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BLACK SEA RIVER BASIN MANAGEMENT PLAN 2025-2030

CONTENTS

1 GENERAL CHARACTERISTICS OF SURFACE AND GROUNDWATER 5

1.1. Description of the river basin 5
1.1.1. Hydrographic and water management zoning 5
1.1.2. Climate 5
1.1.3. Relief 5
1.1.4. Geology 6
1.1.5. Hydrogeology 6
1.1.6. Soils 6
1.1.7. Flora 6
1.1.8. Fauna 7
1.1.9. Hydrological regime 7
1.1.10. Specifics of the river basin 7
1.1.11. Typology of surface water bodies 8
1.1.12. Reference conditions 9

1.2. Water bodies delineation 10
1.2.1. Surface water 10
1.2.2. Groundwater 13

2 SIGNIFICANT ANTHROPOGENIC IMPACTS ON THE QUANTITATIVE AND QUALITATIVE STATUS OF SURFACE AND GROUNDWATER, INCLUDING POINT AND DIFFUSE SOURCES 15

2.1. Surface water 15
2.1.1. Organic pollution 19
2.1.2. Nutrients pollution 22
2.1.3. Pollution by hazardous substances 27
2.1.4. Accidental pollution and impact of contaminated areas (landfills, sites, zones, etc.) 27
2.1.5. Hydromorphological changes 28

2.2. Groundwater 29
2.2.1. Pollution 29
2.2.2 Volumes / reserves 30
2.2.3 Other significant anthropogenic impacts 33

3 ZONES (TERRITORIES) TO BE PROTECTED AND THEIR MAPPING 37

3.1. Emerald Network sites 37

3.2. Sanitary protection zones 38

3.3. Protection zones for valuable aquatic bioresources 39

3.4. SWBs / GWBs used for recreational, medical, resort and health purposes, as well as water intended for bathing 39

3.5. Areas vulnerable to (accumulation of) nitrate 40

3.6. Vulnerable and less vulnerable areas identified in accordance with the criteria approved by the Ministry of Environment 40

4 MAPPING OF THE MONITORING SYSTEM, RESULTS OF MONITORING PROGRAMMES FOR SURFACE WATER (ECOLOGICAL AND CHEMICAL), GROUNDWATER (CHEMICAL AND QUANTITATIVE), AREAS (TERRITORIES) TO BE PROTECTED 42

4.1. Surface water 42
4.1.1. Monitoring system 42
4.1.2. Hydromorphological assessment / status 42
4.1.3. Chemical status assessment 43
4.1.4. Ecological status assessment 46
4.1.5. Ecological potential assessment 47

4.2 Groundwater 48
4.2.1 Monitoring system 48
4.2.2 Chemical assessment / risk assessment 49
4.2.3 Estimation of groundwater volumes/reserves 49

5 A LIST OF ENVIRONMENTAL OBJECTIVES FOR SURFACE WATERS, GROUNDWATER AND PROTECTED AREAS (TERRITORIES) AND DEADLINES FOR THEIR ACHIEVEMENT (IF NECESSARY, JUSTIFICATION FOR SETTING LESS STRINGENT OBJECTIVES AND/OR POSTPONEMENT OF THEIR ACHIEVEMENT) 52

6 ECONOMIC ANALYSIS OF WATER USE 56

6.1 Economic development of the basin area 56

6.2 Characteristics of modern water use 57

6.2.1 Municipal water use 59
6.2.2. Industrial water use 60
6.2.3 Water use in agriculture 60
6.2.4. Water use in transport 61
6.2.5. Other types of water use 61

6.3. Forecast of water demand by major economic sectors 61

6.4. Tools of economic control 63

6.4.1. Payback of water resources use 63
6.4.2. Water tariffs 67

7 A REVIEW OF THE IMPLEMENTATION OF PROGRAMMES OR ACTIVITIES, INCLUDING HOW THE OBJECTIVES HAVE BEEN ACHIEVED 69

8 A COMPLETE LIST OF PROGRAMMES (PLANS) FOR THE RIVER BASIN OR SUB-BASIN AREA, THEIR CONTENT AND PROBLEMS TO BE SOLVED 76

8.1 Surface water 76

8.1.1 Measures to reduce pollution by organic matter, nutrients and hazardous substances (diffuse and point sources) 76
8.1.2. Measures aimed at improving/restoring the hydrological regime and morphological indicators 77

8.2 Groundwater 78

8.3 Other measures 79

9 REPORT ON PUBLIC INFORMATION AND PUBLIC DISCUSSION OF THE DRAFT RIVER BASIN MANAGEMENT PLAN 81

10 LIST OF COMPETENT STATE AUTHORITIES RESPONSIBLE FOR IMPLEMENTING THE RIVER BASIN MANAGEMENT PLAN 83

11 PROCEDURE FOR OBTAINING INFORMATION, INCLUDING PRIMARY INFORMATION, ON THE STATE OF SURFACE AND GROUNDWATER 86

ANNEXES 88

Annex 1. List of identified SWBs in the Azov Sea RBD 89
Annex 2 Characteristics of the identified GWBs and groups of GWBs in the Black Sea RBD 100
Annex 3 List of cases of destruction, stoppages, and disruptions of the technological process of enterprises in the Black Sea RBD 107
Annex 4 List of Emerald Network sites within the Black Sea RBD 108
Annex 5 List of places of recreation and leisure within the Black Sea RBD 110
Annex 6 List of surface water monitoring sites in the Azov Sea RBD 111
Annex 7 Integrated assessment table of the state of the SWBs in the Black Sea River basin for 2021-2023 112
Annex 8 Achievement of environmental objectives for the Black Sea RBD in 2030 113
Annex 9.1 Characteristics of water use in the Black Sea river basin, 2021, million m^3 125
Annex 9.2 Wastewater discharges to water bodies by category of discharged water 125
Annex 10 List of national targeted programmes, regional and local programmes, funds, state investment projects, international technical assistance projects, regional and local infrastructure projects, etc. 126
Annex 11. Full list of mesures presented separately in Excel format 145
Annex 12 Cost-effectiveness analysis of the PoM 146

The maps of the Black Sea River Basin Management Plan for 2025-2030 are attached as a separate file in .PDF format.

LIST OF ABBREVIATIONS

AWB – artificial water body
BOD – Biochemical Oxygen Demand
BUWR – Basin Water Resources Administration
CEA – cost-effectiveness analysis
CMU – Cabinet of Ministers of Ukraine
COD – Chemical Oxygen Demand
EEA – European Environment Agency
EQS – environmental quality standards
EU – European Union
GDP – gross domestic product
GRP – gross regional product
GVA – gross value added
GWB – groundwater body
HMWB – heavily modified water body
LLC – Limited Liability Company
LOQ – limit of quantification
ME – municipal enterprises
MENR – Ministry of Environmental Protection and Natural Resources of Ukraine
NEURC – National Energy and Utilities Regulatory Commission
NNP – natural native park
NRF – Nature Reserve Fund
OSCE – Organization for Security and Co-operation in Europe
PE – population equivalent
PJSC – Public joint stock company
PoM – programme of measures
RBD – river basin district
RBMP – river basin management plan
REPF – Regional Environmental Protection Funds
ROWR – regional office of water resources
SAWR – State Agency of Water Resources of Ukraine
SE – state enterprises
SEF – State Environmental Fund
SEI – State Environmental Inspectorate of Ukraine
SES – State Emergency Service
SFRD – State Fund for Regional Development
STPs – sewage treatment plants
SWB – surface water body
SWMI – significant water management issue
TLV – threshold limit value
TOT – temporarily occupied territories
TPP – Thermal Power Plant
VAT – Value Added Tax
WFD – Water Framework Directive

1 GENERAL CHARACTERISTICS OF SURFACE AND GROUNDWATER

1.1. Description of the river basin

1.1.1. Hydrographic and water management zoning

The Black Sea river basin is entirely located on the territory of Ukraine. The catchment area of the basin's rivers is 26,674 km^2. The basin covers 4.5% of Ukraine's territory.

The Black Sea River Basin District covers the territory of 3 oblasts of Ukraine: Odesa (67.2%), Mykolaiv (11%) and Kherson (21.8%).

The hydrographic network of the Black Sea RBM includes 68 rivers with a catchment area of more than 10 km^2, 3 lakes with a catchment area of more than 0.5 km^2 and 23 reservoirs.

1.1.2. Climate

The climate of the basin is temperate continental with hot, dry summers and mild, snowy, unstable winters. The average temperature in January varies from -5.0°C in the north to -1.8°C in the south; in July, respectively, from +21.0°C to +22.9°C.

Absolute maximum temperatures reach +40°C and above, with minimums of -20°C and below. The frost-free period lasts 130-150 days in the north and 166-208 days in the south.

The annual precipitation within the basin exceeds 450 mm in the north, 400-450 mm in the central part, and 350-400 mm in the southern part. Most of the precipitation occurs during the warm season.

The driest area is in the southeast of the sea coast (Kherson region), where less than 250 mm of precipitation falls during the warm season. Winds from the north and north-west prevail in summer and winter.

The relative humidity is 85-86% in winter and 62-63% in summer. On the sea coast, these figures are significantly higher: 88-90% in winter and 76-78% in summer.

The climate of the basin is arid, and this is its main negative characteristic in terms of agricultural development. The central and southern territories have a high probability of long dry periods of more than 40 days - 60-80% or more, and more than 50 days - 30-40% or more. Adverse climatic events in the basin include dry winds and dust storms (3-8 days per year), thunderstorms (20-26 days), hail (2 days), droughts, and fogs (20-30 days per year) on the sea coast.

1.1.3. Relief

There are two major orographic elements in the basin: the Black Sea Lowland and the Podil Upland.

Most of the territory is located within the Black Sea Lowland, which is a typical plain. Its maximum surface elevations do not exceed 130-150 m and are confined mainly to the northern part. The lowest areas stretch along the sea coast. The dissection is insignificant and decreases from west to east and averages 0.5-0.7 km/km^2.

The north-western part is located on the spurs of the Podilska Upland, which has the highest absolute elevations (up to 288 m) within the basin with deep (up to 80-100 m) erosion valley and ravine dissection.

In the south-west, the basin area is confined to the southern slopes of the Central Moldovan Upland with absolute surface elevations of up to 100-140 m above sea level.

The area is characterised by landforms of various genesis: accumulative, erosion, denudation, subsidence, and artificial. Wide watersheds (primary accumulative plains) are typical for the northern and northeastern parts of the basin.

In the south-east, there are Upper Pliocene marine terraces. Along the sea coast, there are marine accumulative landforms such as beaches, spits, and spits. Some of the sea shores, estuaries and lakes are abrasive, landslide and sometimes landslide.

River valleys and gullies are widespread forms of erosion relief. The combined effect of erosion and accumulation processes created large river valleys with Quaternary and Pliocene floodplain terraces. The transverse profile of the valleys is asymmetrical. Due to the peculiarities of the region's tectonics and differentiated vertical movements of individual blocks, the left slopes of the valleys are steeper and more dissected. Cones of deposition are often found at the mouths of gullies and ravines.

In general, the flatter topography of the territory facilitates intensive economic development of the region.

1.1.4. Geology

The basin is located within the Black Sea Basin. According to the stratigraphic completeness and thickness of the sections, there are two parts: the western part (the sedimentary cover section includes sediments from the Vendian to the anthropogenic) and the eastern part (the sedimentary cover section includes sediments from the Cretaceous to the anthropogenic). The structural plan of both the western and eastern parts is characterised by a gentle dip of the sedimentary strata in the south-western and southern directions. The basement dips in the south and south-west directions.

The basement rocks in this part are overlain by Mesozoic (Lower and Upper Cretaceous) and Cenozoic (Paleogene and Neogene) rocks. The most interesting from the hydrogeological point of view are the carbonate-terigenous deposits of the Neogene, which increase in thickness to the south. The older formations of the Cimmerian-Alpine structural floor are located at considerable depths.

1.1.5. Hydrogeology

The territory of the basin belongs to the Black Sea artesian basin. The hydrogeological conditions of the Black Sea artesian basin are very complex. This is due to the diversity and uneven distribution of both water-bearing and water-resistant sediments, facies and lithological variability of rock composition and the diversity of groundwater quality. Given the peculiarities of hydrogeological conditions, the main aquifers are in Miocene and Pliocene-Quaternary sediments.

The groundwater of the Black Sea artesian basin is also characterised by variability in water salinity and the widespread development of brackish and saline waters.

1.1.6. Soils

The basin's location in the steppe and, to a lesser extent, forest-steppe landscape zones has led to the widespread distribution of black earth soils. Only in the river valleys are meadow-chernozem and meadow and chernozem-meadow saline soils developed.

The soil cover is dominated by chernozems: regraded and typical in the north, ordinary in the central part, southern chernozems in the south, and dark chestnut saline soils in the southeast. Due to the extremely high agricultural development of the territory and intensive ploughing of sloping lands, soil erosion - water and wind erosion (soil deflation) - is widespread in the basin, covering almost half of the cultivated land and causing great damage to agriculture.

According to the agro-soil zoning scheme of Ukraine, there are two agro-soil zones within the basin. The northern part of the basin is part of the Forest-Steppe agro-soil zone with powerful, regraded, leached and podzolic chernozems. Powerful (by profile) soils with low and medium humus content prevail. The steppe chernozem agro-soil zone covers the central and southern parts of the basin and is divided into two agro-soil sub-zones. In the Northern Steppe agro-soil sub-zone with common black soil, low-humus soils of varying capacity prevail: in the north - high and medium capacity, in the south - medium and low capacity. The Southern Steppe agro-soil sub-zone with southern chernozems is distinguished by the distribution of low-humus southern chernozems of medium and low capacity and dark chestnut soils. In this sub-zone, residual-saline chernozems, meadow-chernozem saline soils and saline soils are already developed.

Within the basin, there is a clear zonal differentiation of soils from north-northwest to south, which is complicated by azonal (non-zonal) soils of river valleys.

In general, chernozem soils are highly fertile and constitute the main natural resource of the region. Unfortunately, due to intensive and sometimes improper use, much of the soil cover is degrading significantly. Soils on the slopes suffer from water and wind erosion, which reduces the humus content and their capacity.

1.1.7. Flora

The vegetation cover of the basin is predominantly steppe, with forest-steppe in the north. According to the current geobotanical zoning, the northern territories are part of the Dnipro-Bug geobotanical district of oak steppes. Here, broad-leaved forests are common - oak and oak-hornbeam forests, composed of petiolate oak with an admixture of rock oak. Moving southwards, the meadow steppes are replaced by mixed-grass and fescue steppes with an admixture of steppe vegetation on limestone.

The central part of the basin is occupied by a strip (sub-zone) of mixed-grass-fescue steppes, within which the Saratsky geobotanical district with mixed-grass-fescue steppes and meadow-halophyte associations on the southern spurs of the Central Moldovan Upland and the Dniester-Bug district with mixed-grass-fescue steppes and gully oak woodlands are distinguished.

The southwestern coastal strip of fescue-fescue steppes is represented by the Danube-Dniester geobotanical district with fescue-fescue and wormwood-fescue steppes in combination with halophytic communities and saline meadows. The Dniester-Bug geobotanical region occupies the interfluve of the Dniester and Tiligul estuaries with fescue-fescue steppes and limestone vegetation, which are complemented by wormwood-fescue-fescue steppes along the coastal strip from Odesa to the mouth of the Tiligul estuary.

Almost everywhere, the natural steppes have been converted into arable land for crops. In addition, orchards and vineyards occupy a significant area. At the same time, the former steppes are now intersected by field protection strips, which are home to drought-resistant species of woody and shrubby vegetation.

1.1.8. Fauna

The fauna is represented by steppe, forest-steppe and intrazonal species, including birds, mammals, reptiles and fish. Three zoogeographical districts are distinguished within the basin: Forest-Steppe, Danube-Dniester and Black Sea.

The following forest fauna species are common within the Forest-Steppe Zoogeographical District: Mammals - elk, wild boar, wolf, badger, bats, squirrel, dormouse, red vole, marten, dark (forest) ferret, forest cat, spotted and red deer; Birds - eagles (eagle, spotted eagle), hawks (grouse), red-shouldered hawk, hawk, red-tailed falcon, owls (grey barn owl), woodpeckers (lesser, variegated), titmouse (hobby, long-tailed), nuthatch, flycatchers (white-necked, lesser); reptiles - common viper, copperhead, spindleback.

In the Danube-Dniester zoogeographical district, the main faunal complex is steppe, and in agroecosystems - forest. There are many birds here, including field harrier, blackbird, avocet, pheasant, and grey partridge. Mammals include wild rabbits, hamsters, white-toothed slipstream, and steppe ferret (light).

The Black Sea zoogeographical district (the district of river valleys along the sea and estuaries) is dominated by water-loving fauna.

Several dozen species of fauna are listed in the Red Book of the World and the Red Book of Ukraine and are subject to protection.

1.1.9. Hydrological regime

The climatic conditions and topography of the area have led to the following features of the hydrological regime of the Black Sea basin rivers.

All rivers are low-flowing, and most of them dry up in summer. The Tiligul and Kogilnyk rivers have the highest average annual runoff (over 40 million m^3); the V. Kuyalnik River has less than 30 million m^3 ; the M. Kuyalnik River has less than 20 million m^3. For all other rivers, the average annual runoff is less than 10 million m^3 . Most of the river runoff (80-90%) occurs in the spring.

The rivers are mainly fed by snow. The annual regime is characterised by spring floods and a long summer-autumn low water period with rare storm floods. Due to frequent winter thaws that lead to partial or complete snowmelt, winter floods of varying intensity and water content occur. These conditions often result in low floods in spring with maximum water flows that are often lower than winter floods in January and February.

The rivers in the basin do not drain the main aquifers and therefore have virtually no underground water supply. The short spring runoff and the lack of runoff in the warm season cause an extremely uneven distribution of runoff, leading to their drying up in summer. After the floods have passed, most rivers tend to dry up, and the drying up often continues until the next snowmelt.

The duration of the ice drift is 1-2 months. The rivers are cleared of ice in early and mid-March, without ice drifts.

The slope of the riverbeds is slight (from 0.8 to 1.6 m/km) and the current is slow.

In recent years, there has been a decrease in the water content of most rivers. This is mainly due to climate change (increased average annual air temperature, redistribution of precipitation and intensity, and an increase in the number of drought events in summer) and anthropogenic activities (excessive ploughing of the catchment, straightening of riverbeds, etc.).

It should also be noted that there are no hydrological stations on the rivers of the basin. This makes it impossible to obtain actual data on river flows and water levels in a timely manner. All flow values are calculated using indirect data.

1.1.10. Specifics of the river basin

The Black Sea river basin has no main river; the area consists of relatively small basins of many rivers. The basin has a coastal location. The basin is divided into 3 separate parts.

Wide access to the Azov-Black Sea basin and large river routes (the Danube and Dnipro) determine the great advantages of the transport and geographical location and recreational potential of the basin. Ukraine's largest ports are located here: Odesa, Chornomorsk, and Pivdennyi. Given the developed transport infrastructure and land transport network, the region has a very high transport distribution and international transit potential, which should be considered as a major factor in the economic development of the region and the country as a whole.

The basin is located mainly in the steppe and partially in the forest-steppe natural zones. This determines its main natural wealth - land resources. However, the negative side of the basin is that a large part of the basin is classified as an unstable, insufficiently moist and arid zone. Therefore, all rivers are low-flowing. In this regard, the problem of their environmental protection and cleaning is very acute.

Another feature of the Black Sea rivers is that surface and groundwater do not meet the needs of the economy and population. Therefore, water is supplied to the region from neighbouring river basins. In fact, the Dniester River is the only source of water supply for one of Ukraine's largest agglomerations, Odesa. Kherson region uses Dnipro water for irrigation of agricultural land; Mykolaiv region uses the Southern Bug, and Odesa region uses Danube and Dniester water.

Natural lakes in the Odesa and Mykolaiv regions are represented by estuaries that occupy the flooded lower reaches of river valleys. In the Kherson region, there are many small lakes of lagoonal origin in the coastal area.

1.1.11. Typology of surface water bodies

The SWB typology was developed in accordance with the Methodology for Determining Surface and Groundwater Bodies (Methodology) approved by the Order of the Ministry of Ecology and Natural Resources No. 4 dated 14.01.2019 to detail the hydrographic zoning of Ukraine, prepare a state water monitoring programme, and develop and evaluate the effectiveness of the RBMP implementation.

The Black Sea RBD defined SWB for five categories of surface waters - rivers, lakes, artificial and heavily modified surface waters, transitional and coastal waters.

For the typology and delineation of rivers and lakes, the EU WFD system A was used (Table 1, Table 2).

Table 1: Descriptors for rivers (system A)

Descriptors		
Catchment height, m	Catchment area, km^2	Geological rocks
● midlands: over 800 ● lowlands: 500 - 800 ● upland: 200 - 500 ● lowland: < 200	● small: 10 - 100 ● average: >100 - 1000 ● Large: >1 000 - 10 000 ● very large: > 10 000	● limestone ● silicate ● organic

Table 2: Descriptors for lakes (system A)

Descriptors			
Catchment height, m	Average depth, m	Water mirror area, km^2	Geological rocks
● upland: 200 - 500 ● lowland: < 200	● shallow: <3 ● average in depth: 3 - 15 ● deep: >15	● small: 0,5 - 1 ● average: 1 - 10 ● large: 10 - 100	● limestone ● silicate ● organic

The EU WFD system B is used for the typology of SWB in the categories of "transitional waters" and "coastal waters".

For "transitional waters", in addition to ecoregion and salinity, an additional indicator is used among the mandatory descriptors - origin (Table 3). This indicator, as an additional descriptor, was included following the example of Romania and Bulgaria.

Table 3: Descriptors for transitional waters (system B)

Eco-region	Salinity, ‰	Origin.
● Black Sea ● Sea of Azov	● oligohaline 0.5 to < 5 ● mesogastric 5 to < 18 ● polygamous 18 to < 30 ● euryhaline < 40	● seashore ● estuaries are open ● estuaries are closed

For "coastal waters", in addition to the ecoregion and salinity, additional indicators are used - exposure (protection from waves and wind), the prevailing composition of bottom sediments (Table 4).

Table 4. Descriptors for coastal waters (system B)

Eco-region	Salinity, ‰	Exposition	Bottom deposits
● Black Sea ● Sea of Azov	● desalinated < 0.5 ● oligohaline 0.5 to <5 ● mesogastric 5 to <18	● protected (bays, bays)	● clay-silt ● silty sandy ● sandy

Eco-region	Salinity, ‰	Exposition	Bottom deposits
	● polygamous 18 to <30 ● euryhaline 30 to <40	● open (cape zones, direct coast)	

The Black Sea RBD is located within one ecoregion, the Pontic Province (number 12).

According to the catchment area, the rivers of the basin are classified as small (with a catchment area of less than 100 km^2), medium (from 100 to 1000 km^2) and large (from 1000 to 10,000 km^2) rivers.

According to the elevation of the catchment, the rivers of the basin are located in lowlands (less than 200).

The basin's geological rocks are of two types: limestone (Ca) and silicate (Si).

Table 5. Types of SWBs in the "rivers" category

№	Type code	Type
1	UA_R_12_S_1_Ca	a small river in the lowlands in limestone rocks
2	UA_R_12_S_1_Si	a small river in the lowlands in silicate rocks
3	UA_R_12_M_1_Ca	medium-sized river in the lowlands in limestone rocks
4	UA_R_12_M_1_Si	medium-sized river in the lowlands in silicate rocks
5	UA_R_12_L_1_Si	a large river in the lowlands in silicate rocks

In the category "lakes", 1 type of SWB was identified (Table 6).

Table 6: Type of SWBs in the "lakes" category

№	Type code	Type
1	UA_L_12_M_1_SH_Si	The middle lake in the lowlands is shallow in silicate rocks

In the category of "transitional waters", 6 types of SWBs have been identified (Table 7).

Table 7. Types of SWBs in the "transitional waters" category

#	Type code	Type
1	UA_TW_M5_O_C	Oligohaline closed estuaries
2	UA_TW_M5_M_O	Mesohaline open estuaries
3	UA_TW_M5_M_C	Mesohaline closed estuaries
4	UA_TW_M5_P_O	Polygynous open estuaries
5	UA_TW_M5_E_O	Euryhaline open estuaries
6	UA_TW_M5_E_C	Euryhaline closed estuaries

4 types of SWBs of the "coastal waters" category have been identified (Table 8)

Table 8. Types of SWBs in the "coastal waters" category

#	Type code	Type
1	UA_CW_M5_M_EX_S_CS	Mesohaline protected shallow clay-silt soils
2	UA_CW_M5_M_EX_S_SS	Mesogaline protected shallow silty sandy soils
3	UA_CW_M5_M_SH_S_S	Mesogaline open shallow sandy soils
4	UA_CW_M5_M_SH_S_SS	Mesogaline open shallow silty-sandy

1.1.12. Reference conditions

The assessment of the ecological state of the SWB is based on a comparison of biological indicators (benthic macroinvertebrates, macrophytes, phytobenthos, phytoplankton and fish) with reference conditions that characterise the state of the SWB, which has not been subjected to anthropogenic impact or is minimal.

Reference conditions are determined on the basis of data obtained from reference sites, by modelling (predictive models or retrospective forecasting methods that take into account historical, paleogeographic and other available data that provide a sufficient level of confidence in the values for reference conditions for each type of SWB) or by a combination of these methods or based on expert opinion.

In order to establish reference values for biological indicators based on data from reference sites, it is necessary to establish such sites for each type of SWB in all natural categories. The network should cover a sufficient number of sites to provide a sufficient level of confidence and to account for the variability of values for indicators that correspond to the different ecological status of the SWB type.

Key criteria for selecting reference sites:

- characterise the state of the SWB without anthropogenic impact or with minimal impact,
- there is no industry or intensive agriculture,
- concentrations of specific synthetic pollutants are zero or below the detection limits,
- no morphological changes,
- water intake and flow control cause only minor fluctuations in water levels and do not affect surface water quality,

- the vegetation of the coastal zone is appropriate for the type of SWB and geographical location,
- no invasive species,
- fishing and aquaculture do not affect the functioning of the ecosystem.

In accordance with paragraph 2 of clause VII of the Order of the Ministry of Ecology and Natural Resources of Ukraine No. 5 dated 14.01.2019 "On Approval of the Methodology for Assigning a Surface Water Body to One of the Classes of Ecological and Chemical Status of a Surface Water Body, as well as Assigning an Artificial [...]", type-specific reference conditions may also be determined on the basis of existing reference sites in other countries for the same type of SWB or by combining the procedures described above.

Given that reference conditions for all types of SWBs are not currently defined in Ukraine, it was suggested to use the reference conditions established for the same or similar types in neighbouring EU countries, namely the Slovak Republic and Romania.

The methodology includes four hydrobiological indicators (benthic macroinvertebrates, phytoplankton, phytobenthos, macrophytes, macroalgae and eutrophication, respectively) for four natural categories of surface waters (rivers, lakes, transitional waters and coastal waters) that have been identified in Ukraine.

The environmental quality standards (EQS) were approved by Order of the Ministry of Ecology No. 332 dated 01.04.2024 "On Approval of Environmental Water Quality Standards for Determining the Ecological Status of Surface Water Bodies and Amendments to Certain Regulatory Acts".

In the second cycle of the RBMP, it is necessary to revise the reference conditions (including for the fish fauna indicator) using data from state water monitoring.

1.2. Water bodies delineation

1.2.1. Surface water

In the Black Sea RBD, the SWB was determined for 68 rivers and 3 lakes (according to the State Water Cadastre: Accounting of Surface Water Bodies geoportal of the State Agency of Water Resources of Ukraine).

Within the Black Sea RBD, 231 SWB have been identified. The identified SWB belong to the following categories of surface water:

- rivers,
- lakes,
- artificial (AWB) and heavily modified (HMWB),
- transitional waters,
- coastal waters.

Category "rivers"

According to the Methodology, 127 SWB were identified. The number of identified SWB depending on descriptors and types is shown in Tables 9 and 10.

Table 9. Distribution of SWBs of the "rivers" category by descriptors

Descriptor	Indicator.	Number of SWB
by eco-region	Pontic province	127
by catchment area	small (S)	61
	average (M)	62
	large (L)	4
by the height of the catchment area	in the lowlands	127
by geological type	in silicate rocks	116
	in limestone rocks	11

Table 10. Distribution of SWBs of the "rivers" category by type

№	Type code	Type	Number of designated SWB
1	UA_R_12_S_1_Ca	a small river in the lowlands in limestone rocks	3
2	UA_R_12_S_1_Si	a small river in the lowlands in silicate rocks	58
3	UA_R_12_M_1_Ca	medium-sized river in the lowlands in limestone rocks	8
4	UA_R_12_M_1_Si	medium-sized river in the lowlands in silicate rocks	54
5	UA_R_12_L_1_Si	a large river in the lowlands in silicate rocks	4

Category "lakes"

Three SWB have been identified (Table 11) in the Black Sea RBD.

Table 11. SWBs of the "lakes" category

№	Type code	Type	Quantity of the designated SWB
5	UA_L_12_M_SH_1_Si	The middle lake in the lowlands is shallow in silicate rocks	3

Category "transitional waters"

18 SWB have been identified in the Black Sea RBD.

Table 12. Types of SWBs in the "transitional waters" category

№	Type code	Type	Quantity of the designated SWB
1	UA_TW_M5_O_C	Oligohaline closed estuaries	1
2	UA_TW_M5_M_O	Mesohaline open estuaries	6
3	UA_TW_M5_M_C	Mesohaline closed estuaries	1
4	UA_TW_M5_P_O	Polygynous open estuaries	7
5	UA_TW_M5_E_O	Euryhaline open estuaries	2
6	UA_TW_M5_E_C	Euryhaline closed estuaries	1

Category "coastal waters"

Nine SWB have been identified in the Black Sea RBD.

Table 13. Types of SWBs in the "coastal waters" category

№	Type code	Type	Quantity of the designated SWBs
1	UA_CW_M5_M_EX_S_CS	Mesohaline protected shallow clay-silt soils	1
2	UA_CW_M5_M_EX_S_SS	Mesogaline protected shallow silty sandy soils	2
3	UA_CW_M5_M_SH_S_S	Mesogaline open shallow sandy soils	2
4	UA_CW_M5_M_SH_S_SS	Mesogaline open shallow silty-sandy	4

Category "HMWB".

There are 70 SWBs identified in the basin. The share of HMWB in the total number of SWBs in the Black Sea RBD is **30%**. Most of them (53 SWBs) are classified as HMWB due to overregulation.

16 SWBs are classified as HMWB due to directionality.

1 SWB are classified as HMWB due to a combination of regulation and channel straightening (Fig. 1).

Figure 1 Distribution of HMWB by causes of hydromorphological pressures (%)

Category "artificial water bodies".

In the Black Sea basin, there are 4 SWBs, which are canals.

The percentage distribution of the identified SWBs in the Black Sea RBD by category is shown in Figure 2.

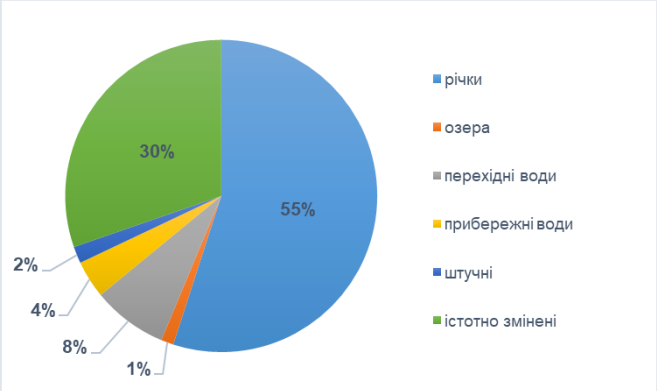


Figure 2 Breakdown of identified SWBs by category (%)

Each of the 231 SWBs identified in the Black Sea RBD has been assigned a unique code that looks like this:

UA_ M5.8_YYYY

- *UA* – Ukraine
- M5.8 - code of the Black Sea RBM (according to the Order of the Ministry of Ecology and Natural Resources of Ukraine No. 103 of 29 March 2017 "On Approval of the Boundaries of River Basin Areas, Sub-basins and Water Management Areas")
- *YYYY is the* unique number of the designated IOU in the Black Sea RDB.

Each linear SWBs (categories "rivers", "AWB and HMWB") has a length (km). The length of the SWBs in the Black Sea RBD ranges from 0.8 km (UA_M5.8_0098 - Sukha Zhuravka River) to 107.2 km (UA_M5.8_0138 - Tiligul River).

Figure 3 shows the distribution of the identified linear SWBs in the Black Sea RBD by length.

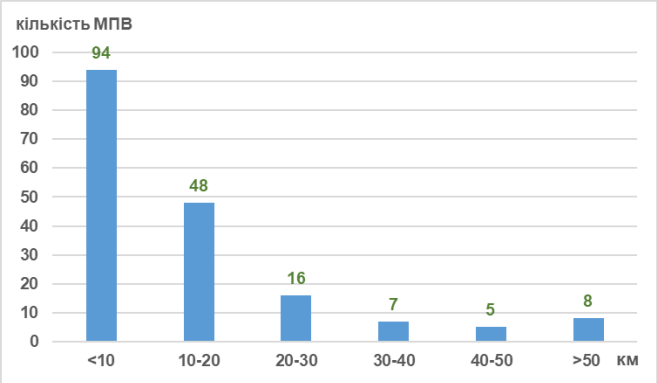


Figure 3 Distribution of the identified linear SWB by length

Each polygonal SWBs (categories "lakes", "AWB and HMWB", "transitional waters", "coastal waters") has an area (km2). The area of SWBs in the Black Sea RBD ranges from 0.16 km2 (UA_M5.8_0202 - Tsybulivske Reservoir) to 1,713 km2 (UA_M5.8_0230 - coastal waters of the Black Sea river basin area).

Figure 4 shows the distribution of the identified polygonal SWBs in the Black Sea RBD depending on the area.

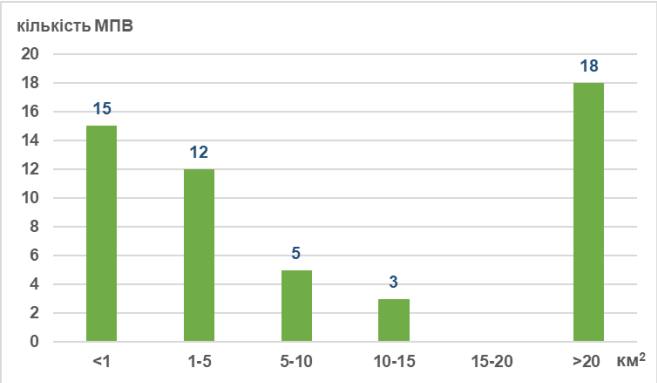


Figure 4 Distribution of identified polygonal SWB by area

1.2.2. Groundwater

The deliniation of the GWBs was carried out in accordance with the Methodology for Determining Surface and Groundwater Bodies (Methodology) approved by the Order of the Ministry of Ecology and Natural Resources No. 4 dated 14.01.2019.

The definition of an GWBs includes the division of aquifers into smaller units, the preliminary establishment of GWBs boundaries based on individual characteristics and available knowledge of hydrogeological systems and anthropogenic impacts.

The definition begins with the analysis of geological maps and well data to identify different hydrogeological units within the aquifer. First of all, attention is paid to those aquifer complexes whose reserves can provide water intake of more than 10 m3 per day.

The youngest aquifers are considered first. As a rule, the boundaries of surface water basins are approximated with the boundaries of groundwater basins, and then the determination of the GWBs for deeper aquifer complexes, the boundaries of which go beyond the boundaries of surface water basins, is performed.

The codes of the defining GWBs are formed as follows:

UAM5800N100

- UA - Ukraine,
- M58 is the code for the Black Sea river basin,
- 0 - river sub-basin, according to the Water Code,
- 0N - geological system (geological age of water-bearing rocks),
- 100 - the number of the GWB.

The Black Sea RBD allocates 6 GWB, including 3 GWB in non-pressure aquifers and 3 GWB in pressure aquifers. Pressure GWB are used for centralised and non-centralised water supply to the population and enterprises. The characteristics of the identified GWB are given in Annex 2.

Table 14. Identified GWB

Unified code of the GWB	GWB	Area of the GWB, km^2
Non-pressure GWB		
UAM5800N100	GWB in alluvial Pleistocene-upper Pliocene sediments	5694
UAM5800N200	GWB in alluvial Upper Pliocene sediments	851,7
UAM5800N300	GWB in Baltic sediments	2835
Pressure GWB for the pressure GWB		
UAM5800N400	GWB in Upper Miocene sediments	5980
UAM5200N500	GWB in the Upper Sarmatian sediments	16478
UAM5800N600	GWB in Middle Sarmatian sediments	20990

The characteristics of the GWBs groups are presented in Annex 2.

The GWB in alluvial Pleistocene-Upper Pliocene sediments (UAM5800N100) was identified in the south-eastern part of the basin (southwestern part of Kherson oblast), within the water management area of the Black Sea coast between the Dnipro estuary and the Crimean peninsula.

The GWB in alluvial Upper Pliocene sediments (UAM5800N200) is located in the southwestern part of the basin (southwest of Odesa oblast), within the water management area of the Black Sea coast between the mouth of the Danube River and the Dniester Estuary.

In some areas, the Pliocene alluvium is overlain by the Pleistocene. In this case, there is a common alluvial aquifer. Water salinity varies from 0.1-0.8 to 1.5-5.0 g/dm^3 ; fresh water with a dry residue of up to 1 g/dm^3 prevails. In the coastal area, as well as near saline estuaries, groundwater salinity reaches 50-70 g/dm^3. The chemical composition of the waters is mixed, but mainly calcium-magnesium hydrocarbonate, magnesium-calcium chloride-hydrocarbonate, and magnesium-sodium chloride-sulfate. Groundwater in the alluvial deposits of the Upper Pliocene contains significant freshwater resources and is widely used by the population for domestic and drinking water supply, including centralised water supply (Bilhorod-Dnistrovskyi, Serhiivka, Odesa Oblast).

The waters of the Baltic sediments in the places of their distribution are widely used for water supply of rural settlements by numerous wells and capped springs. In terms of mineralisation and chemical composition, in the

northern part of the Baltic sediments, the waters are fresh (0.4 - 0.9 g/dm^3) magnesium bicarbonate. In the southern part, there is a predominance of sulphates over bicarbonates, as well as an increased content of chlorides. The aquifer is promising for further use.

The non-pressure aquifers and complexes identified within the basin are overlain by eluvial, aeolian-deluvial loess-like loams and poorly permeable red-brown clays, and are not directly connected with surface ecosystems in most of their distribution.

The Baltic sediments GWB (UAM5800N300) is located in the north-western part of the basin, within the water management areas of the Black Sea coast between the Dniester and Dnipro estuaries, as well as the Tiligul River with the estuary. It occupies the northern part of Odesa region.

The Upper Miocene sediments GWB (UAM5800N400) are located in the south-eastern part of the basin (south-western part of Kherson oblast), within the water management area of the Black Sea coast between the Dnipro estuary and the Crimean peninsula. The water-bearing rocks in the Upper Miocene Pontic, Meotian and Sarmatian regional deposits (N1 p m++ s) are not separated by water-resistant layers and are therefore considered as a single aquifer complex. In the areas where Pontic deposits are absent, the aquifer complex is represented by sediments of the Meotian and Sarmatian regional layers, and in the areas where the Meotian is absent - by Middle and Upper Sarmatian limestones.

The GWB in the Upper Sarmatian sediments (UAM5200N500) is identified in most of the Black Sea river basin, except for the Black Sea coastal area between the Dnipro Estuary and the Crimean Peninsula, where the Upper Sarmatian sediments together with the Pontic and Meotian form the Upper Miocene aquifer complex.

The GWB in the Middle Sarmatian (UAM5800N600) sediments is distributed over most of the basin, occupying the northwestern part of the basin, within the water management areas of the Black Sea coast between the Dniester and Dnipro estuaries, as well as the Tiligul River and the estuary.

The waters of the main pressure GWB have a diverse chemical composition. The anion content is dominated by hydrocarbonate and chloride-hydrocarbonate waters with salinity ranging from 0.1-0.8 to 1-5 g/dm3 and more and a total hardness of 2.5-10.8 mmol/dm3 . According to the cation content, the waters are classified as mixed. There is an increase in mineralisation towards the south and south-east to the value of 3.5-5 g/dm^3 and more.

Pressure aquifers and complexes occur at considerable depths, are covered by poorly permeable sediments from the surface and are not connected to surface ecosystems.

2 SIGNIFICANT ANTHROPOGENIC IMPACTS ON THE QUANTITATIVE AND QUALITATIVE STATUS OF SURFACE AND GROUNDWATER, INCLUDING POINT AND DIFFUSE SOURCES

2.1. Surface water

The Black Sea river basin is located within 3 regions: Odesa, Mykolaiv and Kherson. The socio-economic structure of the basin creates prerequisites for the formation of anthropogenic pressure that affects surface waters. The main factors of anthropogenic pressure include:

- Population. The population within the basin is 1.8 million people, with a population density of 70.9 people/km^2 in Odesa Oblast, 44.8 people/km^2 in Mykolaiv Oblast, and 35.5 people/km^2 in Kherson Oblast (as of 01.06.2021).
- Enterprises in various sectors of the economy.
- Agriculture, which is one of the basin's economic sectors and is characterised by a high level of development.
- Cross structures on small and medium-sized rivers prevent the free passage of water, sediments and migration of aquatic life, and change the transit mode of rivers to an accumulation one.

The characterisation of anthropogenic pressures and its impact was carried out on the basis of chemical, physico-chemical and hydromorphological indicators that reflect the conditions of existence of the biotic component of aquatic ecosystems. Changes in these parameters under conditions of significant anthropogenic pressure may lead to the risk of not achieving the "good" ecological status of the SWBs.

The assessment of the anthropogenic pressures on the SWBs was carried out in accordance with the Methodological Recommendations for the Analysis of the Main Anthropogenic Pressures and Their Impact on the Surface Water Status, which were approved at the meeting of the Scientific and Technical Council of the State Agency of Ukraine for Water Resources on 20 April 2023, Minutes No. 2.

The methodological basis of the assessment was the DPSIR model developed by the European Environment Agency (EEA) and adapted to the conditions of Ukraine. The determination of anthropogenic pressure was based on a sequential analysis of Drivers/Activities → Pressures → State → Impact → Response (Fig. 5).

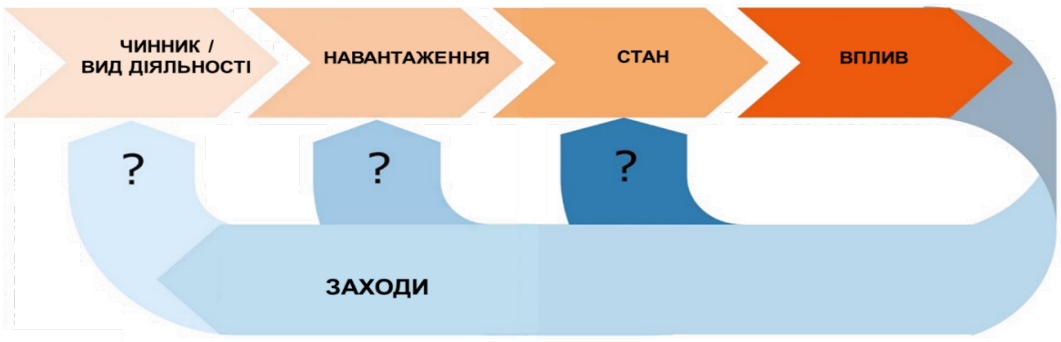


Figure 5 DPSIR conceptual model

The risk of not achieving a "good" ecological status of the SWB is determined on the basis of criteria for chemical, physico-chemical and hydromorphological indicators.

Criteria for chemical and physicochemical indicators:

- Disposal of untreated wastewater (point sources) - used for organic matter and nutrients;
- Wastewater fraction (point sources) - used for hazardous substances;
- Soil nitrogen balance (diffuse sources) - to determine the impact of crop production;
- Livestock index (diffuse sources) - to determine the impact of livestock.

Criteria for hydromorphological indicators:

- Disruption of the continuity of water flow and environments due to the presence of transverse artificial structures in the riverbed, disruption of the continuity of water flow and sediment movement and migration of fish and other aquatic life;
- Water intake;

- Flow control;
- Fluctuations in water levels downstream artificial structures in the channel;
- Morphological changes that reflect a violation of the natural morphological characteristics of rivers.

By comparing the criteria with the thresholds, 3 risk categories are identified:

1. "not at risk"
2. "possibly at risk"
3. "at risk"

The overall risk assessment for a SWB is determined by the worst value of any one criterion.

Assessing the risk of not achieving "good" ecological status

The risk of not achieving "good" ecological status/potential of an SWB is the risk, for each individual SWB, of not achieving the environmental objectives of the EU WFD by the end of the planning cycle, taking into account the current state of the SWB, the expected changes in the pressures on the SWB and the possible effects of government programmes and projects already implemented.

To assess the risk, an analysis of the anthropogenic pressures within the river basin area is carried out, based on chemical and physico-chemical components and hydromorphological changes.

The risk of failure to achieve environmental objectives is assessed separately from diffuse and point sources of pollution, as well as hydromorphological changes.

Assessment of the risk of failure to achieve environmental objectives from point sources of pollution

Based on the results of the assessment of anthropogenic pressures from point sources of pollution and their impact on the basin's SWBs, the risk of not achieving good ecological status/potential (Fig. 6) was identified for

- 170 SWBs - "no risk"
- 43 SWBs - "possibly at risk"
- 18 SWBs - "at risk"

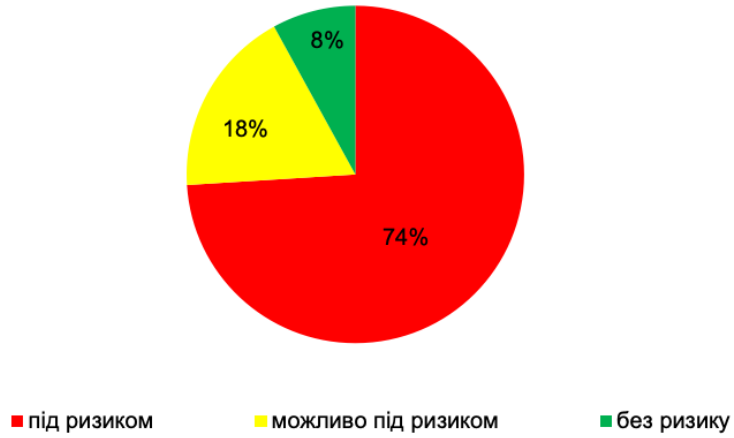


Figure 6 Assessment of the risk of failure to achieve good ecological status/potential based on the results of the assessment of anthropogenic pressures from point sources, %.

Assessment of the risk of failure to achieve environmental objectives from diffuse sources of pollution

Based on the results of the assessment of anthropogenic pressures from diffuse sources of pollution and their impact on the basin's SWBs, the risk of not achieving good ecological status/potential (Fig. 7) was identified for

- 43 SWBs - "no risk"
- 146 SWBs - "possibly at risk"
- 42 SWBs - "at risk"

Figure 7 Assessment of the risk of failure to achieve good ecological status/potential based on the results of the assessment of anthropogenic pressures from diffuse sources, %.

Assessing the risk of not achieving environmental objectives: hydromorphological changes

Based on the results of the assessment of hydromorphological changes,[1] was established:

- 152 SWBs - "no risk"
- 75 SWBs - "at risk"

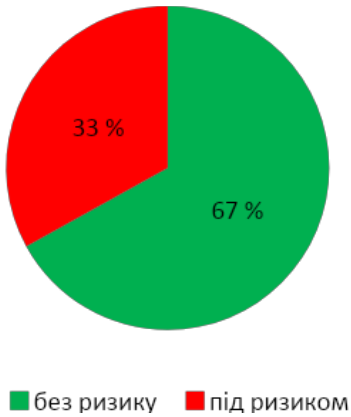


Figure 8 Risk assessment of failure to achieve good ecological status/potential based on anthropogenic pressure assessment: hydromorphological changes, %.

Generalised risk assessment of failure to achieve good ecological status/potential

The risk of not achieving good ecological status/potential has been assessed as follows:

- 15 SWBs - "no risk"
- 98 SWBs - "possibly at risk"
- 118 SWBs - "at risk"

[1] The risk of failure to achieve environmental objectives based on hydromorphological changes was not assessed for the AWB

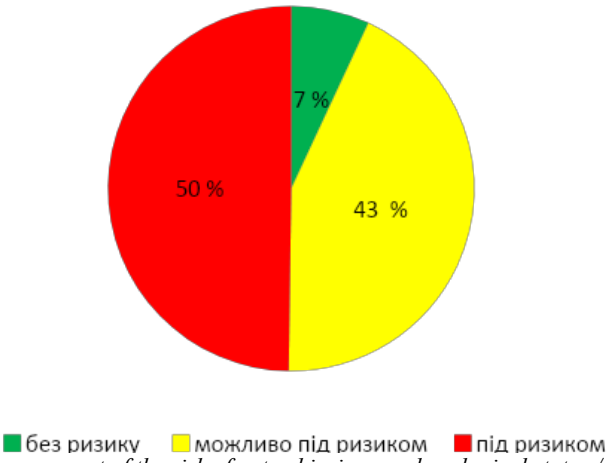


Figure 9 Generalised assessment of the risk of not achieving good ecological status / potential of SWB, %.

Impact of military operations on the state of surface water bodies

Pollution (organic, biogenic, hazardous) substances caused by the **pollution:**

- **destruction, suspension, disruption of the technological process of treatment facilities and increased loads on them due to the growing number of internally displaced persons**

Between the end of February 2022 and May 2024, 3 cases of destruction, suspension or disruption of the technological process of enterprises as a result of hostilities were recorded in the Black Sea river basin.

Two cases involve disruption of the work process and one case makes it impossible to irrigate agricultural land in Skadovsk and Kakhovka districts of Kherson region.

The information was prepared by the Zoy Environmental Network for the OSCE Project Co-ordinator in Ukraine. Detailed information on the cases is presented in Annex 3.

Pollution caused by direct hit of pollutants from missiles, shells of military equipment, their washing away, seepage in combat zones

Artillery shells, rockets and other munitions are mainly composed of a metal shell filled with an explosive, propellant and a detonator.

Explosives are classified into primary explosives (mercury, lead azide, TNT) and secondary explosives (THE, hexogen, tetryl, TNT, picric acid, plastid-4, ammonites, dynamites, ammonals).

Metals are associated pollutants. The most common is lead, but also antimony, copper, cadmium, chromium, mercury, arsenic, nickel, bismuth and tungsten. As a rule, metals are concentrated in the sinkhole.

Flares burn at high altitude and disperse metals over large areas. Pyrotechnics can contain barium, antimony, strontium, copper, magnesium, manganese, chromium and lead. Unlike explosives and propellants, metals occur naturally in the environment, so their background concentrations need to be measured.

The detonation of rockets, artillery shells and mines produces a number of chemical compounds, including carbon monoxide and carbon dioxide, water vapour, nitrogen oxide, nitrogen, etc. A number of toxic elements, including sulphur and nitrogen oxide, also evaporate.

Monitoring of surface water in the area of active hostilities and recently liberated territories is not currently carried out for security reasons.

reducing its programme (spatially and temporally) in the temporarily occupied territories.

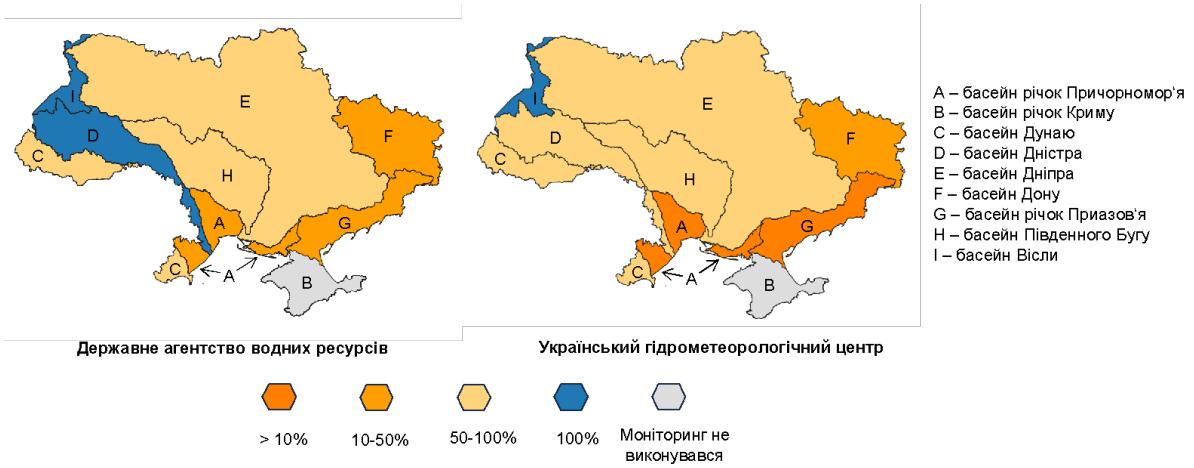


Figure 10 Achievement of surface water monitoring targets by river basin, 2022

Impossibility, restrictions on water management in the temporarily occupied territories

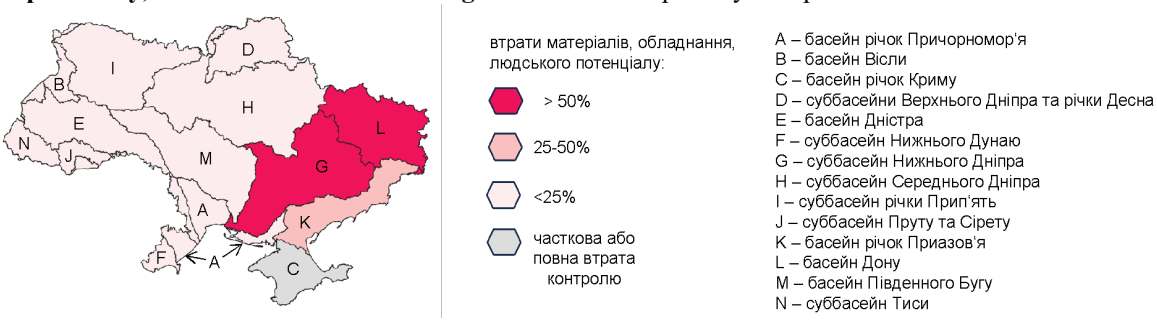


Figure 11 Impact of military operations on the ability to manage water resources, %.

