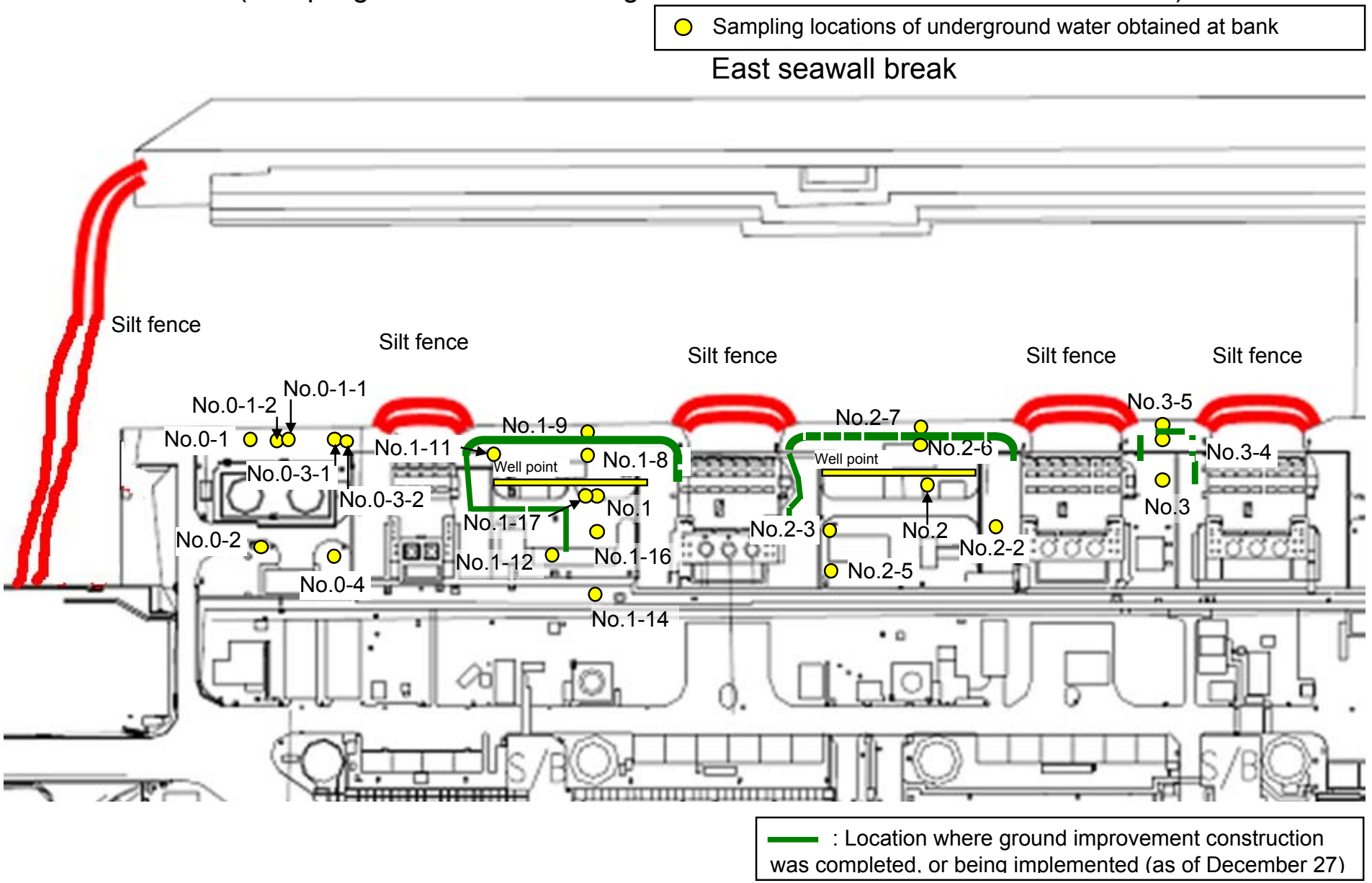
<Reference>
December 31, 2013
Tokyo Electric Power Company

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 (1/3)
Underground Water Obtained at Bank Protection

Unit: Bq/L (exclude chloride)

