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1 GENERAL INFORMATION

1.1 Name of the investment objective

**"REHABILITATION AND MODERNIZATION OF THE PORT INFRASTRUCTURE
IN BECKET PORT"**

1.2 Designer of the works

B.C.P.C. BIROUL DE CONSULTANTA PROIECTARE IN CONSTRUCTII SRL

Address: Bucharest, sector 1, Alexandru Ioan Cuza blvd no 44

Phone / Fax: 021.310.71.14

1.3 Beneficiary of works

CN Administratia Porturilor Dunării Fluviale SA

Registered office: Strada Portului no. 1, Giurgiu

Telephone: 0246.213.003

Fax: 0246.211.888

Mail: secretariat@apdf.ro , apdf_proiecte@yahoo. com

Name of the contact person: Marius OLTEANU, Director General of CN APDF SA

1.4 Author of the report

Mihalcea Raluca Oana - Attestation certificate RGX series no. 317/21.07.2022 issued by
the Romanian Environmental Association 1998

2 Description of the project

2.1 General presentation of the project

Considering the current situation of the Bechet port infrastructure, previously presented, the beneficiary, CN APDF SA Giurgiu, aims to carry out the necessary infrastructure works for the relaunch of the naval transport activity in the Bechet port, in correlation with the short-, medium- and long-term development plans long of the Ministry of Transport and Infrastructure and with the requirements of the European Union in the field of naval transport.

By rehabilitating the infrastructure of Bechet port and bringing the port to the technical-functional parameters of other ports located in the member states of the European Union, port and commercial activities in the area will be relaunched, contributing to regional development.

The main proposed works are:

➤ **Modernization of the Danube mooring front , including:**

- the execution of a vertical wharf, for which two variants were analyzed, namely: wharf made of weight blocks (variant 1 recommended) or of metal sheet piles (variant 2 alternative), with the height of the crest at +7.80 m compared to the local low water, with the cumulative length L = 650 ml, the resulting surface S = 10,918 sq m.

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- Compared to the current situation, where the existing mooring front, with a length of 650 m, is divided into 6 operating berths, in the feasibility study it is proposed to divide the mooring front into 5 berths, each having the recommended length for a river berth, of 130 m, resulting in the same length of the mooring front, of 650 m (5 berths x 130 m/berth). The 5 berths will be numbered, from upstream to downstream, with numbers 2, 3, 4, 5 and 6. Berth 1 will be a new easement, which will be executed in the the solution berth floating, in upstream of the operating front, for relocating pontoons existing, having L = 75 ml;
- concrete platforms behind the new wharf (new berths 2 – 6), approx. 20 m, with the possibility of placing cranes portico type Bocşa of 16 tf x 32 m, for which there are provided beams and running rails, or other machines established by common agreement with the economic operators that carry out their activity in the port and with the designer's opinion, S = 17,222 sq m;
- the execution of a floating easement berth, with a length of 75 m, according to the previous specifications.
 - **Rehabilitation of RO-RO ramp and access roads, including:**
 - rehabilitation of the ferry crossing ramp, S = 4,086 sqm;
 - rehabilitation and extending the directing breakwater ferry crossing point, S = 588 sqm;
 - rehabilitation precinct roads and platform from the area of the border crossing point, S = 12,410 sq m.
 - **Related works, including:**
 - dredging/excavations for the execution of the vertical wharf, the easement berth and rehabilitation of the RO-RO ramp;
 - rehabilitation of the navigation signaling system for the entire work.
 - **Provision of utilities in the port, including:**
 - water supply of the port through its connection to the drinking water network of Bechet, in order to ensure the water necessary for port activity and resupplying ships. Execution of the connection from the main network to the internal supply network, L = 2500 ml;
 - domestic wastewater collection network from the port, including its treatment;
 - rainwater collection network, including its treatment;
 - fire extinguishing installation;
 - power supply of the port, by connecting to the LEA existing in the area, at the entrance to the port, in order to ensure the electricity consumption of the port operators, the charging of electric cars, as well as the resupply of electricity to the ships stationed in the berths. A new PT and a connection network in length of approx. 1,500 ml;
 - perimeter lighting system and port premises;
 - video surveillance and access control system;
 - demand analysis and the possibility of equipping the port with a fueling point for alternative fuels.

2.2 Location of the project

Bechet Port is located in Dolj County, UAT Bechet, being located on the left bank of the Danube River, in the area of km 678 - 681. The area of the port territory managed by CN APDF SA is 76,287 square meters. The length of the walled/vertical/natural wharfs under the administration of

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the beneficiary is 650 m. The port is of the fluvial type, allowing the berthing of barges of up to 2000 t.

Oreahovo Bulgaria Border Crossing Point also operates in Bechet Port. The border crossing infrastructure belongs to APDF and consists of RO-RO platform and ramp roads.

The land is the property of the Romanian State, public domain, and was concessioned to the Beneficiary, CN Administratia Porturilor Dunării Fluviale SA Giurgiu, according to Concession Contract LO/3898 of 15.10.2008, Annex 1, no. MF 150252 issued by the Ministry of Transport.

The investment objective is located on the TEN-T priority axis no. 18 (Rhine - Main - Meuse - Danube). Access by car to the area is on the national road DN 55.

Portul Bechet has a development in the VE direction, being south of the UAT Bechet.

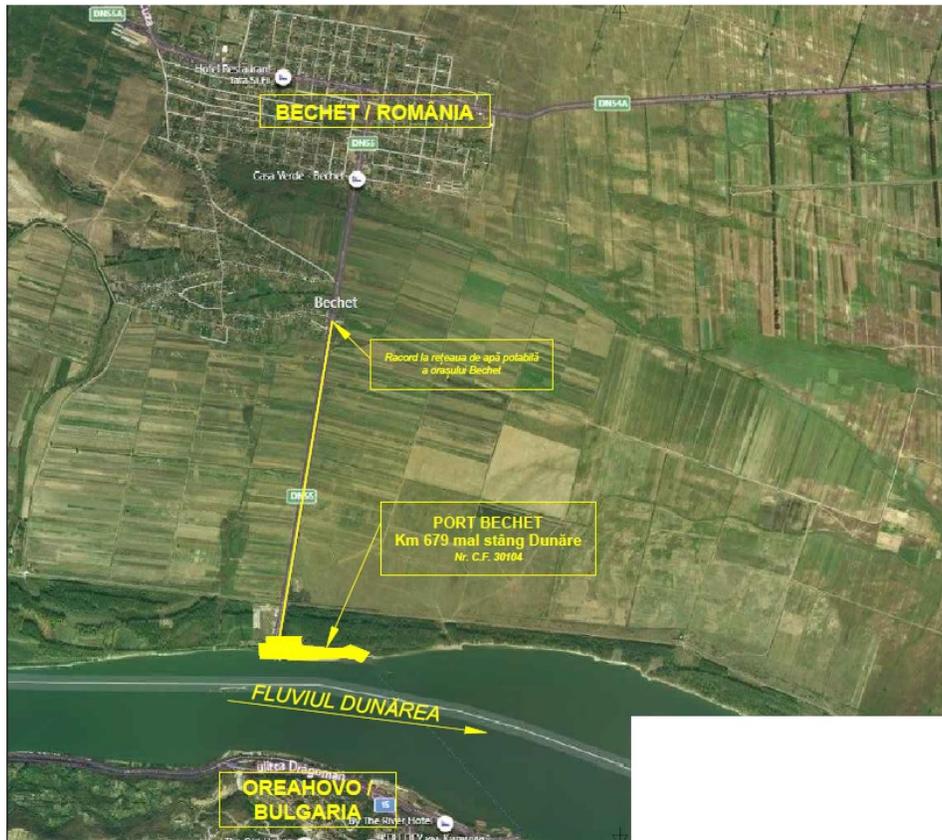


Figure no. 1– Location of the objective

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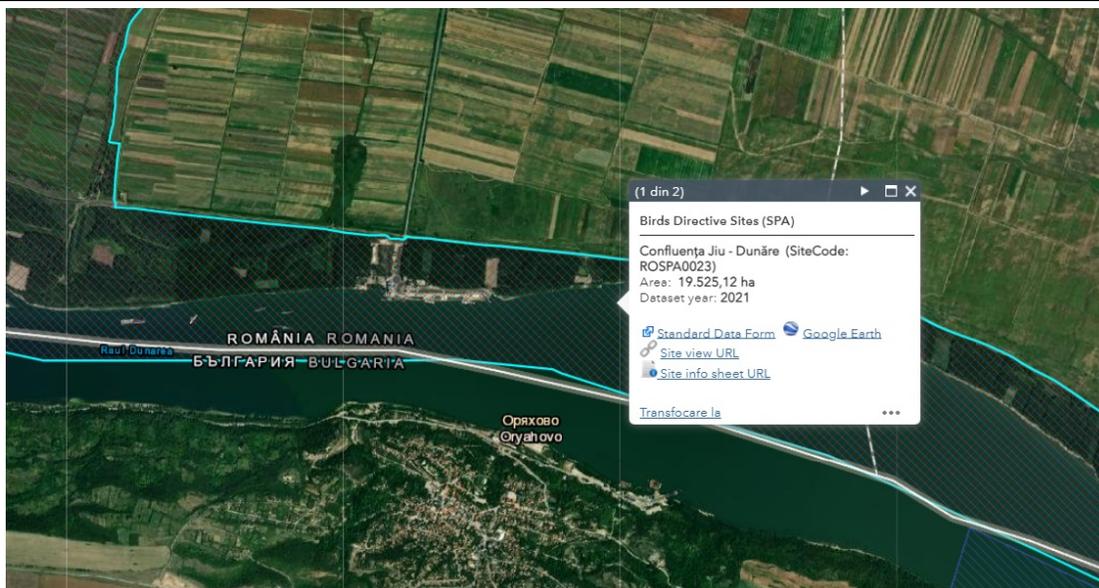


Figure no. 2– Location of the objective and the Natura 2000 site

The port area overlaps with the Natura 2000 area ROSPA0023 Jiu - Danube Confluence and respectively ROSCI0045 Jiului Corridor.

The STEREO coordinates of the location are:

x	y
415812.512	250439.136
415822.214	250415.691
416467.376	250400.330
416499.714	250380.118

The land is located in the suburbs of the city of Bechet and belongs to the public domain of the Romanian State, concessioned to CN APDF SA Giurgiu under Concession Agreement no. 3898 of 15.10.2008 issued by the Ministry of Transport and CN APDF SA Giurgiu conf CF no. 30104 of 18.01.2022.

Current use and destination according to PUG:

- The area of naval communication roads with an area of 76,537.00 square meters.

The total area of the land is 76537 sq m.

S hydrotechnical constructions, platforms and roads - 49024 sq m

S existing buildings that are not part of the project - 3150 sq m.

According to PUG approved with HCL no. 11/2021, the site is located in the area of naval communication routes with height regime P+1-2E+M, POT max - 80% and CUT max - 3.2.

The dominant function – the area of naval communication routes

The total area (built area) on which the port infrastructure rehabilitation works will be carried out is:

- Modernization of the Danube mooring front 28,140 sq m of which 10,918 sq m (vertical wharf) + 17,222 sq m (concrete platforms behind the wharf)

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- rehabilitation of the RO-RO ramp and access roads 17,084 sq.m. of which 4,086 sq.m. rehabilitation of the ferry crossing unction ramp, 588 sq.m. rehabilitation and expansion of the ferry crossing point control pier and 12,410 sq.m. rehabilitation of the roads and platforms in the area of the crossing point of the border.

The current destination of the land is preserved, the works foreseen being the rehabilitation of the existing wharfs, the rehabilitation of the existing roads and platforms in the port, the restoration of the water supply system of the berths and the rainwater drainage system.

2.3 Description of the main physical characteristics of the project

2.3.1 Existing situation

Bechet Port is located in Dolj County, UAT Bechet, being located on the left bank of the Danube River, in the area of km 678 - 681. The area of the port territory managed by CN APDF SA is 76,287 square meters. The length of the walled/vertical/natural wharfs under the administration of the beneficiary is 650 m. The port is of the fluvial type, allowing the berthing of barges of up to 2000 t.

Oreahovo Bulgaria Border Crossing Point also operates in Bechet Port. The border crossing infrastructure belongs to APDF and consists of RO-RO platform and ramp roads.

The port is connected to the local network and national road through DN54A, DN55 and DN55A. The port does not have drinking water facilities and electricity at the berths, nor is it properly lit at night.

According to the specifications in the design theme drawn up by the beneficiary, due to the great age of the existing mooring constructions, with the standard service life expired, as well as due to an intensive exploitation, correlated with the change in climatic conditions in recent years, significant Damage to them is found, with negative consequences on all those who carry out port activities, respectively: degradation of joints, subsidence of the wall, gaps and deviations of the theoretically designed profile, important alluvial deposits in the area of berths, Damaged wharf accessories.

The infrastructure of Bechet port is presented as follows:

BBechet Port offers a mooring front directly at the Danube, with a cumulative length of approx. 650 m, and a ramp for RO-RO ships that provides the connection with the Bulgarian port of Oreahovo, located in the mirror, on the right bank. The infrastructure of Bechet port is as follows:

Access to the wharfs is made directly from the navigable channel of the Danube, the depth required for mooring being at least 2.5 m compared to the local low water (+12.35 mMN75 - according to the data published by the Danube Commission), respectively the quota +9.85 mMN75. At present, this depth is not ensured at any of the berths of the port, as it results from the transversal profiles made. The usual barges operating at the wharf are 1,500 t or 2,000 t.

There is a very large variation in the quota of the crest of the existing wharf, along it, of almost 2 m (from 29.30 – 29.50) mMN75 on the upstream sector to 27.0 – 27.2 mMN75 downstream.

The mooring front in the port of Bechet was executed as a wall of rough-hewn stone masonry, which can be moored by means of a floating pontoon. The wall is executed on heights of approx. 5 - 6 m. At the base, the wall is founded on a simple concrete beam, founded, in turn, on oak

piles. Under the foundation beam of the wall, the slope is protected with stone blocks on fascine mattresses.

At the crest, the wall is turned towards the platform, in certain areas presenting a cresting beam made of stone blocks or concrete.

For the mooring of ships at the wharf, reinforced concrete bitts were provided locally, bollards places, rockfills for supporting the access gangways on the pontoons. On the reinforced wharfs, concrete or stone block stairs were profiled from place to place.

The width of the platforms behind the wharf, up to the road along the port, varies between 10 m next to berth 2 and 25-30 m downstream (berths 3– 6).

The operating infrastructure of the port is deficient. Mooring to berths is done by means of floating pontoons. The port does not have taxiways for wharf cranes. Thus, due to the long distance of ships from the shore and the impossibility of operating with dedicated wharf cranes, operating in the port with mobile cranes is very difficult and conditioned by the water levels in the Danube. Under these conditions, two of the port operators, which operate at berths 1-4, (Cereacom Dolj SRL and DMB Recycling SRL Craiova) have built platforms on which bunkers and conveyor belts have been mounted to allow the loading of ships (especially with cereals). Practically, at present, on the upstream and central sectors of the port, only loading operations are carried out on ships, unloading operations being difficult to carry out. The port operates, for the most part, on the flow of shipping goods.

The third operator, which operates on the downstream sector of the port, at berths 5 and 6, (Transport Trade Services SA), has installed a fixed crane on the wharf - at berth 5 and a conveyor belt at berth 6.

In the area of berth 2, where the width of the platform behind the wharf is very small (max. 10 m) and does not allow the use of the berth for operation, the pontoons AFDJ Galati , Căpităniei and The border police.

From the point of view of technical condition, the queues are presented as follows:

On the upstream sector, the rough stone wall wharf is turned 90° and closed in the bank. It is in good condition, but is covered by vegetation.

In the alignment of the mooring front, at the first berth, the operator built a platform on which 3 grain storage silos were built, which communicates with the wharf with a bunker and a conveyor belt, used for loading ships with grain. With the construction of the concrete platform, the geometry of the slope was changed, the crest of the wharf being elevated and advanced to the water. At this berth, only grain loading activities are carried out on ships, through conveyor belts, the vicinity of the silos built on the platform behind the wharf not allowing the installation of a wharf crane.

Downstream, next to berth 2, loading/unloading operations cannot be carried out, due to the lack of space for the placement of machinery and the storage of material, as the road along the mooring front is very close to the crest of the wharf, as a result of the proximity to the buildings of the crossing the border.

In the area of berths 2 - 6, the pitching is destroyed in some places, subsidence, collapses, local caverns are observed and it is invaded by vegetation. The profile of the wall is variable, with different slopes.

The beam at the base of the wall is fractured or destroyed over extensive sectors.

The crest beam is missing, the wharf crest does not show a rigorous alignment. Concrete or stone block stairs are profiled in places in the wall, some of them in good condition. Locally, in the area

of the connections with the stairs on the slope, local underwashing of the wall was found. There are improvised metal stairs rudimentarily placed on the slope.

Rockfills and the bollards places have been repaired over time, in empirical, inadequate solutions, some fulfill their functions, others are unusable.

In the area of berths 3 - 4, a car scale was built, an installation for loading grain into barges mounted on a trestle built over the reinforced wharf, to be closer to the barges, and a fixed concrete hall is being built armed that prevents the operation at the berth sector behind which it was executed.

Downstream of the hall built on the port platform, another reinforced concrete overpass, founded on columns, was built, which serves as a barge loading point.

The undeveloped land behind the wharf related to berth 5, but also the height of the cresting, which is approx. 2.0 m below the low water of the rear road platform, has not allowed the use of the berth for operation until now. On this sector, the reinforced wharf is generally in good condition, with some fissures /cracks above the foundation beam. The protection with rockfills under the foundation beam of the wall is also in good condition.

In the area of berth 6, the quota of the wharf crest and the rear land was raised by the construction of a gabion wall filled with raw stone, reinforced with concrete buttresses and continued towards the territory with broken stone fillings. The rough-hewn stone pitching is Damaged, cracked, the foundation beam is destroyed, pushed out of the site, towards the water, on extensive sectors. The bollards places are Damaged. The only operating equipment in the port, namely a fixed crane, was mounted on this berth.

On the downstream sector of the mooring front at the Danube, an alveolus made of vertical fixed elements was executed towards the water, for the connection with the upstream beakwater of the ramp where the RO-RO ships dock. On the upper part, the infrastructure of vertically fixed elements continues with a gabion wall, partially covered with concrete. At this alveolus, ships moor directly, but it offers a mooring front length of only 30 m. A mobile conveyor belt is mounted on this alveolus for loading grain into barges.

At the downstream end of the port is located the ramp for the access of RO-RO ships that provides the connection between the ports of Bechet and Oreahovo. The upstream breakwater is made of raw stone, with a crest made of prefabricated reinforced concrete boxes. Some of these boxes are partially rotated/displaced, but the continuity of the cresting is ensured. At the upstream end of the breakwater, a bright LED is mounted to signal at night/unfavorable visibility conditions.

The RO-RO ramp was made of simple monolithic concrete on the medium and high water variation area. The ramp is extended towards the water with prefabs made of reinforced concrete, on the low tide variation area. The concrete slabs were executed with casting joints between them. The platform of the ramp is functional, but it is affected by local destruction, breaks, fractures of the concrete.

The road along the port is in good condition, was recently rehabilitated, has a concrete superstructure. This road is separated by a metal fence from the access roads to the RO-RO ramp, which are Damaged. Both the exit road from the country and the entrance road were executed, for the most part, from concrete sleepers, which are not monolithic between them. The two roads are separated by a strip of grassy land.

2.3.2 Proposed works

2.3.2.1 Moderation of the Danube mooring front

In order to modernize the existing mooring front at the Danube, 650 m long, (for berths numbered from 2 to 6, with lengths of 130 m each), it was proposed to build a vertical wharf, a variant in which ships will dock directly at wharf, at a distance of approximately 20 m towards the water from the alignment of the existing mooring front.

Moving the mooring front towards the water will ensure the creation of a port platform that allows operation at the wharf with Bocşa type port cranes, 16 tf x 32 m. At the same time, moving the front towards the water will ensure the depths necessary for direct mooring at the wharf, with minimal expenses for maintenance operations, respectively dredging.

A. Execution of vertical wharf and concrete platforms behind the wharf

In this variant, the wharf will be made of prefabricated weight blocks of plain concrete C35/45, placed on a 30 cm thick crushed stone foundation bed, for leveling, and a rough stone wharf support bed of 10- 50 kg/pc. The foundation quota of the wharf bed will be at quota of -7.00 m local low water (+14.86 MN75), and the foundation quota of the prefabricated blocks will be -4.50 m local low water (+17.36 MN75). After the weight blocks are put into operation, the gaps provided in them will be filled with crushed stone.

Behind the weight wharf will be a discharge prism made of raw stone 10-150 kg/piece. A geotextile filter of 400 gr/m² is placed between the discharge prism and the filling of granular material from the body of the platform, but also under the bed of the wharf.

At the upper part of the weight wharf, the last block, also considered a crest beam, will be cast monolithically from reinforced concrete C35/45. The beam will be executed in sections, between which are provided, at approx. 40 m, vertical joints of 2 cm extruded polystyrene support layer, with elastic putty. The crest of the beam will be carried out at +7.80 local low water (+29.66 MN75).

The crest beam is provided with a niche for the technological channel along the mooring front and will also act as a beam for the water side of the runway of the Bocşa type wharf crane of 16 tf x 32 m, gauge 10.875 m, in dry conditions of the taxiway will be executed on running beams, indirectly founded on columns Ø 900 mm, arranged at interaxial distances of approx. 3.6 m and founded in the limestone horizon in gray sand binder at -11.00 local low water (+10.86 MN75). Considering the presence of water in the immediate vicinity, the solution of drilling columns with bentonite mud is not accepted.

On the rehabilitated wharf it will be possible to mount one crane for each operating berth, provided that a minimum distance between cranes of 50 m interaxle is observed. Mooring bollards of 25 tf will be mounted on the crest of the wharf made of sheet piles, at distances of approx. 20 m from each other. The edge facing the water of the cresting beam will be protected with a metal plate fixed through gaps, along the entire length of the mooring front. The wharf is equipped with wharf shock absorbers made of rubber rolls positioned on three low waters, the fastening of which will be executed withdrawn from the vertical facing of the wharf.

The port platform will be made of:

- ballast base layer, 36 cm thick;
- broken stone foundation, 30 cm thick;
- platform clothing from BcR 4.5, 24 cm thick.

The road concrete platform is poured in longitudinal strips, between which constructive joints are made. Transverse expansion joints will be provided every 40 m, in correlation with the joints between the sections of the running beams of the wharf crane.

The length of the vertical key from weight blocks will be 650 ml. At the ends, the connections with the bank will be ensured.

B. Execution of easement berth for the replacement of the existing pontoons

Upstream of the vertical wharf, a floating berth (berth 1 – easement berth) was planned to serve the vessels of the authorities operating in the port of Bechet, namely the Border Police, the Bechet Captaincy, the Lower Danube River Administration and the Maritime Danube Ports Administration, these vessels berth at the pontoon in the area of the existing berth 2. With the execution of the vertical mooring front, these pontoons will be relocated to the new upstream floating berth.

The floating easement berth will be made of 2 floating access pontoons with concrete floats (L=35m/pc), they will be fixed in position with the help of hammered metal columns Ø1.00m (t=16mm, anti-corrosion protected) and the length of 26.50m. The connection between the floating access pontoons and the columns will be through metal columns that will allow free vertical movement of the pontoons depending on the water level. For access to the floating pontoons, a pedestrian walkway with a length of 25.00m has been provided, the walkway will be simply supported on an independent floating pontoon towards the water, and at the level of the crest, an embedment of reinforced concrete C35/45 will be executed.

The connection to the shore on the upstream area will be made of rockfills blocks 200-600 kg/pc, with a slope of 1:1.5. The quota at the crest will be +7.80 local low water (+29.66 MN75), the intermediate berm at quota +2.50 local low water and the minimum quota of -3.50 local low water at the base of the slope. The rockfills will be placed on a 400 gr/m² geotextile filter at the top of the wall (dry) and the double geotextile mattress filled with 5500 gr/m² sand from the level of the intermediate berm up to -3.50 local water low water. A C35/45 concrete beam will be constructed at the level of the berm at +2.50 local low water.

2.3.2.2 Rehabilitation of the ferry crossing ramp and access roads

A. RO-RO ramp rehabilitation works

The RO-RO ramp serves the border crossing point. The solution for its rehabilitation involves the laying, over the existing and partially Damaged concrete layer, of a new road concrete covering, with a thickness of 20 cm, between the level +7.80 and +4.40 local low water. This clothing will be reinforced with welded mesh and fixed to the existing road clothing by means of metal connectors. The concrete will be poured with transverse and longitudinal joints, respecting the position of the existing joints. At +4.40 local low water, the construction of a C35/45 reinforced concrete beam is planned. The surface of the ramp located between quota +4.40 and -2.00 local low water will be rehabilitated by installing prefabricated slabs of reinforced concrete C35/45 with dimensions of approx. 2.00 x 2.00 x 0.2 m. The prefabricated tiles will be placed over the existing tiles, after cleaning them of any material deposits.