2.1.1. Organic pollution

The main cause of organic pollution is insufficient or no wastewater treatment. Organic pollution can lead to significant changes in the oxygen balance of surface waters and, as a result, to changes in the species composition of aquatic life or even their death. The input of organic matter with wastewater is usually assessed by indirect indicators of BOD and COD.

Diffuse sources

The significance of diffuse sources for organic water pollution was assessed in terms of the sources of their input. Precipitation has virtually no effect on the migration of organic matter into the WBW, so this source can be neglected.

The main source of organic compounds is the households of the predominantly rural population, which are not served by the sewerage network. Wastewater disposal in such individual households is carried out on the terrain by accumulating in lagoons.

The load from the rural population was assessed using the calculation method. To do this, we used the coefficients of organic matter intake due to the vital activity of 1 person, the load from the population is calculated by the following indicators: BOD5 - 60 g/day per person, COD - 110 g/day per person.

Taking into account changes in protein consumption by the population of Ukraine, a reduction factor of K = 78.9 / 105.2 = 0.75 was calculated. Accordingly, the value of BOD5 per person should be reduced from the physiological norm of 60 g/day to 45 g/day per person. The Intergovernmental Panel on Climate Change recommended a level of BOD5 generation in municipal wastewater of 50 g of O2/day per person for the preparation of the Greenhouse Gas Inventory.

To calculate the BOD5 value, we assumed 50 g of O2 per person per day. The COD level was calculated taking into account the conversion factor of BOD5 to COD equal to 1.7. Accordingly, the figure of 85 g/day per person was used to calculate the COD load. Based on the changes in BOD5 (50/60), the reduction in N total will be 8.8 (50/60) = 7.3 g/day per person. The value of P total was not changed due to the determining influence of detergents in the wastewater.

In rural settlements and small towns, wastewater is discharged into lagoons built into the ground, from where pollutants easily enter groundwater and are transported to the riverbed. Microbial and sorption processes in the

soil cover contribute to the utilisation of 70% of organic matter. At the same time, a significant number of settlements without wastewater collection and treatment systems lead to surface water pollution.

Point sources

The main cause of organic pollution is inadequate or non-existent wastewater treatment after use by settlements, industrial and agricultural point sources. Such pollution can affect the composition of aquatic species and ecological status. The decomposition of organic matter consumes a lot of oxygen, which decreases the water's oxygen content and causes aquatic organisms to die. Organic pollution generated from these sources is assessed by BOD5 and COD.

According to reports on water use in the form No. 2TP - water management (annual), in 2021, the total volume of wastewater discharged into surface water bodies of the Black Sea river basin (including the Black Sea) in Odesa, Kherson and Mykolaiv regions was 109.911 million m3, includingincluding: polluted without treatment and insufficiently treated - 3.311 million m3, normatively clean without treatment - 23.724 million m3, and normatively treated - 82.876 million m3 .

Table 15. Wastewater discharges to surface water bodies in the Black Sea basin (including the Black Sea)

Water user	water user code	Discharge volume, million m^3	Degree of water treatment
Odesa Port Plant JSC	00206539 / 510005	0,9654	regulatory cleared
LLC JV Aquavintex	25040503 / 510259	0,0017	contaminated, insufficiently cleaned
Ananievvodokanal	34108926 / 510723	0,0299	contaminated, insufficiently cleaned
Municipal enterprise "VUZHKG" of Tarutino village	03350444 / 510724	0,0669	contaminated insufficiently cleaned
Berezovka village housing and communal services	03350597 / 510734	0,050	contaminated insufficiently cleaned
Municipal enterprise Podilskvodokanal	30615813 / 510738	0,6312	contaminated insufficiently cleaned
Infox LLC branch of Infoxvodokanal	14289688 / 510760	78,7156 including: 77,8117 0,9039	regulatory cleared insufficiently cleaned
Municipal enterprise "Vodokanal"	32795506 / 511084	0,1819	normatively cleaned (mechanical)
Municipal enterprise "Vodopostachalnyk"	31378219 / 511190	0,0476	contaminated insufficiently cleaned
ME Naberezhne	35452222 / 511345	0,0385	contaminated insufficiently cleaned
ME "Prolisok-1"	37801659 / 512014	0,0138	contaminated insufficiently cleaned
PJSC Odessavinprom	00412027 / 512041	0,0013	normatively cleared (BIO)
ME "Alekseevske"	36140123 / 512092	0,0062	normatively cleared (BIO)
ME "AVRORA" (Skadovsk district)	31793187 / 650494	0,002	regulatory-compliant
ME WASTEWATER TREATMENT PLANTS	32503478 / 651315	0,440	regulatory cleared

Water user	water user code	Discharge volume, million m^3	Degree of water treatment
WAAN RICE INSTITUTE	00858757 / 651489	0,144	regulatory-compliant
SE "Research Farm of the Institute of Rice of the National Academy of Agrarian Sciences"	32368222 / 651490	1,476	regulatory-compliant
PE "ZHUKOVA"	38151273 / 651525	0,154	regulatory-compliant
Pivdenne Farm	30924247 / 651528	1,152	regulatory-compliant
Kolosok Farm	30040592 / 651689	0,522	regulatory-compliant
"RICE OF UKRAINE" LTD	33124250 / 651793	0,789 of them: 0,582 0,207	contaminated regulatory-compliant
PE "SG BASMATI"	35869851 / 651981	0,969	regulatory-compliant
AGROSTANDARD CNC LLC	36838934 / 652053	0,233	regulatory-compliant
IVASHKIVSKY INCUBATOR LTD.	31742242 / 652060	0,988	regulatory-compliant
MARKOBOK FARM	22729902 / 652249	0,200	regulatory-compliant
SLAVICH A LTD.	34554587 / 652543	1, 670	regulatory-compliant
Linkov Farm	31160868 / 652790	1,04	regulatory-compliant
Urozhayne LLC	37390142 / 652911	2,278	regulatory-compliant
YATRAN FARM	32750500 / 353215	0,399	regulatory-compliant
FG "TERRA TAVRIYA"	42058849 / 653658	0,902	regulatory-compliant

Table 16. Organic matter discharges to the Black Sea river basin in 2021

Name of the company	BOD, tonnes	COD, tonnes
LLC JV Aquavintex	0	0
Ananiev Vodokanal	0,5	5,1
Municipal enterprise "VUZHKG" of Tarutino village	0	0
Berezovka village housing and communal services	62,5	--
Municipal enterprise Podolskvodokanal	11,1	--
Infox LLC branch of Infoxvodokanal	751,0	5882,4
Municipal Enterprise of the Ochakiv City Council "Ochakiv-Service"	1,4	3,8
Odesa Port Plant JSC	-	51,0
ME Naberezhne	0,3	-
ME "Prolisok-1"	1,7	-
PJSC Odessavinprom	0	0
ME "Alekseevske"	-	-
Municipal enterprise "Treatment facilities"	-	-
Rice of Ukraine LLC	1,9	-
Odesa JSC	0,2	3,2
Municipal enterprise "Chornomorskvodokanal"	11,1	106,9
Municipal enterprise "Water supply and sewerage"	4,9	9,0
Delta Wilmar Ukraine LLC	2,3	9,7
SE USPA	12,8	25,8

2.1.2. Nutrients pollution

Nutrient inputs to surface waters are the driving force behind eutrophication, which leads to an increase in primary production and accumulation of organic matter. The enrichment of water with nutrients that stimulate the development of autotrophic aquatic organisms, resulting in an undesirable imbalance of organisms in the aquatic environment and a decrease in water quality.

Phosphorus and nitrogen compounds play a dominant role among biogenic substances, with some influence from ferrous, silicon and molybdenum. Of the first two, phosphorus plays a greater role, while nitrogen is much less likely to limit the development of autotrophic organisms, due to the ability of many bacteria and cyanobacteria to fix it.

Nutrients can come from both point and diffuse sources. The main sources are untreated wastewater from municipal and industrial facilities. The widespread use of phosphorus-containing detergents and washing powders with insufficient wastewater treatment increases nutrient pollution. The efficiency of phosphorus removal from wastewater at most wastewater treatment plants in Ukraine does not exceed 20%, but due to outdated equipment, the efficiency of phosphorus removal by treatment plants often does not reach design values.

Diffuse sources

Land cover type is a dominant factor in the anthropogenic load on groundwater pollution from diffuse sources.

Another important indicator of the anthropogenic load from diffuse sources of pollution is the intensity of agriculture, which is expressed primarily in the amount of fertiliser used. According to the statistical offices of the oblasts within the study basin, fertiliser use varied significantly by region and by crop.

Nitrogen fertilisers accounted for the majority of mineral fertilisers applied to various crops. The average application of mineral fertilisers was 125 kg/ha.

The organic fertiliser load is not provided in the statistical information. This indicator is calculated on the basis of data on the number of livestock, manure yields and nitrogen and phosphorus compounds in their composition.

Despite the fact that Ukraine's livestock industry has shrunk significantly since the change in the economic system and is recovering at a slow pace, there are still a large number of domestic animals, especially birds, in the Black Sea basin.

Based on official statistical reports at the district level, we calculated the manure output within the basin for one year. The manure production was calculated by animal type and averaged yield factors (Table 17).

Table 17. Coefficients for calculating manure production from different types of animals

Type of animal, head	Manure production, tonnes per year
CATTLE	11,4
Pigs	4,3
Sheep, goats	1,05
Poultry, 100 heads	5,45

Based on the calculated manure output from livestock and data on the content of nitrogen and phosphorus compounds in it (Table 18), the theoretical nutrient yield from livestock activities was obtained.

Table 18. Content of nitrogen and phosphorus compounds in livestock manure

Animal type	Nutrient content	
	N, kg/t	P2O5, kg/t
Cattle, heads	4,19	1,47
Pigs, heads	6,1	1,43
Poultry, 100 heads	11,83	9,8
Sheep, goats, heads	6,2	1,6

Land use indicators (namely, the share of agricultural land) were used as one of the indicators to assess the impact of diffuse sources.

To assess the possibility of nutrients entering surface waters, direct quantitative indicators should provide more accurate results, including the parameters of fertiliser application and the overall balance of nitrogen and phosphorus in soils. Given that fertilisers in soils can not only be consumed by plants and washed out with water runoff, but also be affected by microbial processes and released into the air, we concluded that calculating the local balance between the supply of nitrogen and phosphorus compounds to the agroecosystem and their consumption

would avoid overestimating the impact of diffuse sources. In addition, in this case, not only the applied ameliorants are taken into account, but also the organic fertilisers accumulated within the basin.

To solve the problem of assessing the impact of diffuse sources, the best results can be obtained using data at the level of individual fields or farms. On the one hand, the initial information for such spatial resolution is not readily available, requiring the use of satellite technologies, and on the other hand, such work entails large and often unjustified expenditures of resources and time. For the purposes of developing the RBMP, it was decided to focus on the level of administrative districts.

Methodology for calculating the balance of nitrogen and phosphorus in the soil cover

The gross nutrient balance formed during the year in the topsoil characterises the potential amount of nutrients that can enter the channel network during runoff formation. The value of this balance is calculated as the difference between the amount of nutrients entering and leaving the agricultural system.

In agricultural practice in Ukraine, the balance of nutrients has so far been calculated only at the regional level.

The balance of nitrogen and phosphorus in soils is defined as the difference between the total supply of these compounds with fertilisers and their removal with crop yields. The latter is calculated by multiplying the crop yield data by the amount of nutrients consumed by the crop during maturation.

The indicators of nitrogen supply with precipitation were regionalised by physical and geographical zones and calculated based on precipitation monitoring data for 2000-2017. Thus, the average annual precipitation for the mixed forest zone was 606 mm, forest-steppe - 571 mm and steppe - 488 mm. The amount of nitrogen supplied by precipitation was 4.5 kg/ha, 5.7 kg/ha and 4.0 kg/ha, respectively.

Determination of risk category thresholds for the Soil Balance indicator

The screening of the monitoring data revealed only 2 points where the threshold value of 50 mg/dm3 was exceeded, which is 11.3 mgN/dm3 in terms of nitrogen. The waters of both facilities were under the influence of point sources of pollution.

Experimental studies carried out at specially equipped small runoff sites to model water exchange within homogeneous hydrological areas have shown that in the absence of fertilisation, nitrate concentrations in water runoff are low.

In the case of mineral fertilisers, the removal of nitrogen compounds from the catchment area increases dramatically. At the same time, nitrogen in the surface runoff was mostly supplied by storm precipitation, and the total concentration of Nmin in the surface runoff water did not exceed 2 mgN/dm3. In the waters of lateral runoff formed in the vadose zone, due to a much longer retention time, the concentration of nitrogen compounds exceeded 60 mgN/dm.

The ecological classification of terrestrial surface waters based on the ecosystem principle was used as a criterion base for determining the pollution of surface waters by nitrate compounds from agricultural sources. In the classification based on tropho-saprobiological criteria, the values of both biotic and abiotic parameters were agreed upon. Thus, the limit of deviation from the good condition of waters, at which they reach a polytrophic state, is the concentration of nitrate ions over 1 mg/dm3.

The entire available surface water monitoring database was sorted according to the above criterion. As a result, 25 monitoring points were identified where N-NO3 concentrations were above the limit of 1 mg/dm3. At the relevant locations, the soil Nitrogen Balance was also determined. The average value was 35 kg/ha, and this value was used to determine the limit of surface water pollution. It should be noted that this value compares well with the risk limit adopted in EU countries, where it is 25 kg/ha.

The rivers are in good ecological condition, fairly clean, mesotrophic and have a maximum nitrate nitrogen concentration of 0.5 mgN/dm^3.

The average value of the Soil Balance at the sites where nitrate nitrogen concentrations of 0.5 mgN/dm^3 were observed was 10 kg/ha, which was taken as the limit for the absence of water pollution risk.

Table 19. Limit values of categories for the criterion for assessing the risk of failure to achieve environmental objectives from diffuse sources "Soil balance"

Category.	Category name	Limit value
1	"not at risk"	BH<10
2	"possibly at risk"	10<BG<35
3	"at risk"	BH >35

Calculation of soil nitrogen balance at the level of administrative districts

The initial information for calculating the balance of nutrients in soils was statistical data on sown areas, crops and their yields, fertiliser application and livestock indicators at the level of administrative districts of the regions that are part of the Black Sea river basin.

At the next stage, the calculated nitrogen balance was adjusted to the MRL of the Black Sea river basin as a weighted average value. The value of the balance varies widely, from a deficit of 9.9 kgN/ha to 63.9 kgN/ha, with an average value of 28.5 kgN/ha.

The phosphorus balance was in deficit, and therefore phosphorus was not used to determine the anthropogenic impact from diffuse sources in the future.

Calculation of the livestock load at the level of administrative districts

In order to estimate the livestock load, it was necessary to convert all animal species to one conventional unit. For this purpose, standard coefficients calculated on the basis of the value of the feed base were used. The basic unit was 1 head of cattle. For pigs, total sheep and goats, the conversion factors were 0.3 and 0.1, respectively. Poultry was converted by a factor of 0.014.

Based on the results, the weighted average livestock unit and the share of livestock for each SWB were calculated.

In general, the share of livestock is low and ranges from 0.0014 to 0.044, with an average of 0.018 heads/ha.

The main factor that determines the anthropogenic load on the IBA from diffuse sources is land use. There is a significant disproportion between the main types of land use in the Black Sea river basin, which results in significant water pollution.

On average, the relative share of arable land in the basin is 86.8%. Disturbance of the soil cover due to ploughing and fertiliser application leads to significant losses of organic and nutrients due to deflation and water runoff.

The highest degree of ploughing is observed in the Stara Donskaya gully (95%), and the lowest in the Kubanka River catchment (82%).

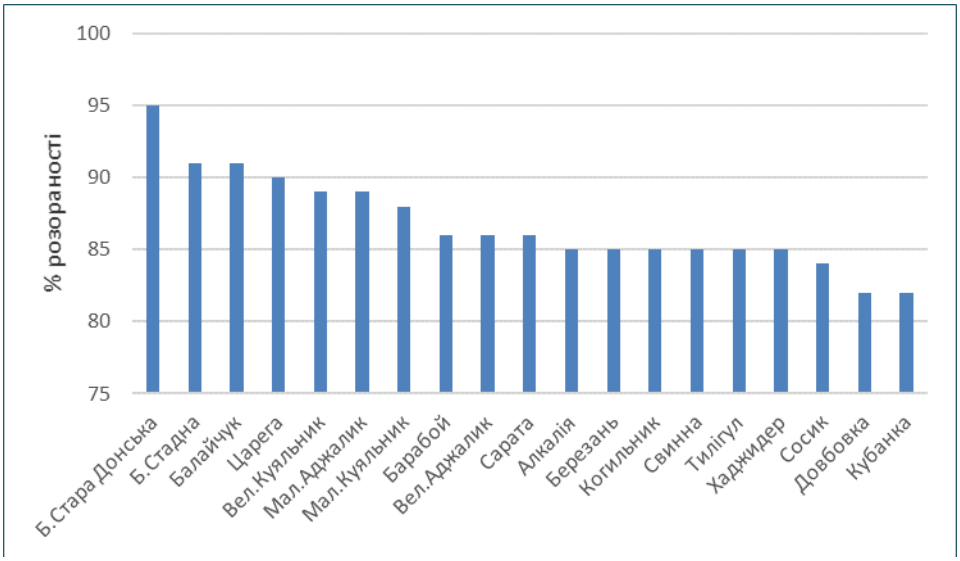


Figure 12 Relative share of arable land in the Black Sea river basin

Determining the anthropogenic load from diffuse sources of nutrient pollution is a matter of modelling. There are different models that take into account the main pathways of substances.

For the first cycle of the management plan, a conceptual model was developed to take into account the main pathways of the studied substances from distributed sources based on GIS land cover layers and substance export coefficients.

The input information was data on water runoff. For those that did not have hydrological information, the water runoff was estimated based on the flow module map. The data on the coefficients of redistribution between the solid and liquid phases were taken from numerous specialised scientific publications or were obtained as a result of personal experimental work in small research catchments.

Data on precipitation and its chemical composition were obtained from the SES of Ukraine hydrometeorological observation database.

The chemical runoff of individual components was calculated for the annual period by integrating the data on daily runoff of the respective substances. To obtain daily concentrations of chemical components, the available data were graphically interpolated using an approximating polynomial. To convert the chemical runoff values to emission values, a retention factor was used, based on water temperature and hydrological characteristics according to the following methodology.

The use of GIS made it possible to differentiate the quantification of nutrient emissions by region.

Nitrogen

The Black Sea river basin generates an emission flow of nitrogen compounds equal to 1947.7 tonnes per year. At the same time, the spatial distribution of nitrogen runoff is characterised by high heterogeneity. The Kogilnik, Tiligul and Alkaliya rivers have the highest rates, with 69.6% of the total nitrogen flow (135.46 tonnes per year) coming from their runoff (Fig. 13). This is due to the large catchment area of these rivers within the Black Sea basin. The basin area for the Tiligul is 3369 km^2, for the Kogilnik - 1296 km^2, and for the Alkaliya - 653 km^2.

Diffuse inputs of nitrogen compounds in the Black Sea basin are mainly driven by agricultural sources. Fertiliser application and soil cultivation account for 78% of the total nitrogen runoff from distributed sources. From the surface of agricultural land, the dominant part of nitrogen (82%) comes in the form of nitrate compounds. The remaining 18% of nitrogen is washed away in the form of eroded organic particles.

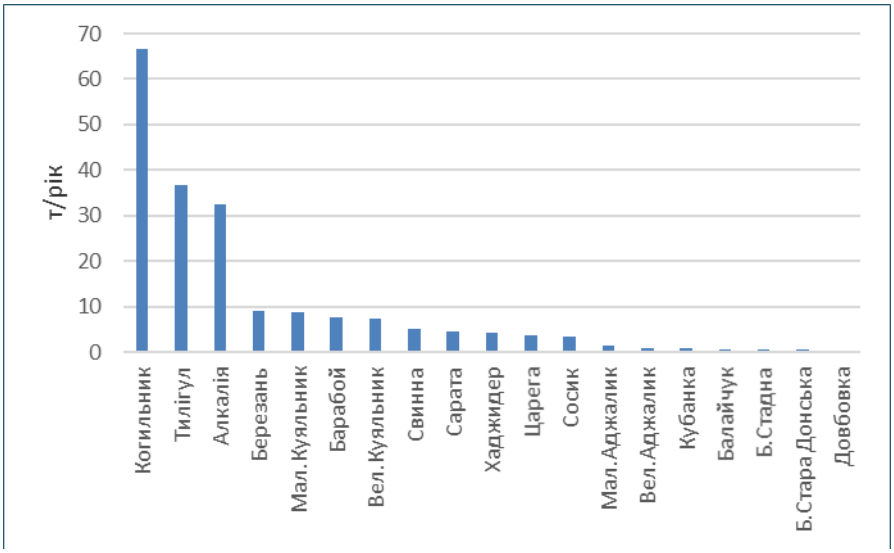


Figure 13 Emission of nitrogen compounds from the catchment area of selected Black Sea rivers

Phosphorus

According to the calculations, the total load of phosphorus compounds is 13.1 tonnes per year. The highest values of phosphorus runoff, similar to nitrogen, are typical for the Kogilnik, Tiligul and Alkaliya rivers (Fig. 14).

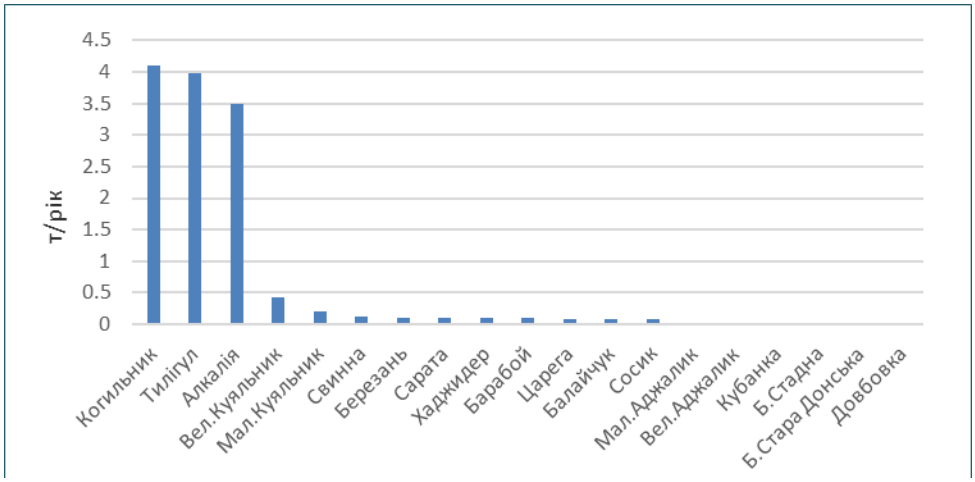


Figure 14 Emission of phosphorus compounds from the catchment area of selected Black Sea rivers

By source, the total phosphorus runoff is primarily determined by the effect of diffuse sources.

In contrast to nitrogen, phosphorus is almost entirely transported from catchment areas as part of erosion particles (94%). The share of soluble forms does not exceed 6%.

Table 20. Inputs of nitrogen and phosphorus compounds from the catchment area of the Black Sea river basin

	Nitrogen, tonnes per year	Phosphorus, tonnes per year
Settlements	185,7	10,9
Agriculture	1878,1	94,0
Other sources	309,6	4,5
Natural background	410,1	17,7
Total	2792	127

The greatest risk of diffuse pollution of surface water will be observed in spring, when runoff rates reach their highest levels. At this time, fertilisers and plant protection products should be applied to crops with the utmost responsibility.

During the period of minimum runoff (summer low water), the role of diffuse sources will decrease dramatically due to the reduction of the water flow carrier. At this time, the role of point sources will be maximised. Given the low water content of most rivers, this will pose a great danger due to the reduced dilution capacity of water runoff. Some rivers may even dry up.

Assessment of risks of failure to achieve good environmental status from diffuse sources

The risks of not achieving "good" environmental status were assessed based on the risk category thresholds for the Soil Balance and Livestock Share indicators

Table 21. Assessment of risks of failure to achieve good environmental status from diffuse sources

Soil balance			Share of livestock production		
Category.	Category name	Criterion.	Category.	Category name	Criterion.
3	At risk	BG > 0.3	3	At risk	Itv > 1.0
2	Possible at risk	10 < BG < 35	2	Possible at risk	0.3 < Itv < 1
1	No risk	BH < 10	1	No risk	Itv < 0.3

The assessment of the risk of pollution from livestock based on the indicator "Share of livestock" indicates that there is no risk of water pollution. The value of the criterion "Share of livestock production" in all SWBs does not exceed the threshold level of risk.

Point sources

Pollution by nutrients from point sources is caused mainly by the discharge of insufficiently treated or untreated wastewater into surface water sources (after use by settlements, industry and agriculture), which significantly increases their concentration in water bodies.

The discharge of nutrients into the basin's water bodies and the impact from point sources was measured and determined by the following indicators: ammonium nitrogen, nitrite ion, nitrate ion, phosphates.

Table 22. Discharge of nutrients into the basin's water bodies and the impact from point sources

Name of the company	Ammonium nitrogen, tonnes	Nitrites, tonnes	Nitrates, tonnes	Phosphates, tonnes
LLC JV Aquavintex, 510259	--	--	--	0,0002
Ananiev-Vodokanal, 510723	1,4	-	1,1	0,1539
Municipal enterprise "VUZHKG" Tarutino, 510724	1,6	0,2	0,3	-
Berezovka village, 510734	-	--	-	0,1435
Podilskvodokanal, 510738	9,0	-	9,5	5,668
Infox LLC branch of Infoxvodokanal, 510760	503,6	202,5	2607,7	390,484
ME Naberezhne, 511345	0,9	0,1	-	0,0874
ME "Prolisok-1", 512014	-	-	9,0	-
PJSC Odessavinprom, 512041	--	--	--	0,001
Rice of Ukraine LLC, 651793	0,3	0,0	0,5	-
ME Ochakiv-Service, 480886	0,1	-	0,8	0,2163
Odesa Port Plant JSC, 510005	0,3	-	14,3	4,3332

Name of the company	Ammonium nitrogen, tonnes	Nitrites, tonnes	Nitrates, tonnes	Phosphates, tonnes
Odesa CHP JSC, 510187	-	-	0,9	0,003
Municipal enterprise "Chornomorskvodokanal", 510187	5,1	0,4	26,4	20,040
Municipal enterprise "Water supply and sewerage", 511033	0,6	-	1,3	0,1228
Delta Wilmar Ukraine LLC, 511335	0,1	-	4,1	0,0005
Saratsky Kommunservice, 511934	0,2	-	0,2	-
AMPU, 511959	0,7	-	2,6	0,1287

2.1.3. Pollution by hazardous substances

Diffuse sources

The risk of pollution by hazardous substances from diffuse sources was not assessed due to the lack of data on pesticide use.

The proposed indicators quite realistically reflect the risks of surface water pollution in the Black Sea river basin from diffuse sources. Just over 20% of the Black Sea SWBs is at risk. After the first cycle of monitoring studies is completed and data on the content of priority substances are obtained, the methodology can be further developed in terms of the Pesticides indicator.

Point sources

The sources of hazardous substances pollution in the Black Sea river basin include industrial wastewater, domestic wastewater, surface runoff from territories, pesticides, oil products, heavy metals and other chemicals used in agriculture, and emergency discharges.)

Table 23. Point sources

Name of the company	Total iron, tonnes	Petroleum products, tonnes
LLC JV Aquavintex, 510259	0,0003	0,0001
Berezovka village, 510734	0,015	0,0008
Podilskvodokanal, 510738	0,0729	0,0316
Infox LLC branch of Infoxvodokanal	4,3254	3,875
PJSC Odessavinprom, 512041	-	-
Municipal enterprise "Treatment facilities"	-	-
LLC JV Aquavintex, 510259	0,0003	0,0001
Ananiev-Vodokanal, 510723	0,5081	0,0015
Municipal enterprise "VUZHKG" Tarutino, 510724	-	-
Berezovka village, 510734	-	0,0008
ME Naberezhne, 511345	-	0,0002
ME "Prolisok-1", 512014	-	-
Rice of Ukraine LLC, 651793	-	-
ME Ochakiv-Service, 480886	0,0053	0,0006
Odesa Port Plant JSC, 510005	0,3006	0,026
Odesa CHP JSC, 510187	0,008	0,006
Municipal enterprise "Chornomorskvodokanal", 510737	0,136	0,072
Municipal enterprise "Water supply and sewerage", 511033	0,0562	0,0209
Delta Wilmar Ukraine LLC, 511335	-	-
Saratsky Kommunservice, 511934	-	-
AMPU, 511959	0,0002	1,2845

2.1.4. Accidental pollution and impact of contaminated areas (landfills, sites, zones, etc.)

The mechanism for preventing and minimising the risk of accidental pollution is established in the EU member states through the implementation of the Seveso-III Directive (Directive 2012/18/EU), the Industrial Waste from Mining Directive (2006/21/EC)10 and the Industrial Emissions Directive-IED (2010/75/EU)11 and for non-EU countries through the implementation of the recommendations of the UNECE Convention on the Transboundary Effects of Industrial Accidents.

The main provisions of the Seveso III Directive (Directive 2012/18/EU) were transposed into Ukrainian legislation in 2021 by amending the Civil Protection Code of Ukraine, the Law of Ukraine "On High Risk Facilities" (the Law) and a number of other laws.

Thus, in accordance with Article 9 of the Law, a business entity identifies high-risk facilities in accordance with the number of threshold masses of hazardous substances. Based on the results of the identification of a high-risk facility, it is assigned a class 1, 2 or 3.

Article 9-1 of the Law provides for the definition and approval of an accident prevention policy for a Class 1 or 2 hazardous facility. According to Article 10 of the Law, for a Class 1 or Class 2 hazardous facility, the operator shall develop and, in cases specified by the Law, review a report on safety measures at the hazardous facility.

Pursuant to Article 11 of the Law, in order to organise the response to accidents at high-risk facilities, operators develop and approve plans for localisation and elimination of accidents and their consequences for each high-risk facility they operate. The plan for localisation and elimination of accidents and their consequences shall be reviewed at least every three years. The procedure for action in the event of an accident at a high-risk facility is set out in Article 14 of the Law. Pursuant to this Article, the Cabinet of Ministers of Ukraine approved the Procedure for Investigation of Accidents at High Risk Facilities by Resolution No. 965 dated 8 September 2023.

Article 15 of the Law stipulates that the operator shall annually submit to the competent authority, local executive authorities, and local self-government bodies information on high-risk facilities owned or operated by the operator by 30 December. At the request of a legal entity or individual or their representatives to obtain information about a hazard that has arisen at high-risk facilities and poses a threat to people and the environment, the operator must submit such information within 48 hours of receiving the request.

Pursuant to Article 16 of the Law, damage caused to individuals or legal entities as a result of an accident at a high-risk facility shall be compensated by the operator who owns the high-risk facility on the relevant legal basis, unless he or she proves that the damage was caused by force majeure or intent of the victim.

No accidental pollution was recorded in the Black Sea river basin in 2021-2022.

2.1.5. Hydromorphological changes

Hydromorphological changes are one of the significant water management issue (SWMI) that impede the achievement of the environmental objectives set out in the RBMP. Hydromorphological changes resulting from economic activity affect the conditions of aquatic communities, which can lead to a deterioration in the ecological status of the SWB in the Black Sea river basin.

Hydromorphological changes are divided into types:

- disruption of the continuity of water flow and habitats - longitudinal disruption of the continuity of rivers and habitats (transverse artificial structures in the river channel, interruption of water flow, disruption of the free flow of rivers, movement of sediments, migration of fish and other aquatic life);
- disruption of the hydraulic connection between river channels and their floodplains;
- hydrological changes (water abstraction, hydropicking / fluctuations in water levels of artificial origin);
- morphological changes (modification of the morphology of the riverbed, banks, and adjacent parts of the floodplain, e.g. straightening).

Disruption of the free flow of rivers. Dams and other artificial cross structures located in riverbeds were built primarily to accumulate water, with its subsequent use for agricultural, public and industrial purposes. In the Black Sea river basin, 53 SWBs have been identified where there is a disruption of the continuity of water flow and environment (overregulation).

The accumulation of water in ponds and reservoirs upstream of dams also provides flood protection for areas downstream of dams. According to the SAWR, a significant number of ponds are in poor technical condition. Most of them were built in 1960-1980 according to simplified design documentation. The dams are earthen, with loose slopes, and many of them are eroded. Spillway structures usually do not meet modern requirements in terms of their technical condition.

The presence of dams and other structures across the river channel disrupts the continuity of water flow and sediment movement, as well as the migration of fish and other aquatic life.

No fish passages have been built in the transverse structures, and as a result, populations of various fish species have declined or disappeared. To date, the construction of fish passages on existing dams on the basin's rivers looks quite problematic due to the lack of not only funds, but also the very assessment of the economic feasibility of building a fish passage.

Disruption of the hydraulic connection between river channels and floodplains. The hydraulic connection between the riverbed and the floodplain plays an important role in the functioning of aquatic ecosystems, providing water for important habitats for fish and aquatic life, and has a positive impact on the condition of surface and groundwater.

The assessment of this type of hydromorphological changes is included in the hydromorphological protocol for assessing the SWB used by the SES in the course of state monitoring of surface waters (indicators No. 10: "Interaction between the channel and the floodplain: 10a - Possibility of floodplain inundation, 10b - Limiting factor for the development of horizontal deformations of the channel").

Hydrological changes. Hydrological changes affect water bodies through water abstractions and fluctuations in water levels below dams, and as a result, lead to changes in the regime and distribution of river flows. Discharges, water withdrawals and artificial periodic fluctuations in water levels (hydroelectricity) are key pressures that require compensatory measures to be implemented on a river basin-wide scale.

There are no SWB with hydrological changes in the Black Sea river basin.

Decreased natural flows in the context of global warming and natural water shortages, reduced flow velocities and the formation of stagnant zones contribute to eutrophication processes, and, as a result, lead to a deterioration in biodiversity and degradation of aquatic ecosystems.

Morphological changes. The main factors that negatively affect the natural morphology of the Black Sea river channels, their banks and floodplains are urbanisation, flood protection, agriculture and shipping. As a result of these activities, rivers in certain areas are straightened, dredged, banks are reinforced, the floodplain adjacent to the channel is ploughed up, and its natural vegetation is changed.

In the basin, 17 SWB have undergone modification of river morphology (straightening). Reduced variability in channel depth and width, disruption of the natural balance of erosion and accumulation, narrowing of the inter-dam space and restriction of free meandering lead to an impoverishment of the composition and reduction in the number of biological indicators, such as fish, benthic invertebrates, higher aquatic vegetation, and phytoplankton.

The criteria for classifying SWB as "HMWB" due to hydromorphological changes are:

- disruption of the continuity of water flow and environments (transverse artificial structures in the riverbed, disruption of the continuity of water flow and sediment movement and migration of fish and other aquatic life);
- water withdrawals (small and medium-sized rivers - water withdrawals exceeding 75% of the supply; large and very large rivers - water withdrawals exceeding 90% of the supply);
- water accumulation (ponds with a ponding area of more than 1 km or several ponds with a ponding area of less than 1 km, but their total length is more than 30% of the length of the SWB, as well as reservoirs with a volume of more than 1 million m^3);
- fluctuations in water levels below the dam (water level fluctuations exceeding 0.5 m per day for most of the year);
- disturbance of natural morphological characteristics of rivers (hydromorphological class below the third according to the monitoring results, or straightening of more than 70% of the length of the main river channel in the absence of monitoring data).

Most cases of hydromorphological changes occur on small rivers in the Black Sea basin. Small rivers, according to the classification of rivers by basin area used in the definition of SWBs, are rivers with a catchment area of up to 100 km^2.

2.2. Groundwater

2.2.1. Pollution

The anthropogenic pressures on the geological environment has a significant impact on the state of groundwater. The main factors affecting the state of the underground hydrosphere include groundwater abstraction for water supply, use of surface water for reclamation purposes, use of mineral fertilisers and pesticides in agricultural production, and discharge of industrial and municipal wastewater.

In terms of territory, this impact can be conditionally classified as local (discharge of municipal and industrial wastewater into the geological environment, formation and operation of household and industrial waste dumps, etc.) and regional (irrigation reclamation, groundwater extraction, use of agrochemicals). At the same time, a number of anthropogenic factors associated with additional water load on the geological environment (irrigation water, various wastewater) can affect both the level and chemical state of groundwater. The use of mineral fertilisers and pesticides as an anthropogenic factor can significantly affect the chemical state of groundwater.

Table 24 shows the data on the application of fertilisers and plant protection products within Odesa, Kherson and

Mykolaiv regions in 2020.

Table 24. Load from pesticides, mineral and organic fertilisers as of 2022 (numerator) and minimum and maximum for the period 2007-2022 (denominator)

Administrative regions	Mineral fertiliser application, 100% of nutrients per 1 ha of sown area, kg	Introduction organic fertilisers, thousand tonnes	Pesticide application, kg/ha
Odesa	79 35-133	70,0 31,5-210,4	0,71 0,57-0,9
Kherson	64 33-142	23,1 11,0-165,7	0,353 0,52-1,56
Mykolaivska	111 29-179	163,2 91,9-206,9	0,753 0,56-1,11

The GWBs in the non-pressure horizons within the Black Sea river basin are conditionally protected. The cover of UAM5800N100 and UAM5800N200 is covered by loams with a total thickness of 20-40 m. The cover of the Balt aquifer (UAM5800N300) consists of loams and clays with a total thickness of 30-40 m. Contaminants may enter the aquifers through defective production wells and in irrigation areas (UAM5800N100). Within the boundaries of settlements, there is spotty contamination of groundwater with nitrogen compounds. The presence of synthetic surfactants, oil products and pesticides in aquifers is also recorded in concentrations that do not exceed the maximum permissible levels. In the areas of intensive exploitation, the impact of technogenesis affects the level regime.

The GWBs in the pressure horizons are located under the thickness of water-resistant sediments, which significantly hinders their connection with surface ecosystems and provides a relatively high level of protection against surface pollution.

In the pressure aquifers in production wells, there is sometimes spot pollution of groundwater with nitrogen compounds, the presence of synthetic surfactants, oil products, and pesticides in concentrations that do not exceed the maximum permissible levels.

In recent years, the number of idle and abandoned wells has been increasing. Wells that have been out of service for a long time or are abandoned eventually become a source of groundwater pollution. So far, groundwater contamination has been localised, but failure to address the issue of repairing or abandoning abandoned wells in the near future could lead to contamination of major aquifers. Artesian wells are also being constructed without design documentation and using plastic casing that does not ensure proper sealing of the annular space and reliable isolation of the target aquifer from the inflow of substandard water from the aquifers above. As a result, the water quality in the well deteriorates over time, and in the future, focal contamination and deterioration of groundwater quality can be expected.

2.2.2 Volumes / reserves

In general, the territory is characterised by unfavourable conditions for the formation of groundwater resources.

No assessment of groundwater resources in non-pressure aquifers has been carried out in Ukraine. As for the pressurised aquifers with drinking water, their assessment was carried out within administrative regions. Information on the forecasted resources, exploitable reserves and groundwater extraction within the oblasts whose territories are located within the basin is presented in Table 25.

Table 25.. Projected resources, exploitable reserves and groundwater production (data for 2020).

Oblast	FGR, ths. m^3/day	FGR on 1 person, m^3/day	OGR (A+B+C), thousand m^3/day	Explo-ration, %	Extraction from FGR, thousand m^3/day	Extraction from OGR, thousand m^3/day	Develop-ment of the OGR, %	Develop-ment of the FGR, %
Odesa	736,7	0,31	487,4	66,2	74,51	31,0	6	10
Kherson	4970,8	4,89	930,5	18,7	121,043	88,1	9	2
Mykolaivska	441,6	0,40	102,9	23,3	32,842	11,4	11	7

The provision of FGR per capita is the lowest in Odesa Oblast and the highest in Mykolaiv Oblast. The exploration of FGR (ratio of OGR to FGR, %) in Odesa, Kherson and Mykolaiv regions is 66.2%, 18.7% and 23.3%, respectively.

Groundwater is used everywhere in public utilities for centralised drinking, industrial and technical water supply, agricultural and industrial production, in individual households and as a source of water supply. Groundwater is exploited both by group water intakes and by individual wells and mine wells. The impact of technogenesis on pressure groundwater bodies is mainly on the level regime.

The indicators of the development of the FGR and OGR in these areas indicate the possibility of increasing groundwater production in most of the basin, except for the southwestern part of the basin, where groundwater of high salinity is common.

It should be noted that in recent years, there has been a downward trend in groundwater production, which has contributed to the recovery of groundwater levels in aquifers.

The impact of military operations on the status of GWBs

Russian aggression is a significant negative factor in the anthropogenic impact on the environment.

Non-pressure GWBs. The quality of non-pressure GWBs may be affected by the ingress of pollutants (heavy metals, fuels and lubricants, organic pollution, etc.) from the surface in areas of intense shelling. The destruction of industrial facilities can lead to the ingress of various pollutants into the soil and rocks of the aeration zone, and in the long term, negatively affect the quality of groundwater.

Changes in the quantitative state of non-pressure GWBs in most of the basin's territory are not expected due to military operations.

Pressure GWBs. A characteristic feature of the war with Russia is large demographic losses: increased mortality, decreased birth rate, migration, which is also typical for the territory of the study basin. Accordingly, in the coming years, industrial production will continue to decline, so, obviously, centralised consumption of groundwater for domestic use will decrease, and groundwater levels in the pressure groundwater supply systems will gradually recover. Therefore, the quantitative indicators will not undergo negative changes.

The chemical composition of the pressure GWBs will remain stable.

Table 26. Pressures on the GWBs

GWBs code	GWBs	Usage	Connecting with ecosystems	Technological load	Pollutants	Natural chemical elements, the content of which in water exceeds normalised values
UAM5800N100	Alluvial Pliocene-Pleistocene	For non-centralised water supply	Indirect	Groundwater extraction	Point source nitrate pollution	
UAM5800N200	Alluvial upper plioce-new	For centralised and non-centralised water supply	Indirect	Groundwater extraction, irrigation and drainage reclamation	Point source nitrate pollution	
UAM5800N300	Baltsky	For non-centralised water supply	In places of access to the daytime surface	Groundwater extraction	Point source nitrate pollution	
UAM5800N400	Upper Miocene	For centralised and non-centralised water supply	None	Groundwater extraction	Point source nitrate pollution	In some places SO4, Cl, mineralisation
UAM5200N500	Upper Sarmatian	For centralised and non-centralised water supply	None	Groundwater extraction	Spot pollution by nitrogen compounds (nitrates, ammonium)	In the southern part of the basin area, the natural content of SO4 , Cl, Na, dry residue, hydrogen sulphide content is increased
UAM5800N600	Middle Sarmatian	For centralised and non-centralised water supply	None	Groundwater extraction	Spot pollution by nitrogen compounds (nitrates, ammonium)	In the southern part of the basin area, the natural content of SO4, Cl, Na, dry residue, and hydrogen sulphide is increased

Assessment of the risk of not achieving good status

Risk assessment of failure to achieve good quality (chemical) status

As for non-pressure GWBs, their quality condition within settlements is most likely poor (nitrate pollution). There is no data on the chemical composition of non-pressure GWBs outside settlements, but a significant anthropogenic load from diffuse sources of pollution within agricultural landscapes and their natural vulnerability allows us to conclude that they are at risk of not achieving good quality (chemical) status. Within agro-landscapes, this risk is caused by the possibility of nitrates and pesticides entering the water. An additional negative impact is caused by substances that have been or may be released into the environment as a result of military operations, such as heavy metals, nitrates, oil products, as well as elements and compounds released into the environment as a result of the destruction of industrial facilities.

Protected from contamination, the pressure GWBs is not at risk of failing to achieve good quality (chemical) status (Table 27).

Figure 14. Assessment of the risk of failure to achieve good chemical status of the GWB

Assessing the risk of not achieving good quantitative position

There is no negative impact from anthropogenic groundwater abstraction for the pressure and non-pressure GWBs identified in the Black Sea RBD. Taking into account the reduction of groundwater extraction, there is no risk of failure to achieve good quantitative status for both pressurised and non-pressurised GWBs, according to available data.

Table 27. Risk assessment of failure to achieve good qualitative (chemical) and quantitative status

GWBs code	GWBs and GWBs groups	Quality risk		Quantitative risk	
		without risk/ at risk	at risk: the reason	without risk/ at risk	at risk: the reason
Non-pressure GWBs					
UAM5800N100	GWBs in alluvial Pleistocene-upper Pliocene sediments	at risk	Nitrate pollution, vulnerability to contamination from the surface	No risk	
UAM5800N200	GWBs in alluvial Upper Pliocene sediments	at risk		No risk	
UAM5800N300	GWBs in Baltic sediments	at risk		No risk	
Pressure GWBs for the pressure GWBs					
UAM5800N400	GWBs in Upper Miocene sediments	No risk		No risk	
UAM5200N500	GWBs in the Upper Sarmatian sediments	No risk		No risk	
UAM5800N600	GWBs in Middle Sarmatian sediments	No risk		No risk	

2.2.3 Other significant anthropogenic impacts

Climate change

One of the main manifestations of regional climate change against the backdrop of global warming is a significant increase in air temperature, changes in the thermal regime and precipitation patterns, an increase in the number of dangerous meteorological phenomena and extreme weather conditions, and the damage they cause to various sectors of the economy and the population. These trends are characteristic of Ukraine in general and the Black Sea river basin in particular. The greatest changes have been observed over the past thirty years, which have been the warmest for the period of instrumental weather observations.

The rise in air temperature is observed not only near the Earth's surface but also in the lower troposphere, accompanied by an increase in tropospheric moisture content, and causes an increase in atmospheric instability and convection intensity. Such changes have led to an increase in the frequency and intensity of convective weather phenomena: thunderstorms, showers, hail, squalls, and an increase in the maximum intensity of precipitation and its storm component.

A characteristic feature of the changing moisture regime in Ukraine is a change in the structure of precipitation. In the warm period, this is manifested in an increase in the intensity of precipitation and an increase in its storm component. The increase in precipitation intensity has led to an increase in daily precipitation, although the number of rainy days has decreased and the maximum duration of the rain-free period has increased. These trends are also typical for the Black Sea river basin.

The rise in air temperature and uneven distribution of precipitation, which is localised and heavy in the warm season and does not ensure effective soil moisture accumulation, has led to an increase in the number and intensity of drought events.

During the cold period, a significant increase in air temperature led to a change in the precipitation pattern due to an increase in the frequency of rain and a decrease in the frequency of snowfall, resulting in an increase in the incidence of sleet, sleet and ice.

The water and heat balance of the river basin is highly sensitive to climate change. Rising air temperatures and changes in precipitation patterns affect not only the hydrological regime of rivers, but also the overall water resources. Climate change is increasing the frequency of floods and droughts, which makes agriculture, energy, transport and the social sector vulnerable, as they depend on water resources.

According to the conclusions of the National Academy of Sciences of Ukraine, the Ukrainian Academy of Agrarian Sciences and the Ukrainian Hydrometeorological Centre, global warming in Ukraine will result in irreversible degradation of the Black Sea steppes and a decrease in forest productivity throughout Ukraine, in particular, due to the spread of infectious plant diseases and pests Increased overall temperatures by 2050, droughts and heat waves, and reduced summer precipitation will also contribute to an increase in the frequency of forest fires and desertification in the southern and southeastern regions of Ukraine. At the same time, regions in southern Ukraine may also be affected by rising levels of the Black and Azov Seas, which are part of the world's oceans, as sea levels have risen by an average of 178 mm over the past 100 years and continue to rise at a rate of 3.4 mm per year. A significant part of Odesa region may be under water. Parts of Kherson and Mykolaiv regions will also be under water. This situation could also lead to a problem with water supply. And according to the National Institute for Strategic Studies, threats to biodiversity due to climate change will manifest themselves in the form of a decrease in the number of useful species, changes in the composition of forests and fauna, degradation of Ukrainian soils, and changes in the species composition of soil flora and fauna. Odesa region is not one of the most vulnerable regions of Ukraine to global climate change, but according to forecasts, the impact of climate change will be felt in most of its territory (the closer to the city, the more).

Pollution of water bodies with solid waste, including plastic

The pollution of water bodies by solid waste, primarily plastic, is one of the pressures that leads to the deterioration of the ecological and chemical state of surface waters. This problem is not specific to the Black Sea river basin, but to the whole country and reflects the problem of waste management at both national and local levels.

Gaps in national legislation, an inefficient system of waste collection, transport and disposal, and a low culture of waste management are manifested in a large number of unauthorised and spontaneous landfills, including on river banks and slopes. Some of the waste is discharged directly into rivers and water bodies, which is not only an aesthetic problem, but also leads to chemical pollution of water, poisoning of living organisms and deterioration of their living conditions.

Over time, plastic breaks down and turns into microplastics, which get into living aquatic organisms, contributing to the accumulation of toxins.

Microplastics are less than 5 mm in size and fall into two groups: primary and secondary. Primary microplastics are part of cosmetics (toothpastes, scrubs, shower gels, etc.), industrial cleaning products, and are also formed as a result of wear and tear on car tyres and when washing synthetic products.

Recycled plastic is produced by shredding large plastic waste such as bottles, disposable tableware, packaging, etc.

No special studies have been carried out on the amount of waste on the banks and directly in rivers and water bodies in the Black Sea river basin, nor on its direct impact on the ecological and chemical state of water bodies.

Invasive species

Invasions of alien species outside their "native" habitats are global in nature. The naturalisation and further spread of invaders can cause irreversible environmental damage and undesirable economic and social consequences.

Currently, biological invasions are considered to be biological pollution, but unlike most pollutants that can decompose in natural ecosystems through self-purification processes and whose content is controlled by humans, alien organisms that have successfully invaded begin to multiply uncontrollably and spread rapidly in the environment. This phenomenon can have unpredictable and irreversible consequences.

In addition, the introduction of alien species leads to irreparable losses of biodiversity, both through direct destruction of native species by predators, food and spatial competition, and as a result of displacement of native species, changes in their habitats and hybridisation. The emergence of any alien species is an indicator and, at the same time, a cause of the deterioration of the ecological state of a water body. All this causes a special danger of invasions and determines the specifics of control measures in terms of the risks of not achieving a "good" ecological status of MPAs where the process of invasion of adventive species is carried out.

The issue of invasion of alien species is legally reflected in the Law of Ukraine "On the Basic Principles (Strategy) of the State Environmental Policy of Ukraine for the Period up to 2030", the Decree of the President of Ukraine of 17 December 2021 No. 668, which put into effect the decision of the National Security and Defence Council of Ukraine of 15 October 2021 "On the Strategy of Biosafety and Biological Protection", the Action Plan for the Implementation of the Strategy of Biosafety and Biological Protection for 2022-2025, approved by the Cabinet of Ministers of Ukraine on 07 July 2022 No. 57Z, and the Convention on Biological Diversity.

In accordance with paragraph 5 of the Action Plan for the Implementation of the Strategy for Biosafety and Biological Protection for 2022-2025, approved by the CMU Resolution No. 573 of 07.07.2022, the Ministry of Ecology approved the "Methodological Recommendations for Assessing the Existing and Potential Impact (Risks) of Invasive Alien Species" by Order No. 290 of 15.03.2024 (https://mepr.gov.ua/nakaz-mindovkillya-290-vid-15-03-2024/).

