

Fukushima Daiichi Nuclear Power Station

Investigation of the rising temperature of land-side impermeable wall (frozen-soil wall) temperature measuring tube 150-7S (update 4)

< Reference document >
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- On October 13, it was observed that in localized areas 3m below the ground (around 1.0m~4.0m below the ground surface) temperatures measured by temperature measurement tube 150-7S near the intersection of drainage channel K (downstream side) continued to exceed 0° C

<[Announced on October 28, 2021](#)>
- The aforementioned intersection has been reinforced to prevent expansion resulting from freezing, but it is assumed that cracks have allowed water to leak into the area of frozen soil. An investigation of the reinforced area of drainage channel K performed from November 2~3 revealed one crack on the upstream side of the reinforced section, and two locations where groundwater was flowing into the channel on the downstream side of the reinforced section.

<[Announced on November 1 and November 4, 2021](#)>
- Results from an excavation investigation of the ground inside of the land-side impermeable wall implemented between November 10 and November 12 confirmed that subterranean temperature at a depth of around -2.7 m is below 0° C, and that there is no groundwater in the excavation area.

<[Announced on November 15, 2021](#)>
- An excavation investigation outside the land-side impermeable wall performed between November 15 and November 21 confirmed that shallow areas around temperature measurement tube 160-7S are frozen, but that there are shallow areas outside the land-side impermeable wall near the diesel fuel tank foundation, which is located on the south side of temperature measurement tube 150-7S, that are not frozen.

- Furthermore, in light of the discovery of spring water during the investigation of the inside of drainage channel K on November 2 and 3, it is hypothesized that ground water flowing into drainage channel K may have caused some portions of the land-side impermeable wall (frozen-soil wall) to thaw, thereby causing the increase in temperature measured by temperature measurement tube 150-7S.
- Therefore, the decision was made to temporarily waterproof the area outside temperature measurement tube 150-7 at the beginning of December in order to prevent the flow of groundwater and watch for changes in temperatures measured by temperature measurement tube 150-7S, as well as the conditions of ground water flowing into drainage channel K.

< [Announced on November 25, 2021](#) >

- Now that preparations have been completed, starting from today (December 6), approximately one week will be taken to temporarily waterproof the area outside of temperature measurement tube 150-7S (mountain side).
 - ※ From 8 AM today, steel tube installation preparation (boring machine installation, setting of steel tubes for boring work, etc.) shall be made and steel tube installation shall take place during the afternoon.
- Eight steel pipes shall be installed on the mountain side of temperature measurement tube 150-7S in order to prevent the flow of groundwater that is thought to be thawing a portion of the land-side impermeable wall.
- During the waterproofing period temperature measurement tube measurements shall be monitored in order to ascertain the impact of waterproofing.
- Since the difference in water levels inside and outside the wall were being maintained, and there has been no change in the amount of water being pumped up by subdrains, it was determined that this is not having an impact on the impermeability of the land-side impermeable wall.

1. Overview of test waterproofing (steel tubes/steel sheet piles)

- The impermeability of the land-side impermeable wall is being maintained, but steel tubes will be installed on the mountain side of temperature measurement tube 150-7S in order to prevent the flow groundwater which is thought to be thawing a portion of the land-side impermeable wall.
- During the test waterproofing period temperature measurement tube measurements shall be monitored (refer to the following page for monitoring targets and frequency) in order to ascertain the impact of waterproofing. If it is determined that waterproofing needs to be improved, steel sheet piles will be installed on the mountain side of the steel tubes.

(To buried pipes were found when confirming the location of steel sheet piles already sunk near the diesel fuel tank. In order to avoid these pipes, the number of steel tubes that will be inserted has been changed to eight, which differs from the plan announced on November 25.)