At the base of the ramp, a prism of 200-600 kg/piece of rockfill will be built, leveled at the top with a 30 cm thick layer of broken stone, in order to strengthen the foot of the ramp. The downstream

slope will be reprofiled and completed with rockfills of 200-600 kg/pc. On the side of the ramp there are 4 bits of 25 tf.

B. Rehabilitation and expansion works of the directing beakwater

The upstream directing beakwater of the RO-RO ramp will be extended by 15 m towards the water, with a prism of 200-600 kg/piece rockfills, in the extension of the existing alignment. The concrete boxes on the crest of the beakwater will be repositioned after the broken stone foundation is restored. The slopes will be reprofiled with anchors 200-600 kg/pc.

At the upper part of the beakwater, after the concrete boxes have been reset on the broken stone layer, it is planned to rockfill the boxes with blocks from the rockfills to ensure better stability and resistance to the pushing force of the water current and ice fields.

The head of the steering beakwater will be signaled with the help of a mobile beacon, which will be located on the crest of the beakwater, depending on the water level.

C. Rehabilitation and modernization of precinct roads and platforms in the PTF area

In order to ensure the safe exploitation of the surrounding roads and adjacent platforms, they will be raised to +7.80 local low water (+29.66 MN75). The quota of the adjacent roads and platforms is necessary considering that they are currently below +7.33 local low water (10% insurance level), being floodable and inoperable.

The existing road system will be dismantled and, where appropriate, used as a foundation for the new road system. The structure of the new road system is similar to that of the operating platform from the new berths 2 - 6, respectively:

- filling from well-compacted local material;
- ballast base layer, 36 cm thick;
- broken stone foundation, 30 cm thick;
- platform clothing from BcR 4.5, 24 cm thick.

For the islands separating the traffic directions, a layer of topsoil with a thickness of 20 cm was provided at the top.

Each traffic direction will be served by two traffic lanes with a width of 3.50 m each. For each direction, road ditches will be constructed that will collect rainwater. The horizontal markings and the vertical signaling corresponding to the border crossing point will be executed.

A metal fence has been provided between the platforms behind the port's operating berths and the border crossing point.

2.3.2.3 Related works: dredging, rehabilitation of the signaling system

In order to carry out the previously specified works, it will be necessary to excavate/dredging the surplus material, according to the dimensions and quotas of the attached drawings.

Dredging will be carried out with absorbent-repelling dredges. The approximate dredging volume is approx. 134,000 m³, and AFDJ Galați, which is the authority that ensures navigation conditions on the Danube sector where Bechet port is located, will establish the unloading area of the dredged material. The working technology is as follows: the dredged material is loaded into the

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sleds moored next to the dredger, which transport it to the indicated unloading place. The material is unloaded in the Danube, by opening/folding the hatches of the barges.

The works that will be executed on water will require signaling throughout the duration of execution. Both the coastal signaling and the passive and luminous signaling of the work equipment will be ensured.

At the completion of the works, the final signage for navigation will be installed, with the necessary static warning, prohibition, and recommendation signals. The hydrometric gauge and the display in the port for the Danube water level will be rebuilt.

2.3.2.4 Provision of utilities in port

2.3.2.4.1 Water-sewage networks and installations

Port Bechet is not equipped with centralized drinking water supply and fire networks, respectively household sewage networks. The buildings in the port are supplied with local water, through wells, and the waste water is discharged through drains. The water for the fire is taken from the Danube with the fire brigade's mobile pumps. The drainage of rainwater has some deficiencies, the water pooling especially on the north side of the premises.

The adopted solutions are the following:

A. Drinking water supply

The water supply for the existing sanitary groups of the port, for loading the drinking water tanks of the ships and for fighting the fire will be made from the public pipeline of the city of Bechet, located about 2500 m away from the port premises (the length of the water connection). The connection will be made to the public water network. In the port premises, a water management consisting of an above-soil storage tank $V = 200 \text{ m}^3$ and a pump station and water pump mounted in a container will be built, according to the description below.

The supply pipe will be made of PEHD 125 mm, P100, PN10, buried, parallel to the port access road. Line chimneys with valves from 500m to 500m will be built on the supply pipe. When crossing the existing valley, next to the existing footbridge, the pipeline will be photographed from the air, protected and thermally insulated. At the entrance to the premises, a valve chamber and water meter will be installed on the supply pipe.

In order to ensure the flow and pressure in the network, a water management was provided consisting of a water tank $V = 200 \text{ mc}$ ($D = 7.64\text{m}$; $H = 4.88\text{m}$) and a pump station and water pump mounted in a container .

The tank, metal, above soil, is purchased as equipment, it is mounted on a concrete foundation and ensures the intangible fire reserve and the daily flow of water for household consumption and the supply of ships. The tank is provided with spigots for the supply from the source, for the suction pipes of the pumping groups for household consumption and fire, for overflow and emptying, as well as for the supply of mobile fire pumps. For frost protection, the tank will be supplied with a 3 kW electric heater.

The pump station and water pump is an above-soil container-type construction, with dimensions of 9.0m x 4.8m x 2.7m, consisting of two modules of 9.0m x 2.4m x 2.7m.

The station will be equipped with the following equipment:

- Drinking water pumping group 2K55/200T having:

$$Q = 20 \text{ m}^3/\text{h};$$

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H = 45 m CA;

P = 2 x 5.5 kW.

- Fire water pumping group 2K40/400T having:

Q = 40 m³/h;

H = 45 m CA;

P = 2 x 7.5 kW.

- Hydrophore container with membrane V = 500 l.

The station will be provided with 2 electric heaters with P = 2000 W each.

The water network in the premises, made of PEHD 125mm, P100, PN10, will ensure the water supply of the existing buildings, the hydrants supplying the ships and the fire hydrants. When under-crossing the crane tracks, the water pipes will be protected in steel pipes, between two valves. Hydrants for supplying ships will be provided with shut-off valves and flow meters.

The water network will be placed between protective layers of sand according to the manufacturer's instructions.

As an additional measure to ensure fire fighting on the port platforms, with water from the Danube, a fire hydrant made of sorb Dn 100mm, the vertical pipe made of galvanized steel pipe Dn 4", and a type A connection for the hydrant was provided at each berth . The necessary flow rate and pressure will be ensured by a mobile motor pump, kept in working order together with the PSI materials.

The motor pump will have the characteristics:

- ✓ maximum flow 1000l/min;
- ✓ maximum pressure 10 bar;
- ✓ maximum suction depth 9m.

B. Household sewage

The domestic waste water evacuation from the sanitary groups of the port buildings will be done through a network of PVC pipes Dn 250 mm and slope $i = 0.008$, to a domestic waste water pumping station located in the port access area.

The pumping station is an undersoil construction of prefabricated concrete elements, having $D_i = 1.80\text{m}$ and $H = 6.0\text{m}$. The station is purchased fully equipped with hydraulic, electrical and automation installations. The station is equipped with 1+1 electric pumps with $Q = 5\text{l/s}$; $H = 16\text{mCA}$; $P = 2 \times 2.5\text{ kW}$.

The evacuation of waste water from the premises will be done through a discharge pipe made of PEHD, P100, with a diameter of 125 mm and PN 6.

On the discharge pipe, chimneys will be built with a cleaning piece from 500m to 500m. When crossing the existing valley, next to the existing footbridge, the pipeline will be aerially photographed, protected and thermally insulated. The discharge pipe and the sewer network will be laid between protective layers of sand according to the manufacturer's instructions.

Household wastewater is collected in a wastewater pumping station and discharged through a 125 mm HDPE pipe, PN 6, into the city's domestic sewage network, 2500 m away.

C. Rainwater drainage

To collect the rainwater from the premises, along the roads and platforms, gutters made of prefabricated concrete elements with a drain slope $i = 0.005$ were provided.

The gutter sections 2x20m each will be connected to the storm sewer network through spillways purchased together with the gutters.

The gutter elements have the following characteristics:

Length	L = 1.0m;
Nominal width	I = 300 mm;
Load class	E 600, heavy traffic

Cover with cast iron grates for heavy traffic, fastened with screws, L = 0.5m, I = 300 mm.

The discharge chimneys have the following characteristics:

Length	L = 0.5 m;
Nominal width	I = 300 mm;
Load class	E 600, heavy traffic

Cover with cast iron grates for heavy traffic, fastened with screws, L = 0.5m, I = 300 mm.

The channel sections will be reinforced in concrete according to the manufacturer's instructions.

The collection of rainwater from the sections of ditches will be done by means of a rainwater drainage network made of PVC pipes Dn 300 mm, Dn 400 mm, Dn 500 mm. The sewer network will be placed between protective layers of sand, according to the manufacturer's instructions.

The storm sewer pipes will be made of PVC, SN8, and the sewer chimneys will be made of access chimneys made of prefabricated concrete elements, Dn 800 mm, on plain concrete foundations and will be covered with cast iron rockfill covers for class D roads 400.

Visiting fireplaces with bench depths greater than 2.0m will be executed with a working chamber made of concrete tubes Dn 1000 mm L = 2m, according to art. 2.2.1 of STAS 2448-82.

For the mechanical purification of rainwater discharged into the Danube, two sludge and hydrocarbon separators were provided, with coalescing filter and built-in by-pass, each with Q = 200/40 l/s characteristics.

Before the discharge into the Danube, a non-return valve will be installed on the final section of the sewer, in order not to allow water from the Danube to enter the sewer, in the event of its level rising above the level of the discharge opening.

The evacuation of water into the Danube will be done by remodeling the existing outlet.

Calculation summary

1. Determination of the flow of drinking water for the sanitary groups from the existing buildings

The necessary water flow for 20 people (administrative staff), 10 people (port operation staff) and 100 people (drivers in traffic) will be ensured.

The water requirement for sanitary needs was determined according to STAS SR 1343/1/1995 with the relationship:

$$Q_{di \text{ med}} = \sum q_{sp} \times N_i / 1000 \quad (\text{mc/ day})$$

N1 = 10 persons (workers)

N2 = 20 persons (TESA)

N3 = 100 persons (drivers in traffic)

$q_{sp1} = 50$ l/ person/day (STAS 1478-90, table 4/19)

$q_{sp2} = 20$ l/ person/day (STAS 1478-90, table 4/2)

$q_{sp3} = 5$ l/ person/day (STAS 1478-90, table 4/16)

$Q_{Yesy\ med} = (10 \times 50 + 20 \times 20 + 100 \times 5)/1000 = 1.4$ m³/day

The maximum daily flow will be:

$Q_{Yesy\ max} = 1.20 \times 1.4 = 1.68$ m³/day

$Q_{timetable\ max} = 5 \times 1.68/16 = 0.88$ mc/h = 0.53 l/s

2. Determination of the required fire water flow rate

On the platform, general goods can be stored in bulk, in stacks or in containers with the maximum dimensions L x W x H = 12.0m x 2.5m x 2.5m.

The volume of a container will be $12 \times 2.5 \times 2.5 = 75$ cubic meters

Assimilating the container with a storage building with fire stability level IV - V, and medium fire risk, from Annex no. 8 of Regulation P118/2-2013, it results that for volumes below 2000 m³ the water flow for extinguishing from the outside of a fire is $q_{ie} = 5$ l/s. The volume of 2000 mc also covers the storage solution of a group of stacked containers, respectively a group of 2000: $75 = 26.7$ containers.

For open warehouses of logs with a volume between 101 cubic meters and 500 cubic meters (Annex no. 11 of Regulation P118/2-2013) or open warehouses of timber with a volume of between 51 cubic meters and 200 cubic meters (Annex no. 10 of Regulation P118/2-2013), the water flow for extinguishing the fire from the outside is $Q_{ie} = 10$ l/s, respectively two jets in simultaneous operation.

Also, ensuring the fire flow rate of 10l/s allows extinguishing the beginnings of fire on ships moored at the wharf, the total required fire flow being ensured with the fire installation on board, or, in the last instance, with the fire engines or the fire boat.

In order to be included in the insured flows, the beneficiary will limit the group of containers or the volume of the stacks to those considered.

3. Determining the flow of potable water for supplying ships

The supply of potable water to the tanks of ships moored at the wharf will be done through wharf hydrants equipped with metering devices.

In the most unfavorable situation, it is considered that 3 ships from those anchored at the wharf are simultaneously supplied with water, each with a tank of about 10 m³.

During a day with intense activity, 6 ships can be fed.

$Q_{zi\ med} = 2 \times 3 \times 10$ mc = 60 mc/day

The water network is assimilated with the street network with distribution through the splits.

$K_{zi} = 1.40$ (table 1 from SR 1343-1/2006)

$Q_{day\ max} = 1.4 \times 60 = 84$ mc/day

$K_{orar} = 2.8$ (table 3 of SR 1343-1/2006)

Max hourly $Q = 2.8 \times 84/24 = 9.8$ mc/h = 2.7 l/s

4 . Determination of the simultaneous flow of potable water for the supply of ships for the sizing of the pipes and the calculation of the pressure required at the connection

Through the PEHD 125 mm network, the flow for filling three tanks, half of the total flow and the flow for fire fighting, will flow simultaneously.

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$$Q_c = 1,35 \text{ l/s} + 10 \text{ l/s} = 11,3 \text{ l/s}$$

At flow rate $Q = 11.35 \text{ l/s}$, the linear load loss through the 125 mm PEHD pipe (PE 100, PN10 at) will be: $i = 14\text{mCA/km}$

The total load loss on the route will be:

$$h_{p \text{ lin}} + h_{l \text{ oc}} = 1.2 \times 0.65 \text{ km} \times 14\text{mCA/km} = 10.92\text{m CA} = 11 \text{ mCA}$$

$$H_g = 10 \text{ m CA (height stacks of materials on the platform)}$$

$$H_u = 13.40 \text{ m CA (Use pressure at fire hydrants)}$$

$$H_{p \text{ f}} = 5 \text{ mCA (pressure losses in the hose)}$$

The calculation is made for the most unfavorable situation, namely fire extinguishing.

$$H_{n \text{ ec}} = H_g + H_u + H_{p \text{ f}} + h_{p \text{ lin}} + h_{l \text{ oc}} = 10\text{mCA} + 13.4\text{m CA} + 5.6 \text{ mCA} + 11.0\text{m CA} = 40 \text{ mCA}$$

5. Storage tank sizing

$$V_{r \text{ ez}} = V_{c \text{ omp}} + V_{i \text{ nc}} \text{ (STAS 4165/88, point 2.1.1)}$$

$$V_{c \text{ omp}} = aV$$

$$a = 1 \text{ (tall pressure , SR 1343/1/2006)}$$

$$V = Q_{z \text{ i max}} = 1.68 \text{ mc/day} + 84 \text{ mc/day} = 85.68 \text{ mc/day}$$

$$V_{c \text{ omp}} = 1 \times 85.68 = 85.68 \text{ mc}$$

$$V_{i \text{ nc}} = T_{i \text{ e}} (a Q_{o \text{ r ar max}} + 3.6 n Q_{i \text{ e}}) + 3.6 Q_{i \text{ i know}}$$

$$T_{i \text{ e}} = 3 \text{ hours (STAS SR 1343/1/2006, note 5 in table 4)}$$

$$a = 1$$

$$Q_{i \text{ e}} = 10 \text{ l/s}$$

$$Q_{i \text{ i}} = 0 \text{ l/s}$$

$$V_{i \text{ nc}} = 3 (1 \times 2.7 + 3.6 \times 1 \times 10) = 116.1 \text{ mc}$$

$$V_{r \text{ ez}} = 85.68 + 116.1 = 201.78 \text{ m}^3$$

A water tank $V = 200 \text{ mc}$ will be built.

6. Determination of water flow at the source

QIC – Water flow from the source up to the tank (SR 1343/1/2006, art.7.1)

$$Q_I = K_p \times K_s \times Q_{z \text{ i max}} + K_p \times K_s \times 24 Q_{r \text{ i}}$$

$$Q_{r \text{ i}} = V_{r \text{ i}} / T_{r \text{ i}}$$

$T_{r \text{ i}} = 36 \text{ hours}$ (SR 1343/1/2006, table 6)

$$K_p = 1.10$$

$$K_s = 1.02$$

$$Q_{r \text{ i}} = 116.1 / 36 = 3.22 \text{ mc/h}$$

$$Q_{I \text{ C}} = 1.10 \times 1.02 \times 85,68 + 1.1 \times 1.02 \times 24 \times 3.22 = 182.73 \text{ mc/day} = 2.11 \text{ l/s}$$

7. Determining the flow rate of returned domestic wastewater

The flow of returned domestic wastewater was determined according to SR 1846-1/2006, point 4.2.1 with the relationship:

$$Q_u = Q_s, \text{ where:}$$

Q_s is the characteristic supply flow of the water demand.

$$Q_{u \text{ Yesy med}} = 1.4 \text{ m}^3/\text{day}$$

$$Q_{u \text{ Yesy max}} = 1.68 \text{ mc/day}$$

$$Q_{u \text{ hourly max}} = 0.88 \text{ mc/h} = 0.53 \text{ l/s}$$

8. Calculation of rainwater flows

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Calculation of the maximum flow produced by the calculation rain with the possibility of exceeding

p % was made according to STAS 1846/2 -2007 with the relationship:

$$Q_{\max p \%} = m \times W \times \emptyset \times i_{p \%} \quad (\text{l/s}):$$

m = 0.8 flow rate reduction coefficient

S = the surface of the sewage basin , (ha)

\emptyset = leakage coefficient afferent of the surface S_i, dimensionless (table 2)

i_{p %} = average rain intensity (l/ s.ha)

The calculation was carried out at the level of the entrance to the sludge and hydrocarbon separator, located near the ferry mooring ramp.

S1= Technological road surfaces and concrete parking platforms

S2 = Grassy surfaces

S1 = 3.6 ha

S2 = 0.8 ha

$\emptyset 1$ = 0.85 (concrete surfaces)

$\emptyset 2$ = 0.10 (grassy surfaces)

tcs = superficial concentration time = 10 min (seat zone)

l = 600 m (the longest route of the water in the channel)

t = t cs + l/v = 10 + 600/50 = 22 min.

According to STAS 9470-73: i_{p %} = 140 l/ s.ha (zone 9, Bechet, t = 22 min., f = 1/2) m = 0.8

$$Q_{\max p \%} = 0.8 \times (3.6 \times 0.85 + 0.8 \times 0.1) \times 140 = 352 \text{ l/s}$$

For the flow rate of 352 l/s, two sludge and hydrocarbon separators with built-in by-pass and coalescing filter are chosen, each having a flow rate of Q = 200/40 l/s

The sewage pipe from PAFSIN Dn 600 mm can take the flow rate of 352 l/s at a slope i = 0.004.

The PVC tube Dn 500 mm can take over at the slope i = 0.003 a maximum flow rate Q = 200 l/s.

Through this project, no works were proposed regarding the management of bilge water from boats in the port area. The rehabilitation and modernization works of the port infrastructure are not related to bilge water and the project that is the subject of this report did not have as its object the collection of bilge water. These are collected and it is estimated that they will be collected at the points on the Danube where there are such services

2.3.2.4.2 Electrical networks

A. Energy data

- Installed electrical power: Pi =3008.5 kW;
- Absorbed electrical power: Pa =2106.0 kW;
- Apparent power post transformation: 2 x 2000 kVA;
- Supply voltage: 400 / 230 Vc.a .;
- Working frequency : 50 Hz ;
- Power factor: 0.9

B. Description of electrical installations

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The power supply is designed from a new transformer station, fully equipped for 2 transformers of 2000 kVA/pc., 20 / 0.4 kV, from which all the consumers provided in this documentation will be supplied from within the port of Bechet.

The consumers provided in this documentation for power supply are:

- indoor lighting, made with 12 lighting poles of 20m height, equipped with 8 400W LED lighting devices each;
- feeding 5 wharf cranes, each of which has an installed power of 325kW and a total maximum absorbed power of 220kW;
- power supply 5 key sockets of 50kW each. located in the immediate access area to the bridge connecting with the ship;
- supply 3 double charging desks for electric cars of 22kW each;
- supply buildings in the premises .

The electric cables are provided to be of the CYAbY type, with the section calculated at the rated current of the protection upstream of the consumer's power supply circuit, as well as checked for the voltage drop depending on the length of the electric circuit route.

The dimensioning of each cable was done considering that the upstream protection (switch), at its nominal current and not at the regulation current, must also protect the power cable, not only the powered consumer. The dimensions of the electrical cables related to the existing buildings were calculated as estimates because the Beneficiary did not provide any information related to them. If the electrical powers are different from the existing ones, the dimensions of the cables will be redone in the next design phase.

The check of the conductor section of the power cable was done at the voltage drop, depending on the length of the power cable. The value of the voltage drop must not exceed 3% for the supply of general electrical panels and 5% for the supply of final consumers (secondary circuits).

The electric cables are expected to be protected along the entire route with corrugated tubes with a diameter of 160 mm.

Electric cables that pass through impassable areas (without the possibility of car traffic) are placed directly in the soil, in a layer of sand of at least 40 cm high.

In the underpass areas of the roads for cars and trucks as well as the concrete platforms, the cables will be placed in a 40cm high concrete bed.

Railway underpasses are made by horizontal directional drilling, with specially designed equipment.

When changing the direction of the electric cable route, pulling cameras were provided, but also intermediate at the distances between two pulling cameras that exceed the length of 100m (according to the rules and regulations in force, a reinforced electric cable cannot be placed for a length longer than 100m high).

The lighting is provided to be achieved with 12 lighting pylons with mobile nacelle, each 20m high, each equipped with 8 lighting devices of 400W each, mounted symmetrically on the mobile nacelle of the lighting pylons.

The lighting pylons are additionally provided with an element to capture lightning strikes.

Each lighting pole is provided with an electric protection and control panel (supplies included in the lighting pole), located at the base of the pole, above the fire chamber specially made to feed the electrical panel related to the pole.

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The electrical switchboards for powering wharf cranes are equipped with one 630A three-pole automatic switch each, set at a current of 500A.

For the proposed traffic road, 29 street lighting poles of 10m height, equipped with 2 lighting devices of 250W, fully equipped, have been provided.

The electrical switchboards for powering ships anchored at the wharf are equipped with one 63A three-phase socket and one 25A single-phase socket, thermo-magnetic protections for each socket and all related materials for a good operation of the electrical switchboard.

All electrical panels are made of metal treated against corrosion due to atmospheric conditions in the area where they are located.

All electrical switchboards will have a door with a 180° opening, provided with a lock system, lock or any other blocking system against unauthorized personnel access inside the electrical switchboard.

All cable routes will be accompanied by the 40x4mm OI-Zn plate that is part of the soiling installation of the premises. All the metal masses in the electrical and non-electrical installations that are not currently under voltage, but which can cause a potential change accidentally, are connected to this flatband.

To complete the earth socket, soiling electrodes of OI-Zn 2 ½" diameter and 3m long will be installed, in the immediate vicinity of the lighting pylons, the lighting poles, in the immediate vicinity of the crane power supply and ship loading panels, as well as around the transformer post.

The dispersion resistance of the earth socket must not exceed the value of 1 ohm. Otherwise, additional measures will be taken, approved by the designer, so as to obtain a value lower than that imposed by the provisions of the rules and regulations in force.

2.3.2.4.3 Video surveillance and access control system

A. The structure of the integrated video surveillance and public address system

The role of the system is to ensure the capture of images from areas of interest, their processing and recording on specialized equipment, the visualization of images through the LAN network, allowing the staff dedicated to monitoring the operation of the system to take quick action in case of malfunctions or unwanted events at the monitored points. Access restriction will be achieved with the help of a car barrier. Access will be by card.

The system is made up of cameras, video cameras, speakers, network switches, NVR and station monitoring. The video surveillance system covers all areas of interest. The entrance to the premises is from also supervised by a video camera that offers the possibility of recognizing the number of car registration. The surveillance system includes real-time recording equipment and will be connected to LAN network for image access. The NVR will be provided with HDDs that allow the recording of signals from all cameras for at least 20 days and will be connected to the LAN network (if this exists), being able to be accessed remotely. The system ensures fast real-time searching and allows for further expansion.

By integrating loudspeakers with IP, the system allows the broadcasting of scheduled announcements, backsoil music, warning or emergency messages, either individually, on zones or on all loudspeakers at the same time.

