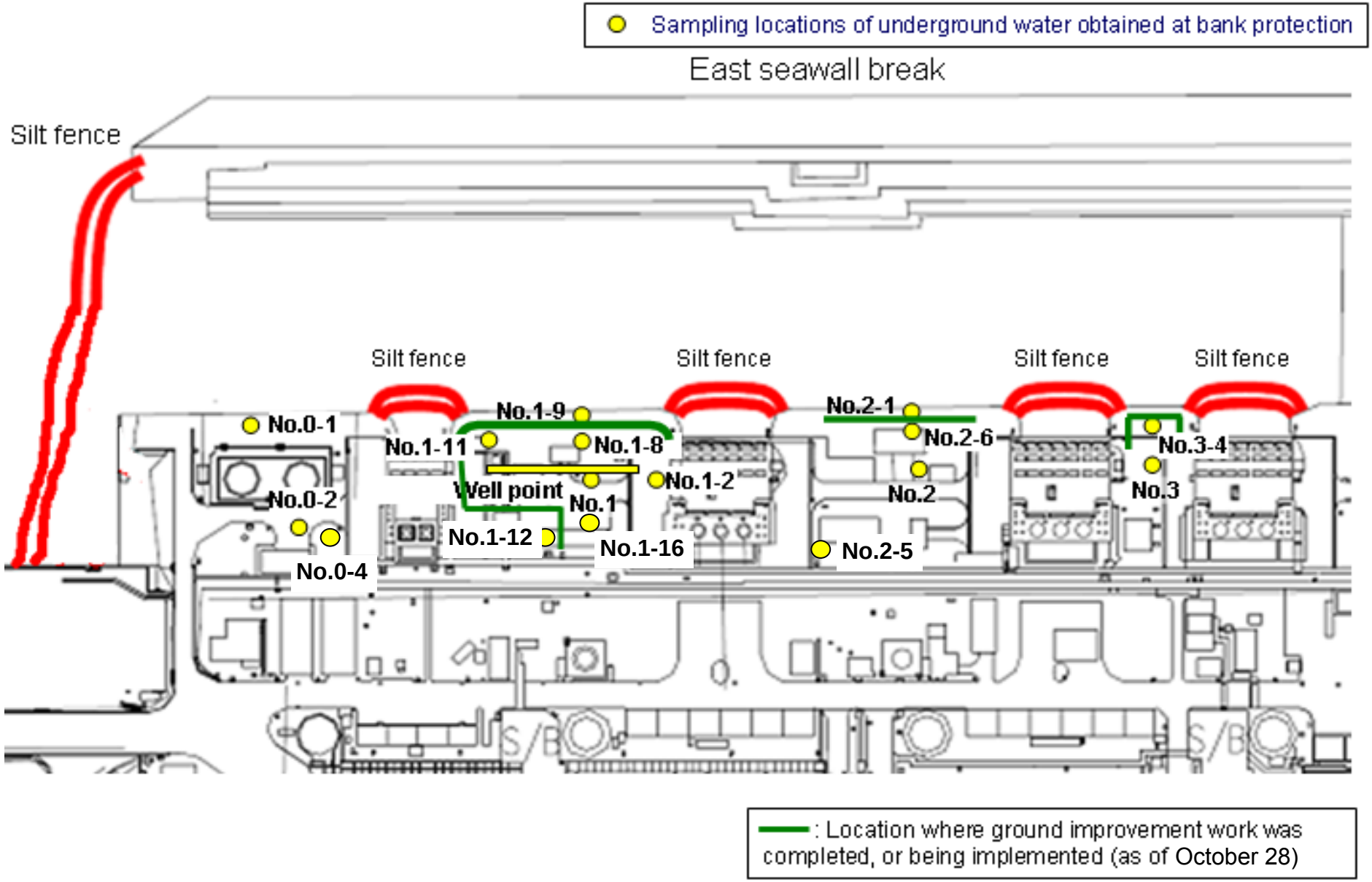
<Reference>
November 1, 2013
Tokyo Electric Power Company

Detailed Analysis Results in the Port of Fukushima Daiichi NPS, around Discharge Channel and Bank Protection
(Sampling Locations of Underground Water Obtained at Bank Protection)



Detailed Analysis Results in the Port of Fukushima Daiichi NPS, around Discharge Channel and Bank Protection (1/4)
Underground Water Obtained at Bank Protection

Unit: Bq/L (exclude chloride)