The Guidelines have been developed with due regard to the Regulation (EU) No 1143/2014 of the European Parliament and of the Council (22 October 2014) on the prevention and management of the introduction and spread of invasive alien species, and Delegated Regulation (EU) 2018/968 of the European Commission of 30 April 2018, supplementing Regulation (EU) No 1143/2014 of the European Parliament and of the Council on the risk assessment of invasive alien species, in order to harmonise approaches to impact (risk) assessment when preparing proposals for the inclusion of alien species in the List of Invasive Alien Species of Flora and Fauna of Ukraine.

Studies of alien aquatic species in the Black Sea river basin are not systematic and are sporadic.

In particular, Vallisneria spiralis (Hydrocharitaceae), a species of subtropical origin, is widespread in the freshwater bodies of the Black Sea region.

The reasons for the appearance of alien species are related to direct anthropogenic impact. Almost half of the identified alien species appeared in the fish fauna as a result of human fishing activities.

The main ways of spreading invasive species are:

- aquaculture or fish farming of commercially valuable fish species;
- Accidental or unintentional introduction of commercial species along with stocking;
- aquarists, which contributed to the spread of species as a result of their deliberate release into natural reservoirs or accidental entry into the latter (sunfish, rotan, silver crucian carp);
- Expansion of the natural ranges of Ponto-Caspian species as a result of hydroelectric construction and global warming (round goby, sand goby, goby, goby, western goby, blunt-nosed goby);
- unauthorised stocking of rivers with alien species without scientific justification and expertise and relevant permits (Danube salmon).

According to the Convention on Biological Diversity (The Hague, 2002), measures aimed at mitigating the effects of invasions by alien species should be mainly preventive, but it is usually not possible to effectively control the process of invasions, primarily due to the lack of a biodiversity monitoring system.

After conducting special studies of alien aquatic species in the Black Sea RBD and determining the list of species at their location, the first and most important step is to establish a basin-wide monitoring system for invasions. Monitoring should be focused on:

- identification and analysis of the species composition of alien species, invasive corridors, geography and dynamics of invasions;
- population dynamics of the most significant invasions from emergence to naturalisation, as well as of invasive species that have already been naturalised, and the consequences of their impact on habitats, native species, communities and ecosystems;
- Inventory of possible intrusion sites and their survey (e.g., municipal wastewater leaks from large cities with a developed aquarium services market, discharges of heated water from thermal power plants and large industrial enterprises).

Provision must also be made at the basin level:

- development of regional/basin cadastral lists of alien, threatened (dangerous) species of flora and fauna of Ukraine;
- predicting the emergence of new invasive species that are potentially dangerous for human activities or established hydroecosystems;
- development of methods to curb the spread of alien species (e.g. physical removal, weakening the development of species using phytophagous animals, use of herbicides). An example is the programme for monitoring, localising and controlling the number of alien (invasive) plant species in the territory of the territorial community of Stryi City Council for the period 2021-2025.

3 ZONES (TERRITORIES) TO BE PROTECTED AND THEIR MAPPING

3.1. Emerald Network sites

The Emerald Network is an ecological network consisting of special areas for the conservation of biological diversity established (designated) in accordance with the Convention on the Conservation of Wild Flora and Fauna and Natural Habitats in Europe (Bern Convention). Its goal is to ensure the long-term survival of species and habitats listed in the Bern Convention that require special protection.

On 30 November 2018, six countries - the Republic of Belarus, Georgia, the Republic of Moldova, Norway, Switzerland and Ukraine - officially approved the lists of Emerald Network sites on their territories. The updated list of Emerald Network sites was approved on 23 May 2023. The Emerald Network of Ukraine includes 537 territories and covers about 20% of Ukraine's territory.

There are 33 Emerald Network sites in the Black Sea river basin, covering approximately 26% (6,982 km^2) of the basin's area.

By category (Fig. 15), the sites of the Black Sea Emerald Network are divided into:

- Biosphere reserve - 3
- nature reserve - 6
- protected area - 19
- national natural park - 5

Figure 15. Breakdown of Emerald Network facilities by category (%)

None of the facilities has a management and development plan. The list of sites of the Black Sea Emerald Network is provided in Annex 4.

Impact of military operations

Part of the basin has been under occupation since February 2022.

According to the information provided by the owners and users of the protected areas and objects, 15 protected areas in the basin were damaged during the hostilities. Due to the constant shelling of the territories and the occupation, access to the protected areas is impossible, and there is no information on their condition.

Three Emerald Network sites were most affected by the hostilities:

1. **Biloberezhzhia Sviatoslava National Nature Park (UA0000097)**

- As of August 2023, the NNP is under occupation, which has been going on almost since the beginning of the full-scale invasion.
- Large-scale forest and steppe fires as a result of hostilities cause irreparable damage
- to natural ecosystems, lead to the destruction and damage of flora and fauna, and soil degradation. According to the information of the Svyatoslav Biloberezhzhzhya National Nature Park, as a result of hostile actions of the Russian Federation, 143 fires were recorded on the territory of the National Park between 24 February 2022 and 18 July 2023, affecting 5916.8 hectares; a significant number of fires are repeated.

- The movement of heavy machinery, construction of fortifications, and spillage of fuels and lubricants lead to damage to the topsoil, destruction of vegetation, and damage to the habitats of rare and endangered species of plants and animals.
- Shelling and mining of the territory lead to the mechanical destruction of wildlife, scaring away birds that cannot breed, and acoustic pollution has a negative impact on dolphins.
- The area was affected by the flooding caused by the explosion of the Kakhovka hydroelectric power station.

2. Kinburnska Kosa (UA0000215))

- As of August 2023, it is under occupation, which has been going on almost since the beginning of the full-scale invasion.
- A significant area of natural floristic complexes of wetland, meadow, steppe and tree and shrub vegetation was damaged as a result of hostilities, in particular due to fires.
- Shelling, mining, movement of heavy equipment, spillage of fuel and lubricants, and construction of fortifications cause damage to soil and vegetation, and the destruction of plant and animal species, including rare and endangered species included in international, national, and regional protection lists, as a result of hostilities.
- Land, air, and water bodies are being polluted by shelling, fires, fuel and lubricant spills, and debris from the destruction.
- Partial flooding was recorded due to the damming of the Kakhovka HPP, with the water level rising by approximately 1 m, and the coast of the Dnipro-Bug estuary, the Vasylivski Plavni tract, and coastal lakes partially flooded.

3. Black Sea Biosphere Reserve (UA0000017), in particular, Volyzhyn Forest, Dovgy and Krugly Islands

- As of August 2023, it is under occupation.
- Fires caused by the hostilities result in damage to habitats of valuable species of flora and fauna listed in the Red Book of Ukraine, the European Red List of Threatened Species, and rare plant communities included in the Green Book of Ukraine and habitats protected under the Berne Convention.
- Shelling, noise pollution, mining, and trenching have a negative impact on the birds of the wetland complex, destroying nesting sites and physically killing species.
- Soils, surface water bodies and aquifers are contaminated with toxic substances, including explosive residues and their metabolites, oil products, heavy metals from shell casings and destroyed equipment.

3.2. Sanitary protection zones

Sanitary protection zones include areas where water intakes for drinking water supply are located. According to the Resolution of the CMU "On the Legal Regime of Sanitary Protection Zones of Water Bodies" of 18 December 1998 No. 2024, these zones are classified as the so-called first zone (strict regime) of compliance with the use regime. The Resolution provides for a number of permitted and prohibited activities within drinking water intakes.

According to the EU WFD (Article 7), "Member States shall identify in each river basin:

- All surface/groundwater bodies used for abstraction of water intended for human consumption, providing on average more than 10 m³ of water per day or providing water consumption for more than 50 people and
- Those water bodies that are intended for future use for the same purpose."

There are 463 water intakes within the Black Sea river basin that withdraw more than 10 m³ of water per day. Of these, 455 are groundwater intakes and 8 are surface water intakes (Figure 16).

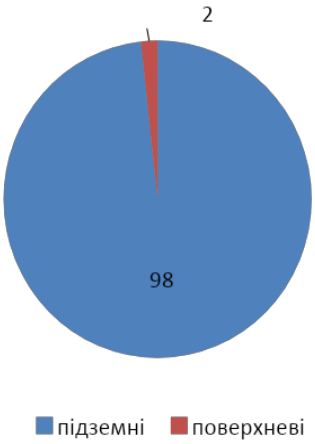


Figure 16. Distribution of drinking water intakes by type (%)

3.3. Protection zones for valuable aquatic bioresources

According to the Resolution of the CMU No. 1209 "On Approval of Tariffs for Calculating the Amount of Compensation for Damage Caused by Illegal Harvesting (Collection) or Destruction of Valuable Aquatic Bioresources" dated 21 November 2011 (as amended by the Resolution of the CMU No. 1039 dated 6 October 2021), the list of valuable bioresources includes both rare and common fish species throughout Ukraine.

At the same time, according to Article 1 of the Law of Ukraine "On Fisheries, Commercial Fishing and Protection of Aquatic Bioresources", a fishery water body (part thereof) is a water body (part thereof) that is used or may be used for fisheries purposes.

Thus, taking into account the above, as well as the lack of an appropriate legislative and regulatory framework, the protection zones for valuable bioresources in Ukraine have not been defined.

3.4. SWBs / GWBs used for recreational, medical, resort and health purposes, as well as water intended for bathing

Recreation areas of water bodies are land plots with adjacent water space intended for organised recreation of the population on the coastal protective strips of water bodies. Places of mass recreation are determined by local governments in accordance with the powers vested in them every year before the start of the summer swimming season. Water protection zones are established along rivers, around lakes, reservoirs and other water bodies, within which land plots are allocated for coastal protection strips.

It is prohibited in water protection zones and coastal protection zones:

- storage and use of pesticides and fertilisers;
- construction of cemeteries, summer camps for livestock, manure storage facilities, cattle cemeteries, waste dumps, filtration fields, liquid and solid waste storage facilities, etc;
- discharge of untreated wastewater;
- construction of any structures (except for hydrotechnical, hydrometric and linear structures), including recreation centres, summer cottages, garages and car parks;
- Washing and maintenance of vehicles and equipment.

Requirements for the location and organisation of water body recreation areas:

- To organise recreational areas on water bodies, their owners or lessees are required to agree the operation of the beach with the State Service of Ukraine for Food Safety and Consumer Protection before the start of each swimming season.
- the recreation area should be located outside the sanitary protection zones of industrial enterprises. The recreation area should be located at the maximum possible distance (at least 500 m) from sluices, hydroelectric power plants, wastewater discharge sites, stables, livestock watering places and other sources of pollution.
- beaches should not be located within the first zone of the sanitary protection belt of drinking water sources.

Environmental goals for recreational areas:

- The water quality of reservoirs and rivers used in recreational areas must meet the requirements of sanitary legislation.

- the composition and properties of water in the area of recreational water use must meet the requirements for physical, chemical and sanitary-microbiological indicators.

Requirements for water monitoring in recreational areas:

- water sampling for departmental control in water bodies should be carried out annually by local authorities at least 2 times before the start of the bathing season (at a distance of 1 km upstream of the bathing area on watercourses and at a distance of 0.1-1.0 km in both directions from it on water bodies, as well as within the bathing area).
- during the swimming season, such water sampling shall be carried out at least twice a month at at least two points selected in accordance with the nature, length and intensity of use of swimming areas.

Pursuant to CMU Resolution No. 264 of 06.03.2002 "On Approval of the Procedure for Registration of Places of Mass Recreation on Water Bodies", local executive authorities and territorial fishery protection authorities are required to identify on maps and schemes land plots and water areas suitable for the organisation of beaches, boat rental facilities, water attractions, as well as places for water sports and places for amateur and sport fishing in winter.

According to the regional SES, no recreation and leisure areas were designated in the Black Sea river basin due to martial law in 2022-2023.

3.5. Areas vulnerable to (accumulation of) nitrate

Ukraine has approved a methodology for determining nitrate vulnerability zones (Order of the Ministry of Ecology of Ukraine No. 244 dated 15.04.2021), as required by the EU Nitrate Directive. The methodological approach is to use a large amount of high-resolution spatial and temporal data, mainly surface and groundwater monitoring data, but the definition of these zones should also use statistical data such as the number of livestock, fertiliser application and surplus calculations for nitrogen. All this information of high quality and sufficient reliability is necessary to identify nitrate vulnerable areas where mandatory measures to reduce nitrate pollution should be taken. At present, the existing surface water monitoring network is insufficient in terms of its integrity and spatial coverage to apply the developed method, and groundwater monitoring is not carried out at all.

Therefore, given that in Ukraine:

- the highest percentage of arable land in the world (53.9%, 2021 data), while the ploughed-out agricultural land rate is 78.2%;
- lack of representative and reliable information on the content of nutrients in surface and groundwater;
- Eutrophication of water bodies is a widespread phenomenon;

In the short term, it is proposed to designate the entire territory of Ukraine as a nitrate vulnerable area. This approach is in line with the EU WFD, reflects the current very limited availability of the necessary information to identify nitrate vulnerable areas, is used in many EU countries (e.g. Germany, Austria, Lithuania and Romania), is easier to assess, and allows for refinement or identification of nitrate vulnerable areas in subsequent reporting periods based on improved, more reliable information.

This approach avoids competition among farmers in the short term and allows all farmers to be financially supported through future rural development programmes without the need to differentiate between different regions. It also allows for the general measures of the action programme to be applied to the entire territory, but for more stringent action programme measures to be applied only to regions where (based on available data) clear agricultural stress can be proven and specified in a step-by-step manner.

Therefore, in the medium term, it is necessary to focus on substantial and gradual improvement of the monitoring network (both groundwater and surface water) and database to ensure a more detailed approach to zone identification and monitoring, and thus achieve full compliance with the WFD with the identified nitrate vulnerable zones during the second cycle of the RBMP (2031-2036).

3.6. Vulnerable and less vulnerable areas identified in accordance with the criteria approved by the Ministry of Environment

As of 2023, no vulnerable or less vulnerable zones have been identified in Ukraine.

The regulatory document governing this issue is the Order of the Ministry of Ecology and Natural Resources of 14 January 2019 No. 6 (registered with the Ministry of Justice of Ukraine on 5 February 2019 under No. 125/33096) on approval of the Procedure for determining the population equivalent of a settlement and the Criteria for determining vulnerable and less vulnerable zones.

Also, in accordance with the Law of Ukraine On Water Disposal and Wastewater Treatment of 12 January 2023 (entered into force on 07 August 2023), Article 12. Powers of *local self-government bodies*, the powers of local self-government bodies in the field of water disposal include - upon the submission of the central executive body implementing the state policy in the field of water sector development, identification of vulnerable and less vulnerable zones in accordance with the criteria approved by the central executive body ensuring the formation of the state policy in the field of environmental protection.

As of 27 March 2024, local governments, upon the submission of the SAWR, recognised 4 SWBs as vulnerable zones, which is 2% of the total number of SWBs in the Black Sea river basin.

4 MAPPING OF THE MONITORING SYSTEM, RESULTS OF MONITORING PROGRAMMES FOR SURFACE WATER (ECOLOGICAL AND CHEMICAL), GROUNDWATER (CHEMICAL AND QUANTITATIVE), AREAS (TERRITORIES) TO BE PROTECTED

4.1. Surface water

Surface water monitoring is carried out in accordance with the Procedure for State Water Monitoring, approved by CMU Resolution No. 758 of 19 September 2018. The Ministry of Ecology, the SAWR and the SES are the subjects of state water monitoring.

Every year since 2020, state water monitoring programmes have been approved by the relevant orders of the Ministry of Ecology (No. 410 of 31.12.2020, No. 3 of 05.01.2022, No. 27 of 17.01.2023) and enforced by the SAWR.

The state water monitoring programme includes:

- information on the object of state water monitoring (code, name of the object, location and other characteristics);
- biological, physicochemical, chemical and hydromorphological indicators, frequency of monitoring, information on the subject and the performer of water monitoring.

State water monitoring is carried out according to the indicators and frequency specified in Annexes 1-3 of the Procedure.

Depending on the goals and objectives of state water monitoring, the following procedures are established:

- the procedure for diagnostic monitoring of the SWBs and GWBs;
- Procedure for operational monitoring of the SWBs and GWBs;
- the procedure for research monitoring of the SWBs;
- procedure for monitoring marine waters.

Diagnostic monitoring is carried out during the first year of state water monitoring. For SWBs that do not pose a risk of failing to achieve environmental objectives, diagnostic monitoring is carried out additionally during the fourth year of state water monitoring.

Operational monitoring is carried out for SWBs that pose a risk of not achieving environmental goals, as well as for SWBs whose water intake to meet drinking and domestic needs of the population averages more than 100 cubic metres per day.

Operational monitoring is carried out annually between the years of diagnostic monitoring.

The research monitoring is carried out by the state water monitoring entities, which independently determine the monitoring points, the list of indicators and the frequency of their measurement.

4.1.1. Monitoring system

In the Black Sea river basin, monitoring is carried out at 16 monitoring sites at 16 SWBs, including:

- 5 points at cross-border SWBs defined in accordance with intergovernmental cooperation agreements.

In 2022-2023, no monitoring was carried out in 4 SWBs of the Black Sea river basin located in Mykolaiv and Kherson regions (due to martial law).

4.1.2. Hydromorphological assessment / status

The hydromorphological status is assessed in accordance with the Methodology approved by the Order of the Ukrainian State Geological Survey No. 23 of 19.02.2019, in five classes.

Hydromorphological monitoring was carried out at 5 SWBs. According to the monitoring results, 3 of the SWBs are classified as nearly natural, and 2 SWBs are classified as slightly modified (Fig. 17).

Figure 17. Hydromorphological status of the Black Sea river basin SWBs

4.1.3. Chemical status assessment

The assessment of the chemical state of the SWBs is based on determining the concentrations of priority substances specified in Directive 2008/105/EC, taking into account Directive 2013/39/EU250, which sets the limit values of environmental quality standards.

In Ukraine, the Order of the Ministry of Ecology and Natural Resources of Ukraine No. 45 of 6 February 2017, registered with the Ministry of Justice of Ukraine on 20 February 2017 under No. 235/30103, defines a list of indicators for which environmental quality standards are set in Annex 8 of the Order of the Ministry of Ecology and Natural Resources of Ukraine No. 5 of 14.01.2019 No. 5 "On Approval of the Methodology for Assigning a Surface Water Body to One of the Classes of Ecological and Chemical Status of a Surface Water Body, as well as Assigning an Artificial or Significantly Modified Surface Water Body to One of the Classes of Ecological Potential of an Artificial or Significantly Modified Surface Water Body".

Directive 2009/90/EC (Article 5), which sets out technical requirements/criteria for the processing of monitoring data, was also taken into account when assessing the chemical state of the SWB:

- If the measured value was below the limit of quantification (LOQ), the calculation uses the value of half the LOQ for this indicator
- When summarising the results of individual isomers or mixtures (e.g. polycyclic aromatic hydrocarbons, cyclodiene pesticides, DDT), in the case of values measured below the LOQ, zero "0" should be used to calculate the average concentrations.

In addition, Article 4 of Directive 2009/90/EC stipulates that the methods for measuring the content of indicators must meet the minimum criteria: have a measurement uncertainty value below 50% (k=2) and a quantification limit equal to or below 30% of the relevant environmental quality standard.

Valuation reliability

The reliability of the chemical state assessment was performed using the criteria for establishing the reliability of the correct determination of the ecological and chemical status of the SWBs specified in Annex 11 of the Order of the Ministry of Ecology and Natural Resources of 14.01.2019 No. 5.

According to the established criteria, a three-stage scheme was used to assess the reliability of the correct determination of the chemical state of the SWB:

- A high level of assessment reliability means that most of the requirements have been met, namely: measurement data are available for all indicators specified in the List of Pollutants for Determining the Chemical State of Surface and Groundwater bodies and the Environmental Potential of an Artificial or Heavily Modified Surface Water Bodies in accordance with the Order of the Ministry of Environment No. 45 dated 6 February 2017, hereinafter referred to as the List, that meet the requirements of the Procedure (almost all relevant requirements for the list of indicators, methods and frequency have been met); the aggregation of SWBs demonstrates reliable results;
- The medium level of reliability of the assessment of the state of the SWB is established in the absence of sufficient monitoring data, frequency and measurement of all indicators identified in the List;

- The low level of reliability of the assessment of the state of SWB means that the assessment of the state of SWB was based on risk assessment, transfer of monitoring data through aggregation of SWB according to certain criteria.

To assess the chemical status of the SWB, statistically processed data of measurements of pollutants in surface waters carried out at 2 monitoring points (2 SWB) in 2022-2023 were used, namely the average and maximum values (Annex 6).

Background concentrations for non-synthetic substances (mercury, lead, cadmium, nickel) were not taken into account when assessing the chemical status of the SWB.

Compliance of the measurement results with the environmental quality standards set for the annual average and maximum permissible concentrations is considered to be compliance with the requirements set for good chemical condition of the SWB.

For SWB where monitoring was not carried out, the chemical state was assessed by interpolating (transferring) the assessment results from SWB where monitoring was carried out, according to the aggregation of SWB.

The following parameters were not measured: brominated diphenyl ethers (esters), chloralkanes, C_{10-13} , di-(2-ethylhexyl)-phthalate, diuron, isoproturon, pentachlorophenol, tributyltin compounds (tributyltin cation), perfluorooctane sulfonate and its derivatives (PFOS), dioxins and dioxin-like compounds, hexabromocyclo-dodecane (HBCDD) - (Annex 7).

For the indicators fluoranthene, hexachlorobenzene, hexachlorobutadiene, mercury and its compounds, dicofol, heptachlor and heptachloroepoxide, for which the recommended object of control is biota, due to the lack of technical capabilities and measurement methods, concentrations were determined only in surface water samples.

The chemical status was assessed based on monitoring data obtained as part of the diagnostic monitoring programmes of the SWB.

Based on the results of the assessment of the chemical status of the Black Sea river basin's SWB in 2022-2023, the following conclusions can be drawn from the monitoring data (Table 28):

- chemical status is "good" – 1 polygonal SWB (1.9% of the total number of polygonal SWB) with an area of 140.26 km^2 (2.5% of the total area of polygonal SWB).
- chemical state of "failure to achieve good" – 1 linear SWB (0.6% of the total number of linear SWB), with a length of 107.1 km (4.3% of the total length of linear SWB).

Table 28. Chemical status of the SWB for 2022-2023 (according to monitoring data)

Chemical status	number of linear SWBs	total length of the SWBs, km	number of polygonal SWB	total area of the SWB, km^2
"good"	-	-	1	140,26
"failure to achieve the good"	1	107,1	-	-

The following substances have been found to exceed the EQS_{MAX} - maximum permissible concentration and/or EQS_{ave} - average annual concentration:

- Cadmium and its compounds (for 1 SWB);
- fluoranthene (for 1 SWB);
- benzo(a)pyrene (for 1 SWB);
- benzo(b)fluoranthene (for 1 SWB);
- benzo(g,h,i,)perylene (for 1 SWB).

The interpolation of the results of SWB monitoring to other SWB was carried out on the basis of SWB aggregation, which was performed in 2022 as part of the implementation of state water monitoring in accordance with the Order of the State Agency of Ukraine for Water Resources dated 06.05.2022 No. 42 "On Approval of the State Agency of Ukraine for Research and Scientific and Technical Development Plan for 2022".

The purpose of SWB aggregation is to combine all SWB in a river basin into different groups based on reasonable criteria for:

- Interpolation of the results of monitoring of the SWB to other SWB that are grouped with them;
- Use the results of aggregation in the development of monitoring programmes for the following years to maximise the interpolation of the assessment results.

The criteria for the aggregation of SWB of the "rivers" and "lakes" category are:

- the type of the defined SWB;
- assessing the risk of not achieving a good chemical status of the SWB;
- a physical and geographical unit of zoning of the basin to which the SWB belongs;
- the type of landscape where the SWB is located.

The criterion for linear SWB of the "HMWB" and "AWB" categories is:

- assessing the risk of not achieving a good chemical status of the SWB.

The criteria for polygonal SWB of the " HMWB" and "AWB" categories are:

- category;
- the volume of the reservoir;
- water exchange regime of the reservoir.

Based on the interpolation of monitoring results according to the aggregation of SWB (low level of reliability of SWB assessment) (Table 29), the following was established:

- chemical status is "good" – 6 polygonal SWB (11.3% of the total polygonal SWB), with an SWB area of 260.04 km^2 (4.7% of the total polygonal SWB).
- chemical status of "failure to achieve good" – not determined.

Table 29. Chemical status of the SWB based on interpolation of monitoring data

Chemical status	number of SWB	total length of the SWB, km	number of SWB	total area of the SWB, km^2
"good"	-	-	6	260,04
"failure to achieve the good"	-	-	-	-

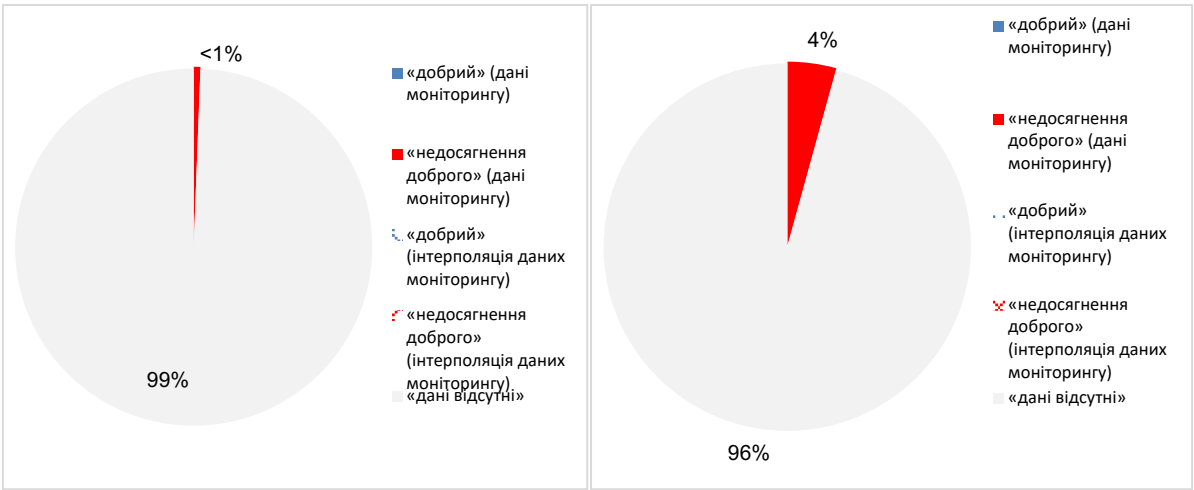
A general assessment of the chemical state of the Black Sea river basin's SWB (based on monitoring and interpolation data) leads to the following conclusions:

- chemical status is "good" – 7 polygonal SWB (13.2% of the total number of polygonal SWB), with an SWB area of 400.3 km^2 (7.2% of the total area of polygonal SWB).
- chemical state of "failure to achieve good" – 1 linear SWB (0.6% of the total number of linear SWB), with a length of 107.1 km (4.3% of the total length of linear SWB).

A general assessment of the chemical status of the SWB for the period 2022-2023 (monitoring data and interpolation of monitoring data) is presented in Table 30 and Fig. 18, 19.

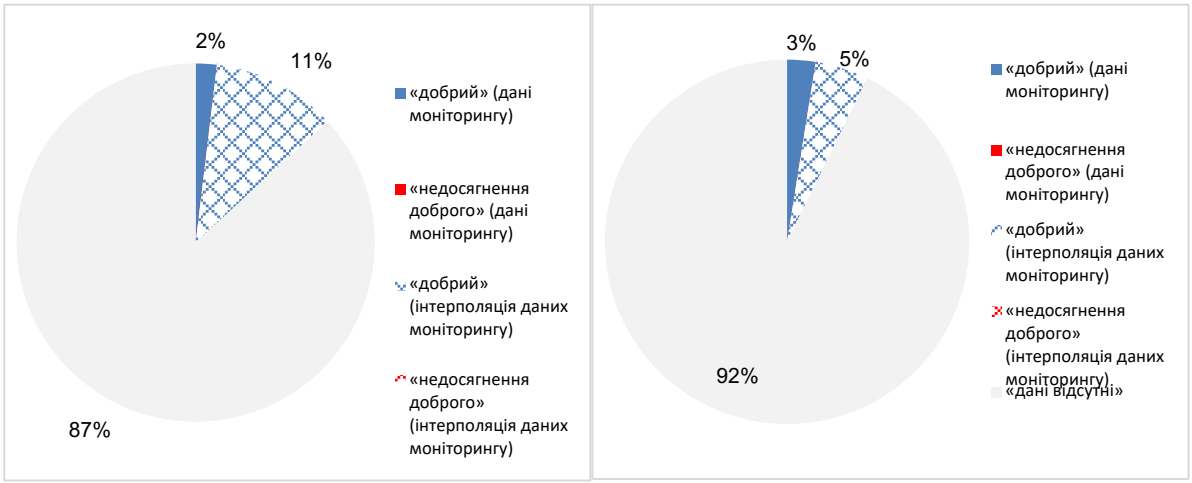
Table 30. General assessment of the chemical status of the SWB for 2022-2023 (monitoring data and interpolation of monitoring data)

Chemical status	number of SWB	total length of the SWB, km	number of SWB	total area of the SWB, km^2
"good"	-	-	8	400,3
"failure to achieve the good"	1	107,1	-	-



a) by the number *b)by the length*

Figure 18. Chemical status of linear SWBs in the Black Sea river basin (monitoring data and interpolation)



a) by the number *b) by the area*

Figure 19. Chemical status of polygonal SWBs in the Black Sea river basin (monitoring data and interpolation)

For the 2 SWBs in the Black Sea basin, the reliability of the assessment of the correct chemical status determination corresponds to an average level of reliability.

6 SWBs were assessed with a low level of reliability based on the transfer of results obtained under the surface water quality monitoring programme to SWBs where no monitoring was carried out in the specified period, according to the aggregation of SWBs.

Taking into account the interpolation of monitoring data, the chemical status was assessed for 8 SWBs, including 1 linear SWB with a length of 107.1 km and 7 polygonal SWBs with an area of 400.3 km 2

4.1.4. Ecological status assessment

The determination of the ecological status of SWBs in accordance with the requirements of the Water Code of Ukraine and Order of the Ministry of Ecology and Natural Resources No. 5 dated 14 January 2019 "On Approval of the Methodology for Assigning a Surface Water Body to One of the Classes of Ecological and Chemical Status of a Surface Water Body, as well as Assigning an Artificial or Significantly Modified Surface Water Body to One of the Classes of Ecological Potential of an Artificial or Heavily Modified Surface Water Body" is based on the use of a set of biotic and abiotic components inherent in aquatic ecosystems.

The basis for assessing the ecological status of SWBs is based on biological quality indicators that best reflect changes in the aquatic environment, including benthic invertebrates, phytobenthos, macrophytes, phytoplankton and fish. Auxiliary indicators include physicochemical and hydromorphological quality indicators. The environmental status assessment also includes specific synthetic and non-synthetic substances that are typical for the river basin.

The classification schemes for biological quality indicators depend on the type of SWBs and include possible anthropogenic pressures (e.g., organic and nutrient pollution, hydromorphological changes). The ecological status of an SWBs is assessed in relation to a reference value (i.e., the status of an SWBs of a certain type without or with minimal anthropogenic pressure). The degree of impact for individual biological quality indicators is converted into an ecological quality coefficient for individual boundaries of the five classes of ecological status of the SWBs.

The algorithm for determining the ecological status of SWBs based on the type-specific classification developed for biological, hydromorphological, chemical and physico-chemical indicators is given in the Order of the Ministry of Ecology and Natural Resources "On Approval of Environmental Water Quality Standards for Determining the Ecological Status of Surface Water Bodies...". Type-specific classification schemes were developed based on existing schemes in neighbouring EU countries for the respective types of intercalated SWBs.

The assessment of physicochemical and chemical indicators took into account the requirements of Directive 2009/90/EC (Article 5), which sets out technical requirements/criteria for the processing of monitoring data.

The results of state water monitoring conducted by the SAWR and the Ukrainian Hydrometeorological Centre were used to assess the ecological status of the SWBs as part of diagnostic and operational monitoring.

If during this period the monitoring of the SWBs was carried out more than once at the monitoring point, the assessment was made on the basis of the results of the last year in which the monitoring was carried out.

To assess the ecological state of the SWBs, we used the data on monitoring the content of synthetic and non-synthetic specific substances typical for the Black Sea RBD: phenol, zinc, copper, zinc, chromium, arsenic, acetochlor, carbaryl, metholachlor, terbutylazine, carbamazepine, triclosan, fluconazole.

Background concentrations of non-synthetic specific substances were not taken into account when assessing the environmental condition of the SWBs.

In the Black Sea RBD, the ecological status was assessed for 3 linear SWBs with a length of 129.8 km based on the data of 2022-2023. The results of the assessment of the ecological status of the SWBs are presented in the table 31 and annex.

Table 31. Ecological status of the SWBs

Ecological status	Number of linear SWBs	Percentage of the total number of linear SWBs, %	Length of linear SWBs, km	Percentage of the total length, %
"high"	0	0	0	0
"good"	2	1,1	115,4	4,6
"moderate"	0	0	0	0
"poor"	1	0,6	14,4	0,6
"bad"	0	0	0	0

The level of reliability of the ecological status assessment is average for all assessed SWBs.

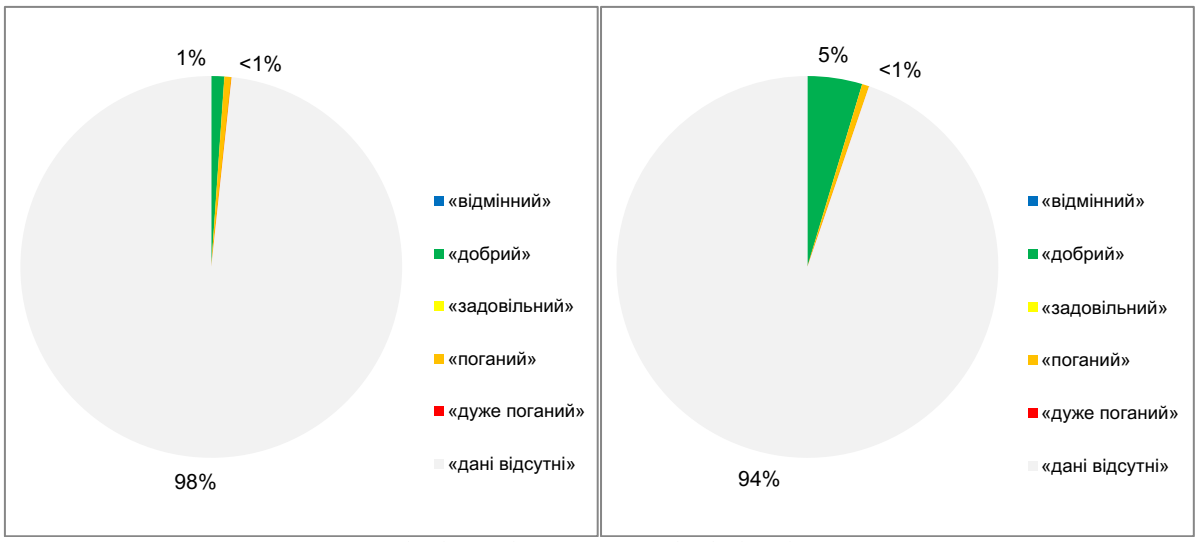
The "high" ecological status was achieved in 2 linear SWBs with a total length of 115.4 km.

The environmental objectives for achieving "good" ecological status were achieved in 2 SWBs, by 4.6% of the total length of the linear SWBs.

There is 1 SWB in "poor" ecological status, which is 0.6% of the total length of the SWBs.

In the Black Sea RBD, the Sosyk River (UA_M5.8_0174) is identified in "poor" ecological status.

The results of the ecological status assessment are presented for the linear SWBs of the "rivers" category in Figure 20.



by the number *by the length*

Figure 20. Assessment of the ecological status of the linear SWBs

4.1.5. Ecological potential assessment

For an AWBs or HMWBs, the environmental objective is to achieve good ecological potential, for which less stringent criteria are applied with respect to impacts associated with hydromorphological changes.

The ecological potential of an AWBs or HMWBs is determined in accordance with the classification established for determining the status of the SWBs of the relevant category (river, lake, transitional waters, coastal waters) to which the AWB or HMWB is most similar in terms of its characteristics.

In the Black Sea RBD, the ecological potential has not been assessed for any of the SWBs.

4.2 Groundwater

4.2.1 Monitoring system

The quantitative and chemical status of groundwater is monitored within the framework of the state groundwater monitoring system and changes in the state are predicted both under natural conditions and under the influence of human activity. Quantitative and chemical monitoring is carried out in the same observation wells. The monitoring is carried out in both non-pressure and pressure aquifers under natural, slightly disturbed and disturbed conditions. The disturbed conditions are investigated within the operational water intakes.

The state groundwater monitoring includes diagnostic and operational monitoring, the indicators and frequency of which are defined in accordance with the WFD and are listed in Annex 2 of the Procedure for State Water Monitoring (Table 32). The components of state monitoring of groundwater bodies include monitoring of quantitative, chemical and physico-chemical indicators. The Procedure for State Water Monitoring does not define the monitoring network (in particular, the number of monitoring points), but establishes the frequency and indicators to be monitored.

Table 32. Procedure for state water monitoring - Indicators and frequency of state monitoring of GWBs

The subject of the monitoring	Name of the indicator	Frequency.	Notes.
Diagnostic monitoring*.**			
State Geological Survey	levels	one to three times a month	amount of water
	Temperature, redox potential permanganate oxidisability, mineralisation	at least twice a year	
	macro components: - calcium, magnesium, sodium, potassium, hydrocarbonate ions, total ferrous iron, - fluoride	four times a year	
	microcomponents	once a year	the list is determined taking into account the specifics of land use and indicators given in DsanPiN 2.2.4-171-10
	Pollutants according to the list of pollutants for determining the chemical state of surface and groundwater bodies and the environmental potential of artificial or significantly altered surface water bodies approved by the Ministry of Ecology and Natural Resources	four times a year	
	Specific synthetic pollutants (pesticides, pharmaceuticals and other substances)	once every two to six years	the list is determined taking into account the specifics of land use
	Specific non-synthetic pollutants (uranium, radium, radon and other substances)		
Operational monitoring***.			
State Geological Survey	Hydrogeological regime: groundwater levels	one to five times a month	
	total hardness, carbonate, non-carbonate mineralisation	quarterly, at least twice a year	
	phenols oil products synthetic surfactants	once every one to two years	

The subject of the monitoring	Name of the indicator	Frequency.	Notes.
	macro components: hydrogen carbonate ions, calcium, potassium, magnesium sodium, silicon, total ferric, fluorine	quarterly, at least twice a year	
	microcomponents: aluminium, argentum, beryllium, cobalt, copper, manganese, molybdenum, nickel, selenium, strontium, chromium, zinc	once a year	The list of micro-components is determined taking into account the specifics of land use
	pollutants according to the list of pollutants for determining the chemical state of surface and groundwater bodies and the environmental potential of artificial or significantly altered surface water bodies approved by the Ministry of Ecology and Natural Resources	quarterly, at least twice a year	
	Specific synthetic pollutants (pesticides, pharmaceuticals and other substances);	once every six years	the list is determined taking into account the specifics of the array
	Specific non-synthetic pollutants (uranium, radium, radon and other substances)		

* In the Exclusion Zone and the Zone of Unconditional (Mandatory) Resettlement of the Territory Affected by Radioactive Contamination as a Result of the Chornobyl Disaster, the State Agency of Ukraine on Exclusion Zone Monitoring of Groundwater Resources is responsible for monitoring groundwater resources.

** Data are updated and supplemented taking into account the specifics of the array.

*** Data are updated and supplemented taking into account the specifics of the array and based on the results of diagnostic monitoring

According to Geoinform, as of 01.01.2021, there were 26 observation points of state groundwater monitoring within the Black Sea river basin, including 18 operating, 2 mothballed, 3 in need of repair, 2 proposed to be liquidated, and the status of 1 observation point was unknown.

Since the beginning of the Russian military aggression in 2022, monitoring has been permanently suspended, as the implementation of the State Programme for the Development of Ukraine's Mineral Resources Base until 2030, which included monitoring and funding, was suspended, and part of the basin was subsequently occupied.

The observation network for groundwater monitoring is currently in a dilapidated state. Observations conducted in 2018-2020 did not meet the requirements of the current Procedure for State Water Monitoring in terms of either quantitative or qualitative indicators.

4.2.2 Chemical assessment / risk assessment

Due to the lack of monitoring data, it is impossible to assess the current qualitative and quantitative state of the GWBs with sufficient reasonableness.

Based on the information from previous studies, it can be assumed that the water quality of non-pressure GWBs is most likely poor due to nitrogen pollution from diffuse sources within agricultural landscapes. As for the water of pressurised GWBs, its quality is mostly good, and the excess of the normative content of some components is of geogenic origin.

4.2.3 Estimation of groundwater volumes/reserves

As for the assessment of the quantitative state of non-pressure GWBs, due to insignificant water withdrawal, this state is obviously good. Some negative changes in this condition may be caused by global warming.

As for the pressure GWBs, according to expert data, the overall quantitative state of the identified GWBs can be preliminarily defined as good. The basis for this conclusion is a comparison of forecasted resources, operational GWBs and data on current water withdrawal volumes.

Ways to restore and develop groundwater monitoring

The monitoring network needs to be urgently restored and improved after the de-occupation of the territory. The placement of observation points should be based on the principle of representativeness, which in the case of

groundwater involves taking into account the prevalence of GWBs and the homogeneity/homogeneity of natural and anthropogenic conditions of groundwater resource formation and their changes over time.

Given the long period of no monitoring and the limited number of observation points, it is necessary to conduct diagnostic monitoring of groundwater quality indicators of all identified GWBs at all observation wells. All identified and within the Black Sea river basin are subject to diagnostic and operational monitoring procedures, as all non-pressure GWBs are associated with surface ecosystems, while pressure GWBs are used for water supply to the population, and the average water withdrawal from them for drinking and domestic needs exceeds 100 cubic metres per year.

The Order of the Ministry of Environment No. 78 of 19.01.24 approving the State Water Monitoring Programme provides for groundwater monitoring in 2024, subject to the availability of funding for the relevant work. In the annex to the above-mentioned order, 9 observation points are identified in the Black Sea river basin (Table 33).

Table 33. Observation points (o.p.) for groundwater monitoring in the Black Sea river basin

Number of points in total	GWBs code	Name of the GWBs	Number of points on the GWBs
9	UAM5800N500	GWBs in Upper Pliocene sediments	1
	UAM5800N400	GWBs in Upper Miocene sediments	1
	UAM5800N600	GWBs in the Middle Miocene sediments	1
	UAM5800N500	GWBs in the Upper Sarmatian sediments	4
	UAM5800N600	GWBs in Middle Sarmatian sediments	2

The list of these observation points was compiled on the basis of data received from regional geological enterprises. It should be noted that the list of observation points does not cover all designated GWBs. However, there are currently no grounds for revising them, as there is no new reliable information on this issue. Obviously, there have been negative changes in recent years due to the consequences of Russian aggression and the final cessation of monitoring, so one of the first tasks should be to re-inventory the observation wells, after which the proposed network will be refined. This will be possible after the de-occupation of the basin and the cessation of hostilities.

In the future, the priority will be to resume groundwater monitoring. At present, the resumption of observations on the state network is unrealistic due to the lack of funding and the occupation of a large part of the territory. The only realistic opportunity to obtain information on the state of the GWBs is to use data from chemical analyses performed at operational water intakes in accordance with the current Procedure for State Water Monitoring (clause 12), which stipulates that for groundwater intakes with a production volume of more than 100 cubic metres per day within the sanitary protection zones and adjacent territories, water users shall set up a local network of observation wells to determine the amount of water and chemical and physicochemical parameters and provide observation data to the State Service of Geology and Subsoil of Ukraine. If this requirement is met, information communication with water users is established, and scientific data processing and analysis is ensured, the state of groundwater monitoring information support could be significantly improved even before funding for observations at the network of wells of the state observation system is restored.

As there is intensive agricultural production within the basin and, according to available data, the waters of non-pressure GWBs are contaminated with nitrogen compounds, special attention should be paid to improving the quality of non-pressure GWBs. One of the problems is that the existing observation points for non-pressure IWRs are wells located within rural settlements. The information obtained during the inspection of wells sometimes reflects the contamination of the water intake facility, not the aquifer. At the same time, there are practically no observation points - wells that are better protected from surface contamination and points located within areas with minimal anthropogenic load - that would allow determining the background levels of chemical elements and compounds in the water of non-pressure GWBs. Obtaining information on background areas would allow more reasonable determination of the quality of non-pressure GWBs and assessment of the risk of their failure to achieve environmental objectives. Obviously, if appropriate funding is available, it is necessary to include new observation points located in protected areas in the monitoring network, and, if possible, to construct new ones (drilling wells) in representative areas that would allow obtaining information that could reasonably be extrapolated to large areas of groundwater distribution.

Protected areas (territories)

The state water monitoring programme for 2023 in the Black Sea river basin does not include any monitoring points within the protected areas (territories).

5 A LIST OF ENVIRONMENTAL OBJECTIVES FOR SURFACE WATERS, GROUNDWATER AND PROTECTED AREAS (TERRITORIES) AND DEADLINES FOR THEIR ACHIEVEMENT (IF NECESSARY, JUSTIFICATION FOR SETTING LESS STRINGENT OBJECTIVES AND/OR POSTPONEMENT OF THEIR ACHIEVEMENT)

Environmental objectives for surface water, groundwater and protected areas (territories) are set separately.

Surface water:

- Prevention of deterioration of all SWBs;
- Achievement/maintenance of good ecological and chemical status of all natural SWBs (rivers, lakes, transitional and coastal waters);
- Achieving/maintaining good ecological potential and chemical status of HMWBs and AWBs;
- Gradual reduction to the complete absence of hazardous substances.

Groundwater:

- Prevention of deterioration of all GWBs;
- Achieving/maintaining good quantitative and chemical status of all GWBs;
- Preventing and limiting groundwater pollution.

Areas (territories) to be protected:

Achieving standards and targets as required by applicable law for:

- Emerald Network facilities;
- sanitary protection zones;
- protection zones for valuable aquatic bioresources;
- surface/ground water bodies used for recreational, medical, resort and health purposes, as well as water intended for bathing;
- areas vulnerable to (accumulation of) nitrates;
- vulnerable and less vulnerable areas identified in accordance with the criteria approved by the Ministry of Environment.

In cases where several objectives are set for a particular SWBs or GWBs, the most stringent ones should be applied, while all other objectives should also be met.

In some cases, the deadlines for achieving environmental objectives or the targets themselves may be postponed as an exception.

It is allowed to postpone the date of achievement of the objective for a period of 6 years (until 2036), but not longer than 12 years (until the end of 2042) from the end of the implementation of the first cycle of the RBMP (2030).

An exemption applied to a particular SWB or GWB should not create a risk of not achieving the environmental objectives of the upstream (for SWB) or downstream (for SWB) and adjacent (for GWB) body or bodies.

The exceptions include:

- **Achieving less stringent objectives or postponing the date of their achievement** due to technical reasons (e.g. lack of a technical solution, technical impracticality or impracticability), disproportionately high cost or the existing natural state of the water body that does not allow for its improvement in a timely manner (e.g. inert groundwater to be restored). The presence or absence of disproportionality is determined by the results of an economic assessment of costs and benefits;
- **Temporary deterioration of the status (objectives) as a result of an unforeseen force majeure of** natural origin (e.g. extreme flood, drought) or anthropogenic (accident);
- **New physical changes to the SWB as a result of infrastructure projects** are permitted if the benefits to society are higher than the environmental benefits and there is no other option to avoid these changes for technical and/or financial reasons. Water pollution from point or diffuse sources is not allowed.

Environmental objectives for surface water

Based on the results of an assessment of the anthropogenic pressure on the SWBs of the Black Sea river basin:

- 15 SWBs are not at risk of failing to achieve good ecological status/potential, 98 SWBs are possibly at risk, and 118 SWBs are at risk.
- 211 SWBs are at no risk of not achieving good chemical status, and 20 SWBs are possibly at risk.

By 2030, 15 SWBs will have achieved good ecological status/potential, of which 10 SWBs are currently risk-free (they need to maintain this status), and 5 SWBs are 5% of SWBs that are at risk or possibly at risk of not achieving environmental objectives based on the results of the anthropogenic pressures assessment and will achieve environmental objectives through the implementation of PoM.

The remaining at-risk or potentially at-risk SWBs in the basin (216 SWBs) could reach good ecological status/potential by 2036 or 2042 with the implementation of PoM.

By 2030, 211 SWBs will have reached good chemical status, including those that are currently at no risk (they need to maintain this status), while 20 SWBs that are possibly at risk according to the results of the anthropogenic pressures assessment will reach the environmental objectives no earlier than 2036 or 2042, provided that environmental protection measures are implemented.

Figure 25. Timeframe for achieving the environmental objectives of the SWBs, %.

Annex 8 (Table 1) lists the environmental objectives of the SWBs, the timeframe for achieving them, reasons for postponement and setting less stringent objectives.

Environmental objectives for groundwater

Environmental targets are set for each GWBs, both in terms of their quantitative and qualitative (chemical) status. According to the WFD, the main objective is to achieve good groundwater status.

Additional targets for each individual IWR are determined depending on the existing quantitative and qualitative status of GWBs, their use or potential use for water supply to the population, anthropogenic pressure and possible impact on surface ecosystems.

The main criterion for the good quantitative status of the GWBs should be the absence of groundwater depletion.

Depletion is the state of aquifers in which, under the influence of artificial drainage, the decline in groundwater levels has reached such indicators that exclude the possibility of further use of the horizon to meet the needs of society using traditional technical means.

The assessment of the depletion of the GWBs is based on information on the level regime, data on groundwater extraction volumes and their comparison with the resources and approved operational reserves.

In addition, for non-pressure GWBs, the criterion of good condition is the appropriate condition of the associated surface water bodies and the absence of negative impact on surface ecosystems, primarily vegetation suppression.

The criteria for the good quality (chemical) status of the GWBs are the natural background content of chemical elements and compounds, as well as the standards set for drinking water by the State Sanitary Norms and Rules "Hygienic Requirements for Drinking Water Intended for Human Consumption" (SanPiN 2.2.4-171-10).

Quantitative state of non-pressure GWBs

The environmental objective is to avoid groundwater depletion and not to deteriorate its quantitative state. Given the extremely limited monitoring data, it can be concluded that, given the insignificant volumes of water extraction from non-pressure GWBs by private water consumers, negative trends in the quantitative state are not expected.

Qualitative (chemical) state of non-pressure GWBs

The non-pressure GWBs in the basin are unprotected and conditionally protected.

Non-pressure GWBs are used by the rural population to meet their drinking needs, therefore, to assess the quality state, the standards of Sanitary and Epidemiological Norms 2.2.4-171-10 should be used, except for those elements and compounds whose content exceeds the normative value in the natural state. For such components, the values of natural backgrounds should be used.

The environmental objective is compliance with Sanitary and Epidemiological Norms 2.2.4-171-10 and no deterioration of the quality state. However, it should be noted that the stability of the quality state is relative, and the content of macro- and micro-components in the water of non-pressure GWBs is subject to significant fluctuations in space and time, so it is necessary to have information on the intervals of changes in the content and to refine it in the course of monitoring.

Quantitative state of pressure GWBs

The quantitative state of the pressure GWBs is assessed by analysing the level regime and comparing the volumes of water withdrawal from these MPSs at water intakes with the volumes of OGR and FGR.

The environmental objective is the stability of the quantitative state and the absence of groundwater depletion. At groundwater abstractions, the volume of water withdrawal should not exceed the estimated operational reserves (within groundwater deposits).

The basin's groundwater is used for water supply, including centralised water supply, and is therefore subject to pressure. However, groundwater extraction does not exceed the value of forecasted resources and operational groundwater reserves. Groundwater exploitation has not led to significant changes in the water level regime, and the reduction of the operational load in recent years has contributed to the recovery of water levels.

Chemical state of pressure GWBs

Under natural conditions, the injection water treatment plants are protected from pollution from the surface. However, in some areas, spotty groundwater contamination with nitrogen compounds is periodically observed, which may indicate the inflow of contamination from overlying aquifers through defective wells.

Since groundwater of all the allocated pressure GWBs is used for centralised drinking water supply to the population, the criteria of good chemical condition were chosen to be the compliance of groundwater chemical parameters with the State Sanitary Norms and Rules "Hygienic Requirements for Drinking Water Intended for Human Consumption" (SanPiN 2.2.4-171-10).

An additional environmental objective is to avoid deterioration in the quality of the discharge GWBs, but conclusions on trends in chemical composition should be based on reliable monitoring data, since the content of components in water is subject to significant natural fluctuations. Therefore, for each GWBs, it is necessary to have information on the interval of changes in the content of water chemical components.

The poor state of groundwater monitoring over the past decades, and, consequently, insufficient information on the current state of the GWBs, allows defining environmental objectives only in the most general form. In the course of monitoring, the environmental objectives for each GWBs will be refined.