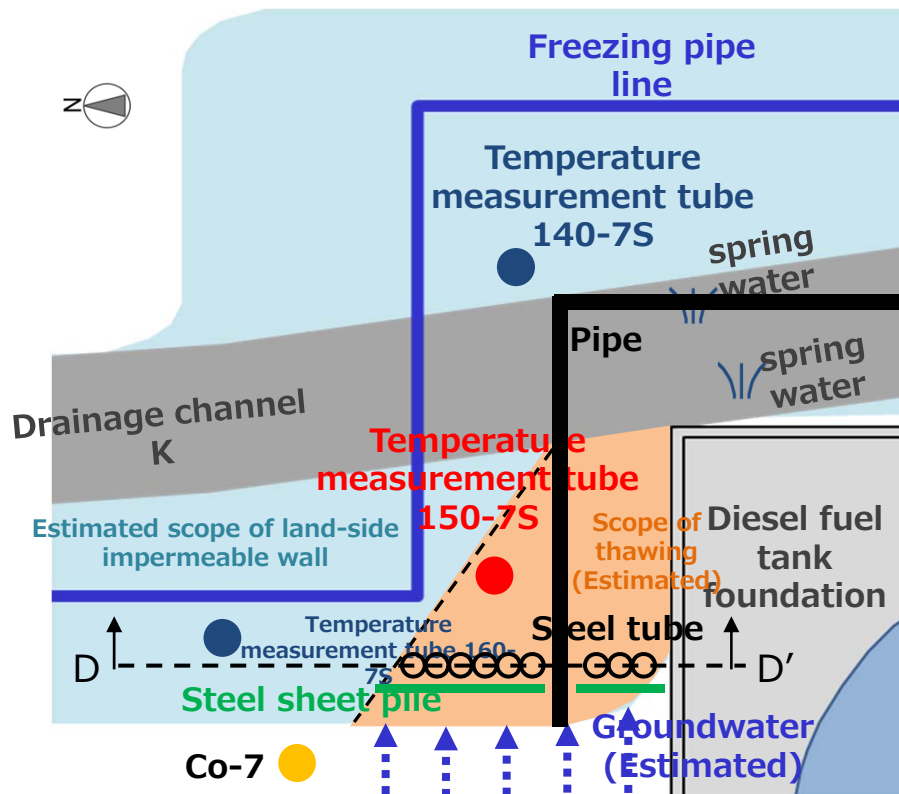
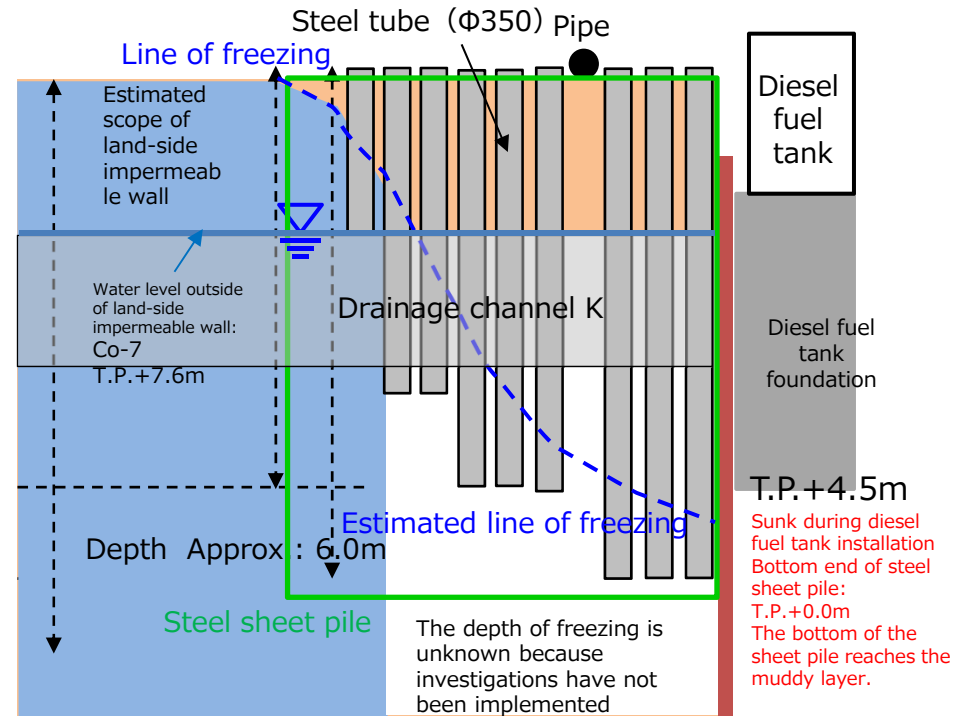


Diagram of test waterproofing



※ The depth of steel tube installation shall be adjusted in accordance with frozen conditions of the land-side impermeable wall.

