NON-TECHNICAL SUMMARY
MYKOLAIV WATER SUPPLY
SUB-PROJECT- 2_MYK_501

TECHNICAL ASSISTANCE FOR UKRAINE MUNICIPAL INFRASTRUCTURE PROGRAMME PROJECTS PREPARATION AND IMPLEMENTATION SUPPORT (FUNDED BY NIP) AA-010067-001

11 August 2025

This technical assistance operation is financed by the EU Neighbourhood Investment Platform (NIP), a mechanism aimed at mobilizing additional funding to finance capital-intensive infrastructure projects in EU partner countries covered by the European Neighbourhood Policy (ENP) in sectors such as transport, energy, environment and social development. The NIP is an integral part of the European Fund for Sustainable Development (EFSD) which is the first pillar of the EU's External Investment Plan.

Document Information

GENERAL INFORMATION

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Document Scope	110 pages
Version	V01
Link	
CRM Number	
Chrono	

CHANGELOG

Version	Date	Prepared by	Verified	Changes
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LIST OF ACRONYMS AND ABBREVIATIONS

AMC	Adverse Meteorological Conditions
ASIL	Approximate Safe Impact Level
BMF	Building of Main Facilities
CMP	Construction Management Plan
CMU	Cabinet of Ministers of Ukraine
COD	Chemical Oxygen Demand
CP	Calculation Point
CWR	Clean Water Reservoir
DBN	Ukrainian State Construction Standard
DSP	State Sanitary Rules
EFSD	European Fund for Sustainable Development
EIA	Environmental Impact Assessment
EIB or Bank	European Investment Bank
EL	Exposure Limit
ENP	European Neighbourhood Policy
ESAP	Environmental and Social Action Plan
ESMP	Environmental and Social Management Plan
EU	European Union
FS	Feasibility Study
GAC	Granular Activated Carbon
LU	Law of Ukraine
MPA	Meteorological Potential of the Atmosphere
MPD	Maximum Permissible Discharge
MSW	Municipal Solid Waste
MUC	Municipal Utility Company "MYKOLAIVVODOKANAL"
NIP	Neighbourhood Investment Platform
NMVOCs	Non-Methane Volatile Organic Compounds
NRF	Nature Reserve Fund
pH	Hydrogen Index
PS	Pumping Station
RO	Reverse Osmosis
SE	Source of Emission
SPL	Sound Pressure Level
STEL	Short-Term Exposure Limit for Pollutants
TA SP	Technical Assistance Service Provider
TWA	Time-Weighted Average for the Exposure to Pollutants
UMIP	Program for the Development of Municipal Infrastructure of Ukraine
USRIEP	Ukrainian Scientific Research Institute of Ecological Problems
WEL	Exposure Limit for Harmful Substances in Workplace Air
WMP	Waste Management Plan
WTP	Water Treatment Plant

1 - NON-TECHNICAL SUMMARY

Name of the document: Environmental Impact Assessment (EIA) Report on the reconstruction of water treatment plant (WTP) in Mykolaiv

Employer: MUC "Mykolaivvodokanal"

Financing: European Investment Bank (EIB)

Project location: The territory of existing WTP in Mykolaiv, located at 324-e, Yantarna Street, Korabelnyi District, Mykolaiv, Mykolaiv Region.

Planned activities, in accordance with paragraph 10 (construction of dams and installation of other equipment for the retention or accumulation of water for long periods of time) and paragraph 13 (economic activities leading to the discharge of pollutants into water bodies) Part 3 of Article 3 of the Law of Ukraine "On Environmental Impact Assessment" dated 23 May 2017 No. 2059-VIII belongs to the second category of activities and objects that may have a significant impact on the environment and are subject to environmental impact assessment. The planned activities will be financed with foreign loans backed by state guarantees.

The shelling by Russian forces in 2022 of critical water supply infrastructure in the city, including the water intake pumping station and main water pipes from the water intake point on the Dnipro River, caused significant damage, leaving the city of Mykolaiv without a safe or sufficient supply of drinking water. In 2022, water with a high mineral content was supplied to the city's network from the Dnipro-Buh Estuary, which led to the destruction of significant sections of steel pipelines.

The state of the water supply system deteriorated significantly in 2023 when Russia destroyed the Kakhovka hydroelectric power plant dam, causing further damage downstream along the Dnipro River. This had a negative impact on water intake facilities in the Kherson region and left the city of Mykolaiv without access to a reliable source of drinking water.

