

- On July 5, the result of the radioactivity analysis of the temporary storage area P catch basin (for data collected on June 29) found that the value of total  $\beta$  radioactivity (hereinafter referred to as total  $\beta$ ) temporarily increased. On July 6, the ground surface near the subject catch basin was surveyed as part of investigating the cause. This survey found a location with the value of the 70 $\mu$ m dose equivalent rate ( $\gamma + \beta$  : 750 $\mu$ Sv/h) significantly higher than the 1cm dose equivalent rate ( $\gamma$  : 3 $\mu$ Sv/h) near the notch tank that is used to store waste in the temporary storage area P (P2) and found no other locations with such significantly higher value as of July 16. Additionally, an analysis of water collected from the drain ditch near the subject area after the rainfall on July 7 found that the total  $\beta$  value was high at the south-side drain ditch of temporary storage area P and the east-side flow-in point (upstream).
- On the same day (July 7), the aforementioned notch tank was investigated, and it was found that four points of the top plate hatch lid and the top plate itself were displaced at two notch tanks and rainwater had entered and filled said tanks to full capacity. Water inside the notch tank and tank top plate was analyzed and their respective total  $\beta$  values were 79,000Bq/L and 71,000Bq/L at maximum (cesium 137 and cesium 134 were below the detectable limit value). On July 11, water inside the notch tanks was removed as much as possible, and the remaining content was flexible container bags containing high  $\beta$  contaminated soil.
- Based on the aforementioned investigation result, it is presumed that total  $\beta$  value of the temporary storage area P catch basin temporarily increased due to the following scenario: Rainwater on the top plate and hatch entered the tank from the gap between the notch tank top plate and tank due to said top plate being displaced for some kind of reason; Later, rainwater eluted the tank content containing radioactive materials and the rainwater overflowed (\*2) from the tank at some point after May 21 (\*1); Some of said rainwater flowed to the east-side flow-in point.

- Additionally, since temporary storage area P catch basin leads to Jinbazawa River via the grit chamber downstream, the possibility that some water containing radioactive water in said catch basin flowed to Jinbazawa River cannot be denied.
- Today (July 19), the analysis result of water accumulated in the temporary storage area P catch basin and notch tanks was confirmed as follows. Since strontium 90 and yttrium 90, which are not natural nuclides, were detected from the temporary storage area P catch basin, it was determined at 1:05pm on the same day that Article 18-10 "Nuclear fuel materials, etc. leak outside controlled areas" of the Rules on Safety of Fukushima Daiichi Nuclear Power Station Reactor Facilities and Protection of Specific Nuclear Fuel Materials applies.

Temporary storage area P catch basin [Unit: Bq/L]

Collected time & date	Cs-134	Cs-137	Total β	Sr-90	Y-90
6/29 9:15	1.0	21	750	17	380

Notch tank (collected on 7/8) [Unit: Bq/L]

Collected location	Cs-134	Cs-137	Total β	Sr-90
Tank water of notch tank (north)	<6.3	<6.5	79,000	60,000
Water on top plate of notch tank (north)	<4.2	<4.9	71,000	57,000
Tank water of notch tank (south)	<5.3	<5.6	33,000	23,000
Water on top plate of notch tank (south)	<4.0	<4.8	30,000	23,000

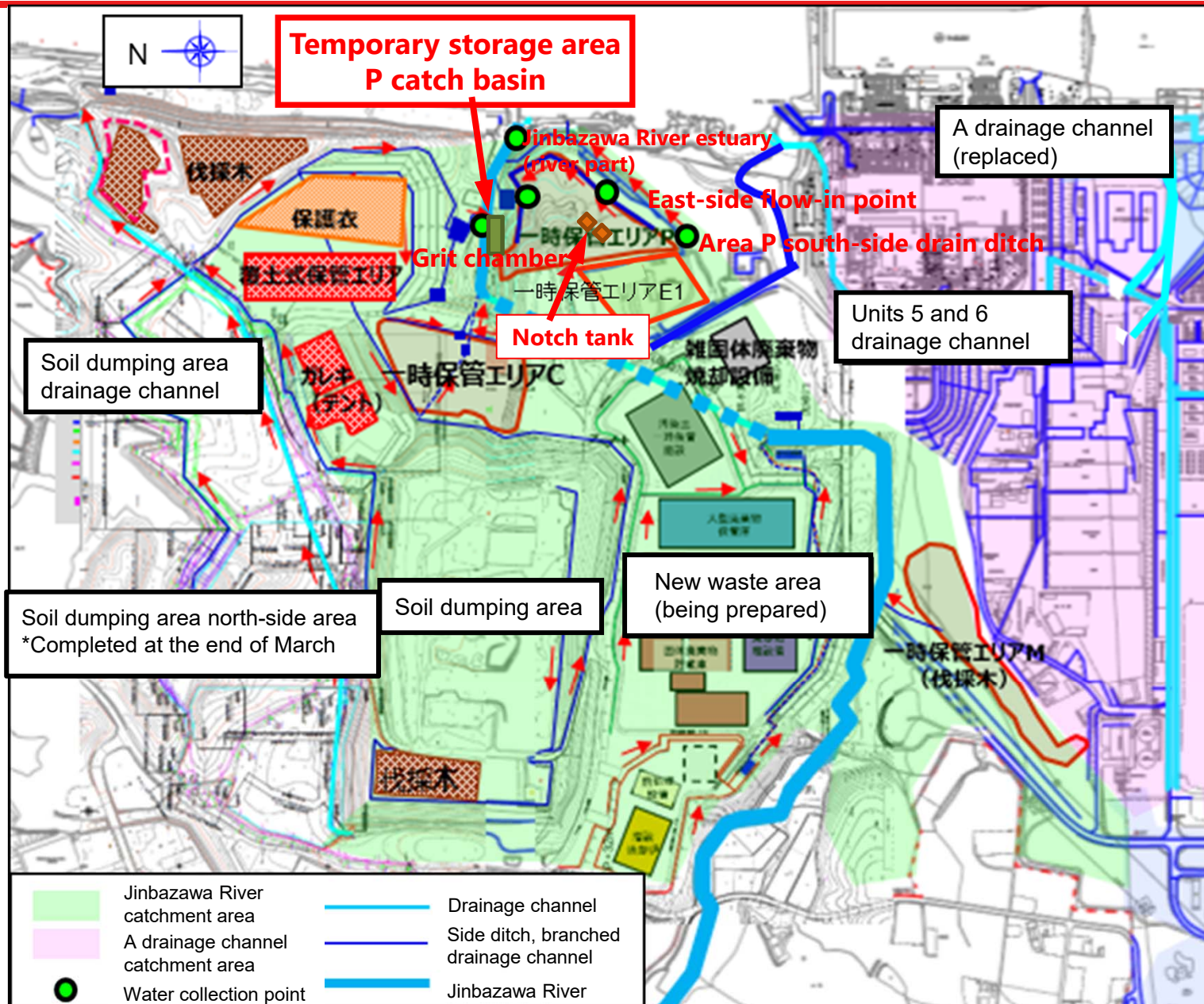
Red: Value confirmed today (July 19)

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- It is assessed as having no impact on the environment, since some of the water that leaked from the tanks remains in the soil near the tanks, flows into Jinbazawa River after its radioactive concentration decreases as the water passes through the temporary storage area P catch basin and grit chamber, and the radioactive concentration of nearby seawater (Units 5 and 6 outlet north-side point, north breakwater north-side point, monitoring points on the northeast side of the port) is within the normal fluctuation range. Additionally, no significant rise of total  $\beta$  radioactive concentration has been observed at the temporary storage area P catch basin and Jinbazawa River estuary (river part) after covering the subject notch tanks and temporary storage area ground surface.

\*1: Since no significant change of the total  $\beta$  value was observed when water of the temporary storage area P catch basin was collected and analyzed on May 21, 2021, the timing of tank overflow is guessed to be between the timing of the previous data collection (May 21) and this data collection (June 29).

\*2: Amount of overflow from the notch tanks was assessed by conservatively assuming that all rainwater that entered the tanks overflowed in the term from June 29 or May 21 until leakage prevention measures were implemented on July 8. As a result, the amount of radioactivity (estimated value) that leaked from the two notch tanks was assessed as 170-330 million Bq.