Table 2 of the Annex 8 shows the environmental objectives of GWBs and their groups, the timeframe for achieving them, reasons for postponement and setting less stringent targets.

It should be noted that the improvement of the condition of non-pressure GWBs under the conditions of implementation of measures to reduce the impact of diffuse sources of pollution should be expected much later than the improvement of the condition of surface water bodies due to their position in the geological environment and a significant amount of accumulated pollutants (primarily nitrates). Given the current situation and a realistic forecast of when large-scale environmental protection measures could be implemented, such improvement should not be expected before 2042.

All 6 of the currently identified GWBs and their groups will reach good quantitative status by 2030, and 3 will reach good chemical status (50% of the identified GWBs and their groups). The remaining 3 groups of GWBs (non-pressure) are projected to reach good chemical (qualitative) status not earlier than 2042 (Fig. 26), provided that large-scale measures are implemented to reduce the load from diffuse sources of pollution within agricultural landscapes.

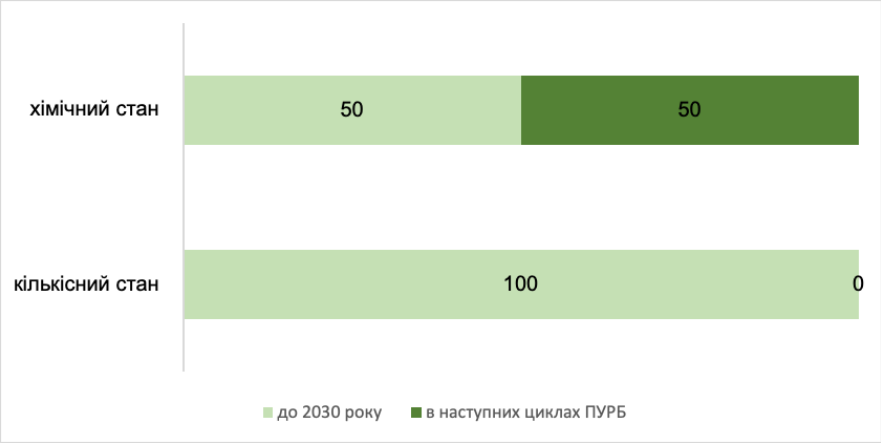


Figure 26. Timeframe for achieving GWBs environmental objectives, %.

6 ECONOMIC ANALYSIS OF WATER USE

The economic analysis of water use was prepared in accordance with the schedule of the RBMP development process based on data for 2015-2019. Due to the full-scale military invasion of Ukraine by the Russian Federation, the economic development of the territories and the structure of water use in the Black Sea river basin have undergone significant changes.

6.1 Economic development of the basin area

The economic development of the Black Sea region is conditioned by its geographical, climatic, economic and socio-demographic situation. Geographically, the Black Sea region partially covers three oblasts: Odesa, Mykolaiv, and Kherson, and the population within the basin in these regions is 1.8 million people, which is 4.34% of the total population of Ukraine as of 2019 (Table 34).

Table 34. Share of area and population of oblasts within the basin, %.

Oblast	Share of the region's area within the basin	Share of the region's population within the basin
Odesa	54,9	72
Mykolaivska	12,1	6
Kherson	20,8	33

The economic development of the basin is largely influenced by the favourable natural and geographical location and significant natural resource potential of the region, namely

- fertile soils, which contributes to the development of agricultural production and the location of powerful food industry enterprises in the region;
- access to the Black Sea, which at one time was an important factor in the formation of a powerful shipbuilding complex in the regional centre;
- significant deposits of minerals, most of which are raw materials for the production of construction materials, namely: sands (construction, silicate, brick raw materials, loams and limestones, granites, crystalline rocks, charnockites, migmatites, metabasites, agglomerates and gneisses. There are also uranium deposits in the north-east of the region;
- great recreational and tourist potential.

Analysis of the Black Sea River Basin GRP. In 2019, the Black Sea basin's GRP amounted to UAH 15.1 million, with a year-on-year growth rate of 114%, the lowest relative value in the last five years. Thus, the largest year-on-year increase in the basin's GRP was in 2017 at 124%. In 2019, the share of the basin's GRP in Ukraine's total GDP was 3.8% (Table 35).

Table 35. GRP dynamics in the Black Sea river basin, 2015-2019

Indicator	**2015**	**2016**	**2017**	**2018**	**2019**
GRP in actual prices, UAH million	76551,87	91921,63	114060,00	132299,21	151054,47
The share of the Black Sea river basin's GRP in Ukraine's total GDP, %.	3,85	3,86	3,82	3,72	3,80
GRP growth rate in the Black Sea river basin, % compared to the previous year	100	120	124	115	114

The dynamics of the basin's GRP reflects an increase in GRP from UAH 7 million to UAH 15 million in 2019.

The GRP per capita within the basin is UAH 75.13 thousand, which is less than the total for the whole of Ukraine (as of 2019, the GRP per capita is UAH 94.7 thousand).

Analysis of the Black Sea river basin's GVA. As of 2019, the Black Sea river basin's GVA in actual prices amounted to UAH 115,157.12 million, and it accounts for 3.36% of Ukraine's total GVA (Table 36).

Table 36. GVA in the basin by economic sector, 2015-2019

Sectors of the economy	**2015**	**2016**	**2017**	**2018**	**2019**
Agriculture, forestry and fisheries, UAH million	9436,3	11754,22	12622,34	13953,08	12666,69

Sectors of the economy	2015	2016	2017	2018	2019
Share of agriculture, forestry and fisheries in the Black Sea river basin in the total GVA of Ukraine, %.	3,93	4,20	4,15	3,86	3,55
Mining and quarrying, UAH million	40,51	66,21	94,52	105,93	133,65
Share of the mining industry and quarrying in the Black Sea river basin in the total gross domestic product of Ukraine, %.	0,04	0,05	0,05	0,05	0,06
Processing industry, UAH million	6579,65	8139,48	9418,16	10319,87	11500,39
share of the processing industry of the black sea river basin in the total gdP of Ukraine, %.	2,78	2,79	2,62	2,53	2,67
Supply of electricity, gas, steam and air conditioning, UAH million	1595,04	1732,2	1877,94	2394,96	2563,09
Share of electricity, gas, steam and air conditioning supply of the Black Sea river basin in the total GVA of Ukraine, %.	2,99	2,32	2,18	2,14	2,05
Water supply, sewerage and waste management, UAH million	333,87	305,88	357,09	454,02	565,04
Share of water supply, sewerage, and waste management in the Black Sea river basin in the total GVA of Ukraine, %.	4,21	3,60	3,60	3,98	3,91
Transport, warehousing, postal and courier activities, UAH million	10319,87	12550,58	15312,71	16688,28	19758,93
Share of transport, warehousing, postal and courier activities of the Black Sea river basin in the total GVA of Ukraine, %.	7,65	8,01	8,01	7,34	7,46

In the structure of the basin's GVA, among the water-dependent economic activities in 2019, the largest percentage is accounted for by transport, warehousing, postal and courier activities (7.46%) and water supply and sewerage, waste management (3.91%), agriculture, forestry and fisheries (3.55%), manufacturing (2.67%), supply of electricity, gas, steam and air conditioning (2.05%), and mining and quarrying (0.06%). The total volume of GRP of water-dependent economic activities in the basin in the total volume of GRP of the basin during 2014-2019 ranged from 41-48% (in 2019 - UAH 472 million, which is 41.0%).

6.2 Characteristics of modern water use

The description of the current water use in the basin area was made on the basis of the state water cadastre data in the section "Water use" for 2019.

Water supply sources in the basin include underground and surface water bodies.

Groundwater is the main source of water (70%) in Odesa, Mykolaiv and Kherson regions, and 30% of water abstraction is from surface water (including sea water). The volume of groundwater abstraction in the basin is 17.099 million m^3. Groundwater (mainly from artesian wells) is used for industrial, agricultural, and domestic water supply needs. A prerequisite for further socio-economic development is the provision of sufficient water and a certain quality to the population, industrial, agricultural and municipal facilities.

An analysis of water intake volumes in 2015-2019 shows a downward trend in demand for water resources in recent years. In 2019, the volume of wastewater discharges decreased compared to 2018, and in general, the volume of wastewater discharges has been variable since 2015.

The main water users within the basin are housing and communal services, industry, agriculture and transport.

In terms of regions, the leader in water intake is Odesa region - 17.63 million m^3, followed by Kherson region - 6.010 million m^3 and the smallest percentage is accounted for by Mykolaiv region - 2.067 million m^3.

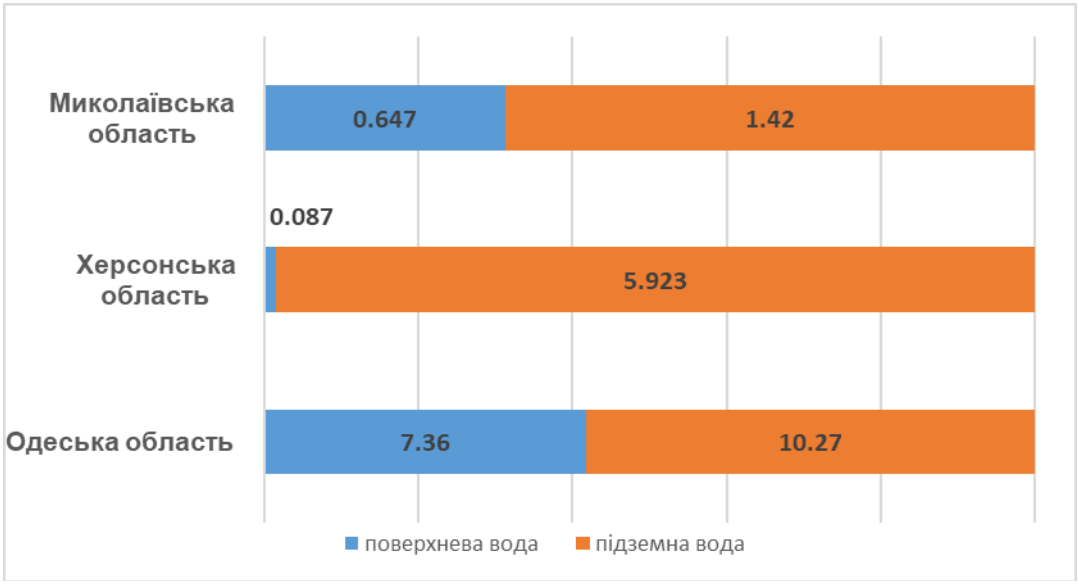


Figure 22. Sources of water intake

The largest percentage of water resources is withdrawn by the housing and utilities sector (43.7%), a significant portion is withdrawn by industrial water users (33.5%), almost 22% of water use is for agricultural needs, and less than 0.7% is withdrawn by other sectors. The volume of water use by economic sector is shown in Figure 23.

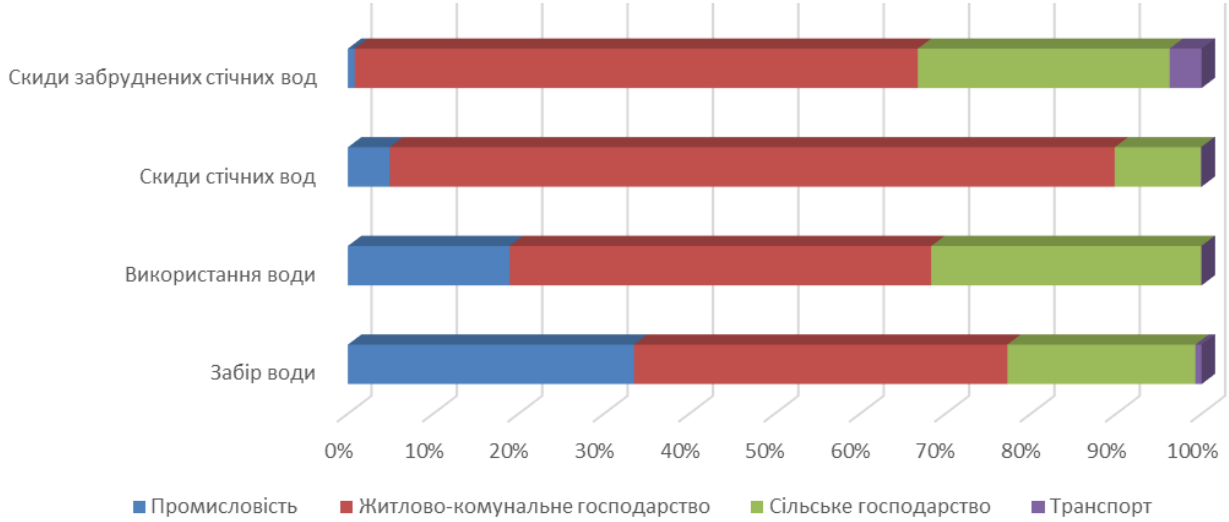


Figure 23. Characteristics of water use in the Black Sea region

In terms of wastewater disposal, 70% of wastewater is discharged into surface waters by water users in the housing and utilities sector, almost 10% by agriculture and 0.5% by industry.

The largest percentage of wastewater discharge (47%) is in Odesa region, 45% in Kherson region and 8% in Mykolaiv region. 10% of the wastewater volume is discharged as normatively clean without treatment, and only 1% is polluted wastewater.

The housing and utilities sector is the main economic sector that affects the quantity and quality of water resources in the Black Sea river basin.

The main polluter is the housing and communal sector, which discharges almost 70% of polluted wastewater in the Black Sea region.

The socio-economic importance of water for economic sectors was assessed on the basis of the European methodology for assessing the value of water. The ranking of economic sectors by 5 indicators of economic and resource direction, which are adapted in accordance with the recommendations of the methodology, was applied, namely

- GVA generated by the industry is an economic indicator of the sector's weight in the region's economy;
- the volume of water withdrawn by the industry;
- water intensity of the industry compared to other industries;

- The industry's dependence on water quality;
- pollution of water bodies by the industry's waste water.

Table 37. Water use and water intensity of the basin's economic sectors

Industry sector	Water intake, million m^3	GVA, million UAH	Water intensity of GVA, m^3 /1000 UAH
Industry	8,612	11634,04	0,740
Housing and utilities	11,247	565,04	19,904
Agriculture	5,661	12666,69	0,446
Transport	0,187	19758,93	0,009
In the whole basin	**25.707**	**44624.7**	**0.576**

The water-dependent sectors of the economy were assessed for each indicator and its socio-economic weight was determined as low, moderate or high.

Table 38. Socio-economic weight of the main water users

Sectors of the economy	Scope of airborne forces creation	Water intake by the industry	Water intensity of the industry	Dependence on water quality	Waste water contamination
Electricity	moderate	high	moderate	low	low
Industry	high	high	moderate	low	low
Mechanical engineering and metalworking	high	moderate	low	low	moderate
Woodworking	moderate	moderate	low	low	moderate
Food industry	low	low	low	moderate	low
Housing and utilities	low	high	high	high	high
Agriculture	high	high	moderate	moderate	moderate
Fisheries	low	moderate	low	moderate	low
Operation of irrigation systems (including irrigation)	low	moderate	low	moderate	low
Transport	moderate	low	low	low	low
Recreation and security health	moderate	low	low	moderate	low

Based on the assessment results, economic sectors are grouped into 5 groups according to their dependence on water resources and socio-economic importance.

Group 1 "Full dependence" includes water users that are highly dependent on 4 indicators - water quality, high water intensity, significant pressure on water resources and small volumes of water supply - housing and communal services.

Group 2, "Multiple dependence" - have high dependence on at least two indicators - industry and agriculture.

Group 3, "Specific dependence", includes those with a high level of dependence on one indicator: machine building and metalworking, woodworking, and electricity.

Group 4, "Moderate dependence", which includes the food industry, operation of irrigation systems (including irrigation), recreation and healthcare, and fisheries, is classified as moderately dependent on at least 2 indicators.

Group 5 "Dependence without water use" includes economic sectors that use water without abstraction from natural water bodies, generate low volumes of Gross Domestic Product (GDP) and are minor polluters.

The assessment showed that the housing and utilities sector is completely dependent on water resources and is the most water-intensive sector of the economy.

6.2.1 Municipal water use

The needs of the housing and communal sector are mainly for drinking and domestic needs of the population and are covered by 72% from underground sources and 28% from surface sources. Water users in the housing and utilities sector abstracted 11.247 million m^3 - 43.8% of the total abstraction.

One of the main tasks of the water sector is to ensure municipal water consumption. This includes the water needs of the population, household and public utilities, public services, and industrial enterprises in settlements connected to local water supply systems. The volume of municipal water consumption depends on the number of residents, the degree of urbanisation and climatic conditions. According to the current standards, it is estimated that a person

needs 150-200 litres of water per day to meet all personal needs, and another 150-200 litres of water per day per person to operate municipal enterprises and all services in the city.

The peculiarity of the Black Sea RB is that surface and groundwater does not meet the needs of the economy and population. Therefore, water is supplied to the region from neighbouring river basins. In fact, the Dniester River is the only source of water supply for one of Ukraine's largest agglomerations, Odesa. Kherson region uses Dnipro water for irrigation of agricultural land; Mykolaiv region uses the Southern Buzka water; and Odesa region uses the Danube and Dniester water.

The main water users in the industry in the Black Sea river basin within the Odesa region are municipal utilities, namely: ME "Ananiev-Vodokanal", ME "VUZHKG" Tarutino, ME "VUZHKG" Berezivka, ME "Podilskvodokanal", ME "Vodokanal" Artsyz, ME "Vodopostachalnyk", Tatarbunary, village. Tatarbunary, Naberezhne, Naberezhne village, Saratakomun Service, Sarata, Prolisok-1, Ivanivka.

The main water users in the industry in the Black Sea river basin within the Kherson region are municipal utilities, namely: Antonivka, Svitanok, Vodnoye Hospodarstvo, Chaplynskyi Komunalnyk, Ochyshni Sposobody, Vidrodzhennia, and Dzherelo.

The main water users in the industry in the Prychornomoria river basin within Mykolaiv Oblast are municipal enterprises, namely: ME "Berezan", Krasnyansky housing and communal enterprise, ME "Koblevsky rural agricultural enterprise", ME "Prychornomoria".

The bulk of water resources (50% of water intake) is used for drinking purposes.

The largest utility companies that discharge waste water into surface water bodies are the following:

- Infox LLC, Infoksvodokanal branch (USREOU code 26472133, water user code 510760) - 78.716 million m^3 (including 0.904 million m^3 of NGOs);
- Municipal enterprise "Podilskvodokanal", m. Podilsk (EDRPOU code 306158, water user code 510738) - total of 0.631 million m^3 (NGO).

The main problems of the housing and utilities sector are the deterioration of the water supply and sewage network, inefficient operation of treatment facilities, which leads to the supply of water of inadequate quality to consumers and the discharge of polluted water into water bodies. Housing, utilities and agriculture are the largest polluters of surface water, discharging 3.011 million m^3 of polluted wastewater into the Black Sea river basin due to inefficient operation of wastewater treatment facilities.

6.2.2. Industrial water use

The industry in the Black Sea region is represented by enterprises of various forms of ownership. The main and most profitable industries are medical, food, machine building (electronic), plastics, concrete building materials, energy supply and publishing. In the Black Sea river basin, industrial enterprises draw water from underground sources.

The main industrial water users in the Black Sea river basin within Odesa, Mykolaiv and Kherson oblasts are food processing companies.

Industrial water use is predominant in Odesa Oblast.

The largest industrial water user is the energy sector: PJSC Odesa Heat and Power Plant**.**

According to the water use reports in the form 2TP-water farm (annual) for 2021, the industry withdrew 0.758 million m^3 from natural water bodies: 0.758 million m3 by the processing industry, and 3.316 million m^3 were used.

The discharge of nutrients into the water bodies of the Black Sea river basin and the impact from point sources was measured and determined by the following indicators: ammonium nitrogen, nitrite ion, nitrate ion, phosphates.

6.2.3 Water use in agriculture

Agriculture is one of the largest water consumers. Agriculture consumes 40-50% of the volume of water taken from water sources for the national economy. Of this amount, 60-80% is used rationally, and the rest is lost. Irrecoverable water consumption is generally between 75 and 90% of the water used. It should be noted that irrecoverable water consumption in agriculture accounts for 65-72% of all irrecoverable water consumption in Ukraine. The main areas of water use in agriculture are irrigation, watering, agricultural water supply, etc. Unlike in industry, where it is sometimes possible to replace water in the technological process, in agriculture it cannot be replaced by anything, and irrigation of crops allows for good results. Thus, water use in agriculture within the Black Sea river basin is a very important and significant area in its socio-economic development.

Water users in the agricultural sector in the Black Sea river basin within the Odesa, Kherson and Mykolaiv regions include agricultural producers, fisheries and the operation of irrigation systems.

Water use in agriculture is carried out mainly from groundwater and surface water bodies. The total water withdrawal for agricultural needs is 135.548 million m^3, used for irrigation - 296.306 million m^3. One of the main problems on the way to establishing highly productive agricultural production is the unsatisfactory technical condition of irrigation systems caused by insufficient funding for their reconstruction and modernisation.

6.2.4. Water use in transport

Water use in transport does not put a significant burden on the Black Sea river basin, as water withdrawals by transport sector users in 2021 amounted to less than 0.87% of the total withdrawals.

In 2021, transport users withdrew 1.363 million million m^3 from groundwater and surface water sources and used 2.210 million m^3 .

Waste water discharge in transport is carried out by the Odesa branch of the State Enterprise "USPA" (Ukrainian Sea Ports Authority) (water user code 511971) (discharge to the Black Sea).

6.2.5. Other types of water use

Other types of water use withdraw water in the amount of less than 0.1% of the total water withdrawal in the river basin.

These industries include trade and catering, logistics, construction, communications, healthcare and physical education, and public education.

6.3. Forecast of water demand by major economic sectors

Water demand forecasts for the main sectors of the economy are made for the period of the RBMP (until 2030) under three scenarios: realistic, optimistic and pessimistic.

The forecast is based on the economic indicators of GDP/GDP for previous years and their forecast values. The increments of the optimistic and pessimistic scenarios are calculated by determining the average annual deviations from the forecast values for the previous years.

The deviation of the forecasted water withdrawal volumes under the pessimistic scenario ranges from 1.2-3.5% of the realistic scenario. The optimistic scenario shows a maximum increase in the projected demand for water resources by 0.1-1.8% compared to the realistic scenario.

Since 2015, water withdrawals from the Black Sea river basin have been decreasing. The main factors affecting water use in the Black Sea river basin include the following:

- the spread of the COVID-19 coronavirus infection and the introduction of restrictive measures;
- economic development - the driving sectors: housing and utilities and agriculture;
- natural: climate change - increased irrigation.

The forecast of water withdrawal for the short-term period - for 2021 - is based on the European Bank for Reconstruction and Development's forecast of Ukraine's GDP for 2021, which shows an increase of 8.8%.

For the medium-term period - 2021-2023, the forecast is based on the Forecast of Economic and Social Development of Ukraine for 2021-2023 of the Ministry of Economy, Trade and Agriculture of Ukraine, which forecasts GDP growth at 4.8% in 2021, 4.1% in 2022 and 4.6% in 2023. The long-term forecast period - 2024-2030 - was calculated based on data from USDA, World Bank, IMF, IHS, Oxford Economic Forecasting, which forecasts Ukraine's GDP growth by 3.2% annually.

In 2021, the Ministry of Economy predicted a slowdown in water withdrawals and a decline in economic performance due to the spread of the acute respiratory disease COVID-19 caused by the SARS-CoV-2 coronavirus.

The largest decrease was expected in the housing and communal services sector, which is the main water user in the Black Sea basin. Almost constant abstraction rates are observed in the industrial and agricultural sectors.

2021 - 2025 - growth is expected with slight fluctuations in water intake in the range of 4-5%.

2025 - 2030 - a trend of intensive growth in water intake due to the projected economic growth of 3.0% annually.

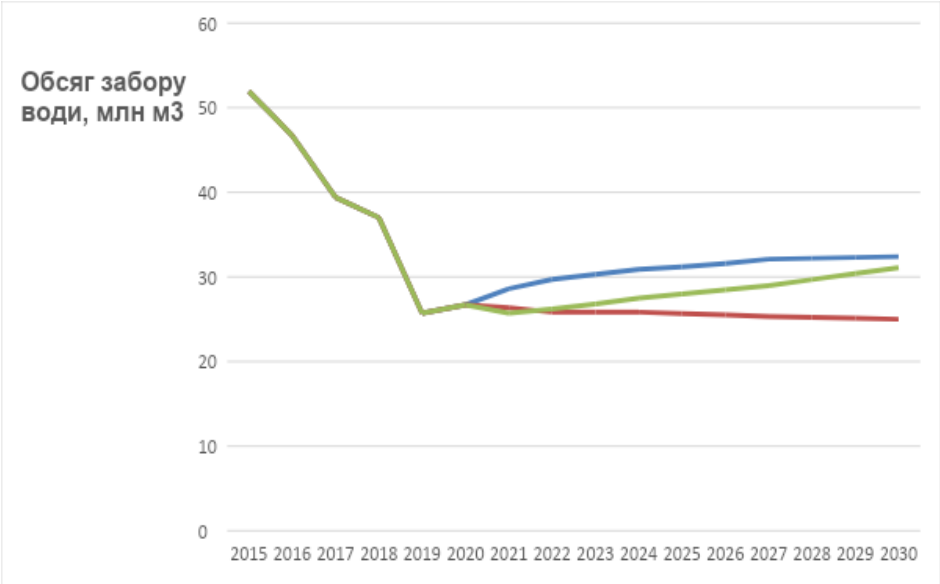


Figure 24. Forecast of water abstraction in the Black Sea river basin until 2030.

Since 2021, there has been a stable trend of gradual growth in water intake.

The forecast of water withdrawals in the basin until 2030 by economic sectors was made on the basis of the analysis of water use data series and their modelling in retrospect based on forecast values.

Within the Black Sea river basin, the housing and utilities sector is the most developed, and this sector also withdraws the largest volumes of water, which affects the overall forecast of water withdrawals in the Black Sea river basin.

The housing and utilities sector is a significant water user in the Black Sea river basin, which has responded more actively to the crisis caused by the spread of the COVID-19 pandemic. Thus, the volume of water withdrawals by this industry in 2020 is projected to decrease by 20%. This indicator is expected to recover in 2021, which is reflected in the total water withdrawals in the Black Sea river basin. In the subsequent period, this indicator is expected to fluctuate within 5%.

In the Black Sea basin industry sector, no significant changes in water withdrawals are expected over the entire 2020-2030 forecast period. A downward trend in water withdrawals can be observed in the retrospective period of 2015-2019. A significant decline in water withdrawals is projected due to significant losses caused by the COVID-19 pandemic.

No significant increase in water withdrawals by transport sector water users is forecast.

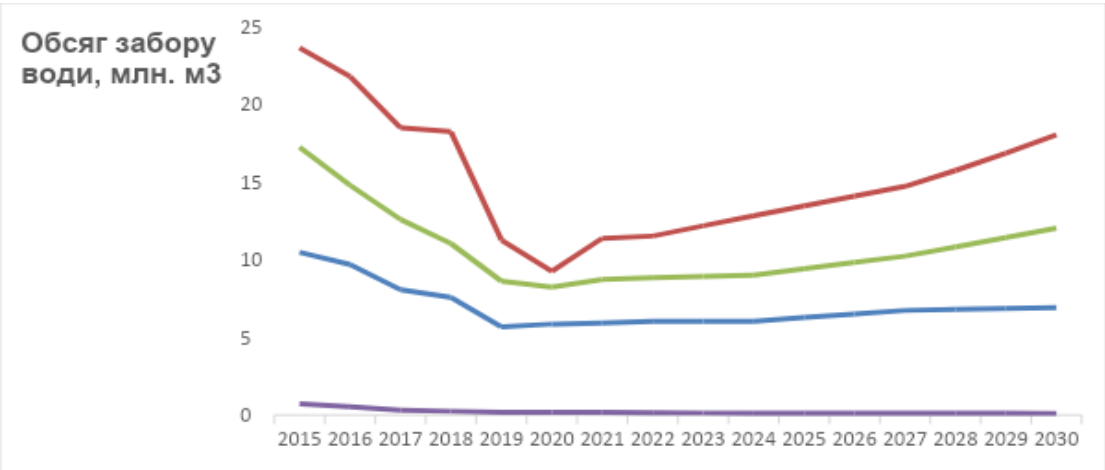


Figure 25. Forecast of water withdrawals in the Black Sea river basin by 2030 by economic sector

6.4. Tools of economic control

6.4.1. Payback of water resources use

The concept of "free" natural resources, which prevailed until the early 1980s, was accompanied by their irrational use, which eventually led to their pollution and shortage. The constant development of Ukraine's economy requires the involvement of more and more natural resources, including water, and thus the need to apply an economic assessment of this resource arises.

Conservation and rational use of water primarily involves improving the system of payment for its use.

Meeting the drinking needs of the population and the use of water by enterprises in their economic activities are referred to as special water use. Special water use is paid for and is carried out on the basis of a special water use permit. The permit for special water use is issued by the territorial bodies of the central executive body that implements the state policy in the field of water development.

The special water use permit sets out the water intake limit, the water use limit and the pollutant discharge limit. In the event of a water shortage, these limits may be reduced by the issuing authority without adjusting the special water use permit.

The terms of special water use are set by the authorities that issued the special water use permit. Special water use may be short-term (for three years) or long-term (from three to twenty-five years).

The legal, economic and organisational framework for the functioning of the drinking water supply system is defined by the Law of Ukraine "On Drinking Water and Drinking Water Supply" of 10 January 2002, No. 2918-111. According to this law, centralised water supply services are provided by municipal enterprises of local communities (water utilities), which supply drinking water to all water users. Vodokanals have their own property and are financially independent, they have the right to set tariffs for water supply and sewerage independently. The activities of these companies are controlled by local governments and state administrations.

In accordance with the "Procedure for setting tariffs for centralised water supply and sewerage services" approved by the Cabinet of Ministers of Ukraine on 10 March 2016, No. 302, the tariff for water supply and sewerage services should ensure reimbursement of operating expenses, financial expenses, expenses (or a share thereof) for capital investments, income tax expenses per unit of service and is determined by the company based on the indicators of the production programme for the base year. The tariffs for water supply and sewerage in different settlements of the region differ significantly.

Key regulators in the water and wastewater sector:

- the National Energy and Utilities Regulatory Commission (NEURC);
- local self-government bodies (LSG) (city, town and village councils).

Payback of water resources use is a comparison of funds received from the use of water resources to funds spent on the provision of water services.

The description of water services and water use in the basin is presented in accordance with the institutional structure of water services regulation:

I. Centralised water supply and sewerage services;

II. Special water use by economic sectors - payments and fees are paid to the budgets of all levels (rent, environmental tax for discharges into water bodies in Ukraine, lease of water bodies);

III. Water supply services for irrigation.

I. Payback of centralised water supply and sewerage services

In the basin, centralised water supply and sewerage services are provided by more than 27 organisations licensed by local governments and centralised sewerage services by one licensee of the National Commission for State Regulation of Energy and Utilities, Infox LLC, Infoxvodokanal branch (Odesa, USREOU code 26472133).

According to the calculations, the water and sewerage company, a licensee of the NEURC in the basin of Infox LLC, received about UAH 789.7 million (including VAT) for sewerage in 2018, UAH 840.5 million (including VAT) in 2019, and UAH 924.6 million (including VAT) in 2020.

According to the calculations, the licensees of local governments in the basin received: UAH 40.7 million (including VAT) in 2018, UAH 46.13 million (including VAT) in 2019, and UAH 50.74 million (including VAT) in 2020, respectively.

The insufficient level of payments by consumers for services rendered, which amounted to 92% in 2020, creates a situation of insufficient coverage of water services by consumer payments and threatens the sustainability of water services, and hence the debts of water utilities for electricity and wages.

The condition of the water supply and sewerage networks in the basin is unsatisfactory, which affects water quality. The cost of rehabilitating the networks is so high that it cannot be covered by depreciation alone.

In the basin, the average profit in tariffs was 3%, but none of the companies provided for the use of profit to form a reserve fund (capital) for modernisation, which should have been included in their business operations.

According to the NEURC, "the amount of production investments from profits is determined in the amounts necessary for the gradual restoration of networks (improvement of the functioning of water and sewerage enterprises), and taking into account the needs to fulfil the financial obligations of licensees to international financial organisations". However, this level is extremely insufficient.

II. Payback of water resources use in the basin (based on public finance calculations)

Revenues for special water use

In accordance with the principles of "user pays" and "polluter pays" The Tax Code of Ukraine establishes a fee for special water use:

A. Rent for water abstraction for different types of water users;

B. Environmental tax on discharges into water bodies.

In addition, there is a fee for the use of water bodies for aquaculture purposes:

C. Rent for water bodies,

D. Payment for special use of water bioresources

A. Rent for special water use

The state budget received a total of UAH 21.5 million from business entities in the basin by administrative region in 2018, UAH 21.3 million in 2019, and UAH 21.6 million in 2020.

The dynamics of rent revenues to the budgets of the Black Sea river basin regions is unstable, with water rents not increasing significantly in two regions of the basin (Table 39).

Table 39. Dynamics of rent revenues for special water use to the state and local budgets in the basin, thousand UAH

Area	2018	2019	2020
Odesa	17197,53	18050,66	18769,7
Mykolaivska	866,03	1390,86	749,2
Kherson	3398,56	1818,62	2109,6
Together	**21462,12**	**21260,14**	**21628,5**

B. Environmental tax on discharges of pollutants into water bodies

In the basin, the state budget and the special fund of local budgets received tax revenues for pollutant discharges directly into water bodies in the amount of UAH 21.3 million in 2018, UAH 26.9 million in 2019, and UAH 33.3 million in 2020.

The dynamics of revenues is unstable in the basin in almost every region of the basin (Table 36).

Table 40. Dynamics of environmental tax revenues for discharges into water bodies to the state and local budgets in the Black Sea river basin, UAH thousand

Area	2018	2019	2020
Odesa	19721,12	25276,26	31541,8
Mykolaivska	616,19	679,13	732,4
Kherson	995,89	967,98	981,5
Together	**21333,2**	**26923,37**	**33255,7**

C. Payment for the lease of water bodies

The weighted average rent is unified for all water bodies in the basin and is constantly increasing. Its dynamics is as follows: 2015 - 114.9 UAH/ha, 2016 - 153.2 UAH/ha, 2017 - 156.9 UAH/ha, 2018 - 162.7 UAH/ha, 2019 - 162.7 UAH/ha, 2020 - 162.7 UAH/ha.

According to estimates, local budgets in the basin received rent for water bodies (parts of them) in the amount of UAH 1,037.4 thousand in 2018-2020

The dynamics of revenues is negative in Odesa and Mykolaiv regions of the basin (Table 41).

Table 41. Dynamics of rent revenues to local budgets in the Black Sea river basin, thousand UAH

Area	2018	2019	2020
Odesa	138,5	148,0	509,8
Mykolaivska	107,8	64,0	33,0
Kherson	8,5	11,7	16,1
Together	**254,8**	**223,7**	**558,9**

D. Payment for special use of water bioresources

The fee for the use of aquatic bioresources is levied in accordance with the Resolution of the Cabinet of Ministers of Ukraine According to the report on local budgets, the fee for the special use of aquatic bioresources amounted to UAH 392.6 thousand in 2018, UAH 626.1 thousand in 2019, and UAH 1919.2 thousand in 2020.

The dynamics of revenues from the use of aquatic bioresources is positive in the basin (Table 38).

Table 42. Dynamics of revenues from fees for the special use of water bioresources to local budgets in the Black Sea river basin, thousand UAH

Area	2018	2019	2020
Odesa	219,23	434,35	1140,6
Mykolaivska	11,46	22,04	45,0
Kherson	161,9	169,7	733,6
Together	**392,59**	**626,09**	**1919,2**

Expenditures on water resources in the Black Sea river basin

A. Capital and current expenditures from the state and local budgets for environmental programmes in the field of water resources protection

According to the state statistical reports, capital investments and current expenditures are directed to the following environmental areas directly related to the reproduction and protection of water resources:

- construction and reconstruction of sewage treatment facilities, etc;
- cleaning riverbeds and protecting them from flooding.

In 2018 and 2019, the percentage of the first and second directions together accounted for a significant share of total capital expenditures in all directions, but in 2020, the percentage of the first and second directions decreased due to the growth of other directions of capital expenditures - Table 43.

Table 43. Dynamics of capital investments in the Black Sea river basin, thousand UAH

Area	2018			2019			2020		
	Total environmental programmes, including	Waste water treatment	Protection and rehabilitation of soil, groundwater	Total environmental programmes, including	Waste water treatment	Protection and rehabilitation of soil, groundwater and surface water	Total environmental programmes, including	Waste water treatment	Protection and rehabilitation of soil, groundwater and surface water
Odesa	37024,3	18204,4	288,5	37024,3	18204,4	288,5	68497,8	5663,0	13236,0
Mykolaivska	15024,4	6844,6	1,8	15024,4	6844,6	1,8	40103,7	6621,6	11,0
Kherson	1530,0	970,5	181,6	1530,0	970,5	181,6	2295,3	1391,2	33,1
Total for the basin	53578,7	26019,5	471,9	53578,7	26019,5	471,9	110896,8	13675,8	13280,1
% of programmes		48,6	0,9		48,6	0,9		12,3	11,9
Total for 2 water protection programmes		**26491,4**			**26491,4**			**26955,9**	

In 2020, the share of the first direction increased significantly, although the total amount of all current expenditures decreased compared to 2018 and 2019 (Table 44).

Table 44. Dynamics of current investments in the Black Sea river basin, thousand UAH

Area	2018			2019			2020		
	Total environmental programmes, including	Waste water treatment	Protection and rehabilitation of soil, groundwater and surface water	Total environmental programmes, including	Waste water treatment	Protection and rehabilitation of soil, groundwater and surface water	Total environmental programmes, including	Waste water treatment	Protection and rehabilitation of soil, groundwater and surface water
Odesa	215533,0	60553,3	311,0	215533,0	60553,3	311,0	216277,7	81912,0	4553,2
Mykolaivska	111657,5	36397,2	1218,2	111657,5	36397,2	1218,2	61988,6	39018,6	3267,6
Kherson	20948,2	7234,6	104,0	20948,2	7234,6	104,0	37805,9	21058,8	100,9
Total for the pool	348138,7	104185,1	1633,2	348138,7	104185,1	1633,2	316072,2	141989,4	7921,7
% of programmes from		29,9	0,5		29,9	0,5		44,9	2,5
Total for 2 water protection programmes		**105818,3**			**105818,3**			**149911,1**	

B. State budget expenditures for the maintenance of water infrastructure under the management of the SAWR

In the Black Sea river basin, water infrastructure maintenance activities are carried out by organisations under the management of the State Agency of Ukraine for Water Resources located in the respective regions of the basin - basin water resource administrations and regional water resource administrations in other regions.

Expenditures for the operation of water infrastructure are made under the comprehensive programme "Operation of the State Water Management Complex and Water Resources Management"; in 2020, expenditures in the Black Sea river basin amounted to UAH 169462.8 thousand.

Determining the payback of water resources use in the Black Sea river basin

If the payback ratio of water resources use, calculated by the formula: "Income / Expenditure * 100"

- is more than 100%, this means that all costs are reimbursed by paying tax and non-tax revenues for services to budgets of all levels or by tariffs; budget revenues, if used for their intended purpose, can be used for water resources restoration; enterprises receive profits that can be used for production development - production investments, formation of a reserve fund (capital), etc. (part of which will be used to pay income tax);

- if the indicator is less than 100%, this indicates a threat to the sustainability of the service, as the costs of budgets or enterprises are not covered by the revenues received.

The payback period for water resources use is calculated by the formula and amounts to 29.2 per cent, which means that costs are higher than tax revenues for water services - Table 45.

Table 45. Calculation of revenues and capital expenditures in the Black Sea river basin in 2020

SOURCES	Receipts, thousand UAH	EXPENSES	Expenses, thousand UAH
Rent for special water use (state and local budgets)	21628,5	Capital expenditure on reproduction and protection water resources	26955,9
Environmental tax on discharges into water bodies (state and local budgets)	33255,7	Expenditures from the state of the budget for exploitation state water management complex	169462,8
Rent for water bodies (parts thereof) provided in use on a lease basis (local budgets)	558,9		

SOURCES	Receipts, thousand UAH	EXPENSES	Expenses, thousand UAH
Payment for aquatic bioresources	1919,2		
TOTAL RECEIPTS	**57362,3**	**TOTAL EXPENSES**	**196418,7**
Payback	29,2		

6.4.2. Water tariffs

1. Tariffs for centralised water supply and sewerage

According to the institutional structure in Ukraine, the NEURC and local governments set the following types of tariffs for centralised water supply and sewerage services:

1) Tariff for centralised supply (cold water, hot water separately) and sewerage (cold and hot water together);
2) Tariff for centralised supply (cold water, hot water separately) and sewerage (cold and hot water) using in-building systems.

As of 2020, local governments have set tariffs for centralised water supply and sewerage for 26 enterprises in the Black Sea river basin.

As of 01.01.2021, there were 51 NEURC licensees in Ukraine, providing services to 76% of consumers in the country. The remaining 24% of consumers are provided with services by about 3,000 enterprises throughout Ukraine that are business entities in the water supply and sewerage sector and are licensed by local governments.

In the Black Sea river basin, only one licensee has established tariffs for water supply and sewerage for consumers who are water supply and sewerage entities in the field of CWS, this is the company INFOX LLC, a branch of Infoxvodokanal, from which other water utilities buy water, the costs of which are included in the tariffs of these companies.

As of 2020, the weighted average tariffs (in aggregate for all licensees of the Black Sea river basin) are as follows (Table 42):

- for centralised water supply services - UAH 13.08 per cubic metre,
- for centralised sewerage services - UAH 13.3 per cubic metre.

The level of cost recovery for centralised water supply and sewerage for consumers who are business entities in the WSS sector (tariff to cost) for all water utilities - licensees of the Black Sea river basin is about 100% and varies from 101% to 130%.

The tariff structure of the licensees includes MLA:

- for centralised water supply: labour costs (39.9%); electricity (28.9%); fuel and lubricants (2.4%); repair costs (6.5%); reagents (1.8%); depreciation (4.3%); financial expenses (8.9%); other expenses (4.8%).
- for wastewater disposal: labour costs (47%); fuel and lubricants (4.8%); repairs (3.2%); depreciation (5%); other costs (41%), etc.

2. Cost of water for industrial enterprises

The cost of water is actually paid by industrial enterprises in the form of a mandatory payment for special water use - a rent, the amount of which depends on the type of water consumed, the purpose, place and region of consumption, and the actual volume of water used. The rent is not paid if the volume of consumption is less than 5 m^3 per day and the water user does not have its own water intake facilities.

The rates of rent for special use of water are set by the Tax Code of Ukraine and are differentiated by regions.

Fees for water pollution are collected in the form of fines and environmental tax for discharges of pollutants into water bodies. The environmental tax is increased annually, with the last increase in environmental tax rates occurring in 2021. The tax rates for discharges of pollutants into water bodies are presented in Table 46.

Table 46. Environmental tax rates for discharges of certain pollutants into water bodies, UAH

Name of the pollutant	Tax rate per 1 tonne
Ammonium nitrogen	12883,84
Organic substances (based on biochemical oxygen consumption)(BOD 5)	5156,8
Suspended solids	369,52
Petroleum products	75792,4
Nitrates	1108,56

Name of the pollutant	Tax rate per 1 tonne
Nitrites	63278,16
Sulphates	369,52
Phosphates	10297,44
Chlorides	369,52

3. Cost of water intake services for irrigation

The state-owned operators of the irrigation water supply market are water management organisations of the SAWR.

The cost of such services is formed on the basis of a unified approach, which is defined by the Order of the State Agency of Ukraine for Water Resources and is determined on the basis of economically justified costs directly related to their provision. The costs include direct labour costs, direct material costs and other direct costs, general and administrative expenses, including renewal and modernisation of fixed assets used in the amount of 10% of direct costs. This cost is differentiated according to technological features.

The principle of pricing this service is not aimed at making a profit, as the state in the risky farming zone has undertaken to subsidise agricultural production. The service of supplying water for irrigation is a kind of subsidy to agribusiness in the form of reducing the cost of irrigation through state maintenance (operation) of irrigation systems and service personnel.

The peculiarity of cost formation is that the calculation of the cost of this service includes the costs of water supply that are not covered by budget financing (including electricity, salaries, capital expenditures).

The cost of the service does not include the cost of water as a resource, as water management organisations are not primary water users.

The cost of water supply for irrigation varied from 1.03 UAH/m^3 to 2.47 UAH/m^3 as of 2020 (Table 47).

Table 47. Cost of water abstraction services for irrigation in the basin, 2018-2020, UAH/m^3 (excluding VAT)

Area	The cost of everything			Including the cost of	
	2018	2019	2020	electricity	own services
Mykolaivska	0,68-1,28	0,88-1,87	1,15-2,47	0,79-1,86	0,36-0,61
Kherson	0,44-1,11	0,91-1,4	1,03-1,95	0,64-1,43	0,37-0,52

The proceeds from these services are used to replenish the special fund of the state budget and are credited to the own revenues of water management organisations, which are used in accordance with the budget approved by the SAWR.

It should be noted that this cost does not cover the costs of modernising and restoring reclamation facilities.

Capital investments from the state budget allocated to the operation of water management facilities, environmental and flood protection measures, water protection and water resources restoration are extremely insufficient.

95% of state budget expenditures are spent on current expenses. Therefore, it is impossible to modernise reclamation systems without investment programmes.

7 A REVIEW OF THE IMPLEMENTATION OF PROGRAMMES OR ACTIVITIES, INCLUDING HOW THE OBJECTIVES HAVE BEEN ACHIEVED

This section provides an overview of the budgetary programmes of different levels implemented in the Black Sea river basin in 2018-2020 and containing measures aimed at improving the environmental status of the SWBs (Annex 10). The list of environmental protection areas and specific measures in the Programmes was determined by the Resolution of the CMU of 17.09.1996 No. 1147 (as amended).

The National Target Programme for the Development of Water Management and Environmental Rehabilitation of the Dnipro River Basin for the Period up to 2021

Paragraph 4 of the CMU Resolution No. 336 of 18 May 2017 "On Approval of the Procedure for Developing RBMPs" states that the development of the first RBMPs for each RBD is carried out during the period of implementation of the National Target Programme for the Development of Water Management and Environmental Rehabilitation of the Dnipro River Basin for the period up to 2021 (hereinafter - the Programme). Funding for the development of the first RBMPs for each RBD is provided in accordance with paragraph 11 of the said Procedure at the expense of the state budget, asprovided for in the same Programme within the expenditures envisaged by the State Budget ofUkraine for the respective year, as well as other sources. The implementation of this programme is important both in the context of the preparation of the Black Sea RBMP and for the implementation of measures to achieve environmental objectives for the Black Sea RBD SWBs.

The purpose of the Programme is to define the main directions of state policy in the field of water management, conservation and restoration of water resources, implementation of the integrated water resources management system based on the basin principle, restoration of the role of reclaimed lands in the food and resource supply of the state, optimisation of water consumption, prevention and elimination of the consequences of harmful water impact.

The main objectives of the Programme are:

- harmonisation of Ukrainian legislation with international standards and improvement of theregulatory framework to ensure innovation and investment development of the water sector
- Implementation of an effective, justified and balanced mechanism for the use, protection and reproduction of water resources, ensuring sustainable development of the state water monitoring system in accordance with international standards;
- Implementation of the integrated water resources management system based on the basin principle, development and implementation of RBMPs, application of the economic model of targeted financing of activities in river basins, establishment of basin councils, and enhancement of the role of existing and creation of new basin water resource management agencies;
- Improving the technological level of water use, introducing low-water and waterless technologies, developing more rational water use standards, construction, reconstruction and modernisation of water supply and sewage systems;
- bank protection and regulation of river channels, construction and reconstruction of hydraulic structures, protective dams, polders, flood control reservoirs, clearing of river channels, improvement of water protection zones and coastal protection strips, development of schemesfor comprehensive flood protection of territories from the harmful effects of water, improvement of methods and technical devices for hydrometeorological observations and flood forecasting - partially completed
- Ensuring the development of land reclamation and improvement of the ecological condition of irrigated and drained lands, including restoration of the water management and reclamation complex, reconstruction and modernisation of reclamation systems and their facilities, engineering infrastructure of land reclamation systems with the creation of integrated technological complexes, introduction of new methods of irrigation and land drainage, application of water and energy-saving environmentally safe irrigation and water regulation regimes.

The estimated amount of funding for the Programme was UAH 46,478.46 million, including UAH 21,029.03 million from the state budget, UAH 9,294.2 million from the local budget, and UAH 16,155.2 million from other sources not prohibited by law, or 0.4% of Ukraine's GDP. The amount of funding for the Programme was determined annually during the drafting of the State Budget of Ukraine for the respective year, taking into account the real capabilities of the state budget. Since the start of the Programme's activities, as of 1 January 2019, 26% of the envisaged need was allocated from budgets of all levels and other sources, and as of 1 January 2020, 17% of the envisaged need, which led to a significant failure to complete its tasks and activities on time.

The main implementer of the Programme is the State Air Traffic Control Service of Ukraine. If we analyse in detail the distribution of state budget expenditures by the State Water Authority of Ukraine over the past 3 years, we can see the following trend. State funds are allocated mainly for the costs of consumption of the water sector, labour remuneration, utilities, the share of financing from the state budget, for example, in 2020 was 93.5% (UAH 2,092,158.5 thousand) from the general fund and81.1% (UAH 2,261,343.4 thousand) from the special fund. Total state budget expenditures to finance the Programme in 2020 amounted to UAH 5,022,671 thousand. The share of all funds used for the operation of the state water management complex and water resources management is UAH 4,561,352.5 thousand (90.8%).

Measures to maintain water management infrastructure in the Black Sea river basin are underway:The BUVR of the Black Sea and Lower Danube Rivers, the ROVR in Mykolaiv Oblast, and the BUVRof the Lower Dnipro. These organisations fall under the management of the BWA. Expenditures on theoperation of water infrastructure are made within the framework of a comprehensive programme "Operation of the State Water Management Complex and Water Resources Management" on aregional basis rather than on a basin basis.

For the third year in a row, the issue of extending the Programme's term from 2022 to 2024 to the period of preparation of the RBMP has been resolved by reviewing the amount of funding for the measures and agreeing on their scope at the central and regional levels. Currently, the SAWR has developed and submitted for interagency approval a draft Law of Ukraine "On Amendments to the National Target Programme for the Development of Water Management and Environmental Rehabilitation of the Dnipro River Basin for the Period up to 2021" to extend the Programme's validity until 2024.

National Target Programme "Drinking Water of Ukraine for 2011-2020" (Drinking WaterProgramme)

"The National Target Programme "Drinking Water of Ukraine for 2011-2020", approved by the Law of Ukraine No. 2455-IV dated 03.03.2005 (hereinafter referred to as the Drinking Water Programme). Its main goal was to ensure the rights of citizens to an adequate standard of living and environmental safety guaranteed by the Constitution of Ukraine by providing drinking water in the required volumes and in accordance with the established standards. The Drinking Water Programme was intended to ensure the implementation of the state policy on:

- development and reconstruction of centralised water supply and sewage systems;
- protection of drinking water sources;
- bringing the quality of drinking water to the requirements of regulatory acts;
- regulatory and legal provision in the field of drinking water supply and wastewater disposal;
- development and implementation of research and development projects using the latestmaterials, technologies, equipment and devices.

The estimated amount of funding for the Drinking Water Programme was UAH 9,471.7 million (in 2010prices), of which UAH 3,004.3 million was allocated from the state budget and UAH 6,467.4 million from other sources. Due to the lack of adequate funding over the 10 years of the Drinking Water Programme in Ukraine, there have been no significant positive changes in the provision of drinking water in the required volumes and of the appropriate quality.

As of 1 January 2020, about 1% of cities, more than 10% of urban-type settlements and almost 70% ofvillages in Ukraine (8.934 million people) were not provided with centralised drinking water supply. Almost 1 in 4 citizens of the country is not provided with centralised water supply. The problem ofusing imported water covers at least 9 regions of the country, and directly affects at least 268,000 people living in 824 settlements.

According to global standards for water quantity and quality, Ukraine is classified as a low-water country. Ukraine ranks 37th out of 40 European countries in terms of drinking water quality. And over the past 10 years, our performance has only been deteriorating. And i n terms of water per capita, Ukraine is 125th in the global ranking. At the same time, the national target programme Drinking Waterof Ukraine is not being implemented or financed at all. The last time the Drinking Water Programme was funded was in 2018, when UAH 200 million was allocated from the State Budget of Ukraine, with water and sewerage companies alone submitting projects totalling UAH 1.3 billion. Such activity of the companies is caused by their unsatisfactory financial and economic condition, as well as the inabilityof local governments to provide the necessary support for the renewal of fixed assets from local budgets. In addition, it should be noted that the procedures for obtaining grants and loans from international financial institutions are quite lengthy and involve significant risks, so obtaining state funds for the implementation of a particular infrastructure project was a desirable goal for each water utility. In 2019-2020, the Drinking Water Programme was not funded and ended in 2020.