The city of Mykolaiv has not been supplied with drinking water of the required quality in recent years. At the end of 2024, the city was still supplied with water that did not meet established standards through an irrigation canal (Snihuriv) on the Inhulets River, a tributary of the Dnipro River.

These changes in the city's water supply system, which took place in 2022-2023 due to Russian military aggression, also significantly affected the operation of the waste treatment plants (WTPs) in Mykolaiv (village of Halytsynove). The city's population has a mixed water supply system, which has complicated the work of municipal wastewater treatment plants due to the discharge of salt concentrate with a mineralisation of 2.3-11.0 g/m3 (exceeding the requirements of DSanPiN 2.2.4-171-10 for mineralisation by up to 11 times) into the sewerage network.

The overall objective of the city's water supply is to ensure a sustainable and safe water supply in the required quantity and quality through the use of the following sources:

- Snihurivka irrigation canal (Inhulets River);
- Dnipro River;
- Southern Buh River in the area of Nova Odesa;
- Vitovske (formerly Zhovtneve) reservoir;
- Buh Estuary (for emergency short-term use).

To this end, the existing WTP will be reconstructed and a new technological chain will be installed, which will allow water from any of the above-mentioned sources to be purified to drinking water quality standards.

Although the desired future scenario is to supply the city from the Dnipro and/or Southern Buh rivers via the Zhovtneve (Vitovske) reservoir, the only available water sources at present are the Inhulets River as the main source and the Buh Estuary as an emergency short-term source. Water from both sources requires purification according to microbiological indicators, as well as turbidity, colour, organic matter content, and desalination.

While water from the Inhulets has a salinity of up to 3,500 mg/dm^3, water from the Bug Estuary has a total soluble solids content of up to 12,000 mg/dm^3. To this end, it is planned to reconstruct the existing water treatment facilities of the WTP.

The positive impact on the social environment will be to provide the city of Mykolaiv with high-quality drinking water. Drinking water will comply with the requirements of DSanPiN 2.2.4-171-10 "Hygienic requirements for drinking water intended for human consumption" and the EU Drinking Water Directive 2020/2184.

Thanks to the reconstruction of water treatment facilities in Mykolaiv and the introduction of modern water treatment technology from five different sources, the reliability and sustainability of water supply for the city of Mykolaiv is ensured. This approach guarantees uninterrupted drinking water supply even in emergency situations, including those caused by military actions, and reduces the city's dependence on individual water sources. The implementation of this project is an important step towards strengthening water security and improving the resilience of critical infrastructure in times of crisis.

Impact of planned activities on the air environment

Reconstruction

During the preparatory and construction works, the gross emissions of pollutants into the atmosphere will amount to 3.721 tonnes per year.

During construction work on the construction site and on the boundary of the first line of residential development, the concentration of any pollutant shall not exceed the hygienic standards for air in populated areas and shall comply with the requirements of the current sanitary legislation of Ukraine.

Operation

During operation of the WTP after reconstruction, gross emissions of pollutants into the atmosphere (including carbon dioxide) will amount to 181,046 tonnes per year.

During operation of the WTP at the boundary of the first line of residential development, the concentration of any pollutant will not exceed the hygienic standards for air in populated areas and will comply with the requirements of the current sanitary legislation of Ukraine.

Impact of planned activities on the aquatic environment

Reconstruction

In order to protect the aquatic environment, the Construction Method Statement sets out the following requirements:

- runoff generated on the construction site (the WTP territory) will be collected and removed using the rainwater collection system existing on the WTP territory. The Method Statement provides for two mobile reinforced gantries for washing the wheels of construction equipment, each equipped with a pallet and special side screens. Waste water after washing shall be collected by special vehicles and transferred to a specialised organisation in accordance with the agreement concluded.

- technical inspection, cleaning and washing of construction machine bodies, as well as refuelling of equipment on the construction site of the facility is not provided for and will take place in specially designated and organised locations (outside the construction site at special refuelling stations) in accordance with the requirements of Ukrainian legislation.

- surface drainage, slope reinforcement;

- equipping construction sites with special areas for waste and rubbish collection and disposal, installing bio-toilets and fencing off the territory;

- use of modern environmentally friendly, energy-efficient construction equipment and technology.

To minimise the negative impact of earthworks, dust suppression (hydro-dust removal) will be carried out. To this end, its moisture content must be brought to 8%. According to preliminary data, approximately 4,000 m^3 of fertile soil and 35,600 m^3 of soil will be removed in connection with the construction of a pipeline for

transporting brine. Water used for dust suppression is irretrievable and will amount to 3,168 m^3/year. Water will be supplied from a technical water supply system.

During construction, the impact on the aquatic environment is considered acceptable and insignificant.

