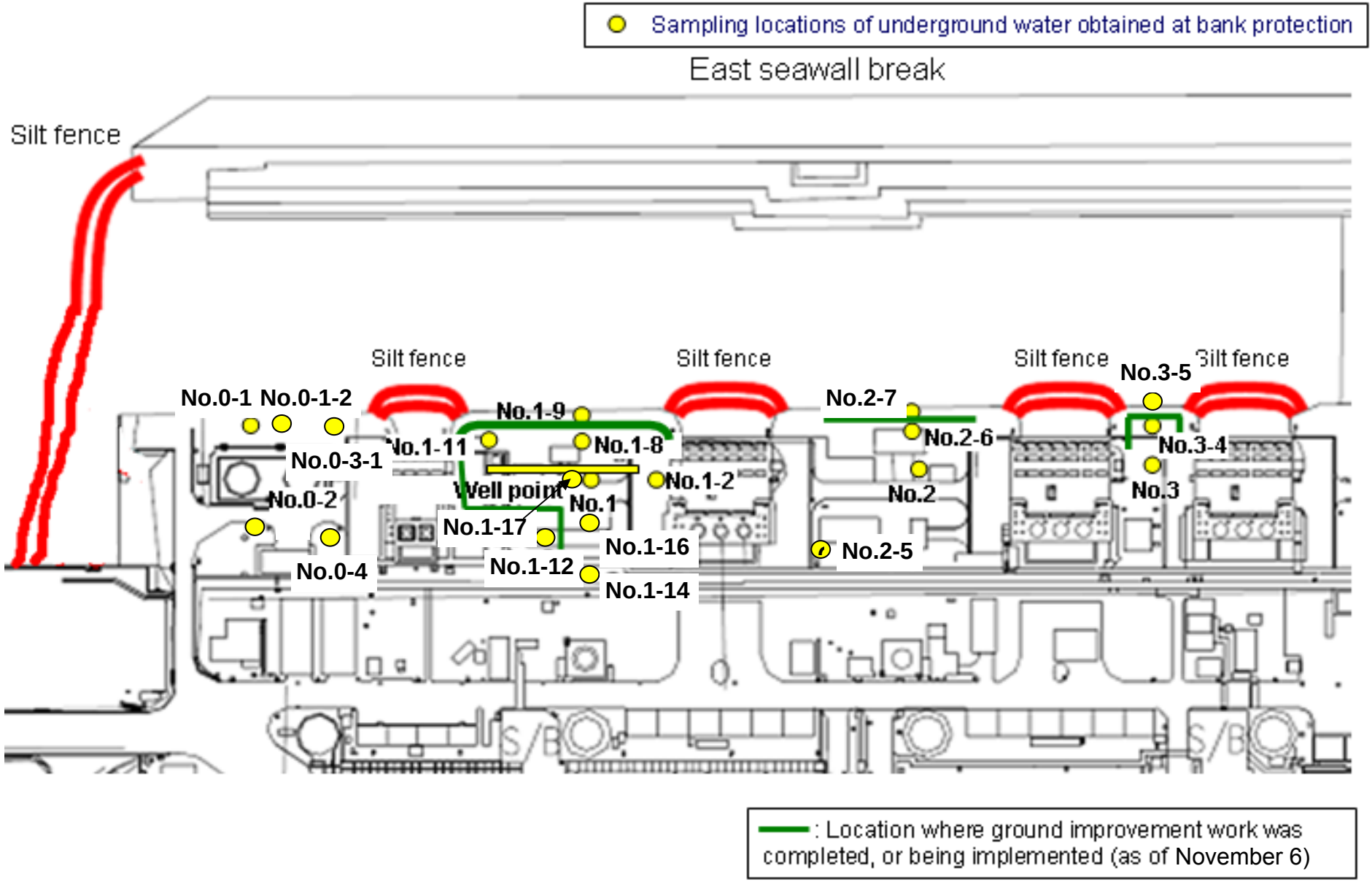
<Reference>
December 4, 2013
Tokyo Electric Power Company