		Underground water observation hole No.0-1	Underground water observation hole No.0-1-1	Underground water observation hole No.0-1-2	Underground water observation hole No.0-2	Underground water observation hole No.0-3-1	Underground water observation hole No.0-3-2	Underground water observation hole No.0-4	Underground water observation hole No.1	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
Date of sampling									Dec 26, 2013			Dec 26, 2013	Dec 26, 2013	Dec 26, 2013	Dec 26, 2013
Time of sampling									9:48 AM			11:12 AM	10:35 AM	10:10 AM	10:55 AM
Chloride (unit: ppm)									-			-	-	-	-
Cs-134 (Approx. 2 years)									ND(0.47)			0.72	4.9	-	ND(2.5)
Cs-137 (Approx.30 years)									1.4			1.4	11	-	2.4
The other γ	Sb-125 (Approx. 3 years)								ND			ND	ND	-	7.7
Gross β									530			2,300	57	250	2,100,000
H-3 (Approx. 12 years)									210,000			20,000	55,000	6,500	20,000
Sr-90 (Approx. 29 years)									-			-	-	-	-

		Underground water observation hole No.1-17	Groundwater pumped up from the well point (between Unit 1 and 2)	Underground water observation hole No.2	Underground water observation hole No.2-2	Underground water observation hole No.2-3	Underground water observation hole No.2-5	Underground water observation hole No.2-6	Underground water observation hole No.2-7	Groundwater pumped up from the well point (between Unit 2 and 3)	Underground water observation hole No.3	Underground water observation hole No.3-4	Underground water observation hole No.3-5
Date of sampling		Dec 26, 2013											
Time of sampling		10:06 AM											
Chloride (unit: ppm)		-											
Cs-134 (Approx. 2 years)		ND(0.54)											
Cs-137 (Approx.30 years)		0.58											
The other γ	Sb-125 (Approx. 3 years)	1.7											
Gross β		44											
H-3 (Approx. 12 years)		21,000											
Sr-90 (Approx. 29 years)		-											

* Data announced this time is provided in a thick-frame. The other data was announced on December 27.
* "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.
* The results obtained in the observation hole No.1-14 are just for reference, since the water was highly turbid.

Detailed Analysis Results in the Port of Fukushima Daiichi NPS, around Discharge Channel and Bank Protection (2/3)
Underground Water Obtained at Bank Protection

