5th, 2024	Cs-134	ND (0.0024)	ND (0.0045)	ND (0.0061)
	Cs-137	ND (0.0021)	ND (0.0042)	ND (0.0043)
	Gross α	ND (0.51)	ND (2.0)	ND (2.3)
	Gross β	ND (0.48)	ND (0.64)	ND (0.60)
	H-3	43	42	43
	Sr-90	ND (0.0015)	ND (0.0013)	ND (0.0062)

* 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 22nd, 2024	Cs-134	ND (0.86)
	Cs-137	ND (0.47)
	Gross β	13
	H-3	0.54