D-D' Cross-sectional diagram

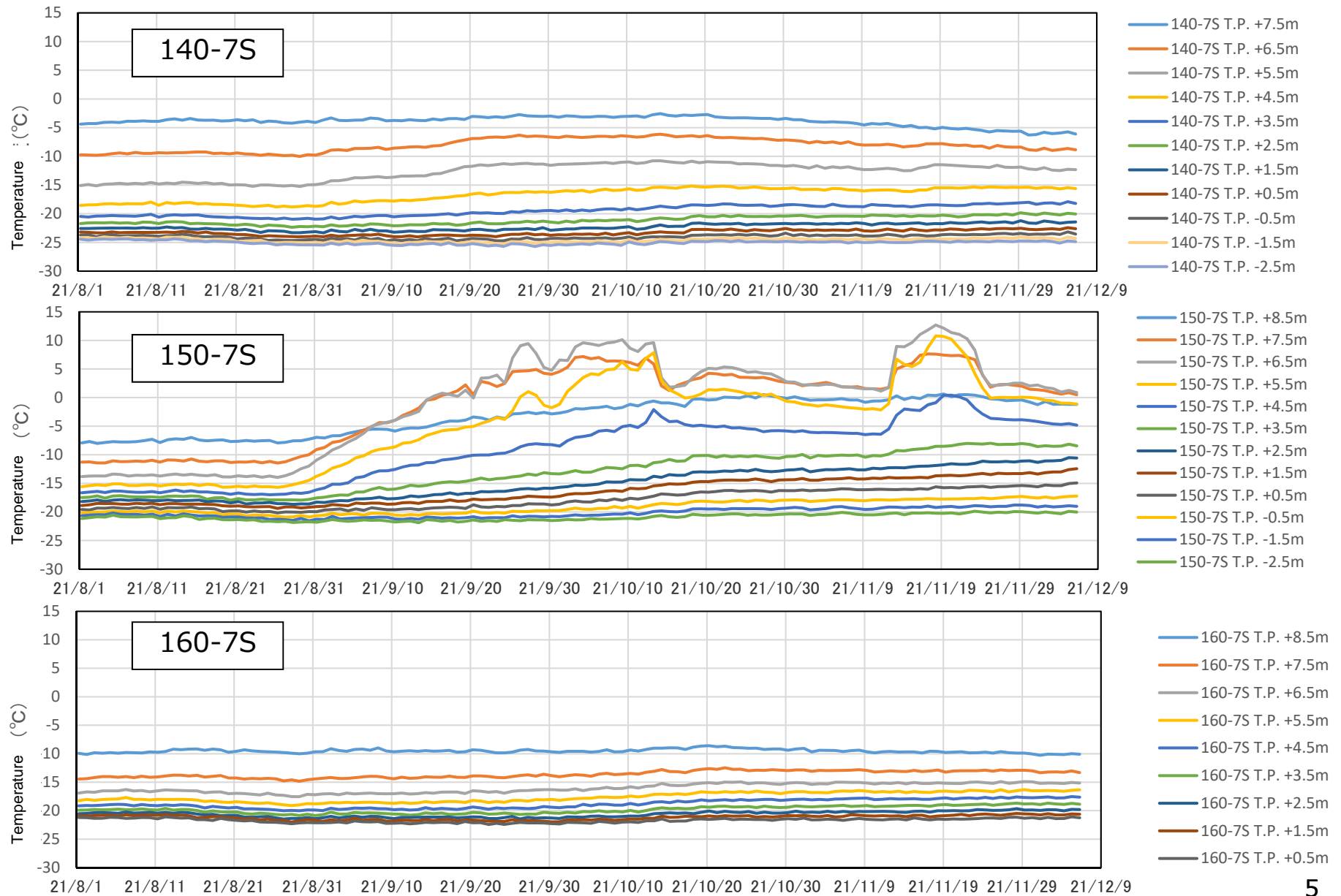
2. Monitoring targets during the waterproofing period and monitoring frequency



