



Nord Stream 2

Committed. Reliable. Safe.

Nord Stream 2 in Russia: Responsible Project Implementation in the Kurgalsky Reserve

Nord Stream 2 AG | Nov-20





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1. About the Project

Nord Stream 2 is a pipeline through the Baltic Sea to transport natural gas over 1,230 kilometres from Russia to the European market. In Russia, the route crosses a section of about 3.7 kilometres of the Kurgalsky reserve, which is protected on both the national and international levels. All works are carried out in line with Russian legislation and international standards.

The starting point of Nord Stream 2 is located near Narva Bay in the Kingisepp district in the southern part of the Leningrad region. The linear section crosses a small territory of **about 3.7 kilometres in the southern part of the Kurgalsky nature reserve**, which is protected under the Ramsar Convention on Wetlands of International Importance especially as Waterfowl Habitat and the Helsinki Convention on the Protection of Marine Environment of the Baltic Sea Area.



Pic. 1. The innovative open-cut construction method allows for a significant reduction of the construction corridor and potential environmental impacts. (July 2019)

Being fully aware of its responsibility to preserve this sensitive habitat, Nord Stream 2 AG, the project company established for planning, construction and subsequent operation of the pipeline, is committed to implementing the project in **the safest possible manner**. As such, the onshore linear section was built **using special trench boxes** to maintain vertical trench walls, while pipelines were pulled into the flooded trenches using a large winch. This **innovative open-cut construction method** was designed with due consideration of the received public comments specifically for crossing the Kurgalsky reserve. It allowed for the **significant reduction of the construction corridor and potential environmental impacts** during construction of the pipeline.

Construction activities were supported by a broad range of mitigation and compensation measures, and included consideration of the feedback received from experts during



consultations. These measures were approved as part of the positive conclusion of the State environmental expert review on the project documentation.

2. Technical Solutions to Minimise the Construction Corridor's Width in the Kurgalsky Reserve

The optimised method for the linear section's construction using trench boxes was the key measure for reducing environmental impacts at the Nord Stream 2's landfall construction site in Russia.

- The construction corridor and related environmental impacts were reduced by 50 percent.
- This method also reduced approximately 70 percent of the excavated material when compared to a traditional construction technique.
- The local hydrological characteristics were also preserved.

The innovative open-cut construction method, which relies on special trench boxes to maintain vertical trench walls, was specifically designed for crossing the Kurgalsky reserve. It enabled a 50 percent reduction of the construction corridor and a 70 percent optimisation in excavated material when compared to a conventional unsupported trench.



Pic. 2. In the sensitive coastal forest habitat, the works are performed only within a corridor limited to a width of 30 metres. (October 2019)

In the most sensitive habitats, the construction was performed only within the corridor with a **width of 30 metres** – the narrowest feasible construction corridor for a pipeline of such capacity. In comparison, the traditional technique would have required an **85- to 100-metre-wide** trench. At the 400m section traversing the **highest dune**, the construction corridor was limited to **40 metres**.



Pic. 3. Construction at the section with the highest dune. (July 2019)

