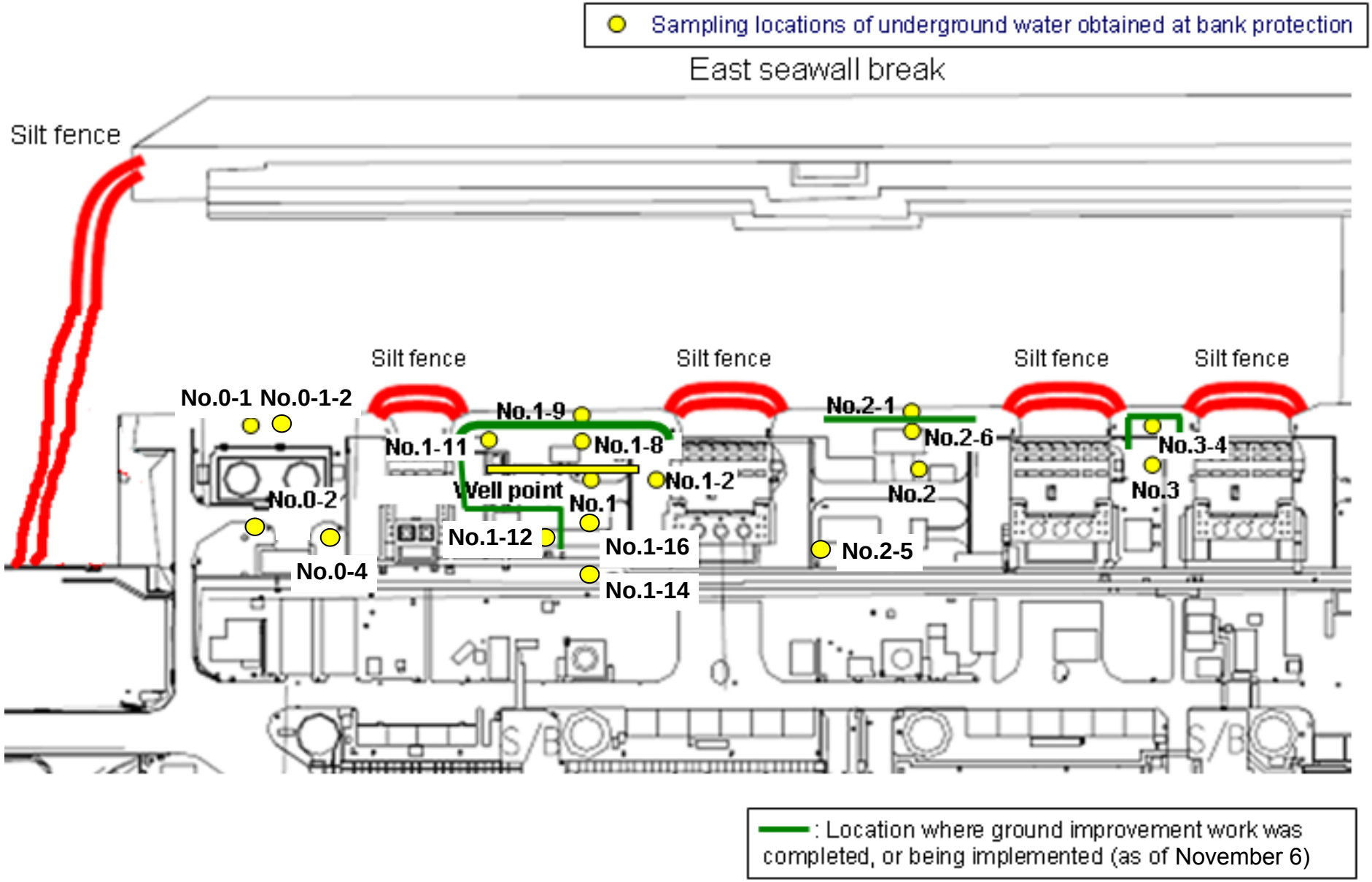
<Reference>
November 16, 2013
Tokyo Electric Power Company