[Reference] Map of temporary storage area P and E

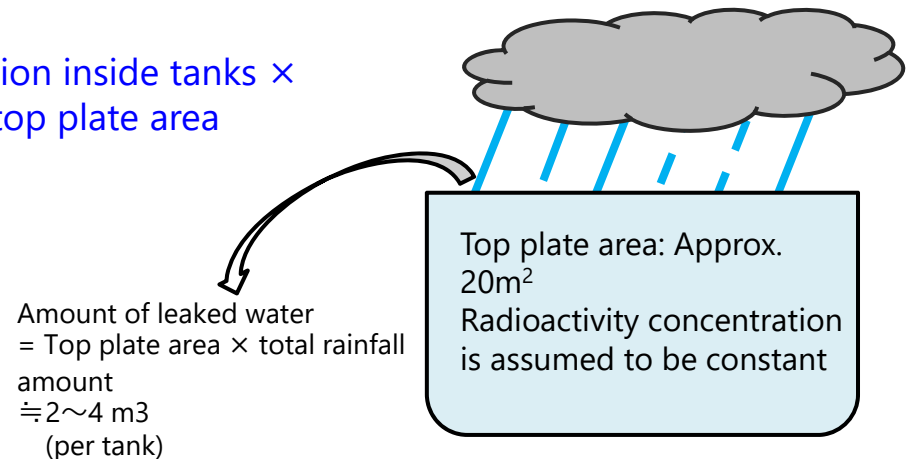


# Estimation of amount of radioactivity that leaked from the notch tanks

- The amount of radioactivity that leaked from the notch tanks is estimated with the following assumptions.
  - ① If all rainwater that entered the tanks leaked outside the tanks in the term between the sampling on June 29 and July 8 when leakage control measures were implemented
    - ⇒ Rainwater accumulated in the tanks between May 21, when no significant change was observed from the temporary storage area P catch basin, and June 28
  - ② If all rainwater that entered the tanks leaked outside the tanks after May 21
    - ⇒ Full water as of May 21
- Concentration of leaked water is fixed as the radioactivity concentration inside tanks as of July 8

$$\text{Amount of leaked radioactivity} = \text{Radioactivity concentration inside tanks} \times \text{Total rainfall amount} \times \text{top plate area}$$

- Radioactive concentration inside tank (Sr-90)  
Notch tank (north): 60,000Bq/L  
Notch tank (south): 23,000Bq/L
- Total rainfall amount: ① 101.5mm (6/29 0:00~7/8 24:00)
- ② 201mm (5/21 0:00~7/8 24:00)
- Top plate area: Approx. 20m<sup>2</sup>



Estimated amount of radioactivity that leaked from the notch tanks (Sr-90)  
Notch tank (north): 120-240 million Bq  
Notch tank (south): 46-97 million Bq    ⇒ Total: 170-330 million Bq

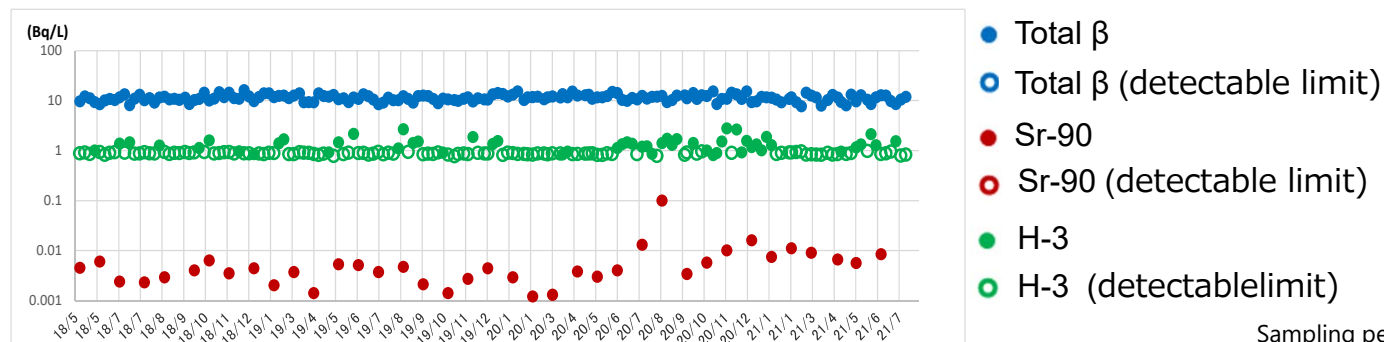
# Assessment of environmental impact

- Amount of radioactivity that leaked from the two notch tanks is estimated to be 170-330 million Bq in Sr-90.
- It is assessed as having no impact on the environment, since some of the water that leaked from the tanks remains in the soil near the tanks, some of notch tank water flows into the temporary storage area P catch basin and Jinbazawa River after its radioactive concentration decreases as the water passes through said catch basin and grit chamber, and the radioactive concentration of nearby seawater is within the normal fluctuation range (\*1).

(\*1) Units 5 and 6 outlet north-side point (sampling point closest to Jinbazawa River), north breakwater north-side point, monitoring points on the northeast side of the port

- No significant rise of total  $\beta$  radioactive concentration has been observed at the temporary storage area P catch basin and Jinbazawa River estuary (river part) after covering the subject notch tanks and temporary storage area ground surface.

Units 5 and 6 outlet north-side point (sampling point closest to Jinbazawa River)



Sampling period:  
May 1, 2018 ~ July 14, 2021

## <Future measures>

Monitoring of Jinbazawa River and seawater near its estuary will be enhanced.

- ✓ Monitoring of Jinbazawa River has been enhanced from July 11 and sampling is conducted every day
- ✓ Seawater near the Jinbazawa River estuary was experimentally sampled in the week of July 19, and its monitoring will be enhanced during container inspection

# Status of measures to suppress entry of radioactive materials into temporary storage area P batch basin and drain ditch

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## ■ Measures to suppress entry of radioactive materials into temporary storage area P batch basin and drain ditch

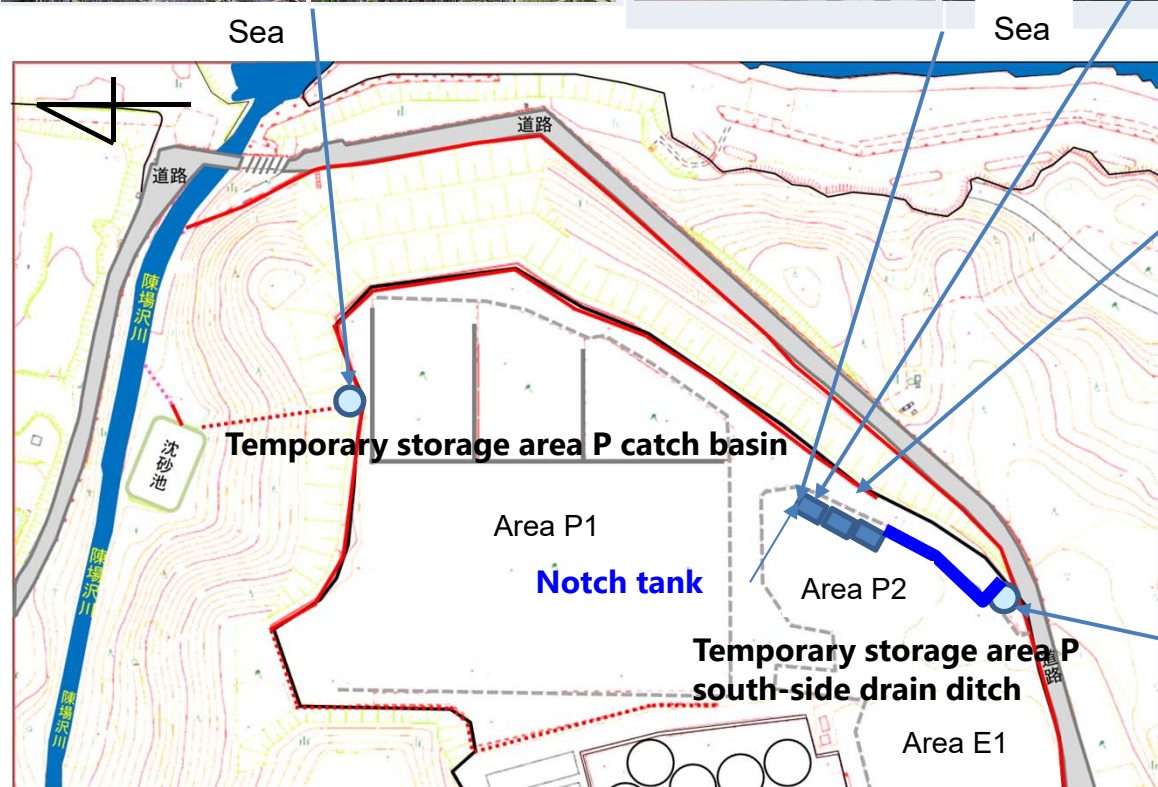
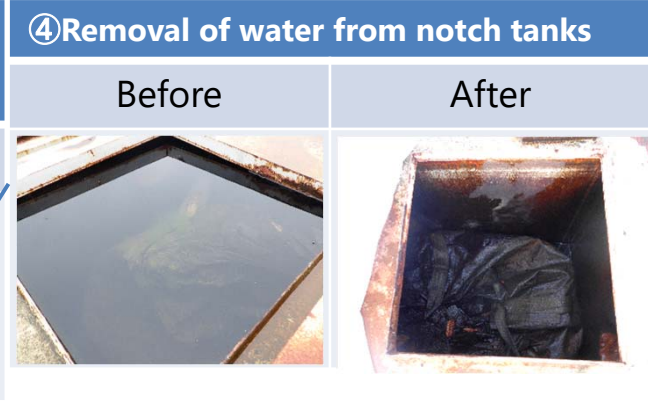
- ① Strontium removing materials and zeolite sandbags were placed in the catch basin (July 5)
- ② Sheet covers were placed on the ground surface around the notch tanks (July 6)
- ③ South-side drain ditch and drain ditch of the east-side flow-in point (upstream) were cleaned and zeolite sandbags were placed (July 7)
- ④ Sheet covers were placed on two notch tanks and zeolite sandbags were placed around the tanks (July 8)
- ⑤ As much water as possible was removed from the two notch tanks which were filled with water, using a pump truck (July 11)
- ⑥ Zeolite sandbags were placed in the south-side drain ditch so that rainwater would not enter (July 11)
- ⑦ Sandbags are being removed from the area around the two notch tanks since July 16