		Underground water observation hole No.0-1	Underground water observation hole No.0-2	Underground water observation hole No.0-4	Underground water observation hole No.1	Underground water observation hole No.1-2	Underground water observation hole No.1-8	Underground water observation hole No.1-9	Underground water observation hole No.1-11	Underground water observation hole No.1-12	Underground water observation hole No.1-16	Groundwater pumped up from the well point
Date of sampling		Oct 27, 2013	Oct 27, 2013		Oct 28, 2013		Oct 28, 2013	Oct 29, 2013	Oct 28, 2013	Oct 28, 2013	Oct 28, 2013	Oct 28, 2013
Time of sampling		9:50 AM	10:40 AM		11:14 AM		9:17 AM	6:20 AM	9:50 AM	10:14 AM	10:43 AM	9:40 AM
Chloride (unit: ppm)		-	-		-		-	350	-	-	-	-
Cs-134 (Approx. 2 years)		2.4	ND(0.42)		ND(0.40)		43	5.5	0.41	26	ND(1.4)	1.3
Cs-137 (Approx.30 years)		5.8	0.58		0.51		95	11	1.3	62	1.4	3.2
The other γ	Mn-54 (Approx. 310 days)	ND	ND		ND		2.60	ND	ND	ND	ND	ND
	Co-60 (Approx. 5 years)	ND	ND		ND		0.44	ND	ND	ND	0.64	ND
	Ru-106 (Approx. 370 days)	ND	ND		ND		ND	ND	ND	5.4	9.2	ND
	Sb-125 (Approx. 3 years)	ND	ND		ND		ND	ND	ND	6.0	4.5	ND
All β		61	22		570		11,000	86	29	410	650,000	230,000
H-3 (Approx. 12 years)		8,600	ND(120)		240,000		2,000	480	24,000	420,000	14,000	99,000
Sr-90 (Approx. 29 years)		-	-		-		-	-	-	-	-	-

		Underground water observation hole No.2	Underground water observation hole No.2-1	Underground water observation hole No.2-5	Underground water observation hole No.2-6	Underground water observation hole No.3	Underground water observation hole No.3-4
Date of sampling							
Time of sampling							
Cs-134 (Approx. 2 years)							
Cs-137 (Approx.30 years)							
The other γ							
All β							
H-3 (Approx. 12 years)							
Sr-90 (Approx. 29 years)							

* Data announced this time is provided in a thick-frame. The other data was announced on October 28,29 and 30.
* "ND" indicates that the measurement result is below the detection limit, and the detection limit of each nuclide is provided in parentheses.
* "-" indicates that the measurement was out of range.

Detailed Analysis Results in the Port of Fukushima Daiichi NPS, around Discharge Channel and Bank Protection (2/4)
Underground Water Obtained at Bank Protection