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.0-1-2	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.1-14	Underground water observation hole No.1-16	Groundwater pumped up from the well point
Date of sampling		Nov 10, 2013		Nov 10, 2013	Nov 10, 2013	Nov 11, 2013		Nov 11, 2013	Nov 12, 2013	Nov 11, 2013	Nov 11, 2013		Nov 11, 2013	Nov 11, 2013
Time of sampling		10:04 AM		11:03 AM	12:10 PM	10:02 AM		9:10 AM	6:31 AM	9:36 AM	9:11 AM		9:35 AM	9:10 AM
Chloride (unit: ppm)		-		-	-	-		-	350	-	-		-	-
Cs-134 (Approx. 2 years)		6.3		0.46	ND(0.44)	ND(0.36)		31	12	0.75	9.0		ND(1.4)	ND(1.1)
Cs-137 (Approx.30 years)		14		0.80	0.5	0.66		69	31	2.0	21		2.0	1.3
The other γ	Mn-54 (Approx. 310 days)	ND		ND	ND	ND		3.6	ND	ND	ND		ND	ND
	Co-60 (Approx. 5 years)	ND		ND	ND	ND		ND	ND	ND	ND		0.53	ND
	Ru-106 (Approx. 370 days)	ND		ND	ND	ND		ND	ND	ND	ND		ND	8.7
	Sb-125 (Approx. 3 years)	ND		ND	ND	ND		ND	ND	ND	ND		7.5	ND
All β		80		ND(17)	ND(17)	440		11,000	94	42	160		650,000	240,000
H-3 (Approx. 12 years)		31,000		ND(110)	19,000	220,000		2,700	810	17,000	390,000		20,000	96,000
Sr-90 (Approx. 29 years)		-		-	-	Under analysis		Under analysis	-	Under analysis	Under analysis		Under analysis	-

		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 November 11, 12 and 13.
* "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

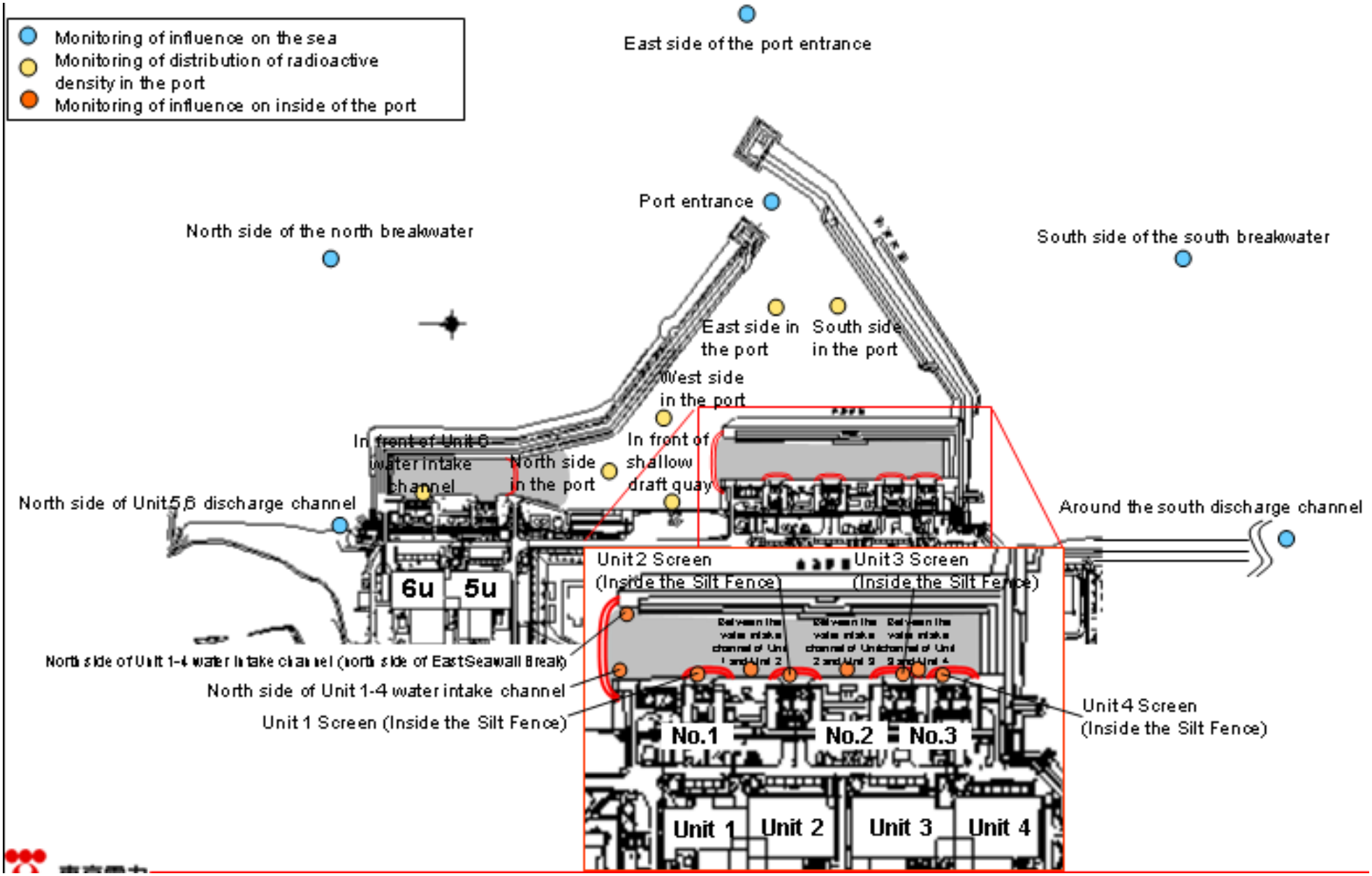
Unit: Bq/L (exclude chloride)