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.0-3-1	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	Underground water observation hole No.1-17
Date of sampling								Dec 1, 2013					
Time of sampling								6:58 AM					
Chloride (unit: ppm)								12:00 AM					
Cs-134 (Approx. 2 years)								3.3					
Cs-137 (Approx.30 years)								7.7					
The other γ													
The other γ													
The other γ													
All β								200					
H-3 (Approx. 12 years)								580					
Sr-90 (Approx. 29 years)								-					

	Groundwater pumped up from the well point	Underground water observation hole No.2	Underground water observation hole No.2-5	Underground water observation hole No.2-6	Underground water observation hole No.2-7	Underground water observation hole No.3	Underground water observation hole No.3-4	Underground water observation hole No.3-5
Date of sampling				Dec 1, 2013				
Time of sampling				9:57 AM				
Chloride (unit: ppm)				-				
Cs-134 (Approx. 2 years)				ND(0.39)				
Cs-137 (Approx.30 years)				ND(0.46)				
The other γ								
The other γ								
The other γ								
All β				2,700				
H-3 (Approx. 12 years)				1,100				
Sr-90 (Approx. 29 years)				-				

* Data announced this time is provided in a thick-frame. The other data was announced on December 2.
* "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

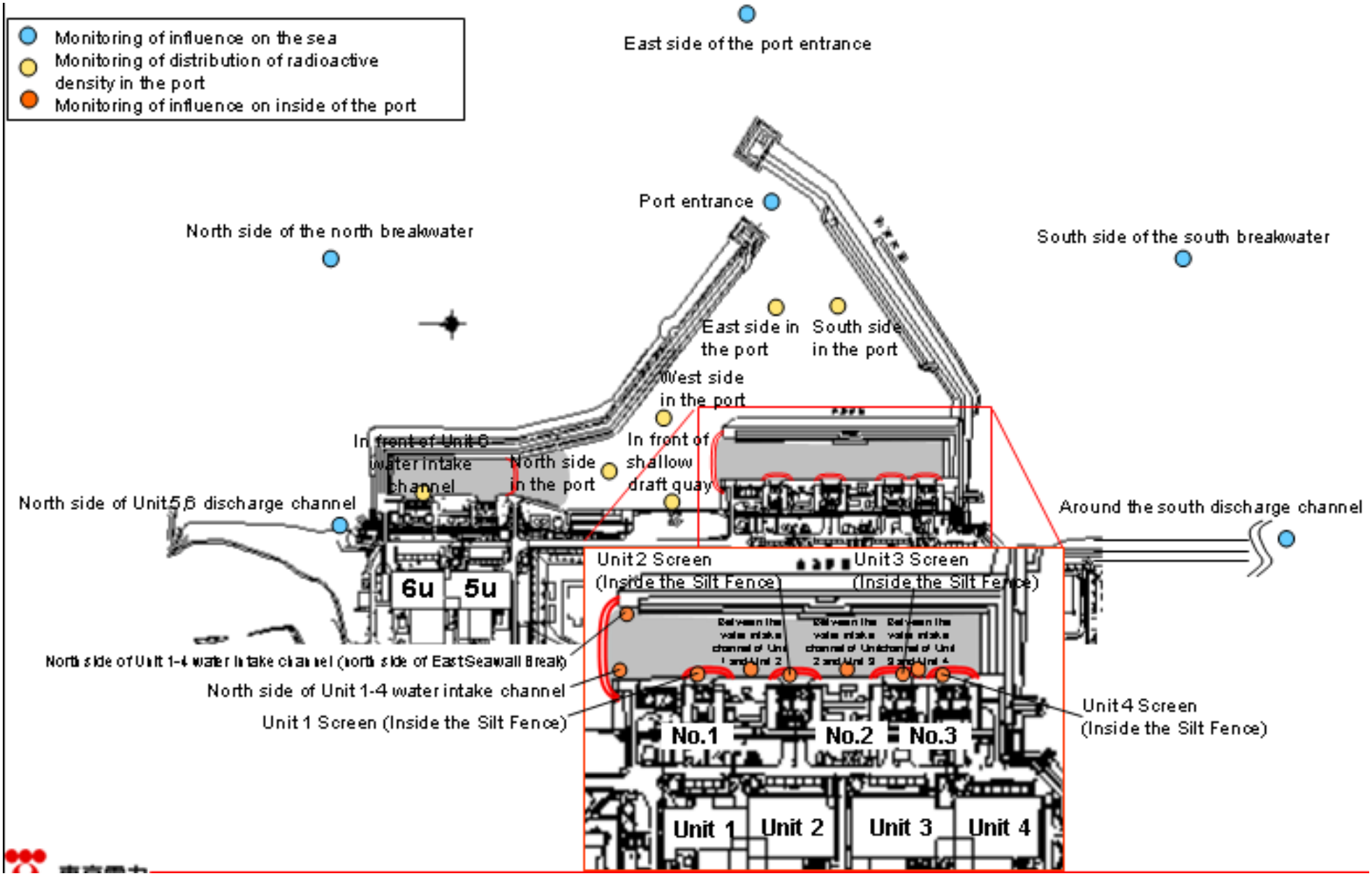
Unit: Bq/L (exclude chloride)

