



# **Nord Stream 2 Natural Gas Pipeline construction and operation in the Finnish EEZ Environmental and Technical Monitoring Quarterly Report Q1 2020**

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*The original report is written in Finnish and has been translated into Swedish and English. If there are conflicting information in the different language versions, the Finnish version prevails.*

## Summary

The report presents results and preliminary findings of the environmental and technical monitoring for construction activities of the Nord Stream 2 Gas Pipeline in the Finnish EEZ for the first quarter of 2020. Monitoring is based on the Nord Stream 2 Environmental Monitoring Programme, Finland. The programme was approved on April 12, 2018 within the water permit decision (Nro 53/2018/2, Dnro ESAVI/9101/2017). It was amended with a decision by Uusimaa ELY Centre on November 8, 2019. In accordance, during 2020, water quality and currents will be monitored at three stations at the Sandkallan long term monitoring site, but no longer at the Control sites in eastern and western Gulf of Finland.

Sitowise Oy prepared this report based on data and reports provided by Nord Stream 2 AG and its' monitoring and technical contractors. All findings are preliminary and final conclusions will be reported in the annual report 2020 to be published in May 2021.

The only remaining construction activity in Finnish EEZ during the first quarter was post-lay rock placement. By the end of Q1, the total number of finalized berms was 344 and the total volume of rock installed was 1,181,100 m<sup>3</sup>. Post-lay rock placement continues in the second quarter of 2020.

Environmental monitoring continued during Q1 at Sandkallan. Results will be shown in the Q2 report due to late recovery of the data in April.

There were no incidents to be notified to the Finnish authorities during the reporting period. One notification about construction was made to the authorities. It presents the justification for using re-designed route on three sections of pipelay, and describes the reason for construction, planned location and construction of an additional berm falling outside the security corridor of Line B prior to construction, as requested in the Water Permit.

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Annex 1 Nord Stream 2 construction activities during Q1/2020