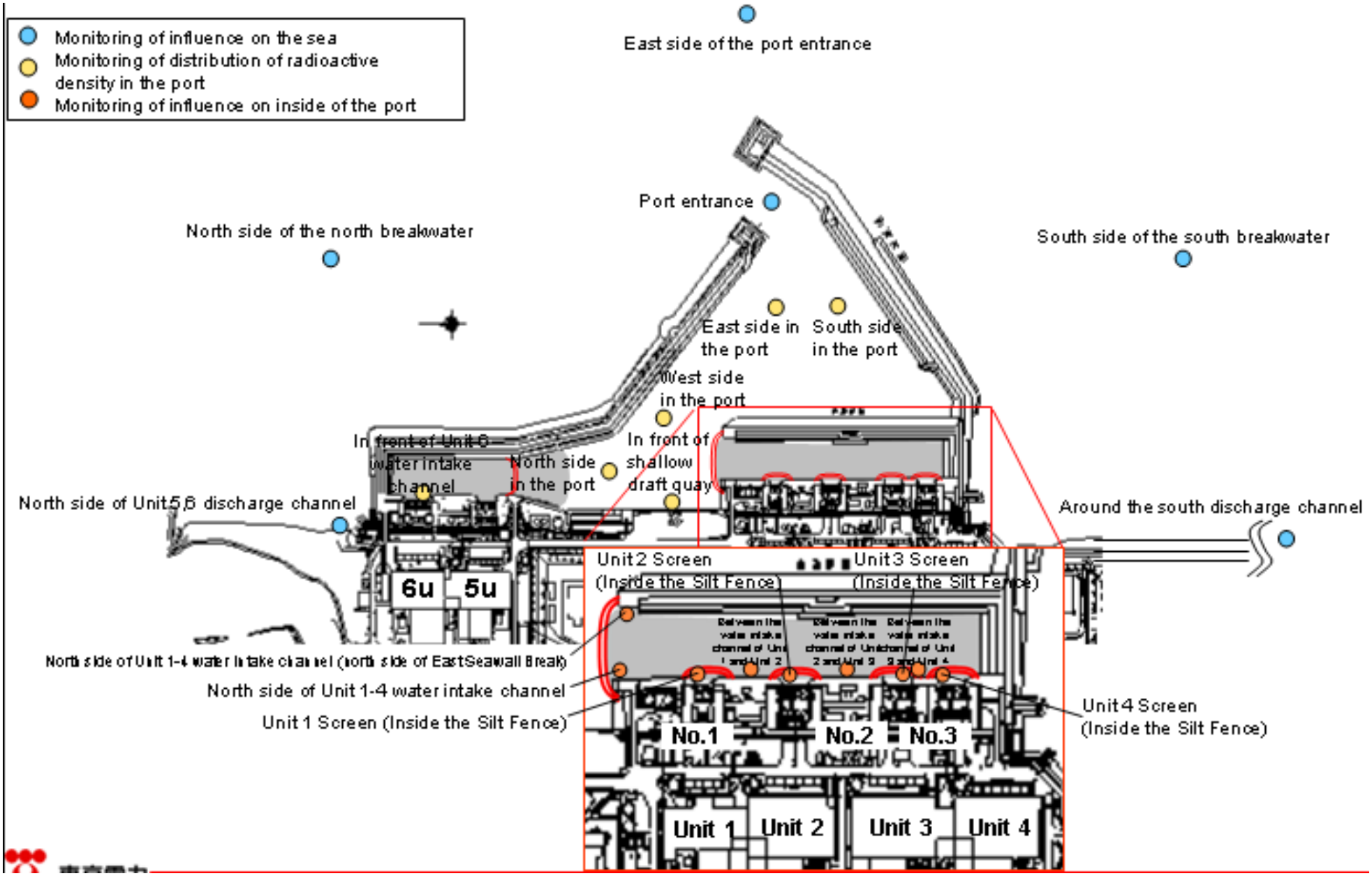
Unit: Bq/L (exclude chloride)

		Underground water observation hole No.0-1	Underground water observation hole No.0-1-1	Underground water observation hole No.0-1-2	Underground water observation hole No.0-2	Underground water observation hole No.0-3-1	Underground water observation hole No.0-3-2	Underground water observation hole No.0-4	Underground water observation hole No.1	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
Date of sampling									Dec 30, 2013	Dec 30, 2013		Dec 30, 2013	Dec 30, 2013	Dec 30, 2013	Dec 30, 2013
Time of sampling									10:13 AM	10:36 AM		10:13 AM	9:10 AM	9:35 AM	9:27 AM
Chloride (unit: ppm)									–	–		–	–	–	–
Cs-134 (Approx. 2 years)									ND(0.49)	29		0.56	4.9	1:55 PM	ND(2.9)
Cs-137 (Approx.30 years)									ND(0.53)	67		1.3	12	9:36 AM	ND(1.6)
The other γ	Ru-106 (Approx. 370 days)								4.7	ND		ND	ND	ND	ND
	Mn-54 (Approx. 310 days)								ND	6.3		ND	ND	ND	ND
Gross β									560	26,000		35	130	290	2,100,000
H-3 (Approx. 12 years)									Under analysis	Under analysis		Under analysis	Under analysis	Under analysis	Under analysis
Sr-90 (Approx. 29 years)									-	-		-	-	-	-