## ■ Inspection status of areas\* using notch tanks for waste storage other than temporary storage area P

\*Temporary storage areas C, E1, P2, W1, X. Area N which has a roof does not apply.

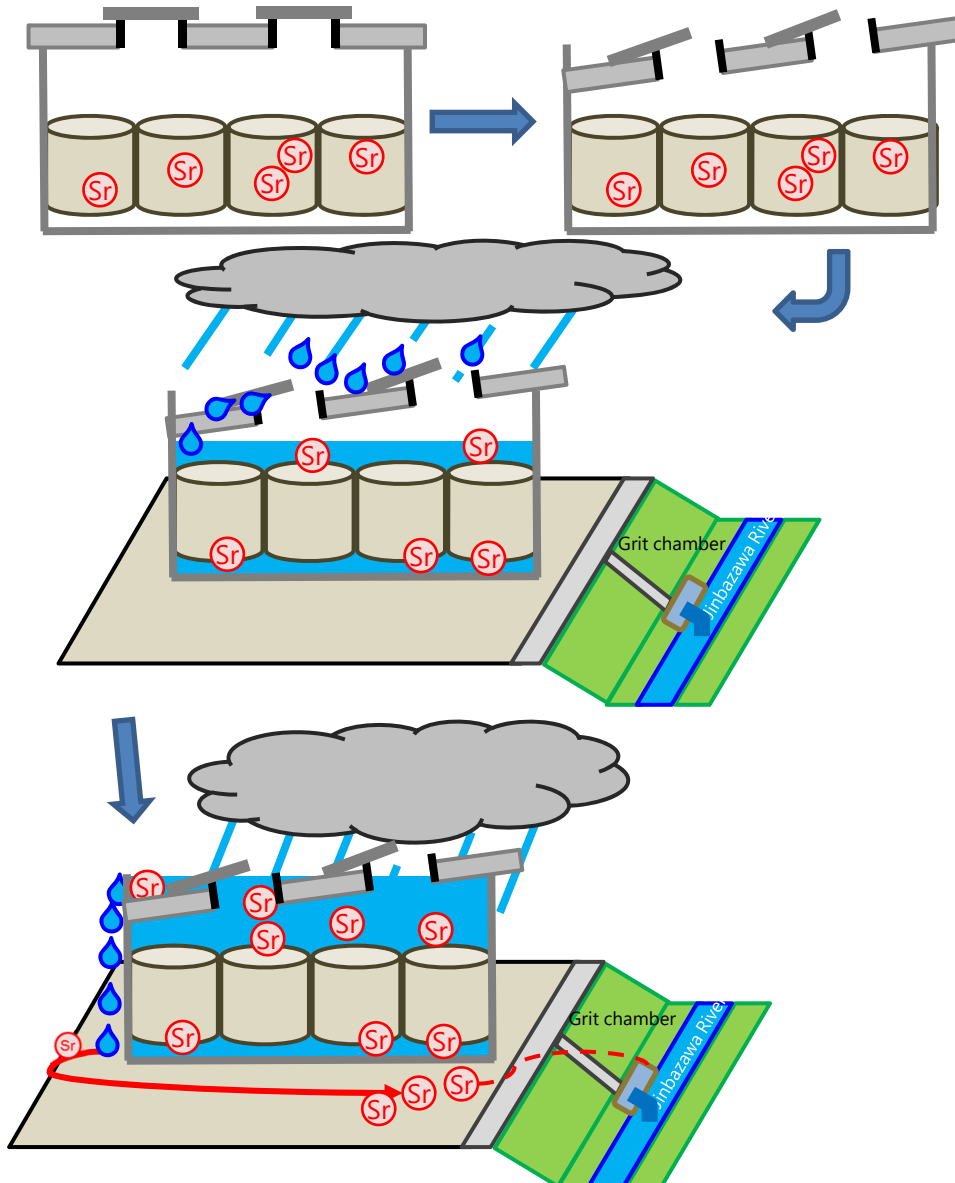
- Situation of the hatch lid of the notch tank top plate was investigated with a drone (July 8)
  - ⇒ It was found that the top plate hatch lid of one of the tanks of temporary storage area X was displaced. On July 9, the lid was placed back to its proper position and sandbags were placed on the lid so that it will not become displaced.
- The top plate of the notch tank was investigated with a drone and it was found that the top plate was not displaced (July 15)
- Sheet covers will be placed on all notch tanks in the subject area

[Reference] Situation of measures to suppress entry of radioactive materials into temporary storage area P batch basin and drain ditch





# Cause of overflow from notch tanks (speculated)



High  $\beta$  contaminated soil is stored in notch tanks

Hatch lid opened due to some kind of reason and the end of the top place slipped into the notch tank

Rainwater that fell on the top plate and hatch entered the notch tank

High  $\beta$  radiation source dissolved into rainwater inside the notch tank (hereinafter referred to as notch tank water)