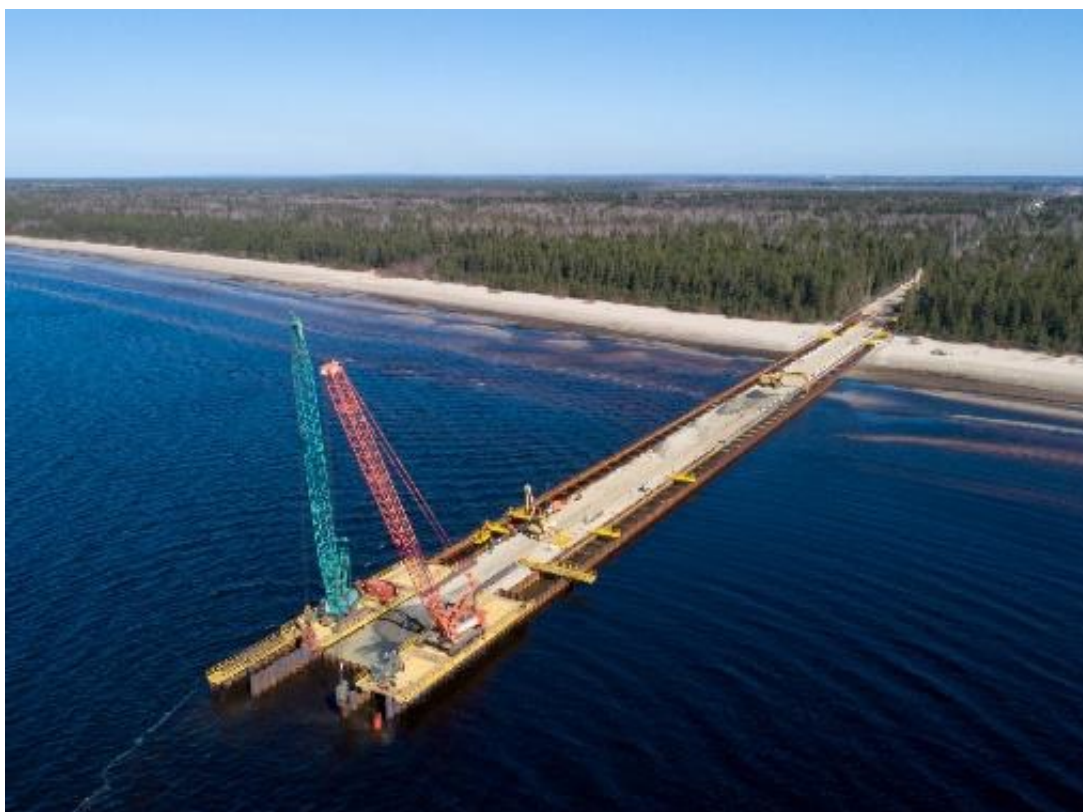
Nord Stream 2's innovative method was a departure from traditional pipelaying, as it was not **performed by heavy equipment** (such as side booms) and **did not require welding alongside the trench**.

Instead, **the pipes were welded outside the reserve and the pipelines were pulled** in a flooded trench from either end by a large, centrally placed winch. This removes the need for dewatering and ensures the **preservation of the local hydrological regime**.

The combination of using trench boxes and pulling welded pipes in a flooded trench has a number of environmental benefits: **the groundwater levels** and, consequently, **the local hydrological regime was preserved** during and after construction; **the amount of heavy equipment was significantly reduced**; and **noise emissions** and other impacts on flora and fauna were minimised.



Pic. 4. Pulling the pipeline through the trench with a large winch. (July 2019)



Pic. 5. The cofferdam limits the spread of suspended sediments during trenching and backfilling at the nearshore section. (July 2019)

To minimise the trench and related impacts at the shore crossing during construction, **a 460-metre cofferdam** was built at **the nearshore section**. The temporary structure consisted of parallel vertical steel walls and limited the quantity of excavated material and the spread of suspended sediments during trenching and backfilling at the nearshore section. Upon the pipelay completion, the cofferdam was removed.

3. Local Hydrology Preservation and a Responsible Approach to Reinstatement

As a responsible developer of an infrastructure project, Nord Stream 2 paid special attention to preserving the local hydrological regime and ensuring the successful reinstatement in the Kurgalsky reserve, which is a wetland of international importance.

The innovative open-cut construction method was one of **the key measures for the preservation of the local hydrological regime**. As opposed to the traditional open-cut construction technique, **groundwater was not drained from the trenches** built with trench boxes. Pipes were welded outside the Kurgalsky reserve and pulled **into the flooded trenches**.



Pic. 6. A groundwater management system maintains water levels within trenches. (July 2019)

Once construction was completed and trench boxes are removed, **the entire area was reinstated**. **The twin pipeline corridors (approximately 7.5 metres wide)** will be maintained free of trees and naturally vegetated as required by Russian safety standards that forbid planting trees over or near high-pressure pipelines.



Given that local biodiversity depends directly on saturated soils, preserving **groundwater levels in their natural state** is one of the keys to **successful reinstatement**. As such, the **area's microrelief** will also be reinstated to preserve natural surface runoff, and **soil and peat will be backfilled maintaining the natural layers**.

The Kurgalsky reserve's special status demands that reinstatement meets high standards, one of which is ensuring that **vegetation is given the opportunity to regenerate naturally**. To facilitate this, the company separated **the living top peat and lower peat layers and stores them separately**. Topsoil was also carefully segregated from subsoil and stored separately.



Pic. 7. Topsoil stockpiles (July 2019)

The 3.7-kilometre linear section covers a range of soils and ecosystems: from forested sand dunes to swamps. The company's soil storage **system records each soil type and the location** from which it was extracted.