		Underground water observation hole No.1-17	Groundwater pumped up from the well point (between Unit 1 and 2)	Underground water observation hole No.2	Underground water observation hole No.2-2	Underground water observation hole No.2-3	Underground water observation hole No.2-5	Underground water observation hole No.2-6	Underground water observation hole No.2-7	Groundwater pumped up from the well point (between Unit 2 and 3)	Underground water observation hole No.3	Underground water observation hole No.3-4	Underground water observation hole No.3-5
Date of sampling		Dec 30, 2013	Dec 30, 2013										
Time of sampling		10:33 AM	10:00 AM										
Chloride (unit: ppm)		-	-										
Cs-134 (Approx. 2 years)		ND(0.43)	ND(0.95)										
Cs-137 (Approx.30 years)		ND(0.51)	1.2										
The other γ	Ru-106 (Approx. 370 days)	3.2	9.3										
	Co-60 (Approx. 5 years)	0.59	ND										
	Mn-54 (Approx. 310 days)	ND	0.83										
Gross β		72	240,000										
H-3 (Approx. 12 years)		Under analysis	Under analysis										
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 (3/3)
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	Dec 30, 2013	Dec 30, 2013	Dec 30, 2013		Dec 30, 2013	Dec 30, 2013			Dec 30, 2013	Dec 30, 2013	Dec 30, 2013	Dec 30, 2013		
Time of sampling	6:45 AM	7:00 AM	6:25 AM		6:52 AM	6:33 AM			6:37 AM	6:39 AM	6:42 AM	6:46 AM		
Cs-134(Approx. 2 years)	ND(0.70)	ND(1.8)	ND(2.3)		8.2	27			28	24	19	13	60	10
Cs-137(Approx.30 years)	0.82	2.9	4.9		19	58			76	56	52	33	90	10
Gross β	12	ND(22)	ND(22)		72	370			360	310	150	130		
H-3 (Approx. 12 years)	Under analysis	Under analysis	Under analysis		Under analysis	Under analysis			Under analysis	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	Dec 30, 2013	Dec 30, 2013						Dec 29, 2013	Dec 29, 2013	Dec 29, 2013	Dec 29, 2013	Dec 29, 2013		
Time of sampling	6:45 AM	6:00 AM						10:06 AM	10:03 AM	9:56 AM	9:43 AM	9:51 AM		
Cs-134(Approx. 2 years)	9.7	ND(0.77)						ND(0.54)	ND(0.77)	ND(0.77)	ND(0.67)	ND(0.75)	60	10
Cs-137(Approx.30 years)	31	ND(0.55)						ND(0.72)	ND(0.67)	ND(0.67)	ND(0.80)	ND(0.72)	90	10
Gross β	130	13						ND(15)	ND(15)	ND(15)	ND(15)	ND(15)		
H-3 (Approx. 12 years)	Under analysis	Under analysis						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.0-1-1	Groundwater observation hole No.0-1-2	Groundwater observation hole No.0-2	Groundwater observation hole No.0-3-1	Groundwater observation hole No.0-3-2	Groundwater observation hole No.0-4	Groundwater observation hole No.1	Groundwater observation hole No.1-1[*1]	Groundwater observation hole No.1-2[*1]	Groundwater observation hole No.1-3[*1]	Groundwater observation hole No.1-4[*1]	Groundwater observation hole No.1-5[*1]
Cs-134 (Approx. 2 years)		7.6 〔12/15〕	ND	ND	0.61 〔10/13〕	0.44 〔11/24〕	0.41 〔12/26〕	ND	13 〔8/29〕	1.9 〔7/8〕	11,000 〔7/9〕	10 〔9/2〕	1.5 〔7/8〕	310 〔8/5〕
Cs-137 (Approx.30 years)		17 〔12/15〕〔12/29〕	0.58 〔12/7〕	0.51 〔11/17〕	1.6 〔10/13〕	0.86 〔11/20〕	0.91 〔12/26〕	0.49 〔12/1〕	31 〔8/29〕	3.6 〔7/8〕	22,000 〔7/9〕	24 〔9/2〕	3.6 〔7/8〕	650 〔8/5〕
The other γ	Ru-106 (Approx. 370 days)	ND	ND	ND	ND	ND	ND	ND	26 〔5/24〕	7.9 〔7/8〕	160 〔8/15〕	17 〔7/22〕〔8/8〕	3.1 〔8/8〕	ND
	Mn-54 (Approx. 310 days)	ND	ND	ND	ND	ND	ND	ND	ND	1.0 〔7/5〕	62 〔7/5〕	ND	ND	ND
	Co-60 (Approx. 5 years)	ND	ND	ND	ND	ND	ND	ND	0.50 〔7/19〕	ND	3.1 〔7/8〕	ND	ND	ND
	Sb-125 (Approx. 3 years)	ND	ND	ND	ND	ND	ND	ND	1.7 〔7/11〕	ND	250 〔7/15〕	1.4 〔7/12〕〔8/26〕	ND	12 〔8/8〕
Gross β		300 〔8/22〕	21 〔12/7〕	21 〔11/10〕	87 〔10/13〕	ND	67[*2] 〔12/11〕	29 〔12/29〕	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〕
H-3 (Approx. 12 years)		45,000 〔8/29〕	18,000 〔12/7〕	74,000 〔12/15〕	3,100 〔12/22〕	ND	69,000 〔12/17〕[*2] 〔12/19〕[*2] 〔12/26〕	20,000 〔12/1〕〔12/8〕〔12/15〕	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〕
Sr-90(Approx. 29 years)		Under analysis	Under analysis	Under analysis	Under analysis	Under analysis	Under analysis	Under analysis	1,200 〔6/7〕	Under analysis	Under analysis	Under analysis	Under analysis	Under analysis