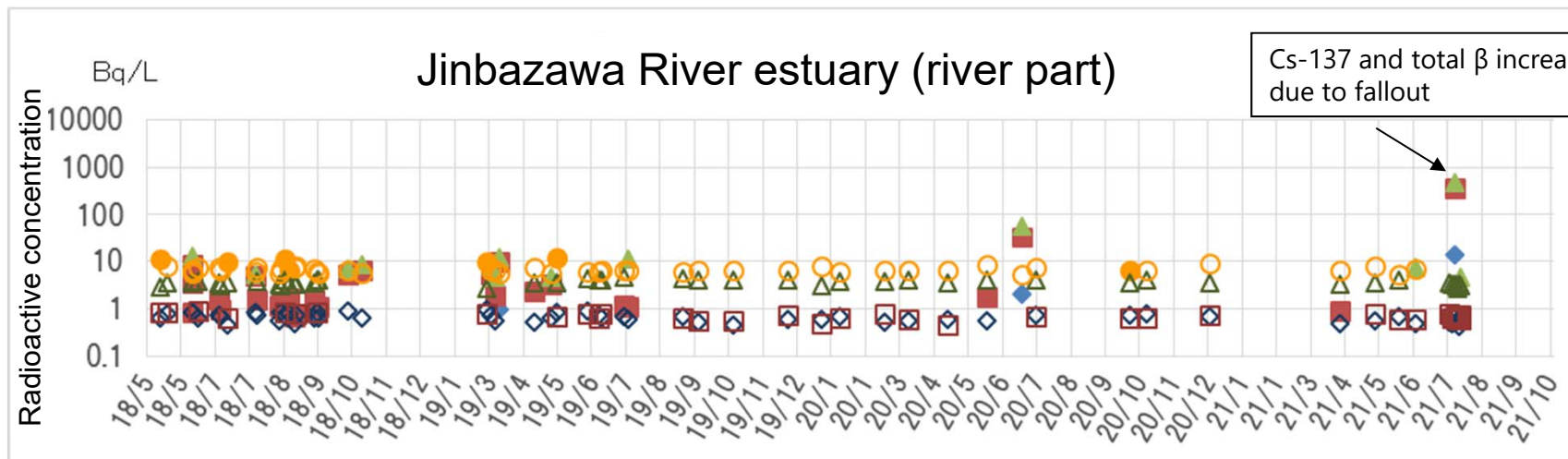
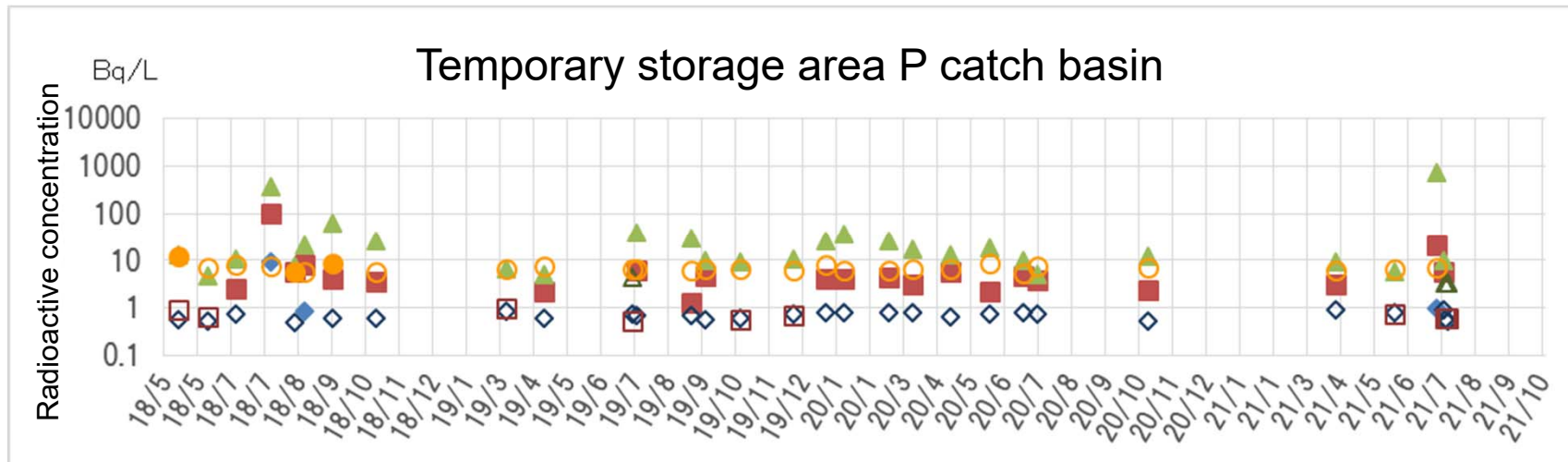
Notch tank water overflowed during a rainfall after May 21\* \*Previous sampling date

Some of the notch tank water reached the temporary storage area P catch basin via the side ditch

6/29 Tptal  $\beta$  of temporary storage area P drain ditch significantly increased

Some of the notch tank water that remained in P catch basin flowed into Jinbazawa River via the grit chamber

[Reference result] Water analysis result of temporary storage area P and Jinbazawa River



Sampling period:  
May 1, 2018 ~ July 14, 2021



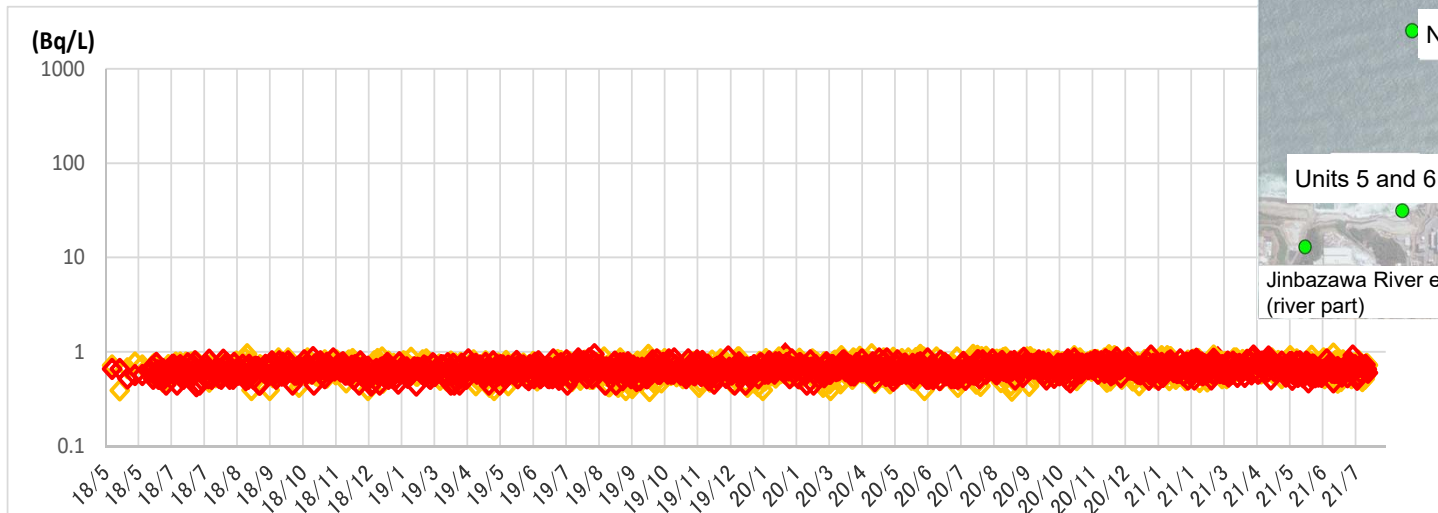
# [Reference] Measurement result of Jinbazawa River estuary (river part)

Jinbazawa River estuary (river part)			
Sampled time and date [2021]	Cs-134	Cs-137	Total $\beta$
	Bq/L	Bq/L	Bq/L
4/29 8:52	< 0.57	< 0.80	< 3.6
5/21 10:25	< 0.70	< 0.61	< 3.9
6/4 8:45	< 0.50	< 0.60	7.2
7/5 10:13	< 0.52	< 0.78	< 3.6
7/7 9:10	< 0.50	< 0.63	< 3.3
7/9 8:37	14	360	480
7/10 7:25	< 0.72	< 0.67	< 3.2
7/11 7:45	< 0.70	< 0.68	< 3.0
7/12 7:13	< 0.55	< 0.60	< 2.6
7/13 7:18	< 0.43	< 0.63	< 3.3
7/14 7:15	< 0.55	< 0.74	< 3.0
7/15 7:33	< 0.63	< 0.58	4.6
7/16 7:45	< 0.68	< 0.60	< 2.7
7/17 7:10	< 0.66	< 0.71	< 3.1
7/18 7:14	< 0.61	< 0.80	< 3.0