Pic. 8. Topsoil stockpile, with original location recorded. (July 2019)



Pic. 9. Watering excavated peat to prevent drying out. (July 2019)

During construction, it is important to **prevent the excavated peat and its seed bank from drying out**, as **preserving peat in its original state** is one of the keys to successful reinstatement. To this end, subcontractors **regularly watered the stored peat stockpiles**.



Pic. 10. Backfilling the trenches with stored peat. (July 2019)

Once the welded pipe strings were pulled through and trench boxes were removed, the trenches were **backfilled with the peat and soil in layers** to maintain its hydraulic properties, preserve hydrology, and enable habitat recovery. As part of the reclamation of the onshore section of the Nord Stream 2 gas pipeline, hydroseeding was carried out in September 2020.



Pic 11. Hydroseeding as part of the construction corridor reclamation. (September 2020)



The reclamation process consisted of two stages: technical (surface marking, restoration of the terrain, backfilling of the upper fertile soil layer) and biological (hydroseeding). Biological reclamation was carried out within the construction site and landfall in Russia and included the creation of surface grass cover by hydroseeding. In the area of the dune crossing, the slopes were pre-strengthened and covered with previously removed soil-vegetation to create a top fertile layer. Hydroseeding on the relic dune section was carried out along the entire width of the construction corridor, including the surface of slopes and the restored surface of the dismantled access road. The main control method was visual inspection of the reclaimed areas. Hydroseeding works were completed in autumn 2020.

4. Minimisation of the Impact on Flora and Fauna of the Kurgalsky Reserve

Pre-construction measures

As part of the construction corridor's preparation, the company implemented a wide range of mitigation measures to minimise impact on the reserve's biodiversity. Reducing the width of the construction corridor **by 50 percent** through the use of an innovative construction method helped **to avoid direct impacts on flora and fauna by reducing area to be cleared of vegetation**.

As a result of detailed environmental surveys and thorough pre-construction monitoring, **protected species' habitats** were identified within and near the construction corridor. As required by Russian legislation, Nord Stream 2 took all the necessary measures **to preserve the protected plants** found within the corridor (such as relocating them to other suitable habitats) **before any construction or vegetation clearance took place**. These works were completed by the end of 2018. The preliminary results of the ongoing monitoring confirmed that **the relocation measures were successful**.



Pic. 12. Successfully relocated Small Pasqueflower, Red Data Book of the Russian Federation. (May 2019)



Pic. 13. Successfully relocated Eastern Pasqueflower, Red Data Book of the Leningrad Region. (May 2019)



Several protected species were identified near the construction corridor and outside the Kurgalsky reserve. Their relocation was not envisaged, however their **locations were marked**, and warning signs were installed.

As a result of the pre-construction surveys, **a protected white-tailed eagle's nest** was discovered not far from the construction corridor. The innovative construction method allowed for the **reduction of the corridor width at the area near the nest, and thus the related potential impacts on the bird**. Taking into consideration best international practices, in 2017, even before construction works had commenced, the company installed **six nesting platforms** in the southern part of the Kurgalsky reserve. It allows the eagle to choose alternative breeding sites.



Pic. 14. Artificial nesting platforms for large birds installed prior to the construction works. (July 2019)

Monitoring of installed platforms, performed as part of the comprehensive ornithological monitoring carried out by the leading regional experts, revealed that **birds do not use the artificial platforms**. The monitoring will be continued.

Measures implemented during construction

Preserving biodiversity in the Kurgalsky reserve is one of Nord Stream 2's key priorities. In this regard, a range of mitigation measures was implemented during the construction stage to minimise impacts on flora and fauna.



Pic. 15. Vehicle wheels' cleaning at the entrance to the reserve. (July 2019)

The penetration and spread of invasive (alien) plant species was one of the threats to the biodiversity of the reserve. In order to **prevent the invasion of alien plant species** on vehicle wheels during freight transportation and construction activities, the company organised **the wheel cleaning stations** at the exit points (a common industry practice primarily implemented to prevent the contamination of public roads) and at the **entrance of the reserve**.



Pic. 16. Dust suppression during periods of dry weather. (July 2019)

During periods of hot and dry weather, regular **dust suppression** activities were carried out **to minimise the spread of dust on plants** located in the immediate vicinity to the construction corridor and **provide comfortable working conditions for personnel**.