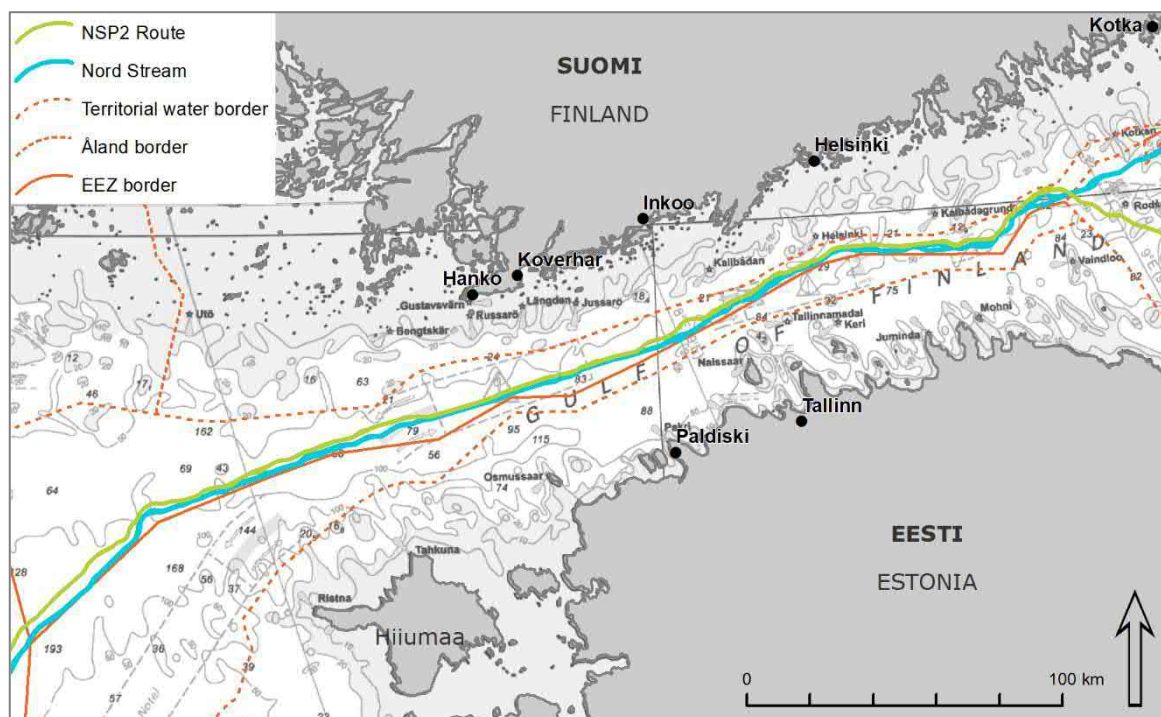
# 1 Introduction

The report presents results and preliminary findings of the environmental and technical monitoring for the construction activities of the Nord Stream 2 Gas Pipeline in the Finnish EEZ for the first quarter (Q1) of 2020.

Nord Stream 2 AG is constructing a new offshore natural gas twin pipeline from Russia to Germany through the Baltic Sea (Figure 1). The length of the corridor is approximately 1,230 km. Parallel pipelines pass through the territorial waters and/or Exclusive Economic Zones (EEZ) of Russia, Finland, Sweden, Denmark and Germany.

In the Finnish EEZ, the route is approximately 374 km and follows the existing Nord Stream pipeline route. Pipelay of Line A in the Finnish EEZ started on September 5, 2018 and was completed on April 30, 2019, and pipelay of Line B started on May 18, 2019 and was completed in August 21, 2019.

When construction works are completed in all countries the pipelines will to be taken into operation.



*Figure 1. The Nord Stream 2 route passes through the Finnish EEZ. It is situated north of the existing Nord Stream pipelines with an exception of a short section in the east, close to Russian territorial waters.*

Nord Stream 2 AG is responsible for environmental monitoring and reporting during construction and operation of the pipelines. The scope of monitoring activities is presented in the Environmental Monitoring Programme, Finland /1/. The programme has been approved within the water permit decision on April 12, 2018 (N:o 53/2018/2, Dnro ESAVI/9101/2017). It was amended with a decision by Uusimaa ELY Centre on November 8, 2019. In accordance with the decision, during 2020, water quality and currents will be

monitored at three stations at the Sandkallan long term monitoring site, but no longer at the Control sites in eastern and western Gulf of Finland. Monitoring is most intensive during the construction phase (Table 1).

*Table 1. General schedule for monitoring activities during 2018–2023 in the Finnish EEZ (based on /1/, modified).*

Monitoring target	Construction		Operation			
	2018	2019	2020	2021	2022	2023
Underwater noise	X					
Water quality and currents	X	X	X*			
Commercial fishery					X	
Cultural heritage	X		X			

\* Water quality monitoring continues in 2020 until four weeks have passed after completion of construction in the vicinity of the Sandkallan monitoring site.

The supervisory authorities for monitoring of underwater noise, currents and water quality are the Southeast Finland, Uusimaa and Southwest Finland ELY Centres (the Centres for Economic Development, Transport and the Environment). For fishery monitoring, the supervisory authority is the Southwest Finland ELY Centre. For cultural heritage, the supervisory authority is the Finnish Heritage Agency.

Quarterly reports will be provided three months after the end of each quarter during the construction period, and annual reports by the end of May of the following year during construction and operation.

Quarterly reporting aims at presenting the main results from technical and environmental monitoring to the authorities. For this reason, they are concise and focused on results. Annual reports will include further data analysis, comparisons to the impact assessments presented in the EIA Report and the water permit application and more thorough discussion on the observed impacts.