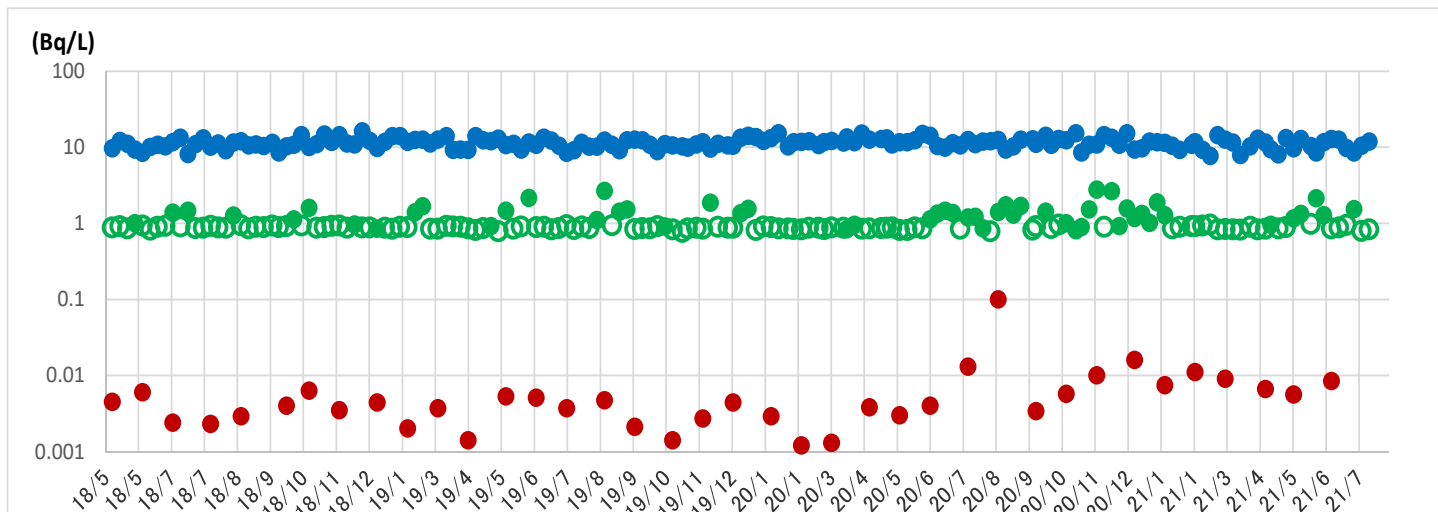
Cs-137 and total  $\beta$  increased due to fallout

# [Reference] Analysis result of Units 5 and 6 outlet north-side seawater

Analysis result of Units 5 and 6 outlet north-side seawater did not find any significant increase



- ◆ Cs-134
- ◇ Cs-134 (Detectable limit)
- ◆ Cs-137
- ◇ Cs-137 (Detectable limit)

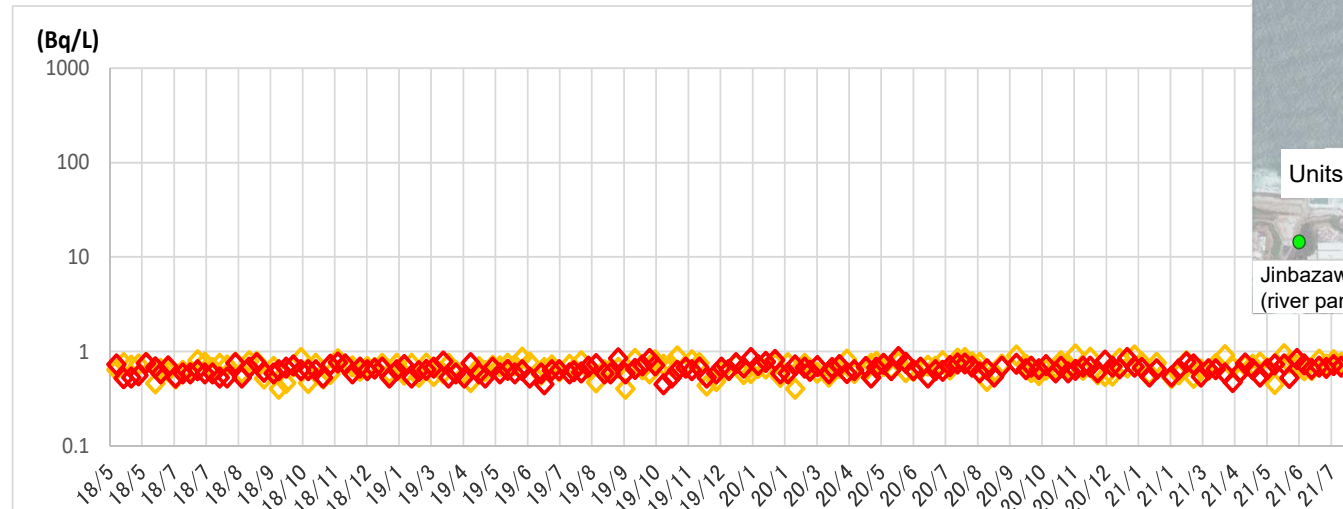


- Total β
- Total β (Detectable limit)
- Sr-90
- Sr-90 (Detectable limit)
- H-3
- H-3 (Detectable limit)

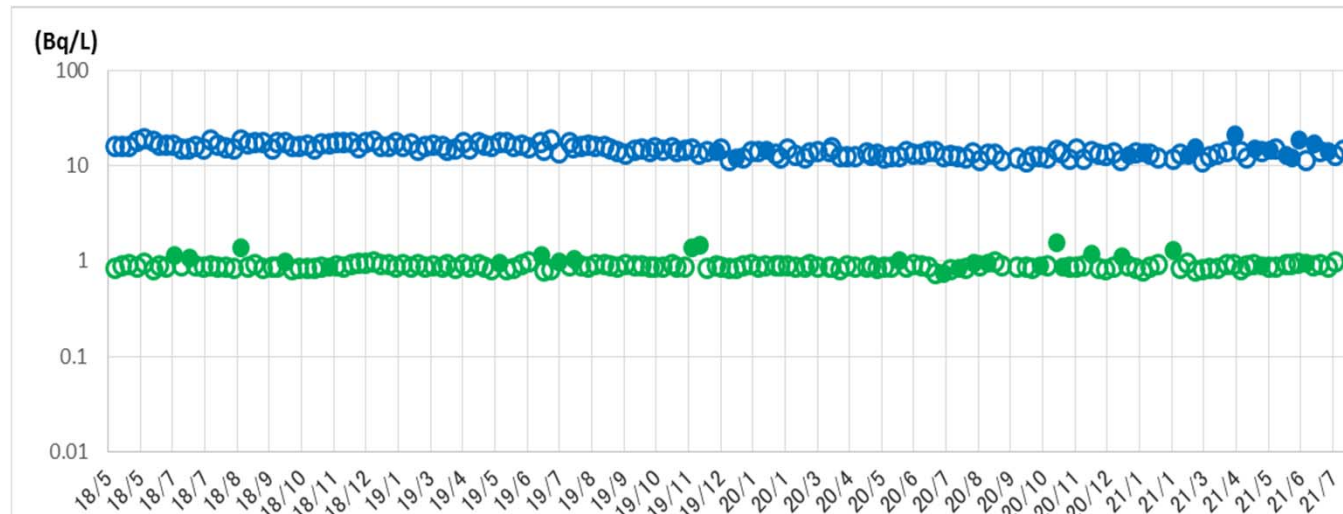
Sampling period:  
May 1, 2018 ~ July 14, 2021

# [Reference] Analysis result of north breakwater north-side seawater

Analysis result of north breakwater north-side seawater did not find any significant increase



- ◆ Cs-134
- ◇ Cs-134 (Detectable limit)
- ◆ Cs-137
- ◇ Cs-137 (Detectable limit)