Operation

The reconstruction of the wastewater treatment plant in Mykolaiv involves the construction of a station for the treatment (purification) of wash water and its reuse (purified wash water is fed into the head of the WTP), while the removed and dewatered sludge is disposed of (transported to a solid waste landfill), ensuring a closed filter washing cycle. This will have a positive impact on the aquatic environment, as 16,731.6 tonnes of sludge from wash water per year will not enter the Vitovka River and the Buh Estuary, but will be transported to a solid waste landfill.

Impact of planned activities on groundwater

Reconstruction: No impact.

Operation: No impact.

Impact of planned activities on public health

Reconstruction

During construction work on the edge of residential buildings, the concentration of pollutants in the air and noise pollution from construction equipment in residential areas will comply with health requirements. Equivalent sound levels during the day will be 48.2 dBA. During the reconstruction work, temporary inconveniences may occur due to the movement of heavy vehicles on adjacent local roads.

The impact on the social environment is considered acceptable.

Operation

During the operation of the WTP at the edge of residential buildings, the concentration of pollutants in the atmospheric air will comply with sanitary requirements.

There is a negligible probability of harmful effects on the respiratory system in case of non-compliance with the requirements of the OHS regarding the use of personal protective equipment during associated works on the territory of the WTP.

According to calculations, the risk of carcinogenic effects from the planned activity is acceptable.

The results of risk calculations showed that the operation of the WTP in Mykolaiv will not have a negative impact on public health.

Impact of planned activities on flora and fauna

Reconstruction

The estimated total number of green spaces to be removed is 260.

At the next stage of design, a list of green spaces to be removed will be drawn up and compensation measures will be planned.

Due to the fact that all the habitats studied have been modified as a result of human activity, no significant impact on fauna is expected. During the study of the area where construction work is planned, no habitats or species of plants and animals requiring special protection were identified. The activities planned within the existing WTP of the city of Mykolaiv, MUC "Mykolaivvodokanal", will not lead to a transformation of the biodiversity structure within its boundaries.

Operation: No impact.

Impact of planned activities on biodiversity

Reconstruction

During the study of the project implementation area, no habitats or plant and animal species requiring special protection were identified.

The activities planned in the existing WTP of Mykolaiv, MUC "Mykolaivvodokanal", will not lead to a transformation of the biodiversity structure within their boundaries.

Operation: There is no impact on biodiversity during the operation of the WTP.

Impact of planned activities on land and soil

Reconstruction

The reconstruction of the WTP is planned within the existing land plot (cadastral number 4810136600:06:042:0051), with an area of 52.8282 hectares, allocated for the economic activities of the enterprise. There is no vegetation layer in the soil. As for the construction of a pipeline for transporting brine, temporary land allocation with an estimated area of 4.5 hectares is planned for its construction. Before the start of pipeline construction, the fertile soil layer is to be removed, according to geological survey data (approximately 4,000 m^3). The surface soil cover (fertile soil layer) will be removed based on a working land management project developed in accordance with the procedure established by law for the removal and transfer of the fertile soil layer, which will specify the scope of work for the removal, transfer and storage of the fertile soil layer and, in the case of earthworks, also the scope of work for the rational use of the fertile soil layer that is removed or accumulated, the technologies developed and the sequence of work, as well as the costs of their implementation.

The estimated volume of fertile soil removed, amounting to 4,000 m3, will be stored in dumps at the edge of the temporary diversion area and, after completion of the brine pipeline construction, will be returned to its original location to reinforce the disturbed areas in the same quantity of 4,000 m^3. A balance sheet for the fertile soil layer will be drawn up at the next stage of the project.

During the construction of the brine pipeline, an estimated 35,600 m^3 of soil will be removed, with 28,620 m^3 of soil being returned to the trench. As a result of the work, there will be an excess of 6,980 m^3 of soil, which will be transferred either to the Infrastructure Restoration and Development Service in the Mykolaiv region or used as an insulating layer at a solid waste landfill (this issue will be resolved at the next stage of design).

The impact on the soil is temporary. With proper execution of the work and compliance with environmental legislation, the impact can be minimised.

Operation: During operation, the WTP has no impact on the geological environment or soil.

Impact of planned activities on climate factors

Reconstruction: No impact.

Operation:

An analysis of climate projections for Mykolaiv based on the RCP 4.5 and RCP 8.5 scenarios indicates moderate to high risks for the water supply sector, in particular due to rising average air temperatures, more extreme heat waves, changes in precipitation intensity and increased pressure on freshwater ecosystems. At the same time, there is no risk from wind loads. These challenges can be effectively addressed through the implementation of targeted adaptation measures.