## 2 Environmental conditions during the first quarter 2020

According to the statistics of the Finnish Meteorological Institute, January was record mild all the way up to the Oulu level in northern Finland. In the record-breaking areas, January was generally 7–8 degrees milder than during the reference period (1981–2010). While precipitation was 1.5–2 times higher than usual in mainland, the precipitation levels remained close to long-term average in the southwest archipelago. At the end of the month the southern and western coastal areas were mainly snow-free. /2/

February was exceptionally mild in southern Finland. Compared to the statistical reference period (1981–2010), the average temperature was 5–6 degrees higher than normal. February was exceptionally rainy and precipitation in southwest Finland was 2.5 times higher than typically in the reference period. The southern and western parts of the country were still free of snow. /3/

Exceptionally mild conditions continued in March, with approximately 3 degrees higher average temperature than during the statistical reference period (1981–2010) in southern Finland. Precipitation did not differ from long-term average, and by the end of the month there still was no snow cover in southern Finland. /4/

Due to the mild winter, the Gulf of Finland was completely free of ice during the whole first quarter. Therefore, the open sea wave buoy located in the Gulf of Finland (see Annex 1) approximately six kilometres north of GKP 185, could operate throughout the winter period.

According to the Finnish Meteorological Institute's open data /5/, during the period of January 1 to March 31, 2020, significant wave height in the open Gulf of Finland varied between 0.1 and 4.1 m (Figure 2) and the wind speed between 0 to 21 m/s (Figure 3) /5/. The wind speed data is compiled from the Helsinki lighthouse weather station, which is located in the middle of the Gulf of Finland (see Annex 1).



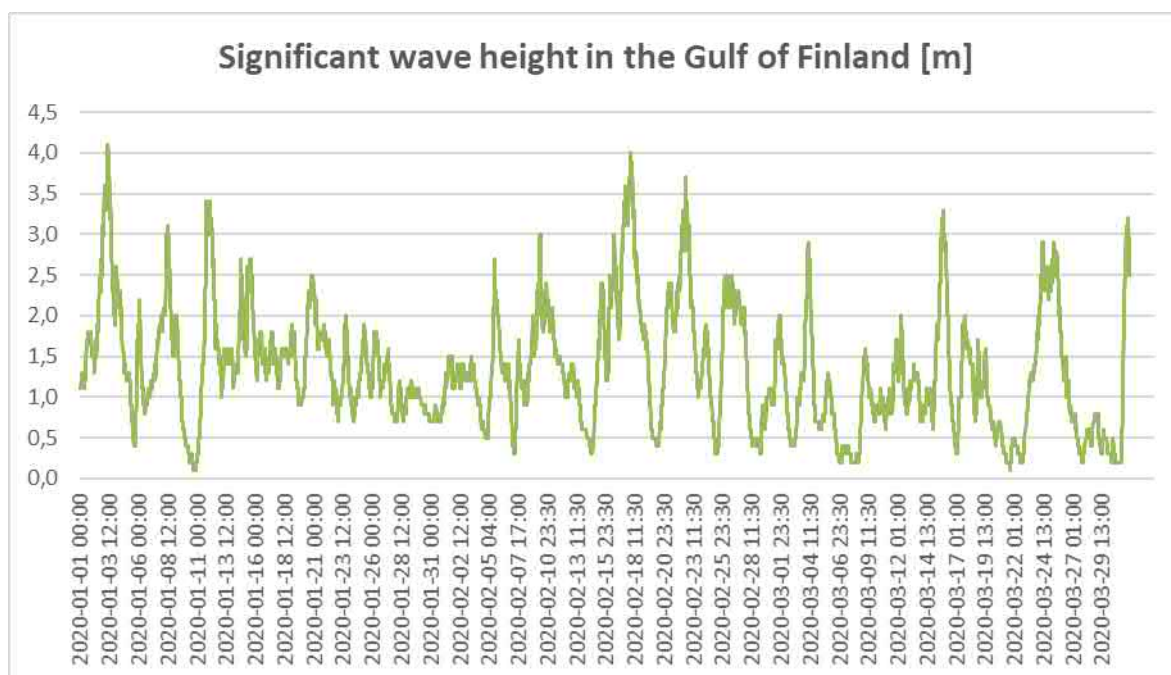


Figure 2. Significant wave height in the Gulf of Finland during the period from January 1 to March 31, 2020 /5/. The data was collected from an open sea wave buoy located in the Gulf of Finland (see Annex 1) and consists of measurements conducted every half an hour.