Odesa Regional Integrated Environmental Protection Programme for 2020-2021

The Programme was approved by the decision of the Odesa Regional Council of 20 December 2019 No. 1165-VII (as amended on 03 March 2020 No. 1240-VII, 10 August 2020 No. 1384-VII, 16 April 2021 No. 147-VIII).

The initiator, developer and responsible executor of the Programme is the Department of Ecology and Natural Resources of the Oblast State Administration.

Total financial resources required for the Programme implementation: UAH 237,793.684 thousand in total, including: state budget funds - UAH 101,358.101 thousand, local budget funds - UAH 132,785.583 thousand (including the oblast budget - UAH 128,778.071 thousand, of which the rayon, territorial communities, city budget - UAH 2,100.00 thousand, budgets of villages, settlements, cities ofrayon significance - UAH 1,907.512 thousand), other sources - UAH 3,650.00 thousand.

The programme participants are the Department of Ecology and Natural Resources of the Oblast State Administration, local governments, the Tiligulsky Regional Landscape Park, and the I. I. Mechnikov Odesa National University.

The programme's main activities are:

- protection and rational use of water resources;
- protection and rational use of land and mineral resources
- preservation of the nature reserve fund and ecological network, protection and rational use of flora and fauna;
- Rational use and storage of production and household waste;
- science, information and education, personnel training, environmental impact assessment, strategic environmental assessment, labour organisation, participation in internationalenvironmental organisations, and implementation of an economic mechanism for environmental protection.

The Odesa Regional Comprehensive Environmental Protection Programme for 2020-2021, approved by the decision of the Odesa Regional Council dated 20.12.2019 No. 1165-VII, envisaged the following environmental protection measures in the Black Sea river basin, namely

- item 1.1.4 "Construction of domestic sewage and sewage treatment facilities in the village ofVyzyrka, Liman district, Odesa region - regional budget - UAH 35,000.0 thousand;
- Clause 1.1.5 Construction of wastewater treatment facilities with a capacity of 150 m^3 /day p.Vasylivka, Bilyaevka district, Odesa region, regional budget - UAH 485,321 thousand
- item 1.2.7 "Measures to restore and maintain a favourable hydrological regime and sanitarycondition of the Sarata River near the village of Petropavlivka in Sarata district" - oblast budget - UAH 2000.0 thousand
- item 1.2.14 Overhaul. Clearing the Sarata riverbed and flood protection in Petropavlivka village,Saratskyi district, Odesa region, oblast budget - UAH 1000.0 thousand.

In 2021, the Odesa Regional Comprehensive Environmental Protection Programme for 2020-2021 included the following activities in the section on preservation of the nature reserve fund and ecological network, protection and rational use of flora and fauna, namely

- item 3.1. development of land management documentation on organisation and establishment of boundaries of territories and objects of the nature reserve fund (NRF) and measures to enter information into the State Land Cadastre, planned expenditures - UAH 1500.0 thousand, financed - UAH 524.948 thousand;
- item 3.8. reconstruction of the connecting canal between the Tiligul estuary and the Black Sea in Kominternivskyi district of Odesa region - planned expenditures - UAH 45171,477 thousand, financed - UAH 2170,0 thousand.

Regional Comprehensive Environmental Protection Programme for Mykolaiv Region for 2021- 2027

The programme was approved by the decision of the Mykolaiv Regional Council of 23 December 2020 No.16.

The initiator, developer and responsible executor of the Programme is the Department of Ecology andNatural Resources of the Oblast State Administration.

The total amount of financial resources required for the implementation of the Programme: a total of UAH 904638.613 thousand, including: state budget funds - UAH 448433.737 thousand, regional budget funds - UAH 53911.494 thousand, other sources - UAH 82426.382 thousand, extra-budgetary -UAH 319867.00 thousand.

The programme participants are the Department of Ecology and Natural Resources of the OblastState Administration, the Department of Capital Construction of the Oblast State Administration, the Directorate of Regional Landscape Parks, local governments, enterprises, institutions and organisations.

The main activities of the programme are:

- reducing the volume of untreated and insufficiently treated wastewater discharged into waterbodies
- ensuring environmentally safe collection and disposal of waste, including unusablepesticides
- reducing air pollution;
- raising the level of environmental education of the population;
- development of nature reservefund organisations, conservation of biological andlandscape biodiversity;
- Implementation of greening measures in settlements;
- restoring and maintaining a favourable hydrological regime and favourable condition ofrivers.

The comprehensive environmental protection programme for 2021-2027, approved by the decision of the Mykolaiv Regional Council of 23 December 2020 No. 16, envisaged the following environmental protection measures in the Black Sea river basin, namely

- item 1.19 "Reconstruction of sewage treatment facilities in Berezanka, Mykolaiv region (including preparation of design estimates and expert evaluation)" state budget - UAH 7110 thousand and local budget - UAH 1590 thousand
- item 7.2 "Development and implementation of measures to preserve small rivers and/orsprings (Sosyk river of local importance, Berezansky district, Mykolaiv region)". regional budget - UAH 5020.0 thousand;
- item 7.3 "Conducting a study of the ecological state of the Berezanskyi estuary in the area of the dam near the village of Rivne of the Chornomorska rural territorial community of Mykolaiv district, Mykolaiv region, assessment of environmental value" regional budget - UAH 400 thousand.

Regional programme for the development of the water sector in Odesa region for the period upto 2021.

The programme was approved by the decision of the Odesa Regional Council of 18 September 2013No. 882-VI, as amended on 15 May 2020 No. 1304-VII.

The initiator, developer and responsible implementer of the Programme is the Black Sea and Lower Danube BUVR. The Programme has been developed inorder to:

- Increase the efficiency of the state reclamation network and on-farm reclamation systems in the region, increase crop yields, improve the ecological state of rural areas and living conditions;
- implementation of the state and regional water policy, meeting the needs of the population for quality water and the region's economic sectors for water resources;
- Inventory and certification of water bodies, creation of a register of hydraulic structures and their owners in river basins, and the establishment of riverine protective strips;
- flood protection of the region's river basins and protection of rural settlements and agricultural land from the harmful effects of water.

Total amount of financial resources required for the Programme implementation: UAH 2,969,160.698 thousand, including: state budget funds - UAH 1,656,100.698 thousand, local budget funds - UAH 450,324 thousand, funds from other sources - UAH 862,736 thousand.

The participants of the programme are the Department of Agrarian Policy of the Regional State Administration, the Department of Ecology and Natural Resources of the Regional StateAdministration, the Main Directorate of the State Emergency Service of Ukraine in Odesa Oblast, theState Enterprise "Odesa United Directorate for the Construction of Water Management Facilities", theUkrainian state regional design and survey Institute"Ukrpivdenprovodgosp, local authorities.

The breakdown of funding by programme area is as follows:

Ensuring the development of land reclamation and improvement of the ecological condition ofirrigated land - UAH 2,240,820 thousand.

Priority provision of centralised water supply to rural settlements that use imported water -UAH 582,680,698 thousand.

Comprehensive flood protection - UAH 62,670 thousand.

Protection of rural settlements and agricultural land from the harmful effects of water - UAH82,990 thousand.

The Regional Programme for the Development of the Water Sector in Mykolaiv Region for theperiod up to 2021.

The programme was approved by the decision of the Mykolaiv Regional Council of 21 December 2018No. 35, as amended on 15 May 2020 No. 1304-VII.

The initiator of the development is the Department of Agro-Industrial Complex of the Mykolaiv Regional State Administration, and the developer is the South Bug BUVR. Responsible implementers of the Programme: Department of Agro-Industrial Complexof Mykolaiv Oblast State Administration, South Bug BUVR. The Programme was developed in order to:

- improving the efficiency of the region's reclamation systems, restoring the role of reclaimed land in the country's food and resource supply;
- implementation of the state and regional water policy, provision of centralised drinking water supply to the rural population, improvement of the ecological state of rural areas and living conditions, meeting the water demand of the region's economic sectors, and optimisation of water consumption;
- Identification of water protection zones and coastal protection strips, conservation and restoration of water resources;
- preventing and eliminating the effects of harmful water impacts.

The total amount of financial resources required for the implementation of the Programme is UAH 4369.44 million, including: state budget funds - UAH 966.49 million, local budget funds - UAH 200.68 million, and funds from other sources - UAH 3220.27 million.

The programme participants are the Department of Agricultural Complex of Mykolaiv Regional State Administration, the Department of Ecology and Natural Resources of Mykolaiv Regional State Administration, and local authorities.

The breakdown of funding by programme area is as follows:

1. Ensuring the development of land reclamation and improvement of the environmentalcondition of irrigated land - UAH 3,579.6 million.

2. Priority provision of centralised water supply to rural settlements that use imported water -UAH 366.40 million.

3. Protection of rural settlements and agricultural land from the harmful effects of water – UAH 423.44 million.

Regional Programme for the Conservation and Restoration of Water Resources in the Kuyalnik Estuary Basin for 2019-2023

The programme was approved on 25.10.2019 No. 1095-VII and on 16.04.2021 No. 146-VIII by the Odesa Regional Council.

The initiator, developer and responsible executor of the Programme is the Department of Ecology and Natural Resources of the Oblast State Administration.

Total amount of financial resources required for the Programme implementation: UAH 555677.849 thousand in total, including: state budget funds - UAH 368300.0 thousand, local budget funds - UAH 65330.0 thousand (including oblast budget - UAH 65280.0 thousand, rayon, territorial communities,city budget - UAH 50.0 thousand), other sources - UAH 122047.849 thousand.

The programme participants are structural units of the regional state administration, central executive authorities and their territorial bodies, district state administrations, executive committees of councils ofcities of regional significance, local self-government bodies of the region, legal entities of all forms of ownership.

The programme's main activities are:

- creating a water management system in the Kuyalnik Estuary basin;
- Improving the hydroecological situation in the basin of the Bolshoi Kuyalnik River, otherwatercourses and the Kuyalnik Estuary;
- scientific support and survey of changes in the hydro-ecological state in the Kuyalnik estuarybasin;
- measures to implement the Law of Ukraine "On declaring the natural areas of the KuyalnykEstuary in Odesa Oblast a resort of national importance;
- educational activities.

According to the information on the implementation of the Programme for 2019-2021:

- item 2.1 development of design and estimate documentation for restoration and maintenance of favourable hydrological and sanitary conditions of the Velykyi Kuyalnyk River, other watercourses and the Kuyalnyi Estuary - UAH 19030.0 thousand;
- item 3.2 scientific research of the hydroecological regime and condition of the Kuyalnyk Estuary and sea water from the Gulf of Odesa (hydrological, hydrochemical, hydrobiological and medical-biological survey) - UAH 11100.0 thousand;

Regional programme for the development of land relations and land protection for 2016-2020

Approved by the decision of the Odesa Regional Council of 21 December 2015 No. 39-VII.

The initiator, developer and responsible executor of the Programme is the Main Department of the StateGeoCadastre in Odesa Oblast.

Total amount of financial resources required for the Programme implementation: UAH 40870.8 thousand, including: local budget funds - UAH 40870.8 thousand (including the oblast budget - UAH 38350.8 thousand, rayon, territorial communities, city budget - UAH 2520.0 thousand).

The programme participants are the Department of Finance of the Odesa Oblast State Administration, the Department of Economic Policy and Strategic Planning of the Odesa Oblast State Administration, relevant district state administrations, executive committees of city councils, enterprises and organisations

The programme's main activities are:

- conducting land inventory work;
- development of land management projects to establish (change) the boundaries ofadministrative and territorial entities;
- carrying out regulatory monetary valuation of land;
- rational use and protection of land resources.

The work on this project, including the surveying of the land fund boundaries, began in 2017 and wasnot completed due to lack of funding

Regional Programme "Drinking Water of Odesa Region" for 2021-2024

Approved by the decision of the Odesa Regional Council of 16 April 2021 No. 141-VIII.

The programme is aimed at solving problems with drinking water supply and sewerage in settlementsand at developing the water supply and sewerage system, improving its efficiency and reliability.

The objective of the Programme is to provide the population of the region with drinking water of standard quality, develop the water supply and sewerage sector, and improve its efficiency and reliability.

The initiator, developer and responsible executor of the Programme is the Department of Life Support Systems and Energy Efficiency of the Odesa Oblast State Administration.

The Programme participants are district state administrations, local governments, and the Department of Life Support Systems and Energy Efficiency of the Odesa Oblast State Administration.

The total amount of funding is UAH 1,367,010 thousand, including state budget funds

UAH 384,000 thousand, funds from district and city budgets - UAH 326,200 thousand, f u n d s f r o m village, town, city of district subordination and territorial communities - U A H 385,200 thousand, funds from other sources - UAH 271,610 thousand.

Areas of activity of the Programme:

- protection of drinking water sources;
- bringing the quality of drinking water to the established standards;
- improvement provision centralized water supplyand sewerage.

Regional Oblast Programme "Drinking Water of Mykolaiv Region" for 2021-2025

Approved by the decision of the Mykolaiv Regional Council of 29 September 2021 No. 4. Theprogramme is aimed at solving the problems with drinking water supply and sewerage in settlements and at developing the water supply and sewerage system, improving its efficiency and reliability.

The objective of the Programme is to provide the population of the region with drinking water in the required quantity and in accordance with the established standards, improve the quality of centralised water supply and sewerage services, and develop centralised water supply and sewerage systems in the settlements of Mykolaiv Oblast.

The initiator, developer and responsible executor of the Programme is the Housing and Communal Services Department of the Mykolaiv Oblast State Administration.

The Programme participants are district state administrations, local self-government bodies, the Department of Housing and Communal Services of the Mykolaiv Oblast State Administration, the Department of Ecology and Natural Resources of the Oblast State Administration, the Department of Urban Development, Architecture,

Capital Construction and Development Project Support of theMykolaiv Oblast State Administration, and the Regional Water Resources Office i n t h e Mykolaiv Oblast.

The total amount of funding is UAH 1,574.3 million, including UAH 687.1 million from the state budget, UAH 565.3 million from the local budget, and UAH 321.9 million from other sources.

Areas of activity of the Programme:

- providing settlements with high-quality centralised water supply;
- bringing the quality of drinking water to regulatory requirements;
- Implementation of the state policy in the field of drinking water and drinking water supply for the development and reconstruction of centralised water supply and centralised sewerage systems.

8 A COMPLETE LIST OF PROGRAMMES (PLANS) FOR THE RIVER BASIN OR SUB-BASIN AREA, THEIR CONTENT AND PROBLEMS TO BE SOLVED

The PoM was developed in accordance with the "Methodological Recommendations for Setting Environmental Objectives, Developing a Programme of Measures and Performing a Cost-Effectiveness Analysis of the River Basin Management Plan" (Methodological Recommendations), approved at a meeting of the Scientific and Technical Council of the SAWR on 12 July 2023. The PoM was developed by the Black Sea and Lower Danube BUVR in cooperation with local executive authorities, local governments, non-governmental organisations (NGOs), scientific and educational institutions and other stakeholders, taking into account the proposals and decisions of the Black Sea River Basin Council.

The PoM development took into account the chemical status of transboundary SWB based on monitoring data from 2022-2023.

The programme is developed for a period of 6 years, starting with the first cycle of the plan for 2025-2030. The start of the measure implementation should be no later than the third year from the beginning of the cycle (no later than 1 January 2028). In total, the programme includes 80 measures (67 main and 13 additional).

A full list of measures is provided in Annex 11.

8.1 Surface water

For surface waters, the PoM includes measures aimed at:

- Reducing organic pollution (diffuse and point sources);
- Reducing nutrient pollution (diffuse and point sources);
- Reducing pollution by hazardous substances (diffuse and point sources);
- Improvement/restoration of the hydrological regime and morphological indicators in case of disruption of the free flow of rivers, hydraulic connection between river channels and their floodplains, hydrological changes, and modification of river morphology.

In addition to these measures, the PoM includes other measures aimed at addressing other SWMI of the Black Sea RBD, identified in view of the specifics and transboundary nature of the basin.

8.1.1 Measures to reduce pollution by organic matter, nutrients and hazardous substances (diffuse and point sources)

The anthropogenic pressures on the SWB is primarily due to pollution with organic, biogenic and hazardous substances from sewage treatment plants (STPs) and diffuse sources.

Number of measures aimed at reducing pollution (diffuse and point sources):

- organic substances - 17;
- biogenic substances - 26;
- hazardous substances - 17.

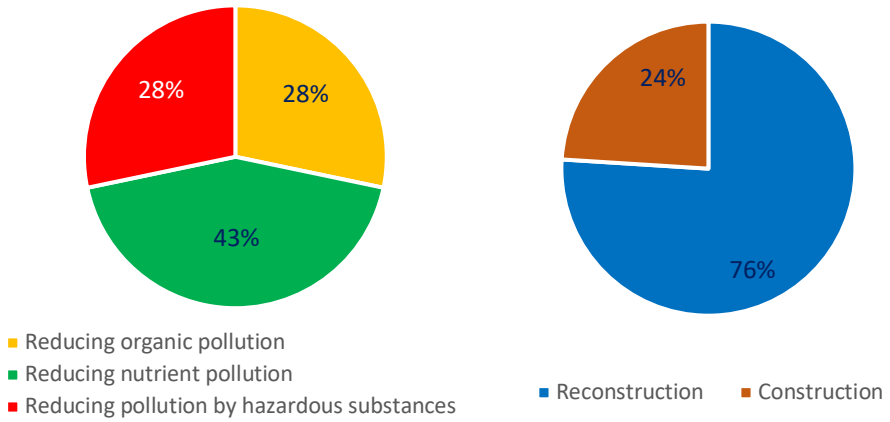


Figure 26. Measures aimed at reducing pollution by organic, biogenic and hazardous substances from point and diffuse sources and the way they are implemented (reconstruction or construction of STPs and SN), %

Measures aimed at reducing pollution by nutrients (diffuse sources) also include measures to establish water protection zones and bank protection strips for water bodies in the Black Sea RBD communities (#2, 9, 16, 23, 39, 46, 47, 53, 61, Annex 11).

In accordance with the requirements of the Law of Ukraine "On Wastewater Disposal and Treatment" dated 12 January 2023 No. 2887-IX, in order to ensure high-quality centralised wastewater disposal while reducing the impact of return (wastewater) on the SWB, it is planned to build/reconstruct STPs and SNs for 17 settlements in the Black Sea river basin with a population equivalent of 2,000 or more. Reconstruction/modernisation of STPs and SNs is envisaged in 13 communities, including 9 communities with tertiary (proper) wastewater treatment with removal of nitrogen and phosphorus compounds. The construction of new STPs and SNs is planned in 4 communities.

Among the measures aimed at reducing pollution by organic, biogenic and hazardous substances (diffuse and point sources), 15 measures relate to SWBs that are "at risk" of failing to achieve environmental objectives. Measures aimed at reducing pollution by organic, biogenic and hazardous substances from point sources, depending on the risk assessment of the SWB, are presented in Fig. 27.

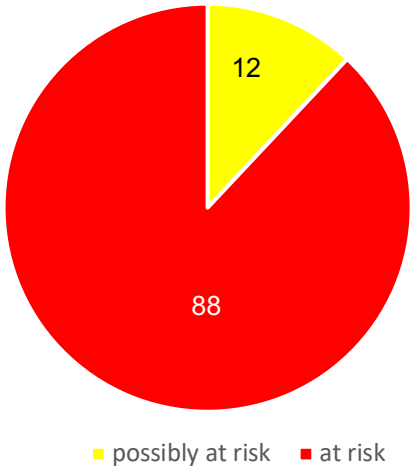


Figure 27. Measures aimed at reducing pollution by organic, biogenic and hazardous substances from point sources of pollution depending on the risk assessment of the SWB, %

8.1.2 Measures aimed at improving/restoring the hydrological regime and morphological indicators

40 measures aimed at improving/restoring the hydrological regime and morphological indicators in case of disruption of the free flow of rivers, hydraulic connection between river channels and their floodplains, hydrological changes, and modification of river morphology. When developing the measures, it was taken into account that the environmental objectives are to maintain the "good" status of 19 SWB and achieve "good" status for 21 SWB. Measures aimed at improving/restoring the hydrological regime and morphological indicators in case of impaired free flow of rivers, hydraulic connection between river channels and their floodplains, hydrological changes, modification of river morphology depending on the risk assessment of the SWB are presented in Fig. 28.

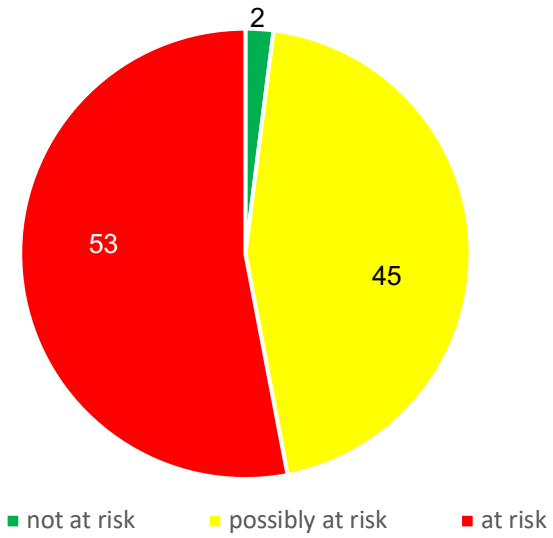


Figure 28. Measures aimed at improving/restoring the hydrological regime and morphological indicators in case of disruption of free flow of rivers, hydraulic connection between river channels and their floodplains, hydrological changes, modification of river morphology, depending on the assessment of SWB risks, %

In order to improve the state accounting of water use, assessment of anthropogenic pressures and regulation of groundwater/surface water withdrawals, analysis of hydrological changes, and real-time balancing, the programme includes the measure: "Improvement of state accounting of water use in the Black Sea river basin within Odesa, Mykolaiv and Kherson Oblasts" (#67, Annex 11). All water users in the region are scheduled to install/upgrade water metering devices with online data transmission.

8.2 Groundwater

The programme includes measures aimed at:

- reducing pollution (diffuse and point sources);
- preventing groundwater depletion;
- reducing the impact of planned infrastructure projects on water status.

It is mandatory to establish the boundaries of sanitary protection zones for groundwater intakes used for centralised water supply to the population, medical and recreational needs, indicate them in land management documentation, urban planning documentation at the local and regional levels, enter information on the relevant restrictions on land use in the State Land Cadastre and mark these boundaries on the ground with information signs. For groundwater abstractions with an extraction volume of more than 100 m^3/day within the sanitary protection zones and adjacent territories, water users shall set up a local network of observation wells to determine the amount of water and chemical and physicochemical parameters and provide observation data to the State Service of Geology and Subsoil of Ukraine.

Due to the cessation of groundwater monitoring since 2018, all measures are considered additional measures that relate not to a separate groundwater monitoring, but to groundwater monitoring in general, namely

1) Inventory of the observation well network. The inventory is necessary to resume monitoring observations and assess the need to drill additional observation wells.

2) Based on the results of the inventory, wells requiring repair, remedial plugging or conservation will be identified.

3) For non-pressure GWB, it is advisable to arrange new observation points to characterise their quality state in areas with minimal anthropogenic impact on the quantitative and qualitative state of groundwater, including from point and diffuse sources.

4) At water intakes, where operational monitoring is carried out in accordance with the "Procedure for State Water Monitoring", it is necessary to reassess the operational groundwater reserves, which will allow for a more reliable assessment of the quantitative state of the GWB.

8.3 Other measures

Other measures include legislative and legal, administrative, fiscal, research, training and educational, aimed at introducing new technologies, environmental and communication, project, and other measures. For example, the educational event "Dissemination of innovative knowledge and promotion of green financing for sustainable river basin management (on the example of the Black Sea river basin)". The main goal of the event is to promote the implementation of European green finance experience to restore and maintain an acceptable state of river basins through systematic professional training and expert information support to local communities on the implementation of the best innovative green practices and tools in river basin management in Ukraine.

Analysis of the cost-effectiveness of the PoM

The cost-effectiveness analysis (CEA) was conducted only for the main measures.

The largest share of measures is aimed at reducing pollution of the SWB (70%). Some measures are aimed at addressing several SWMI. Most of the main measures relate to settlements with a population of 2-10 thousand - 29 measures (50%), for settlements with a population of 10-100 thousand - 26 (45%), for settlements with a population of more than 100 thousand - only 3 (5%), these are measures for three communities of the Black Sea river basin.

The measures envisaged in the Programme shall be financed from the state and local budgets, as well as other sources not prohibited by law. Financing of these measures from the state budget shall be carried out within the limits of expenditures provided for in the State Budget of Ukraine for the relevant year.

The total cost of the main measures for the period 2025-2030 is UAH 25,523 million, with a per capita cost of UAH 8753 (UAH 1,459 per year) per capita (2.9 million people, 2020 data). The most costly is the reconstruction of sewage treatment plants in the cities of Odesa, Chornomorsk and Podilsk.

No measures with a very high level of effectiveness were identified among the main measures.

The group with a high level of efficiency includes 4 measures with a total value of UAH 20,444 million (80%). Social impact is expected for 1135.8 thousand people. These are measures aimed at reducing pollution by organic, biogenic and hazardous substances (SWMI 1 - 3) from the largest cities in the basin: Odesa, Chornomorsk, Podilsk and Kalanchak. All of the objects of the measures belong to the housing and utilities sector.

The group with an medium level of efficiency includes 14 measures with a total cost of UAH 1,628 million (6%). The measures are aimed at reducing pollution by organic, nutrient and hazardous substances from small towns and villages in the basin. The social effect is 1097.5 thousand people (low and very low social effectiveness). The balance of measures is at the medium and low level according to the criterion under evaluation.

The group with a low level of efficiency includes 30 measures with a total cost of UAH 3,254 million (13%). These include measures to define the boundaries of water protection zones, coastal protection strips of water bodies in the basin and river revitalisation. The social effect is 580 thousand people. Measures in this group are not associated with significant pressure from water use (low level according to the criterion being assessed).

The group with a very low level of effectiveness includes 19 measures aimed at addressing hydromorphological changes (SWMI 4). UAH 196 million (1%) is envisaged for the implementation of these measures, which will achieve a social effect for 75.3 thousand people, which corresponds to a very low level according to the criteria being evaluated.

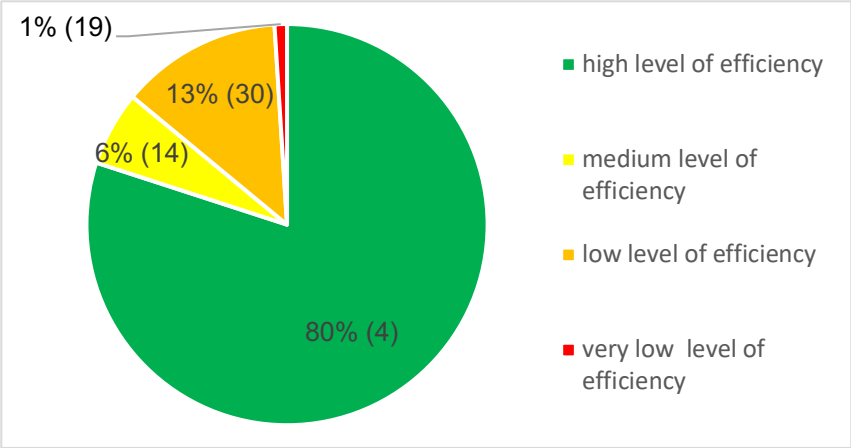


Figure 29. Distribution of main measures with different levels of efficiency by total cost of measures (number of measures in brackets)

A detailed CEA of the measures is provided in the Annex 12.

9 REPORT ON PUBLIC INFORMATION AND PUBLIC DISCUSSION OF THE DRAFT RIVER BASIN MANAGEMENT PLAN

The main requirements for the organisation and conduct of public consultations by executive authorities on the formation and implementation of state policy are set out in the Procedure approved by the Cabinet of Ministers of Ukraine on 3 November 2010, No. 996. In accordance with paragraph 5 of the Procedure, public consultations are organised and conducted by the executive body that is the main developer of the draft legal act. In accordance with paragraphs 11 and 12 of the Procedure, public consultations on draft regulatory legal acts that define strategic goals, priorities and objectives in the relevant area of public administration, affect the vital interests of citizens, including those that affect the state of the environment, are mandatory in the form of public discussion and/or electronic public consultations.

In accordance with the second paragraph of clause 7 of the Procedure for Developing a River Basin Management Plan, public discussion of the draft river basin management plan is conducted for at least six months from the date of their publication. In accordance with the first paragraph of clause 8-1, the public has the right to provide comments and suggestions on information on the main anthropogenic impacts on the quantitative and qualitative status of surface and groundwater, including point and diffuse sources, within six months from the date of their publication on the website of the Ministry of Ecology.

Consultations in the process of drafting the RBMP

During 2022-2023, the Black Sea and Lower Danube River Basin Water Management Authority (BUVR) held consultations with the public in Odesa, Mykolaiv and Kherson oblasts on the SWMI of the Black Sea river basin, development of a complete list of action programmes (plans), their content and problems to be solved (PoM) and preparation of a draft Black Sea RBMP for 2025-2030.

To ensure timely preparation of the Black Sea RBMP approved by the Order of the Ministry of Environmental Protection and Natural Resources of Ukraine No. 313 of 27 November 2020 "Schedule for the Development of the Draft Black Sea River Basin Management Plan", implementation of the Orders of the State Agency of Water Resources of Ukraine No. 44 "On Approval of the Action Plan" of 16 May 2022, and No. No. 1105 "On the Development of Draft River Basin Management Plans", the BUVR of the Black Sea and Lower Danube Rivers held online meetings for three days (10-12 August) in 2022, and offline meetings with representatives of district state administrations, territorial communities and water users in April-May 2023 to ensure the preparation of the Black Sea RBMP for the period 2025-2030, taking into account the need to plan measures during the military and reconstruction periods.

Additionally, in order to ensure the preparation of the PoM for the development of the Black Sea RBMP for the period 2025-2030, the Black Sea and Lower Danube Rivers BUVR prepared and sent letters to business entities providing water supply and sewerage services (water utilities), industrial enterprises agricultural enterprises, hotel and tourist and health resort complexes of the region that discharge waste water into surface water bodies (SWB) of the Black Sea river basin with a request to submit their proposals to the PoM aimed at addressing the SWMI of the Black Sea river basin.

At a regular meeting of the Black Sea Rivers Basin Council, all proposals aimed at addressing the SWMI of the Black Sea river basin were considered and approved.

Public consultation of the draft RBMP

The information notice on the public consultations of the draft RBMP (2025-2030) and the draft RBMPs was published on the website of the SAWR on 21 December 2023 at the link: https://davr.gov.ua/informacijne-povidomlennya-pro-provedennya-publichnogo-gromadskogo-obgovorennya-proyektiv-planiv-upravlinnya-richkovimi-basejnami-20252030

Information on the start of public consultations of draft RBMPs and draft RBMPs was published on the website of the Ministry of Environment on 25 December 2023 at the link: https://mepr.gov.ua/ukrayina-zavershyla-robotu-nad-9-proyektamy-planiv-upravlinnya-richkovymy-basejnamy-rozpochalosya-gromadske-obgovorennya/

According to the information published in the announcement of the public consultations of the draft RBMPs (2025-2030), comments and proposals in hard copy were accepted at the following address: State Agency of Water Resources of Ukraine, 8 Velyka Vasylkivska St., Kyiv, 01024, and in electronic form to the e-mail address rbmp@davr.gov.ua. The deadline for submitting comments and proposals to the draft RBMP was 21 June 2024.

As part of the public consultations, the SAWR, with the support of the EU4Environment project, initiated a series of public engagement activities, the schedule of which was announced on 28 February 2024 on the website at the link: https://davr.gov.ua/news/derzhvodagentstvo-iniciyuye-zahodi-iz-zaluchennya-gromadskosti-do-

obgovorennya-proyektiv-purb

In particular, an invitation to public consultations of the draft Black Sea RBMP was published on the SAWR website for everyone on 1 April 2024 https://davr.gov.ua/news/gromadske-obgovorennya-proyektu-purb-richok-prichornomorya-ta-proyektu-purb-dunayu-subbasejn-nizhnogo-dunayu--na-20252030.

It should be noted that the two draft RBMPs for the Black Sea and Danube rivers (Lower Danube sub-basin) were discussed at the same meeting, as many stakeholders overlapped.

The Lower Danube and Black Sea BUVR has sent out invitations to water users, all territorial communities and other stakeholders. The invitation to the public consultations of the draft Black Sea RBMP was also published on the same day on the BUVR Facebook page at the following link: https://www.facebook.com/odessa.buvr/posts/pfbid0YtczUUi5Cv8YMoMKUN4TSTbLcVhuvNG1qpTPB4BgATHxVSnqrNQs1iv3dcLoyKHBl

In order to present the results of the analysis of the status of SWB in the Black Sea river basin and the relevant PoM, 7 infographics were developed: basin location features; SWMI; ecological status of the SWBs (by biological indicators); chemical status of the SWBs; hydromorphological changes; PoM; and how to join public discussions.

The infographics are published on the website of the SAWR at the link: https://davr.gov.ua/plan-upravlinnya-richkovim-basejnom-richok-prichornomorya1

On 5 April 2024, an event was held in Odesa to discuss the draft RBMP for the Danube River Basin (Lower Danube sub-basin) and the Black Sea rivers. The event was attended by 104 participants, including representatives of government authorities, water management organisations, members of the basin council, representatives of local communities, water users in the basin, scientists, NGOs and stakeholders. The event presented the results of the analysis of the above-mentioned basin and the PoM, the vast majority of which relate to the construction or reconstruction of sewage treatment plants. This was followed by a discussion of the proposals and comments made by the participants to the draft RBMP. The results of the discussion are recorded in the Minutes (Annex 1 to the report on the results of the public consultations). Information about the event is available on the website of the Lower Danube and Black Sea Rivers BUVR https://oouvr.gov.ua/%d0%bf%d1%80%d0%be%d0%b2%d0%b5%d0%b4%d0%b5%d0%bd%d0%bd%d1%8f-%d0%bf%d1%83%d0%b1%d0%bb%d1%96%d1%87%d0%bd%d0%be%d0%b3%d0%be-%d0%b3%d1%80%d0%be%d0%bc%d0%b0%d0%b4%d1%81%d1%8c%d0%ba%d0%be%d0%b3%d0%be/

The report on the results of the public consultations will be posted on the website of the SAWR and on the website of the Ministry of Environment.

Strategic environmental assessment of the draft RBMP

In accordance with paragraph 7 of the Procedure for the Development of a River Basin Management Plan, approved by the Resolution of the Cabinet of Ministers of Ukraine No. 336 of 18.05.2017, the Ministry of Ecology ensures that strategic environmental assessment of draft river basin management plans is carried out in accordance with the Protocol on Strategic Environmental Assessment to the Convention on Environmental Impact Assessment in a Transboundary Context, ratified by the Law of Ukraine No. 562-VIII of 1 July 2015. The Ministry of Ecology contacted all affected states, but none of them expressed a desire to participate in the transboundary consultations.

The procedure for conducting a strategic environmental assessment (SEA) is set out in the Law of Ukraine "On Strategic Environmental Assessment" No. 2354-VIII dated 20 March 2018. Pursuant to Article 9(3)(1) of the Law, one of the stages of the SEA is public discussion and consultations in accordance with the procedure set out in Articles 12 and 13 of the Law, as well as transboundary consultations in accordance with the procedure set out in Article 14 of the Law. Pursuant to part nine of Article 12 of the Law, "based on the results of the public discussion, the customer shall prepare a certificate on public discussion, which summarises the comments and proposals received and indicates how the state planning document and the strategic environmental assessment report take into account the comments and proposals submitted in accordance with this article (or justify their rejection), and also justifies the selection of this particular state planning document in the form in which it is proposed for approval, among other justified al The certificate shall be accompanied by the minutes of public hearings (if held) and written comments and suggestions received. The certificate of public discussion is public information and is entered by the customer into the Unified Register of Strategic Environmental Assessment."

The certificate of public consultations of the draft RBMP will be entered by the SAWR into the Unified Register of Strategic Environmental Assessment together with the approved RBMP for the Black Sea rivers.

10 LIST OF COMPETENT STATE AUTHORITIES RESPONSIBLE FOR IMPLEMENTING THE RIVER BASIN MANAGEMENT PLAN

According to part two of Article 13 of the Water Code of Ukraine, the CMU, the Council of Ministers of the Autonomous Republic of Crimea, village, town and city councils and their executive bodies, district and regional councils, executive authorities and other state bodies are responsible for public administration in the field of water use and protection and water resources restoration in accordance with the legislation of Ukraine.

The executive authorities in the field of water use and protection and water resources reproduction are the Ministry of Ecology, the SAWR, the State Geological Survey, the State Ecological Inspectorate and other bodies in accordance with the law.

Table 48. Executive authorities in the field of water use and protection and water resources reproduction

Title.	Address.	Address of the official website
Ministry of Environmental Protection and Natural Resources of Ukraine (MENR)	35, Metropolyt Vasyl Lypkivskyi St., Kyiv, 03035 tel.: (044) 206-31-00, (044) 206-31-15, fax: (044) 206-31-07, E-mail: info@mepr.gov.ua	www.mepr.gov.ua
State Agency of Water Resources of Ukraine (SAWR)	8 Velyka Vasylkivska St., Kyiv, 01024 tel./fax: (044) 235-31-92, tel. (044) 235-61-46 E-mail: davr@davr.gov.ua	www.davr.gov.ua
State Service of Geology and Mineral Resources of Ukraine (Derzhgeonadra)	16 Anton Tsedik St., Kyiv, 03057 tel: (044) 536-13-18 E-mail: office@geo.gov.ua	www.geo.gov.ua
State Environmental Inspectorate of Ukraine (SEI)	3, building 2, Novopecherskyi lane, Kyiv, 01042 tel./fax +38 (044) 521-20-40 tel: (044) 521-20-38 E-mail: info@dei.gov.ua	www.dei.gov.ua

Table 49. Main regulatory acts that define the powers of executive authorities in the field of water use and protection and water resources reproduction

Name of the body	Legal act	Link on the official website of the Parliament of Ukraine
Ministry of Environmental Protection and Natural Resources of Ukraine (MEPNR)	The Water Code of Ukraine of 6 June 1995, No. 213/95-BP (Bulletin of the Verkhovna Rada of Ukraine (VVR), 1995, No. 24, p. 189) - Articles 15 and 15[1]	https://zakon.rada.gov.ua/laws/show/213/95-%D0%B2%D1%80#Text
	Regulation on the Ministry of Environmental Protection and Natural Resources of Ukraine, approved by the Resolution of the Cabinet of Ministers of Ukraine of 25 June 2020, No. 614 (Official Gazette of Ukraine, 2020, No. 59, p. 32, Article 1853)	https://zakon.rada.gov.ua/**laws/show/614-2020-%D0%BF#Text**

Name of the body	Legal act	Link on the official website of the Parliament of Ukraine
State Agency of Water Resources of Ukraine (SAWR)	The Water Code of Ukraine of 6 June 1995, No. 213/95-BP (Bulletin of the Verkhovna Rada of Ukraine (VVR), 1995, No. 24, p. 189) - Article 16	https://zakon.rada.gov.ua/laws/show/213/95-%D0%B2%D1%80#Text
	Regulation on the State Agency of Water Resources of Ukraine, approved by the Resolution of the Cabinet of Ministers of Ukraine of 20 August 2014, No. 393 (Official Gazette of Ukraine, 2014, No. 71, p. 34, Article 1995)	https://zakon.rada.gov.ua/laws/show/393-2014-%D0%BF#Text
State Service of Geology and Mineral Resources of Ukraine (Derzhgeonadra)	The Water Code of Ukraine of 6 June 1995, No. 213/95-BP (Bulletin of the Verkhovna Rada of Ukraine (VVR), 1995, No. 24, p. 189) - Article 17	https://zakon.rada.gov.ua/laws/show/213/95-%D0%B2%D1%80#Text
	Regulation on the State Service of Geology and Subsoil of Ukraine, approved by the Resolution of the Cabinet of Ministers of Ukraine of 30 December 2015 No. 1174 (Official Gazette of Ukraine, 2016, No. 3, p. 284, Article 192)	https://zakon.rada.gov.ua/laws/show/1174-2015-%D0%BF#Text
State Environmental Inspectorate of Ukraine (SEI)	The Water Code of Ukraine of 6 June 1995, No. 213/95-BP (Bulletin of the Verkhovna Rada of Ukraine (VVR), 1995, No. 24, p. 189) - Article 15^2	https://zakon.rada.gov.ua/laws/show/213/95-%D0%B2%D1%80#Text
	Regulation on the State Environmental Inspectorate of Ukraine, approved by the Resolution of the Cabinet of Ministers of Ukraine of 19 April 2017, No. 275 (Official Gazette of Ukraine, 2017, No. 36, p. 73, Article 1131)	https://zakon.rada.gov.ua/laws/show/275-2017-%D0%BF#Text
	Regulations on Territorial and Interregional Territorial Bodies of the State Environmental Inspectorate, approved by the Order of the Ministry of Energy and Environmental Protection of Ukraine dated 07 April 2020 No. 230, registered with the Ministry of Justice of Ukraine on 16 April 2020 under No. 350/34633 (Official Gazette of Ukraine, 2020, No. 33, p. 25, Article 1116)	https://zakon.rada.gov.ua/**laws/show/z0350-20#Text**

In order to ensure the implementation of the state policy in the field of management, use and reproduction of surface water resources within the Black Sea river basin area, to direct and coordinate the activities of organisations under the management of the State Agency of Water Resources of Ukraine on the management, use and

reproduction of surface water resources within the Black Sea river basin area, as well as to ensure the implementation of the state policy in the field of water management within Odesa region, the State Agency of Water Resources of Ukraine established the Basin Water Resources Management for the Black Sea andLower Danube Rivers (BUVR).

Table 50. Contact information

Name of the organisation	Address.	Telephone/fax	Email.	Website.
Basin Water Resources Management for the Black Sea andLower Danube Rivers (BUVR)	13, Ivan and Yurii Lypiv Str., Odesa, 65078	(048) 766-91-02	buvr_odesa@oouvr.gov.ua	oouvr.gov.ua

(*Source:* https://**davr.gov.ua/vodogospodarskiorganizacii)**

The names of sub-basins and water management areas within river basin districts are given in the Annex to the Order of the Ministry of Ecology and Natural Resources of Ukraine No. 25 "On the Allocation of Sub-Basins and Water Management Areas within Established River Basin Districts" dated 26 January 2017, registered with the Ministry of Justice of Ukraine on 14 February 2017 under No. 208/30076 (https://zakon.rada.gov.ua/laws/show/z0208-17#Text).

The boundaries of river basin districts, sub-basins and water management areas were approved by the Order of the Ministry of Ecology and Natural Resources of Ukraine No. 103 dated 03.03.2017, registered with the Ministry of Justice of Ukraine on 29 March 2017 under No. 421/30289 (https://zakon.rada.gov.ua/laws/show/z0421-17#Text).

The Black Sea and Lower Danube River Basin Water Resources Management Authority is a budgetary non-profit organisation that falls under the management of the State Agency of Ukraine for Water Resources. The Regulation on the Black Sea and Lower Danube River Basin Water Resources Management was approved by the Order of the State Agency of Ukraine for Water Resources dated 06.07.2023 No. 80 (https://oouvr.gov.ua/pro-buvr/poloshenya/).

In order to develop proposals and ensure coordination of interests of enterprises, institutions and organisations in the field of water use and protection and water resources restoration within the Black Sea river basin area, to promote integrated water resources management within the Black Sea river basin area, to ensure coordination of interests and coordination of actions of stakeholders in water resources management within the Black Sea river basin area, to facilitate cooperation between central and local executive authorities, the The Black Sea Rivers Basin Council is an advisory body of the State Agency of Ukraine for Water Resources within the Black Sea River Basin region. The Regulation on the Black Sea Rivers Basin Council was approved by the Order of the State Agency of Water Resources of Ukraine No. 848 dated 13.11.2018 (https://davr.gov.ua/polozhennya-pro-basejnovu-radu-richok-prichornomorya)

According to the List approved by Resolution of the Cabinet of Ministers of Ukraine No. 1371 dated 13 September 2002 (as amended by Resolution of the Cabinet of Ministers of Ukraine No. 1276 dated 30 November 2011) (https://zakon.rada.gov.ua/laws/show/1371-2002-%D0%BF#n38), the Ministry of Ecology and/or the State Agency of Water Resources of Ukraine are responsible for fulfilling international obligations in the field of water protection arising from Ukraine's membership in international organisations or in accordance with international treaties concluded by Ukraine.

In addition, pursuant to Article 9 of the UNECE Convention on the Protection and Use of Transboundary Watercourses and International Lakes (https://zakon.rada.gov.ua/laws/show/801-14#Text), the Government of Ukraine has concluded bilateral agreements on the protection of border/boundary waters, the responsibility for which lies with the State Agency of Water Resources:

- Agreement between the Government of Ukraine and the Government of the Republic of Moldova on the Joint Use and Protection of Boundary Waters of 23 November 1994 (https://zakon.rada.gov.ua/laws/show/498_051#Text).
- The Commissioners of the Cabinet of Ministers of Ukraine for Cooperation on Boundary Waters and their deputies were appointed by the Resolution of the Cabinet of Ministers of Ukraine of 10 March 2017 No. 126 as amended {As amended by the Resolutions of the Cabinet of Ministers of Ukraine No. 489 of 05.06.2019 No. 45 of 13.01.2021 No. 1186 of 18.10.2022) (https://zakon.rada.gov.ua/laws/show/126-2017-%D0%BF#Text).

11 PROCEDURE FOR OBTAINING INFORMATION, INCLUDING PRIMARY INFORMATION, ON THE STATE OF SURFACE AND GROUNDWATER

In order to ensure proper organization of access to public information, implementation of the Law of Ukraine “On Access to Public Information”, Decree of the President of Ukraine dated May 5, 2011 No. 547 “Issues of ensuring access to public information by executive bodies”, resolutions of the Cabinet of Ministers of Ukraine dated May 25, 2011 No. 583 “Issues of implementation of the Law of Ukraine “On Access to Public Information” in the Secretariat of the Cabinet of Ministers of Ukraine, central and local executive bodies” (Official Gazette of Ukraine, 2011, No. 41, p. 1694), dated October 21, 2015 No. 835 “On approval of the Regulation on data sets subject to publication in the form of open data” (Official Gazette of Ukraine, 2015, No. 85, p. 2850), by order of the Ministry of Environment dated December 2, 2021 No. 793, registered with the Ministry of Justice of Ukraine on February 1, 2022 under No. 123/37459, approved the Procedure for compiling, submitting and processing requests for information, managed by the Ministry of Environmental Protection and Natural Resources of Ukraine, a form for submitting a request for information in writing, a form for submitting a request for information by e-mail and a form for submitting a request for information by telephone.

To regulate the procedure for access to public information, the SAWR adopted Order No. 163 dated 08.12.2023 "On Certain Issues of Implementation of the Law of Ukraine "On Access to Public Information" in the SAWR".

In accordance with paragraphs 16-18 of the Procedure for State Water Monitoring, approved by Resolution of the Cabinet of Ministers of Ukraine No. 758 of 19 September 2018, the results of state water monitoring are:

- Primary information (observation data) provided by the subjects of state water monitoring;
- generalised data relating to a certain period of time or a certain territory;
- Assessment of the ecological and chemical state of surface water bodies, the ecological potential of artificial or significantly modified surface water bodies, the quantitative and chemical state of groundwater bodies, the ecological state of marine waters and identification of sources of negative impact on them;
- forecasts of water conditions and their changes;
- scientifically based recommendations necessary for making management decisions in the field of water use and protection and water resources reproduction.

Subjects of state water monitoring are obliged to store primary information (observation data) obtained as a result of state water monitoring for an indefinite period of time.

The information obtained and processed by the state water monitoring bodies is official.

Primary information (observation data), generalised data, assessment results, forecasts and recommendations resulting from the state water monitoring are provided free of charge:

- for SWBs (including coastal waters) - to the SAWR and the Ministry of Environment;
- for GWBs – to the State Service of Geology and Mineral Resources and the Ministry of Environment, as well as to the SAWR in terms of generalised data, assessment results and forecasts;
- for marine waters - the Ministry of Environment.

The subjects of state water monitoring shall exchange information with each other on the data and results of state water monitoring on a free-of-charge basis.

The SAWR collects and publishes information on the state of surface waters in the public domain by maintaining the following information resources:

- geoportal "State Water Cadastre: Accounting of Surface Water Bodies" (http://geoportal.davr.gov.ua:81/);
- the web-based system "Monitoring and Environmental Assessment of Water Resources of Ukraine" (http://monitoring.davr.gov.ua/EcoWaterMon/GDKMap/Index).

Automatic data exchange has been set up between these information resources and the Ministry of Ecology's EcoHazard resource.

ANNEXES
TO THE BLACK SEA RIVER BASIN
MANAGEMENT PLAN
2025-2030

ANNEX 1. LIST OF IDENTIFIED SWBS IN THE AZOV SEA RBD

The risk of not achieving the environmental objectives of the SWB: 1 – no risk, 2 – possibly at risk, 3 – at risk.