The video cameras will be of 4 types:

- Bullet-type outdoor video camera, IP66 degree of protection, built-in IR, with IP and PoE, minimum color illumination 0.2 lux, minimum AN illumination 0 lux, resolution 1920x1080p,

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25/30 fps, CMOS image sensor 1/2.8, WDR, horizontal angle 115gr, vertical angle 64gr, operating temperature -30 – 50grC;

- LPR outdoor video camera, anti-vandal IK10, protection degree IP66, built-in IR, with IP and PoE, minimum color illumination 0.16 lux, minimum AN illumination 0 lux, resolution 1920x1080p, 50/60 fps, security function - does not accept access unauthorized, CMOS image sensor 1/2.8, WDR, horizontal angle 16-2.3gr, vertical angle 9.6-1.3gr, remote zoom, operating temperature -30 – 50grC;
- Dome type video cameras, outdoor, anti-vandal IK10, protection degree IP66, with IP and PoE, built-in optimized IR, minimum color illumination 0.1 lux, minimum AN illumination 0 lux, HDTV 1920x1080p, 50/60 fps, depending on security – does not accept unauthorized access, CMOS image sensor 1/2.8, WDR, horizontal angle 100-36gr, vertical angle 53-20gr, remote zoom, remote focus, operating temperature -30 – 50grC;
- Panoramic video camera, outdoor, anti-vandal IK10, degree of protection IP66, with IP and PoE, minimum color illumination 0.16 lux, minimum AN illumination 0.05 lux, resolution 5120x2560p, 50/60 fps, security function - does not accept unauthorized access , CMOS image sensor 1/2.8, WDR, horizontal angle 180gr, vertical angle 90gr, operating temperature -30 – 50grC;
- The recording of images will be done on a 1U rack-able NVR, with management software included, license for 32 cameras, HDD included 16TB, supported RAID levels 0, 1, 5, 6, 10, recording speed 384 Mbit/s.
- The images will be viewed on an operating station with Intel® Core™ i5 processor, 8GB memory, video card, RJ45 network, interface for 4 monitors, mouse, keyboard, minimum 2 27-inch monitors. The license will be installed on the operating station for viewing the images from all video cameras, as well as for controlling the speakers. Also, a microphone was provided for broadcasting messages.
- The loudspeakers will be suitable for outdoor mounting, with IP66 degree of protection, RJ45 connection, PoE, security function, internal memory.
- The following were provided for the communication infrastructure:
- Switches with 4 Ethernet ports, PoE, 1 SFP port, degree of protection IP67, for outdoor mounting, power supply 100–240 Vac, 50/60 Hz, HTTPS, 10 Gbps, MAC table 8K, frames 10Kb, with management software;
- Switch with 16 Ethernet ports, PoE, 1 SFP port, power supply 100–240 Vac, 50/60 Hz, DHCP server included, 36 Gbps, MAC table 8K, frames 9216 Bytes, rack-able, with software management;
- Switch FO – 16 100/1000BASE-X mini GBIC/SFP slots, with 19" rack mounting system, with management, equipped with SFP 1000BASE-SX/LX.
- A 6KVA rack-able UPS will be used to power the video surveillance system;
- The above equipment will be mounted in a 19" rack.
- The system wiring will be done as follows:
- Utp cat6 cable for connecting cameras and speakers in outdoor switches, as well as
- for connecting the NVR and the operating station in the switch.
- Fiber cable.

Video surveillance areas

No. crt.	Equipment type	Supervised area
1	LPR outdoor video camera	Car entrance to the area
2	Panoramic video camera Dome video camera	BAC crossing platform
3	Outdoor bullet type video cameras	Customs
4	Outdoor bullet type video cameras	Main access in buildings
5	Dome video camera	Scale
6	Dome video cameras	Danube's shore

The video surveillance system will be powered from its own service power supply panels, via UPS.

B. Access control system

The restriction of car access to the premises will be achieved with the help of two car barriers, mounted on both directions (entrance - exit). Access will be done with an RFID card. A number of cards will be defined for employees and visitors.

The structure of the access control system will be as follows:

- car barriers with 3m arm, controller for 2 inductive loops;
- controller for 2 doors (or 2 master-slave controllers), for connecting two readers, 2 control relays;
- RFID readers ;
- power source ;
- semaphorus.

2.3.3 Operation stage

The purpose of this project is to rehabilitate the Bechet port platform to facilitate the development of the activity, through the development of naval traffic and not only of goods.

Along with the rehabilitation and modernization of the port infrastructure, optimal working conditions and the running of specific activities under normal conditions will be ensured.

2.3.4 Demolition / decommissioning stage

Decommissioning works are not foreseen in the project that is the subject of this documentation.

2.4 Duration of execution of the works

The execution of the works involves the completion of the following stages:

- preparing the studies, the technical project and execution details, the technical quality check of the project, documentation for approvals, agreements;

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- handover of the site and layout of the works, arrangements for environmental protection and bringing it to the initial state, relocation works / protection of utilities;
- execution of construction works - assembly for the basic investment;
- works for the provision of utilities necessary for the objective, namely the water - canal and electrical networks;
- consulting, technical assistance;
- site organization, various and unforeseen;
- preparation of the Construction Technical Book, reception at the end of the works.

The duration of the investment was staggered over a period of approx. 24 months, of which the actual execution was estimated at approx. 21 calendar months.

2.5 Information regarding the production that will be carried out

during the execution of the works provided in the project, the main sources of energy will be the fuel necessary for the operation of the construction equipment for the implementation of the designed works.

based on the estimate of the volumes of works designed for the realization of the project, the table below presents information regarding the production and the energy resource requirements for the realization of the works.

Production		Resources used to ensure production		
Name	Total quantities	Name	Annual consumption	PROVIDER
fillers	36000 sq.m	ballast, stone	-	authorized careers
		DIESEL	20000 l	warehouses / fuel stations in the area
excavation	6000 cubic meters	DIESEL	5000 l	warehouses / fuel stations in the area
concretes	2000 cubic meters	DIESEL	2000 l	warehouses / fuel stations in the area
		cement	-	profile commercial companies
material transport	3000 l	DIESEL	3000 l	warehouses / fuel stations in the area

It was estimated that in order to carry out the works that are the subject of this study, the transport of materials, their handling on the platform of the work front, 1 forklift, 1 front loader and 1 bulldozer will carry out their activity (all of them working 100% with Diesel engines).

the daily diesel consumption for these machines is estimated at 300 l / 8 h.

certain quantities of materials will be needed to complete the project, such as: broken stone, ballast, concrete, cement.

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for the assessment of the impact during the execution of the works, it is estimated that the concrete, broken stone, ballast, etc. will be procured from specialized suppliers, on the basis of a contract - which will be the responsibility of the Contractor.

Regarding the natural resources necessary for the construction / realization of the works that are the subject of this study, the following can be mentioned:

- some of the ballast sources have crushing stations and produce aggregates for concrete. other sources have selection and sorting stations, but they can also produce other types of aggregates
- the ballast and aggregates that are put into operation within the project can generate suspended powders during unloading operations, spreading the material with the bulldozer as well as during leveling. The quantitative level of suspended powders, generated during the implementation of this material, are reduced considering the fact that in the ballasts and quarries these materials are washed beforehand.

The transport of materials from the ballast yards / quarries in the area close to Bechet port can be transported on barges.

It is recommended that during the execution of the works, the supply of materials should be carried out gradually, as they are put into operation, in order to avoid the formation of stocks of materials for long periods of time within the work front / site organization.

during the operation period of the port, the types of materials required for the execution of the repair works will be similar to those during the execution of the works, but the quantities / volumes will be much smaller.

2.6 Information about the raw materials and about the substances and/or chemical preparations used

Based on the estimate of the volumes of works designed for the realization of the project, the table below specifies information about the raw materials and substances/preparations that could be used for the execution of the works.

Raw materials	Total consumption	Classification and labeling of chemical substances or preparations	
		Category Hazardous (P) / Non-hazardous (N)	Risk phrases
natural aggregates	36000 sq.m	N	inert, non-toxic
concrete	2000 cubic meters	N	nontoxic
concrete additives	0.3 tons	N	nontoxic
DIESEL	30000 l	p	toxic, flammable

2.7 Setting up the site organization

The arrangement, location, equipment of the construction site organization are not the subject of this project, but in this chapter, further details / recommendations will be mentioned regarding the location of the construction site organization, the potential sources of pollution of the environmental factors as well as the necessary measures for protection environmental factors during the operation of the site organization.

2.7.1 Necessary works for setting up the site organization

In order to carry out the previously described works, it may be necessary to build a production base, storage of materials and equipment, the location of which will be indicated by the beneficiary of the work, in the next design phase, in case the investment objective will obtain financing, and the works proposed in the documentation will be executed. In the next design phase, the project for organizing the execution of the works will be drawn up.

On the location of the site organization/work point there must be no construction that needs to be demolished, nor networks that need to be diverted or protected.

The site organization will be set up as close as possible to the center of gravity of the basic works, so that the necessary transports to the objective make the investment more economical.

Depending on the equipment and the needs of the builder, the organization of the site/work site will include the arrangement of a platform, fences and gates, equipment with containers, connection to the existing utility networks in the area.

The platform will be able to be used for placing containers, storing materials, parking and maintaining machinery. It is specified that it is preferable that the supply of the work point is done in accordance with the commissioning of the materials, so that the area temporarily occupied with the storage of the materials is as small as possible.

Access is provided up to the work by the existing communication ways, so it is not necessary to set up additional access ways.

Depending on the number of personnel who will serve the work, the site organization may be equipped with a site manager's office container, equipped with work desks and annexes (wardrobe, shelves), equipped with heating and air conditioning installations, a workers' changing room container, shower container and sanitary unit, storage container and mechanical workshop, mini-container for security.

2.7.2 Description of the environmental impact of site organization works

During the execution of the works, some toxic and dangerous substances will be used, especially petroleum products and thinners, whose storage, handling and use regime will comply with the provisions and regulations in force. The most used products are: fuel used for machinery and transport vehicles (gasoline, diesel) and lubricants (oils, paraffin). These will be purchased from the profile stations, or, if it will be necessary to supply the work point with these substances, they will be stored in sealed tanks that do not allow exfiltration.

Construction materials (especially pulverulent) stored in uncovered warehouses can be washed away by rainwater, and the fine particles can be carried to the adjacent lands. That is why material deposits (aggregates, cement, binders, and other types of materials) will be closed or covered, so that there is no danger of scattering in the atmosphere and depositing on the soil, or of infiltration into the undersoil waters or the Danube, through rain water.

The potential impact of site organization can be generated by the following factors:

- noxious emissions in air, water and waste generation
- landscape impact during the existence of the site organization (although the area is one with industrial specifics, being the port area where various activities are carried out).

Noxious emissions into the atmospheric air will fall within the maximum limits allowed in Order 462/1993, for water discharges, appropriate collection and discharge systems will be provided so that the quality limits established by HG no. 188/2002 with subsequent amendments and additions, and the noise and vibration level will fall within the limits allowed by STAS 10009/2017. The impact of the machinery's activity on the air and water is reduced in the case of strict compliance with the environmental protection rules (as mentioned in the previous chapters 6.1.1 and 6.1.2 respectively of this memorandum).

The builder has the obligation to not affect the natural environment in the respective area through the activity he carries out on the construction site. The staff will be trained to comply with cleanliness within the construction site organization and hygiene standards.

2.7.3 Sources of pollutants and installations for the retention, evacuation, dispersion of pollutants in the environment during the operation of the construction site

The sources of pollutants during the site organization are represented by:

- the movement of vehicles and machinery;
- the activities carried out within the construction site organization;
- meteoric waters falling on the work platforms of the site organization.

If there is no possibility of connecting the sanitary groups within the site organization to the sewer network in the port area, ecological toilets will be provided for the collection of waste water. For the collection of waste water from the site, companies specialized in this regard will be called upon. Depending on the number of people who will use the water for domestic purposes, a system with one or more emptyable basins will be adopted, which will be emptied periodically, by the care of the contractor, based on a contract concluded with an authorized operator.

It is also recommended to provide a system of the type of perimeter gutters for the collection of liquid losses and rainwater that drains and washes the site organization platform.

If this does not exist, the platform of the site organization must be designed so that the meteoric water is also collected through a system of trenches or walled gutters, in the harbor rainwater drainage network.

2.7.4 Equipment and measures for emission control

In order to prevent and/or reduce the pollution of environmental factors during the operation of the site organization, it is necessary to consider the following measures:

- the storage of dangerous products/substances used for the execution of the works will be carried out in accordance with the legal provisions in force, in spaces with restricted access, covered, on an impermeable surface, provided with a collection system for accidental leaks
- periodic checks of machinery and means of transport regarding the level of carbon monoxide and the concentrations of emissions in the exhaust gases. They will be put into operation only after fixing any defects
- equipment with a low noise level will be used as much as possible

- the vehicles will be equipped with a catalyst and will be kept in good working condition, with up-to-date inspections.

In order to control pollutant emissions into the environment, throughout the execution period of the works, the following will be monitored:

- the operating condition of transport equipment and machines to reduce the risk of pollution, on a daily basis;
- the amounts of waste by type generated and handed over to authorized operators by the constructor - monthly;
- concentrations of dust emissions in the atmosphere - monthly;
- the quantities of water used and discharged - monthly.

It will not be accepted to wash machines or dump trucks in the site, as the water from these washes has an alkaline character, being potentially contaminated with petroleum products (oils, fuels). In order to eliminate the danger of oil contamination of the soil and, by implication, the water of the Danube, it is necessary to properly maintain the machines and perform oil changes from the machines in special stations for such operations. As I mentioned before, fuels and chemical products will be stored in sealed cells.

In order to eliminate the risk of surface water pollution, the work teams will have, at the end of the program, cleaning the workplace, collecting and storing household waste in bins.

The works carried out as part of the site organization will not negatively affect other works or existing networks in the area. After the completion of the basic works, the site organization will be decommissioned, the land returning to its original use.

2.8 Territorial planning

The land has the function of a naval communication road area, according to the mentions in the urban planning certificate issued for this project.

The site is located in the suburbs of Bechet , Dolj county.

The area plan and the situation plan are attached to this study.

Bechet Port is located in Dolj County, UAT Bechet, being located on the left bank of the Danube River, in the area of km 678 - 681. The area of the port territory managed by CN APDF SA is 76,287 square meters. The length of the walled/vertical/natural wharfs under the administration of the beneficiary is 650 m. The port is of the fluvial type, allowing the berthing of barges of up to 2000 t.

The Bechet - Oreahovo Bulgaria Border Crossing Point also operates in Bechet Port. The border crossing infrastructure belongs to APDF and consists of RO-RO platform and ramp roads.

The port is connected to the local and national road network through DN54A, DN55 and DN55A.

The land is located in the suburbs of the city of Bechet and belongs to the public domain of the Romanian State concessioned to CN APDF SA Giurgiu according to Concession Agreement no. 3898 /15.10.2008 issued by the Ministry of Transport and CN APDF SA Giurgiu according to CF no. 30104/18.01.2022.

The current use and destination according to the PUG is *the naval communication channel area with an area of 76,537 square meters*.

The built area is 76,537 square meters of which:

- surface of hydrotechnical constructions and roads of account 49,024 sq m
- surface of existing buildings that are not part of the project 3,150 sq m.

According to PUG approved with HCL no. 11/2021 the location is located in the area of naval communication routes with height regime P+1+2E+M, POT max = 80%, CUTmax = 3.20.

The dominant function is the *area of naval communication routes*.

2.9 Ensuring connection to utilities

During the execution of the works, the utilities are ensured by the care of the contractor, by connecting to the existing networks where possible.

During the operating period, the utility insurance method is described below.

2.9.1 Water networks and installations - channel in the area of the commercial port

2.9.1.1 Drinking water supply to ships

The water supply for the existing sanitary groups of the port, for loading the drinking water tanks of the ships and for fighting the fire will be made from the public pipeline of the city of Bechet located about 2500 m away from the port premises. In order to ensure the flow and pressure in the network, a water management consisting of a water tank $V = 200$ mc and a pump station and water pump mounted in a container was provided.

2.9.1.2 Water supply for fire fighting

As an additional measure to ensure fire fighting on the port platforms, with water from the Danube, a fire hydrant made of sorb Dn 100mm, the vertical pipe made of galvanized steel pipe Dn 4", and a type A connection for the hydrant was provided at each berth.

2.9.1.3 Evacuation of household water in the port area

The domestic waste water evacuation from the sanitary groups of the port buildings will be done through a network of PVC pipes Dn 250 mm and slope $i = 0.008$, to a domestic waste water pumping station located in the port access area.

The pumping station is an undersoil construction of prefabricated concrete elements, having $D_i = 1.80$ m and $H = 6.0$ m. The station is purchased fully equipped with hydraulic, electrical and automation installations. The station is equipped with 1+1 electric pumps with $Q = 5$ l/s; $H = 16$ mCA; $P = 2 \times 2.5$ kW.

2.9.1.4 Evacuation of rainwater in the port area

To collect the rainwater from the premises, along the roads and platforms, gutters made of prefabricated concrete elements with a drain slope $i = 0.005$ were provided.

The gutter sections 2x20m each will be connected to the storm sewer network through spillways purchased together with the gutters.

For the mechanical purification of the rainwater discharged into the Danube, two sludge and hydrocarbon separators with a coalescing filter and a built-in by-pass with $Q = 200/40$ l/s characteristics were provided.

Before the discharge into the Danube, a non-return valve will be installed on the final section of the sewer, in order not to allow water from the Danube to enter the sewer if its level rises above the level of the discharge mouth.

2.9.2 Electrical networks and installations

The power supply is designed from a new transformer station, fully equipped for 2 transformers of 2000 kVA/pc., 20 / 0.4 kV, from which all the consumers provided in this documentation will be supplied from within the port of Bechet.

2.10 Estimation of the types and quantities of emissions and waste

Both during the construction period and during the exploitation period of the port platform, there will be no sources of biological, radioactive or electromagnetic pollution.

The only physical pollutants that can generate an impact both during the construction period and during the exploitation period are represented by the noxious emissions that can affect the quality of the air, water, soil and subsoil, noise and vibrations specific to each stage of the project. In the following, information is presented about these pollutants as well as the protective measures provided for in the project.

2.10.1 Emissions in water

During the execution of the works, in this environmental impact assessment study, the impact that the site organization will have (location, equipment, operation) will not be analyzed, considering that this is not the object of this project, it is not known its location, equipment, insurance method with utilities.

All the information related to a potential impact is informative and has taken into account the hypothesis of the location of the site organization near the work area, following that at the moment when the Contractor will be appointed for the execution of the works, the necessary regulatory acts must be obtained, according to the legislation in force .

The potential sources of water pollution during the execution of the works can be constituted by:

- point sources
- diffuse sources of pollution.

The point sources of water pollution during the execution of the rehabilitation and modernization works of the port platform in the port of Bechet are the accidental discharges of domestic wastewater, uncontrolled evacuation from the site of the work front and the site organization.

For the collection of waste water, it is recommended to install a drainable basin with periodic emptying (if it is not possible to connect to a sewerage network - the closest to the site area) and periodically, by the Contractor's care, to carry out the emptying of these waters with an authorized operator and transporting them to the nearest sewage treatment plant.

The diffuse sources of pollution are represented by:

- construction works: earthworks, traffic associated with the works, machinery operation
- activities carried out within the organization of the construction site: storage of bulk construction materials (especially powdery and small ones) that can be carried by rainwater or wind on the surface of the Danube river

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- machine washing - the water with which machines are washed can be contaminated with oils and petroleum products and have an alkaline character (pH > 8.5)
- uncontrolled storage of waste, especially organic/household waste, which can lead to leakage of leachate into the water body or onto the soil.

All maintenance / repair / washing of equipment will be carried out only in specialized centers, outside the project site, at a great distance from the bed of any water course. During the execution of the works, the handling of materials (construction materials, sand, etc.) and the earth can attract fine particles that can reach the surface or in the body of surface water. Also, the accidental loss of materials, fuel, hydrocarbons or engine oil from the trucks used in the execution of construction works, for the transport of materials to the work site or of waste can contribute to the impurity of surface water or under soil water in the area where the works are located. By observing the measures to protect the environmental factors and the execution technology, they will not be able to affect the quality of the water body (Danube river). In the event of accidental pollution, the contractor must intervene with the team designated for such situations and with the materials provided, to limit or stop the pollution. If the pollution cannot be remedied by the constructor's staff, it is recommended to contact a company specialized in depollution and the urgent remediation of the produced pollution.

Considering the fact that the project provides for the rehabilitation and modernization of the existing port platform, which also involves work on the existing berths and the development of the area in the immediate vicinity of the berths for the berthing of ships, dredging works will be carried out. These works can lead to an increase in turbidity in the water body and could also lead to a change in the quality of the water if the tools used are not in good working condition. In order to reduce the impact that the execution of these works could generate, through this study a series of measures are proposed that first of all provide for the assurance of the contractor that the machines that will execute these works are in good working order and that they have no loss of oil or petroleum products that can reach the water body. Also, there is a schedule for the execution of the works with the observance of pause times that allow suspended matter from the water body to settle, so that the flora and fauna are only affected locally and for short periods of time.

Rainwater that will wash the port platform is collected and passed through hydrocarbon separators before being discharged into the Danube. During the execution of the works, these waters resulting from the platform of the work fronts, will be collected in drainable basins from where they will be emptied (under the care of the contractor) and transported to the nearest treatment station.

It is recommended that there are no fuel deposits on the construction site site, that the machines/vehicles are refueled at the nearest and authorized points. In order to be able to intervene in the shortest possible time to remedy any leakage of petroleum products / dangerous chemical substances on the site of the work front, it is recommended to provide the necessary materials (sand, absorbents) to be able to remedy any accidental pollution and limit the impact it can be generated by absorption of environmental factors (water, soil).

During the execution of the works, another potential source of surface water pollution is possible road accidents in which dangerous chemical substances / oil products are involved. In order to prevent their occurrence, it is recommended that, through the care of the traffic manager appointed by the contractor, ensure appropriate signaling of the work front area, limiting the speed of movement of vehicles, especially in the areas near the water body.

During the operating period of the port, the forecasted increase in activity in the port area will not represent a significant risk of pollution due to bilge water, ballast water or ship waste. For these categories of water, the project provided for collection and evacuation systems either in the

sewerage network of the city of Bechet or by discharge into the Danube after they were actually passed through a hydrocarbon and sludge separator.

2.10.2 Air emissions

During the execution of the rehabilitation and modernization works of the port infrastructure in Bechet port, the air may be polluted as a result of the activities carried out both within the site organization and especially in the area of the work fronts and on the access roads to and from the front For work.

Air pollution occurs especially during excavation, excavation, filling as a result of earth handling and traffic for transporting earth and ballast.

The level of pollution caused by these operations depends on the technology used and the efficiency of the machines used.

Air pollution will occur punctually within the work front and access roads, the sources of pollution being characterized by:

- soil sources with effective emission heights of up to 4 m above soil level
- open sources that involve the handling of soil and/or used material with a high content of suspended matter
- mobile sources represented by the construction equipment, means of transport used for the realization of the project.

Regarding the site organization, the main sources generating emissions can be the material warehouses, which can generate high concentrations of emissions in periods with higher wind intensity and for which it is recommended to moisten them periodically or cover them with tarpaulins (if the surfaces allow this). Another source of air pollution is the exhaust gases of vehicles entering/leaving the construction site. These aspects related to the pollutants generated by the activity carried out within the site organization will be analyzed in detail at the time of obtaining the regulatory documents for its operation, after the appointment of the contractor who will perform the work.

Car traffic is a source of air pollution during the construction period and will be analyzed further.

Atmospheric pollution in the case of car traffic occurs due to the burning of fuels in engines and the frictional wear of the materials of the various contact surfaces. This type of pollution manifests itself as a result of:

- exhausting combustion products from vehicle engines into the atmosphere
- the production of powders of various kinds from the wear of the running track and springs, braking and clutch devices.

The pollutants resulting from the combustion of the fuel mixture are: CO₂, CO, nitrogen oxides (NO_x), burnt and unburned hydrocarbons (HC), sulfur oxides, especially SO₂. Also, depending on the type of fuel used, the exhaust gases may also contain particles with Pb and smoke particles.

The concentrations of these compounds depend on a number of factors such as:

- type of fuel used (gasoline, diesel)
- traffic speed, traffic conditions (number of accelerations, braking, idling)
- the intensity of traffic on the roads
- traffic on the ramp or on straight roads.

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The activities in the front area / work fronts that can generate pollutant emissions in the air are:

- vehicle traffic
- operation of the necessary equipment for excavations, loading/unloading of materials, handling of materials, etc
- material loading/unloading operations, excavations.

The machines used to carry out the works will move only on the access roads from the project site and within the work fronts and will have a radius of action of no more than 20 m. It is strictly forbidden to move the machines outside the existing exploitation roads so as not to be affected than the areas specified in the project.

Atmospheric pollutant emissions will be generated by the vans used for the transport of construction materials (transport of ballast, cement concrete and asphalt mixtures, etc.). Also, emissions will be generated by vehicles used to transport workers and equipment. These emissions will occur linearly (along the access roads to the project site) and will not be significant.

Another source of air pollution during construction works is the transport activity.

The level of emissions varies depending on the technology and equipment used during these activities.

Impact forecasting during the execution period

The atmosphere is considered the widest vector for the propagation of pollution, the emitted pollutants affecting directly and indirectly, at short and long distances, both the human element and all other components of the natural and artificial (built) environment.