Targeted facilities	Targets	Monitoring method	Monitoring frequency [※]
temperature measurement tube 140-7S, 150-7S, 160-7S	Subterranean temperature	Measurement value	Twice a day
Observation holes Co-7, RW18	Groundwater level	Measurement value	Twice a day
Relay tanks No.4, No.5	Pumped volume	Measurement value	Once a day
Drainage channel K (Inside)	Outer view	Visual check at location	Once a day
	Spring water volume Temperature Muddiness	Measurement taken at location	Twice a day
Investigation excavation area (inside)	Ground conditions	Visual check at location	Once a day
	Subterranean temperature	Measurement taken at location	Once a day
Diesel fuel tank foundation/oil dike	Outer view	Visual check at location	Once a day
	Displacement	Measurement taken at location	Once a week
Ground around the common pool	Outer view	Visual check at location	Once a day

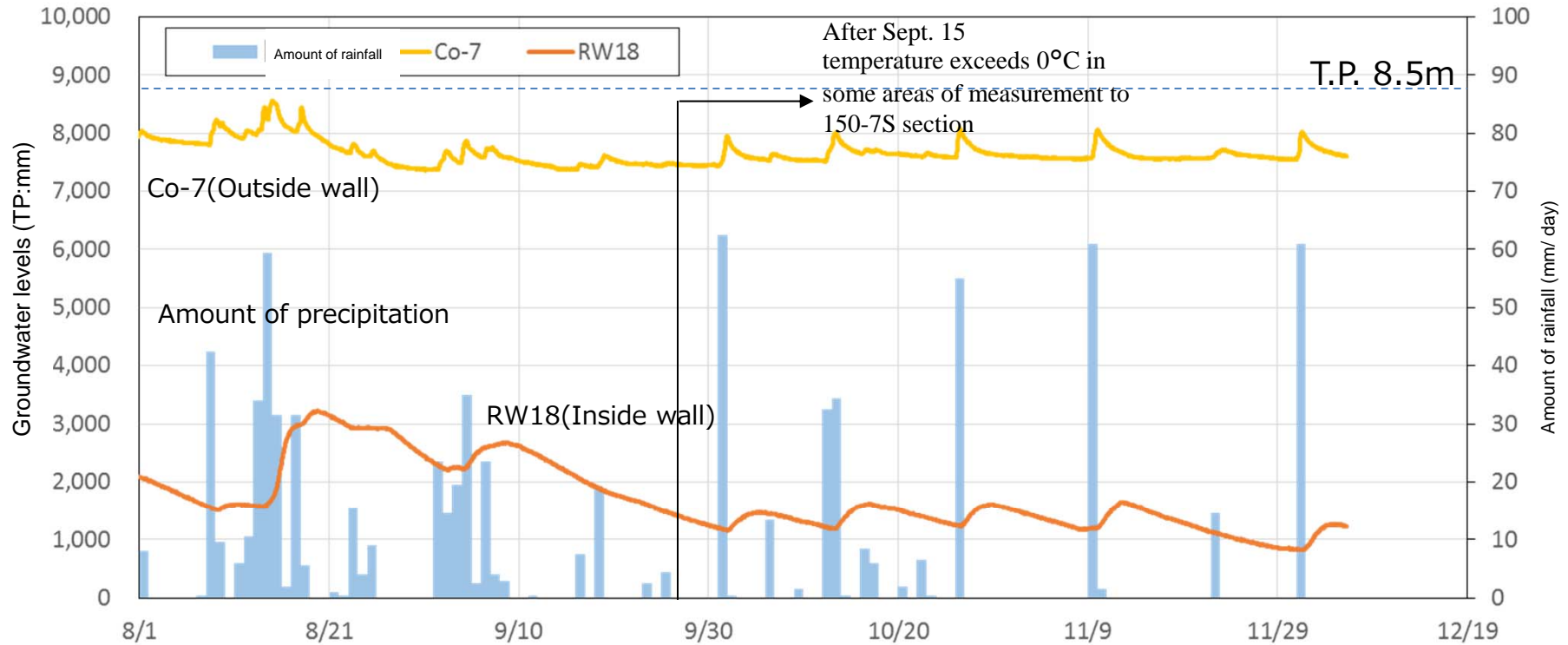
(Reference)