The project to reconstruct the water treatment plant (WTP) in Mykolaiv is not only aimed at solving pressing problems with the quality and stability of water supply, but also makes a significant contribution to adaptation to the effects of climate change. Thanks to the introduction of modern treatment technologies, improved energy efficiency, modernisation of engineering infrastructure and reduced water losses, the project will contribute to:

- Improving the resilience of the water supply system to extreme weather conditions, including heat waves and precipitation fluctuations.
- Reducing anthropogenic pressure on freshwater ecosystems by reducing water losses and introducing technologies for the reuse of treated water.

- Optimising energy consumption and reducing greenhouse gas emissions, which is an important component on the path to climate neutrality.
- Improving the microclimate of the site, in particular through planned greening measures, heat-resistant materials and passive cooling.

Thus, the implementation of the project will have not only engineering and technical significance, but also environmental and climatic significance, contributing to the adaptation of urban infrastructure to climate change and the sustainable development of the Mykolaiv region.

Impact of planned activities on archaeological and cultural heritage sites

Reconstruction

There are no cultural heritage sites in the vicinity of the WTP. The only historical monument located 100 m from the pipeline construction site for brine transportation is the Mohyla-Mayachna burial mound. . There is no information about the official protection status of the Mohyla-Mayachna burial mound.

Due to the significant distance between the burial mound and the brine pipeline construction site, the impact is considered insignificant. However, the project provides for more detailed research at the next stage of design and the development of an Action Plan in case an object with signs of archaeological heritage or historical and cultural heritage is identified.

Operation: No impact.

Impact on the landscape

Reconstruction No impact.

Operation: During operation, the WTP has no impact on the landscape.

Impact of planned activities on socio-economic conditions

Reconstruction

During construction work on the edge of residential buildings, the concentration of pollutants in the air and noise pollution from construction equipment in residential areas will comply with health requirements. Equivalent sound levels during the day will be 48.2 dBA. During the reconstruction work, temporary inconveniences may occur due to the movement of heavy vehicles on adjacent local roads.

The impact on socio-economic conditions is considered acceptable and insignificant.

Operation

During operation of the WTP at the boundary of the residential area, the concentration of pollutants in the atmospheric air and noise levels in the residential area will comply with sanitary requirements. Equivalent sound levels during the day will be 35.8 dBA.

The impact on the social environment is considered positive.

The positive impact on the social environment will be to provide the city of Mykolaiv with high-quality drinking water. Drinking water will comply with the requirements of DSanPiN 2.2.4-171-10 'Hygienic requirements for drinking water intended for human consumption' and the EU Drinking Water Directive 2020/2184.

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Impact on the environment caused by light, heat, radiation pollution, electromagnetic and ionising radiation

Reconstruction

The project does not provide for construction work at night. Light pollution is not expected.

Heat pollution may occur during the construction of the reinforced concrete pavement of the WTP territory. The road surface may heat up when the air temperature reaches +28°C to 40-42°C. When laying the road surface on the WTP territory, a separating layer made of geosynthetic material with a surface density of 400 g/m2 is to be used, which has very low thermal conductivity and will therefore not affect soil heating.

The use of installations, equipment and materials that emit radiation pollution into the environment, as well as electromagnetic or ionising radiation at the facility, is not expected.

Operation

During WTP operation, there is no environmental impact from light, heat, radiation, electromagnetic or ionising radiation.

Waste

Reconstruction

The estimated amount of waste generated during the reconstruction process is 22,312.7 tonnes. Industrial and domestic waste will be stored in metal containers with lids, installed in designated areas. Temporary waste storage areas will be provided with a solid covering to prevent hazardous waste components from entering the soil. Waste will be accumulated to volumes that allow for its transfer in terms of economic feasibility, subject to compliance with applicable industrial waste management regulations.

Operation

The estimated annual amount of waste from the operation of the WTP is 16,842.812 tonnes, of which 16,731.6 tonnes/year is dehydrated sludge.

A site with separate waste collection containers is planned for temporary storage of waste. Waste will be sorted according to class and taking into account the possibility of further use. Separate containers will be allocated for glass, waste paper, metal products and polymers. Solid household waste will be regularly transported to the municipal solid waste landfill.

Conclusions

The proposed project is technically and socially feasible, complies with Ukrainian environmental legislation and EU standards, and will ensure a reliable and safe water supply for the city of Mykolaiv. It will reduce dependence on a single water source and make the water treatment system more resilient to crisis situations.

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