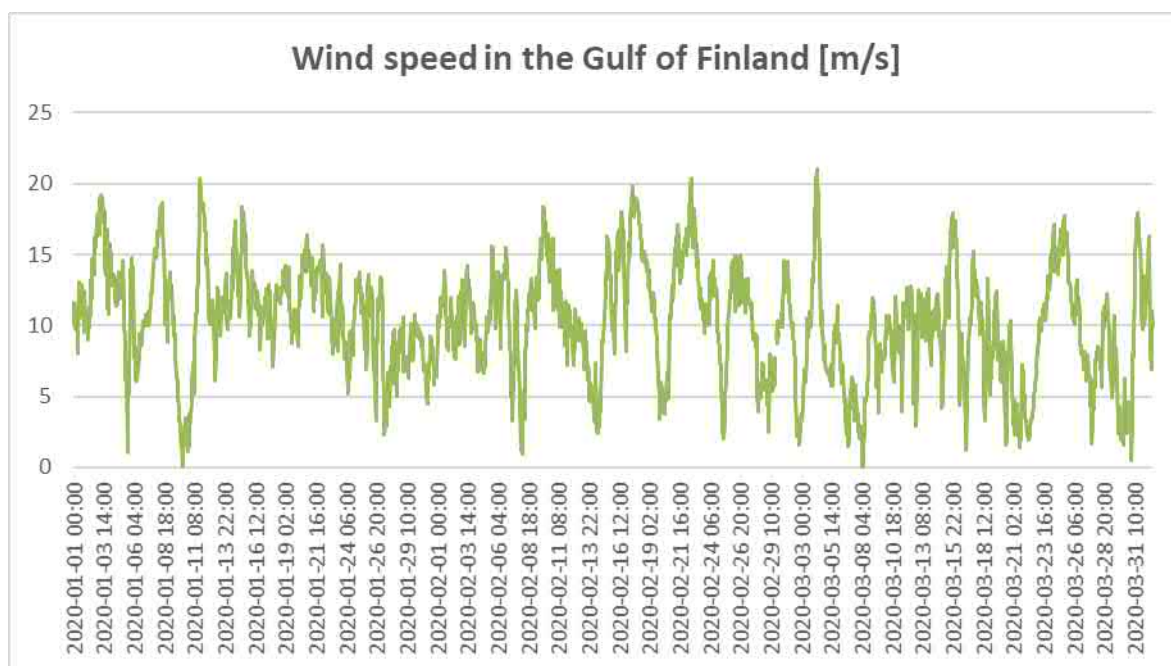


Figure 3. Wind speed in the Gulf of Finland during period from January 1 to March 31, 2020 /5/. The data was collected from a Helsinki lighthouse weather station located in the middle of Gulf of Finland (see Annex 1) and consists of measurements conducted once an hour.



### 3 Construction activities during the first quarter 2020

#### 3.1 Schedule

The only construction activity continuing in the Finnish EEZ during the first quarter was post-lay rock placement (Table 2).

Table 2. Construction activities during Q1 2020.

2020 Q1	January					February					March			
Week	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Rock placement														

#### 3.2 Activities during the period

##### Rock placement

During the first quarter of 2020, rock placement in the Finnish EEZ was rather intensive and was carried out by four vessels: Bravenes, Rockpiper, Nordnes and Stornes.

Rock placement vessel Bravenes performed rock placement in the Finnish EEZ by completing one berm, at GKP 253 on January 2, 2020 /6/.