The emissions generated by the burning of fuels include common pollutants (NO_x, SO₂, CO, particles), substances with carcinogenic potential (cadmium, nickel, chromium and polycyclic aromatic hydrocarbons), nitrous oxide (N₂O) - the substance incriminated in the depletion of the layer of stratospheric ozone, methane - which together with CO₂ have global effects on the environment, being gases that contribute to the appearance of the greenhouse effect.

Dust emissions often vary substantially from one day to the next, depending on the level of activity, the specifics of the operations and the weather conditions.

Pollutant emissions decrease as the performance of the engine is more advanced, the current trend in the world is the manufacture of engines with the lowest possible consumption per power unit and with the most restrictive control of emissions.

For means of transport, included in the category of heavy vehicles (heavy duty vehicles according to the CORINAIR methodology), the correlations between pollutant emissions and the technological level of the engine, fuel consumption per power unit or per 100 km, the age of the vehicle, are also valid. running speed, etc.

It is mentioned that the 16 t dump trucks manufactured in Romania have a high fuel consumption of 40 - 45 l/100 km, while the CORINAIR methodology estimates an average consumption of 29.9 l/100 km for heavy duty vehicles (diesel heavy duty vehicles) . The real consumption of very heavy vehicles carrying 40-45 t does not exceed 50-55 l/100 km. The specific consumption, related to 1 ton of transported material, is approximately 2 times lower compared to the consumption of 16 t dump trucks.

For the construction of the objective, it is assumed that heavy vehicles with average characteristics will be used: capacity 30 t and consumption 40 l/100 km. Taking into account the

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aspects mentioned above, the values of atmospheric pollutant emissions were estimated for the period of execution of the works that are the subject of this study.

Mass flows and concentrations of polluting substances in the air

The machines, regardless of their type, operate with Diesel engines, the exhaust gases discharged into the atmosphere containing the entire complex of pollutants specific to the internal combustion of diesel: nitrogen oxides (NOx), non-methane volatile organic compounds (COVnm), methane (CH₄), oxides of carbon (CO, CO₂), ammonia (NH₃), heavy metal particles (Cd, Cu, Cr, Ni, Se, Zn), polycyclic aromatic hydrocarbons (PAH), sulfur dioxide (SO₂).

The complex of organic and inorganic pollutants emitted into the atmosphere together with the exhaust gases contains substances with different degrees of toxicity. The presence, in addition to common pollutants (NOx, SO₂, CO, particles), of some substances with carcinogenic potential highlighted by epidemiological studies carried out under the auspices of the WHO (World Health Organization), namely: cadmium, nickel, chromium and hydrocarbons, is noted polycyclic aromatics (PAH).

The main area of emission of pollutants resulting from the activity of machinery and means of transport is considered the area of the work front.

The maximum concentrations of pollutants are achieved within this area. Dispersion studies completed with measurements show that, outside the circulated areas, the concentrations of polluting substances in the air are substantially reduced. Thus, at 20 m outside the transport corridor the concentrations are reduced by 50% and at over 50 m the reduction is 75%.

Within the construction site and along the transport corridor, the distribution of pollutants is considered uniform. Means of transport are assimilated to linear sources of pollution. The machines, on the other hand, move short distances, in the area of the work fronts.

The assessments of fuel consumption during the execution period were carried out based on the volumes of works. According to these data, the daily fuel consumption in the most active periods resulted in:

- for means of transport - 198 l
- for machines - 179 l
 - total - 377 l.

Based on these premises and the US EPA /AP - 42 methodology, the emissions of pollutants into the atmosphere during the execution of the works are estimated to be:

Table no. 1- Pollutant flows resulting from fuel combustion

Nature of the pollutant	Emissions (g/kg)	Daily emissions (g/day)	Hourly emissions (g/h)
NOx	0.64	8.05	0.80
Co.	0.26	3.22	0.32
VOC	0.10	1.29	0.13
powders in suspension	0.05	0.64	0.06
SO ₂	0.13	1.61	1.61
CH ₄	0.003	0.039	0.004

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N ₂ O	0.002	0.019	0.002
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Table no. 2- Pollutant flows resulting from vehicle traffic

Nature of the pollutant	Emissions (g/kg)	Daily emissions (g/day)	Hourly emissions (g/h)
NOx	0.60	8.39	0.84
Co.	0.52	7.22	0.72
VOC	0.12	1.61	0.16
powders in suspension	0.06	0.79	0.08
SO ₂	0.14	1.98	0.20
CH ₄	0.003	0.048	0.005
N ₂ O	0.002	0.024	0.010

According to the US-EPA - AP - 42 assessments, the emissions of suspended particles (including PM10) resulting from the activity of the machines can be estimated, on construction sites, at 2.69 t/ha/month.

Concentration values of 1.0 - 1.2 mg/m³ can be achieved. The particles in suspension in the air from the activity of the machines are added to those from the means of transport, on the sectors where both activities are carried out.

The above assessments regarding the concentrations of material particles (dust) in the air correspond to the most unfavorable meteorological and technological situations. By monitoring the construction works and by applying concrete measures (such as sprinkling dirt roads, stopping the activity in periods of strong wind), the construction works will fall within the legal limits in terms of the concentration of particles in the air

It must be specified that the choice of equipment, the organization of the construction site, the execution technology, the work flow, all of these fall under the duties of the designated constructor, but will be selected in such a way that the emissions of atmospheric pollutants are as low as possible

2.10.3 Emissions on the soil and undersoil

The realization of the rehabilitation and modernization of the port infrastructure of Bechet port does not represent a direct source of soil pollution from the location of the works. During the construction period, accidental soil pollution may occur as a result of the following:

- deposition of sedimentable powders resulting from excavation activities, transport and unloading of construction materials
- the deposition of polluting substances from the air generated by the movement of vans used for the transport of construction materials and the movement of construction equipment

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- accidental spills of hydrocarbons (oils, lubricants, fuels, paints) in the work area, in the site organization or during transport
- leaks on the soil of mortar, cement paste, suspensions in the places where the concrete is poured during the work
- improper storage of construction materials and waste (including dangerous ones) directly on the soil or in undeveloped spaces
- washing machines outside specially designed centers/places and dumping these waters directly on the soil
- the occurrence of accidents involving vehicles transporting toxic substances or hydrocarbons and their spillage on the soil.

During the operating period, there are no sources of soil pollution except in the case of the production of road works on the port platform that result in leakage of products containing hazardous substances and that reach the non-concrete / asphalted areas.

2.10.4 Noise emissions and vibrations

The noise sources present on the site of the proposed project are represented by the natural backsoil and specific port activities (loading / unloading of goods).

the technological execution processes (excavations, wharf fillings, transportation of construction materials, etc.) involve the use of groups of machines with appropriate functions. these working machines are sources of noise.

During the execution period, the noise sources are grouped as follows:

- in the work fronts, the noise is produced by the operation of the construction equipment specific to the works (excavations and site cleaning, construction of the designed structures, etc.) to which is added the supply of materials
- on the routes in the construction site and outside it, the noise is produced by the traffic of vehicles that transport materials necessary for the execution of the works.

the noise propagation conditions depend either on the nature of the machines and their arrangement or on additional external factors such as:

- meteorological phenomena and in particular the speed and direction of the wind, the degree of temperature
- absorption of acoustic waves by the soil
- absorption of acoustic waves in air, depending on pressure, temperature
- relative humidity
- topography of the land
- vegetation.

Starting from the values of the acoustic power levels of the main machines used and their number in a certain work front, I can make some assessments regarding the noise levels and the distances at which they are recorded.

the equipment used and approximate associated acoustic powers:

- bulldozers Lw - 115 dB(A)
- charger Wolla Lw - 112 dB(A)
- excavator Lw - 117 dB(A)

- compactor Lw - 105 d(A)
- paver Lw - 115 dB(A)
- dump trucks Lw - 107 dB(A).

In addition to the acoustic impact, the construction machinery with large own masses, through their movements or through the activity in the work points, constitute sources of vibrations.

The second main source of noise and vibrations in the construction site is represented by the movement of means of transport. For the transport of materials (anchorage, prefabricated) dump trucks / heavy vehicles are used, with a load ranging from a few tons to 20 tons.

For the construction period, the noise at the source and the noise in the near field have acoustic characteristics corresponding to the nature and layout of the machines.

The noise in the far field is affected by several external factors, including wind speed and direction, temperature and wind gradient, absorption of acoustic waves by the soil (soil effect), absorption in the air (depending on pressure, temperature and relative humidity, noise frequency), topography and type of vegetation.

2.10.5 Radiation and light emissions

The proposed project does not generate thermal or radioactive pollution, both during the execution of the works and during the operation period.

2.10.6 Types and amounts of waste

Through HG no. 856/2002 for " *Record of waste management and for the approval of the list including waste, including hazardous waste* " the obligation is established for economic agents and for any other generators of waste, natural or legal persons to keep records of waste management. The record of waste management will be kept on the basis of the " *List containing waste, including hazardous waste* ", presented in Annex 2 of HG 856/2002.

According to the mentioned list - the waste resulting from the period of construction and development of the infrastructure in Bechet port is presented below.

- earth and excavated materials (stone, broken stone, concrete); category 17;
 - code 17 01 01 concrete;
 - code 17 01 04 earth and excavated materials;
- waste of mixed construction materials; category 17,
 - code 17 01 07 mixtures of concrete, bricks, tiles and ceramic materials without the content of dangerous substances;
 - code 17 02 01 – 17 02 03: wood, glass, plastic materials;
 - code 17 05 00 earth and excavated or dredged materials;
 - code 17 09 00 mixed waste of construction materials;
 - code 17 04 07 metals (including their alloys), metal mixtures;
 - code 17 04 11 waste from making the electrical connection;
 - code 17 04 metals (including their alloys): code 17 04 05 iron and steel; code 17 04 07 metallic mixtures
- recyclable waste: categories 15 and 20,
 - code 15 01 01 paper-cardboard packaging;

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- code 15 01 02 plastic packaging;
 - code 15 01 03 wooden packaging;
 - code 15 01 07 glass packaging;
 - code 20 01 01 paper and cardboard waste;
 - code 20 01 08 biodegradable waste from kitchens and canteens
 - code 20 01 39 plastic materials;
 - code 20 01 38 wood;
- mixed municipal waste (household waste): category 20, code 20 03 01.

In order to ensure an adequate level of protection for people and the environment, the technical revisions of the machinery/means of transport used during the construction period (oil changes, replacement of oil filters, brake fluid, antifreeze, replacement of used accumulators, used tires) will be performed in authorized specialized service workshops.

The waste generated during the execution of the designed construction works is waste that can be recovered (wooden material waste, metal waste), mixed municipal waste will be disposed of by authorized economic agents specialized in sanitation.

According to HG no. 856/2002, the builder has the obligation to keep records of the production, temporary storage, treatment and transportation of waste for recycling or their permanent storage.

The constructor will keep strict records regarding the calendar dates, the quantities removed and the identification data of the means of transport used for the transport of waste. These data will be synthesized and presented in the annual monitoring report that will be submitted to the Environmental Protection Agency.

The waste will be collected selectively, and the recyclables will be recovered through a specialized company.

The estimates regarding the quantities of waste that can be produced during the construction period were made taking into account the complexity of the designed works.

The table below shows the estimated amounts of waste generated during the execution of the works.

Table no. 3- Waste management during the execution period

Waste code	Waste type	Physical condition ¹	Estimated quantity	Waste generator	Collection / evacuation mode	Remarks	Responsibility
08 01 11*	waste paints, varnishes containing hazardous substances and organic solvents	S	0.07 t/year	Results behind execution works of road markings and painting superstructures.	They will be collected separately in suitable containers and stored temporarily in special spaces set up, to be picked up and transported by operators authorized at regulated disposal facilities.	Management record waste is done according to the legislation in force.	Entrepreneur, by care of the environmental officer
15 01 01	paper and cardboard packaging	S	0.5 t/year	results from the packaging of the products / materials used	collected in bins / areas intended for each type of waste, to be picked up and transported by operators authorized at regulated disposal facilities.	Management record waste is done according to the legislation in force.	Entrepreneur, by care the environmental officer
15 01 02	plastic packaging	S	0.5 t/year			Management record waste is done according to the legislation in force.	Entrepreneur, by care the environmental officer
15 01 03	wooden packaging	S	0.5 t/year			Management record	Entrepreneur, by

¹S- solid, L – liquid, SS - semi-solid

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Waste code	Waste type	Physical condition ¹	Estimated quantity	Waste generator	Collection / evacuation mode	Remarks	Responsibility
						waste is done according to the legislation in force.	care the environmental officer
15 01 10*	packaging that contains residues or is contaminated with dangerous substances	S	0.5 t/year		waste is stored in bins intended for this type of waste, separated from other types of packaging waste, to be picked up and transported by operators authorized at regulated disposal facilities.	Management record waste is done according to the legislation in force.	Entrepreneur, by care the environmental officer
15 02 02*	absorbents, filter materials, construction materials, protective clothing contaminated with dangerous substances	S	0.3 t/year	generated from the works carried out on the site	They will be collected separately in suitable containers and stored temporarily in special spaces set up, to be picked up and transported by operators authorized at regulated disposal facilities.	Management record waste is done according to the legislation in force.	Entrepreneur, by care of the environmental officer
17 01 01	concrete	S	50 mc/month			Waste production	Entrepreneur, by

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Waste code	Waste type	Physical condition ¹	Estimated quantity	Waste generator	Collection / evacuation mode	Remarks	Responsibility
17 03 02	asphalts, other than those specified in 17 03 01	S	3 mc / month	concrete or waste asphalt mixtures	In case of non-compliance with the work schedule or materials inadequate from a qualitative point of view.	from discarded loads can be partially eliminated by ensuring correct work schedules and operation	care of the environmental officer
17 02 01	wood	S	1 t/year	current maintenance and site activities	They will be selected and reused according to size as accessories and support elements in construction works	Capitalization is desired its entirety	Entrepreneur, by care of the environmental officer
17 04 07	metal mixtures	S	2 t/year	current maintenance and site activities	The authorization will be selected and taken over by the operators in order to capitalize	Capitalization is desired its entirety	Entrepreneur, by care of the environmental officer
17 05 04	earth and stones	S	80 mc/month	current site activities as well as bridge demolition works	They will be taken over by operators for recovery	Management record	Entrepreneur, by care of the environmental officer
20 03 06	sludge from decanters	SS	12 mc/month	emptying activities of the sedimentation basin / hydrocarbon separator	They will be taken over by operators for disposal	waste is done according to the legislation in force.	Entrepreneur, by care of the environmental officer

Waste code	Waste type	Physical condition ¹	Estimated quantity	Waste generator	Collection / evacuation mode	Remarks	Responsibility
20 03 01	mixed municipal waste	S	3 t/year	activities carried out within the work fronts, site organization	Collection in type containers bins, disposal at waste depots through specialized companies on a contract basis	Management record waste is done according to the legislation in force.	Entrepreneur, by care of the environmental officer

Table no. 4- Waste management during the execution period

Waste code	Waste type	Physical condition ²	Estimated quantity	Waste generator	Collection / evacuation mode	Remarks	Responsibility
08 01 11*	waste paints, varnishes containing hazardous substances and organic solvents	S	0.02 t/year	Results behind execution works of road markings and painting superstructures.	They will be collected separately in suitable containers and stored temporarily in special spaces set up, to be picked up and transported by operators authorized at regulated disposal facilities.	Management record waste is done according to the legislation in force.	Holder by care of the environmental officer
20 03 06	sludge from decanters	SS	12 cubic meters / year	results from the cleaning of	will be collected and disposed of at waste depots or treatment plants	evidence of waste will be kept according to the legislation in force	Holder by care of the environmental officer

²S- solid, L – liquid, SS - semi-solid

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Waste code	Waste type	Physical condition ²	Estimated quantity	Waste generator	Collection / evacuation mode	Remarks	Responsibility
				hydrocarbon separators			

Tabelul nr. 5- Gestiunea deeurilor in perioada de operare

Waste code	Waste type	Physical state ³	Estimate quantity	Waste generator	Collection / evacuation mode	Observations	Responsability
08 01 11*	waste paints, varnishes containing hazardous substances and organic solvents	S	0,02 t/an	generated from repair/maintenance works in the Bechet port area	Will be collected separately in suitable containers and temporarily stored in specially arranged spaces, to be picked up and transported by authorized operators to regulated disposal facilities.	The record of waste management is made pursuant to the legislation in force.	Beneficiary, through the care of the environmental officer
20 03 06	sludge from decanters	SS	12 cm / year	results from the cleaning of hydrocarbon separators	will be collected and disposed of at waste depots or treatment plants	The record of waste management is made pursuant to the legislation in force.	Beneficiary, through the care of the environmental officer
20 03 01	mixed municipal waste	S	2 t/year	activities carried out within the port of Bechet	Collection in bin-type containers, disposal at waste depots through specialized companies on a contract basis	The record of waste management is made pursuant to the legislation in force.	Beneficiary, through the care of the environmental officer

³ S- solid, L – lichid, SS - semisolid

Waste code	Waste type	Physical state ³	Estimate quantity	Waste generator	Collection evacuation mode /	Observations	Responsability
15 01 01	paper and cardboard packaging	S	0,2 t/year	results from the usual activities but also from the maintenance/repair works in the Bechet port area	collected in the bins / areas intended for each type of waste, to be picked up and transported by authorized operators for recovery.	The record of waste management is made pursuant to the legislation in force.	Beneficiary, through the care of the environmental officer
15 01 02	plastic packaging	S	0,2 t/year	results from the usual activities but also from the maintenance/repair works in the Bechet port area	collected in the bins / areas intended for each type of waste, to be picked up and transported by authorized operators for recovery.	The record of waste management is made pursuant to the legislation in force.	Beneficiary, through the care of the environmental officer
15 02 02*	absorbents, filter materials, polishing materials, protective clothing contaminated with dangerous substances	S	0,3 t/year	generated from repair/maintenance works in the Bechet port area	Will be collected separately in suitable containers and temporarily stored in specially arranged spaces, to be picked up and transported by authorized operators to regulated disposal facilities.	The record of waste management is made pursuant to the legislation in force.	Beneficiary, through the care of the environmental officer

During the operating period, the generated waste will be taken over by the CN APDF SA administrator or the operators (from the commercial port area) by authorized operators for the types of waste generated and transported for disposal / recovery depending on the type of waste, both from the commercial port area especially from the passenger port area. The storage of generated waste will be done on waterproof (concrete) platforms, in the bins intended for each type of waste, labeled with the stored waste code, sized according to the amount of waste that can be generated to prevent their non-compliant storage outside the bins. A monthly record of the quantities/types of waste generated, handed over for disposal/recovery will be maintained and will be reported either at the request of the environmental authorities, or at the deadline established by the regulatory acts or annually (according to the provisions of GEO 92/2021 regarding the regime waste).

Waste types 13 04 01 – satin oil from river navigation and respectively 13 04 02 – satin oil from canalization systems in quays will be managed, as up to now, directly by the beneficiary. The management of these types of waste water were not the object of the works provided by this project.

The waste management plan

Waste management must be carried out without affecting human health and the environment and without generating risks for air, water, soil, subsoil, fauna and flora.

Preventing or reducing the production of the amount of waste generated following the execution stage will be possible through: reuse/recovery of waste (metal, earth from excavation or other waste that can be reused) through recycling, recovery or any other process through which materials are obtained secondary premiums.

The disposal of waste resulting from the use of chemical products will be carried out by companies authorized in terms of environmental protection.

The waste management plan involves the collection/storage/disposal of both solid waste and hazardous and non-hazardous liquid waste. In this sense, the waste generated during execution periods is managed as follows:

- textile waste (laundry) is collected in sealed containers and is taken over on the basis of a contract with an authorized company.
- household waste is pre-collected in containers (bins) located in the site organization area. The disposal and storage of household waste is done by an authorized company;
- the packaging waste of dangerous chemical substances will be collected in large bags and utilized based on contracts with authorized companies.
- used oils will be collected in metal barrels and recycled through authorized companies.

Employees will be trained on waste handling as well as how to sort them by category, in the containers specially provided for each category of waste. The delivery of waste generated to the extent of its generation will be pursued in order to avoid the production of stocks that could harm the environmental factors.

The contractor will prepare and keep records of the recovered quantities in accordance with the provisions of GD 856/2002 and GEO No. 92/2021 regarding the waste regime, with subsequent amendments and additions.

The contractor will ensure that it complies with the requirements of the National Waste Management Plan and the National Waste Prevention Plan. waste hierarchy " principle will be put into practice, which classifies the different waste management options and priority will be given to waste prevention, waste minimization, waste reuse, recycling, energy recovery and, finally, disposal by incineration or storage.

3 Project alternatives, conceptual framework and impact assessment method

3.1 Conceptual framework

The choice of assessment methodology was made taking into account the large scale of the project, the complexity and the diversity of its implementation area. Attention was paid, according to the requirements of the Milieu/COWI Guide - 2017, to those changes proposed by the project likely to generate significant impacts.

The conceptual framework used, which includes the methodological steps followed, is presented schematically in the following figure. In the following sections, the main methodological elements considered in the environmental impact assessment process are highlighted.

We make it clear that in this report the terms "environmental component", "sensitive receptor" has been used alternatively to describe the environmental factors.

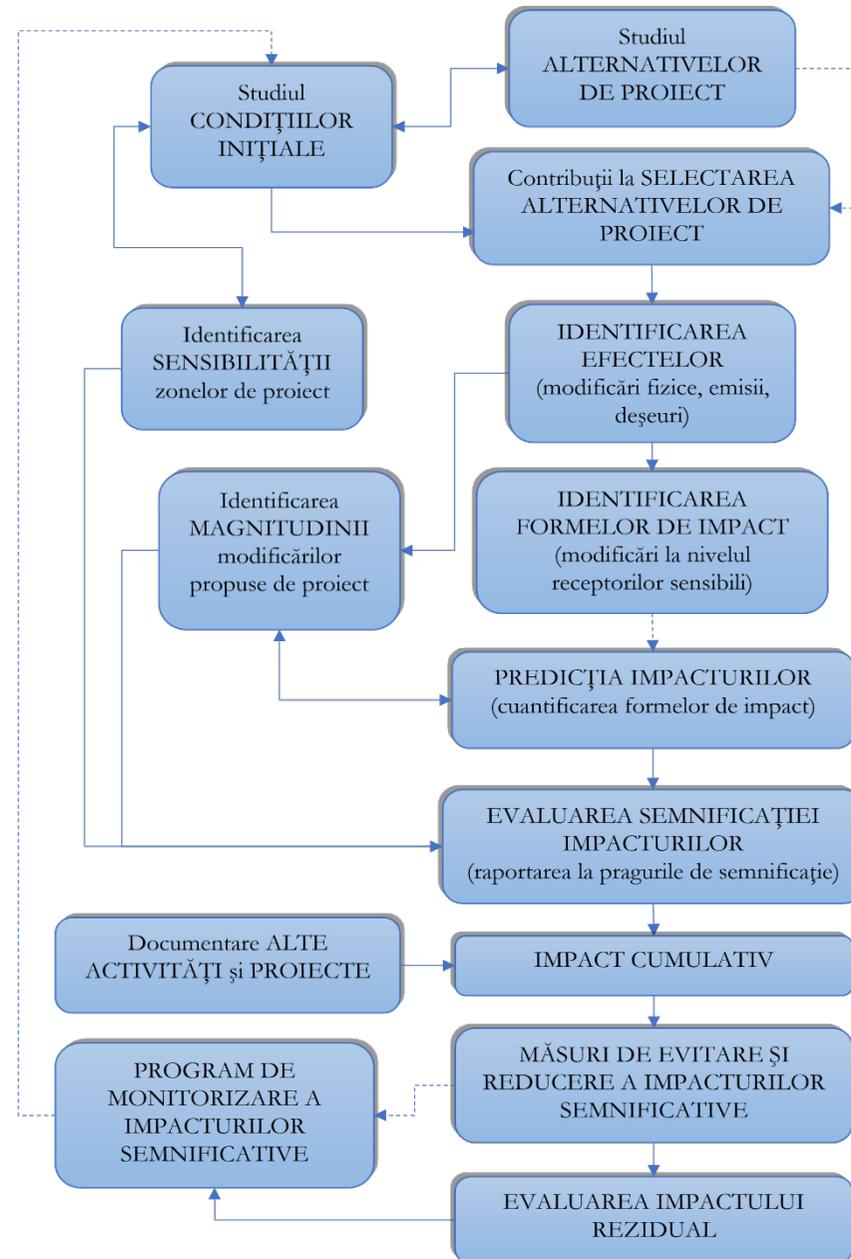


Figure no. 3- The conceptual framework for environmental impact assessment

3.2 Project alternatives

For the project that is the subject of this study, two alternatives were analyzed, namely:

- "no project" alternative
- the "with project" alternative.

3.2.1 Alternative "no project"

This option implies the non-realization of the project (the non-realization of the rehabilitation and modernization works of the port infrastructure in Bechet port) and the maintenance of the current state.