Linear SWBs

River basin	Name of the SWB	Where the SWB flows into	Type of SWB	Length, km	Category of SWB	SWB code	Point sources	Diffuse sources	Hydromorphology	Risk of not achieving environmental objectives	
										good ecological status	good chemical status
Black Sea	Kogilnik	Sasyk (Kunduk)	HMWB	97,59	HMWB	UA_M5.8_0001	3	2	3	3	2
Black Sea	Skynosa	Kogilnik	HMWB	20,19	HMWB	UA_M5.8_0002	1	2	3	3	1
Black Sea	Smoking machine	Skynosa	HMWB	6,69	HMWB	UA_M5.8_0003	1	2	3	3	1
Black Sea	Anchokrak	Kogilnik	UA_R_12_S_1_Si	17,40	river	UA_M5.8_0004	2	2	1	2	2
Black Sea	Chaga	Kogilnik	HMWB	11,49	HMWB	UA_M5.8_0005	1	2	3	3	1
Black Sea	Chaga	Kogilnik	UA_R_12_M_1_Si	30,13	river	UA_M5.8_0006	1	2	1	2	1
Black Sea	Chaga	Kogilnik	UA_R_12_L_1_Si	35,91	river	UA_M5.8_0007	3	3	1	3	2
Black Sea	Colic	Chaga	UA_R_12_M_1_Si	2,57	river	UA_M5.8_0008	1	2	1	2	1
Black Sea	Karadai	Chaga	UA_R_12_S_1_Si	13,14	river	UA_M5.8_0009	1	2	1	2	1
Black Sea	Saka	Chaga	UA_R_12_S_1_Si	12,71	river	UA_M5.8_0010	1	2	1	2	1
Black Sea	Saka	Chaga	UA_R_12_M_1_Si	33,08	river	UA_M5.8_0011	2	2	1	2	1
Black Sea	Kolbarash	Saka	UA_R_12_S_1_Si	10,85	river	UA_M5.8_0012	1	2	1	2	1
Black Sea	Kantemir	Saka	UA_R_12_S_1_Si	2,20	river	UA_M5.8_0013	1	2	1	2	1
Black Sea	Kantemir	Saka	HMWB	1,07	HMWB	UA_M5.8_0014	1	2	3	3	1
Black Sea	Kantemir	Saka	UA_R_12_S_1_Si	7,69	river	UA_M5.8_0015	1	2	1	2	1
Black Sea	Kantemir	Saka	HMWB	1,40	HMWB	UA_M5.8_0016	1	2	3	3	1
Black Sea	Kantemir	Saka	UA_R_12_S_1_Si	5,17	river	UA_M5.8_0017	1	2	1	2	1
Black Sea	Arsa	Saka	UA_R_12_S_1_Si	16,91	river	UA_M5.8_0018	2	2	1	2	1
Black Sea	Mouldings	Chaga	UA_R_12_S_1_Si	22,42	river	UA_M5.8_0019	1	3	1	3	1
Black Sea	Jalar	Kogilnik	UA_R_12_S_1_Si	4,81	river	UA_M5.8_0020	1	3	1	3	1
Black Sea	Jalar	Kogilnik	HMWB	1,25	HMWB	UA_M5.8_0021	1	3	3	3	1
Black Sea	Jalar	Kogilnik	UA_R_12_S_1_Si	9,17	river	UA_M5.8_0022	1	3	1	3	1
Black Sea	Jalar	Kogilnik	HMWB	2,30	HMWB	UA_M5.8_0023	1	3	3	3	1
Black Sea	Jalar	Kogilnik	UA_R_12_S_1_Si	3,77	river	UA_M5.8_0024	1	3	1	3	1
Black Sea	Chilliguide	Kogilnik	UA_R_12_S_1_Si	5,80	river	UA_M5.8_0025	1	2	1	2	1
Black Sea	Chilliguide	Kogilnik	HMWB	1,19	HMWB	UA_M5.8_0026	1	2	3	3	1

River basin	Name of the SWB	Where the SWB flows into	Type of SWB	Length, km	Category of SWB	SWB code	Point sources	Diffuse sources	Hydromorphology	Risk of not achieving environmental objectives	
										good ecological status	good chemical status
Black Sea	Chilliguide	Kogilnik	UA_R_12_S_1_Si	5,97	river	UA_M5.8_0027	1	3	1	3	1
Black Sea	Chilliguide	Kogilnik	HMWB	1,20	HMWB	UA_M5.8_0028	1	3	3	3	1
Black Sea	Chilliguide	Kogilnik	UA_R_12_S_1_Si	6,58	river	UA_M5.8_0029	1	2	1	2	1
Black Sea	Chilliguide	Kogilnik	UA_R_12_M_1_Si	7,52	river	UA_M5.8_0030	1	2	1	2	1
Black Sea	Chilliguide	Kogilnik	UA_R_12_M_1_Si	27,90	river	UA_M5.8_0032	2	3	1	3	1
Black Sea	Kagach	Kogilnik	UA_R_12_S_1_Si	1,08	river	UA_M5.8_0033	1	2	1	2	1
Black Sea	Kagach	Kogilnik	UA_R_12_S_1_Si	8,11	river	UA_M5.8_0035	2	2	1	2	1
Black Sea	Kagach	Kogilnik	HMWB	5,94	HMWB	UA_M5.8_0036	2	2	3	3	1
Black Sea	Sarata	Sasyk (Kunduk)	UA_R_12_S_1_Si	9,18	river	UA_M5.8_0037	1	2	1	2	1
Black Sea	Sarata	Sasyk (Kunduk)	HMWB	48,43	HMWB	UA_M5.8_0038	2	3	3	3	1
Black Sea	Sarata	Sasyk (Kunduk)	UA_R_12_L_1_Si	29,72	river	UA_M5.8_0039	2	3	1	3	2
Black Sea	Brezoy	Sarata	HMWB	8,20	HMWB	UA_M5.8_0040	1	2	3	3	1
Black Sea	Kopchak	Sarata	HMWB	4,59	HMWB	UA_M5.8_0041	1	3	3	3	1
Black Sea	Babey	Sarata	UA_R_12_M_1_Si	10,79	river	UA_M5.8_0042	1	3	1	3	1
Black Sea	Jalar	Sarata	UA_R_12_S_1_Si	16,11	river	UA_M5.8_0043	1	3	1	3	1
Black Sea	Jalar	Sarata	UA_R_12_M_1_Si	6,05	river	UA_M5.8_0045	1	3	1	3	1
Black Sea	Kuruder	Sarata	UA_R_12_S_1_Si	9,62	river	UA_M5.8_0046	1	3	1	3	1
Black Sea	Kuruder	Sarata	HMWB	6,13	HMWB	UA_M5.8_0048	2	3	3	3	1
Black Sea	Kuruder	Sarata	UA_R_12_M_1_Si	6,38	river	UA_M5.8_0049	1	3	1	3	1
Black Sea	Hajider	Hajider	HMWB	7,86	HMWB	UA_M5.8_0050	1	3	3	3	1
Black Sea	Hajider	Hajider	HMWB	5,59	HMWB	UA_M5.8_0052	1	3	3	3	1
Black Sea	Hajider	Hajider	HMWB	20,64	HMWB	UA_M5.8_0053	2	3	3	3	1
Black Sea	Hajider	Hajider	HMWB	27,20	HMWB	UA_M5.8_0055	2	3	3	3	1
Black Sea	Kaplan	Hajider	UA_R_12_M_1_Si	4,34	river	UA_M5.8_0056	1	3	1	3	1
Black Sea	Kaplan	Hajider	HMWB	14,86	HMWB	UA_M5.8_0058	2	3	3	3	1
Black Sea	Balaccela	Hajider	UA_R_12_S_1_Si	2,49	river	UA_M5.8_0059	1	3	1	3	1
Black Sea	Balaccela	Hajider	HMWB	1,46	HMWB	UA_M5.8_0060	1	3	3	3	1
Black Sea	Balaccela	Hajider	UA_R_12_S_1_Si	4,12	river	UA_M5.8_0061	1	3	1	3	1
Black Sea	Balaccela	Hajider	UA_R_12_M_1_Si	7,13	river	UA_M5.8_0062	2	3	1	3	2

River basin	Name of the SWB	Where the SWB flows into	Type of SWB	Length, km	Category of SWB	SWB code	Point sources	Diffuse sources	Hydromorphology	Risk of not achieving environmental objectives	
										good ecological status	good chemical status
Black Sea	Alkali	Lake. Solone	UA_R_12_S_1_Si	14,95	river	UA_M5.8_0063	2	3	1	3	1
Black Sea	Alkali	Lake. Solone	HMWB	3,86	HMWB	UA_M5.8_0064	1	3	3	3	1
Black Sea	Alkali	Lake. Solone	UA_R_12_M_1_Si	4,12	river	UA_M5.8_0066	1	3	1	3	2
Black Sea	Alkali	Lake. Solone	UA_R_12_M_1_Si	38,01	river	UA_M5.8_0068	2	3	1	3	2
Black Sea	Drummer	Black Sea	HMWB	9,65	HMWB	UA_M5.8_0070	2	2	3	3	1
Black Sea	Drummer	Black Sea	UA_R_12_M_1_Si	9,90	river	UA_M5.8_0071	2	2	1	2	1
Black Sea	Drummer	Black Sea	UA_R_12_M_1_Si	27,04	river	UA_M5.8_0073	3	2	1	3	2
Black Sea	Drummer	Black Sea	HMWB	2,55	HMWB	UA_M5.8_0074	1	2	3	3	1
Black Sea	Drummer	Black Sea	UA_R_12_M_1_Si	22,78	river	UA_M5.8_0075	2	2	1	2	1
Black Sea	Pork	Khadzhibey estuary	UA_R_12_M_1_Si	23,32	river	UA_M5.8_0076	1	3	1	3	1
Black Sea	Pork	Khadzhibey estuary	HMWB	1,96	HMWB	UA_M5.8_0078	1	3	3	3	2
Black Sea	B. Karpiv Yar	Pork	UA_R_12_M_1_Si	10,54	river	UA_M5.8_0079	1	3	1	3	1
Black Sea	Pigsty	Pork	UA_R_12_M_1_Si	20,64	river	UA_M5.8_0080	1	3	1	3	1
Black Sea	Maly Kuyalnik	Khadzhibey estuary	UA_R_12_M_1_Si	50,86	river	UA_M5.8_0081	2	2	1	2	1
Black Sea	Maly Kuyalnik	Khadzhibey estuary	UA_R_12_M_1_Si	5,40	river	UA_M5.8_0083	2	2	1	2	1
Black Sea	Maly Kuyalnik	Khadzhibey estuary	UA_R_12_L_1_Si	24,82	river	UA_M5.8_0084	2	2	1	2	1
Black Sea	B. Torosova	Maly Kuyalnik	UA_R_12_S_1_Si	10,11	river	UA_M5.8_0085	1	3	1	3	1
Black Sea	B. Good	Maly Kuyalnik	UA_R_12_S_1_Si	13,46	river	UA_M5.8_0086	1	3	1	3	1
Black Sea	Srednyi Kuyalnik	Maly Kuyalnik	UA_R_12_M_1_Ca	4,41	river	UA_M5.8_0087	1	2	1	2	1
Black Sea	Srednyi Kuyalnik	Maly Kuyalnik	HMWB	1,46	HMWB	UA_M5.8_0088	1	2	3	3	1
Black Sea	Srednyi Kuyalnik	Maly Kuyalnik	UA_R_12_M_1_Ca	4,68	river	UA_M5.8_0089	1	2	1	2	1
Black Sea	Srednyi Kuyalnik	Maly Kuyalnik	UA_R_12_M_1_Si	46,65	river	UA_M5.8_0090	2	2	1	2	1
Black Sea	Bolshoi Kuyalnik	Kuyalnik estuary	UA_R_12_S_1_Si	8,56	river	UA_M5.8_0091	1	2	1	2	2

River basin	Name of the SWB	Where the SWB flows into	Type of SWB	Length, km	Category of SWB	SWB code	Point sources	Diffuse sources	Hydromorphology	Risk of not achieving environmental objectives	
										good ecological status	good chemical status
Black Sea	Bolshoi Kuyalnik	Kuyalnik estuary	HMWB	5,01	HMWB	UA_M5.8_0092	1	2	3	3	1
Black Sea	Bolshoi Kuyalnik	Kuyalnik estuary	UA_R_12_M_1_Ca	30,57	river	UA_M5.8_0093	2	2	1	2	1
Black Sea	Bolshoi Kuyalnik	Kuyalnik estuary	UA_R_12_M_1_Si	19,08	river	UA_M5.8_0094	2	2	1	2	1
Black Sea	Bolshoi Kuyalnik	Kuyalnik estuary	HMWB	2,69	HMWB	UA_M5.8_0095	1	2	3	3	1
Black Sea	Bolshoi Kuyalnik	Kuyalnik estuary	UA_R_12_M_1_Si	41,24	river	UA_M5.8_0096	3	2	1	3	1
Black Sea	Bolshoi Kuyalnik	Kuyalnik estuary	HMWB	47,17	river	UA_M5.8_0097	2	2	3	3	2
Black Sea	Dry Zhuravka	Bolshoi Kuyalnik	UA_R_12_M_1_Si	0,76	river	UA_M5.8_0098	1	2	1	2	1
Black Sea	Dry Zhuravka	Bolshoi Kuyalnik	HMWB	2,05	HMWB	UA_M5.8_0099	1	2	3	3	1
Black Sea	Dry Zhuravka	Bolshoi Kuyalnik	UA_R_12_M_1_Si	12,11	river	UA_M5.8_0100	1	2	1	2	1
Black Sea	Dubovyi Yar	Bolshoi Kuyalnik	UA_R_12_S_1_Si	14,36	river	UA_M5.8_0101	1	2	1	2	1
Black Sea	Dubovyi Yar	Bolshoi Kuyalnik	UA_R_12_M_1_Si	7,63	river	UA_M5.8_0102	1	2	1	2	1
Black Sea	Koshkovka	Bolshoi Kuyalnik	UA_R_12_S_1_Si	20,28	river	UA_M5.8_0103	2	2	1	2	1
Black Sea	Koshkovka	Bolshoi Kuyalnik	UA_R_12_M_1_Si	25,64	river	UA_M5.8_0104	2	2	1	2	1
Black Sea	Koshkovka	Bolshoi Kuyalnik	UA_R_12_M_1_Si	2,22	river	UA_M5.8_0106	1	2	1	2	1
Black Sea	Б. Raikova	Koshkovka	UA_R_12_S_1_Si	15,67	river	UA_M5.8_0107	1	2	1	2	1
Black Sea	Б. Dry	Koshkovka	UA_R_12_S_1_Si	13,18	river	UA_M5.8_0108	1	2	1	2	1
Black Sea	Dovboka	Kuyalnik estuary	UA_R_12_S_1_Si	14,41	river	UA_M5.8_0109	1	2	1	2	1
Black Sea	Kubanka	Kuyalnik estuary	UA_R_12_S_1_Si	14,00	river	UA_M5.8_0110	1	2	1	2	1
Black Sea	Kubanka	Kuyalnik estuary	UA_R_12_M_1_Si	5,56	river	UA_M5.8_0111	1	2	1	2	1

River basin	Name of the SWB	Where the SWB flows into	Type of SWB	Length, km	Category of SWB	SWB code	Point sources	Diffuse sources	Hydromorphology	Risk of not achieving environmental objectives	
										good ecological status	good chemical status
Black Sea	Big Ajalyk	The Great Adzhalya Estuary	HMWB	14,38	HMWB	UA_M5.8_0112	1	2	3	3	1
Black Sea	Big Ajalyk	The Great Adzhalya Estuary	UA_R_12_M_1_Si	1,91	river	UA_M5.8_0113	1	2	1	2	1
Black Sea	Big Ajalyk	The Great Adzhalya Estuary	UA_R_12_M_1_Si	4,73	river	UA_M5.8_0115	1	2	1	2	1
Black Sea	Big Ajalyk	The Great Adzhalya Estuary	HMWB	2,26	HMWB	UA_M5.8_0116	1	2	3	3	1
Black Sea	Big Ajalyk	The Great Adzhalya Estuary	UA_R_12_M_1_Si	1,19	river	UA_M5.8_0117	1	2	1	2	1
Black Sea	Big Ajalyk	The Great Adzhalya Estuary	HMWB	1,49	HMWB	UA_M5.8_0118	1	2	3	3	1
Black Sea	Big Ajalyk	The Great Adzhalya Estuary	UA_R_12_M_1_Si	2,41	river	UA_M5.8_0119	1	2	1	2	1
Black Sea	Small Ajalyk	Adzhalitsky estuary	UA_R_12_S_1_Si	16,61	river	UA_M5.8_0120	2	2	1	2	1
Black Sea	Small Ajalyk	Adzhalitsky estuary	HMWB	5,70	HMWB	UA_M5.8_0121	2	2	3	3	1
Black Sea	Small Ajalyk	Adzhalitsky estuary	UA_R_12_M_1_Si	1,67	river	UA_M5.8_0123	1	2	1	2	1
Black Sea	B. Wide	Small Ajalyk	UA_R_12_S_1_Si	12,89	river	UA_M5.8_0124	1	2	1	2	1
Black Sea	Kodintsovka	Small Ajalyk	UA_R_12_S_1_Si	4,70	river	UA_M5.8_0125	1	2	1	2	1
Black Sea	Kodintsovka	Small Ajalyk	HMWB	1,25	HMWB	UA_M5.8_0126	1	2	3	3	1
Black Sea	Kodintsovka	Small Ajalyk	UA_R_12_S_1_Si	8,43	river	UA_M5.8_0127	2	2	1	2	1
Black Sea	Balaychuk	Tiligul estuary	UA_R_12_S_1_Si	8,88	river	UA_M5.8_0128	1	2	1	2	1
Black Sea	Balaychuk	Tiligul estuary	UA_R_12_M_1_Si	50,34	river	UA_M5.8_0129	3	2	1	3	1

River basin	Name of the SWB	Where the SWB flows into	Type of SWB	Length, km	Category of SWB	SWB code	Point sources	Diffuse sources	Hydromorphology	Risk of not achieving environmental objectives	
										good ecological status	good chemical status
Black Sea	B. Gola Chudska	Balaychuk	UA_R_12_S_1_Si	15,01	river	UA_M5.8_0130	1	2	1	2	1
Black Sea	B. Balaychuk	Balaychuk	UA_R_12_S_1_Si	17,75	river	UA_M5.8_0131	2	2	1	2	1
Black Sea	Б. Stara Donskaya	Tiligul estuary	UA_R_12_S_1_Si	15,40	river	UA_M5.8_0132	1	2	1	2	1
Black Sea	Tiligul	Tiligul estuary	UA_R_12_S_1_Ca	9,49	river	UA_M5.8_0133	1	2	1	2	1
Black Sea	Tiligul	Tiligul estuary	UA_R_12_M_1_Ca	11,29	river	UA_M5.8_0134	1	2	1	2	1
Black Sea	Tiligul	Tiligul estuary	HMWB	1,46	HMWB	UA_M5.8_0135	1	2	3	3	1
Black Sea	Tiligul	Tiligul estuary	UA_R_12_M_1_Ca	16,12	river	UA_M5.8_0136	3	2	1	3	1
Black Sea	Tiligul	Tiligul estuary	UA_R_12_M_1_Si	23,50	river	UA_M5.8_0137	2	2	1	2	1
Black Sea	Tiligul	Tiligul estuary	UA_R_12_L_1_Si	107,15	river	UA_M5.8_0138	3	2	1	3	2
Black Sea	Lipetsk	Tiligul	UA_R_12_S_1_Ca	1,79	river	UA_M5.8_0139	1	2	1	2	1
Black Sea	Lipetsk	Tiligul	HMWB	1,02	HMWB	UA_M5.8_0140	1	2	3	3	1
Black Sea	Lipetsk	Tiligul	UA_R_12_S_1_Ca	12,27	river	UA_M5.8_0141	2	2	1	2	2
Black Sea	Lipetsk	Tiligul	UA_R_12_M_1_Ca	18,18	river	UA_M5.8_0142	3	2	1	3	1
Black Sea	Melanka	Tiligul	UA_R_12_S_1_Si	14,35	river	UA_M5.8_0143	1	2	1	2	1
Black Sea	Melanka	Tiligul	HMWB	14,42	HMWB	UA_M5.8_0144	2	2	3	3	1
Black Sea	Б. Zaplazy	Melanka	UA_R_12_S_1_Si	15,74	river	UA_M5.8_0145	1	2	1	2	1
Black Sea	B. Kozachyi Yar	Melanka	UA_R_12_S_1_Si	12,64	river	UA_M5.8_0146	1	2	1	2	1
Black Sea	B. Kozachyi Yar	Melanka	HMWB	1,26	HMWB	UA_M5.8_0147	1	2	3	3	1
Black Sea	B. Kozachyi Yar	Melanka	UA_R_12_S_1_Si	2,56	river	UA_M5.8_0148	1	2	1	2	1
Black Sea	Crane	Tiligul	HMWB	5,23	HMWB	UA_M5.8_0149	1	2	3	3	1
Black Sea	Crane	Tiligul	UA_R_12_M_1_Ca	3,07	river	UA_M5.8_0150	1	2	1	2	1
Black Sea	Crane	Tiligul	HMWB	1,46	HMWB	UA_M5.8_0151	1	2	3	3	1
Black Sea	Crane	Tiligul	UA_R_12_M_1_Ca	5,84	river	UA_M5.8_0152	1	2	1	2	1
Black Sea	Crane	Tiligul	UA_R_12_M_1_Si	2,36	river	UA_M5.8_0153	1	2	1	2	1

River basin	Name of the SWB	Where the SWB flows into	Type of SWB	Length, km	Category of SWB	SWB code	Point sources	Diffuse sources	Hydromorphology	Risk of not achieving environmental objectives	
										good ecological status	good chemical status
Black Sea	Crane	Tiligul	HMWB	1,65	HMWB	UA_M5.8_0154	1	2	3	3	1
Black Sea	Crane	Tiligul	UA_R_12_M_1_Si	2,85	river	UA_M5.8_0155	1	2	1	2	1
Black Sea	Crane	Tiligul	HMWB	1,55	HMWB	UA_M5.8_0156	1	2	3	3	1
Black Sea	Crane	Tiligul	UA_R_12_M_1_Si	51,61	river	UA_M5.8_0157	2	2	1	2	1
Black Sea	Oak	Tiligul	UA_R_12_S_1_Si	16,75	river	UA_M5.8_0158	1	1	1	1	1
Black Sea	Oak	Tiligul	UA_R_12_M_1_Si	15,34	river	UA_M5.8_0159	1	2	1	2	1
Black Sea	Blind woman	Tiligul	UA_R_12_S_1_Si	12,46	river	UA_M5.8_0160	1	2	1	2	1
Black Sea	Blind woman	Tiligul	UA_R_12_M_1_Si	12,01	river	UA_M5.8_0161	1	2	1	2	1
Black Sea	Б. Blind	Blind woman	UA_R_12_S_1_Si	22,87	river	UA_M5.8_0162	1	2	1	2	1
Black Sea	Untitled	Tiligul	UA_R_12_S_1_Si	13,57	river	UA_M5.8_0163	1	2	1	2	1
Black Sea	Tartakai	Tiligul	UA_R_12_S_1_Si	11,53	river	UA_M5.8_0164	1	2	1	2	1
Black Sea	Tartakai	Tiligul	UA_R_12_M_1_Si	13,90	river	UA_M5.8_0165	3	2	1	3	1
Black Sea	B. Cologlia	Tiligul	UA_R_12_S_1_Si	15,27	river	UA_M5.8_0166	3	2	1	3	1
Black Sea	Б. Herds	Tiligul estuary	UA_R_12_S_1_Si	16,45	river	UA_M5.8_0167	1	2	1	2	1
Black Sea	Tsarega	Tiligul estuary	UA_R_12_S_1_Si	10,38	river	UA_M5.8_0168	1	2	1	2	1
Black Sea	Tsarega	Tiligul estuary	UA_R_12_M_1_Si	37,20	river	UA_M5.8_0169	1	2	1	2	1
Black Sea	B. Tsaregol	Tsarega	UA_R_12_S_1_Si	13,00	river	UA_M5.8_0170	1	2	1	2	1
Black Sea	B. Tsaregol	Tsarega	HMWB	1,81	HMWB	UA_M5.8_0171	1	2	3	3	1
Black Sea	B. Tsaregol	Tsarega	UA_R_12_M_1_Si	2,06	river	UA_M5.8_0172	1	2	1	2	1
Black Sea	Sosik	Berezansky estuary	UA_R_12_S_1_Si	16,62	river	UA_M5.8_0173	1	2	1	2	1
Black Sea	Sosik	Berezansky estuary	UA_R_12_M_1_Si	14,40	river	UA_M5.8_0174	1	2	1	2	1
Black Sea	Sosik	Berezansky estuary	HMWB	3,17	HMWB	UA_M5.8_0175	1	2	3	3	1
Black Sea	Sosik	Berezansky estuary	UA_R_12_M_1_Si	25,15	river	UA_M5.8_0176	1	2	1	2	1
Black Sea	Berezan	Berezansky estuary	UA_R_12_S_1_Si	2,33	river	UA_M5.8_0177	1	2	1	2	1
Black Sea	Berezan	Berezansky estuary	UA_R_12_S_1_Si	8,26	river	UA_M5.8_0179	1	2	1	2	1

River basin	Name of the SWB	Where the SWB flows into	Type of SWB	Length, km	Category of SWB	SWB code	Point sources	Diffuse sources	Hydromorphology	Risk of not achieving environmental objectives	
										good ecological status	good chemical status
Black Sea	Berezan	Berezansky estuary	UA_R_12_M_1_Si	4,76	river	UA_M5.8_0180	1	2	1	2	1
Black Sea	Berezan	Berezansky estuary	UA_R_12_M_1_Si	4,97	river	UA_M5.8_0182	1	2	1	2	1
Black Sea	Berezan	Berezansky estuary	HMWB	2,01	HMWB	UA_M5.8_0183	1	2	3	3	1
Black Sea	Berezan	Berezansky estuary	UA_R_12_M_1_Si	3,68	river	UA_M5.8_0184	1	2	1	2	1
Black Sea	Berezan	Berezansky estuary	UA_R_12_M_1_Si	10,08	river	UA_M5.8_0186	1	2	1	2	1
Black Sea	B. Lysych	Berezan	UA_R_12_S_1_Si	3,56	river	UA_M5.8_0189	2	2	1	2	1
Black Sea	B. Lysych	Berezan	UA_R_12_M_1_Si	3,00	river	UA_M5.8_0190	1	2	1	2	1
Black Sea	B. Lysych	Berezan	UA_R_12_M_1_Si	7,99	river	UA_M5.8_0192	1	2	1	2	1
Black Sea	B. Lysych	Berezan	HMWB	1,64	HMWB	UA_M5.8_0193	1	2	3	3	1
Black Sea	B. Lysych	Berezan	UA_R_12_M_1_Si	7,16	river	UA_M5.8_0194	1	2	1	2	1
Black Sea	Kalanchak	Kalanchak Bay	UA_R_12_S_1_Si	1,04	river	UA_M5.8_0195	1	1	1	1	1
Black Sea	Kalanchak	Kalanchak Bay	UA_R_12_M_1_Si	30,21	river	UA_M5.8_0196	3	1	1	3	1
Black Sea	Kakhovka main canal		AWB	57,83	SHMPV	UA_M5.8_0197	1	1	3	3	1
Black Sea	Chaplinsky Canal		AWB	46,90	SHMPV	UA_M5.8_0198	1	1	3	3	1
Black Sea	North Crimean Canal		AWB	57,77	SHMPV	UA_M5.8_0199	1	2	3	3	1
Black Sea	Alexandrovsky Canal		AWB	101,97	SHMPV	UA_M5.8_0200	1	2	3	3	1

Polygonal SWBs

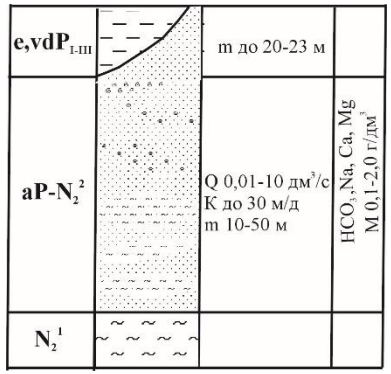
Name of the SWB	Type of SWB	Area, km2	Category of SWB	SWB code	Point sources	Diffuse sources	Hydromorphology	Risk of not achieving environmental objectives	
								good ecological status	good chemical status
Vedenskoye reservoir	HMWB	0,79	HMWB	UA_M5.8_0031	1	1	3	3	1
Kagachskoye reservoir	HMWB	1,05	HMWB	UA_M5.8_0034	1	1	3	3	1
Pharaoh's Reservoir	HMWB	0,47	HMWB	UA_M5.8_0044	1	1	3	3	1
Plakhtiyivske Reservoir	HMWB	0,515	HMWB	UA_M5.8_0047	1	1	3	1	1
Russko-Ivanovo reservoir	HMWB	0,48	HMWB	UA_M5.8_0051	1	1	3	3	1
Khadjider reservoir	HMWB	4,1	HMWB	UA_M5.8_0054	1	1	3	3	1
Starotsarychanske reservoir	HMWB	0,618	HMWB	UA_M5.8_0057	1	1	3	3	1
Karnalievo reservoir	HMWB	0,51	HMWB	UA_M5.8_0065	1	1	3	3	1
Monash Reservoir	HMWB	0,859	HMWB	UA_M5.8_0067	1	1	3	3	1
Solone Lake	UA_L_12_M_SH_1_Si	3,34	lake	UA_M5.8_0069	1	1	1	1	1
Baraboyskoye reservoir	HMWB	2,31	HMWB	UA_M5.8_0072	1	1	3	3	1
Yegorivske Reservoir	HMWB	2,3	HMWB	UA_M5.8_0077	1	1	3	3	1
Chervonoznamenskoye reservoir	HMWB	2,95	HMWB	UA_M5.8_0082	1	1	3	3	1
Severynivske Reservoir	HMWB	0,94	HMWB	UA_M5.8_0105	1	1	3	3	1
Blessed reservoir	HMWB	0,16	HMWB	UA_M5.8_0114	1	1	3	3	1
Pryportovske reservoir	HMWB	0,85	HMWB	UA_M5.8_0122	1	1	3	3	1
Katerynivka Reservoir	HMWB	2,25	HMWB	UA_M5.8_0178	1	1	3	3	1
Stepovske Reservoir	HMWB	2,28	HMWB	UA_M5.8_0181	1	1	3	3	1
Danilovskoye reservoir	HMWB	0,81	HMWB	UA_M5.8_0185	1	1	3	3	1
Nechayanske reservoir	HMWB	3,12	HMWB	UA_M5.8_0187	1	1	3	3	1
Sukhodolsk reservoir	HMWB	2,56	HMWB	UA_M5.8_0188	1	1	3	3	1
Shyrokolanivske reservoir	HMWB	0,79	HMWB	UA_M5.8_0191	1	1	3	3	1
Oleksandrivske Reservoir	HMWB	1,18	HMWB	UA_M5.8_0201	1	1	3	3	1
Tsybulivske reservoir	HMWB	0,16	HMWB	UA_M5.8_0202	1	1	3	3	1
Lake Magalivske	UA_L_12_M_SH_1_Si	1,06	lake	UA_M5.8_0206	1	1	1	1	1
Lake Buduri estuary	UA_L_12_M_SH_1_Si	2,73	lake	UA_M5.8_0208	1	1	1	1	1
Lake Sasyk (Kunduk)	UA_TW_M5_O_C	205,39	Transitional waters	UA_M5.8_0203	1	2	3	3	2
Lake Dzhantsheyskoye	UA_TW_M5_P_O	10,77	Transitional waters	UA_M5.8_0204	1	1	1	1	1
Maly Sasyk Lake	UA_TW_M5_P_O	2,9	Transitional waters	UA_M5.8_0205	2	2	3	3	1

Name of the SWB	Type of SWB	Area, km2	Category of SWB	SWB code	Point sources	Diffuse sources	Hydromorphology	Risk of not achieving environmental objectives	
								good ecological status	good chemical status
Lake Shagany	UA_TW_M5_P_O	72,06	Transitional waters	UA_M5.8_0207	1	1	1	1	2
Lake Karachaus	UA_TW_M5_P_O	12,46	Transitional waters	UA_M5.8_0209	1	1	1	1	1
Lake Alibey	UA_TW_M5_E_O	80,57	Transitional waters	UA_M5.8_0210	1	1	1	1	1
Lake Hadjider	UA_TW_M5_P_O	11,96	Transitional waters	UA_M5.8_0211	2	2	1	2	2
Lake Kurudiyol	UA_TW_M5_P_O	5,02	Transitional waters	UA_M5.8_0212	1	1	1	1	1
Lake Burnas	UA_TW_M5_M_O	23,17	Transitional waters	UA_M5.8_0213	2	1	1	2	1
Buda estuary	UA_TW_M5_M_O	29,09	Transitional waters	UA_M5.8_0214	2	1	1	2	1
Dry estuary	UA_TW_M5_M_O	7,82	Transitional waters	UA_M5.8_0215	3	1	1	3	1
Khadzhibey estuary	UA_TW_M5_M_C	109,3	Transitional waters	UA_M5.8_0216	3	2	3	3	1
Kuyalnik estuary	UA_TW_M5_E_O	62,74	Transitional waters	UA_M5.8_0217	2	2	3	3	1
The Great Adzhalya Estuary	UA_TW_M5_P_O	5,38	Transitional waters	UA_M5.8_0218	2	2	1	2	1
Adzhalitsky estuary	UA_TW_M5_M_O	8,23	Transitional waters	UA_M5.8_0219	3	2	3	3	1
Tiligul estuary	UA_TW_M5_M_O	140,26	Transitional waters	UA_M5.8_0220	2	2	1	2	1
Tuzla pond	UA_TW_M5_E_C	0,118	Transitional waters	UA_M5.8_0221	1	1	1	1	1
Berezansky estuary	UA_TW_M5_M_O	60,0	Transitional waters	UA_M5.8_0222	3	2	1	3	1
Black Sea region	UA_CW_M5_M_SH_S_SS	246,24	Coastal waters	UA_M5.8_0223	1	2	1	2	1
Black Sea region	UA_CW_M5_M_SH_S_S	62,82	Coastal waters	UA_M5.8_0224	1	2	1	2	1
Black Sea region	UA_CW_M5_M_SH_S_SS	83,66	Coastal waters	UA_M5.8_0225	3	3	1	3	2

Name of the SWB	Type of SWB	Area, km2	Category of SWB	SWB code	Point sources	Diffuse sources	Hydromorphology	Risk of not achieving environmental objectives	
								good ecological status	good chemical status
Black Sea region	UA_CW_M5_M_EX_S_CS	54,165	Coastal waters	UA_M5.8_0226	3	3	1	3	2
Black Sea region	UA_CW_M5_M_SH_S_SS	469,94	Coastal waters	UA_M5.8_0227	3	3	1	3	2
Black Sea region	UA_CW_M5_M_EX_S_SS	935,4	Coastal waters	UA_M5.8_0228	1	1	1	1	1
Black Sea region	UA_CW_M5_M_SH_S_SS	206,14	Coastal waters	UA_M5.8_0229	1	1	1	1	1
Black Sea region	UA_CW_M5_M_EX_S_SS	1713,37	Coastal waters	UA_M5.8_0230	3	2	1	3	2
Black Sea region	UA_CW_M5_M_SH_S_S	909,93	Coastal waters	UA_M5.8_0231	1	1	1	1	1

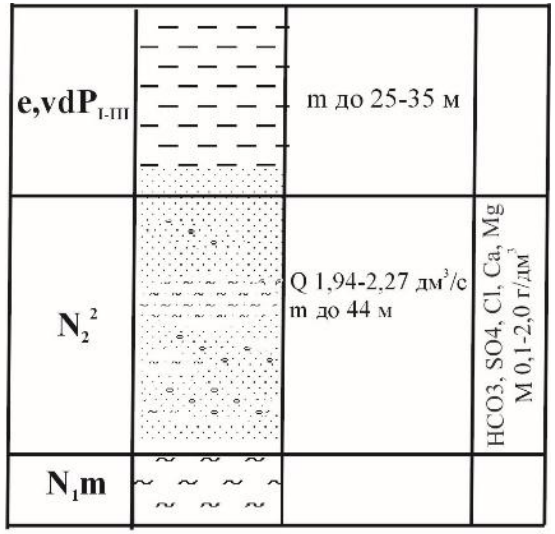
Annex 1 Characteristics of the identified GWBs and groups of GWBs in the Black Sea RBD

Table 1: Characteristics of the GWB in alluvial Pleistocene - Upper Pliocene sediments (code UAM5800N100)

Parameters	Aquifer in alluvial Pleistocene-Upper Pliocene sediments	Lithological and hydrogeological column
Groundwater massif code	UAM5800N100	
Name of the groundwater body	Alluvial Pleistocene-Upper Pliocene	
Area of distribution, km2	5694	
Geological index	aP-N22	
Lithology	Sands with inclusions of gravel and pebbles, sandy loam, loamy loam layers, rarely sandstones and siltstones in the form of lenses and layers in the lower part.	
Groundwater or pressure water	It is non-pressurised, and in the south-western part it is slightly pressurised.	
Composition of the overlying sediments	Loess-like loam, soil layer	
Aquifer thickness, m: Min, Max, Average	From 10-20 to 50	
Filtration coefficient, K, m/d. Min, Max, Average	From hundredths to 30	
Water supply coefficient, Km, m2/d. Min, Max, Average		
Groundwater level, m, Min, Max, Average for the observation period	From 0.5-5 to 25-50	
Annual amplitude of level fluctuations, m	0,2-0,6	
Water withdrawal >10 m3/d: yes/no	Yes	
Number of production wells (water intakes)	25 wells (19 of them are drainage wells)	
Used for drinking, agricultural or industrial water supply	Domestic, drinking and agricultural water supply. 1 drinking water deposit has been explored	
Flow rate of wells or sources, dm3/s	Wells - from 0.01-0.2 to 0.5-10	
Chemical composition (main cations and anions)	Mineralisation 0.1 - 2.0, predominantly 0.5-1.5 g/dm3 (HCO3, Na, Ca, Mg)	
Main power supply	Infiltration of precipitation, water from the Dnipro River, in the coastal zone - inflow of surface water from estuaries and the sea, filtration losses from irrigation canals and infiltration of irrigation water	
Relationship with surface water	With the waters of the Dnipro River and estuaries, canals and reservoirs	
Trend of level change (decreasing-increasing)	Natural fluctuations depending on the amount of precipitation; lowering of the level in areas of intensive groundwater exploitation, increasing of the level in the flood zone	
The predominant type of human activity over the object	Groundwater extraction for water supply	

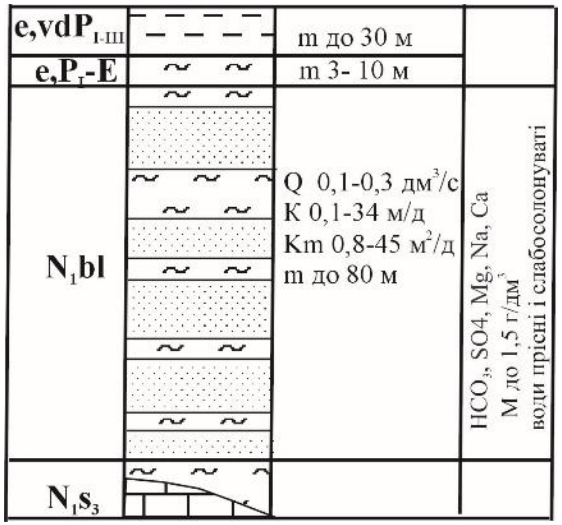
Chemical state	Good	
Quantitative state	Good	
Reliability of information (high/low)	High	
Annual precipitation, mm, long-term average	By weather stations: Nova Kakhovka - 441, Kherson - 446, Bekhtery - 431, Askania Nova - 392, Khorly - 388	

Table 2: Characteristics of the MWP in alluvial Upper Pliocene sediments (massif code UAM5800N200)

Parameters.	Aquifer in alluvial Upper Pliocene sediments	Lithological and hydrogeological column
Groundwater massif code	UAM5800N200	
Name of the groundwater body	Alluvial Upper Pliocene	
Area of distribution, km2	851,7	
Geological index	N22	
Lithology	The sands are multigrained with inclusions of gravel and pebbles and sandy loam layers.	
Groundwater or pressure water	Pressurised and non-pressurised	
Composition of the overlying sediments	Loess-like loam	
Aquifer thickness, m: Min, Max, Average	From 2 to 44, typical 15-20	
Filtration coefficient, K, m/d. Min, Max, Average	9-37	
Water supply coefficient, Km, m2/d. Min, Max, Average	110-1400	
Groundwater level, m, Min, Max, Average for the observation period	34-38	
Annual amplitude of level fluctuations, m	0,4	
Water withdrawal >10 m3/d: yes/no	Yes	
Number of production wells	32 wells (3 water intakes)	
Used for drinking, agricultural or industrial water supply	Domestic, drinking and agricultural water supply, including centralised water supply. 1 drinking water deposit has been explored	
Flow rate of wells or sources, dm3/s	1,94-2,27	
Chemical composition (main cations and anions)	Mineralisation 0.3-1.3 g/dm3 (HCO3, SO4, Cl, Ca, Mg)	
Main power supply	Infiltration of atmospheric precipitation, and in the coastal zone - inflow of surface waters of the estuary during floods and the sea.	
Relationship with surface water	With the waters of the estuary and the sea	

Trend of level change (decreasing-increasing)	Natural fluctuations depending on the amount of precipitation; lower levels in areas of intensive groundwater exploitation	
The predominant type of human activity over the object	Groundwater extraction for water supply.	
Chemical state	Good	
Quantitative state	Good	
Reliability of information (high low)	High	
Annual precipitation, mm, long-term average	By weather stations: Odesa - 425 Sarata - 475 Bolgrad - 312	

Table 3: Characteristics of the MWP in the Baltic sediments (array code UAM5800N300)

Parameters.	Aquifer in Baltic sediments	Lithological and hydrogeological column
Groundwater massif code	UAM5800N300	
Name of the groundwater body	Baltsky	
Area of distribution, km2	2835	
Geological index	N1bl	
Lithology	Interlayering of sandy clays, siltstones, sands with inclusion of gravel and pebbles, rarely sandstones and limestones in the form of lenses, layers and even thicknesses	
Groundwater or pressure water	Mostly non-pressure	
Composition of the overlying sediments	Clays, loams	
Aquifer thickness, m Min, Max, Average	Total 30-80, thickness of aquifers ranges from 1-2 to 25-35	
Filtration coefficient, K, m/d. Min, Max, Average	From 0.1 to 34, mostly 0.15-2.5	
Water supply coefficient, Km, m2/d. Min, Max, Average	From 0.8 to 45, 2 to 9 prevail	
Groundwater level, m, Min, Max, Average for the observation period	In watersheds, it is 18-70, on slopes - 0-16.5	
Annual amplitude of level fluctuations, m		
Water withdrawal >10 m3/d: yes/no	Yes	
Number of production wells	7 mine wells	
Used for drinking, agricultural or industrial water supply	Domestic drinking and agricultural water supply.	
Flow rate of wells or sources, dm3/s	Springs, wells - prevail 0.1-0.3, rarely more	

Chemical composition (main cations and anions)	Mineralisation 0.4-0.9 g/dm3 (HCO3, Mg, Ca), up to 1.5 g/dm3 (SO4, Cl, HCO3, Mg, Na) in the south	
Main power supply	Infiltration of precipitation and surface water, flows from adjacent horizons.	
Relationship with surface water	Undecided	
Trend of level change (decreasing-increasing)	Natural fluctuations depending on the amount of precipitation.	
Prevalence of human activity over the object	Groundwater extraction for water supply	
Chemical state	Good. Spot pollution by nitrogen compounds	
Quantitative state	Good	
Reliability of information (high low)	High	
Annual precipitation, mm, long-term average	By weather stations: Lyubashivka - 504 Lull - 504	

Table 4. Characteristics of the MWP in the Upper Miocene sediments (code UAM5800N400).

Parameters.	Aquifer in Upper Miocene sediments	Lithological and hydrogeological column
Groundwater massif code	UAM5800N400	
Name of the groundwater body	Upper Miocene	
Area of distribution, km2	5980	
Geological index	N1 p+m+s	
Lithology	Limestone is organogenic, oolitic with low-thick layers of marl, sand and clay	
Groundwater or pressure water	Mostly pressure	
Composition of the overlying sediments	Pliocene clays	
Aquifer thickness, m Min, Max, Average	From 35-100 in the eastern part of the massif, to 140-176 in the south-western part	
Filtration coefficient, K, m/d. Min, Max, Average	Limestone - 25-600, predominantly 120-250	
Water supply coefficient, Km, m2/d. Min, Max, Average	From 700 to 10900, 1200-3600 prevail	
Groundwater level, m, Min, Max, Average for the observation period	Depending on the terrain - at depths from 0.4-0.9 to 30-41.7	
Annual amplitude of level fluctuations, m	0,5-1	
Water withdrawal >10 m3/d: yes/no	Yes	
Number of production wells	341 wells (217 water intakes)	

Used for drinking, agricultural or industrial water supply	Centralised domestic, drinking and agricultural water supply. 6 fields have been explored.
Flow rate of wells or sources, dm3/s	Wells - from 3.3-11.5 to 24-53
Chemical composition (main cations and anions)	Mineralisation up to 1 g/dm3 (HCO3, Cl, Ca, Na). In the north-eastern part of the massif, mineralisation is up to 1.5 g/dm3 and more (Cl, SO4, Na, Mg)
Main power supply	Infiltration of precipitation, flows from adjacent horizons, and feeding from the Kakhovka reservoir and the Dnipro River.
Relationship with surface water	Water of the Dnipro River and Kakhovka Reservoir
Trend of level change (decreasing-increasing)	Natural fluctuations depending on the amount of precipitation; lower levels in areas of intensive groundwater exploitation
Prevalence of human activity over the object	Groundwater extraction for water supply
Chemical state	Good
Quantitative state	Good
Reliability of information (high/low)	High
Annual precipitation, mm, long-term average	By weather stations: Nova Kakhovka - 441 Kherson - 446 Bechteri - 431 Askania Nova - 392 Horlicks - 388

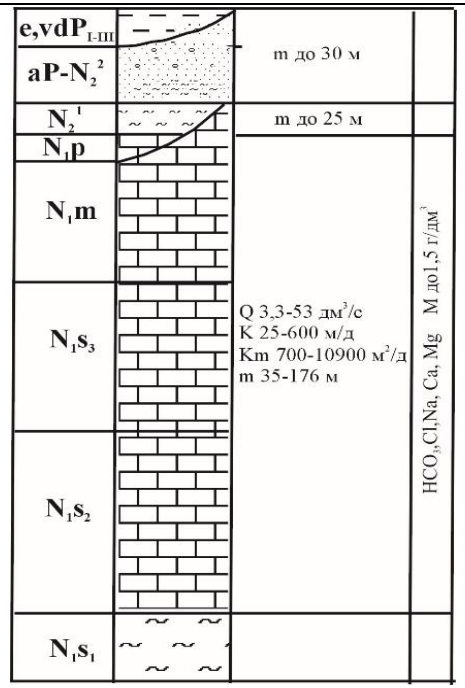


Table 5. Characteristics of the MMPs in Upper Sarmatian sediments (code UAM5800N500)

Parameters.	Aquifer in Upper Sarmatian sediments	Lithological and hydrogeological column
Groundwater massif code	UAM5800N500	
Name of the groundwater body	Upper Sarmatian	
Area of distribution, km2	16478	
Geological index	N1s3	
Lithology	Layers of limestone, sandstone, sand, siltstone, which are isolated from each other by layers of clay	
Groundwater or pressure water	Pressure	
Composition of the overlying sediments	Sediments are overlain by single-age clays and meiosis clays	
Aquifer thickness, m Min, Max, Average	The thickness of the layers is from 0.4-0.8 to 6.5-15, rarely more, the total thickness is from 1 to 65	
Filtration coefficient, K, m/d. Min, Max, Average	Limestone prevails 5-10, rarely more, sands up to 5.5	

Water supply coefficient, Km, m2/d. Min, Max, Average	Sands up to 10, limestones - 10-25, rarely more
Groundwater level, m, Min, Max, Average for the observation period	Depending on the terrain - at depths from 2.5 to 90-100
Annual amplitude of level fluctuations, m	Fluctuations depending on water withdrawal; lower levels in areas of intensive groundwater exploitation
Water withdrawal >10 m3/d: yes/no	Yes
Number of production wells	912 wells (560 water intakes)
Used for drinking, agricultural or industrial water supply	Domestic drinking and agricultural water supply. 6 drinking water deposits and 8 mineral water deposits have been explored
Flow rate of wells or sources, dm3/s	Wells - 0.1-10, rarely more
Chemical composition (main cations and anions)	Mineralisation 0.7-1.5 g/dm3 (HCO3 SO4 Cl Ca Na Mg); in the southern part of the massif 1.5-3.8 g/dm3 (Cl Na)
Main power supply	Infiltration of precipitation and surface water in shallow areas, feeding from adjacent aquifers
Relationship with surface water	No.
Trend of level change (decreasing-increasing)	Fluctuations depending on water withdrawal; lower levels in areas of intensive groundwater exploitation
Prevalence of human activity over the object	Groundwater extraction for water supply. Explored 6 deposits of drinking water and 8 deposits of mineral water
Chemical state	Good
Quantitative state	Good
Reliability of information (high/low)	High
Annual precipitation, mm, long-term average	By weather stations: Zatyshche - 504, Serbka - 423 Berezanka - 414, Rozdilna - 509, Ochakiv - 420, Odesa - 508, Sarata - 491

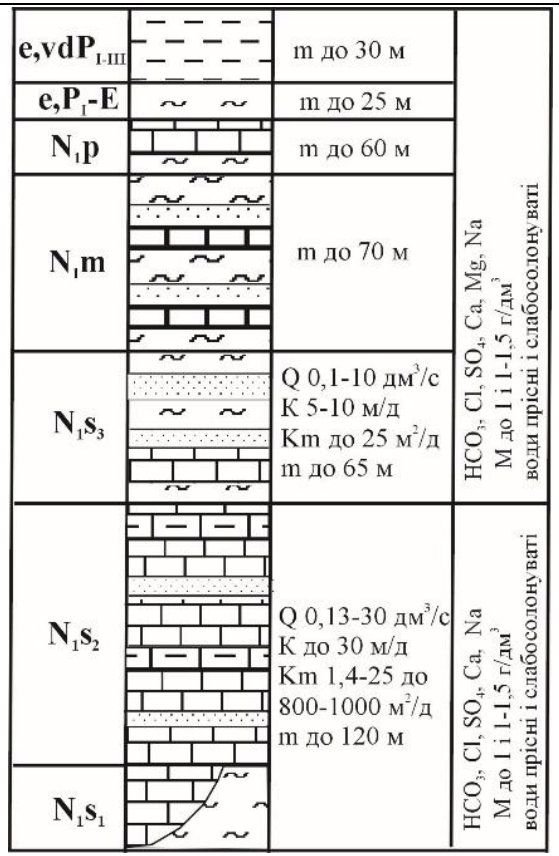
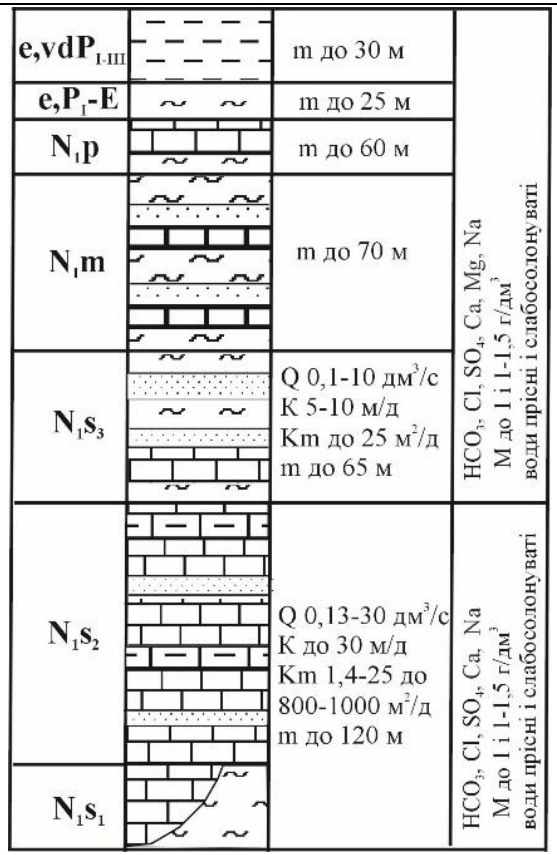


Table 6. Characteristics of MMPs in Middle Sarmatian sediments (code UAM5800N600)

Parameters.	Aquifer in Middle Sarmatian sediments	Lithological and hydrogeological column
Groundwater massif code	UAM5800N600	
Name of the groundwater body	Middle Sarmatian	
Area of distribution, km2	20990	
Geological index	N1s2	
Lithology	Mostly limestone, with interbeds and lenses of marl, sand, siltstone	

Groundwater or pressure water	Pressure
Composition of the overlying sediments	Clays of the Uniformitarian and Upper Sarmatian
Aquifer thickness, m: Min, Max, Average	From a few metres to 120
Filtration coefficient, K, m/d. Min, Max, Average	Limestone - 1.5-10, less often up to 30 or more
Water supply coefficient, Km, m2/d. Min, Max, Average	From 1.4 to 25 in watersheds to 800-1000 in river valleys
Groundwater level, m, Min, Max, Average for the observation period	Depending on the terrain - at depths from 20 to 150
Annual amplitude of level fluctuations, m	0,5-1
Water withdrawal >10 m3/d: yes/no	Yes
Number of production wells	562 wells (335 water intakes)
Used for drinking, agricultural or industrial water supply	Domestic drinking and agricultural water supply. 8 drinking water and 2 mineral water deposits have been explored
Flow rate of wells or sources, dm3/s	Wells - from 0.13-8.0 to 30, rarely more, predominant1-5, springs - 0.1-1.4
Chemical composition (main cations and anions)	Mineralisation 0.5-1 g/dm3 (HCO3, Cl, Ca, Mg); mineralisation up to 1.5 g/dm3 (HCO3, Cl, SO4, Ca, Na). In the southern part of the massif, mineralisation is over 3 g/dm3 (Cl, Na)
Main power supply	Infiltration of precipitation
Relationship with surface water	No.
Trend of level change (decreasing-increasing)	Stable
Prevalence of human activity over the object	Groundwater extraction for water supply
Chemical state	Good
Quantitative state	Good
Reliability of information (high low)	High
Annual precipitation, mm, long-term average	By weather stations: Lyubashivka - 504, Zatyshshya - 504, Serbka - 423, Berezanka - 414, Rozdilna - 509, Ochakiv - 420, Odesa - 508, Sarata - 491



Annex 2 List of cases of destruction, stoppages, and disruptions of the technological process of enterprises in the Black Sea RBD

№	Date	Object name	Object type	A hazardous substance that has become a pollutant	Sphere of influence	Type of case	Length	Latitude	Settlement	Territorial community	District	Area.
1	26.02.2022	The dam of the North Crimean Canal	Hydraulic structures	Not defined	Environment + Population	Destruction of infrastructure	46.20	33.45	Gavrilovka Druha	Kalanchatska	Skadovsky	Kherson
2	21.07.2023	An agricultural enterprise in Pavlivka village	Crop production	pesticides	Environment + Population	Destruction of infrastructure	45.96	29.47	Pavlivka	Pavlovska	Bolgradsky	Odesa
3	23.07.2023	Odesa garment factory	Textile production	Not defined	Environment + Population	Destruction of infrastructure	46.49	30.73	Odesa	Odesa	Odesa	Odesa

Annex 3 List of Emerald Network sites within the Black Sea RBD

№	River basin	Name of the territory	Code	Area, km2
1	Black Sea region	Askania-Nova Biosphere Reserve	UA0000016	333.927
2	Black Sea region	Black Sea Biosphere Reserve	UA0000017	1158.473
3	Black Sea region	Danube Biosphere Reserve	UA0000018	38.105
4	Black Sea region	Sviatoslav's White Coast National Nature Park	UA0000097	352.306
5	Black Sea region	Dzharylgach National Nature Park	UA0000108	100.178
6	Black Sea region	Tarutino steppe	UA0000137	61.640
7	Black Sea region	Tiligul estuary	UA0000138	232.305
8	Black Sea region	Tuzly Estuaries National Nature Park	UA0000140	277.389
9	Black Sea region	Kuyalnik Estuary National Nature Park	UA0000143	84.323
10	Black Sea region	Sasyk estuary	UA0000151	189.514
11	Black Sea region	Bessarabian Colchicum	UA0000158	33.790
12	Black Sea region	Domuzla	UA0000193	16.399
13	Black Sea region	Tuzla	UA0000206	13.566
14	Black Sea region	Berezansky estuary	UA0000207	88.234
15	Black Sea region	Zatoka	UA0000214	1050.805
16	Black Sea region	Kinburn Spit	UA0000215	465.802
17	Black Sea region	Khadzhibey estuary	UA0000222	32.827
18	Black Sea region	Ochakovsky	UA0000253	4.739
19	Black Sea region	Svetlogorsk-Altestovsky streams	UA0000308	26.959
20	Black Sea region	Dniester estuary	UA0000350	1.982

№	River basin	Name of the territory	Code	Area, km2
21	Black Sea region	Barnashivske tract	UA0000367	7.380
22	Black Sea region	Black Valley	UA0000368	4.944
23	Black Sea region	Green tract	UA0000370	15.811
24	Black Sea region	Small Chapel tract	UA0000372	10.232
25	Black Sea region	Gulf of Karkinit	UA0000398	1184.695
26	Black Sea region	Sosyk River Valley	UA0000457	53.436
27	Black Sea region	Tiligul steppes	UA0000458	457.055
28	Black Sea region	Berezan-Soloninskaya steppe	UA0000571	225.862
29	Black Sea region	Chilliguide	UA0000576	60.431
30	Black Sea region	Hadjider-Alkali	UA0000577	82.532
31	Black Sea region	Sarata	UA0000578	131.067
32	Black Sea region	Chaga	UA0000594	121.701
33	Black Sea region	Kogilnik	UA0000595	63.697

Annex 4 List of places of recreation and leisure within the Black Sea RBD

In the Black Sea river basin, due to martial law, no recreation and leisure areas were allocated in 2022-2023.