Changes over time in the temperature of temperature measurement tubes 150-7S, and peripheral temperature measuring tubes (Surface layer excerpt)



(Reference)

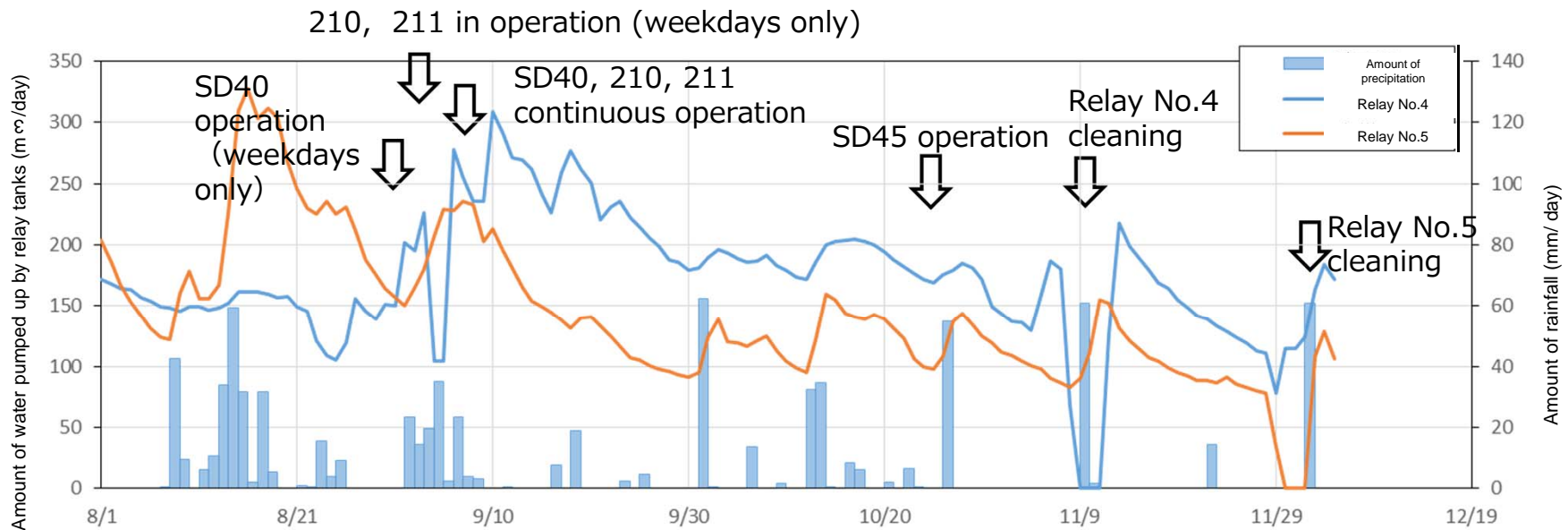
Changes in water levels inside/outside the land-side impermeable wall (frozen-soil wall) and rainfall over time



Changes in water levels inside/outside of the land-side impermeable wall over time (as of 7 AM, December 6)

(Reference)

The relationship between the amount of water pumped up by subdrains No. 4, No.5 relay tanks and the amount of precipitation



- Throughout the construction period, the amount of water being pumped up including operation status will be monitoring