The infrastructure of the port currently does not allow the mooring of ships near the shore, so it is not possible to operate cranes at the wharf, thus making it impossible to unload ships at the shore (the activity being carried out is loading). The port operates, for the most part, on the flow of shipping goods. The application of this alternative will primarily lead to maintaining a low level of the economy in the area of Bechet city (the low level of transactions with goods in the port area will not lead to an increase in receipts, and implicitly in taxes, etc.). At the same time, there will be no increase in the number of jobs, and the maintenance of the port platform in its current state with the existing degradation will lead over time to their amplification and the intensification of the degree of environmental pollution by increasing the level of noise, emissions of suspended dust and of the concentrations of exhaust gases, from the vehicles that will develop their area here and that will have to intensify the acceleration / deceleration maneuvers considering the degradation of the concrete platform and to be able to avoid the occurrence of possible accidents.

3.2.2 Alternative "with project"

Regarding the alternative with the project with two scenarios, namely:

- scenario 1 with a project that provides for the realization of hydrotechnical works in the port area, which involves *the Modernization of the Danube mooring front by the execution of a vertical wharf made of weight blocks, rehabilitation of the RO-RO ramp and access roads, related works that include dredging/excavations for the execution of the vertical wharf, the easement berth and rehabilitation of the RO-RO ramp and, respectively, the rehabilitation of the navigation signaling system for the entire work, works to ensure utilities in the port area (water supply, collection and evacuation of domestic waste water and rainwater, fire extinguishing installations, power supply, ensuring video surveillance and access control*

- scenario 2 with a project that provides for the realization of hydrotechnical works in the port area, which involves *the Modernization of the Danube mooring front through the execution of a vertical wharf made of piles, rehabilitation of the RO-RO ramp and access roads, related works that include dredging/excavations for the execution of the vertical wharf, the easement berth and rehabilitation of the RO-RO ramp and, respectively, the rehabilitation of the navigation signaling system for the entire work, works to ensure utilities in the port area (water supply, collection and evacuation of domestic waste water and rainwater, fire extinguishing installations, power supply, ensuring video surveillance and access control* .

The works that were proposed to be executed in the first version are detailed in the previous chapters of this memorandum.

In the second version, the proposed works are similar to those proposed in the first version, with the exception of the modernization works of the mooring front in which the variation of making the vertical wharf from piles is proposed. These works are briefly described below.

➤ **Mornification of the mooring front at the Danube**

In order to modernize the existing mooring front at the Danube, 650 m long, (for berths numbered from 2 to 6, with lengths of 130 m each), it was proposed to build a vertical wharf, a variant in which ships will dock directly at wharf, at a distance of approximately 20 m towards the water from the alignment of the existing mooring front.

Moving the mooring front towards the water will ensure the creation of a port platform that allows operation at the wharf with Bocşa type port cranes, 16 tf x 32 m. At the same time, moving the front towards the water will ensure the depths necessary for direct mooring at the wharf, with minimal expenses for maintenance operations, respectively dredging.

➤ **Execution of vertical key made of metal piles**

In this variant, the wharf will be made of metal sheet piles type Larssen S 430 GP or equivalent, with a width/pile of 60 cm, between quota +7.80 m and -11.00 m local low water (lowered in the limestone layer in binder of sand), along the entire length of the mooring front, of 650 ml. At the ends of the wharf, the sheet piles will be embedded in the shore, perpendicular to it, for 2 x 25 m = 50 m. The final foundation height of the pile screen will be established in the next design phase, after the preparation of a detailed geotechnical study, which to highlight the stratification of the land along the wharf.

The piles will be anchored to a dry wall with Ø 75 mm tie bars, placed at distances of 2.4 m from each other and having a minimum length of 20 m. Additionally, in the profile of the bollards, one additional anchorage will be made with Ø 59 mm tie bars, with lengths of at least 18.5 m, made of S355 steel.

For the uniform distribution, on all the piles, of the efforts from the anchorages (and to keep the piles in the same position relative to each other) stiffening beams attached to the piles with bolts at 2.40 m from each other will be executed. This will result in an alternation between anchors and bolts every 1.20 m along the sheet pile walls.

The stiffening beams are formed by two U-profiles, solidarized by welded eclipses. Also, stiffening plates are provided next to the bolts and anchors. Stiffening beams are placed on welded gussets of sheet piles.

The sheet piles will be inserted into the soil by vibro-driving. The anti-corrosion protection of the piles will be ensured by the quality of the steel used and, additionally, by painting with polyurethane paint applied before vibro-driving, so that the piles are painted from the upper level to 2.00 m below the soil level. All metal constructions will also be protected with polyurethane paint, after their installation.

After the pilings are put into operation, in front of the mooring front, the bottom of the bed will be set up along the entire length of the mooring front (650 ml) by dredging the land up to -4.5 m local low water, on a width of approx. 7 m. In front of the sheet pile wall, a blockage with a minimum thickness of 1 m will be made, made of rough stone placed on the reverse filter. The works in front of the mooring front will be carried out from the water, before the installation of the shock absorbers and without affecting the sheet pile wall in any way.

At the upper part of the sheet pile wall, the construction of the crest beam made of reinforced concrete C35/45 was planned. The beam will be executed in sections, of approx. 40 m, between which there are vertical joints made of a 2 cm extruded polystyrene support layer, with elastic putty.

The crest beam will be poured towards the platform behind the piles on a leveling concrete layer, and on the side facing the water on a metal formwork made of thick sheet metal, welded to the wall with sheet piles, after its commissioning. The water side of the crest of the beam will be protected with a thick sheet metal plate embedded in the beam by means of concrete steel blanks.

On the mooring front, 5 metal ladders are provided, which will fit inside the front line, one for each operating berth, in order to ensure access between the ships and the quay. The stairs will be embedded at the top in the crest beam.

The port platform will be made of:

- ballast base layer, 36 cm thick;
- broken stone foundation, 30 cm thick;
- platform clothing from BcR 4.5, 24 cm thick.

The road concrete platform is poured in longitudinal strips, between which constructive joints are made. Transverse expansion joints will be provided every 40 m, in correlation with the joints between the sections of the running beams of the wharf crane.

In order to create the possibility of the subsequent installation, by the port operators, at Berths 2 - 6, of some 16 tf x 32m Bocsca type quay cranes, reinforced concrete running beams will be placed in the body of the platform, both dry and to the water, indirectly founded, on drilled columns Ø 900 mm, arranged at interaxial distances of approx. 3.6 m and founded in the limestone horizon in gray sand binder at -11.00 local low water (+10.86

MN75). It will be considered that the position of the drilled piles does not overlap the position of the anchors. Considering the presence of water in the immediate vicinity, the solution of drilling columns with bentonite mud is not accepted.

On the rehabilitated quay, it will be possible to mount one crane for each operating berth, provided that a minimum distance between cranes of 50 m interaxle is observed. Mooring bollards of 25 tf will be mounted on the crest of the quay made of piles, at distances of approx. 20 m from each other. The waterward edge of the crest beam will be protected with a metal plate fixed through gaps, along the entire length of the mooring front. The keel is equipped with keel shock absorbers made of rubber rollers positioned on three levels.

➤ **Execution of easement berth for the replacement of the existing pontoons**

Upstream of the vertical wharf, a floating berth (berth 1 – easement berth) was planned to serve the vessels of the authorities operating in the port of Bechet, namely the Border Police, the Bechet Captaincy, the Lower Danube River Administration and the Maritime Danube Ports Administration, these vessels berth at the pontoon in the area of the existing berth 2. With the execution of the vertical mooring front, these pontoons will be relocated to the new upstream floating berth.

The floating easement berth will be made of 2 floating access pontoons with concrete floats (L=35m/pc), they will be fixed in position with the help of hammered metal columns Ø1.00m (t=16mm, anti-corrosion protected) and the length of 26.50m. The connection between the floating access pontoons and the columns will be through metal columns that will allow free vertical movement of the pontoons depending on the water level. For access to the floating pontoons, a pedestrian walkway with a length of 25.00m has been provided, the walkway will be simply supported on an independent floating pontoon towards the water, and at the level of the crest, an embedment of reinforced concrete C35/45 will be executed.

The connection to the shore on the upstream area will be made of rockfills blocks 200-600 kg/pc, with a slope of 1:1.5. The quota at the crest will be +7.80 local low water (+29.66 MN75), the intermediate berm at quota +2.50 local low water and the minimum quota of -3.50 local low water at the base of the slope. The rockfills will be placed on a 400 gr/m² geotextile filter at the top of the wall (dry) and the double geotextile mattress filled with 5500 gr/m² sand from the level of the intermediate berm up to -3.50 local water low water. A C35/45 concrete beam will be constructed at the level of the berm at +2.50 local low water.

The implementation of the proposed works and which are the subject of this study will lead to an improvement primarily of the socio-economic conditions in the area by increasing the number of jobs during the execution of the works and eventually, where the situation requires it through the development and intensification of activities and during of operation, but also the intensification and diversification of activities with a positive impact on the local economy (increased level of receipts, increase in taxes, etc.).

At the same time, the environmental conditions in the area will be improved by improving traffic conditions, reducing the level of noise, vibrations and improving air quality.

3.3 Identification and quantification of effects

The methodology proposed in this report proposes a differentiation between the concept of "effect" and that of "impact". The effects refer to the changes caused to the physical environment as a direct consequence of the causes (changes) generated by the project (both in the construction and in the operation stage).

The effects mainly include:

- topography modification
- pollutant emissions, waste.

Impacts include changes at the level of sensitive receptors, such as

- affecting the population and human health,
- loss, alteration or fragmentation of habitats,
- reduction of population numbers for species of wild flora and fauna,
- changing the landscape, etc.

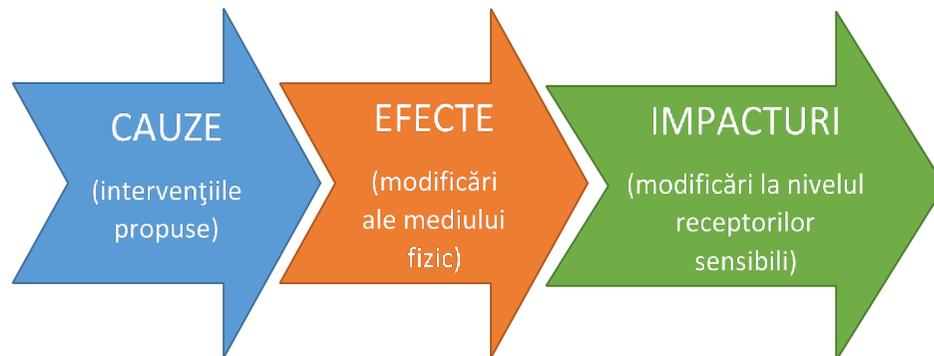


Figure no. 4- Conceptual model applied for the identification of effects and forms of impact

The identification of the effects involved the following steps:

- analysis of all interventions proposed within the project;
- identification of all activities resulting from the construction and operation of investments;

- identifying all the changes (**effects**) that occur in the physical and socio-economic environment as a result of the implementation and operation of the interventions.

Interest for the assessment presents those effects that can be quantified and that lead with certainty to the emergence of a form of impact. The identification of the effects was achieved with the help of a matrix that allowed the analysis of the stages and activities corresponding to each of the investment objectives proposed within the project.

The effects were quantified based on:

- the information provided by the designer (affected surfaces, spatial location, quantities, volumes of works, etc.);
- calculations based on agreed methodologies (eg: calculations of atmospheric emissions made according to *EMEP/EEA* or *AP42*).

Conclusion: in this report on the impact on the environment, the effects that the works proposed to be carried out for the rehabilitation and modernization of the Bechet port infrastructure may have on environmental factors have been analyzed, based on the methodology described in this sub-chapter, starting from the analysis of all the interventions proposed in the framework of the project, the identification of the activities resulting from the construction and operation of the proposed investments to be carried out and the effects that can occur in the physical and socio-economic environment that can generate a potential impact on the environment and for which measures have been proposed prevention / mitigation, in all three phases (execution, operation, decommissioning).

3.4 Identification of forms of impact

The identification of the forms of impact was made based on the list of effects (see previously) also using an analysis based on a matrix. The principle of analysis is relatively simple and is based on the identification of changes that may occur at the level of sensitive receptors as a result of any effect generated by the project. For example: air pollutant emissions can generate an impact both on air quality and on the comfort of citizens, the state of health of the population, biodiversity components, cultural objectives/historical monuments or on climate changes.

In the impact identification stage, all the causal links between the identified effects and the potential impacts are listed without analyzing the probability of occurrence of the impacts or their magnitude.

3.5 Prediction of impacts

It represents a qualitative and quantitative assessment of the forms of impact. The parameters taken into account for the assessment of the impacts are:

- project stage (construction, operation, decommissioning);

- type of impact (positive, negative);
- the nature of the impact (direct, secondary, indirect);
- cumulative potential (yes/no);
- spatial expansion (local, zonal, regional, national, cross-border);
- duration (short, medium, long term);
- frequency (accidental, intermittent, periodic, non-stop, one time/temporary);
- probability (uncertain, improbable, likely, very likely);
- reversibility (reversible, irreversible).

Table no. 6- The parameters taken into account for the assessment of the impacts

Assessment parameter	The variables of the assessment parameters	Description of the characteristics of the assessment parameters variables
Impact type	Positive	The changes contribute to improving the condition/achieving the objectives of the analyzed component
	Negative	The changes contribute to the deterioration of the condition/failure to achieve the objectives of the analyzed component.
Impact nature	Direct	The main form of impact produced by the occurrence of an effect.
	Secondary	The form of impact generated by a direct impact.
	Indirect	The form of impact that appears not due to an effect generated by the project, but to some activities that are encouraged to occur as a consequence of the project.
Cumulative potential	Yes	The impact has the potential to generate, together with other effects/impacts from the same project or from different projects, greater changes at the level of the analyzed environmental component
	Not	There is no risk that this impact will produce, along with other impacts, greater changes at the level of the environmental component
Spatial extension	Local	The impact manifests itself on surfaces smaller than the site limit / UAT, in one or more locations of the project
	AREA	The impact is manifested on surfaces larger than the site limit / UAT, in one or more locations of the project.
	Regional	The impact is manifested at the level of the region (several counties), meaning the entire length of the project and the adjacent areas.

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Assessment parameter	The variables of the assessment parameters	Description of the characteristics of the assessment parameters variables
	National	The impact produces changes felt at the level of the entire country.
	border	The impact is manifested on the territory of some neighboring countries.
term	Short term	The impact is manifested only during the intervention
	Medium term	The impact is manifested during construction works and for a short post-construction period (or during decommissioning and a short post-decommissioning period).
	Long term	The impact manifests itself throughout the construction and operation (or throughout the decommissioning and many years after decommissioning)
Frequency	Accidentally	The impact manifests itself only as a result of an accident (accidental pollution).
	One time/temporary	The impact is manifested only once in one of the stages of the project. Most often associated with a short duration.
	Intermittent	The impact occurs repeatedly/discontinuously, with an unknown frequency
	Periodic	The impact manifests itself repeatedly, with a known frequency.
	Without interruptions	The impact is manifested continuously after the moment of occurrence (Caution! It must be correlated with the "Duration" parameter: "without interruption" on "medium term" means that the impact is continuous during the construction period).
Probability	Uncertain	The probability of producing the impact is unknown, most certainly it will not occur
	Unlikely	The probability of producing the impact is low - it is possible to occur.
	Probable	The probability of producing the impact is high - it is very possible to occur.
	Very likely	Impact production is safe.
Reversibility	Reversible	After the impact disappears, the affected component can return to its initial conditions
	Irreversible	The impact does not allow the return to the initial conditions of the affected environmental component.

Where possible, the prediction of impacts is carried out quantitatively and can be expressed in surface units (hectares) or time (number of years), as well as regarding the changes occurring at the level of the studied component/sensitive receptor (decrease/increase in population numbers, number of affected inhabitants, etc.).

The quantitative assessments are mainly based on the numerical modeling of the behavior of some pollutants or some processes and on the use of spatial analysis (GIS).

In situations where a precise quantification is not possible (information is missing, there is no quantification method, the degree of uncertainty is high, etc.) the qualitative assessment classes of each parameter are used (see the information specified in the brackets of the previous enumeration).

In the assessment process, as far as possible, the redundancies were eliminated. More precisely, when two effects lead to the same form of impact on the same surface and in the same time interval, the effect has been maintained which can include the other redundant effects (e.g. removal of vegetation, soil compaction and soil structural changes that lead to the alteration of habitats on the same surface).

3.6 Assessment of the significance of the impacts

The assessment of the significance of the impact was carried out based on the following two criteria:

- the sensitivity of the area and the components located in the study area;
- the magnitude of the changes proposed through the implementation of the project.

The sensitivity and magnitude were established for each environmental factor potentially affected by the project, mentioned in the EIA Directive: water (surface and undersoil), air, soil, geology, biodiversity, climate, population, human health, material assets, heritage cultural, landscape.

The sensitivity and magnitude classes are presented in the sections dedicated to each environmental factor (sensitive receptor) in Chapter 7.

The sensitivity classes and the magnitude classes do not allow the ad letteram framing of all the situations encountered in the project assessment, but they certainly provide a framework for guiding how to use the "expert opinion" for all the identified forms of impact.

The impact classes used in this report are:

- significant impact (negative/positive);
- moderate impact (negative/positive);
- low impact (negative/positive);
- without impact (where it is estimated that no changes will appear at the level of the environmental factor or their level is undetectable).

The assessment of the level of significance is carried out with the help of the matrix presented in the following table. For a better understanding of the assessment results, the prediction and assessment of the significance of the impacts are presented in the same chapter.

Table no. 7- The impact significance assessment matrix

The meaning of the impact		The magnitude of the change										
		Very big negative	Big negative	Moderate negative	Small negative	Very small negative	No change	Very small positive	Small positive	Moderately positive	Big positive	Very positive
Area sensitivity	Very big	Significantly negative	Significantly negative	Significantly negative	Moderately negative	Moderately negative	No impact	Moderately positive	Moderately positive	Significantly positive	Significantly positive	Significantly positive
	Big	Significantly negative	Significantly negative	Moderately negative	Moderately negative	Reduced negative	No impact	Reduced positive	Moderately positive	Moderately positive	Significantly positive	Significantly positive
	Moderate	Significantly negative	Moderately negative	Moderately negative	Reduced negative	Reduced negative	No impact	Reduced positive	Reduced positive	Moderately positive	Moderately positive	Significantly positive
	Classified	Moderately negative	Moderately negative	Reduced negative	Reduced negative	Reduced negative	No impact	Reduced positive	Reduced positive	Reduced positive	Moderately positive	Moderately positive
	Very small	Moderately negative	Reduced negative	Reduced negative	Reduced negative	Reduced negative	No impact	Reduced positive	Reduced positive	Reduced positive	Reduced positive	Moderately positive

where,

Color code	The meaning of the impact	Necessary measures
	Significant negative impact	If effective reduction measures cannot be formulated (residual impact should not be significant), measures must be taken to avoid the impact (modification of the proposed location, modification of the proposed technical/technological solution, etc.) or, as the case may be, compensation.
	Moderate negative impact	Impact reduction measures are required.
	Low negative impact	Avoidance/reduction measures are not necessary, but some measures can be formulated to ensure that the negative impact is kept to a minimum.
	No impact	It's not necessary
	Low positive impact	Any measure that can lead to the extension/multiplication of the effects
	Moderate positive impact	
	Significant positive impact	

3.7 The cumulative impact

The assessment of the cumulative impact was carried out by going through the following steps:

- identification of important existing and/or proposed projects in the project implementation areas;
- analyzing the probability that these projects will generate forms of cumulative impact (contribute with additional effects and/or synergistic effects with the analyzed project);
- evaluating the significance of the cumulative impact.

The cumulative impact assessment process involves addressing a number of uncertainties related to the characteristics of the other projects (certainty of implementation, spatio-temporal dynamics, quantification of impacts, etc.). These uncertainties make it difficult to quantitatively estimate the cumulative impact.

3.8 Measures to avoid and reduce the impact

For all forms of impact where the possibility of a significant impact or a moderate impact was identified, measures to avoid or reduce the impact were proposed.

Avoidance measures were considered those that can eliminate or drastically reduce the probability of a significant impact, and **reduction measures** were considered those that, by reducing the magnitude of the changes, can ensure a reduction in the significance of the impact (from significant to moderate or to moderate to low).

The avoidance and reduction measures that meet the above requirements have been included in Tables no. 45-49, necessary to evaluate the residual impact. Other measures to reduce the impact can be found formulated within each section of Chapter 7, corresponding to the impact assessment for each environmental factor. These are rather good practice requirements and/or generally applicable conditions and were not taken into account in the residual impact assessment.

3.9 Residual impact

The residual impact represents a prediction of the significance of the impact under the conditions of the implementation of the avoidance and reduction measures. Conventionally, in the report, a high level of efficiency of each proposed measure was considered (the efficiency to be tested through the monitoring program).

The assessment of the residual impact was carried out on the basis of the assessment matrix of the significance of the impact using the same classes of sensitivity and magnitude presented in each section of Chapter 7 for each environmental factor.

3.10 Monitoring

The proposed monitoring program took into account two main requirements:

- the need to evaluate the effectiveness of measures to avoid and reduce the impact;
- the need to ensure that the predicted level of impacts (from this report) will not be exceeded through the construction and operation of the project.

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Systematic ex-post monitoring of the effects and/or impacts resulting from the construction and operation of the project offers the opportunity to identify if the forecasted impact does not develop as it was foreseen, so that remedial measures can be taken.

Also, monitoring allows the consideration of additional or unforeseen relevant information (eg climate changes or cumulative impact), which also allows the implementation of remedial measures.

The monitoring of the emissions and especially the immissions during the execution of the works will be monitored according to the mentions in this environmental report in order to be able to keep under control the possible excesses of the analyzed indicators that could affect the population of the neighboring country - Bulgaria.

4 Description of the relevant aspects of the current state of the environment

4.1 The water. Bodies of water

4.1.1 Surface water bodies

The project that is the object of this study is located in the perimeter south of Bechet, between km 678-681, UAT Bechet, Dolj county, on the left bank of the Danube, in the area of the Bechet port

- water course / name and cadastral code: Port Bechet is located in the river basin of the Danube river, cadastral code XIV-1.000.00.00.00, on the left bank of the Danube.
- body of water (surface and/or underoil): the Danube river.



Figure no. 5- Location of the project and surface water body (Danube River)

According to **the Atlas of Dry Rivers in Romania**, the Danube belongs to the category of permanent rivers.

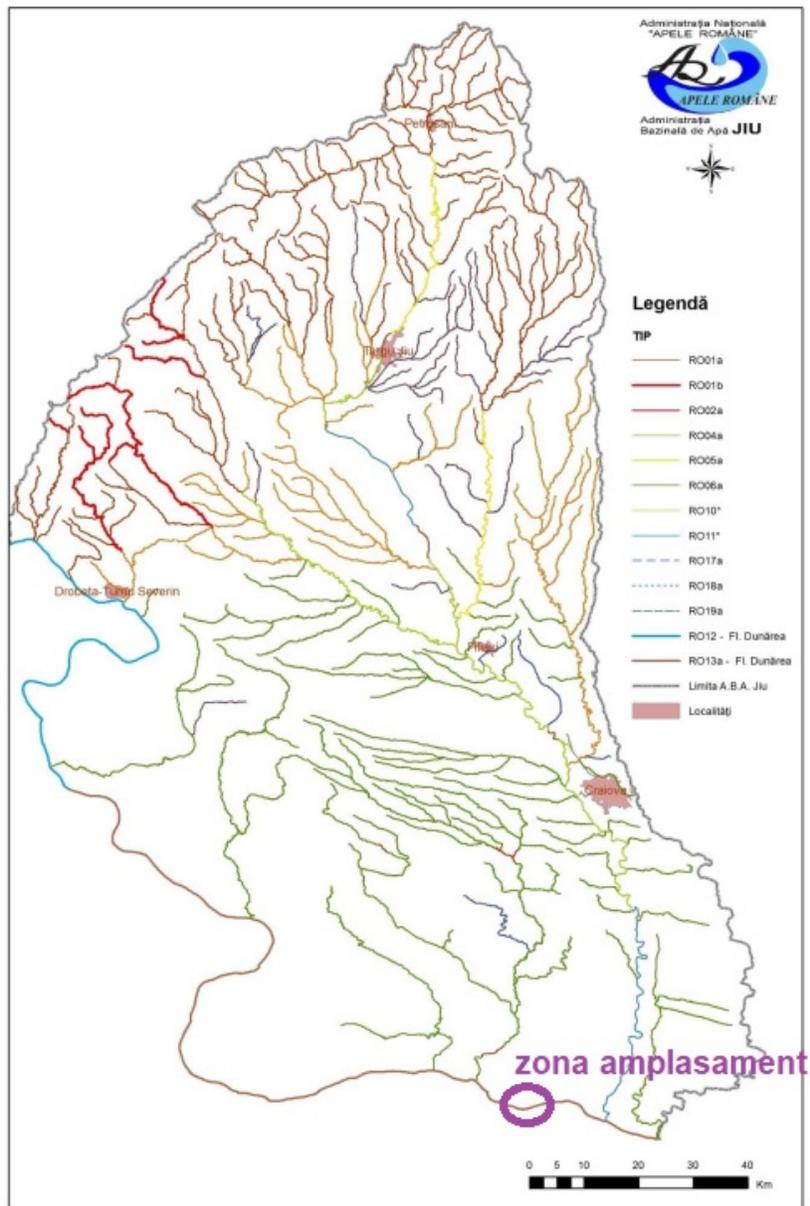


Figure no. 6– Typology of water courses in bh Jiu⁴

The area of the works falls into the category of surface waters - code *RO12 Danube River - Cazane* .