Annex 5 List of surface water monitoring sites in the Azov Sea RBD

№	SWB code	Name of the SWB	Name of the monitoring point	Code of the monitoring point	Geographical coordinates		Category of SWB	Type of SWB
					Longitude	Latitude		
Diagnostic monitoring								
1	UA_M5.8_0001	Kogilnik	131 km, village. Serpneve, border with the Republic of Moldova	UA_M5.8_0001_01	29°0'51,7 "E	46°17'46,2 "N	HMWB	no
2	UA_M5.8_0005	Chaga	66 km, Petrovka village, border with the Republic of Moldova	UA_M5.8_0005_01	29°10'10,6 "E	46°30'4,4 "N	HMWB	no
3	UA_M5.8_0038	Sarata	94 km, Miniailivka village, border with the Republic of Moldova	UA_M5.8_0038_01	29°30'38,79 "E	46°23'51,5 "N	HMWB	no
4	UA_M5.8_0050	Hadjider	68 km, Chystovodne village, border with the Republic of Moldova	UA_M5.8_0050_01	29°44'19,8 "E	46°28'15,1 "N	HMWB	no
5	UA_M5.8_0055	Hadjider	Serhiivka village	UA_M5.8_0055_01	29°57'56 "E	45°59'18 "N	HMWB	no
6	UA_M5.8_0056	Kaplan	19 km, Krutoyarivka village, border with the Republic of Moldova	UA_M5.8_0056_01	29°51'35,29 "E	46°20'43,2 "N	river	UA_R_12_M_1_Si
7	UA_M5.8_0068	Alkali	near the village of Monashi	UA_M5.8_0068_01	30°02'49.3 "E	46°10'28.3 "N	river	UA_R_12_M_1_Si
8	UA_M5.8_0097	Bolshoi Kuyalnik	Odesa-Kyiv bridge, near the village of Petroverivka	UA_M5.8_0097_01	30°18'37" E	47° 15'53.1 "N	river	UA_R_12_M_1_SI
9	UA_M5.8_0138	Tiligul	Bridge on the R-55 road near the village of Viktorivka	UA_M5.8_0138_01	30°57'05.6 "E	47°09'41.3 "N	river	UA_R_12_L_1_SI
10	UA_M5.8_0174	Sosik	within the village of Komisarivka	UA_M5.8_0174_01	31°18'05,1 "E	47°01'22,5 "N	river	UA_R_12_M_1_Si
11	UA_M5.8_0179	Berezan	within the village of Stepove	UA_M5.8_0179_01	31°30'58,3 "E	47°12'04,5 "N	river	UA_R_12_S_1_Si
12	UA_M5.8_0196	Kalanchak	within Kalanchak village	UA_M5.8_0196_01	33°17'39,5 "E	46°15'17,0 "N	river	UA_R_12_M_1_Si
13	UA_M5.8_0203	Sasyk reservoir	Borysivka village	UA_M5.8_0203_01	29°38'30,6 "E	45°47'45,8 "N	transitional waters	UA_TW_M5_O_C
14	UA_M5.8_0216	Khadzhibey estuary	outside the village of Altestovo	UA_M5.8_0216_01	30°32'18,1 "E	46°38'26,3 "N	transitional waters	UA_TW_M5_M_C
15	UA_M5.8_0220	Tiligul estuary	within the village. Marianivka	UA_M5.8_0220_01	31°06'54,0 "E	46°50'09,6 "N	transitional waters	UA_TW_M5_M_O
16	UA_M5.8_0222	Berezansky estuary	within the Limany village	UA_M5.8_0222_01	31°47'62,6 "E	46°69'01,19 "N	transitional waters	UA_TW_M5_M_O

Annex 6 Integrated assessment table of the state of the SWBs in the Black Sea River basin for 2021-2023

#	Surface water body				Biological indicators						Hydromorphological indicators - high status (Yes/No)	Chemical and physicochemical parameters	Basin specific		Environmental status	Assessment reliability level*.	Artificial and substantially modified IPA			Chemical state	
	Name of the SWB	Code	Type	The length of the pipeline, km	Phytoplankton	Microphytobenthos	Vascular plants	Bottom macroinvertebrates	The state of the MPA by biological indicators	Assessment reliability level*.			Basin specific	Assessment reliability level*.			Artificial MPV (Yes/No)	Substantially amended MOU (Yes/Candidate)	Environmental potential	Chemical state****.	Assessment reliability level*.
1	p. Tiligul	UA_M5.8_0138	UA_R_12_L_1_SI	107,15	A/A	V/A	V/V	A/A	2	C	yes	3	Д	C	2	C				ND	C
2	p. Sosik	UA_M5.8_0174	UA_R_12_M_1_Si	14,4	second-hand	S/W	S/A	V/V	3	C	no	n/a			3	C					
3	p. Berezan	UA_M5.8_0179	UA_R_12_S_1_Si	8,3	second-hand	V/V	V/A	A/A	2	C	yes	n/a			2	C					
4	Tiligul estuary	UA_M5.8_0220	UA_TW_M5_M_O	140,26	n/a	n/a	n/a	n/a	n/a		-	3	Д	C						Д	C

Notes:

- not applicable

н/пр no monitoring was conducted

б/о without assessment

Level of reliability of the assessment **

B high

C medium

H low

Ecological status/potencial:

1 High

2 Good

3 Moderate

4 Poor

5 Bad

Chemical status**

D Good

ND Failing to achieve good

Annex 8 Achievement of environmental objectives for the Black Sea RBD in 2030

Table 1: Achievement of the environmental objectives of the SWB in 2030

№	Title SWB	Code SWB	Category (PR, HMWB/AWB) [2]	Assessment of the risks of not achieving good status (completed in 2020)		Environmental goals, 2030		Reason for postponement of the date of achievement of environmental objectives (NN, TA, VH, VO, NA)[3]
				Ecological status/potential (at risk, possibly at risk, not at risk)	Chemical status (at risk, possibly at risk, not at risk)	Good ecological status/ potential (yes, no, unknown)	Good chemical status (yes, no, unknown)	
1	2	3	4	5	6	7	8	9
SWBs without risk								
1	Solone Lake	UA_M5.8_0069	PR	risk-free	risk-free	yes	yes	
2	Oak	UA_M5.8_0158	PR	risk-free	risk-free	yes	yes	
3	Kalanchak	UA_M5.8_0195	PR	risk-free	risk-free	yes	yes	
4	Lake Dzhantsheyskoye	UA_M5.8_0204	PR	risk-free	risk-free	yes	yes	
5	Lake Magalivske	UA_M5.8_0206	PR	risk-free	risk-free	yes	yes	
6	Lake Buduri estuary	UA_M5.8_0208	PR	risk-free	risk-free	yes	yes	
7	Lake Karachaus	UA_M5.8_0209	PR	risk-free	risk-free	yes	yes	
8	Lake Alibey	UA_M5.8_0210	PR	risk-free	risk-free	yes	yes	
9	Lake Kurudiyol	UA_M5.8_0212	PR	risk-free	risk-free	yes	yes	
10	Tuzla pond	UA_M5.8_0221	PR	risk-free	risk-free	yes	yes	
5% SWBs								
1	Kogilnik	UA_M5.8_0001	HMWB	at risk	possibly at risk	yes	yes	
2	Bolshoi Kuyalnik	UA_M5.8_0091	HMWB	possibly at risk	possibly at risk	yes	yes	
3	Bolshoi Kuyalnik	UA_M5.8_0096	PR	at risk	risk-free	yes	yes	
4	Bolshoi Kuyalnik	UA_M5.8_0097	HMWB	at risk	possibly at risk	yes	yes	

[2] PR - SWB of natural categories (rivers, lakes, transitional, coastal), HMWB/AWB – heavily modified or artificial SWB

[3] NN - natural causes, TA - technical causes (lack of technical solution, technical impracticality or impracticability), VH - disproportionately high cost, VO - causes related to military operations, temporary occupation of the territory, NA - unknown causes

№	Title SWB	Code SWB	Category (PR, HMWB/AWB) [2]	Assessment of the risks of not achieving good status (completed in 2020)		Environmental goals, 2030		Reason for postponement of the date of achievement of environmental objectives (NN, TA, VH, VO, NA)[3]
				Ecological status/potential (at risk, possibly at risk, not at risk)	Chemical status (at risk, possibly at risk, not at risk)	Good ecological status/ potential (yes, no, unknown)	Good chemical status (yes, no, unknown)	
5	Sosik	UA_M5.8_0176	PR	possibly at risk	risk-free	yes	yes	
all other SWBs								
1	Skynosa	UA_M5.8_0002	HMWB	at risk	risk-free	no	yes	NV
2	Smoking machine	UA_M5.8_0003	HMWB	at risk	risk-free	no	yes	NV
3	Anchokrak	UA_M5.8_0004	PR	possibly at risk	possibly at risk	no	yes	NV
4	Chaga	UA_M5.8_0005	HMWB	at risk	risk-free	no	yes	NV
5	Chaga	UA_M5.8_0006	PR	possibly at risk	risk-free	no	yes	NV
6	Chaga	UA_M5.8_0007	PR	at risk	possibly at risk	no	yes	NV
7	Colic	UA_M5.8_0008	PR	possibly at risk	risk-free	no	yes	NV
8	Karadai	UA_M5.8_0009	PR	possibly at risk	risk-free	no	yes	NV
9	Saka	UA_M5.8_0010	PR	possibly at risk	risk-free	no	yes	NV
10	Saka	UA_M5.8_0011	PR	possibly at risk	risk-free	no	yes	NV
11	Kolbarash	UA_M5.8_0012	PR	possibly at risk	risk-free	no	yes	NV
12	Kantemir	UA_M5.8_0013	PR	possibly at risk	risk-free	no	yes	NV
13	Kantemir	UA_M5.8_0014	HMWB	at risk	risk-free	no	yes	NV
14	Kantemir	UA_M5.8_0015	PR	possibly at risk	risk-free	no	yes	NV
15	Kantemir	UA_M5.8_0016	HMWB	at risk	risk-free	no	yes	NV
16	Kantemir	UA_M5.8_0017	PR	possibly at risk	risk-free	no	yes	NV
17	Arsa	UA_M5.8_0018	PR	possibly at risk	risk-free	no	yes	NV
18	Mouldings	UA_M5.8_0019	PR	at risk	risk-free	no	yes	NV
19	Jalar	UA_M5.8_0020	PR	at risk	risk-free	no	yes	NV
20	Jalar	UA_M5.8_0021	HMWB	at risk	risk-free	no	yes	NV
21	Jalar	UA_M5.8_0022	PR	at risk	risk-free	no	yes	NV
22	Jalar	UA_M5.8_0023	HMWB	at risk	risk-free	no	yes	NV

№	Title SWB	Code SWB	Category (PR, HMWB/AWB) [2]	Assessment of the risks of not achieving good status (completed in 2020)		Environmental goals, 2030		Reason for postponement of the date of achievement of environmental objectives (NN, TA, VH, VO, NA)[3]
				Ecological status/potential (at risk, possibly at risk, not at risk)	Chemical status (at risk, possibly at risk, not at risk)	Good ecological status/ potential (yes, no, unknown)	Good chemical status (yes, no, unknown)	
23	Jalar	UA_M5.8_0024	PR	at risk	risk-free	no	yes	NV
24	Chilliguide	UA_M5.8_0025	PR	possibly at risk	risk-free	no	yes	NV
25	Chilliguide	UA_M5.8_0026	HMWB	at risk	risk-free	no	yes	NV
26	Chilliguide	UA_M5.8_0027	PR	at risk	risk-free	no	yes	NV
27	Chilliguide	UA_M5.8_0028	HMWB	at risk	risk-free	no	yes	NV
28	Chilliguide	UA_M5.8_0029	PR	possibly at risk	risk-free	no	yes	NV
29	Chilliguide	UA_M5.8_0030	PR	possibly at risk	risk-free	no	yes	NV
30	Vedenskoye reservoir	UA_M5.8_0031	HMWB	at risk	risk-free	no	yes	TP
31	Chilliguide	UA_M5.8_0032	PR	at risk	risk-free	no	yes	NV
32	Kagach	UA_M5.8_0033	PR	possibly at risk	risk-free	no	yes	NV
33	Kagachskoye reservoir	UA_M5.8_0034	HMWB	at risk	risk-free	no	yes	TP
34	Kagach	UA_M5.8_0035	PR	possibly at risk	risk-free	no	yes	NV
35	Kagach	UA_M5.8_0036	HMWB	at risk	risk-free	no	yes	NV
36	Sarata	UA_M5.8_0037	PR	possibly at risk	risk-free	no	yes	NV
37	Sarata	UA_M5.8_0038	HMWB	at risk	risk-free	no	yes	NV
38	Sarata	UA_M5.8_0039	PR	at risk	possibly at risk	no	yes	NV
39	Brezoy	UA_M5.8_0040	HMWB	at risk	risk-free	no	yes	NV
40	Kopchak	UA_M5.8_0041	HMWB	at risk	risk-free	no	yes	NV
41	Babey	UA_M5.8_0042	PR	at risk	risk-free	no	yes	NV
42	Jalar	UA_M5.8_0043	PR	at risk	risk-free	no	yes	NV
43	Pharaoh's Reservoir	UA_M5.8_0044	HMWB	at risk	risk-free	no	yes	TP
44	Jalar	UA_M5.8_0045	PR	at risk	risk-free	no	yes	NV
45	Kuruder	UA_M5.8_0046	PR	at risk	risk-free	no	yes	NV

№	Title SWB	Code SWB	Category (PR, HMWB/AWB) [2]	Assessment of the risks of not achieving good status (completed in 2020)		Environmental goals, 2030		Reason for postponement of the date of achievement of environmental objectives (NN, TA, VH, VO, NA)[3]
				Ecological status/potential (at risk, possibly at risk, not at risk)	Chemical status (at risk, possibly at risk, not at risk)	Good ecological status/ potential (yes, no, unknown)	Good chemical status (yes, no, unknown)	
46	Plakhtiyivske Reservoir	UA_M5.8_0047	HMWB	at risk	risk-free	no	yes	TP
47	Kuruder	UA_M5.8_0048	HMWB	at risk	risk-free	no	yes	NV
48	Kuruder	UA_M5.8_0049	PR	at risk	risk-free	no	yes	NV
49	Hajider	UA_M5.8_0050	HMWB	at risk	risk-free	no	yes	NV
50	Russko-Ivanovo reservoir	UA_M5.8_0051	HMWB	at risk	risk-free	no	yes	TP
51	Hajider	UA_M5.8_0052	HMWB	at risk	risk-free	no	yes	NV
52	Hajider	UA_M5.8_0053	HMWB	at risk	risk-free	no	yes	NV
53	Khadjider reservoir	UA_M5.8_0054	HMWB	at risk	risk-free	no	yes	TP
54	Hajider	UA_M5.8_0055	HMWB	at risk	risk-free	no	yes	NV
55	Kaplan	UA_M5.8_0056	PR	at risk	risk-free	no	yes	NV
56	Starotsarychanske reservoir	UA_M5.8_0057	PR	at risk	risk-free	no	yes	TP
57	Kaplan	UA_M5.8_0058	HMWB	at risk	risk-free	no	yes	NV
58	Balaccela	UA_M5.8_0059	PR	at risk	risk-free	no	yes	NV
59	Balaccela	UA_M5.8_0060	HMWB	at risk	risk-free	no	yes	NV
60	Balaccela	UA_M5.8_0061	PR	at risk	risk-free	no	yes	NV
61	Balaccela	UA_M5.8_0062	PR	at risk	possibly at risk	no	yes	NV
62	Alkali	UA_M5.8_0063	PR	at risk	risk-free	no	yes	NV
63	Alkali	UA_M5.8_0064	HMWB	at risk	risk-free	no	yes	NV
64	Karnalievo reservoir	UA_M5.8_0065	HMWB	at risk	risk-free	no	yes	TP
65	Alkali	UA_M5.8_0066	PR	at risk	possibly at risk	no	yes	NV
66	Monash Reservoir	UA_M5.8_0067	HMWB	at risk	possibly at risk	no	yes	TP
67	Alkali	UA_M5.8_0068	PR	at risk	possibly at risk	no	yes	NV

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				Ecological status/potential (at risk, possibly at risk, not at risk)	Chemical status (at risk, possibly at risk, not at risk)	Good ecological status/ potential (yes, no, unknown)	Good chemical status (yes, no, unknown)	
68	Drummer	UA_M5.8_0070	HMWB	at risk	risk-free	no	yes	NV
69	Drummer	UA_M5.8_0071	PR	possibly at risk	risk-free	no	yes	NV
70	Baraboyskoye reservoir	UA_M5.8_0072	HMWB	at risk	risk-free	no	yes	TP
71	Drummer	UA_M5.8_0073	PR	at risk	possibly at risk	no	yes	NV
72	Drummer	UA_M5.8_0074	HMWB	at risk	risk-free	no	yes	NV
73	Drummer	UA_M5.8_0075	PR	possibly at risk	risk-free	no	yes	NV
74	Pork	UA_M5.8_0076	PR	at risk	risk-free	no	yes	NV
75	Yegorivske Reservoir	UA_M5.8_0077	HMWB	at risk	risk-free	no	yes	TP
76	Pork	UA_M5.8_0078	HMWB	at risk	possibly at risk	no	yes	NV
77	B. Karpiv Yar	UA_M5.8_0079	PR	at risk	risk-free	no	yes	NV
78	Pigsty	UA_M5.8_0080	PR	at risk	risk-free	no	yes	NV
79	Maly Kuyalnik	UA_M5.8_0081	PR	possibly at risk	risk-free	no	yes	NV
8	Chervonoznamenskoye reservoir	UA_M5.8_0082	HMWB	at risk	risk-free	no	yes	TP
81	Maly Kuyalnik	UA_M5.8_0083	PR	possibly at risk	risk-free	no	yes	NV
82	Maly Kuyalnik	UA_M5.8_0084	PR	possibly at risk	risk-free	no	yes	NV
83	B. Torosova	UA_M5.8_0085	PR	at risk	risk-free	no	yes	NV
84	B. Good	UA_M5.8_0086	PR	at risk	risk-free	no	yes	NV
85	Srednyi Kuyalnik	UA_M5.8_0087	PR	possibly at risk	risk-free	no	yes	NV
86	Srednyi Kuyalnik	UA_M5.8_0088	HMWB	at risk	risk-free	no	yes	NV
87	Srednyi Kuyalnik	UA_M5.8_0089	PR	possibly at risk	risk-free	no	yes	NV
88	Srednyi Kuyalnik	UA_M5.8_0090	PR	possibly at risk	risk-free	no	yes	NV
89	Bolshoi Kuyalnik	UA_M5.8_0092	HMWB	at risk	risk-free	no	yes	NV
90	Bolshoi Kuyalnik	UA_M5.8_0093	PR	possibly at risk	risk-free	no	yes	NV

№	Title SWB	Code SWB	Category (PR, HMWB/AWB) [2]	Assessment of the risks of not achieving good status (completed in 2020)		Environmental goals, 2030		Reason for postponement of the date of achievement of environmental objectives (NN, TA, VH, VO, NA)[3]
				Ecological status/potential (at risk, possibly at risk, not at risk)	Chemical status (at risk, possibly at risk, not at risk)	Good ecological status/ potential (yes, no, unknown)	Good chemical status (yes, no, unknown)	
91	Bolshoi Kuyalnik	UA_M5.8_0094	PR	possibly at risk	risk-free	no	yes	NV
92	Bolshoi Kuyalnik	UA_M5.8_0095	HMWB	at risk	risk-free	no	yes	NV
93	Dry Zhuravka	UA_M5.8_0098	PR	possibly at risk	risk-free	no	yes	NV
94	Dry Zhuravka	UA_M5.8_0099	HMWB	at risk	risk-free	no	yes	NV
95	Dry Zhuravka	UA_M5.8_0100	PR	possibly at risk	risk-free	no	yes	NV
96	Dubovyi Yar	UA_M5.8_0101	PR	possibly at risk	risk-free	no	yes	NV
97	Dubovyi Yar	UA_M5.8_0102	PR	possibly at risk	risk-free	no	yes	NV
98	Koshkovka	UA_M5.8_0103	PR	possibly at risk	risk-free	no	yes	NV
99	Koshkovka	UA_M5.8_0104	PR	possibly at risk	risk-free	no	yes	NV
100	Severynivske Reservoir	UA_M5.8_0105	HMWB	at risk	risk-free	no	yes	TP
101	Koshkovka	UA_M5.8_0106	PR	possibly at risk	risk-free	no	yes	NV
102	Б. Raikova	UA_M5.8_0107	PR	possibly at risk	risk-free	no	yes	NV
103	Б. Dry	UA_M5.8_0108	PR	possibly at risk	risk-free	no	yes	NV
104	Dovboka	UA_M5.8_0109	PR	possibly at risk	risk-free	no	yes	NV
105	Kubanka	UA_M5.8_0110	PR	possibly at risk	risk-free	no	yes	NV
106	Kubanka	UA_M5.8_0111	PR	possibly at risk	risk-free	no	yes	NV
107	Big Ajalyk	UA_M5.8_0112	HMWB	at risk	risk-free	no	yes	NV
108	Big Ajalyk	UA_M5.8_0113	PR	possibly at risk	risk-free	no	yes	TP
109	Blessed reservoir	UA_M5.8_0114	HMWB	at risk	risk-free	no	yes	NV
110	Big Ajalyk	UA_M5.8_0115	PR	possibly at risk	risk-free	no	yes	NV
111	Big Ajalyk	UA_M5.8_0116	HMWB	at risk	risk-free	no	yes	NV
112	Big Ajalyk	UA_M5.8_0117	PR	possibly at risk	risk-free	no	yes	NV
113	Big Ajalyk	UA_M5.8_0118	HMWB	at risk	risk-free	no	yes	NV

№	Title SWB	Code SWB	Category (PR, HMWB/AWB) [2]	Assessment of the risks of not achieving good status (completed in 2020)		Environmental goals, 2030		Reason for postponement of the date of achievement of environmental objectives (NN, TA, VH, VO, NA)[3]
				Ecological status/potential (at risk, possibly at risk, not at risk)	Chemical status (at risk, possibly at risk, not at risk)	Good ecological status/ potential (yes, no, unknown)	Good chemical status (yes, no, unknown)	
114	Big Ajalyk	UA_M5.8_0119	PR	possibly at risk	risk-free	no	yes	NV
115	Small Ajalyk	UA_M5.8_0120	PR	possibly at risk	risk-free	no	yes	NV
116	Small Ajalyk	UA_M5.8_0121	HMWB	at risk	risk-free	no	yes	NV
117	Pryportovske reservoir	UA_M5.8_0122	HMWB	at risk	risk-free	no	yes	TP
118	Small Ajalyk	UA_M5.8_0123	PR	possibly at risk	risk-free	no	yes	NV
119	B. Wide	UA_M5.8_0124	PR	possibly at risk	risk-free	no	yes	NV
120	Kodintsovka	UA_M5.8_0125	PR	possibly at risk	risk-free	no	yes	NV
121	Kodintsovka	UA_M5.8_0126	HMWB	at risk	risk-free	no	yes	NV
122	Kodintsovka	UA_M5.8_0127	PR	possibly at risk	risk-free	no	yes	NV
123	Balaychuk	UA_M5.8_0128	PR	possibly at risk	risk-free	no	yes	NV
124	Balaychuk	UA_M5.8_0129	PR	at risk	risk-free	no	yes	NV
125	B. Gola Chudska	UA_M5.8_0130	PR	possibly at risk	risk-free	no	yes	NV
126	B. Balaychuk	UA_M5.8_0131	PR	possibly at risk	risk-free	no	yes	NV
127	Б. Stara Donskaya	UA_M5.8_0132	PR	possibly at risk	risk-free	no	yes	NV
128	Tiligul	UA_M5.8_0133	PR	possibly at risk	risk-free	no	yes	NV
129	Tiligul	UA_M5.8_0134	PR	possibly at risk	risk-free	no	yes	NV
130	Tiligul	UA_M5.8_0135	HMWB	at risk	risk-free	no	yes	NV
131	Tiligul	UA_M5.8_0136	PR	at risk	risk-free	no	yes	NV
132	Tiligul	UA_M5.8_0137	PR	possibly at risk	risk-free	no	yes	NV
133	Tiligul	UA_M5.8_0138	PR	at risk	possibly at risk	no	yes	NV
134	Lipetsk	UA_M5.8_0139	PR	possibly at risk	risk-free	no	yes	NV
135	Lipetsk	UA_M5.8_0140	HMWB	at risk	risk-free	no	yes	NV
136	Lipetsk	UA_M5.8_0141	PR	possibly at risk	possibly at risk	no	yes	NV
137	Lipetsk	UA_M5.8_0142	PR	at risk	risk-free	no	yes	NV

№	Title SWB	Code SWB	Category (PR, HMWB/AWB) [2]	Assessment of the risks of not achieving good status (completed in 2020)		Environmental goals, 2030		Reason for postponement of the date of achievement of environmental objectives (NN, TA, VH, VO, NA)[3]
				Ecological status/potential (at risk, possibly at risk, not at risk)	Chemical status (at risk, possibly at risk, not at risk)	Good ecological status/ potential (yes, no, unknown)	Good chemical status (yes, no, unknown)	
138	Melanka	UA_M5.8_0143	PR	possibly at risk	risk-free	no	yes	NV
139	Melanka	UA_M5.8_0144	HMWB	at risk	risk-free	no	yes	NV
140	Б. Zaplazy	UA_M5.8_0145	PR	possibly at risk	risk-free	no	yes	NV
141	B. Kozachyi Yar	UA_M5.8_0146	PR	possibly at risk	risk-free	no	yes	NV
142	B. Kozachyi Yar	UA_M5.8_0147	HMWB	at risk	risk-free	no	yes	NV
143	B. Kozachyi Yar	UA_M5.8_0148	PR	possibly at risk	risk-free	no	yes	NV
144	Crane	UA_M5.8_0149	HMWB	at risk	risk-free	no	yes	NV
145	Crane	UA_M5.8_0150	PR	possibly at risk	risk-free	no	yes	NV
146	Crane	UA_M5.8_0151	HMWB	at risk	risk-free	no	yes	NV
147	Crane	UA_M5.8_0152	PR	possibly at risk	risk-free	no	yes	NV
148	Crane	UA_M5.8_0153	PR	possibly at risk	risk-free	no	yes	NV
149	Crane	UA_M5.8_0154	HMWB	at risk	risk-free	no	yes	NV
150	Crane	UA_M5.8_0155	PR	possibly at risk	risk-free	no	yes	NV
151	Crane	UA_M5.8_0156	HMWB	at risk	risk-free	no	yes	NV
152	Crane	UA_M5.8_0157	PR	possibly at risk	risk-free	no	yes	NV
153	Oak	UA_M5.8_0159	PR	possibly at risk	risk-free	no	yes	NV
154	Blind woman	UA_M5.8_0160	PR	possibly at risk	risk-free	no	yes	NV
155	Blind woman	UA_M5.8_0161	PR	possibly at risk	risk-free	no	yes	NV
156	Б. Blind	UA_M5.8_0162	PR	possibly at risk	risk-free	no	yes	NV
157	Untitled	UA_M5.8_0163	PR	possibly at risk	risk-free	no	yes	NV
158	Tartakai	UA_M5.8_0164	PR	possibly at risk	risk-free	no	yes	NV
159	Tartakai	UA_M5.8_0165	PR	at risk	risk-free	no	yes	NV
160	B. Cologlia	UA_M5.8_0166	PR	at risk	risk-free	no	yes	NV
161	Б. Herds	UA_M5.8_0167	PR	possibly at risk	risk-free	no	yes	NV

№	Title SWB	Code SWB	Category (PR, HMWB/AWB) [2]	Assessment of the risks of not achieving good status (completed in 2020)		Environmental goals, 2030		Reason for postponement of the date of achievement of environmental objectives (NN, TA, VH, VO, NA)[3]
				Ecological status/potential (at risk, possibly at risk, not at risk)	Chemical status (at risk, possibly at risk, not at risk)	Good ecological status/ potential (yes, no, unknown)	Good chemical status (yes, no, unknown)	
162	Tsarega	UA_M5.8_0168	PR	possibly at risk	risk-free	no	yes	NV
163	Tsarega	UA_M5.8_0169	PR	possibly at risk	risk-free	no	yes	NV
164	B. Tsaregol	UA_M5.8_0170	PR	possibly at risk	risk-free	no	yes	NV
165	B. Tsaregol	UA_M5.8_0171	HMWB	at risk	risk-free	no	yes	NV
166	B. Tsaregol	UA_M5.8_0172	PR	possibly at risk	risk-free	no	yes	NV
167	Sosik	UA_M5.8_0173	PR	possibly at risk	risk-free	no	yes	NV
168	Sosik	UA_M5.8_0174	PR	possibly at risk	risk-free	no	yes	NV
169	Sosik	UA_M5.8_0175	HMWB	at risk	risk-free	no	yes	NV
170	Berezan	UA_M5.8_0177	PR	possibly at risk	risk-free	no	yes	NV
171	Katerynivka Reservoir	UA_M5.8_0178	HMWB	at risk	risk-free	no	yes	TP
172	Berezan	UA_M5.8_0179	PR	possibly at risk	risk-free	no	yes	VD
173	Berezan	UA_M5.8_0180	PR	possibly at risk	risk-free	no	yes	VD
174	Stepovske Reservoir	UA_M5.8_0181	HMWB	at risk	risk-free	no	yes	VD
175	Berezan	UA_M5.8_0182	PR	possibly at risk	risk-free	no	yes	VD
176	Berezan	UA_M5.8_0183	HMWB	at risk	risk-free	no	yes	VD
177	Berezan	UA_M5.8_0184	PR	possibly at risk	risk-free	no	yes	VD
178	Danilovskoye reservoir	UA_M5.8_0185	HMWB	at risk	risk-free	no	yes	VD
179	Berezan	UA_M5.8_0186	PR	possibly at risk	risk-free	no	yes	VD
180	Nechayanske reservoir	UA_M5.8_0187	HMWB	at risk	risk-free	no	yes	TP
181	Sukhodolsk reservoir	UA_M5.8_0188	HMWB	at risk	risk-free	no	yes	VD
182	B. Lysych	UA_M5.8_0189	PR	possibly at risk	risk-free	no	yes	NV
183	B. Lysych	UA_M5.8_0190	PR	possibly at risk	risk-free	no	yes	NV

№	Title SWB	Code SWB	Category (PR, HMWB/AWB) [2]	Assessment of the risks of not achieving good status (completed in 2020)		Environmental goals, 2030		Reason for postponement of the date of achievement of environmental objectives (NN, TA, VH, VO, NA)[3]
				Ecological status/potential (at risk, possibly at risk, not at risk)	Chemical status (at risk, possibly at risk, not at risk)	Good ecological status/ potential (yes, no, unknown)	Good chemical status (yes, no, unknown)	
184	Shyrokolanivske reservoir	UA_M5.8_0191	HMWB	at risk	risk-free	no	yes	TP
185	B. Lysych	UA_M5.8_0192	PR	possibly at risk	risk-free	no	yes	VD
186	B. Lysych	UA_M5.8_0193	HMWB	at risk	risk-free	no	yes	VD
187	B. Lysych	UA_M5.8_0194	PR	possibly at risk	risk-free	no	yes	VD
188	Kalanchak	UA_M5.8_0196	PR	at risk	risk-free	no	yes	NV
189	Kakhovka main canal	UA_M5.8_0197	AWB	at risk	risk-free	no	yes	TP
190	Chaplinsky Canal	UA_M5.8_0198	AWB	at risk	risk-free	no	yes	TP
191	North Crimean Canal	UA_M5.8_0199	AWB	at risk	risk-free	no	yes	TP
192	Alexandrovsky Canal	UA_M5.8_0200	AWB	at risk	risk-free	no	yes	TP
193	Oleksandrivske Reservoir	UA_M5.8_0201	HMWB	at risk	risk-free	no	yes	TP
194	Tsybulivske reservoir	UA_M5.8_0202	HMWB	at risk	risk-free	no	yes	TP
195	Lake Sasyk (Kunduk)	UA_M5.8_0203	PR	at risk	possibly at risk	no	yes	NV
196	Maly Sasyk Lake	UA_M5.8_0205	PR	at risk	risk-free	no	yes	NV
197	Lake Shagany	UA_M5.8_0207	PR	risk-free	possibly at risk	no	yes	NV
198	Lake Hadjider	UA_M5.8_0211	PR	possibly at risk	possibly at risk	no	yes	NV
199	Lake Burnas	UA_M5.8_0213	PR	possibly at risk	risk-free	no	yes	NV
200	Buda estuary	UA_M5.8_0214	PR	possibly at risk	risk-free	no	yes	NV
201	Dry estuary	UA_M5.8_0215	PR	at risk	risk-free	no	yes	NV
202	Khadzhibey estuary	UA_M5.8_0216	PR	at risk	risk-free	no	yes	NV
203	Kuyalnik estuary	UA_M5.8_0217	PR	at risk	risk-free	no	yes	NV

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				Ecological status/potential (at risk, possibly at risk, not at risk)	Chemical status (at risk, possibly at risk, not at risk)	Good ecological status/ potential (yes, no, unknown)	Good chemical status (yes, no, unknown)	
204	The Great Adzhalya Estuary	UA_M5.8_0218	PR	possibly at risk	risk-free	no	yes	NV
205	Adzhalitsky estuary	UA_M5.8_0219	PR	at risk	risk-free	no	yes	NV
206	Tiligul estuary	UA_M5.8_0220	PR	possibly at risk	risk-free	no	yes	NV
207	Berezansky estuary	UA_M5.8_0222	PR	at risk	risk-free	no	yes	VD
208	Black Sea region	UA_M5.8_0223	PR	possibly at risk	risk-free	no	yes	NV
209	Black Sea region	UA_M5.8_0224	PR	possibly at risk	risk-free	no	yes	NV
210	Black Sea region	UA_M5.8_0225	PR	at risk	possibly at risk	no	yes	NV
211	Black Sea region	UA_M5.8_0226	PR	at risk	possibly at risk	no	yes	NV
212	Black Sea region	UA_M5.8_0227	PR	at risk	possibly at risk	no	yes	NV
213	Black Sea region	UA_M5.8_0228	PR	risk-free	risk-free	no	yes	VD
214	Black Sea region	UA_M5.8_0229	PR	risk-free	risk-free	no	yes	VD
215	Black Sea region	UA_M5.8_0230	PR	at risk	possibly at risk	no	yes	VD
216	Black Sea region	UA_M5.8_0231	PR	risk-free	risk-free	no	yes	VD

Table 2. Achievement of environmental objectives by GWBs and their groups

№	GWB code	Name of the GWB	Quantitative state		Chemical state		Reason for the postponement[4]	Reason for setting less stringent targets[5]	Notes[6]
			Objective	Timeframe for achievement	Objective	Timeframe for achievement			
Groups of non-pressure GWB									
1	UAM5800N100	GWB in alluvial Pleistocene-Upper Pliocene sediments	Good status	2030	Good status	2042	T, S	NA	EO
2	UAM5800N200	GWB in alluvial Upper Pliocene sediments	Good status	2030	Good status	2042	T, S	NA	EO
3	UAM5800N300	GWB in Baltic sediments	Good status	2030	Good status	2042	T, S	NA	EO
Pressure GWB and groups of pressure GWB									
4	UAM5800N400	GWB in Upper Miocene sediments	Good status	2030	Good status	2030			EO
5	UAM5200N500	GWB in the Upper Sarmatian sediments	Good status	2030	Good status	2030			EO
6	UAM5800N600	GWB in Middle Sarmatian sediments	Good status	2030	Good status	2030			EO

[4] T - technical reasons, H - disproportionately high cost, S - existing natural state

[5] not applicable (NA) in the first cycle of the RBMP 2025-2030

[6] RCA - risk assessment of failure to achieve good status, ES - ecological status according to monitoring data, CS - chemical status according to monitoring data, EO - expert assessment

Annex 9.1 Characteristics of water use in the Black Sea river basin, 2021, million m^3

Industry	Water intake	Usage waters	Discharges of waste water into surface water bodies	Discharges of polluted wastewater
Communal economy	10,709	17,358	84,090	2,429
Industry	0,785	3,316	1,400	0,002
Agriculture, including irrigation	135,548	298,313	12,313	0,582
Transport	1,363	2,210	1,349	0,260
Together	155,622	332,238	109,911	3,311

Annex 9.2 Wastewater discharges to water bodies by category of discharged water

Name of economic sectors	Volume of water discharged, million m^3	including			Share of the total discharge within the sub-basin, %.
		contaminated	normatively clean without purification	normatively cleaned at facilities	
Industry	1,400	0,002	0,317	1,081	0,89
including energy	5,012	0,039	4,863		3,22
Housing and utilities	84,090	2,429	-	81,661	54,03
Agriculture	12,313	0,582	11,731	-	7,91
Total for the sub-basin	109,911	3,311	23,724	82,876	100

Annex 10 List of national targeted programmes, regional and local programmes, funds, state investment projects, international technical assistance projects, regional and local infrastructure projects, etc.

Name of the national target programme or fund	"National Target Programme for the Development of Water Management and Environmental Rehabilitation of the Dnipro River Basin for the Period up to 2021", approved by the Law of Ukraine No. 4836-VI of 24 May 2012 (hereinafter referred to as the Dnipro-2021 Programme).
Name of the environmental protection measure of the national target programme or fund	Ensuring the development of land reclamation and improvement of the environmental condition of irrigated and drained land.
Relevance of the environmental measure to the main water and environmental issues	Pollution by nutrients. Issues related to the relationship between water quantity and quality in relation to climate change. Droughts and water shortages.
Implementation of environmental protection measures and their financing	The Dnipro-2021 Programme provided funding of UAH 30,090.49 million for the implementation of measures to ensure the development of land reclamation and improve the environmental condition of irrigated and drained land for the entire period of implementation from 2013 to 2021 (9 years). This measure was supposed to be a continuation of the implementation of the previously existing state target programme "Comprehensive programme for the development of land reclamation and improvement of the ecological condition of irrigated and drained lands in 2001-2005 and forecast to 2010" . The measure was to ensure the development of land reclamation and improvement of the ecological condition of irrigated and drained lands, including the restoration of the water management and reclamation complex, reconstruction and modernisation of reclamation systems and their facilities, engineering infrastructure of reclamation systems with the creation of integrated technological complexes, introduction of new methods of irrigation and land drainage, application of water and energy-saving environmentally safe irrigation and water regulation regimes. The implementation of the planned action was carried out over 9 years, in two stages : 2013-2016 and 2017-2021. Since the start of the Dnipro-2021 Programme's activities, as of 1 January 2019, 26% of the envisaged need has been allocated from budgets of all levels and other sources, and as of 1 January 2020, UAH 5115.383 million (17%), which has led to a significant failure to complete its tasks and activities on time. Low levels of actual funding for tasks and activities from all sources of funding.
Achievement of set goals	The set goals were not achieved.
Name of the national target programme or fund	"National Target Programme for the Development of Water Management and Environmental Rehabilitation of the Dnipro River Basin for the Period up to 2021", approved by the Law of Ukraine of 24 May 2012, No. 4836-VI.
Name of the environmental protection measure of the national target programme or fund	Priority provision of centralised water supply to rural settlements that use imported water.
Relevance of the environmental measure to the main water and environmental issues	Issues related to the relationship between water quantity and quality in relation to climate change. Droughts and water shortages.
Implementation of environmental protection measures and their financing	The Dnipro-2021 Programme provided funding for the measure in the amount of UAH 1668.6 million for the entire implementation period from 2013 to 2021 (9 years). This event was a continuation of the implementation of the state target programme "Comprehensive programme of priority provision of rural settlements using imported water with centralised water supply in 2001-2005 and forecast until 2010" .

	The event was supposed to improve the technological level of water use, introduce low-water and waterless technologies, develop more rational water use standards, build, reconstruct and modernise water supply systems, and provide Ukrainian settlements that used to use imported water with drinking water of sufficient quantity and quality. The implementation of the planned event was carried out over 9 years, in two stages: 2013-2016 and 2017-2021. As of 1 January 2020, the Dnipro-2021 Programme has received UAH 283.6 million from budgets of all levels and UAH 283.6 million less than the envisaged need, which has led to a significant failure to complete its tasks and activities on time. For example, the use of funds according to the departmental and programme classifications of expenditures and lending to the state budget in 2020 for the implementation of this measure within the Dnipro-2021 Programme, the State Agency of Water Resources of Ukraine used only UAH 205,000 thousand (4.2% of the total expenditures for 2020)
Achievement of set goals	has not been achieved.
Name of the national target programme or fund	"National Target Programme for the Development of Water Management and Environmental Rehabilitation of the Dnipro River Basin for the Period up to 2021", approved by the Law of Ukraine of 24 May 2012, No. 4836-VI.
Name of the environmental protection measure of the national target programme or fund	Protecting rural settlements and agricultural land from the harmful effects of water
Relevance of the environmental measure to the main water and environmental issues	Hydromorphological changes. Issues related to the relationship between water quantity and quality in relation to climate change. Floods and floods, flooding of territories.
Implementation of environmental protection measures and their financing	The Dnipro-2021 Programme envisaged allocating UAH 1571.48 million for the implementation of measures to protect rural settlements and agricultural land from the harmful effects of water for the entire implementation period from 2013 to 2021 (9 years). This measure was intended to continue the implementation of the previously existing "Comprehensive Programme for Protection against Harmful Effects of Water from Rural Settlements and Agricultural Lands in Ukraine in 2001-2005 and Forecast to 2010". The event included work on bank protection and regulation of river channels, construction and reconstruction of hydraulic structures, protective dams, polders, flood control reservoirs, clearing river channels, arranging water protection zones and coastal protection strips, developing schemes for comprehensive flood protection of territories from the harmful effects of water, improving methods and technical devices for hydrometeorological observations and flood forecasting The implementation of the planned event was carried out over 9 years, in two stages: 2013-2016 and 2017-2021. As of 1 January 2020, UAH 267.152 million of the required amount has been allocated from budgets of all levels and other sources since the start of the Dnipro-2021 Programme.
Achievement of set goals	was not achieved.
Name of the national target programme or fund	"National Target Programme for the Development of Water Management and Environmental Rehabilitation of the Dnipro River Basin for the Period up to 2021", approved by the Law of Ukraine of 24 May 2012, No. 4836-VI.
Name of the environmental protection measure of the national target programme or fund	Operation of the state water management complex and management of water resources, including environmental rehabilitation of the Dnipro River basin and improvement of drinking water quality

Relevance of the environmental measure to the main water and environmental issues	Pollution by organic substances. Pollution by nutrients. Pollution by hazardous substances. Hydromorphological changes. Spread of invasive species. Issues related to the relationship between water quantity and quality in relation to climate change. Droughts and water shortages.
Implementation of environmental protection measures and their financing	The event was implemented over 9 years, in two stages: 2013-2016 and 2017-2021. Stage 2 is particularly noteworthy, during which it was planned to: implement a system of integrated water resources management based on the basin principle by developing and implementing river basin management plans, applying an economic model of targeted financing of activities in river basins, establishing river basin councils, as well as enhancing the role of existing and establishing new basin water resource management departments; implement water-saving technologies that ensure the improvement of the functioning of the water management and reclamation system. Since the start of the Dnipro-2021 Programme, as of 1 January 2019, 26% of the envisaged need has been allocated from budgets of all levels and other sources, and as of 1 January 2020, 17% has been allocated. State funds are allocated mainly for the costs of consumption in the water sector, labour remuneration, and utilities, the share of which was financed from the state budget in 2020, for example: from the general fund - 93.5% (UAH 2092158.5 thousand), from the special fund - 81.1% (UAH 2261343.4 thousand). Total state budget expenditures for financing the Dnipro 2021 Programme in 2020 amounted to UAH 5022671.0 thousand. The lion's share of all funds is used for the operation of the state water management complex and water resources management - UAH 4,561,352.5 thousand (90.8%). Total expenditures for the operation of the water sector in 2020 amounted to UAH 435,3501.9 thousand (86.7%) of total expenditures. At the same time, UAH 144620 thousand was allocated for the development of the water sector from the state fund and UAH 524549.1 thousand from the special fund, which totalled UAH 669169.1 thousand (13.3%) of the expenditures for the entire Programme.
Achievement of set goals	partially.
Name of the national target programme or fund	The National Target Programme "Drinking Water of Ukraine for 2011-2020" was approved by the Law of Ukraine No. 2455-IV dated 03.03.2005
Name of the environmental protection measure of the national target programme or fund	Implementation of the state policy on development and reconstruction of centralised water supply and sewerage systems; protection of drinking water sources; bringing the quality of drinking water to the requirements of regulatory acts; regulatory support in the field of drinking water supply and sewerage; development and implementation of research and development developments using the latest materials, technologies, equipment and devices
Relevance of the environmental measure to the main water and environmental issues	Pollution by organic substances. Pollution by nutrients. Pollution by hazardous substances. Hydromorphological changes. Spread of invasive species. Issues related to the relationship between water quantity and quality in relation to climate change. Droughts and water shortages.

Implementation of environmental protection measures and their financing	The estimated amount of funding for the Programme was UAH 9,471.7 million (in 2010 prices), of which UAH 3,004.3 million was allocated from the state budget and UAH 6,467.4 million from other sources. Main objectives of the Programme: Bringing sanitary protection zones and water protection zones of drinking water sources into compliance with regulatory requirements, assessing the environmental and hygienic condition of drinking water sources for compliance with the established requirements; inventory of sewage treatment facilities; construction and reconstruction of water and sewage treatment facilities to reduce the amount of untreated wastewater discharged into water bodies and to recycle sediments; construction and implementation of drinking water treatment plants and bottling stations using the latest materials, technologies, equipment, devices and research and development; Developing schemes to optimise the operation of centralised water supply systems; equipping water and wastewater quality control laboratories with modern control and analytical equipment; Bringing the regulatory framework for drinking water supply and wastewater disposal in line with EU standards, taking into account national peculiarities, including in terms of increased liability for violations of environmental pollution standards, primarily discharges by industrial enterprises into water bodies; Carrying out comprehensive research and development activities using the latest technologies, equipment, materials, and devices, the use of which is aimed, in particular, at energy and resource conservation, improving the quality of drinking water and wastewater treatment, and implementing such developments. Funding for the last 3 years: 2018 - UAH 200 million (the need is UAH 1.3 billion), 2019 - no funds were allocated at all. 2020: no funds were allocated at all. Lack of funding for the project from the state budget
Achievement of set goals	was not achieved.
Name of the national target programme or fund	The State Target Programme for the Development of Land Relations in Ukraine for the period up to 2020 was approved by the Cabinet of Ministers of Ukraine on 17 June 2009, No. 743-r.
Name of the environmental protection measure of the national target programme or fund	Protection and rational use of land
Relevance of the environmental measure to the main water and environmental issues	Pollution by nutrients. Pollution by hazardous substances. Spread of invasive species. Issues related to the relationship between water quantity and quality in relation to climate change. Droughts and water shortages.
Implementation of environmental protection measures and their financing	Excessive ploughing of agricultural land leads to a disruption of the ecologically balanced ratio of agricultural, nature reserve and other environmental, health, recreational, historical, cultural, forestry, water fund lands, and an increase in the area of degraded, low-productive and technologically polluted land. The Ministry of Agrarian Policy and Food of Ukraine (MAPF), as the main spending unit of the state budget, and the StateGeoCadastre, as the lower-level spending unit, were responsible for the implementation of the Programme.

	As of 1 January 2021. 500,000 hectares of degraded, underutilised and technologically contaminated land are to be conserved, 143,000 hectares of disturbed land need to be rehabilitated, and 294,000 hectares of underutilised land need to be improved. Ineffective management by the Ministry of Agrarian Policy as the main spending unit and the StateGeoCadastre as a lower-level spending unit resulted in the liquidation of the Ministry of Agrarian Policy and the reform of the StateGeoCadastre by the government in 2020. Lack of funding for the Programme from the state budget in this area in 2018-2020.
Achievement of set goals	was not achieved.
Name of the national target programme or fund	Environmental Protection Funds (hereinafter referred to as EPFs)
Name of the environmental protection measure of the national target programme or fund	Environmental protection
Relevance of the environmental measure to the main water and environmental issues	Pollution by organic substances. Pollution by nutrients. Pollution by hazardous substances. Littering with plastic and other solid waste. Hydromorphological changes. Spread of invasive species. Issues related to the relationship between water quantity and quality in relation to climate change. Floods and floods, flooding of territories. Droughts and water shortages.
Implementation of environmental protection measures and their financing	Currently, Ukraine has a three-tier system of environmental funds, consisting of the State Environmental Fund, regional and local (city, town and village) environmental funds. At the regional level, the regional and local environmental funds are a significant source of funding for environmental protection measures. The environmental funds are used for targeted financing of environmental protection measures in accordance with the List of activities that are considered to be environmental protection measures approved by the Cabinet of Ministers of Ukraine on 17.09.1996 No. 1147. In accordance with the Law of Ukraine "On Environmental Protection" dated 25.06.1991 No. 1264-XII (as amended on 18.12.2019), financing of environmental protection measures (hereinafter referred to as NEP), including water resources, is carried out at the expense of the State Budget of Ukraine, local budgets, funds of enterprises, institutions and organisations, NEP funds, voluntary contributions and other funds. The CMU Resolution "On Approval of the Regulation on the State Environmental Protection Fund" dated 7.05.1998 No. 634 (as amended by the CMU Resolution No. 1065 dated 4.12.2019), according to which the State Environmental Protection Fund became part of the State Budget of Ukraine. According to 2018 data, the share of environmental revenues (rent, environmental tax, special permits, fines) in the state budget was over UAH 52 billion, of which UAH 4.6 billion was allocated to support the activities of the relevant central government agencies and environmental control, and only UAH 4.2 billion, or only 8% of environmental funds, were allocated for the implementation of environmental protection measures. This also includes the allocation of funds for the national budget programmes Dnipro-2021 and Drinking Water-2020. If these 4.2 billion UAH are divided between agencies and entities, the following picture emerges; the State Agency of Water Resources (38%), local budgets (24%),

	SAUEZM (22%), Ministry of Ecology (now Ministry of Environment) (9%), State Ecological Inspectorate (4%), and State Geological Survey (2%) received the most environmental funds. At present, Ukraine lacks monitoring of the effectiveness of environmental protection measures, a system of proper planning, inefficient use of funds, and the possibility of financial support for environmental modernisation by business entities themselves.
Achievement of set goals	was not achieved.
Name of the national target programme or fund	Regional Programme for the Development of Water Management in Odesa Oblast for the period up to 2021, approved by the Odesa Oblast Council on 18 September 2013, No. 882-VI
Name of the environmental protection measure of the national target programme or fund	Increasing the efficiency of the use of the state reclamation network and on-farm reclamation systems of the region, increasing crop yields, improving the ecological state of rural areas and living conditions of the population; implementing state and regional water policy, meeting the needs of the population for quality water and the region's economic sectors for water resources; inventorying and certifying water bodies, creating a register of hydraulic structures and their owners in the basins
Relevance of the environmental measure to the main water and environmental issues	Hydromorphological changes. Issues related to the relationship between water quantity and quality in relation to climate change. Floods and floods, flooding of territories. Droughts and water shortages.
Implementation of environmental protection measures and their financing	Stages of the Programme implementation: Stage I - 2013-2016, Stage II - 2017-2021. The total amount of financial resources required for the implementation of the Programme is UAH 2,969,160,698 thousand, including: state budget funds - UAH 1,656,100,698 thousand, local budget funds - UAH 450,324 thousand, funds from other sources - UAH 862,736 thousand. Due to the lack of funding, many performance indicators could not be achieved. The expenditures of the regional water management department for the implementation of functional tasks, including the maintenance of the water management and reclamation complex in terms of the operation of national reclamation systems, were practically funded, and local budget funds were sufficient to address extremely urgent problems. Separate state investments were allocated to address the issue of water supply to the region's settlements that use imported water.
Achievement of set goals	was not achieved.
Name of the national target programme or fund	Odesa Regional Comprehensive Environmental Protection Programme for 2020-2021, approved by the decision of the Odesa Regional Council of 20 December 2019 No. 1165-VII
Name of the environmental protection measure of the national target programme or fund	Construction of domestic sewerage and sewage treatment facilities in the village of Vyzyrka, Liman district, Odesa region
Relevance of the environmental measure to the main water and environmental issues	Pollution by organic substances. Pollution by nutrients. Pollution by hazardous substances. MPA Adzhalitsky estuary UA_M5.8_0219
Implementation of environmental protection measures and their financing	The implementation of this measure is specified in paragraph 1.1.4. Programmes. The event will be financed from the regional budget - UAH 3,500 thousand This measure is not included in the list of activities funded in 2021-2022 under the Programme. The main executor of the event is the Department of Finance of the Regional State Administration. This event was not funded from the regional budget.
Achievement of set goals	was not achieved.