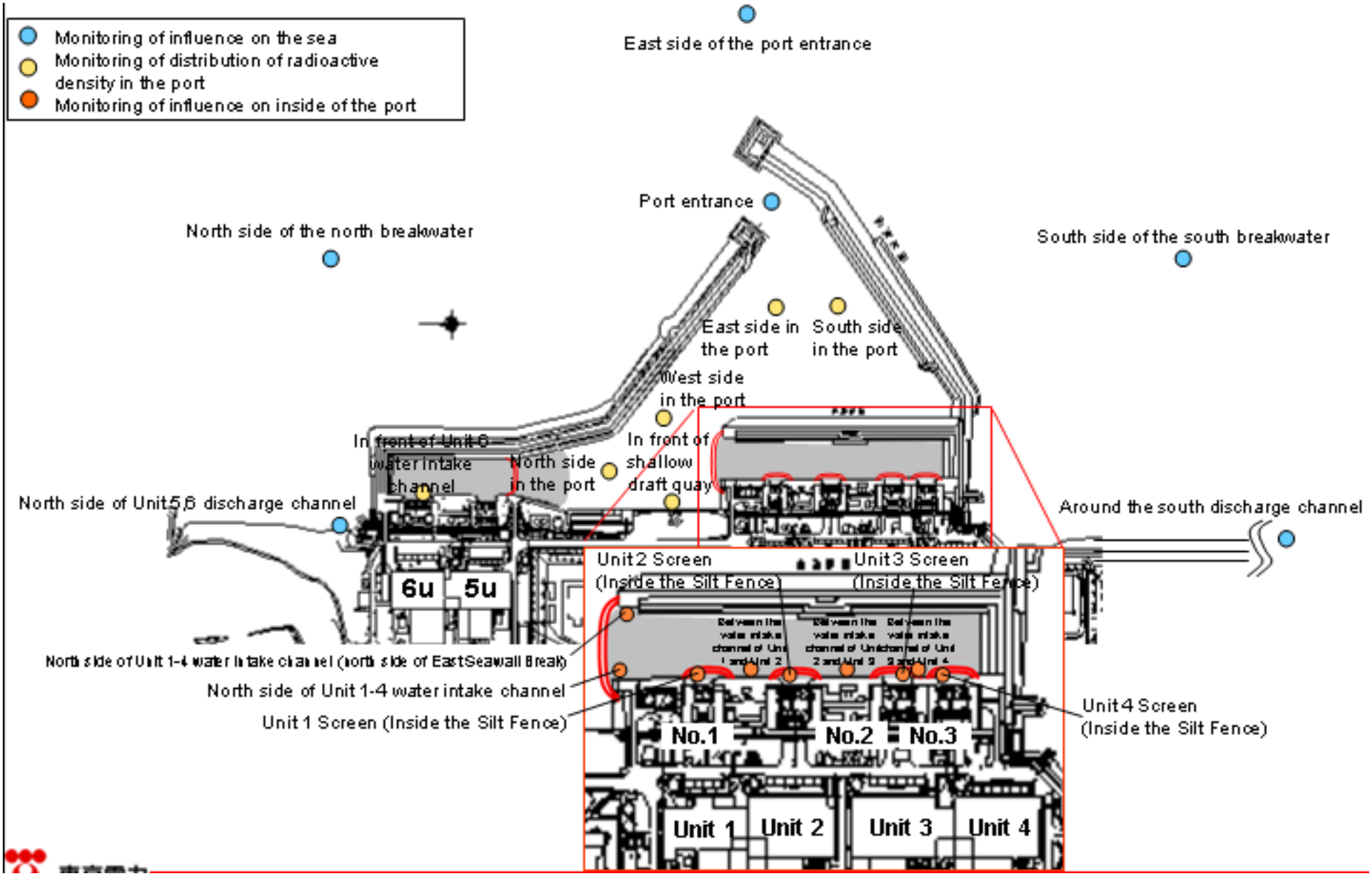
Unit: Bq/L (exclude chloride)

		Underground water observation hole No.0-1	Underground water observation hole No.0-2	Underground water observation hole No.0-4	Underground water observation hole No.1	Underground water observation hole No.1-2	Underground water observation hole No.1-8	Underground water observation hole No.1-9	Underground water observation hole No.1-11	Underground water observation hole No.1-12	Underground water observation hole No.1-16	Groundwater pumped up from the well point
Date of sampling					Oct 31, 2013			Oct 31, 2013	Oct 31, 2013	Oct 31, 2013	Oct 31, 2013	
Time of sampling					10:59 AM			6:15 AM	9:50 AM	10:15 AM	10:35 AM	
Chloride (unit: ppm)					—			350	-	-	-	
Cs-134 (Approx. 2 years)					ND(0.45)			6.0	0.94	15	ND(1.6)	
Cs-137 (Approx.30 years)					ND(0.54)			15.0	1.8	29	2.4	
The other γ	Co-60 (Approx. 5 years)				ND			ND	ND	ND	0.87	
	Ru-106 (Approx. 370 days)				5.6			ND	ND	ND	ND	
	Sb-125 (Approx. 3 years)				ND			ND	ND	2.1	5.2	
All β					420			57	19	150	550,000	
H-3 (Approx. 12 years)					Under analysis			Under analysis	Under analysis	Under analysis	Under analysis	
Sr-90 (Approx. 29 years)					-			-	-	-	-	

		Underground water observation hole No.2	Underground water observation hole No.2-1	Underground water observation hole No.2-5	Underground water observation hole No.2-6	Underground water observation hole No.3	Underground water observation hole No.3-4
Date of sampling							
Time of sampling							
Cs-134 (Approx. 2 years)							
Cs-137 (Approx.30 years)							
The other γ							
All β							
H-3 (Approx. 12 years)							
Sr-90 (Approx. 29 years)							

* "ND" indicates that the measurement result is below the detection limit, and the detection limit of each nuclide is provided in parentheses.
* "-" indicates that the measurement was out of range.