	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.0-3-1	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	Underground water observation hole No.1-17
Date of sampling								Dec 3, 2013					
Time of sampling								7:03 AM					
Chloride (unit: ppm)								380					
Cs-134 (Approx. 2 years)								42					
Cs-137 (Approx.30 years)								110					
The other γ													
The other γ													
The other γ													
All β								160					
H-3 (Approx. 12 years)								Under analysis					
Sr-90 (Approx. 29 years)								-					

	Groundwater pumped up from the well point	Underground water observation hole No.2	Underground water observation hole No.2-5	Underground water observation hole No.2-6	Underground water observation hole No.2-7	Underground water observation hole No.3	Underground water observation hole No.3-4	Underground water observation hole No.3-5
Date of sampling				Dec 3, 2013				
Time of sampling				9:42 AM				
Chloride (unit: ppm)				-				
Cs-134 (Approx. 2 years)				ND(0.41)				
Cs-137 (Approx.30 years)				ND(0.53)				
The other γ								
The other γ								
The other γ								
All β				3,100				
H-3 (Approx. 12 years)				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 (3/4)
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				Dec 1, 2013			Dec 1, 2013	Dec 1, 2013						
Time of sampling				6:48 AM			6:53 AM	6:53 AM						
Cs-134(Approx. 2 years)				22			21	26					60	10
Cs-137(Approx.30 years)				46			58	54					90	10
All β				300			240	220						
H-3 (Approx. 12 years)				690			560	480					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														
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

* Data announced this time is provided in a thick-frame. The other data was announced on December 2.