Name of the national target programme or fund	Odesa Regional Comprehensive Environmental Protection Programme for 2020-2021, approved by the decision of the Odesa Regional Council of 20 December 2019 No. 1165-VII
Name of the environmental protection measure of the national target programme or fund	Construction of wastewater treatment facilities with a capacity of 150 m3/day in Vasylivka village, Bilyayiv district, Odesa region
Relevance of the environmental measure to the main water and environmental issues	Pollution by organic substances. Pollution by nutrients. Pollution by hazardous substances Baraboi River MPA UA_M5.8.0070, UA_M5.8.0071
Implementation of environmental protection measures and their financing	The implementation of this measure is described in paragraph 1.1.5. The event will be financed from the regional budget - UAH 485.32 thousand This activity is not included in the list of activities funded in 2020-2021 under the Programme. According to the Explanatory Note to the Programme from the Department of Ecology and Natural Resources of the Odesa Regional State Administration, it is stated that due to the lack of funding from the regional budget, all other environmental measures of the Odesa Regional Comprehensive Environmental Protection Programme for 2020-2021 approved by the decision of the Odesa Regional Council of 20 December 2019 No. 1165-VII (as amended on 3 March 2020 No. 1240-VII and 10 August 2020 No. 1384-VII) were not implemented in 2020-2021. The main executor of the event is the Department of Finance of the Regional State Administration. In fact, this event was not funded.
Achievement of set goals	was not achieved.
Name of the national target programme or fund	Odesa Regional Comprehensive Environmental Protection Programme for 2020-2021, approved by the decision of the Odesa Regional Council of 20 December 2019 No. 1165-VII
Name of the environmental protection measure of the national target programme or fund	Measures to restore and maintain a favourable hydrological regime and sanitary condition of the Sarata River near the village of Petropavlivka in Sarata district
Relevance of the environmental measure to the main water and environmental issues	Hydromorphological changes. Issues related to the relationship between water quantity and quality in relation to climate change. Droughts and water shortages. Sarata river MWR UA_M5.8_0038
Implementation of environmental protection measures and their financing	The implementation of this measure is described in clause 1.2.7. The event will be financed from the regional budget - UAH 2000 thousand This measure is not included in the list of activities funded in 2020-2021 under the Programme. According to the Explanatory Note to the Programme from the Department of Ecology and Natural Resources of the Odesa Regional State Administration, it is stated that due to the lack of funding from the regional budget, all other environmental measures of the Odesa Regional Comprehensive Environmental Protection Programme for 2020-2021 approved by the decision of the Odesa Regional Council of 20 December 2019 No. 1165-VII (as amended on 3 March 2020 No. 1240-VII and 10 August 2020 No. 1384-VII) were not implemented in 2020-2021. The main executor of the event is the Department of Ecology and Natural Resources of the Regional State Administration and territorial communities. In fact, this event was not funded.
Achievement of set goals	was not achieved.

Name of the national target programme or fund	Odesa Regional Comprehensive Environmental Protection Programme for 2020-2021, approved by the decision of the Odesa Regional Council of 20 December 2019 No. 1165-VII
Name of the environmental protection measure of the national target programme or fund	Major repairs. Clearing the Sarata riverbed and protecting Petropavlivka village from flooding in Saratsky district, Odesa region
Relevance of the environmental measure to the main water and environmental issues	Littering with plastic and other solid waste Hydromorphological changes. Issues related to the relationship between water quantity and quality in relation to climate change. Floods and floods, flooding of territories Sarata river MWR UA_M5.8_0038
Implementation of environmental protection measures and their financing	The implementation of this measure is described in clause 1.2.14. The event will be financed from the regional budget - UAH 1000 thousand This activity is not included in the list of activities funded in 2020-2021 under the Programme. According to the Explanatory Note to the Programme from the Department of Ecology and Natural Resources of the Odesa Regional State Administration, it is stated that due to the lack of funding from the regional budget, all other environmental measures of the Odesa Regional Comprehensive Environmental Protection Programme for 2020-2021 approved by the decision of the Odesa Regional Council of 20 December 2019 No. 1165-VII (as amended on 3 March 2020 No. 1240-VII and 10 August 2020 No. 1384-VII) were not implemented in 2020-2021. The main executor of the event is the Department of Finance of the Regional State Administration. In fact, this event was not funded.
Achievement of set goals	was not achieved.
Name of the national target programme or fund	Odesa Regional Comprehensive Environmental Protection Programme for 2020-2021, approved by the decision of the Odesa Regional Council of 20 December 2019 No. 1165-VII
Name of the environmental protection measure of the national target programme or fund	Development of land management documentation on the organisation and establishment of boundaries of territories and objects of the nature reserve fund (NRF) and measures to enter information into the State Land Cadastre
Relevance of the environmental measure to the main water and environmental issues	Littering with plastic and other solid waste. Spread of invasive species.
Implementation of environmental protection measures and their financing	The event will be funded from the state budget - UAH 300.0 thousand, the regional budget - UAH 1,200 thousand This event is among the list of activities funded in 2020 under the Programme. According to the Explanatory Note to the Programme from the Department of Ecology and Natural Resources of the Odesa Regional State Administration, this measure is still being implemented. The main executor of the event is the Department of Ecology and Natural Resources of the Regional State Administration. In fact, this event was financed in the amount of UAH 524,948 thousand at the expense of the regional budget.
Achievement of set goals	partially.
Name of the national target programme or fund	Odesa Regional Comprehensive Environmental Protection Programme for 2020-2021, approved by the decision of the Odesa Regional Council of 20 December 2019 No. 1165-VII
Name of the environmental protection measure of the national target programme or fund	Reconstruction of the connecting channel between the Tiligul Estuary and the Black Sea in the Kominternivskyi district of Odesa region

Relevance of the environmental measure to the main water and environmental issues	Issues related to the relationship between water quantity and quality in relation to climate change. Littering with plastic and other solid waste. Spread of invasive species. MPA Tiligul estuary UA_M5.8_0220
Implementation of environmental protection measures and their financing	The implementation of this measure is specified in clause 3.8. Programmes. The event will be financed from the state budget - UAH 35557.9 thousand, from the regional budget - UAH 9 613.566 thousand. The main executors of the event are the Department of Ecology and Natural Resources of the Regional State Administration and the Municipal Enterprise "Tiligulsky Regional Landscape Park". This event was financed in 2021 from the regional budget in the amount of UAH 2170.0 thousand
Achievement of set goals	was not achieved.
Name of the national target programme or fund	Regional Programme for the Development of Land Relations and Land Protection for 2016-2020, approved by the Odesa Regional Council on 21 December 2015, No. 39-VII.
Name of the environmental protection measure of the national target programme or fund	Rational use and protection of land resources.
Relevance of the environmental measure to the main water and environmental issues	Pollution by nutrients.
Implementation of environmental protection measures and their financing	The total amount of financial resources required for the implementation of the Programme is UAH 40870.8 thousand, all at the expense of the local budget and the oblast budget. In 2019, UAH 4,079.72 thousand was allocated from the regional budget for the implementation of the Programme's activities. Unfortunately, the work on this project, including the surveying of the land fund boundaries, started in 2017 and was not completed due to lack of funding.
Achievement of set goals	not achieved
Name of the national target programme or fund	The Regional Programme "Drinking Water of Odesa Region" for 2021-2024 was approved by the decision of the Odesa Regional Council of 16 April 2021 No. 141-VIII.
Name of the environmental protection measure of the national target programme or fund	Improvement of drinking water supply sources
Relevance of the environmental measure to the main water and environmental issues	Pollution by organic substances. Pollution by nutrients. Pollution by hazardous substances.
Implementation of environmental protection measures and their financing	The programme focuses on the protection of drinking water sources. The indicator of the measure is the number of water intakes where sanitary protection zones for drinking water sources will be improved. According to the programme, there should be 88 such water intakes. The event is planned to be implemented in stages: 2021 - 12 water intakes, 2022 - 24, 2023 - 26 and 2024 - 26 water intakes. The event is funded from district and city budgets (UAH 16,400.0), as well as from the budgets of villages, towns, cities of district significance, territorial communities (UAH 13,100.0), and other sources (UAH 20,000.0). As of the end of 2021, the planned event was partially completed due to insufficient funding.

Achievement of set goals	In the process of implementation
Name of the national target programme or fund	The Regional Programme "Drinking Water of Odesa Region" for 2021-2024 was approved by the decision of the Odesa Regional Council of 16 April 2021 No. 141-VIII.
Name of the environmental protection measure of the national target programme or fund	Construction and reconstruction of water intake facilities using the latest technologies and equipment
Relevance of the environmental measure to the main water and environmental issues	Pollution by organic substances. Pollution by nutrients. Pollution by hazardous substances.
Implementation of environmental protection measures and their financing	The programme focuses on the protection of drinking water sources. The indicator of the measure is the number of water intake structures to be built and reconstructed. According to the programme, there should be 253 such water intake structures. The event is planned to be implemented in stages: 2021 - 36 structures, 2022 - 59, 2023 - 68 and 2024 - 90 structures. The event is financed from district and city budgets (UAH 34,500.0), as well as from the budgets of villages, towns, cities of district significance, territorial communities (UAH 11,700.0), and other sources (UAH 48,300.0). As of the end of 2021, the planned event was partially completed due to insufficient funding.
Achievement of set goals	In the process of implementation
Name of the national target programme or fund	The Regional Programme "Drinking Water of Odesa Region" for 2021-2024 was approved by the decision of the Odesa Regional Council of 16 April 2021 No. 141-VIII.
Name of the environmental protection measure of the national target programme or fund	Implementation of drinking water treatment plants in centralised water supply systems, primarily for water supply to pre-schools, schools and hospitals, particularly in rural areas, and arrangement of drinking water bottling points with delivery by special vehicles
Relevance of the environmental measure to the main water and environmental issues	Pollution by organic substances. Pollution by nutrients.
Implementation of environmental protection measures and their financing	The programme's objective is to bring the quality of drinking water to the established standards. The indicator of the measure is the number of drinking water treatment stations (facilities) in centralised drinking water supply systems and drinking water bottling points to be implemented. According to the programme, there should be 36 such stations (installations). The implementation of the measure is planned in stages: 2021 - 0 structures, 2022 - 9, 2023 - 11 and 2024 - 18 stations. The event is financed from the state budget (UAH 9,000.0), district and city budgets (UAH 33,000.0), as well as from the budgets of villages, towns, cities of district significance, territorial communities (UAH 49,500.0), and other sources (UAH 7,600.0). In 2021, according to the Programme, this measure was not funded.
Achievement of set goals	In the process of implementation
Name of the national target programme or fund	The Regional Programme "Drinking Water of Odesa Region" for 2021-2024 was approved by the decision of the Odesa Regional Council of 16 April 2021 No. 141-VIII.
Name of the environmental protection measure of the national target programme or fund	Inventory of sewage treatment plants
Relevance of the environmental measure to the main water and environmental issues	Pollution by organic substances. Pollution by nutrients. Pollution by hazardous substances.

Implementation of environmental protection measures and their financing	The programme's objective is to bring the quality of drinking water to the established standards. The indicator of the measure is the number of sewage treatment plants to be inventoried. According to the programme, there should be 15 such treatment facilities. The measure is planned to be implemented in stages: 2021 - 0 structures, 2022 - 2, 2023 - 4 and 2024 - 9 structures. The event is funded from district and city budgets (UAH 2,000.0), as well as from the budgets of villages, towns, cities of district significance, territorial communities (UAH 3,300.0), and other sources (UAH 4,500.0). In 2021, according to the Programme, this measure was not funded.
Achievement of set goals	In the process of implementation
Name of the national target programme or fund	The Regional Programme "Drinking Water of Odesa Region" for 2021-2024 was approved by the decision of the Odesa Regional Council of 16 April 2021 No. 141-VIII.
Name of the environmental protection measure of the national target programme or fund	Construction and reconstruction of water and sewage treatment facilities using the latest technologies and equipment
Relevance of the environmental measure to the main water and environmental issues	Pollution by organic substances. Pollution by nutrients. Pollution by hazardous substances.
Implementation of environmental protection measures and their financing	The programme's objective is to bring the quality of drinking water to the established standards. The indicator of the measure is the number of treatment facilities to be built and reconstructed. According to the programme, there should be 14 such treatment facilities. The event is planned to be implemented in stages: 2021 - 1 structure, 2022 - 3 structures, 2023 - 5 structures and 2024 - 5 structures. The event is funded from the state budget (UAH 260,000.0), district and city budgets (UAH 90,000.0), as well as from the budgets of villages, towns, cities of district significance, territorial communities (UAH 44,600.0), and other sources (UAH 42,000.0). As of the end of 2021, the planned event was partially completed due to insufficient funding.
Achievement of set goals	In the process of implementation
Name of the national target programme or fund	The Regional Programme "Drinking Water of Odesa Region" for 2021-2024 was approved by the decision of the Odesa Regional Council of 16 April 2021 No. 141-VIII.
Name of the environmental protection measure of the national target programme or fund	Development of schemes for optimising the operation of centralised water supply and sewage systems
Relevance of the environmental measure to the main water and environmental issues	Pollution by organic substances. Pollution by nutrients. Pollution by hazardous substances.
Implementation of environmental protection measures and their financing	The programme's objective is to bring the quality of drinking water to the established standards. The indicator of the measure is the number of schemes for optimising the operation of centralised water supply and sewerage systems to be developed. According to the programme, there should be 22 such schemes. The event is planned to be implemented in stages: 2021 - 2 schemes, 2022 - 6, 2023 - 6 and 2024 - 8 schemes.

	The event is funded from district and city budgets (UAH 40,200.0), as well as from the budgets of villages, towns, cities of district significance, territorial communities (UAH 12,400.0), and other sources (UAH 8,210.0). As of the end of 2021, the planned event was partially completed due to insufficient funding.
Achievement of set goals	In the process of implementation
Name of the national target programme or fund	The Regional Programme "Drinking Water of Odesa Region" for 2021-2024 was approved by the decision of the Odesa Regional Council of 16 April 2021 No. 141-VIII.
Name of the environmental protection measure of the national target programme or fund	Equipping water and wastewater quality control laboratories with modern control and analytical equipment
Relevance of the environmental measure to the main water and environmental issues	Pollution by organic substances. Pollution by nutrients. Pollution by hazardous substances.
Implementation of environmental protection measures and their financing	The programme's objective is to bring the quality of drinking water to the established standards. The number of laboratories that will be equipped with modern equipment is an indicator of the measure's implementation. According to the programme, there should be 8 such treatment laboratories. The event is planned to be implemented in stages: 2021 - 0 laboratories, 2022 - 2, 2023 - 3 and 2024 - 3 laboratories. The event is financed entirely from other sources (UAH 8,500.0). In 2021, according to the Programme, this measure was not funded.
Achievement of set goals	In the process of implementation
Name of the national target programme or fund	The Regional Programme "Drinking Water of Odesa Region" for 2021-2024 was approved by the decision of the Odesa Regional Council of 16 April 2021 No. 141-VIII.
Name of the environmental protection measure of the national target programme or fund	Construction, reconstruction and repair of centralised water supply networks
Relevance of the environmental measure to the main water and environmental issues	Pollution by organic substances. Pollution by nutrients. Pollution by hazardous substances.
Implementation of environmental protection measures and their financing	The programme's focus area is Improving the provision of centralised water supply and sewerage. The measure of the measure is the length of centralised water supply networks to be built, reconstructed and repaired. According to the programme, the length of such networks will be 478 km. The event is planned to be implemented in stages: 92 km in 2021, 126 km in 2022, 130 km in 2023 and 130 km in 2024. The event is financed from the state budget (UAH 115,000.0), district and city budgets (UAH 56,000.0), as well as from the budgets of villages, towns, cities of district significance, territorial communities (UAH 118,000.0), and other sources (UAH 72,000.0). As of the end of 2021, the planned event was partially completed due to insufficient funding.
Achievement of set goals	In the process of implementation
Name of the national target programme or fund	The Regional Programme "Drinking Water of Odesa Region" for 2021-2024 was approved by the decision of the Odesa Regional Council of 16 April 2021 No. 141-VIII.
Name of the environmental protection measure of the national target programme or fund	Construction, reconstruction, and repair of centralised sewerage networks.

Relevance of the environmental measure to the main water and environmental issues	Pollution by organic substances. Pollution by nutrients. Pollution by hazardous substances.
Implementation of environmental protection measures and their financing	The programme's focus area is Improving the provision of centralised water supply and sewerage. The measure of the measure is the length of centralised sewage networks to be built, reconstructed and repaired. According to the programme, the length of such networks will be 165 km. The event is planned to be implemented in stages: 2021 - 26 km, 2022 - 42 km, 2023 - 46 km and 2024 - 51 km. The event is funded from the state budget (UAH 107,500.0), district and city budgets (UAH 42,000.0), as well as from the budgets of villages, towns, cities of district significance, territorial communities (UAH 15,800.0), and other sources (UAH 49,700.0). As of the end of 2021, the planned event was partially completed due to insufficient funding.
Achievement of set goals	In the process of implementation
Name of the national target programme or fund	The Regional Programme "Drinking Water of Odesa Region" for 2021-2024 was approved by the decision of the Odesa Regional Council of 16 April 2021 No. 141-VIII.
Name of the environmental protection measure of the national target programme or fund	Overhaul and reconstruction of pumping stations.
Relevance of the environmental measure to the main water and environmental issues	Pollution by organic substances. Pollution by nutrients. Pollution by hazardous substances.
Implementation of environmental protection measures and their financing	The programme's focus area is Improving the provision of centralised water supply and sewerage. The number of stations to be overhauled and reconstructed is an indicator of the measure's implementation. According to the programme, there will be 24 such stations. The event is planned to be implemented in stages: 2021 - 4 stations, 2022 - 6, 2023 - 6 and 2024 - 8 stations. The event is financed from district and city budgets (UAH 12,100.0), as well as from the budgets of villages, towns, cities of district significance, territorial communities (UAH 11,500.0), and other sources (UAH 10,800.0). As of the end of 2021, the planned event was partially completed due to insufficient funding.
Achievement of set goals	In the process of implementation
Name of the national target programme or fund	The Regional Programme for the Conservation and Restoration of Water Resources in the Kuyalnik Estuary Basin for 2019-2023 was approved by the Regional Council's decision No. 1095-VII dated 25 October 2019.
Name of the environmental protection measure of the national target programme or fund	Measures for hydro-ecological rehabilitation of the Kuyalnyk Estuary basin, including the watercourses that feed it
Relevance of the environmental measure to the main water and environmental issues	Pollution by organic substances. Pollution by nutrients. Pollution by hazardous substances. Littering with plastic and other solid waste. Hydromorphological changes.

	Spread of invasive species. Issues related to the relationship between water quantity and quality in relation to climate change. Droughts and water shortages. Velykyi Kuyalnyk River MPAs UA_M5.8_0091, UA_M5.8_0092, UA_M5.8_0093, UA_M5.8_0094, UA_M5.8_0095, UA_M5.8_0096, UA_M5.8_0097 Sukha Zhuravka River MPA UA_M5.8_0100 MNR Yar Dubovyi UA_M5.8.0101, UA_M5.8.0102 Dovboka River WMP UA_M5.8_0109 Kubanka River MPA UA_M5.8_0110, UA_M5.8_0111 Sukha Zhuravka river MWR UA_M5.8.0098, UA_M5.8.0099 Koshkivka river MWP UA_M5.8_0106 MPA Kuyalnik estuary UA_M5.8_0217
Implementation of environmental protection measures and their financing	The programme was designed for 5 years in 2 stages: Stage 1 - 2019-2020, Stage 2 - 2021-2023. The total cost of the Programme implementation amounted to UAH 555677.849 thousand, the state budget - UAH 368300.00 thousand, the oblast budget - UAH 65280.00 thousand, local district, city (cities of oblast significance) budgets - UAH 50.00 thousand, other non-budgetary sources - UAH 122047.849 thousand. The following activities were funded from the regional budget in 2020-2021: Development of design and estimate documentation for restoration and maintenance of favourable hydrological and sanitary conditions of the Velykyi Kuyalnyk River, other watercourses and the Kuyalnyi Estuary - UAH 19030.0 thousand planned expenditures, UAH 1230.0 thousand financed; scientific research of the hydroecological regime and condition of the Kuyalnyk Estuary and sea water from the Gulf of Odesa (hydrological, hydrochemical, hydrobiological and medical-biological survey) - UAH 11100.0 thousand planned and UAH 1476.0 thousand financed; Thus, the planned activities were partially implemented due to insufficient funding.
Achievement of set goals	In the process of implementation
Name of the national target programme or fund	The Regional Water Development Programme for Mykolaiv Oblast for 2019-2021, approved by the decision of the Mykolaiv Oblast Council of 21 December 2018, No. 35.
Name of the programme or fund's environmental measure	Ensuring the development of land reclamation and improvement of the ecological condition of irrigated land; priority provision of centralised water supply to rural settlements that use imported drinking water; inventory and certification of water bodies, mapping and arrangement of river coastal protection strips; protection of rural settlements and agricultural land from the harmful effects of water.
Relevance of the environmental measure to the main water and environmental issues	Hydromorphological changes. Issues related to the relationship between water quantity and quality in relation to climate change. Floods and floods, flooding of territories. Droughts and water shortages.
Implementation of environmental protection measures and their financing	The total amount of financial resources required for the implementation of the Programme is UAH 4369.44 million, including: state budget funds - UAH 966.49 million, local budget funds - UAH 200.68 million, funds from other sources - UAH 3202.27 million Due to the lack of funding, many performance indicators could not be achieved. The expenses of the Regional Water Resources Office in Mykolaiv Oblast were practically funded for the implementation of

	functional tasks, in particular, the maintenance of the water management and reclamation complex in terms of operation of the national reclamation systems, and local budget funds were sufficient to address extremely urgent problems. Separate state investments were allocated to address the issue of water supply to the region's settlements that use imported water. Actually financed for the implementation of the Programme activities, a total of UAH 1135.187 million, including: state budget funds - UAH 844.747 million, local budget funds - UAH 65 million, funds from other sources - UAH 225.44 million
Achievement of set goals	Partially.
Name of the national target programme or fund	Regional Comprehensive Environmental Protection Programme of Mykolaiv Oblast for 2021-2027, approved by the decision of the Mykolaiv Oblast Council of 23 December 2020 No. 16.
Name of the environmental protection measure of the national target programme or fund	Development and implementation of measures to preserve small rivers and/or springs (Sosyk river of local importance, Berezansky district, Mykolaiv region).
Relevance of the environmental measure to the main water and environmental issues	Hydromorphological changes. Issues related to the relationship between water quantity and quality in relation to climate change. Droughts and water shortages. Sosik River MPA UA_M5.8_0176
Implementation of environmental protection measures and their financing	The implementation of this measure is specified in clause 7.2 of the Programme. The event is to be financed from the regional budget, in accordance with Article 85 of the Budget Code of Ukraine - UAH 5,020 thousand. This event is among the list of activities financed in 2021 -2022 under the Programme. The main executor of the event is the Department of Ecology and Water Resources of the Mykolaiv Regional State Administration. The works are completed. UAH 8132.49 thousand was actually disbursed The water content of the small Sosyk River, which flows into the Berezanka Estuary, was restored over a 1.5 km stretch within the Berezanka village: the riverbed was cleared of silt and reeds, bank slopes were formed, the coastal zone was landscaped, and grass and trees were planted.
Achievement of set goals	Achieved.
Name of the national target programme or fund	Regional Comprehensive Environmental Protection Programme of Mykolaiv Oblast for 2021-2027, approved by the decision of the Mykolaiv Oblast Council of 23 December 2020 No. 16.
Name of the environmental protection measure of the national target programme or fund	Reconstruction of sewage treatment facilities in Berezanka, Mykolaiv region (including preparation of design and estimate documentation and expert evaluation).
Relevance of the environmental measure to the main water and environmental issues	Pollution by organic substances. Pollution by nutrients. Pollution by hazardous substances. Sosik River MPA UA_M5.8_0176
Implementation of environmental protection measures and their financing	The implementation of this measure is specified in paragraph 1.19 of the Programme. The event will be financed from the state budget - UAH 7110 thousand and the local budget - UAH 1590 thousand. This measure is not included in the list of activities funded in 2021-2022 under the Programme. The main organisers of the event are the Capital Construction Department of Mykolaiv Regional State Administration and the executive bodies of Berezan Village Council (as agreed).

	In 2021, the working draft was adjusted with the recalculation of the estimate documentation to current prices for the "Reconstruction of wastewater treatment facilities in Berezanka, Mykolaiv region" at the expense of the local budget - UAH 156,306 thousand This event was not funded from the state budget.
Achievement of set goals	Not achieved.
Name of the national target programme or fund	Regional Comprehensive Environmental Protection Programme for Mykolaiv Oblast for 2021-2027, approved by the decision of the Mykolaiv Oblast Council of 23 December 2020 No. 16.
Name of the environmental protection measure of the national target programme or fund	Conducting a study of the ecological state of the Berezanskyi estuary in the area of the dam near the village of Rivne of the Chornomorskaya rural territorial community of the Mykolaiv district of the Mykolaiv region, assessing its conservation value.
Relevance of the environmental measure to the main water and environmental issues	Hydromorphological changes. Issues related to the relationship between water quantity and quality in relation to climate change. Droughts and water shortages. MPA Berezansky estuary UA_M5.8_0222
Implementation of environmental protection measures and their financing	The implementation of this measure is specified in clause 7.3 of the Programme. The event is to be financed from the regional budget, in accordance with Article 85 of the Budget Code of Ukraine - UAH 400 thousand This measure is not included in the list of activities funded in 2021-2022 under the Programme. The main executor of the event is the Department of Ecology and Water Resources of the Mykolaiv Regional State Administration. In fact, this event was not funded.
Achievement of set goals	Not achieved.
Name of the national target programme or fund	The Regional Regional Programme "Drinking Water of Mykolaiv Region" for 2021-2025 was approved by the decision of the Mykolaiv Regional Council of 29 September 2021 No. 4.
Name of the environmental protection measure of the national target programme or fund	Improvement of sanitary protection zones for drinking water sources.
Relevance of the environmental measure to the main water and environmental issues	Pollution by organic substances. Pollution by nutrients. Pollution by hazardous substances.
Implementation of environmental protection measures and their financing	The implementation of this measure is specified in paragraph 1.2 of the Programme. The indicator of the measure is the number of water intakes where sanitary protection zones for drinking water sources will be improved. According to the programme, there should be 28 such water intakes. The measure is planned to be implemented in stages: 2021 - 13 water intakes, 2022 - 4, 2023 - 5, 2024 - 3 and 2025 - 3 water intakes. The event will be financed from local budgets - UAH 10.55 million As of 01.01.2022, there are no implemented projects under this measure within the Black Sea river basin.
Achievement of set goals	In the process of implementation.
Name of the national target programme or fund	The Regional Regional Programme "Drinking Water of Mykolaiv Region" for 2021-25 was approved by the decision of the Mykolaiv Regional Council of 29 September 2021 No. 4.
Name of the environmental protection measure of the national target programme or fund	Construction, reconstruction and repair of water intake facilities using the latest technologies and equipment.

Relevance of the environmental measure to the main water and environmental issues	Pollution by organic substances. Pollution by nutrients. Pollution by hazardous substances.
Implementation of environmental protection measures and their financing	The implementation of this measure is specified in paragraph 1.1 of the Programme. The programme focuses on the protection of drinking water sources. The indicator of the measure is the number of water intake structures to be built, reconstructed or repaired. According to the programme, there should be 37 such water intake structures. The event is planned to be implemented in stages: 2021 - 15 structures, 2022 - 7, 2023 - 7, 2024 - 4 and 2025 - 4 structures. The event is to be financed from the state budget - UAH 37.33 million, the local budget - UAH 29.04 million, and extra-budgetary funds - UAH 16.59 million. In 2021, projects under this measure were implemented within the Black Sea river basin in the settlements of the Chornomorskaya rural territorial community at the expense of the local budget in the amount of UAH 288,185 thousand As of 01.01.2022, the planned action was partially completed due to insufficient funding.
Achievement of set goals	In the process of implementation.
Name of the national target programme or fund	The Regional Regional Programme "Drinking Water of Mykolaiv Region" for 2021-2025 was approved by the decision of the Mykolaiv Regional Council of 29 September 2021 No. 4.
Name of the environmental protection measure of the national target programme or fund	Implementation of drinking water treatment stations (facilities) in centralised water supply systems, primarily for water supply to pre-school and general secondary education institutions, healthcare facilities, particularly in rural areas, and arrangement of drinking water bottling points with delivery by special vehicles.
Relevance of the environmental measure to the main water and environmental issues	Pollution by organic substances. Pollution by nutrients.
Implementation of environmental protection measures and their financing	The implementation of this measure is specified in paragraph 2.1 of the Programme. The programme is aimed at bringing the quality of drinking water to the established standards. The indicator of the measure is the number of drinking water treatment stations (facilities) in centralised drinking water supply systems and drinking water bottling points to be implemented. According to the programme, there should be 32 such stations (installations). The event is planned to be implemented in stages: 2021 - 5 structures, 2022 - 5, 2023 - 5, 2024 - 7 and 2025 - 10 structures. The event will be financed from the state budget - UAH 1.13 million, the local budget - UAH 0.75 million and extra-budgetary funds - UAH 1.5 million. As of 01.01.2022, there are no implemented projects under this measure within the Black Sea river basin.
Achievement of set goals	In the process of implementation.
Name of the national target programme or fund	The Regional Regional Programme "Drinking Water of Mykolaiv Region" for 2021-2025 was approved by the decision of the Mykolaiv Regional Council of 29 September 2021 No. 4.
Name of the environmental protection measure of the national target programme or fund	Construction, reconstruction and repair of water and sewage treatment facilities.
Relevance of the environmental measure to the main water and environmental issues	Pollution by organic substances. Pollution by nutrients. Pollution by hazardous substances.

Implementation of environmental protection measures and their financing	The implementation of this measure is specified in paragraph 3.1 of the Programme. The programme is aimed at bringing the quality of drinking water to the established standards. The indicator of the measure is the number of water intake structures to be built, reconstructed or repaired. According to the programme, there should be 13 such water intake structures. The event is planned to be implemented in stages: 2021 - 4 structures, 2022 - 1, 2023 - 1, 2024 - 4 and 2025 - 3 structures. The event is to be financed from the state budget - UAH 396.35 million, the local budget - UAH 308.27 million and extra-budgetary funds - UAH 176.15 million. As of 01.01.2022, there are no implemented projects under this measure within the Black Sea river basin.
Achievement of set goals	In the process of implementation.
Name of the national target programme or fund	The Regional Regional Programme "Drinking Water of Mykolaiv Region" for 2021-2025 was approved by the decision of the Mykolaiv Regional Council of 29 September 2021 No. 4.
Name of the environmental protection measure of the national target programme or fund	Construction, reconstruction and repair of water supply and sewerage networks.
Relevance of the environmental measure to the main water and environmental issues	Pollution by organic substances. Pollution by nutrients. Pollution by hazardous substances.
Implementation of environmental protection measures and their financing	The implementation of this measure is specified in paragraph 3.2 of the Programme. The programme is aimed at bringing the quality of drinking water to the established standards. The measure is the number of networks (km) to be built, reconstructed or repaired. According to the programme, there should be 179 km of such networks. The event is planned to be implemented in stages: 2021 - 34 km, 2022 - 50 km, 2023 - 27 km, 2024 - 32 km and 2025 - 36 km. The event is to be financed from the state budget - UAH 252.33 million, the local budget - UAH 196.26 million and extra-budgetary funds - UAH 112.15 million. As of 01.01.2022, there are no implemented projects under this measure within the Black Sea river basin.
Achievement of set goals	In the process of implementation.
Name of the national target programme or fund	The Regional Regional Programme "Drinking Water of Mykolaiv Region" for 2021-2025 was approved by the decision of the Mykolaiv Regional Council of 29 September 2021 No. 4.
Name of the environmental protection measure of the national target programme or fund	Carrying out systematic annual maintenance and overhaul of water supply and sewerage networks.
Relevance of the environmental measure to the main water and environmental issues	Pollution by organic substances. Pollution by nutrients. Pollution by hazardous substances.
Implementation of environmental protection measures and their financing	The implementation of this measure is specified in paragraph 3.3 of the Programme. The programme is aimed at bringing the quality of drinking water to the established standards. The measure is measured by the number of water supply and sewerage networks that have been repaired and overhauled (km). According to the programme, there should be 100 km of such networks. The event is planned to be implemented in stages: 2021 - 20 km, 2022 - 20, 2023 - 20, 2024 - 20 and 2025 - 20 km. The event will be financed from the local budget - UAH 0.5 million and from extra-budgetary funds - UAH 0.5 million

	In 2021, projects under this measure were implemented within the Black Sea river basin in the settlements of the Berezanska settlement territorial community at the expense of the local budget in the amount of UAH 360,707 thousand As of 01.01.2022, the planned action was partially completed due to insufficient funding.
Achievement of set goals	In the process of implementation.
Name of the national target programme or fund	The Regional Regional Programme "Drinking Water of Mykolaiv Region" for 2021-2025 was approved by the decision of the Mykolaiv Regional Council of 29 September 2021 No. 4.
Name of the environmental protection measure of the national target programme or fund	Implementation of commercial water metering devices.
Relevance of the environmental measure to the main water and environmental issues	Issues related to the relationship between water quantity and quality in relation to climate change.
Implementation of environmental protection measures and their financing	The implementation of this measure is specified in paragraph 3.4 of the Programme. The measure is measured by the number of commercial water metering devices (units). According to the programme, there should be 3,500 such networks. The measure is planned to be implemented in stages: 2021 - 700 units, 2022 - 700 units, 2023 - 700 units, 2024 - 700 units and 2025 - 700 units. The event is to be financed from the local budget - UAH 19.9 million and from extra-budgetary funds - UAH 15.0 million As of 01.01.2022, 93.5% of residential buildings and 98.3% of non-residential buildings were equipped with commercial water meters. According to this indicator, Mykolaiv region ranks 1st and 5th in Ukraine, respectively.
Achievement of set goals	In the process of implementation.

Annex 11. Full list of mesures presented separately in Excel format

Annex 12 Cost-effectiveness analysis of the PoM

№	Name of the measure	Level of efficiency	Description of the level of efficiency	SWMI	Success rate	Pressure from the water sector	Number of people affected by the measure *thousands of people*	Social efficiency	Total cost of investment *million UAH*	Value for money
1	**2**	**3**	4	**5**	**6**	**7**	*8*	**9**	*10*	**11**
64	Reconstruction of STP in Odesa, Odesa region	4,25	high	SWMI 1, SWMI 2, SWMI 3	3	5	993,1	4	17874	5
57	Reconstruction of STP, deep-water outlet of STP and sewage collectors from the SPS to the existing STP in the city of Odesa. Chornomorsk, Odesa rayon Odesa oblast	4	high	SWMI 1, SWMI 2, SWMI 3	3	5	64,1	3	1155	5
26	Reconstruction of STP in Podilsk Podilska community Podilskyi district, Odesa region	3,5	high	SWMI 1, SWMI 2, SWMI 3	3	5	43,9	2	790,8	4
55	Reconstruction of STP in village Kalanchak community Skadovsk district, Kherson region	3,5	high	SWMI 1, SWMI 2, SWMI 3	3	5	34,7	2	624,6	4
1	Reconstruction of STP for full biological treatment in Artsyz, Artsyzka community, Bolhrad district, Odesa region	3,25	medium	SWMI 1, SWMI 2, SWMI 3	3	5	10,9	2	196,2	3
17	Reconstruction of sewerage networks and construction of STP in Teplodar, Teplodarska community, Odesa district, Odesa region	3,25	medium	SWMI 1, SWMI 2, SWMI 3	3	5	10,1	2	181,8	3
63	Reconstruction of STP in Skadovsk Skadovska community Skadovsk district, Kherson region	3,25	medium	SWMI 1, SWMI 2, SWMI 3	3	5	19	2	342	3
12	Construction of new modern complete sewage pumping stations and construction of STP and SN in the village of Uspenka. Uspenivska community, Bilhorod-Dnistrovskyi district, Odesa region	3	medium	SWMI 1, SWMI 2, SWMI 3	3	5	7,1	1	127,8	3
15	Construction of STP and SN in the village Starokozache, Starokozatska community, Bilhorod-Dnistrovskyi district, Odesa region	3	medium	SWMI 1, SWMI 2, SWMI 3	3	5	5,1	1	133,5	3
38	Reconstruction of STP in Ananiev Ananievska community Podilskyi district, Odesa region	3	medium	SWMI 1, SWMI 2, SWMI 3	3	5	9	1	72,1	3

№	Name of the measure	Level of efficiency	Description of the level of efficiency	SWMI	Success rate	Pressure from the water sector	Number of people affected by the measure *thousands of people*	Social efficiency	Total cost of investment *million UAH*	Value for money
62	Reconstruction of STP in Lazurne village Lazurnenska community Skadovsk district, Kherson region	3	medium	SWMI 1, SWMI 2, SWMI 3	3	5	6,5	1	52	3
8	Reconstruction of STP in Sarata village Saratska community Bilhorod-Dnistrovskyi district, Odesa region	2,75	medium	SWMI 1, SWMI 2, SWMI 3	3	5	6	1	48,1	2
11	Construction of new modern complete sewage pumping stations, sewerage networks and sewage treatment plants in Kulevchany village, Kulevchanska community, Bilhorod-Dnistrovskyi district, Odesa region	2,75	medium	SWMI 1, SWMI 2, SWMI 3	3	5	4,9	1	39,2	2
25	Reconstruction of STP in Ivanivka village, Ivanivska community Berezivskyi district, Odesa region	2,75	medium	SWMI 1, SWMI 2, SWMI 3	3	5	2,4	1	19,2	2
40	Construction of sewage treatment plants and sewerage networks in Berezivka. Berezivska community Berezivskyi district Odesa region	2,75	medium	SWMI 1, SWMI 2, SWMI 3	3	5	3,5	1	28	2
49	Reconstruction of STP in Berezanka village Berezanska community Mykolaiv district, Mykolaiv region	2,75	medium	SWMI 1, SWMI 2, SWMI 3	3	5	4,2	1	33,6	2
65	Reconstruction of STP in Naberezhne Usativska village, Odesa district, Odesa region	2,75	medium	SWMI 1, SWMI 2, SWMI 3	3	5	0,8	1	6,4	2
66	Comprehensive environmental project for the restoration of the Kuyalnyk Estuary within Odesa and Usativska communities of Odesa district, Odesa region	2,5	medium	SWMI 4	1	1	1008	5	348,3	3
67	Improvement of state water accounting in the Black Sea river basin within Odesa, Mykolaiv and Kherson regions	2,25	low	SWMI 4, SWMI 6, SWMI 9	3	3	0	1	47,943	2
37	Revitalisation of the Tiligul River Berezivska community, Raukhivska community, Mykolayivska community, Andriyevo-Ivanivska community Berezivskyi rayon, Ananivska community, Podilska community Podilskyi rayon Odesa oblast	2,25	low	SWMI 4	1	1	91,5	3	595	4
4	Revitalisation of the Kogylnyk River within Tarutynska COMMUNITY , Artsyzka community, Pavlivska community, Teplytska community of Bolhradskyi district of Odesa region	2	low	SWMI 4	1	1	62,8	3	265,3	3

№	Name of the measure	Level of efficiency	Description of the level of efficiency	SWMI	Success rate	Pressure from the water sector	Number of people affected by the measure *thousands of people*	Social efficiency	Total cost of investment *million UAH*	Value for money
27	Revitalisation of the Sukha Zhuravka River, a tributary of the V.Kuyalnyk River Kuyalnytsia community, Ananivska community Podilskyi district and Shyriayivska community Berezivskyi district Odesa region	2	low	SWMI 4	1	1	75	3	154	3
53	Establishment of water protection zones and bank protective strips of water bodies on the territory of Kalanchak community Skadovsk district, Kherson region	1,75	low	SWMI 2, SWMI 4	2	1	0	1	182	3
3	Revitalisation of the Kogylnyk River within the Tatarbunary community of Bilhorod-Dnistrovskyi district, Odesa region	1,75	low	SWMI 4	1	1	24,2	2	54,95	3
7	Revitalisation of the Sarata River Petropavlivska, Saratska, Plakhtiyivska, Tatarbunarska, Lymanska community Bilhorod-Dnistrovskyi district	1,75	low	SWMI 4	1	1	25,58	2	372,05	3
10	Revitalisation of the Khadzhider River within Uspenivska, Diviziyska, Kulevchanska community Bilhorod-Dnistrovskyi district, Odesa region	1,75	low	SWMI 4	1	1	18,6	2	144,9	3
14	Revitalisation of the Alkaliya River Marazliyivska community, Starokozatska community Bilhorod-Dnistrovskyi district, Odesa region	1,75	low	SWMI 4	1	1	25,58	2	219,8	3
18	Revitalisation of the Baraboy River Dalnytska community Odesa district Odesa region	1,75	low	SWMI 4	1	1	13,8	2	79,73	3
19	Revitalisation of the Malyi Kuyalnyk River Tsebrykivska community, Zatyshanska community Rozdilnyansky district, Odesa region	1,75	low	SWMI 4	1	1	12,2	2	159,25	3
24	Revitalisation of the Velykyi Kuyalnyk River Shyriayivska community Berezivskyi district, Odesa region	1,75	low	SWMI 4	1	1	17,4	2	66,9	3
29	Revitalisation of the Dubovyi Yar, a tributary of the V.Kuyalnyk River Konoplyanska community, Rozkvitivska COMMUNITY Berezivskyi district, Odesa region	1,75	low	SWMI 4	1	1	10,4	2	55	3
30	Revitalisation of unnamed beams, tributaries of the V.Kuyalnyk River Ivanivska community, Konoplyanska community Berezivskyi district, Odesa oblast	1,75	low	SWMI 4	1	1	18,3	2	66,75	3

№	Name of the measure	Level of efficiency	Description of the level of efficiency	SWMI	Success rate	Pressure from the water sector	Number of people affected by the measure *thousands of people*	Social efficiency	Total cost of investment *million UAH*	Value for money
31	Revitalisation of the Koshkivka River, a tributary of the V.Kuyalnyk River Konoplyanska community, Rozkvitivska community, Velykobuyalytska community Berezivskyi district	1,75	low	SWMI 4	1	1	16,6	2	160,65	3
39	Establishment of water protection zones and coastal protective strips of water bodies on the territory of Znamianska, Chohodariyivska, Ivanivska, Petrovirivska COMMUNITY , Shyriayivska COMMUNITY , Konoplyanska community , Raukhivska COMMUNITY , Berezivska COMMUNITY , Stryukivska COMMUNITY , Staromayakivska COMMUNITY , Novokalchevska COMMUNITY , Andriyevo-Ivanivska COMMUNITY in Berezivskyi district of Odesa region	1,5	low	SWMI 2, SWMI 4	2	1	0	1	3,96	2
6	Revitalisation of the Fontanka River Tatarbunarska COMMUNITY Bilhorod-Dnistrovskyi district, Odesa region	1,5	low	SWMI 4	1	1	24,2	2	37,85	2
20	Revitalisation of the Malyi Kuyalnyk River Znamianska COMMUNITY Berezivskyi district, Odesa region	1,5	low	SWMI 4	1	1	9,5	1	101,5	3
28	Revitalisation of an unnamed gully, a tributary of the Yar Dubovyi River on the tributary of the V. Kuyalnyk River Konoplyanska COMMUNITY Berezivskyi District Odesa Region	1,5	low	SWMI 4	1	1	5,5	1	59,75	3
47	Establishment of water protection zones and coastal protection strips for water bodies in 8 COMMUNITY s of Mykolaiv district and Voznesenka district Mykolaiv region	1,5	low	SWMI 2, SWMI 4	2	1	0	1	4,32	2
32	Revitalisation of the B. Raykova River (a tributary of the Koshkivka River), V. Kuyalnyk River basin Ivanivska COMMUNITY i, Konoplyanska COMMUNITY , Velykobuyalytska COMMUNITY Berezivskyi district, Odesa region	1,5	low	SWMI 4	1	1	19,9	2	39,3	2
35	Cleaning of the Fontanska water reservoir Odesa district, Odesa region	1,5	low	SWMI 4	1	1	18	2	15,96	2
36	Revitalisation of the Hlyboka Balka stream (Svitloe village) Fontanska COMMUNITY Odesa rayon, Odesa oblast	1,5	low	SWMI 4	1	1	18	2	24,5	2

№	Name of the measure	Level of efficiency	Description of the level of efficiency	SWMI	Success rate	Pressure from the water sector	Number of people affected by the measure *thousands of people*	Social efficiency	Total cost of investment *million UAH*	Value for money
45	Revitalisation of the Zhuravka River Stryukivska COMMUNITY Berezivskyi district, Odesa region	1,5	low	SWMI 4	1	1	2,8	1	59,5	3
50	Revitalisation of the Sosyk River Berezanska COMMUNITY Mykolaiv district Mykolaiv region	1,5	low	SWMI 4	1	1	8,7	1	75	3
51	Revitalisation of the Berezan River Berezanska COMMUNITY Mykolaiv district Mykolaiv region	1,5	low	SWMI 4	1	1	8,7	1	56	3
54	Revitalisation of the Kalanchak River within the administrative boundaries of the Kalanchak COMMUNITY of Skadovsk Rayon	1,5	low	SWMI 4	1	1	9,8	1	67,0	3
58	Revitalisation of the Sychavka beam, in the channel of which the Sychavka ponds are located Yuzhnenska COMMUNITY Odesa district, Odesa region	1,5	low	SWMI 4	1	1	35,3	2	21,25	2
59	Revitalisation of the Dalnyk River Avanhardivska COMMUNITY Odesa district Odesa region	1,5	low	SWMI 4	1	1	19,6	2	29,05	2
60	Revitalisation of the Skurtyanka River Ovidiopolska COMMUNITY Odesa rayon Odesa oblast	1,5	low	SWMI 4	1	1	15,5	2	35,5	2
5	Revitalisation of the Anchokrak River (Bakhmutka) Tarutynska COMMUNITY Bolhradskyi district, Odesa region	1,25	very low	SWMI 4	1	1	5,8	1	43,5	2
13	Revitalisation of the Kaplan River Uspenivska COMMUNITY Bilhorod-Dnistrovskyi district, Odesa region	1,25	very low	SWMI 4	1	1	7,1	1	15,8	2
21	Revitalisation of the Balka Torosova river Zatyshanska COMMUNITY Rozdilnyansky district Odesa region	1,25	very low	SWMI 4	1	1	6,5	1	11,3	2
22	Revitalisation of the Balka Khoroshcha river Zatyshanska COMMUNITY Rozdilnyansky district, Odesa region	1,25	very low	SWMI 4	1	1	6,5	1	14,5	2
33	Revitalisation of an unnamed stream (tributary of the Koshkivka River), V.Kuyalnyk River basin Konoplyanska COMMUNITY Berezivskyi district, Odesa region	1,25	very low	SWMI 4	1	1	5,5	1	11,5	2
34	Revitalisation of the B. Sukha River (tributary of the Koshkivka River), V. Kuyalnyk River Basin Ivanivska COMMUNITY Berezivskyi District, Odesa Oblast	1,25	very low	SWMI 4	1	1	8,2	1	33	2

№	Name of the measure	Level of efficiency	Description of the level of efficiency	SWMI	Success rate	Pressure from the water sector	Number of people affected by the measure *thousands of people*	Social efficiency	Total cost of investment *million UAH*	Value for money
52	Reconstruction of the spillway structure of the Nechayane reservoir in Nechayane village Nechayanska COMMUNITY Mykolaiv district, Mykolaiv region	1,25	very low	SWMI 4	1	1	3,6	1	23,9	2
9	Establishment of water protection zones and coastal protection strips for water bodies in Starokozatska COMMUNITY , Diviziyska COMMUNITY , Kulevchanska COMMUNITY , Marazliyivska COMMUNITY , Serhiivska COMMUNITY, Bilhorod-Dnistrovskyi district Odesa region	1,25	very low	SWMI 2, SWMI 4	2	1	0	1	1,1	1
2	Establishment of water protection zones and coastal protective strips of water bodies on the territory of Artsyzka COMMUNITY, Teplytska COMMUNITY, Pavlivska COMMUNITY, Tarutynska COMMUNITY, Borodynska COMMUNITY, Tatarbunarska COMMUNITY in Bolhradskyi district of Odesa region	1,25	very low	SWMI 2, SWMI 4	2	1	0	1	1,7	1
16	Establishment of water protection zones and coastal protection strips of water bodies in the territory of Lyman COMMUNITY, Rozdilnyanska COMMUNITY, Zatyshanska COMMUNITY, Tsebrykivska COMMUNITY of Rozdilnyanskyi district of Odesa region	1,25	very low	SWMI 2, SWMI 4	2	1	0	1	0,73	1
23	Establishment of water protection zones and coastal protection strips for water bodies in Kuyalnytsia COMMUNITY, Dolyna COMMUNITY, Balta COMMUNITY, Ananievo COMMUNITY, Lyubashivka COMMUNITY, Podilskyi district of Odesa region	1,25	very low	SWMI 2, SWMI 4	2	1	0	1	1,42	1
46	Establishment of water protection zones and coastal protection strips of water bodies on the territory of Mykolaiv COMMUNITY, Berezovsky district, Mykolaiv region	1,25	very low	SWMI 2, SWMI 4	2	1	0	1	0,036	1
61	Establishment of water protection zones and coastal protective strips of water bodies on the territory of Vygodianska COMMUNITY, Velykodolynska COMMUNITY, Krasnosilska COMMUNITY, Dobroslavska	1,25	very low	SWMI 2, SWMI 4	2	1	0	1	0,89	1

№	Name of the measure	Level of efficiency	Description of the level of efficiency	SWMI	Success rate	Pressure from the water sector	Number of people affected by the measure *thousands of people*	Social efficiency	Total cost of investment *million UAH*	Value for money
	COMMUNITY, Vyzyrska COMMUNITY, Avanhardivska COMMUNITY, Velykodalnytska COMMUNITY in Odesa district of Odesa region									
56	Revitalisation of the Gluboka Divisiyska beam COMMUNITY Bilhorod-Dnistrovskyi district, Odesa region	1,25	very low	SWMI 4	1	1	5,7	1	34,5	2
41	Measure to increase the water capacity of the Tiligul River near Zavodivka village, Raukhivska COMMUNITY, Berezivskyi rayon, Odesa oblast	1	very low	SWMI 4	1	1	7,8	1	0,54	1
42	Dismantling of a dam in an unnamed gully (72 km from the mouth) (Isaivskyi pond No. 1), left tributary of the Tiligul River Andriyevo-Ivanivska COMMUNITY Berezivskyi district, Odesa oblast	1	very low	SWMI 4	1	1	3,3	1	0,114	1
43	Dismantling of a dam in an unnamed gully (66 km from the mouth) (Isaivskyi pond No. 2), left tributary of the Tiligul River Andriyevo-Ivanivska COMMUNITY, Berezivskyi district, Odesa oblast	1	very low	SWMI 4	1	1	3,3	1	0,593	1
44	Dismantling of a dam in an unnamed gully (66 km from the mouth) (Isaivskyi pond No. 3), left tributary of the Tiligul River Andriyevo-Ivanivska COMMUNITY, Berezivskyi district, Odesa oblast	1	very low	SWMI 4	1	1	3,3	1	0,956	1
48	Elimination of the retaining wall on the Tsareha River in Tashyne village, Berezanska COMMUNITY, Mykolaiv district, Mykolaiv region	1	very low	SWMI 4	1	1	8,7	1	0,12	1