		Underground water observation hole No.0-1	Underground water observation hole No.0-1-2	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.1-14	Underground water observation hole No.1-16	Groundwater pumped up from the well point
Date of sampling						Nov 14, 2013			Nov 14, 2013	Nov 14, 2013	Nov 14, 2013	Nov 14, 2013	Nov 14, 2013	
Time of sampling						10:45 AM			6:27 AM	10:28 AM	9:35 AM	10:15 AM	9:55 AM	
Chloride (unit: ppm)						-			350	-	-	-	-	
Cs-134 (Approx. 2 years)						ND(0.48)			3.4	0.56	7.9	1.2	1.6	
Cs-137 (Approx.30 years)						0.54			8.8	1.3	19	1.8	1.7	
The other γ	Co-60 (Approx. 5 years)					ND			ND	ND	ND	ND	0.52	
	Ru-106 (Approx. 370 days)					3.9			ND	ND	ND	ND	9.1	
	Sb-125 (Approx. 3 years)					ND			ND	ND	ND	ND	6.1	
All β						490			76	18	110	22	660,000	
H-3 (Approx. 12 years)						Under analysis			Under analysis	Under analysis	Under analysis	Under analysis	Under analysis	
Sr-90 (Approx. 29 years)						-			Under analysis	-	-	-	-	

		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	Nov 11, 2013	Nov 11, 2013	Nov 11, 2013	Nov 12, 2013	Nov 11, 2013	Nov 11, 2013	Nov 12, 2013	Nov 12, 2013	Nov 11, 2013	Nov 11, 2013	Nov 11, 2013		
Time of sampling	6:05 AM	6:20 AM	5:38 AM	6:19 AM	6:15 AM	5:49 AM	6:32 AM	6:32 AM	5:55 AM	6:00 AM	6:06 AM		
Cs-134(Approx. 2 years)	ND(1.2)	ND(2.0)	2.6	18	9.0	12	22	16	23	9.9	17	60	10
Cs-137(Approx.30 years)	ND(1.2)	ND(2.0)	7.1	40	15	36	46	39	47	28	44	90	10
All β	ND(17)	ND(18)	29	760	72	420	500	210	370	200	86		
H-3 (Approx. 12 years)	ND(1.9)	3.5	8.3	2,900	170	1,400	1,600	650	1,400	430	120	60,000	10,000
Sr-90 (Approx. 29 years)	Under analysis	-	Under analysis	-	Under analysis	Under analysis	-	-	Under analysis	Under analysis	Under analysis	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	Nov 11, 2013	Nov 11, 2013	Nov 11, 2013										
Time of sampling	6:04 AM	6:10 AM	5:15 AM										
Cs-134(Approx. 2 years)	11	20	ND(0.83)									60	10
Cs-137(Approx.30 years)	20	50	ND(1.3)									90	10
All β	150	97	ND(17)										
H-3 (Approx. 12 years)	280	150	ND(1.9)									60,000	10,000
Sr-90 (Approx. 29 years)	Under analysis	Under analysis	Under analysis									30	10