Rock placement continued on January 22, as vessel Rockpiper returned from Russia to work on two berms in Finland at GKP 120 and GKP 121. In Mid-February Rockpiper returned once again to the Finnish EEZ installing berms from February 14 to February 25 between GKP 120 and GKP 130, after which the vessel transferred to Sweden. On March 29, Rockpiper continued rock placement works in Finland and installed seven berms by March 31 /6/.

In February 4, 2020 vessel Nordnes returned from Russia to the Finnish EEZ for one day installing several rock berms between GKP 241 and GKP 245. The work in the Finnish EEZ continued from February 12 to February 21, at various locations between GKP 134 and GKP 358.

In February 6, vessel Stornes started rock placement and continued until February 24, 2020. Rock placement was performed at various locations between GKP 140 and GKP 405. Afterwards Stornes moved to Sweden.

Of the constructed berms, altogether 15 were within 10 kilometres of the Sandkallan protected area.

Rock placement contractors were Boskalis Offshore Contracting B.V. and Van Oord Offshore B.V. (BoVO). Contractors report the proceeding of the rock placement works in an as-built register, which is summarized in the quarterly reports.

The volume of rock used in the completed berms during the first quarter was 272,000 m<sup>3</sup>, all for post-lay rock placement (Table 3). Only Finnish rock material was used. By the end

of Q1, the total cumulative volume of rock material used in the Finnish EEZ was 1,181,100 m<sup>3</sup> and the cumulative number of berms was 344.

Table 3. Rock placement (completed berms) during Q1, 2020. Data summarized from /6/.

Berm type	Installed volume m <sup>3</sup> *	Number of berms
Stress/freespan correction (post-lay)	217,900	59
In service buckling, lateral stability	42,900	38
Unexploded ordnance	11,100	5
<b>Total</b>	<b>272,000</b>	<b>102</b>

\* Installed volume is notified to Nord Stream 2 by contractors as tonnes (t), which is converted to cubic metres using a factor 1.5625 t/m<sup>3</sup>