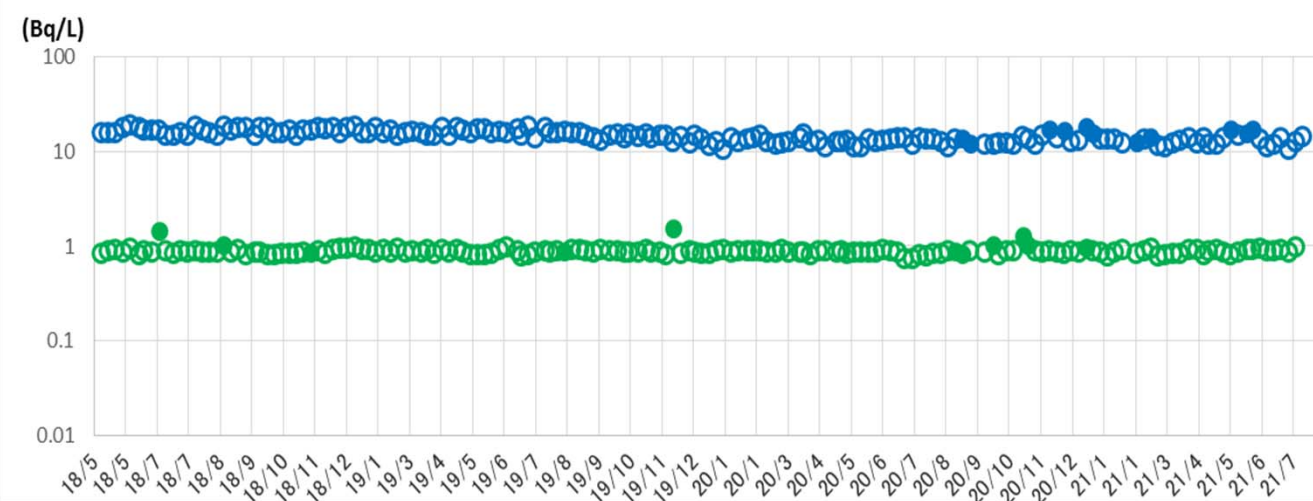
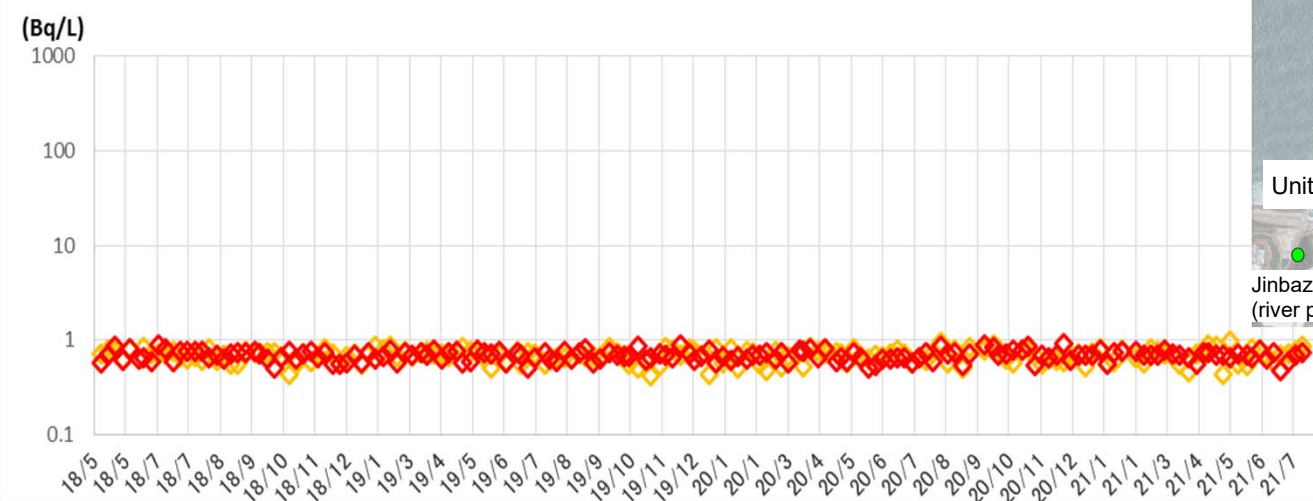


- Total β
- Total β (Detectable limit)
- H-3
- H-3 (Detectable limit)

Sampling period:  
May 1, 2018 ~ July 14, 2021

# [Reference] Analysis result of port northeast-side seawater

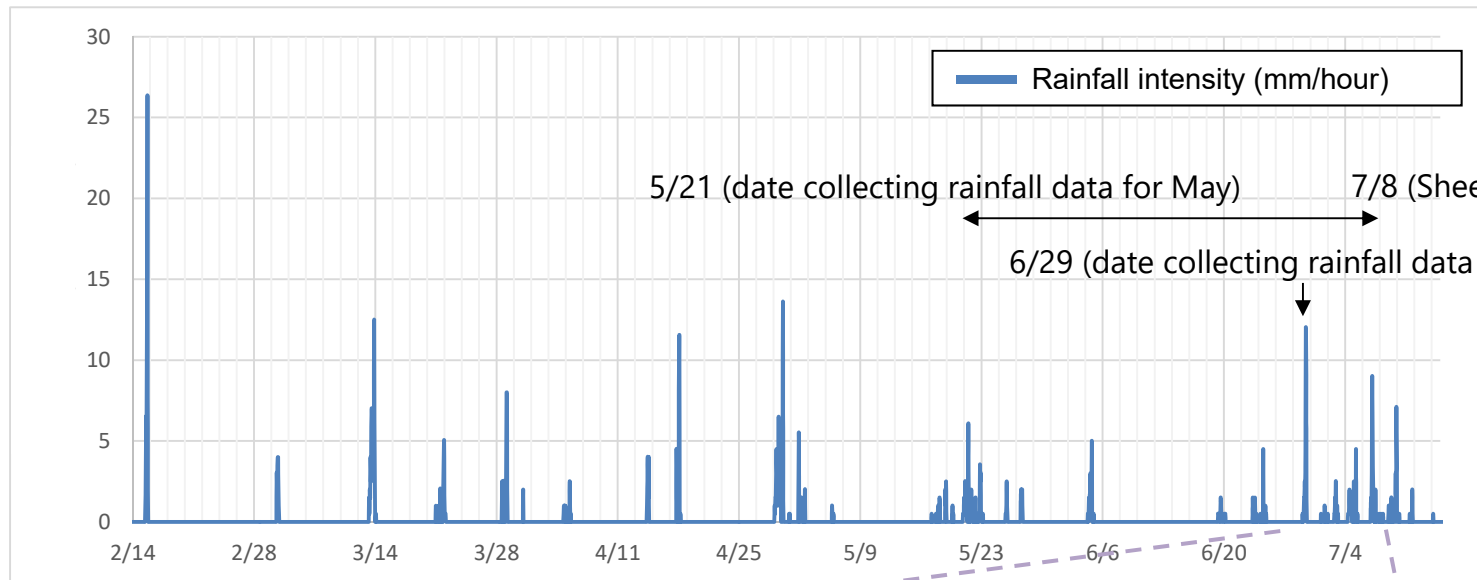
Analysis result of port northeast-side seawater did not find any significant increase



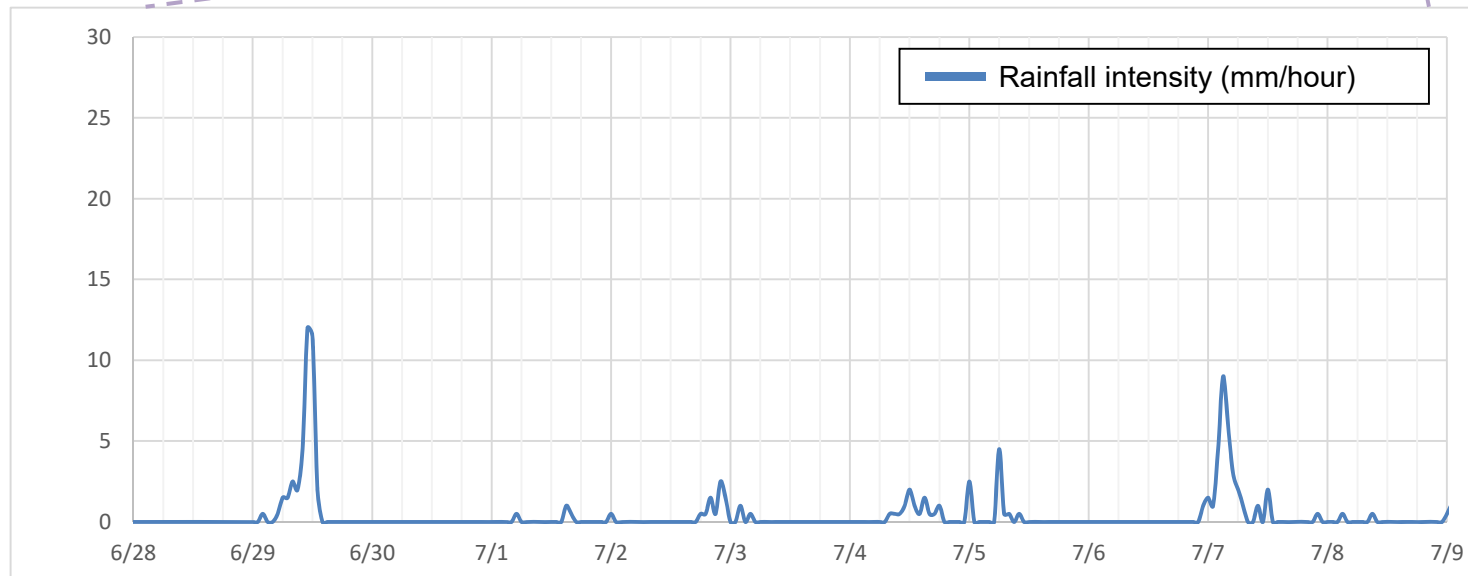
- ◆ Cs-134
- ◇ Cs-134 (Detectable limit)
- ◆ Cs-137
- ◇ Cs-137 (Detectable limit)
- Total β
- Total β (Detectable limit)
- H-3
- H-3 (Detectable limit)