* "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				Dec 3, 2013			Dec 3, 2013	Dec 3, 2013						
Time of sampling				6:47 AM			6:56 AM	6:56 AM						
Cs-134(Approx. 2 years)				23			27	22					60	10
Cs-137(Approx.30 years)				50			67	52					90	10
All β				570			410	170						
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														
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.0-1-2	Groundwater observation hole No.0-2	Groundwater observation hole No.0-3-1	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
Cs-134 (Approx. 2 years)		6.5 〔12/1〕	ND	0.61 〔10/13〕	0.44 〔11/24〕	ND	13 〔8/29〕	1.9 〔7/8〕	11,000 〔7/9〕	10 〔9/2〕	1.5 〔7/8〕	310 〔8/5〕	47 〔11/25〕
Cs-137 (Approx.30 years)		16 〔12/1〕	0.51 〔11/17〕	1.6 〔10/13〕	0.86 〔11/20〕	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〕	110 〔11/25〕
The other γ	Ru-106 (Approx. 370 days)	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	ND
	Mn-54 (Approx. 310 days)	ND	ND	ND	ND	ND	ND	1.0 〔7/5〕	62 〔7/5〕	ND	ND	ND	7.1 〔11/25〕〔12/2〕
	Co-60 (Approx. 5 years)	ND	ND	ND	ND	ND	0.50 〔7/19〕	ND	3.1 〔7/8〕	ND	ND	ND	0.58 〔11/18〕
	Sb-125 (Approx. 3 years)	ND	ND	ND	ND	ND	1.7 〔7/11〕	ND	250 〔7/15〕	1.4 〔7/12〕〔8/26〕	ND	12 〔8/8〕	ND
All β		300 〔8/22〕	21 〔11/10〕	87 〔10/13〕	ND	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〕	18,000 〔11/25〕
H-3 (Approx. 12 years)		45,000 〔8/29〕	64,000 〔11/24〕	260 〔11/24〕	ND	19,000 〔11/10〕	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〕	6,600 〔11/25〕
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.1-9	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 (notch tank)
Cs-134 (Approx. 2 years)		170 〔9/3〕	0.94 〔10/31〕	74 〔10/21〕	1.2 〔11/14〕	1.6 〔11/14〕	ND	110 〔9/23〕
Cs-137 (Approx.30 years)		380 〔9/3〕	2.2 〔12/2〕	170 〔10/21〕	2.3 〔11/21〕	3.4 〔10/10〕	ND	250 〔9/23〕
The other γ	Ru-106 (Approx. 370 days)	ND	ND	5.4 〔10/28〕	ND	9.2 〔10/28〕	4.0 〔11/22〕〔11/28〕	25 〔9/2〕
	Mn-54 (Approx. 310 days)	ND	ND	ND	ND	ND	ND	ND
	Co-60 (Approx. 5 years)	ND	ND	0.51 〔10/24〕	ND	0.9 〔11/7〕	0.61 〔11/25〕	ND
	Sb-125 (Approx. 3 years)	ND	ND	61 〔10/21〕	ND	8.6 〔11/18〕	2.1 〔11/25〕	ND
All β		2,100 〔11/17〕	72 〔10/3〕	730 〔10/21〕	160 〔11/21〕	1,300,000 〔12/2〕	130 〔12/2〕	700,000 〔9/23〕
H-3 (Approx. 12 years)		860 〔11/14〕	85,000 〔9/13〕	440,000 〔10/31〕	11,000 〔11/25〕	43,000 〔9/26〕	12,000 〔11/28〕	460,000 〔8/19〕
Sr-90(Approx. 29 years)		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*	Groundwater observation hole No.2-5*1	Groundwater observation hole No.2-6	Groundwater observation hole No.2-7	Groundwater observation hole No.3	Groundwater observation hole No.3-1*	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〕	3.9 〔11/7〕	0.56 〔10/30〕	1.3 〔11/21〕	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〕	3.1 〔11/21〕	5.9 〔8/8〕	2.6 〔8/1〕	4.3 〔11/27〕	-
The other γ	Ru-106 (Approx. 370 days)	ND	ND	ND	ND	ND	ND	ND	ND	-
	Mn-54 (Approx. 310 days)	ND	ND	0.77 〔9/29〕	ND	ND	ND	ND	0.54 〔10/30〕	-
	Co-60 (Approx. 5 years)	ND	ND	ND	ND	ND	ND	ND	ND	-
	Sb-125 (Approx. 3 years)	ND	ND	26 〔9/29〕	ND	ND	1.1 〔9/5〕	ND	ND	-
All β		1,700 〔7/8〕	380 〔7/29〕	46,000 〔9/29〕	2,700 〔12/1〕	18 〔11/21〕	1,400 〔7/11〕	180 〔8/1〕	ND	35*2 〔11/27〕
H-3 (Approx. 12 years)		850 〔6/26〕	440 〔8/26〕	3,100 〔11/7〕	1,200 〔11/24〕〔11/27〕	1,000 〔11/21〕	3,200 〔H24. 12/12〕	460 〔8/1〕	170 〔9/18〕	ND*2
Sr-90(Approx. 29 years)		54 〔5/31〕	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 Since the water of No.3-5 obtained on Novemeber 23 and 27 was highly turbid, only chloride, all β and tritium were analyzed as a reference.
* "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〕	46 〔10/11〕	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〕	770 〔7/15〕	50 〔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〕	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〕	2,700 〔11/7〕	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	2.7 〔10/11〕	3.3 〔10/17〕	3.9 〔12/2〕	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〕	9.2 〔12/2〕	8.4 〔12/2〕	7.8 〔10/17〕	ND	ND	1.6 〔10/18〕	ND	ND
All β	360 〔10/7〕	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)	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