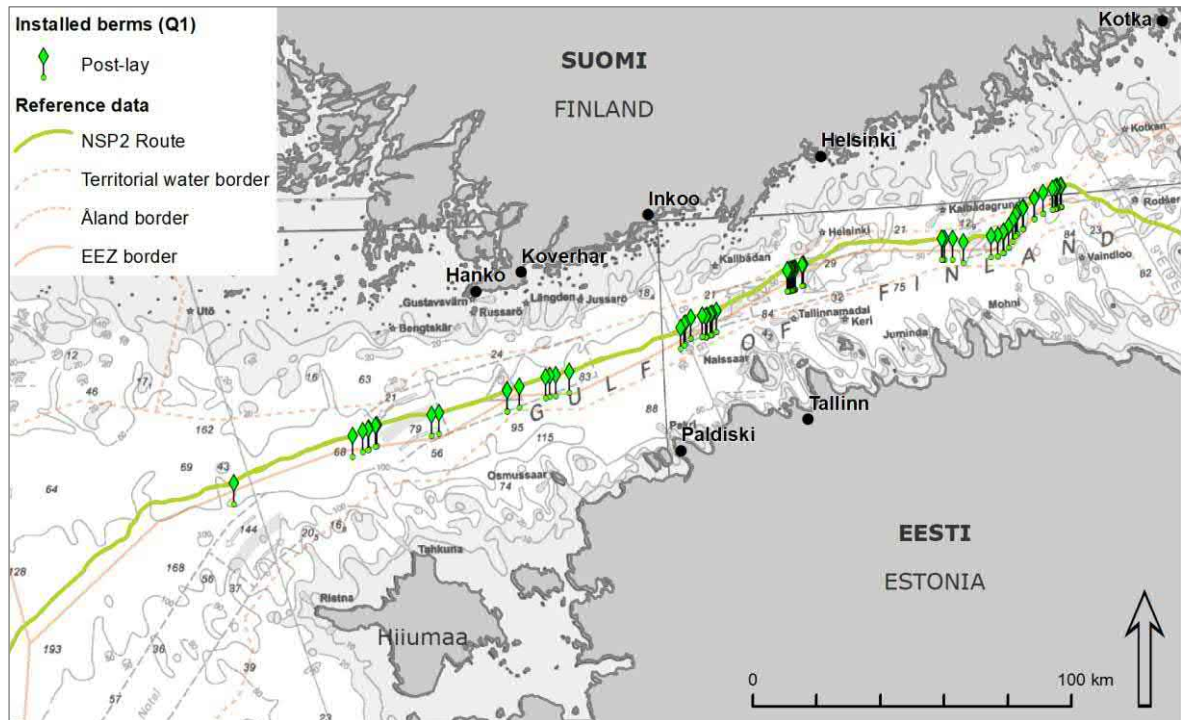


Figure 4. Rock placement during Q1.

Many berms are built in several phases (pre-lay, post-lay, possible top-ups), and the contractors report them upon completion in the as-built register. Therefore, the total number of berms is not the sum of berms reported as “completed” in the as-built register. Similarly, there is a small difference between the total installed value calculated from the latest as-built register and the total installed values calculated as the sum of Q reports. Such discrepancies will be further explained in the Annual Report 2020, to be published in May 2021.

## 4 Water quality and currents

### 4.1 Monitoring activities

Water quality and current velocity was monitored at three stations at the Sandkallan long term monitoring site. Sandkallan site consists of three separate water quality stations. One of them is equipped with profiling current meter (ADCP) measuring flow speeds and directions in separate depth layers covering the whole depth range from the bottom to the surface /7/. Water quality monitoring includes turbidity, oxygen concentration, salinity and temperature measurements in three depth layers near the seabed. The water depth at the stations varies between 49 and 67 metres.

Due to winter conditions, monitoring equipment was not serviced during Q1. Data will be collected, and monitoring equipment serviced during the second quarter.

Table 4. Installation, last service and data recovery of water quality and current monitoring sites.

	Installed	Last service	Next service
Control 1	17.4.2018	8.12.2019	-
Control 2	18.4.2018	10.12.2019	-
Sandkallan	18.4.2018	10.12.2019	Q2/2020