Detailed Analysis Results in the Port of Fukushima Daiichi NPS, around Discharge Channel and Bank Protection (Sampling Locations of Seawater)



Detailed Analysis Results in the Port of Fukushima Daiichi NPS, around Discharge Channel and Bank Protection (3/4)
Seawater

Unit: Bq/L

	1F, North side of Unit 5,6 discharge channel	1F, In front of Unit 6 water intake channel	1F, In front of shallow draft quay	1F, North side of Unit 1-4 water intake channel	1F, North side of Unit 1-4 water intake channel (north side of East Seawall Break)	1F, Unit 1 Screen (Inside the Silt Fence)	1F, Between the water intake channel of Unit 1 and Unit 2 (surface layer)	1F, Between the water intake channel of Unit 1 and Unit 2 (lower layer)	1F, Unit 2 Screen (Inside the Silt Fence)	1F, Between the water intake channel of Unit 2 and Unit 3	1F, Unit 3 Screen (Inside the Silt Fence)	Density Limit Specified by the Reactor Regulation *	WHO Guidelines for drinking-water quality
Date of Sampling	Oct 28, 2013	Oct 28, 2013	Oct 28, 2013	Oct 29, 2013	Oct 28, 2013	Oct 28, 2013	Oct 29, 2013	Oct 29, 2013	Oct 28, 2013	Oct 28, 2013	Oct 28, 2013		
Time of sampling	6:10 AM	6:30 AM	5:55 AM	6:11 AM	6:22 AM	6:01 AM	6:17 AM	6:17 AM	6:06 AM	6:09 AM	6:11 AM		
Cs-134(Approx. 2 years)	ND(1.0)	ND(1.7)	2.5	22	9.1	19	21	16	20	18	22	60	10
Cs-137(Approx.30 years)	ND(1.3)	ND(2.4)	4.2	47	26	49	47	44	56	34	49	90	10
All β	ND(15)	ND(15)	21	800	150	740	680	420	690	410	160		
H-3 (Approx. 12 years)	ND(1.8)	17	10	2,700	330	2,800	2,000	1,200	2,100	950	280	60,000	10,000
Sr-90 (Approx. 29 years)	-	-	-	-	-	-	-	-	-	-	-	30	10

Unit: Bq/L

	1F, Between the water intake channel of Unit 3 and Unit 4	1F, Unit 4 Screen (Inside the Silt Fence)	1F, Around the south discharge channel	1F, Port entrance	1F, East side in the port	1F, West side in the port	1F, North side in the port	1F, South side in the port	North side of the north breakwater	East side of the port entrance	South side of the south breakwater	Density Limit Specified by the Reactor Regulation *	WHO Guidelines for drinking-water quality
Date of Sampling	Oct 28, 2013	Oct 28, 2013	Oct 28, 2013										
Time of sampling	6:15 AM	6:13 AM	5:20 AM										
Cs-134(Approx. 2 years)	17	27	ND(1.3)									60	10
Cs-137(Approx.30 years)	33	60	2.9									90	10
All β	250	140	ND(18)										
H-3 (Approx. 12 years)	590	ND(120)	ND(1.8)									60,000	10,000
Sr-90 (Approx. 29 years)	-	-	-									30	10

* Data announced this time is provided in a thick-frame. The other data was announced on October 29 and 30.

* "ND" indicates that the measurement result is below the detection limit, and the detection limit of each nuclide is provided in parentheses.

* "-" indicates that the measurement was out of range.

* Density Limit Specified by the Rule for the Installation, Operation, etc. of Commercial Nuclear Power Reactors (the density limit in the water outside the surrounding monitored areas is provided in section 6 of Appendix 2 [the amount is converted from Bq/cm^3 to Bq/L]).

Detailed Analysis Results in the Port of Fukushima Daiichi NPS, around Discharge Channel and Bank Protection (4/4)
Seawater