Unit: Bq/L

		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.1-14	Groundwater observation hole No.1-16	Groundwater observation hole No.1-17	Groundwater pumped up from the well point (between Unit 1 and 2)
Cs-134 (Approx. 2 years)		47 〔11/25〕	170 〔9/3〕	0.94 〔10/31〕	74 〔10/21〕	1.2 〔11/14〕	3.1[*2] 〔12/13〕	1.2 〔12/5〕	110 〔9/23〕
Cs-137 (Approx.30 years)		110 〔11/25〕	380 〔9/3〕	2.2 〔12/2〕	170 〔10/21〕	2.3 〔11/21〕	3.4 〔10/10〕	0.66 〔12/12〕	250 〔9/23〕
The other γ	Ru-106 (Approx. 370 days)	ND	ND	ND	5.4 〔10/28〕	ND	9.2 〔10/28〕	4.1 〔12/12〕	25 〔9/2〕
	Mn-54 (Approx. 310 days)	9.7 〔12/16〕	ND	ND	ND	ND	ND	ND	ND
	Co-60 (Approx. 5 years)	0.63 〔12/23〕	ND	ND	0.51 〔10/24〕	ND	0.9 〔11/7〕	0.61 〔11/25〕	ND
	Sb-125 (Approx. 3 years)	ND	ND	ND	61 〔10/21〕	ND	11 〔12/5〕	2.1 〔11/25〕	ND
Gross β		31,000 〔12/16〕	2,100 〔11/17〕	2,300 〔12/26〕	730 〔10/21〕	250 〔12/23〕〔12/26〕	2,100,000 〔12/26〕	130 〔12/2〕〔12/23〕	700,000 〔9/23〕
H-3 (Approx. 12 years)		11,000 〔12/23〕	860 〔11/14〕	85,000 〔9/13〕	440,000 〔10/31〕	11,000 〔11/25〕	43,000 〔9/26〕	18,000 〔12/19〕	460,000 〔8/19〕
Sr-90(Approx. 29 years)		Under analysis	Under analysis	Under analysis	Under analysis 〔10/21〕	Under analysis	Under analysis	Under analysis	-