In this category - water sector located in the plain area, with a geology b - calcareous with a lithological structure of sand, gravel, boulders with a slope of 0.07, altitude 100 - 200 m and a basin area of 570,900 - 574,850 square meters

At the bh Jiu level, a number of 169 water bodies (158 natural natural water bodies and 11 heavily modified/artificial water bodies) were analyzed and characterized from the point of view of ecological status/ecological potential and chemical status, of which:

- 148 water bodies (representing 93.67% of natural water bodies, respectively 87.57% of the total water bodies) are in good ecological condition and 5 water bodies (representing

⁴Jiu basin management plan

45.45% of strongly modified/artificial, respectively 2.96% of water bodies) are in good ecological potential;

- 156 natural water bodies (representing 98.73% of natural water bodies and 92.31% of total surface water bodies) are in good chemical status and 11 heavily modified/artificial water bodies are in good chemical status.

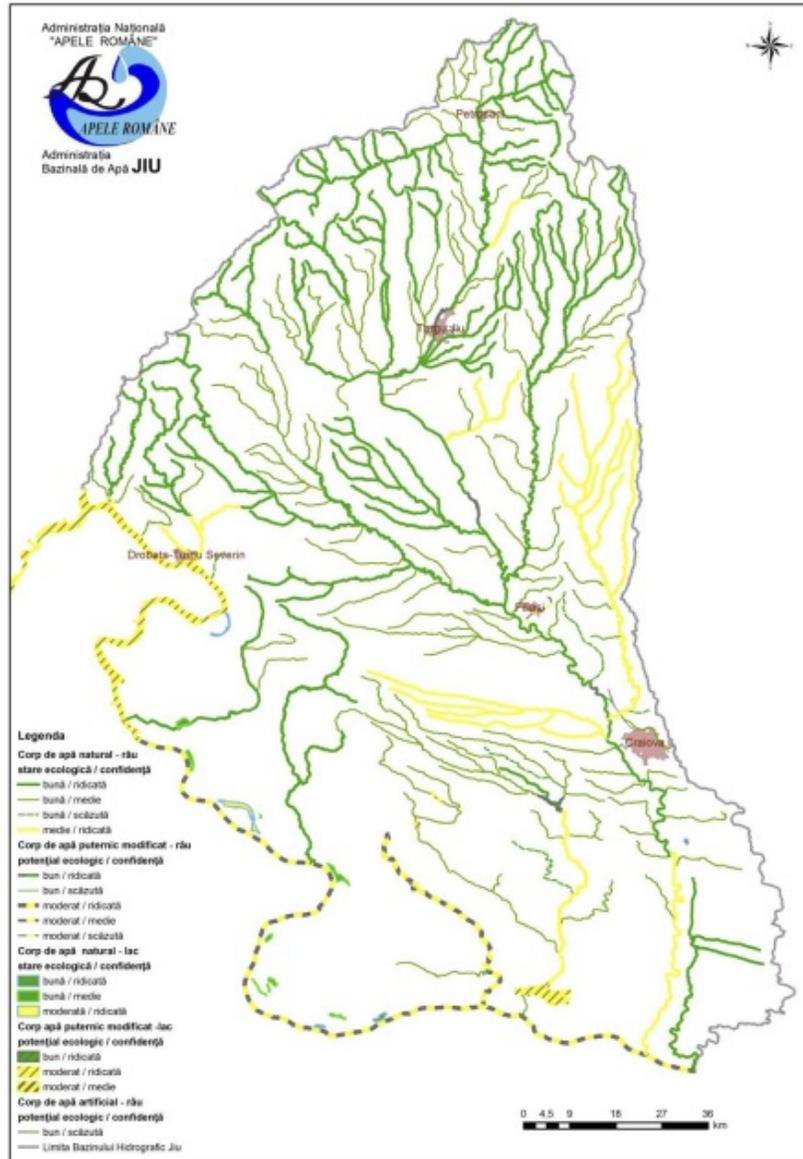


Figure no. 7- Ecological status/ecological potential of surface water bodies

4.1.2 Undersoil water bodies

The delimitation of undersoil water bodies was made only for areas where there are aquifers of significant importance for water supply, namely exploitable flows greater than 10 m³/day.

In the rest of the area, even if there are local conditions for the accumulation of water undersoil, they do not constitute water bodies, according to the provisions of the Framework Directive 2000/60/EC. The geological criterion intervenes not only through the age of the water-bearing deposits, but also through the petrographic, structural characteristics, or their capacity and properties to store water.

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Porous and karst-fissural water bodies were thus delimited and characterized. The hydrodynamic criterion acts especially in relation to the expansion of water bodies. Thus, bodies of phreatic water extend only to the limit of the hydrographic basin, which corresponds to their balance line, while deep bodies can also extend outside the basin. The state of the water body, both quantitative and chemical, was the central objective in the process of delimitation, assessment and characterization of an undersoil water body.

Soilwater bodies that develop in the border area and continue on the territory of neighboring countries are defined as transboundary.

In the territory administered by ABA Jiu, a number of 8 bodies of undersoil water were identified, delimited and described.

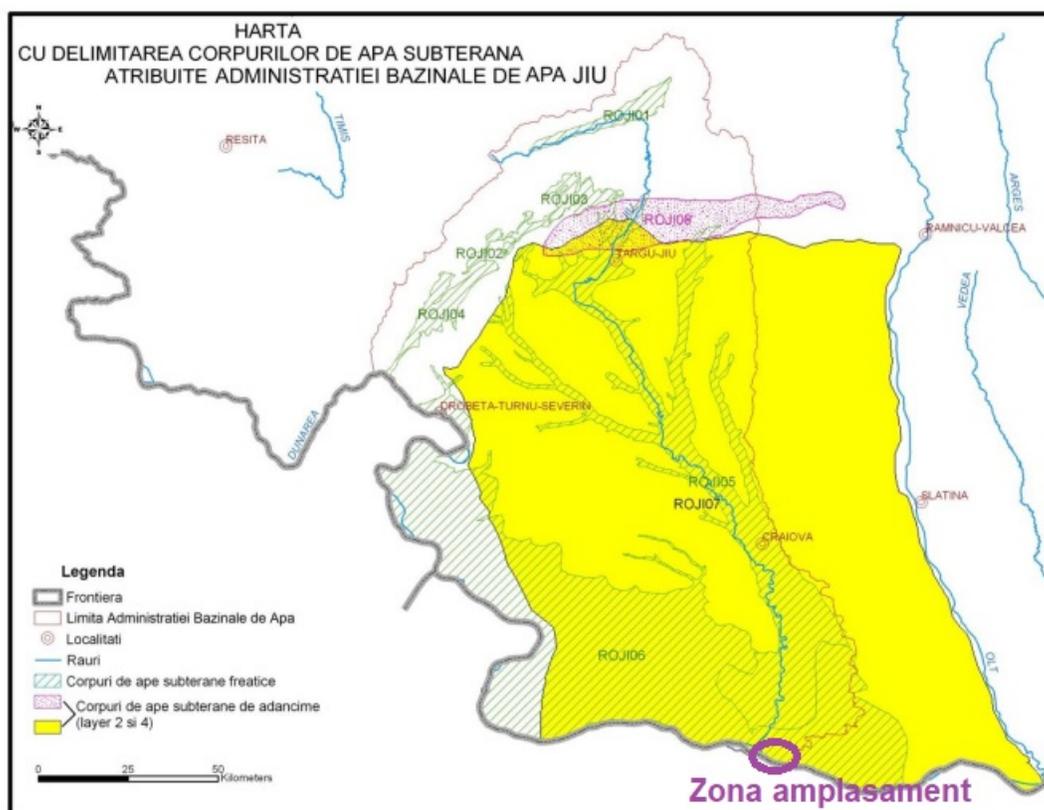


Figure no. 8– Delimitation of undersoil water bodies

In the project area, the undersoil water bodies that are found are *ROJ106 – Meadow and terraces of the Danube (Calafat)*.

The body has an area of 4896 km², it is type P - porous, it is not a body under pressure, the water is used for purposes PO - water supply of the population, I - industry, Z - animal husbandry and P - fish farming. The global protection degree is PM - average, the quality status is B - good.

The undersoil water body is interdependent with the surface water body of the Danube River.

4.2 Air

4.2.1 Current state of air quality

The Dolj Environmental Protection Agency, within the Monitoring and Laboratories service, performs air quality monitoring through automatic stations and sampling procedures and manual analyzes carried out in the laboratory.

Starting from 2006, air quality monitoring in Dolj county was carried out through the automatic air quality monitoring system included in the RNMCA, consisting of 5 automatic stations, which were located in the Craiova agglomeration according to the specific criteria currently stipulated in Law 104/2011. At the end of 2016, the DJ-6 station, located in Calafat, entered the territorial network, for which the data acquisition and assessment process began in March 2017.

The structure of the network in Dolj county is presented as follows:

➤ stations located in the Craiova agglomeration:

- station DJ-1 - urban traffic station, located in Craiova, on Calea București, opposite Piața Mare, the respective location being representative from the point of view of traffic (radius of the representative area max 100m); the monitored pollutants are SO₂, NO, NO₂, NO_x, CO, PM₁₀ and BTEX;
- station DJ-2 - urban backsoil station located in the area of Craiova City Hall - its parking lot, less exposed to traffic and industry; monitored pollutants SO₂, NO, NO₂, NO_x, CO, PM_{2.5} and BTEX;
- station DJ-3 - industrial station with traffic influence, located in the urban environment, in Craiova, Maria Tănase str., Casa Tineretului area, under the influence of both thermal power plants and the heavy traffic network in the west of the city (the radius of the representative area is max 1 km); the monitored pollutants are SO₂, NO, NO₂, NO_x, PM₁₀ and O₃;
- station DJ-5 - suburban backsoil station located in the Jiu bridge area towards the entrance to Breasta, located at a distance from almost all major pollution sources in the agglomeration, sometimes affected by emissions from CET Ișalnița; the monitored pollutants are SO₂, NO, NO₂, NO_x, PM₁₀, CO and O₃ - it should be mentioned that the latter is found in the special European ozone monitoring and assessment network, along with other stations in the country.

➤ stations located in Dolj county:

- station DJ-4 - industrial station, located at the entrance to Ișalnița, in a suburban environment, mainly under the influence of the thermal power plant in the area; the monitored pollutants are SO₂, NO, NO₂, NO_x, and O₃;
- the DJ-6 traffic station, located at the entrance to Calafat, near the Romanian-Bulgarian cross-border bridge; the monitored pollutants are SO₂, NO, NO₂, NO_x, CO, PM_{2.5}, PM₁₀ and O₃.

None of the monitoring stations located in the monitoring network of Dolj county are located near the area of interest of the project, so the state of air quality in all monitored areas will be mentioned.

4.2.2 Description of air quality in Dolj

At the level of 2022, the conclusions regarding the analysis of the measurements from the 6 automatic air quality monitoring stations at the level of Dolj County are presented below (based on the data provided by the Annual Environmental Report ⁵).

Nitrogen dioxide (NO₂)

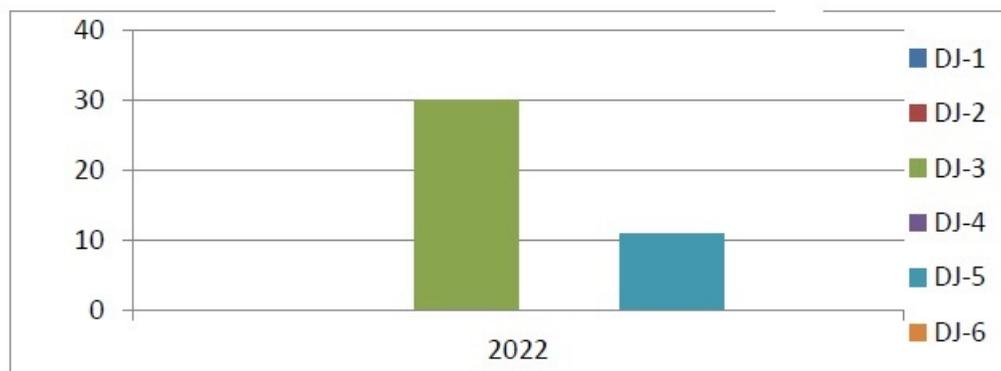
Nitrogen dioxide (NO₂), reddish-brown gas with a strong suffocating smell. Nitrogen oxides are very reactive gases and are formed at high temperatures, in the combustion processes of fuels. Nitrogen oxides are responsible for the formation of smog, acid rain, the deterioration of water quality, the accumulation of nitrates in the soil, the intensification of the greenhouse effect and the reduction of visibility in urban areas.

Nitrogen oxides, in Dolj county, have as sources the emissions from fuel combustion processes in various industries and from domestic heating, but also significantly from urban and extra-urban traffic.

- at the DJ-2 urban backsoil station, insufficient data for assessment was obtained due to the failure of the analyzer
- at the DJ-1 traffic station, not enough data was obtained for assessment due to the failure of the station's electrical supply during March
- at the industrial station with traffic influence DJ-3 an annual average of 30 µg/m³ was obtained
- at the suburban bottom station DJ-5, an annual average of 11 µg/m³ was obtained
- at the DJ-4 industrial station, insufficient data for assessment was obtained due to the failure of the analyzer
- at the DJ-6 traffic station located in Calafat, sufficient data for assessment was not obtained due to technical problems of the analyzer.

⁵ Source: APM Dolj

stație	poluant	media anuală	unitate masura
DJ-1	NO ₂		μg/m ³
DJ-2	NO ₂		μg/m ³
DJ-3	NO ₂	30	μg/m ³
DJ-4	NO ₂		μg/m ³
DJ-5	NO ₂	11	μg/m ³
DJ-6	NO ₂		μg/m ³



Sulfur dioxide (SO₂)

Sulfur dioxide (SO₂) is emitted especially in the processes of burning solid fuels, which have a higher sulfur content, processes that in our area are produced in thermal power plants that use coal as fuel and for domestic heating.

- at the urban backsoil station DJ-2, the annual average of 13 μg/m³ was obtained
- at the DJ-1 traffic station, not enough data was obtained for assessment due to the failure of the station's electrical supply during March
- at the DJ-3 industrial station, the annual average of 12 μg/m³ was obtained
- at the suburban bottom station DJ-5, an annual average of 11 μg/m³ was obtained
- at the DJ-4 industrial station, an annual average of 15 μg/m³ was obtained
- at the Calafat DJ-6 traffic station, the annual average of 14 μg/m³ was obtained.

An hourly VL was exceeded at the DJ-4 station, during June. No daily VL was exceeded at any of the stations. No exceedances of the alert threshold were recorded.

✓ carbon monoxide (CO)

The VL of the 8-hour moving average was not exceeded at any of the stations, the maximum of the 8-hour moving average recorded in 2022 being 2.66 mg/m³ at DJ-1, respectively 2.44 mg/m³ at DJ-2, at both stations we do not have enough data for assessment, and at DJ-6 the maximum was 1.89 66 mg/m³

- at the urban backsoil station DJ-2, not enough data was obtained for the assessment
- at the DJ-1 traffic station, not enough data was obtained for assessment due to the failure of the station's electrical supply during March
- this pollutant is not monitored at the DJ-3 industrial station
- at the suburban bottom station DJ-5, not enough data were obtained for assessment
- this pollutant is not monitored at the DJ-4 industrial station

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- at the Calafat DJ-6 traffic station, the annual average of 0.44 mg/m³ was obtained.

✓ Ozone (O₃)

Ozone, a secondary pollutant whose formation and accumulation in the atmosphere depends a lot on climatic conditions - namely solar radiation and high temperatures in the spring-autumn season, high pressure, wind and the existence mainly of organic precursors and nitrogen oxides.

- at the DJ-2 urban backsoil station it is not monitored
- at traffic station DJ-1 is not monitored
- at the DJ-3 industrial station, the data are uncertain - urban industrial station
- at the DJ-4 industrial station, sufficient data for assessment was not obtained due to the failure of the analyzer
- at the suburban bottom station DJ-5 the annual average of 49 µg/m³ was obtained
- at traffic station DJ-6 the data is uncertain- traffic station.

There were no exceedances of the alert or information threshold at any of the stations.

The number of exceedances of the target value for human health was not higher than that allowed in Law 104/2011 in Işalniţa (DJ-4) one exceedance, and in DJ-5 - 5 days with maximum average concentrations at 8 hours higher than target value (allowed 25 days).

✓ Particles in suspension (PM₁₀)

The PM₁₀ fraction of suspended particles includes particles that have an aerodynamic diameter smaller than 10 µm, and come from both natural sources (sandstorms, pollen dispersion, etc.) and anthropogenic sources, namely industrial activities, combustion processes, traffic road etc. Due to their very small size, in the atmosphere, they behave like gases.

- at the urban backsoil station DJ-2, not enough data was obtained for the assessment
- at traffic station DJ-1, not enough data was obtained for assessment
- at the urban industrial station DJ-3 an annual average of 33 µg/m³ was obtained at a data capture of 81%
- this pollutant is not monitored at the DJ-4 industrial station
- at the suburban bottom station DJ-5, for technical reasons no data were obtained for the assessment of gravimetric PM₁₀;
- at traffic station DJ-6 in Calafat we do not have enough data for assessment; continuous measurements show an average of 22 µg/m³.

The number of VL exceedances per 24 hours was 9 at DJ-2, where we have insufficient data for assessment (65% data capture), and 32 at DJ-3.

We can specify that the evolution of the pollutant during the autumn and winter months was characterized by higher concentrations, in periods characterized by atmospheric calm and lack of precipitation, as in previous years.

✓ Particles in suspension (PM_{2.5})

The PM_{2.5} fraction of suspended particles includes particles with an aerodynamic diameter smaller than 2.5 µm, which have very high stability and diffusion capacity in the atmosphere.

- at the urban backsoil station DJ-2, an average of 17 µg/m³ was obtained, at approximately 84% data capture.

✓ Metals and benzenes

Regarding the monitoring of benzene:

- at the urban backsoil station DJ-2, not enough data was obtained for the assessment
- at traffic station DJ-1, insufficient data was obtained for assessment.

Pb, Ni, As, Cd - for heavy metals, determinations are made from PM10 filters collected 8 weeks/year, according to the special monitoring program through indicative measurements established at the ANPM level, at the DJ-2 and DJ-6 stations. The data below refer to the results obtained under these conditions.

For the year 2022, the following averages were obtained:

- at the DJ-2 station, for Pb the average was 0.02 µg/m³, for Cd -1.37 ng/m³, and for Ni - 11 ng/m³
- at station DJ-6, for Pb the average was 0.02 µg/m³, for Cd -1.72 ng/m³, and for Ni - 12.73 ng/m³.

For technical reasons related to the operation of the analysis device, we do not have sufficient data for assessment at As.

4.2.3 The main sources of emissions in the atmosphere

Air pollutant emissions come from most industrial and social activities, representing a real risk for ecosystems and the health of the population. At the European level, policies and actions have led to a significant reduction in anthropogenic emissions, but certain air pollutants continue to harm human health. The situation of rivers and lakes in Romania has improved due to the reduction of pollutant emissions with an acidifying effect, but at the same time, the surplus of nitrogen in the atmosphere endangers biodiversity.

The most important problems regarding air pollution are generated by pollutant emissions. They cause acidification of the atmosphere, affect the production of tropospheric ozone, increase the concentration in the atmosphere of suspended particles, heavy metal particles and greenhouse gases, deplete the ozone layer and cause climate change. Currently, suspended particles, O₃ and NO₂ are the main pollutants that cause health problems. Their effects can range from minor respiratory problems to cardiovascular disease and premature death. It is estimated that, at European level, around 5 million people die annually due to PM_{2.5}.

The energy sector remains the main source of air pollution, accounting for around 70% of Europe's SO₂ emissions and 21% of NO_x emissions, despite significant reductions in emissions since 1990.

Road transport is another important source of pollution. Heavy vehicles are important sources of NO_x emissions, while passenger cars are some of the most important sources of CO, NO_x, PM_{2.5} and non-methane volatile organic compounds emissions.

Energy used in households (fuels such as wood or coal) is an important source of PM_{2.5} emissions.

The level of emissions of polluting substances released into the atmosphere can be significantly reduced by implementing environmental policies and strategies such as:

- greater use of renewable energy sources (wind, solar, hydro, geothermal, biomass)
- replacing classic fuels with alternative fuels (biodiesel, ethanol)
- the use of installations and equipment with high energy efficiency (low consumption, high yields)

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- carrying out a program of afforestation and creation of green spaces (absorption of CO₂, retention of fine particles, release of oxygen into the atmosphere).

Emissions of acidifying pollutants

The indicator follows the trends of anthropogenic emissions of acidifying substances: nitrogen oxides (NO_x), ammonia (NH₃) and sulfur oxides (SO_x, SO₂), with each of them taking into account its acidifying potential.

The indicator also provides information on changes in emissions from the main source sectors: energy production and distribution; energy use in industry; industrial processes; road transport; non-road transport; the commercial, industrial and household sector; use of solvents and products; agriculture; waste; others.

The main emission sources for sulfur dioxide and nitrogen oxides

- the main sources are the combustion installations of solid and gaseous fuels in large combustion installations, in industry and residential installations, road traffic, internal traffic on the territory of economic agents - diesel combustion machines / vehicles;
- agriculture, animal husbandry, management of animal excreta, collection, purification and storage of waste water and processes generating atmospheric emissions related to the category of sources - latrines (they are the main sources of ammonia emissions in the atmosphere).

Emissions of ozone precursors

- follows trends in anthropogenic emissions of ozone precursor pollutants: NO_x, CO, CH₄, non-methane volatile organic compounds;
- the main sources of emissions are: production and distribution of thermal energy, use of energy in industry, industrial processes, road and non-road transport, commercial, industrial sector, households, use of solvents and products with VOC content, agriculture, waste, others.

Emissions of primary particles and secondary particle precursors

- follows the trends of emissions of primary particles with a diameter smaller than 2.5 μm (PM_{2.5}) and respectively 10 μm (PM₁₀) and of secondary particle precursors (nitrogen oxides (NO_x), ammonia (NH₃) and sulfur dioxide (SO₂), from anthropogenic sources, by source sectors: energy production and distribution, energy use in industry, industrial processes, road and non-road transport; commercial, institutional and residential, use of solvents and other products with VOC content, agriculture; waste; other sources.;

Heavy metal emissions

- presents the trends of anthropogenic emissions of heavy metals from the main activity sectors: energy production and distribution, energy use in industry, industrial processes, road and non-road, commercial, institutional and residential transport, use of solvents and other products with VOC content, agriculture; waste; other sources;

Emissions of persistent organic pollutants

- presents the trends of anthropogenic emissions of persistent organic pollutants, of polycyclic aromatic hydrocarbons (PAH), from the main sub-sectors of activity: energy production and distribution; energy use in industry; industrial processes road transport; non-road transport; commercial, institutional and residential; the use of solvents and other products with VOC content, agriculture; waste; other sources.

4.3 Soil

The quality of agricultural land includes both the soil fertility and the way other environmental factors manifest in relation to plants. From this point of view, agricultural land is grouped into 5 quality classes, differentiated according to the average credit score, per country (1st class - 81-100 points - 5th class - 1-20 points). The quality classes of the lands give their suitability for agricultural uses. The number of credit points is obtained through a complex operation of in-depth knowledge of a land, expressing its favorability for the existence requirements of certain cultivated plants, under normal climatic conditions and within the framework of rational use.

In Dolj county, the area of chernozems, the southernmost extends only to the West of Jiu, on the first 3 terraces of the Danube, it is limited to the NORTH by a winding line that starts from the Cetate and passes through Băilești, Siliștea Crucii, Urzicuta, Bârca , Comoșteni.

These soils with high natural fertility feel a lot the lack of water precisely during the growing season of the cultivated plants, on the one hand due to the insufficient amount of atmospheric precipitation, and on the other hand due to the high permeability of both the soils, but especially the substrate those in which deposits with a light texture (sandy, sandy-loamy, loamy) predominate.

This lack is felt less by the phreatic-humid chernozems in the area that occupy large areas, especially to the WEST of Desnățui.

The area of reddish-brown soils reaches NORTH on the line of Carpen, Bucovăț, Lăcrița Mare localities, presenting an entrance NORTH from Craiova to beyond Șimnic.