Sampling period:  
May 1, 2018 ~ July 14, 2021

# [Reference] Rainfall



Data period: 2021/2/14~2021/7/14



Enlarged data  
for 6/28 0:00 to  
7/9 0:00

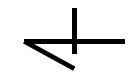
# [Reference] Survey result near temporary storage area P

- Survey was conducted near temporary storage area P
- Areas where 70 $\mu$ m dose equivalent rate ( $\beta + \gamma$ ) was significantly higher than 1cm dose equivalent rate ( $\gamma$ ) were observed

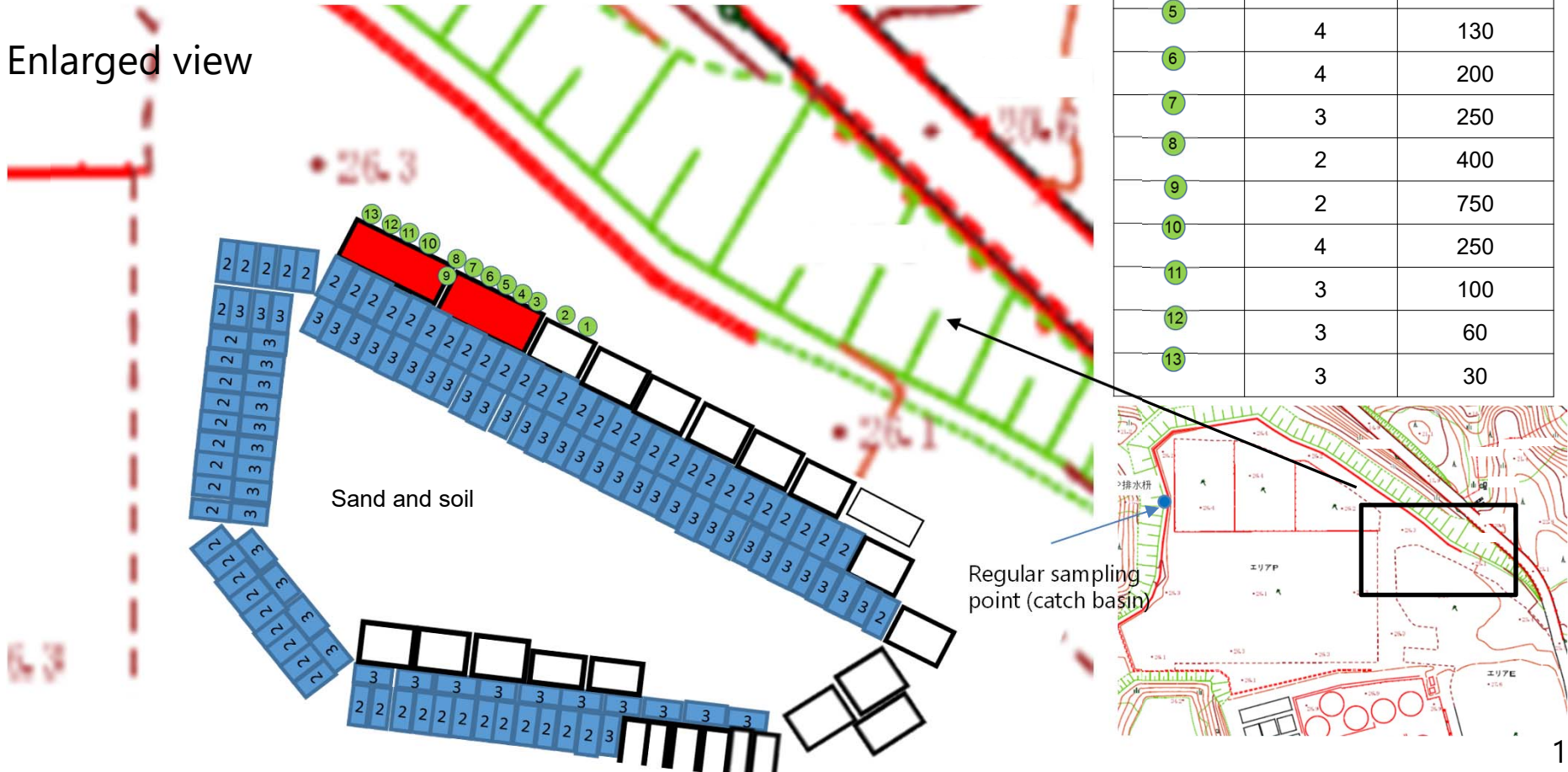
Measured date: July 6, 2021

Unit:  $\mu$ Sv/h

Point	1cm dose equivalent rate	70 $\mu$ m dose equivalent rate
1	—	11
2	—	70
3	4	80
4	4	60
5	4	130
6	4	200
7	3	250
8	2	400
9	2	750
10	4	250
11	3	100
12	3	60
13	3	30



Enlarged view





# [Reference] Survey result near temporary storage area P

Measured date: July 6, 2021

Regular sampling point  
(catch basin)

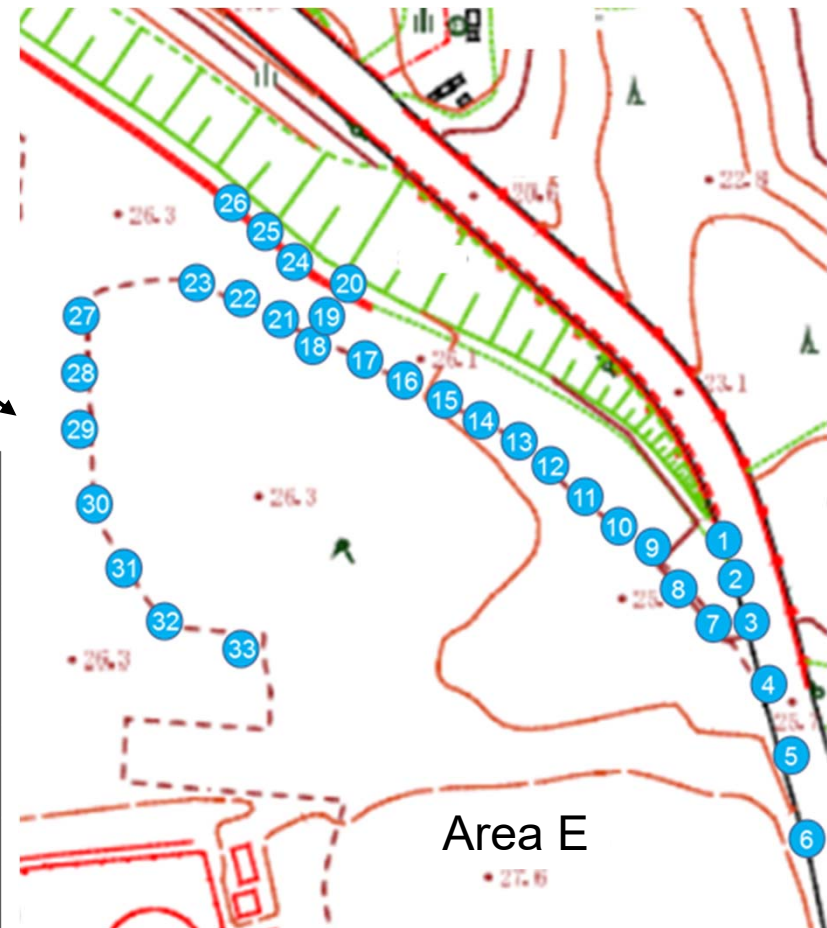
Unit:  $\mu\text{Sv/h}$

Point	1cm dose equivalent rate	70 $\mu\text{m}$ dose equivalent rate
1	4	5
2	4	10
3	4	6
4	6	15
5	7	9
6	17	18
7	5	11
8	6	13
9	5	22
10	5	8
11	5	7
12	6	7
13	5	5
14	5	5
15	5	5
16	5	7
17	5	7
18	5	130
19	4	4
20	4	12