* Data announced this time is provided in a thick-frame. The other data was announced on November 12 and 13.

* "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)	1F, Between the water intake channel of Unit 3 and Unit 4	Density Limit Specified by the Reactor Regulation *	WHO Guidelines for drinking-water quality
Date of Sampling				Nov 14, 2013			Nov 14, 2013	Nov 14, 2013						
Time of sampling				6:17 AM			6:25 AM	6:25 AM						
Cs-134(Approx. 2 years)				22			21	19					60	10
Cs-137(Approx.30 years)				51			53	47					90	10
All β				680			670	250						
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, 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	Northeast side of the port entrance	East side of the port entrance	Southeast 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								Nov 13, 2013	Nov 13, 2013	Nov 13, 2013	Nov 13, 2013	Nov 13, 2013		
Time of sampling								10:33 AM	10:28 AM	10:40 AM	10:51 AM	10:46 AM		
Cs-134(Approx. 2 years)								ND(0.73)	ND(0.76)	ND(0.52)	ND(0.63)	ND(0.71)	60	10
Cs-137(Approx.30 years)								ND(0.64)	ND(0.76)	ND(0.64)	ND(0.76)	ND(0.58)	90	10
All β								ND(17)	ND(17)	ND(17)	ND(17)	ND(17)		
H-3 (Approx. 12 years)								Under analysis	Under analysis	Under analysis	Under analysis	Under analysis	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.0-1-2	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
Cs-134 (Approx. 2 years)		6.3 〔11/10〕	ND	0.61 〔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〕
Cs-137 (Approx.30 years)		14 〔11/10〕	ND	1.6 〔10/13〕	0.48 〔11/10〕	31 〔8/29〕	3.6 〔7/8〕	22,000 〔7/9〕	24 〔9/2〕	3.6 〔7/8〕	650 〔8/5〕	95 〔10/28〕	380 〔9/3〕
The other γ	Ru-106 (Approx. 370 days)	ND	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
	Mn-54 (Approx. 310 days)	ND	ND	ND	ND	ND	1.0 〔7/5〕	62 〔7/5〕	ND	ND	ND	3.6 〔11/11〕	ND
	Co-60 (Approx. 5 years)	ND	ND	ND	ND	0.50 〔7/19〕	ND	3.1 〔7/8〕	ND	ND	ND	0.44 〔10/28〕	ND
	Sb-125 (Approx. 3 years)	ND	ND	ND	ND	1.7 〔7/11〕	ND	250 〔7/15〕	1.4 〔7/12〕〔8/26〕	ND	12 〔8/8〕	ND	ND
All β		300 〔8/22〕	21 〔11/10〕	87 〔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〕〔11/11〕	600 〔9/8〕
H-3 (Approx. 12 years)		45,000 〔8/29〕	36,000 〔11/10〕	ND	17,000 〔11/3〕	500,000 〔5/24〕〔6/7〕	630,000 〔7/8〕	430,000 〔9/16〕	290,000 〔7/12〕	98,000 〔7/11〕	72,000 〔8/15〕	2,500 〔10/14〕	770 〔10/1〕
Sr-90(Approx. 29 years)		Under analysis	Under analysis	Under analysis	Under analysis	1,200 〔6/7〕	Under analysis	Under analysis	Under analysis	Under analysis	Under analysis	Under analysis	Under analysis