Unit: Bq/L

	1F, North side of Unit 5,6 discharge channel	1F, In front of Unit 6 water intake channel	1F, In front of shallow draft quay	1F, North side of Unit 1-4 water intake channel	1F, North side of Unit 1-4 water intake channel (north side of East Seawall Break)	1F, Unit 1 Screen (Inside the Silt Fence)	1F, Between the water intake channel of Unit 1 and Unit 2 (surface layer)	1F, Between the water intake channel of Unit 1 and Unit 2 (lower layer)	1F, Unit 2 Screen (Inside the Silt Fence)	1F, Between the water intake channel of Unit 2 and Unit 3	1F, Unit 3 Screen (Inside the Silt Fence)	Density Limit Specified by the Reactor Regulation *	WHO Guidelines for drinking-water quality
Date of Sampling				Oct 31, 2013			Oct 31, 2013	Oct 31, 2013					
Time of sampling				6:01 AM			6:07 AM	6:07 AM					
Cs-134(Approx. 2 years)				23			22	17				60	10
Cs-137(Approx.30 years)				48			47	40				90	10
All β				810			740	210					
H-3 (Approx. 12 years)				Under analysis			Under analysis	Under analysis				60,000	10,000
Sr-90 (Approx. 29 years)				-			-	-				30	10

Unit: Bq/L

	1F, Between the water intake channel of Unit 3 and Unit 4	1F, Unit 4 Screen (Inside the Silt Fence)	1F, Around the south discharge channel	1F, Port entrance	1F, East side in the port	1F, West side in the port	1F, North side in the port	1F, South side in the port	North side of the north breakwater	East side of the port entrance	South side of the south breakwater	Density Limit Specified by the Reactor Regulation *	WHO Guidelines for drinking-water quality
Date of Sampling													
Time of sampling													
Cs-134(Approx. 2 years)												60	10
Cs-137(Approx.30 years)												90	10
All β													
H-3 (Approx. 12 years)												60,000	10,000
Sr-90 (Approx. 29 years)												30	10

* "ND" indicates that the measurement result is below the detection limit, and the detection limit of each nuclide is provided in parentheses.

* "-" indicates that the measurement was out of range.

* Density Limit Specified by the Rule for the Installation, Operation, etc. of Commercial Nuclear Power Reactors (the density limit in the water outside the surrounding monitored areas is provided in section 6 of Appendix 2 [the amount is converted from Bq/cm^3 to Bq/L]).

<Reference> The Highest Dose Until the Previous Measurement (Groundwater Obtained at Bank Protection)

Unit: Bq/L

		Groundwater observation hole No.0-1	Groundwater observation hole No.0-2	Groundwater observation hole No.0-4	Groundwater observation hole No.1	Groundwater observation hole No.1-1	Groundwater observation hole No.1-2	Groundwater observation hole No.1-3	Groundwater observation hole No.1-4	Groundwater observation hole No.1-5	Groundwater observation hole No.1-8	Groundwater observation hole No.1-9	Groundwater observation hole No.1-11	Groundwater observation hole No.1-12	Groundwater observation hole No.1-16	Groundwater pumped up from the well point (notch tank)
Cs-134 (Approx. 2 years)		5.1 〔10/20〕	〔1/0〕 〔10/13〕	ND	13 〔8/29〕	1.9 〔7/8〕	11,000 〔7/9〕	10 〔9/2〕	1.5 〔7/8〕	310 〔8/5〕	43 〔10/28〕	170 〔9/3〕	0.92 〔10/14〕	74 〔10/21〕	1.5 〔10/3〕	110 〔9/23〕
Cs-137 (Approx.30 years)		9.5 〔10/20〕	1.6 〔10/13〕	ND	31 〔8/29〕	3.6 〔7/8〕	22,000 〔7/9〕	24 〔9/2〕	3.6 〔7/8〕	650 〔8/5〕	95 〔9/16〕	380 〔9/3〕	2.0 〔10/10〕	170 〔10/21〕	3.4 〔10/10〕	250 〔9/23〕
The other γ	Ru-106 (Approx. 370 days)	ND	ND	ND	26 〔5/24〕	7.9 〔7/8〕	160 〔8/15〕	17 〔7/22〕〔8/8〕	3.1 〔8/8〕	ND	ND	ND	ND	5.4 〔10/28〕	9.2 〔10/28〕	25 〔9/2〕
	Mn-54 (Approx. 310 days)	ND	ND	ND	ND	1.0 〔7/5〕	62 〔7/5〕	ND	ND	ND	2.6 〔10/28〕	ND	ND	ND	ND	ND
	Co-60 (Approx. 5 years)	ND	ND	ND	0.50 〔7/19〕	ND	3.1 〔7/8〕	ND	ND	ND	0.44 〔10/28〕	ND	ND	0.51 〔10/24〕	0.64 〔10/28〕	ND
	Sb-125 (Approx. 3 years)	ND	ND	ND	1.7 〔7/11〕	ND	250 〔7/15〕	1.4 〔7/12〕〔8/26〕	ND	12 〔8/8〕	ND	ND	ND	61	4.5 〔10/28〕	ND
All β		300 〔8/22〕	〔3/27〕 〔10/13〕	ND	1,900 〔5/24〕	4,400 〔7/8〕	900,000 〔7/5〕〔7/9〕	160,000 〔8/12〕〔8/15〕	380 〔8/19〕	56,000 〔8/5〕	11,000 〔10/28〕	600 〔9/8〕	72 〔10/3〕	730 〔10/21〕	880,000 〔10/14〕	700,000 〔9/23〕
H-3 (Approx. 12 years)		45,000 〔8/29〕	ND	13000 〔10/27〕	500,000 〔5/24〕〔6/7〕	630,000 〔7/8〕	57,000 〔10/3〕	290,000 〔7/12〕	98,000 〔7/11〕	72,000 〔8/15〕	2500 〔10/14〕	770 〔10/1〕	85,000 〔9/13〕	390,000 〔10/24〕	43,000 〔9/26〕	460,000 〔8/19〕
Sr-90(Approx. 29 years)		Under analysis	Under analysis	Under analysis	1,200 〔6/7〕	Under analysis	Under analysis	Under analysis	Under analysis	Under analysis	Under analysis	Under analysis	Under analysis	Under analysis 〔10/21〕	Under analysis	-