They are clayey-iluvial soils with an average degree of natural fertility, which can be used both for various field crops and in fruit growing and viticulture.

The northernmost is the area of brown soils, which includes the Amaradia Hills in their entirety and the greater part of the hilly Plain of Argetoaiia and the Piedmont Plain of Olt.

In this area, due to the pronounced fragmentation of the relief, the slopes have eroded soils that pose special protection problems, they have a large extent, in some places even exceeding that of flat lands with non-eroded soils.

The zone of leached chernozems can be found to the NORTH of the area of chernozems proper, on the older and higher terraces of the Danube and in the southern part of the Sălcuței field, as well as to the EAST of Jiu on the Amarăștilor and Leu - Dioști fields.

The intrazonal soils in which the most widespread are the so-called smolnites (vertisols).

They are soils that are very difficult to work, both wet and dry.

The undeveloped soils include the vegosols on the intensively eroded slopes in the north of the county, most of the soils in the meadows and the area of aeolian sands between the Danube and Desnățui and east of Jiu.

These soils require special, permanent agrotechnical and hydro-ameliorative works to be maintained in the agricultural circuit.

The agricultural area of Dolj county ⁶is **585135 ha** , of which the arable area is represented by **488560 ha** .

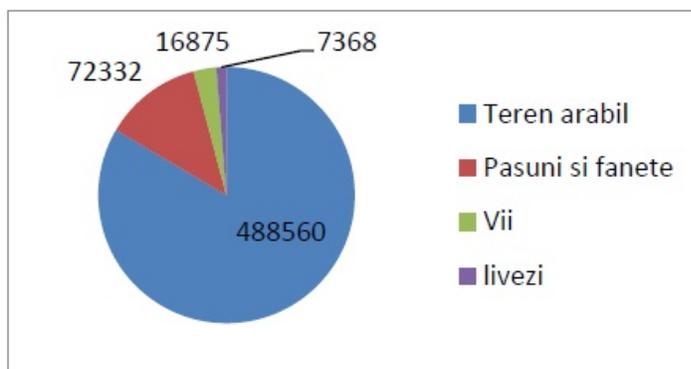
The way of using the total area of 742641 ha is as follows :

- Agricultural area - 585135 ha
- Forests – 85308 ha
- Water – 20886 ha
- Access roads – 13536 ha
- Courts – 30510 ha
- Non-productive – 6026 ha.

From the agricultural area, Dolj county has an arable area of 488560 ha.

The way of using the agricultural area at the level of Dolj county.

Dolj	2017	2018	2019	2020	2021
Teren arabil	489729	489714	487551	488556	488560
Pasuni si fanete	71357	71357	71357	72332	72332
Vii	16837	16837	16837	16875	16875
livezi	7348	6843	6245	7372	7368



4.4 Biodiversity

The project intersects 2 NATURA 2000 sites:

- ROSCI0045 Jiului Corridor;
- ROSPA0023 Confluence Jiu - Danube.

The figure below shows the project map in relation to the location of the 2 NATURA 2000 sites, located in the area of the project site.

⁶ Source - Activity Report 2021 Directorate for Agriculture Dolj

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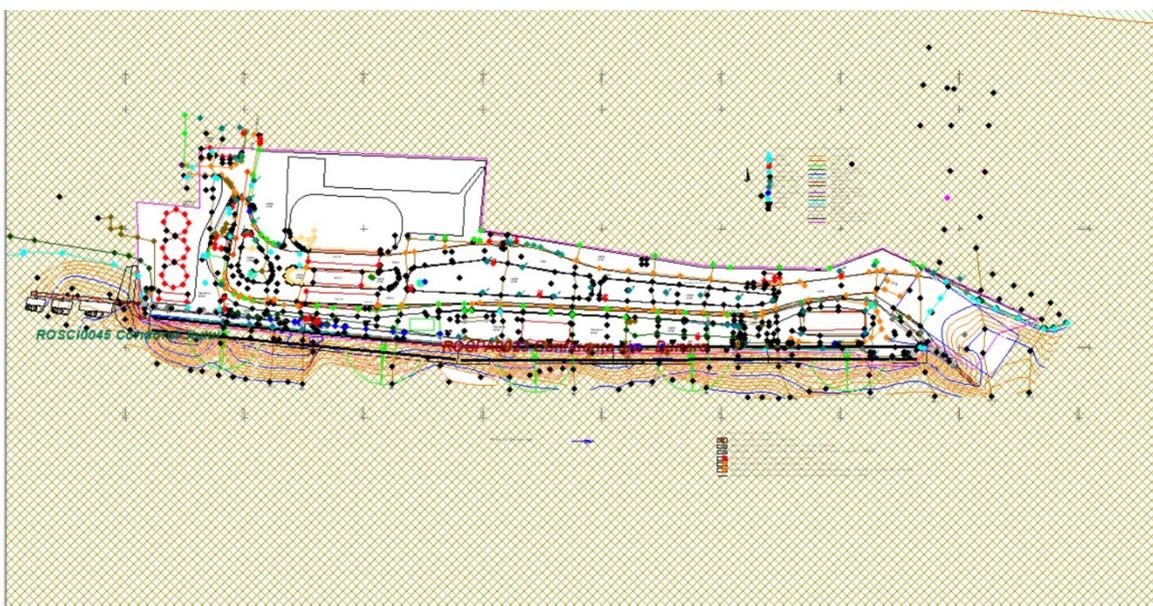
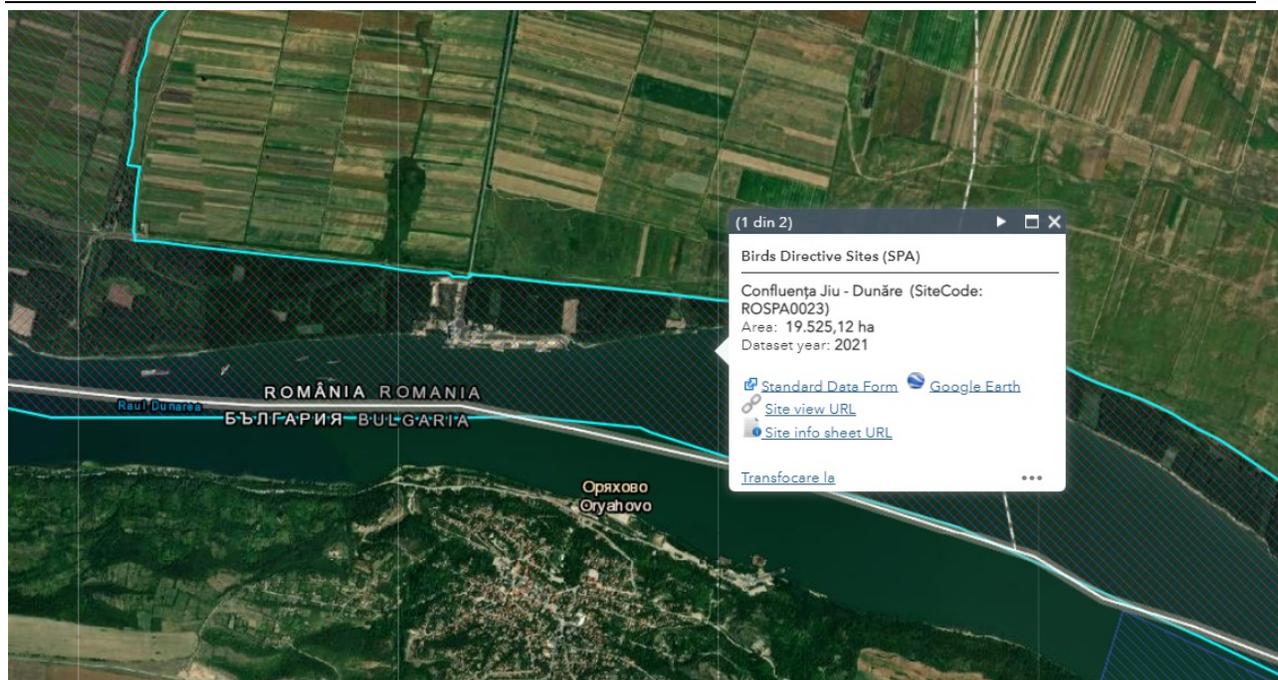


Figure no. 9 - Location of works in relation to ROSCI0045 Corridorul Jiului and ROSPA0023 Confluence Jiu - Danube

4.4.1 ROSCI0045 Jiului Corridor

ROSCI0045 Jiului Corridor it was designated by OM no. 1964 of December 13, 2007, with subsequent amendments and additions, and has an area of 27,109 ha. It includes the ROSPA0023 Avifaunistic Special Protection Area. Both sites belong to the continental biogeographical region (100 %) (fig. 11).

From an administrative point of view, the ROSCI0045 site is located in:

- Dolj county on the administrative territory of the localities of Almaj (4%), Bechet (27%), Bistreț (42%), Brădești (6%), Braloștița (14%), Bratovoști (23%), Breasta (5%), Bucovăț (41%), Călărași (10%), Calopăr (21%), Cârna (79%), Coțofenii din Dos (10%), Coțofenii

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din Față (13%), Craiova (3%), Dăbuleni (7%) , Dobrești (47%), Drănic (17%), Filiași (7%), Gângiova (28%), Ghindeni (4%), Gighera (39%), Goicea (<1%), Ișalnița (<1%) , Măceșu de Jos (41%), Malu Mare (5%), Mârșani (2%), Ostroveni (63%), Podari (10%), Rojiște (4%), Sadova (29%), Scaești (4%) , Segarcea (<1%), Teasc (18%), Țuglui (76%), Țuglui (14%), Valea Stanciului (19%), Vârvoru de Jos (14%)

- Olt county on the administrative territory of Ianca locality (4%)
- Mehedinți county on the administrative territory of Butoiești locality (3%)
- Gorj County on the administrative territory of Aninoasa (23%), Bălteni (23%), Bălteni (33%), Bărbăți (9%), Borăscu (<1%), Brănești (35%), Dănești (6%) , Drăguțești (14%), Ionești (13%), Negomir (<1%), Plopșoru (54%), Săulești (<1%), Tântăreni (9%), Țicleni (24%), Turburea (3%) , Turks (28%), Urdari (99%), Urdari (33%) .

The main types of habitats identified in the area are: sandy beaches – 0.26%, rivers, lakes – 11.54 %, swamps, peatlands – 9.30 %, crops (arable land) – 18.33 %, pastures – 9.48% , other arable land – 1.72 %, deciduous forests – 45.78 %, vineyards and orchards – 0.26%, other artificial lands (localities, mines) – 0.46 %, forest habitats (forests in transition) – 2.73 %.

The coordinates of *ROSCI0045 Coridorul Jiului* are: 23.0031055 longitude and 43.0044805 latitude.

Ongoing research reveals that the area belongs to the priority territories for the conservation of continental biodiversity with a very high value. Thus, although it occupies only 0.5% of the country's forest area and 0.6% of the national area, it still concentrates 9 (91E0*, 91F0, 91I0*, 91M0, 91Y0, 9130, 91V0, 9170, 92A0), respectively 32% of the 28 types of natural forest habitats protected by Romanian and EU legislation, of which 2 (91E0*, 91I0*), respectively 33% , from the 6 priority protected ones, arranged in 4, respectively 36%, of the 11 phytoclimatic layers of the country (The hilly layer of cypresses - gorunets, ceretes, garnisetes, mixtures of these - and hill sleazes; The hilly layer of cypresses with oak - and with sky, garniță, gorun, their mixtures; Silvestepa Forest Plain); 56 (26 %) of the 212 forest resort types identified in Romania; 22 (44 %) of the 50 forest formations, with 97 (32 %) of the 306 forest types identified in the country. The Jiului Valley is one of the main trans-Balkan bird migration routes (the Central European-Bulgarian road) followed by a impressive number of birds. Along with the sedentary ones, 135 (33%) of the 406 avifaunistic species reported in Romania were identified in the Jiului Corridor, of which 114 (84%) are protected by Romanian and EU laws. The cantonment of relevant contingents from the country's living inventory, of which many rare sub-Mediterranean elements, others endemic, some protected, gives the territory a remarkable specificity, highlighted by: - the concentration of plant associations of great biohistorical value that reflect the interference of the southern thermophilic elements with the central ones - European; - the preservation of unaltered relict fragments of archetypal forest structures located on the edge of biogeographic areas or even disjoint (beech islands from Dâlga, Șuglui, Bucovăț) or anthropically insularized (brumăriu oak from Braniștea Bistrețului Forest, etc.); - housing sustainable populations of animal and plant species whose conservation requires, according to the law, the designation of special conservation areas, areas of special avifaunistic protection and strict protection, etc.

The sustainable exploitation of this exceptional natural heritage justifies and requires:

- the use of the natural forest as a management benchmark for practical forestry close to nature - the conservation of wildlife, relict natural habitats and a local reservoir of valuable genes;

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- responsible management of the entire local natural heritage, in general and of the forest, in particular;
- the maintenance of some wild, rare and unusual landscape units, with a great power of seduction;
- the formalization of a natural park that, through its multiple functions, will provide the basis for the reconversion of the local workforce and jobs in an area of great national and international interest;
- ensuring a natural space for ecological education and training - promoting ecotourism, a source of non-polluting currency, by perpetuating traditional local activities;
- optimizing the decision, protecting the environment, protecting life and health and increasing the quality of life.

The territory, located along the middle and lower reaches of the Jiu, includes one of the rarest and most representative relict samples of a rapidly disappearing little-altered European meadow. Located between 23 ° 30'02" and 24 ° 14'05" east longitude and between 43 ° 42'01" and 44 ° 54'55" north latitude, with a length in the NNW-SSE direction of about 129 km, this area crosses 4, respectively 27% of the 15 ecoregions (Getic Plateau, The Găvanu-Burdea Plains, the Silvestepa of the Romanian Plain, the Danube Meadow) of the continental biogeographical region in Romania, on a level difference of 355 m, located between 50 and 405 m above sea level. Of the total area of 147,540 ha, 34,979 ha (24 %) belong to the forest fund, of which forests own 33,543 ha (23 %) and concentrate a complex of mainly natural ecosystems, with a considerable diversity and a local abundance 764 – 5,000 times higher average values specific to the Romanian forest, which gives it an exceptional biogeographic personality.

The Site of Community Importance *ROSCI0045 Corridorul Jiului* has been designated for the conservation of:

➤ 18 types of habitats:

- 1530* - Pannonian salt marshes and steppes ;
- 92A0 - Galleries of *Salix alba* and *Populus alba*;
- 91F0 - Mixed riparian forests of *Quercus robur*, *Ulmus laevis* and *Ulmus minor*, *Fraxinus excelsior* or *Fraxinus angustifolia*, along large rivers (*Ulmenion minoris*);
- 91I0* - Euro-Siberian steppe forests with *Quercus* spp.;
- 3130 - Oligotrophic to mesotrophic stagnant waters, with *Littorelletea uniflorae* and/or *Isoëto-Nanojuncetea* vegetation;
- 3140 – Oligo-mesotrophic hard waters with benthic vegetation of *Chara* spp;
- 3150 – Natural eutrophic lakes with *Magnopotamion* or *Hydrocharition* vegetation;
- 6120* – Xeric and calciphile meadows on sands;
- 6430 - Grasslands of tall hydrophilic lowland and montane to alpine grasses;
- 3260 - Watercourses from plain to mountain level, with *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation;
- 3270 - Rivers with muddy banks with vegetation of *Chenopodion rubri* and *Bidention*)
- 6440 – Alluvial meadows of the river valleys of *Cnidion dubii*;
- 6510 - Low altitude hay (*Alopecurus pratensis*, *Sanguisorba officinalis*);
- 9130 – *Asperulo-Fagetum* type beech forests

- 9170 – Galio-Carpinetum hornbeam oak forests
- 91M0 - Balkan-Pannonian forests of sky and gorun.
 - 2 mammal species (1335 Spermophilus citellus - Popândău; 1355 Lutra lutra - Otter)
 - 3 species of amphibians and reptiles (1188 Bombina bombina - Red-bellied pond turtle; 1166 Triturus cristatus - Crested newt; 1220 Emys orbicularis - Water turtle)
 - 12 species of fish (4125 Alosa immaculata - Danube flounder; 1130 Aspius aspius – Aun; 6963 Cobitis taenia complex; 1157 Gymnocephalus schraetzer – Raspar; 1145 Misgurnus fossilis – Chiscar; 2522 Pelecus cultratus – Sabita; 5339 Rhodeus amarus – Behlita; 5329 Romanogobio vladkovi; 5347 Sabanejewia bulgarica; 1160 Zingel streber; 1159 Zingel zingel);
 - 5 species of invertebrates (4013 Carabus hungaricus, 4045 Coenagrion ornatum, 1042 Leucorrhinia pectoralis, 1083 Lucanus cervus, 4045 Pholidoptera transsylvanica)
 - 2 plant species (1898 Eleocharis carniolica, 1428 Marsilea quadrifolia)

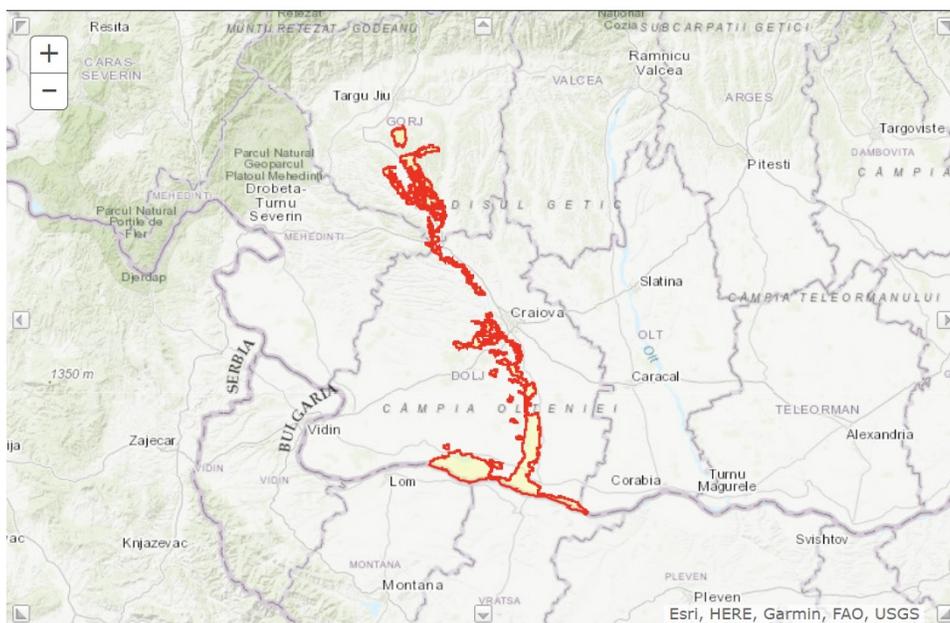


Figure no. 10- Geographical location of ROSCI0045 Jiului Corridor

4.4.2 ROS PA0023 Confluence Jiu - Danube

The special avifaunistic protection area *ROSPA0023 Jiu-Danube confluence*, with an area of 19,530.20 ha, falls entirely within the continental area and covers the counties

- Olt: Ianca (4%)
- Dolj: Bechet (27%), Bratovoesti (23%), Calopăr (16%), Călărași (10%), Dăbuleni (7%), Dobrești (12%), Drănic (13%), Gângiova (28%), Ghindeni (4%), Gighera (26%), Malu Mare (5%), Mârșani (2%), Ostroveni (62%), Podari (3%), Rojiște (3%), Sadova (12%), Segarcea (<1%), Teasc (15%), Țuglui (9%), Valea Stanciului (6%).

The coordinates of *ROSPA0023 Confluence Jiu - Danube* are: 23.865008 longitude and 43.918472 latitude.

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Special Avifaunistic Protection Area ROSPA0023 The Jiu - Danube Confluence hosts important populations of some protected bird species. According to the data, we have the following categories:

- number of species from Annex 1 of the Birds Directive: 34
- number of other migratory species, listed in the annexes of the Convention on Migratory Species (Bonn): 77
- number of globally endangered species: 5 The site is important for the nesting populations of the following species: *Crex crex* *Haliaeetus albicilla* *Ciconia ciconia* *Burhinus oedicnemus*.

The site is important during the migration period for the species: *Tringa glareola* *Pelecanus crispus* *Platalea leucorodia* *Plegadis falcinellus*.

The site is important for wintering for the following species: *Phalacrocorax pygmaeus*.

During the migration period, the site hosts more than 20,000 specimens of marsh birds, possibly being nominated as a RAMSAR site.

Lunca Jiului presents itself as a rich territory in terms of habitats, here meeting meadow and sedge forests, orchards, meadows, agricultural land, wetlands - ponds and canals and numerous anthropogenic habitats, all concentrated on this surface, so that interpenetrating and their delimitation sometimes becomes difficult. The presence of waterfowl species, which have found living and breeding conditions here, is noteworthy

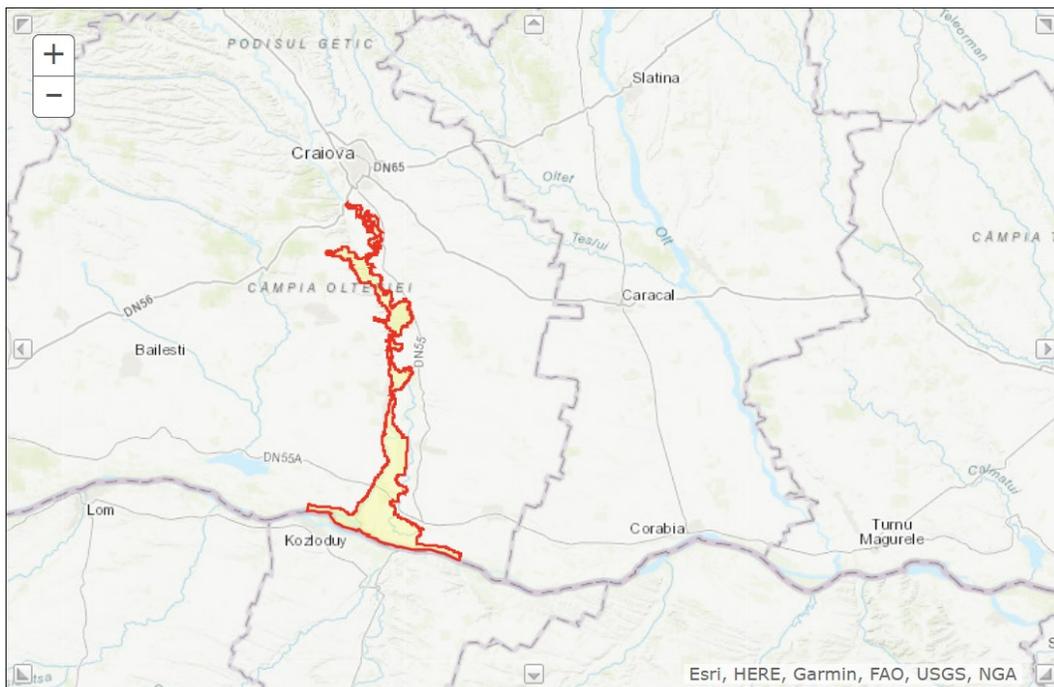


Figure no. 11- Geographical location of ROSPA0023 Confluence Jiu – Danube

4.5 Landscape

The images below show the current situation in the Bechet port area. You can easily see the artificial landscape and the degraded trees.

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In the entire sector of the port area, the natural situation has been completely changed by the consolidation of the sea wall, by the construction of the wharfs and by the furnishing of the port platform. This change is not recent, but dates back to the first development of Bechet port.



4.6 Social and economic environment

In 2022, the population of Dolj county numbered 599,567 residents, of which 300,563 were in the urban area and 299,004 in the rural area.

At the Galati County level, out of the total population, 258,199 live in the urban environment and 236,801 in the rural environment.

As far as Vrancea County is concerned, of the total population, 109,670 are in the urban area and 224,386 in the rural area.

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In the town of Bechet, according to the census carried out in 2022, the population was 4,355 inhabitants. According to the national census in 2021, the population of Bechet is composed of 2,135 males, representing 49.02% of the total population, and 2,220 females, representing 50.98% of the total population.

4.7 Cultural heritage

The location of the objective is located in UAT Bechet in the inner city of the town. As can be seen from the picture below, there are no places of worship or historical monuments in the site area that will be affected both during the execution of the works and during the operation period.

Near the town of Bechet there are several places of worship/historical monuments which will not be affected during the execution of the works by observing the measures that are imposed and also during the operation period (due to the location in front of the area of interest).