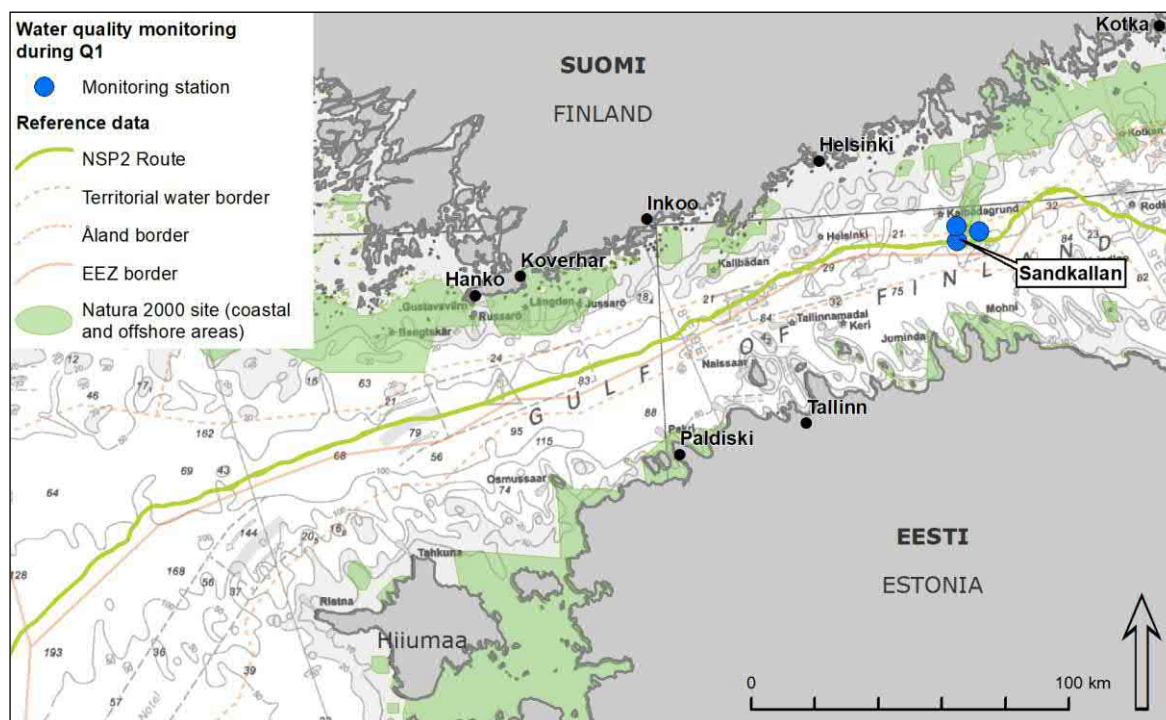


Figure 5. Water quality and current monitoring sites during Q1 2020.

## 4.2 Results

Results of the monitoring during Q1 will be shown in Q2 report, due to late recovery of the data in April 2020.

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## 5 Notifications

One notification related to the construction activities was provided to Finnish authorities on March 27, 2020. It presents the justification for using re-designed route on one section of pipelay of Line A and two sections of pipelay of Line B. At Line A, the route was optimized to accommodate the crossing with Balticconnector gas pipeline from GKP 252 to GKP 261. From GKP 207 to GKP 209 at Line B, the re-routing was done due to a steep slope of the seabed near several cable crossings. The minor deviation took the pipelay to a more even area to guarantee mattress stability at the crossings. From GKP 450 to GKP 453 at Line B, the re-route was necessary due to large boulders at the seafloor, endangering mattress installation and thereby safe cable crossing with a cable of unknown owner. In addition, the notification describes the reason for construction, planned location and construction of an additional berm falling outside the security corridor of Line B prior to construction, as requested in the Water Permit. /8/

## 6 Conclusions

Construction activities in the first quarter of 2020 in the Finnish EEZ consisted solely of post-lay rock placement, which continues in the second quarter of 2020.

Construction work progressed according to plans.

Results of the water quality and currents monitoring during Q1 will be shown in the Q2 report.

Environmental and technical monitoring has been carried out according to the monitoring programme. The results in this report are preliminary. The final results for the year 2020 will be presented in the Annual monitoring report 2020.

## 7 List of references

### Literature

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8. 800-961-PE-EIA-PFI-EMA-200327EN. Minor route deviations and additional berm. Notification to the ELY Centres Uusimaa, Southwest Finland and Southeast Finland. March 27, 2020.