Unit: Bq/L

		Groundwater observation hole No.2	Groundwater observation hole No.2-1	Groundwater observation hole No.2-5*1	Groundwater observation hole No.2-6	Groundwater observation hole No.3	Groundwater observation hole No.3-1	Groundwater observation hole No.3-4
Cs-134 (Approx. 2 years)		0.50 〔7/9〕	0.66 〔9/1〕	3.7 〔9/29〕	0.56 〔10/30〕	3.5 〔7/25〕	1.2 〔7/25〕〔8/8〕	1.8 〔10/30〕
Cs-137 (Approx.30 years)		1.2 〔7/11〕〔8/1〕	1.1 〔8/29〕〔9/1〕	10 〔9/29〕	0.6 〔10/13〕	5.9 〔8/8〕	2.6 〔8/1〕	3.8 〔10/30〕
The other γ	Ru-106 (Approx. 370 days)	ND	ND	ND	ND	ND	ND	ND
	Mn-54 (Approx. 310 days)	ND	ND	0.77 〔9/29〕	ND	ND	ND	0.54 〔10/30〕
	Co-60 (Approx. 5 years)	ND	ND	ND	ND	ND	ND	ND
	Sb-125 (Approx. 3 years)	ND	ND	26 〔9/29〕	ND	1.1 〔9/5〕	ND	ND
All β		1,700 〔7/8〕	380 〔7/29〕	46,000 〔9/29〕	1,100 〔10/30〕	1,400 〔7/11〕	180 〔8/1〕	ND
H-3 (Approx. 12 years)		850 〔6/26〕	440 〔8/26〕	1,500 〔9/29〕	1,100 〔10/13〕〔10/17〕	3,200 〔2012/12/12〕	460 〔8/1〕	170 〔9/18〕
Sr-90(Approx. 29 years)		54 〔5/31〕	Under analysis	Under analysis	Under analysis	8.3 〔2012/12/12〕	Under analysis	Under analysis

*1 Although we previously announced the analysis result of γ and all β on September 29, we have reanalyze the sample.
The analysis result of No.2-5 is the reference value, since we could not sample groundwater by a regular procedure.
* "ND" indicates that the measurement result is below the detection limit.
* Date of sampling is provided in parentheses.

<Reference> The Highest Dose Until the Previous Measurement* (Seawater)