Unit: Bq/L

		Groundwater observation hole No.1-11	Groundwater observation hole No.1-12	Groundwater observation hole No.1-14	Groundwater observation hole No.1-16	Groundwater pumped up from the well point (notch tank)
Cs-134 (Approx. 2 years)		0.94 〔10/31〕	74 〔10/21〕	0.84 〔11/10〕	1.5 〔10/3〕	110 〔9/23〕
Cs-137 (Approx.30 years)		2.0 〔10/10〕〔11/11〕	170 〔10/21〕	2.0 〔11/10〕	3.4 〔10/10〕	250 〔9/23〕
The other γ	Ru-106 (Approx. 370 days)	ND	5.4 〔10/28〕	ND	9.2 〔10/28〕	25 〔9/2〕
	Mn-54 (Approx. 310 days)	ND	ND	ND	ND	ND
	Co-60 (Approx. 5 years)	ND	0.51 〔10/24〕	ND	0.9 〔11/7〕	ND
	Sb-125 (Approx. 3 years)	ND	61 〔10/21〕	ND	7.5 〔11/11〕	ND
All β		72 〔10/3〕	730 〔10/21〕	33 〔11/10〕	880,000 〔10/14〕	700,000 〔9/23〕
H-3 (Approx. 12 years)		85,000 〔9/13〕	440,000 〔10/31〕	2,600 〔11/10〕	43,000 〔9/26〕	460,000 〔8/19〕
Sr-90(Approx. 29 years)		Under analysis	Under analysis 〔10/21〕	Under analysis	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〕	3.9 〔11/7〕	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〕	0.61 〔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〕	2,000 〔11/13〕	1,400 〔7/11〕	180 〔8/1〕	ND
H-3 (Approx. 12 years)		850 〔6/26〕	440 〔8/26〕	3,100 〔11/7〕	1,100 〔10/13〕〔10/17〕〔11/6〕〔11/10〕	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)	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)
Cs-134(Approx. 2 years)	1.8 (6/21)	2.4 (8/19)	5.3 (8/5)	89 (10/10)	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)	28 (9/16)	4.8 (8/20)	62 (9/16)
Cs-137(Approx.30 years)	3.3 (6/26)	4.7 (8/19)	8.6 (8/5)	190 (10/10)	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)	50 (9/16)	7.7 (8/20)	140 (9/16)
All β	ND	46 (8/19)	40 (7/3)	1,400 (11/7)	320 (8/12)	740 (10/28)	740 (8/15) (10/13) (10/31)	450 (7/16)	1,700 (10/9)	480 (10/7)	85 (8/20)	1,000 (7/15)	390 (8/12)	57 (8/20)	360 (10/7)
H-3 (Approx. 12 years)	8.6 (6/26)	24 (8/19)	340 (6/26)	4,800 (11/7)	510 (9/2)	2,800 (10/28)	2,700 (11/7)	1,600 (9/1)	2,100 (10/28)	1,200 (10/7)	-	410 (9/2)	650 (8/12)	-	400 (8/12) (10/7)
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	Under analysis	-	Under analysis

Unit: Bq/L

	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	Northeast side of the port entrance	East side of the south breakwater	Southeast side of the north breakwater	South side of the south breakwater
Cs-134(Approx. 2 years)	ND	2.7 (10/11)	3.3 (10/17)	2.6 (8/19)	2.5 (10/17)	3.5 (10/17)	ND	ND	ND	ND	ND
Cs-137(Approx.30 years)	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	ND	1.6 (10/18)	ND	ND
All β	ND	69 (8/19)	74 (8/19)	60 (7/4)	69 (8/19)	79 (8/19)	ND	ND	ND	ND	ND
H-3 (Approx. 12 years)	ND	68 (8/19)	67 (8/19)	59 (8/19)	52 (8/19)	60 (8/19)	4.7 (8/14)	ND	6.4 (10/8)	ND	ND
Sr-90 (Approx. 29 years)	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.

● The underlined part was corrected on January 10, 2014.

[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