In all construction activities there is a risk of lubricants being accidentally spilled into the environment. To mitigate the impact of such accidental releases, **Nord Stream 2 has ensured that, where appropriate, hydraulic oils and grease products are replaced with environmentally acceptable (biodegradable) lubricants**. These measures are applied to a wide range of machinery used in the project: from **chainsaws** used during vegetation clearance, to heavy equipment such as **excavators, hydraulic vibratory pile drivers and cranes** for the onshore construction, as well as **dredgers and other vessels** for the offshore activities. The use of environmentally acceptable (biodegradable) lubricants is a **voluntary commitment of Nord Stream 2 that goes beyond statutory requirements**.



Pic. 17. Machinery running on biodegradable lubricants to minimise impacts on biodiversity. (September 2018)



Pic. 18. Machinery running on biodegradable lubricants to minimise impacts on biodiversity. (December 2018)

A range of measures was also implemented **to mitigate impacts on fauna**. In line with the list of measures approved by the competent authorities, when technically possible, **sea navigation routes were selected** to ensure maximum possible distance to key habitats of marine mammals and birds in the northern part of the Kurgalsky Peninsula. Vehicles transporting freight for the project from the port of Ust-Luga to the construction site in the Narva Bay **used a longer route. The construction schedule was optimised** in line with important periods for marine mammals, ichthy- and ornithofauna. For example, prior to the vegetation clearance along the planned route, environmental experts advising Nord Stream 2 on a wide range of environmental issues confirmed that the **bird nesting period had ended**.

In order to ensure the possibility of crossing the construction corridor at the relict dune area, which is approximately in the middle of the linear section, a special passage for animals was organised. The effectiveness of this measure has been confirmed by the monitoring data of 2020.

The construction site was also fenced off to prevent animals from falling into the trench.



Pic. 19. Fencing off the territory to prevent wild animals from falling to the trench. (July 2019)



Pic. 20. Special passage for animals. (July 2019)



5. Multi-Level Control and Oversight System to Ensure Compliance with the Environmental Commitments

Comprehensive environmental monitoring programme

As part of the Nord Stream 2 project in Russia, an environmental monitoring programme has been implemented, involving a broad range of specialised subcontractors. It enables the comparison of actual environmental impacts with the data estimated in the Environmental Impact Assessment report. The monitoring programme has been approved as part of the positive conclusion of the State environmental expert review issued by the Russian Federal Service for Supervision of Natural Resource Use (Rospirodnadzor).

- > On the offshore section, over 30 monitoring stations with different parameters were set up. The disposition of the stations was dictated by the particular features of the water area. The network ensures the data's representability.
- > On the nearshore section, where environmental sensitivity is greater, the network spacing is considerably closer.
- > Additional monitoring of salmon migration is performed in the spring and autumn periods.
- > Over 20 monitoring stations have been organised onshore, supplemented by transect surveys.

External auditors ensure compliance with Russian legislation and international standards

Construction activities are being monitored by the competent authorities, such as Rospirodnadzor, regional Committee for State Environmental Control and the Leningrad region's Forestry Department and others, which regularly receive reports and inspects the construction site.

As a responsible developer of an international infrastructure project, and as part of the commitments to preserve biodiversity at the Kurgalsky reserve and comply with international standards, Nord Stream 2 follows a multi-level control and oversight system to ensure that the activities are performed to the highest safety and environmental standards. For that purpose, the company retained two independent watchdogs and an environmental auditor beyond the requirements of national legislation to oversee activities in Russia:

- > VNII Ecology: project activities within the Kurgalsky reserve are being audited by a prominent Russian research institute with special expertise on the management of protected areas.
- > Royal HaskoningDHV: a leading international engineering and environmental consultancy has been retained as a watchdog to ensure compliance of the activities performed at the onshore and nearshore sections with international standards.
- > ERM, a global provider of environmental, health, safety, risk, and social consulting services, regularly audits the onshore construction activities against the project Environmental and Social Management System.



None of the independent watchdogs or consultants discovered critical discrepancies in the company's or subcontractor activities with Russian legislation, international standards or project documentation. No violations were found during Nord Stream 2's activities in the Kurgalsky nature reserve. All comments and recommendations provided by watchdogs and consultants are technical in nature and are aimed at further improving the company's sustainable performance.