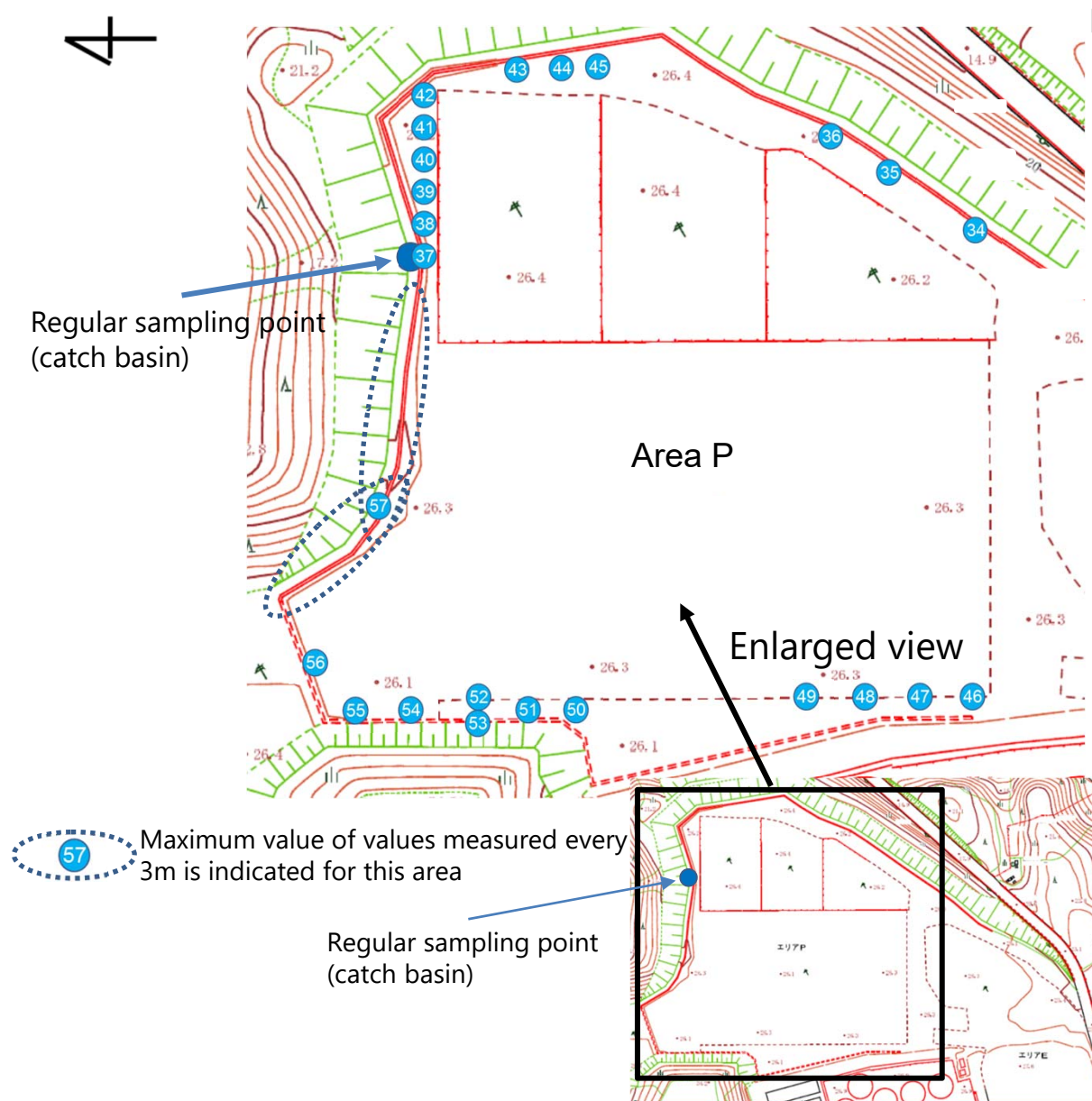


Enlarged view

Point	1cm dose equivalent rate	70 $\mu\text{m}$ dose equivalent rate
21	4	150
22	4	170
23	4	20
24	3	4
25	3	4
26	3	3
27	8	10
28	10	15
29	13	20
30	14	15
31	14	15
32	9	10
33	13	28



# [Reference] Survey result near temporary storage area P



Measured date: July 6, 2021

Unit:  $\mu\text{Sv/h}$

Point	1cm dose equivalent rate	70 $\mu\text{m}$ dose equivalent rate
34	9	10
35	14	19
36	4	4
37	<1	<1
38	<1	<1
39	<1	<1
40	<1	<1
41	<1	<1
42	<1	2
43	4	10
44	2	2
45	2	2
46	3	3
47	-	3
48	-	4
49	-	2
50	-	5
51	-	3
52	-	4
53	-	4
54	-	4
55	-	4
56	-	4
57	-	3

# [Reference] Survey result near temporary storage area E



Regular sampling point (catch basin)

Measured date: July 8 and 16, 2021



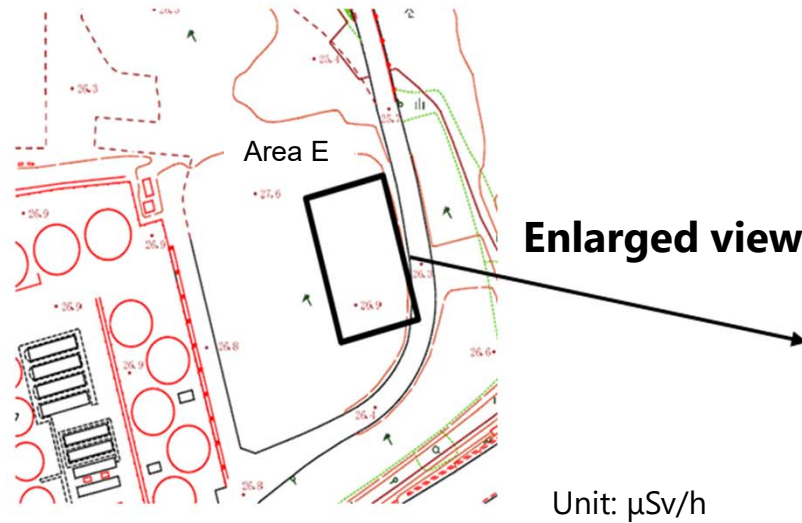
**Enlarged view**



Unit:  $\mu\text{Sv/h}$

Point	1cm dose equivalent rate	Point	70 $\mu\text{m}$ dose equivalent rate
1	10	13	45
2	7	14	5
3	25	15	40
4	17	16	35
5	30	17	90
6	21	18	75
7	19	19	10
8	27	20	60
9	19	21	23
10	10	22	20
11	60	23	16
12	50	24	50

# [Reference] Survey result near temporary storage area E



Point	1cm dose equivalent rate	70 $\mu\text{m}$ dose equivalent rate	Point	1cm dose equivalent rate	70 $\mu\text{m}$ dose equivalent rate
①	130	250	⑬	11	17
②	43	70	⑭	13	15
③	40	60	⑮	15	19
④	50	75	⑯	20	30
⑤	35	60	⑰	60	75
⑥	23	40	⑱	70	120
⑦	18	25	⑲	100	300
⑧	17	25	⑳	21	30
⑨	12	18	㉑	14	22
⑩	14	22	㉒	15	24
⑪	14	28	㉓	16	25
⑫	11	17			



[Reference] Situation of notch tanks (before outflow prevention measures)



(Photo taken on July 8, 2021)



(Photo taken on July 8, 2021)



(Photo taken on July 8, 2021)



After closing front hatch lid  
(Photo taken on July 6, 2021)