Unit: Bq/L

	1F, North side of Unit 5,6 discharge channel	1F, In front of Unit 6 water intake channel	1F, In front of shallow draft quay	1F, North side of Unit 1-4 water intake channel	1F, North side of Unit 1-4 water intake channel (north side of East Seawall Break)	1F, Unit 1 Screen (Inside the Silt Fence)	1F, Between the water intake channel of Unit 1 and Unit 2 (surface layer)	1F, Between the water intake channel of Unit 1 and Unit 2 (lower layer)	1F, Unit 2 Screen (Inside the Silt Fence)	1F, Between the water intake channel of Unit 2 and Unit 3 (surface layer)	1F, Between the water intake channel of Unit 2 and Unit 3 (lower layer)	1F, Unit 3 Screen (Inside the Silt Fence)
Cs-134(Approx. 2 years)	1.8 〔6/21〕	2.4 〔8/19〕	5.3 〔8/5〕	59 〔10/13〕	32 〔10/11〕	73 〔10/10〕	87 〔10/10〕	93 〔10/10〕	370 〔10/9〕	46 〔10/11〕	3.5 〔8/20〕	350 〔7/15〕
Cs-137(Approx.30 years)	3.3 〔6/26〕	4.7 〔8/19〕	8.6 〔8/5〕	140 〔10/13〕	73 〔10/11〕	170 〔10/10〕	200 〔10/10〕	200 〔10/10〕	830 〔10/9〕	110 〔10/11〕	9.8 〔8/20〕	770 〔7/15〕
All β	ND	46 〔8/19〕	40 〔7/3〕	1,100 〔8/15〕	320 〔8/12〕	710 〔10/10〕	740 〔8/15〕〔10/13〕	450 〔7/16〕	1700 〔10/9〕	480 〔10/7〕	85 〔8/20〕	1,000 〔7/15〕
H-3 (Approx. 12 years)	8.6 〔6/26〕	24 〔8/19〕	340 〔6/26〕	4,700 〔8/15〕	460 〔7/15〕	2,500 〔8/12〕	2,600 〔8/15〕〔10/13〕	1,600 〔9/1〕	1,900 〔10/9〕	1,200 〔10/7〕	-	410 〔9/2〕
Sr-90 (Approx. 29 years)	5.8 〔6/26〕	-	7.4 〔6/26〕	Under analysis	Under analysis	Under analysis	Under analysis	Under analysis	Under analysis	Under analysis	-	Under analysis

Unit: Bq/L

	1F, Between the water intake channel of Unit 3 and Unit 4 (surface layer)	1F, Between the water intake channel of Unit 3 and Unit 4 (lower layer)	1F, Unit 4 Screen (Inside the Silt Fence)	1F, Around the south discharge channel	1F, Port entrance	1F, East side in the port	1F, West side in the port	1F, North side in the port	1F, South side in the port	North side of the north breakwater	East side of the port entrance	South side of the south breakwater
Cs-134(Approx. 2 years)	22 〔8/12〕	4.8 〔8/20〕	62 〔9/16〕	ND	2.7 〔10/11〕	3.3 〔10/17〕	2.6 〔8/19〕	2.5 〔10/17〕	3.5 〔10/17〕	ND	ND	ND
Cs-137(Approx.30 years)	45 〔8/12〕	7.7 〔8/20〕	140 〔9/16〕	3.0 〔7/15〕	7.3 〔10/11〕	9.0 〔10/17〕	6.5 〔8/19〕	5.8 〔10/17〕	7.8 〔10/17〕	ND	1.6 〔10/18〕	ND
All β	390 〔8/12〕	57 〔8/20〕	360 〔10/7〕	ND	69 〔8/19〕	74 〔8/19〕	60 〔7/4〕	69 〔8/19〕	79 〔8/19〕	ND	ND	ND
H-3 (Approx. 12 years)	650 〔8/12〕	-	400 〔8/12〕〔10/7〕	ND	68 〔8/19〕	67 〔8/19〕	59 〔8/19〕	52 〔8/19〕	60 〔8/19〕	4.7 〔8/14〕	6.4 〔10/8〕	ND
Sr-90 (Approx. 29 years)	Under analysis	-	Under analysis	0.36 〔6/26〕	3.5 〔6/20〕	Under analysis	Under analysis	-	-	-	-	-

* The highest result announced in "Detailed Analysis Results in the Port of Fukushima Daiichi NPS, around Discharge Channel and Bank Protection" or the other handouts is provided.
  As for "1F, North side of Unit 1-4 water intake channel", the data is obtained since January 14, 2013. For the other locations, the data is obtained since June 14.
* "ND" indicates that the measurement result is below the detection limit.
* Date of sampling is provided in parentheses.
* "-" indicates that the measurement was out of range.

[Reference] Standard values

Unit: Bq/L

	Cs-134	Cs-137	H-3	Sr-90
Density Limit Specified by the Rule for the Installation, Operation, etc. of Commercial Nuclear Power Reactors (the density limit in the water outside the surrounding monitored areas is provided in section 6 of Appendix 2)	60	90	60,000	30
WHO Guidelines for drinking-water quality	10	10	10,000	10