### Maps and GIS data

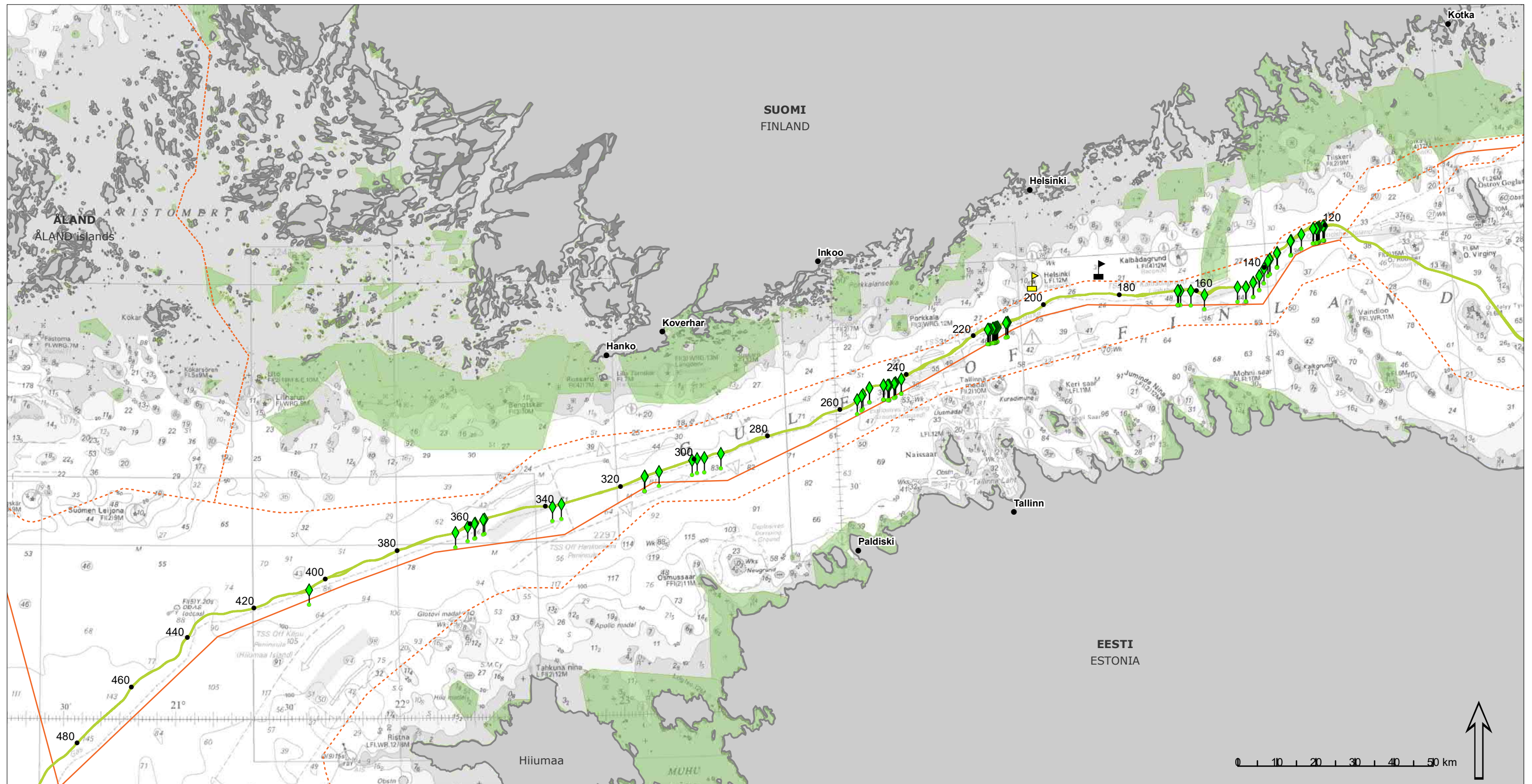
Background admiralty charts, 2018. Charts are not to be used for navigation.

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European Environmental Agency (EEA) 2018. Natura 2000 sites. © Directorate-General for the Environment (DG ENV).

Finnish Environmental Institute (SYKE) 2018. Natura 2000 sites. International Boundaries Research Unit (IBRU) 2010. Borders of the Exclusive Economic Zones and Territorial Waters.





## Nord Stream 2 Construction activities during Q1/2020

### Rock Placement

◆ Post-lay

### Reference data

— NSP2 Route

• Global Kilometre Point (GKP)

▲ Wave data

▲ Wind data

■ Natura 2000 site (coastal and offshore areas)

--- Territorial water border

--- Åland border

— EEZ border

### References:

- Limits of Exclusive Economic Zones and Territorial Waters: IBRU May 2010  
 - Background sea charts are "Not to be used for navigation"  
 - Background sea chart; © Crown Copyright and/or database rights. Unauthorized copying prohibited. See further copyright description in the report.  
 - Natura 2000 sites. EEA and SYKE 2018.

### Annex 1

Version: Q1 report EN ver4  
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 Prepared: Antti Kinnunen  
 Controlled: Sanna Vaalgamaa

### Construction activities during Q1/2020

**SITOWISE**