6. Environmental and Community Initiatives Programme

In addition, the company is implementing the **Environmental and Community (ECo-I) Initiatives Programme** to ensure sustainable project implementation and benefits for the environment and communities in the project area in the Kingisepp District. The programme covers the following categories: **statutory compensation measures, biodiversity enhancement initiatives, community initiatives and sponsorship**. Beyond compliance with mandatory Russian legislation, Nord Stream 2 has committed to the environmental and social sustainability standards of the International Finance Corporation (IFC PS).

In the summer of 2018, Nord Stream 2 supported the Kingisepp Forestry Unit with the maintenance of firebreaks **to prevent fires** in the Kurgalsky reserve. The firebreaks consist of ditches with bevelled edges, dug down to the subsoil. In order to protect the area's biodiversity value from spreading wildfires, the breaks are to be maintained in good condition. As such, **over 80 kilometres of firebreaks were renovated** across the reserve, which entails redistributing and levelling the subsoil with a plough.



Pic. 21. The maintenance of firebreaks in the Kurgalsky reserve. (August 2018)



The company also purchased and handed over to the Kingisepp Forestry Unity a fire monitoring **CCTV-camera** to be installed in the southern part of the Kurgalsky reserve and connected with **the regional fire detection system**.

In May 2019, the company kickstarted **a hogweed eradication campaign in the Kurgalsky reserve and adjacent territories**, mainly within the Kuzemkinsky rural settlement. This programme draws on the results of the 2018 unique studies of invasive plant species, carried out by the experts from **the All-Russian Institute of Plant Genetic Resources (VIR), the leading Russian research institute in plant genetics**. VIR also provides scientific guidance for the eradication campaign. It is a four-stage project with hogweed being removed mechanically, as it is prohibited to use herbicides in the reserve and water conservation zones. Plants have been removed from **an area of 150 hectares** in the Kuzemkinsky rural settlement and adjacent territories.

7. Publication of a Report by the Ramsar Secretariat on the Kurgalsky Nature Reserve

In spring 2020, the Ramsar Secretariat published a report on its visit to the Kurgalsky reserve. The Advisory Mission acknowledged and commended the undertakings by Nord Stream 2 AG **to minimise impacts** of its construction activities and to support **long-term rehabilitation**, restoration and site management of the Kurgalsky Peninsula Ramsar Site and Nature Reserve.

The Advisory Mission also endorsed Nord Stream 2 AG's efforts to develop proposals for the Kurgalsky reserve management plan. The project is being implemented in agreement with the Committee for Natural Resources of the Leningrad Oblast. The initiative also involves JSC Ecoproject and the St. Petersburg State University. Together, Nord Stream 2's partners have conducted studies into tourism load and the impact of unregulated tourism on the Kurgalsky reserve. A so-called Visioning Study, which serves as a strategic basis for the management plan proposal, has also been carried out to assess the Kurgalsky reserve's conservation requirements, identify threats and opportunities for its sustainability, and develop a framework to improve biodiversity preservation, including measures to promote sustainable tourism and thereby reduce its footprint and associated adverse impact.

The Advisory Mission's report confirmed the findings of Nord Stream 2 AG's environmental monitoring of the pipeline's offshore and onshore impacts. Previously released monitoring results showed that construction activities in 2018 and 2019 were in line with or below the assessed impacts in national environmental impact assessments (EIAs). Monitoring also showed that any impacts were temporary and local in nature, as confirmed by leading Russian and international companies retained as external watchdogs to oversee the company's compliance with commitments and high environmental standards when working in the Kurgalsky reserve.



For more information about Nord Stream 2, please visit our website: <https://www.nord-stream2.com/>.

For more information about the Environmental and Community Initiative Strategy (ECo-I): <https://www.nord-stream2.com/responsibility-sponsoring/eco-i-russia/>

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About Nord Stream 2 AG

Nord Stream 2 is a planned pipeline through the Baltic Sea, which will transport natural gas over 1,230 km from the world's largest gas reserves in Russia via the most efficient route to consumers in Europe. Nord Stream 2 will largely follow the route and design of the successful Nord Stream pipeline. With Europe's domestic gas production projected to halve in the next 20 years, Nord Stream 2's twin pipeline system will help Europe to meet its future gas import needs, with the capacity to transport 55 billion cubic metres of gas per year, enough to supply 26 million European households. This secure supply of natural gas with its low CO₂ emissions will also contribute to Europe's objective to have a more climate-friendly energy mix with gas substituting for coal in power generation and providing back-up for intermittent renewable sources of energy such as wind and solar power.

www.nord-stream2.com