Unit: Bq/L

		Groundwater observation hole No.2	Groundwater observation hole No.2-1[*1]	Groundwater observation hole No.2-2	Groundwater observation hole No.2-3	Groundwater observation hole No.2-5[*1]	Groundwater observation hole No.2-6	Groundwater observation hole No.2-7	Groundwater pumped up from the well point (between Unit 2 and 3)	Groundwater observation hole No.3	Groundwater observation hole No.3-1[*1]	Groundwater observation hole No.3-4	Groundwater observation hole No.3-5
Cs-134 (Approx. 2 years)		0.50 〔7/9〕	0.66 〔9/1〕	11 〔12/25〕	ND	5.2 〔12/4〕	0.56 〔10/30〕	1.3 〔11/21〕	1.1 〔12/12〕	3.5 〔7/25〕	1.2 〔7/25〕〔8/8〕	1.8 〔10/30〕	29 〔12/18〕
Cs-137 (Approx.30 years)		1.2 〔7/11〕〔8/1〕	1.1 〔8/29〕〔9/1〕	26 〔12/25〕	1.2 〔12/25〕	12 〔12/4〕	0.61 〔10/13〕	3.1 〔11/21〕	2.4 〔12/7〕	5.9 〔8/8〕	2.6 〔8/1〕	4.3 〔11/27〕	74 〔12/18〕
The other γ	Ru-106 (Approx. 370 days)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-
	Mn-54 (Approx. 310 days)	ND	ND	ND	0.29 〔12/6〕	0.87 〔12/4〕	ND	ND	ND	ND	ND	0.54 〔10/30〕	-
	Co-60 (Approx. 5 years)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-
	Sb-125 (Approx. 3 years)	ND	ND	ND	ND	26 〔9/29〕	ND	ND	ND	1.5 〔12/25〕	ND	ND	-
Gross β		1,700 〔7/8〕	380 〔7/29〕	530 〔12/29〕	1,500 〔12/6〕	46,000 〔9/29〕	3,200 〔12/5〕	270 〔12/20〕	240,000 〔12/12〕	1,400 〔7/11〕	180 〔8/1〕	ND	43 〔12/18〕
H-3 (Approx. 12 years)		870 〔12/8〕	440 〔8/26〕	560 〔12/25〕	1,700 〔12/6〕	6,300 〔12/4〕	1,200 〔11/24〕〔11/27〕	1,000 〔11/21〕〔12/4〕	5,100 〔12/6〕	3,200 〔2012/12/12〕	460 〔8/1〕	170 〔9/18〕	160 〔12/18〕
Sr-90(Approx. 29 years)		54 〔5/31〕	Under analysis	Under analysis	Under analysis	Under analysis	Under analysis	Under analysis	-	8.3 〔2012/12/12〕	Under analysis	Under analysis	-

*1 The analysis result of No.2-5 obtained on September 29 is the reference value, since we could not sample groundwater by a regular procedure
*2 Analysis result of pumped water.
* "ND" indicates that the measurement result is below the detection limit.
* Date of sampling is provided in parentheses.
* "*" is provided next to the name of the holes where the sampling could not be performed due to the chemical injection of ground improvement.
● The underlined part was corrected on January 10, 2014.

<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		1F, Unit 3 Screen (Inside the Silt Fence)		1F, Between the water intake channel of Unit 3 and Unit 4	
Cs-134(Approx. 2 years)	1.8	(6/21)	2.8	(12/2)	5.3	(8/5)	89	(10/10)	32	(10/11)	73	(10/10)	87	(10/10)	93	(10/10)	370	(10/9)	52	(12/21)	350	(7/15)	28	(9/16)
Cs-137(Approx.30 years)	3.3	(6/26)	5.8	(12/2)	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) (12/21)	770	(7/15)	53	(12/16)
Gross β	12	(12/23)	46	(8/19)	40	(7/3)	1,400	(11/7)	320	(8/12)	740	(10/28)	1,200	(12/8)	450	(7/16)	1,700	(10/9)	480	(10/7)	1,000	(7/15)	390	(8/12)
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)	2,800	(12/8)	1,600	(9/1)	2,100	(10/28)	1,200	(10/7)	410	(9/2)	650	(8/12)
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	

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 south breakwater		Southeast side of the north breakwater	South side of the south breakwater
Cs-134(Approx. 2 years)	62	(9/16)	ND		3.3	(12/24)	3.3	(10/17)	4.4	(12/24)	5.0 (12/2)	3.5	(10/17)	ND		ND	ND		ND	ND
Cs-137(Approx.30 years)	140	(9/16)	3.0	(7/15)	7.3	(10/11)	9.0	(10/17)	10	(12/24)	8.4 (12/2)	7.8	(10/17)	ND		ND	1.6	(10/18)	ND	ND
Gross β	360	(10/7)	13	(12/16)	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)	400	(8/12) (10/7)	1.9	(11/25)	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)	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.

● 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