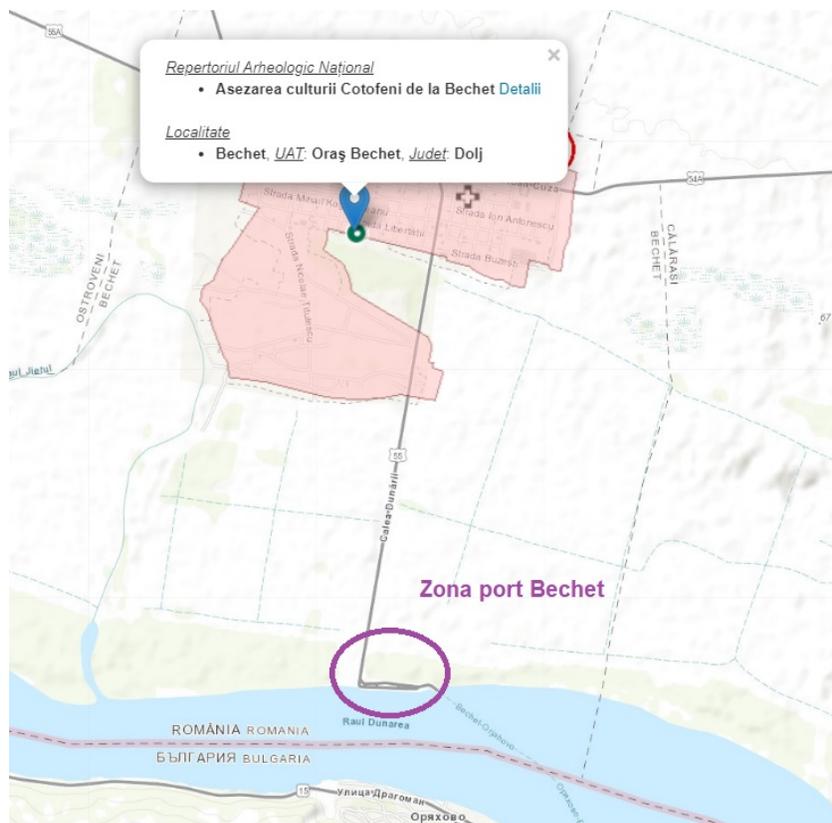


Figure no. 12- The location of the cult houses in the bordering area of the port

5 Description of relevant environmental factors likely to be affected by the project

5.1 Population

The potential impact on the population, uses, material goods and human health, including the consideration of noise and vibrations is insignificant and is the result of the traffic associated with the works. The project is being implemented near the city of Bechet. Material assets of the population are not affected.

The works proposed to be carried out on the banks of the Danube will only affect the population working in the area, and this to a small extent.

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Considering the distance of 500 m between the port of Bechet and the city of Oryahovo, the Republic of Bulgaria, during the construction activities that will take place for the rehabilitation of the port of Bechet, it is necessary to take into account the following measures:

- during dry and windy working periods, it is necessary to spray the open construction site in the Bechet port area with water, to prevent the dispersion of dust emissions scattered in the direction of the city of Oryahovo
- the proposed activities must be carried out only during working hours in order to limit the noise exposure of the population of the city of Oryahovo during the evening and/or night.

In another vein, the revitalization of Bechet port activity in the perspective of the coming years will have beneficial effects both economically and socially for the population and the local economic activity, first of all but also for the economic units and their workers with activity in other more distant areas but which they use the port and the Danube for transporting products.

The increase in port traffic will ensure new jobs in the port and in related port services. Achieving this objective will have the effect of attracting existing local resources into the economic circuit and capitalizing on them, with the use of local labor. For economic units that use water transport and port services, the lower costs of water transport (2-3 times lower compared to road transport and equivalent to rail transport), will contribute to reducing the prices of products delivered to the beneficiary's gate and increasing the competitiveness of the respective units.

In perspective, all these activities for the population will have beneficial effects, both economic and social, for the residents of the area but also for those from other areas.

During the execution of the works, the number of jobs in the area will increase, this being an important aspect of the social and human factor with the prospect of increasing the number of jobs even after the completion of the works and the intensification of capacity in the port area.

5.2 Human health

During the execution period, the main effects on human settlements and other objectives of public interest, determined by the works carried out, are:

- accidental discharges of pollutants into surface water;
- the generation of emissions and dust during the execution of works and the movement of machinery and means of transport;
- the noise and vibrations produced as a result of the works performed and the works specific to the site organizations/production bases;
- uncontrolled storage of waste and materials.

In order to avoid accidental pollution, construction materials will not be stored on the banks of the water, and the machinery, equipment and means of transport used will have an up-to-date technical inspection.

The amounts of pollutants that may normally reach surface water during the execution period will not affect aquatic ecosystems or water uses. Only the accidental discharge of significant quantities of fuels, oils or construction materials could cause damage to the aquatic environment.

Surface water quality will be monitored during the execution period, in order to determine its possible contamination and to be able to intervene quickly in case of accidental discharges of pollutants.

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The negative impact generated by the realization of manifests itself during the execution period, mainly through:

- the discomfort of people carrying out their activities in the area of the port platform caused by the presence of the construction site, which attracts noise-producing activities, the increase in the concentration of dust, as well as the presence of construction machinery in motion;
- possible traffic conflicts due to high-tonnage vehicles transporting construction materials;
- the inconvenience of the staff working in the port area, caused by the waste generated by the construction activities stored in an uncontrolled manner.

During the period of operation, the impact is positive by improving the conditions in the rehabilitated area of the RO-RO ramp, modernizing the mooring front at the Danube, rehabilitating the water supply and sewage networks, ensuring controlled access to the port area, setting up a video surveillance system.

5.3 Biodiversity

The significant impact of biodiversity (especially of avifaunistic species and ichthyofauna in the site area) as a result of the implementation of the project implies the registration of one of the following situations:

- worsening the current state of the species of community interest in the Natura 2000 area intersected by the project and/or preventing the achievement of a favorable conservation state
- the loss, alteration or degradation of favorable habitats for species of conservative interest within the area
- the interruption of connectivity at the level of the ecological corridor and the fragmentation of habitats.

5.4 The land and the soil

The dust resulting from the processes of loading, transporting and respectively unloading the materials used can be considered pollutants only to the extent that they are associated with other pollutants (for example: SO₂ with dust particles). Given the location of the works, the impact on the soil is considered insignificant. The designed works do not generate pollutants for the soil.

Also, the works proposed to be carried out will not occupy additional land surfaces, as they will be carried out in the port area on the concrete site.

5.5 Water

The quality of the water body is only affected for a short period of time, during the execution of the works to modernize the mooring front by making a vertical wharf from weight blocks, excavation works / dredging for the construction of the wharf, the easement berth, rehabilitation of the RO-RO ramp.

We mention the fact that the dredging works will be carried out on a width of only 7 m from the Bechet port area, the dredged volume will be transported gradually as the works are carried out, so that in the exceptional case of an accident, the volume of material dredged so as not to affect

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the water quality of the Danube river only locally and for a short period of time (until the cleaning of the area or its deposition). Thus the activity with the barge in the Oryahova area will not suffer.

In order to limit the impact of the water body, it is recommended to use less polluting technologies, the materials used should be inert so as not to change the quality of the water body, and in the case of the production of high concentrations of suspended matter in the water body, it is recommended to stop the works until to calm them down so as not to disturb too much the habitat area for fish species in transit.

5.6 Air

The potential impact on the air and climate is negative, local and manifests itself only during the construction period. On the general climatic backsoil, in the site area there is a specific topoclimate of the meadow, wetter and cooler in the summer and wetter and less cold in the winter.

The specifics of the foreseen works do not involve air quality protection measures during the operation period .

5.7 Material goods and cultural heritage

This component is likely to be affected by the project, depending on its development phase, in the following situations:

- the occurrence of accidents accompanied by explosions and/or fires, which may cause financial losses among the parties involved and the residents of the project area.

Regarding the potential impact on the historical and cultural heritage, we mention that in the area of the works there are no heritage or architectural objectives that will be affected during the execution of the works or during the operation period.

5.8 Landscape

The potential impact on the landscape and the visual environment is recorded only during the period of the works. During the operating period, the impact is positive by improving the conditions in the area by modernizing the mooring front, rehabilitating the RO-RO ramp and the access roads, the works proposed to ensure the utilities: water supply, domestic wastewater collection, rainwater collection , fire extinguishing system, power supply.

5.9 The interaction between environmental factors

Interactions refer to the reactions produced between project effects and environmental factors.

Analyzing the relationships and interactions between different effects provides the opportunity to analyze the global effects of the project, which may not be immediately obvious.

Examples of the interaction of effects within the project are the relations between soil and geology, between surface and undersoil waters, between air quality or noise level and the effects on the community.

The table below shows the interaction of the effects on the environmental factors.

Table no. 8- Matrix of interaction between environmental factors

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Environmental factors	Soil and basement	The water	Air	Noise and vibrations	Climate	Fauna	Flora	Landscape	Population	Cultural heritage	Goods
Soil and basement		x	x			x	x		x		
The water	x		x			x	x		x		
Air	x	x				x	x		x		
Noise and vibrations						x			x		
Climate			x			x	x		x		
Fauna	x	x	x	x	x		x		x		
Flora	x	x	x		x	x			x		
Landscape						x	x		x		x
Population	x	x	x	x	x	x	x	x			
Cultural heritage											
Goods	x	x	x	x	x	x	x	x	x		

Next, a model of how these environmental factors interact is presented.

Table no. 9- Mode of interaction between environmental factors

Environmental factor	Environmental factor with which it interacts	Mode of interaction
Air	The water	Dust emissions may affect surface water quality in the project's area of influence.
	biodiversity	Dust emissions that can affect biodiversity in the project area
	Population	In the context of the proposed project, the main aspects are related to dust (results both in the construction phase and in the operation phase) and gaseous pollutant emissions and their impact on the population that carries out its activity in the port area
Noise	biodiversity	The noise can affect the wildlife in the area.

5.10 Climate. Impact associated with climate change

The way in which the climate and climate changes can affect the project is described in detail in chapter 6.7.3. of the present study.

5.11 Impact associated with the risks of major accidents and the risk of disasters

The description of how the project can be affected by natural disasters is described in chapter 9 of this study.

5.12 Use of natural resources

The proposed project intersects with the Natura 2000 area *ROSPA0023 Jiu - Danube Confluence* and respectively *ROSCI0045 Jiului Corridor*.

The works that will take place in this area include the characteristic works of rehabilitating a port platform, as described in the previous chapters with excavations, fillings, excavations, etc.

The supply of necessary natural resources will be made only from authorized companies located near the site where the project is to be implemented.

The natural resources for the project include mineral aggregates (sand, gravel, crushed stone) from quarries and ballast.

The mineral aggregates used to carry out the proposed works (sand and ballast aggregates) will be bought from the quarries/ballasts, regulated by ANRM, existing near the work area.

The locations for the procurement of aggregates and filling materials will be chosen so as to optimize costs and be located as close as possible to the project area.

In accordance with the legal provisions in force, for the realization of the designed works, no natural resources will be exploited within or in the immediate vicinity of the natural areas included in the European ecological network Natura 2000.

Ensuring the necessary technological water will be realized by connecting to the network in the area. The drinking water needed by the staff will be purchased from the trade.

Upon completion of the execution works, the land area temporarily occupied by the project will be returned to its original state, by removing all temporary structures, machinery, equipment and material remains from the site.

6 Description of the significant effects the project may have on the environment

The Dolj Environmental Protection Agency decided, as a result of the meeting of the Technical Analysis Commission, that the project ***Rehabilitation and modernization of the port infrastructure in Bechet port***, proposed to be located in Dolj county, *is subject to environmental impact assessment, subject to adequate assessment*.

The decision of the recruitment stage no. 217/13.02.2023 is valid for the duration of the project, and in the event that new elements, unknown at the time of issuance, or the conditions that were the basis for issuing the decision change, the owner has the obligation to notify the issuing competent authority.

This Environmental Impact Report was prepared in accordance with the requirements of the following legal provisions:

- Directive 2014/52/EU of the European Parliament and of the Council of April 16, 2014 amending Directive 2011/92/EU regarding the assessment of the effects of certain public and private projects on the environment (including the annexes)

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- Law no. 292/2018 regarding the assessment of the impact of certain public and private projects on the environment
- OM no. 269/2020 regarding the approval of the general guide applicable to the stages of the environmental impact assessment procedure, the guide for environmental impact assessment in a cross-border context and other specific guidelines for different fields and categories of projects.

6.1 Construction and existence of the project, including, if necessary, demolition works

The realization of the rehabilitation and modernization works of the port infrastructure - port Bechet can have a negative impact on the environment through:

- atmospheric pollutant emissions generated by the transport of construction materials and the operation of machinery in the works site
- noise emissions and vibrations in the works site.

This impact is insignificant, temporary and reversible, it manifests itself only during the execution of the works and punctually within each work front. Upon completion of the construction works, there will be no residual impact in the area.

The positive impact of the works will be manifested through:

- rehabilitation and modernization of the entire mooring front;
- building the platforms behind the berths, with their connection to the existing road;
- utility networks, upgrades for the centralized drinking water supply system and ring fire network, including the installation of external hydrants by connecting this system to the water network of the city of Bechet;
- rainwater collection network in the port area, including their treatment;
- domestic wastewater collection network, including its treatment;
- the supply of electricity to the port in order to ensure the consumption of economic operators, the supply of electricity to ships in the operating berths and charging stations for electric cars;
- port enclosure fencing, video surveillance, perimeter lighting;
- navigation signaling system;
- analyzing the possibility of placing a supply point for alternative fuels in the port.

6.2 The emission of pollutants, noise, vibrations, light, heat and radiation, the creation of negative effects and the elimination and recovery of waste; description of the possible effects as a result of the development/implementation of the project, taking into account the noise maps and the related action plans developed, as the case may be, for the area in the area of influence of the project

The emissions of physical and chemical pollutants, the types of waste generated by the implementation of the project were presented in chapter 2.10 of this environmental impact assessment study. The impact generated by these emissions will be quantified in the chapter below.

6.3 Risks for human health, for cultural heritage or for the environment

The analyzed project does not fall under the SEVESO legislation. Although dangerous chemical substances will be used and stored during the execution stage of the construction works, but considering their quantities, there is no risk that they will lead to accidents with significant effects on the population and the environment.

Natural disasters such as earthquakes, landslides, floods can lead to the closure of traffic and damage to human health. When designing the works, these natural hazards were taken into account, so that the risks for human health and environmental factors are very low.

There are no cultural heritage objectives in the project implementation area

6.4 Cumulation of the effects with those of other existing and/or approved projects, taking into account any existing environmental problems related to areas of particular importance from the point of view of the environment, which could be affected, or the use of natural resources

Based on the information displayed on the website of the Dolj Environmental Protection Agency at the date of the preparation of this environmental impact assessment study of the project no decisions were displayed other projects proposed to be carried out in the bordering area of the site.

We also mention the fact that, in the area of the location, there are no activities generating noxious emissions that could affect the quality of the environmental factors during the execution of the works and during the period of operation of the bridge.

The analyzed project falls under the scope of the Convention on environmental impact assessment in a cross-border context, adopted in Espo on February 25, 1991, ratified by Law no. 22/2001, with subsequent additions.

According to the plan for the area (attached), the location of the objective is located on the bank of the Danube - Bechet port area.

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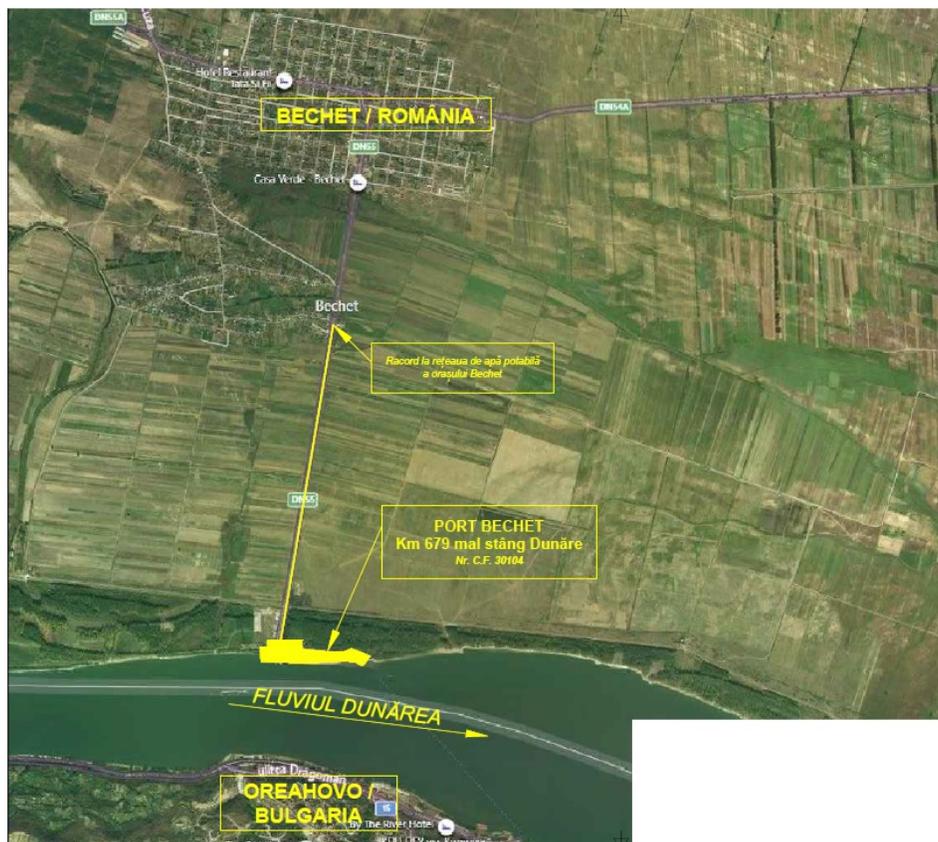


Figure no. 13 - Fitting in the area of the objective

The distance to the Bulgarian bank of the Danube is approximately 0.500 km. The works proposed to be carried out by this project will not affect the water quality of the common water body with the Bulgarian area (Danube River) which could create a potential cross-border impact, the distance being 500 m, the works are carried out in stages, they are of short duration and provide only a limited area near the shore for the arrangement of the vertical wharf).

Also, dredging works are carried out during the operation period of the port, they are periodic works that ensure navigation on the Danube so that the impact during the execution period of the works will not be greater than that expected during the normal operating periods of the port (either the Romanian one or the one from the neighboring country – Bulgaria).

Also, the executed works, car traffic will not generate a significant increase in noxious emissions, which will affect the surrounding area. Added to this aspect is the fact that the distance from the work area to the neighboring shore, of 500 m, significantly reduces the concentrations of noxious emissions, so that the impact of the works proposed to be carried out and which concern the rehabilitation and redevelopment of Bechet port will have an impact insignificant negative impact on the neighboring area - Bulgaria, and the population of the residential area of the Bulgarian city of Rahova will not be affected.

The monitoring of the emissions and especially the immissions during the execution of the works will be monitored according to the mentions in this environmental report in order to be able to keep under control the possible excesses of the analyzed indicators that could affect the population of the neighboring country - Bulgaria.

6.5 The impact generated by the project through the technologies and materials used

For the realization of the project of rehabilitation and modernization of the port infrastructure in Bechet port, the works proposed to be carried out are described in chapter 2. The materials and technologies used can generate an impact only in the case of improper use or accidents.

In this analysis, the analysis of the impact generated by the organization of the site will not be included, as this is not the object of this project. Thus, the analysis of the impact generated by the execution of the works is presented in the table below.

Table no. 10 Identification of cause-effect relationships during the construction and operation of the bridge

Type of intervention	Causes / activities	Environmental factors	Effects / risks	Direct impact
Rehabilitation and modernization works of the port infrastructure	Soil handling	Human health	Emissions of atmospheric pollutants	Increase in the incidence of diseases
			Increasing noise level	Discomfort generated by noise
		Air quality	Emissions of atmospheric pollutants	Change in air quality
		Soil	Soil removal	Quantitative soil losses
		Landscape	Structural changes due to the execution of the debles	Loss of the aesthetic value of the landscape
		Biodiversity	Vegetation removal	Loss of habitats
	Increasing noise level		Disturbance of species activity	
	Accidental spills of pollutants on the soil	Soil	Penetration of pollutants into the soil	Alteration of soil quality
Car traffic flow	Car traffic in the port area	Air quality	Pollutant emissions in the air	Change in air quality
			The occurrence of fires	Change in air quality
		Soil	Deposition of atmospheric pollutants on the soil	Changing the quality of the soil
		Human health	The occurrence of accidents	Loss of human lives
		Surface water	Penetration of pollutants into surface waters	Change in water quality

6.6 Forecasting the impact on environmental factors

The purpose of this project is to carry out the rehabilitation and modernization of the port infrastructure in Bechet port with the aim of improving the conditions of goods traffic in the port area, expanding the activity and developing the area.

6.6.1 The water environmental factor

The sources of impact for water quality are:

- the operation of washing/cleaning the machines when leaving the site
- household waste water resulting from the site.

For the period of execution of the works, it is mentioned that all the materials that will be used for the construction (raw stone, sort, sand, etc.) are non-hazardous, and in contact with water they do not produce chemical reactions.

Some minor water pollution with petroleum products may occur, representing fuel losses from their operation. The pollution will be easily observed on the surface of the water and the necessary intervention measures can be taken urgently.

During the execution of the works, the diffuse sources of pollution are made up of:

- intermediate deposits (bulk) of construction materials (especially powdery), which are washed away by rainwater, the fine particles being carried to the adjacent lands. That is why it is recommended to set up the storage platforms with guard perimeter ditches. Deposits of materials (aggregates, cement, binders, and other types of materials) will be closed or covered, so there is no danger of scattering in the atmosphere and deposition on the soil, their infiltration into the undersoil water through rainwater being excluded.

- washing machines (dumpers) in the rain - the water from these washes has an alkaline character (pH >8.5) being potentially contaminated with petroleum products (oils, fuels). The volume of rainwater within the organization of the work point will depend on the concrete surface. It is recommended to systematize the entire surface of the workplace organization, so that all rainwater can be pre-purified mechanically. The pollutant loading of these waters will depend on how the bulk materials are stored, the machinery maintained and the premises kept clean. In order to eliminate the danger of oil contamination of the soil and, by implication, the water of the Danube, it is necessary to properly maintain the machines and perform oil changes from the machines in special stations for such operations because oils and fats are very polluting. **Fuels and chemical products will not be stored on the work site.**

Most of the time, construction site activity is not optimal from the point of view of environmental protection. Therefore, the probability of **more or less accidental leakages of polluting substances** (especially oil) will not be zero. In this case, the impact produced by the execution of the works will appear mainly due to the local pollution of the undersoil waters (in the case of the organization of the work point) or the pollution of the surface waters as a result of the entrainment in them, by the rainwater, of the oil product or of other substances.

At the end of the program, the teams of workers are tasked with cleaning the platform, collecting and storing household waste in bins. In this way, the risk of surface water pollution is reduced and even eliminated.

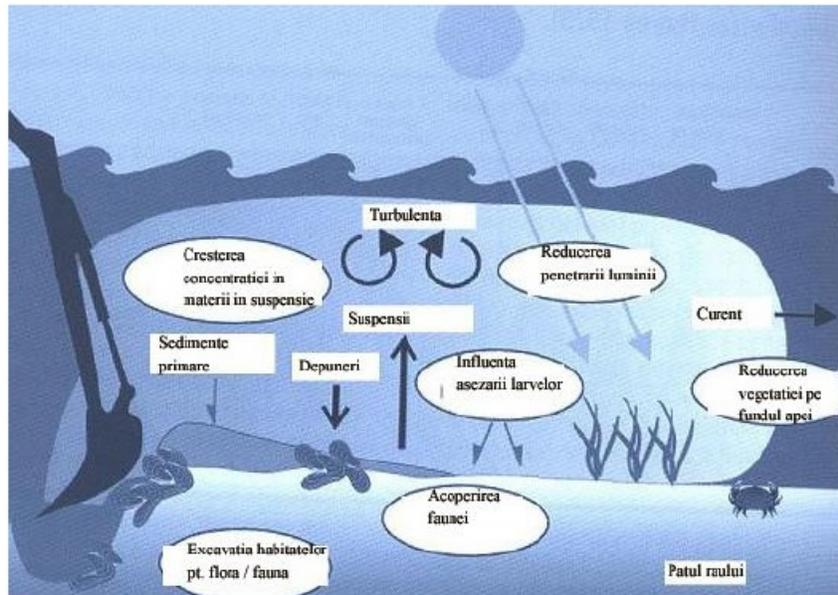
The presence of floating underwater excavation equipment is a potential source of pollutants, especially residues of petroleum products (diesel, oils, etc.), household waste water or bilge

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water. This source is activated only in case of imperfect technical condition of the machine or its improper exploitation.

The presence of floating equipment for underwater excavation is a potential source of pollutants, especially residues of petroleum products (diesel, oils, etc.), household waste water or bilge water. This source is activated only in case of improper technical condition of the machine or faulty operation.

Schematically, the impact of the dredging works is shown in the figure below.



When dredging is carried out, the fine parts and dust existing in the mass of the alluvial material will enter into suspension, contributing to the increase of water turbidity. The particles in suspension can be resettled on the bottom of the bed either by natural deposition or, if they are mobile enough and are carried by the water current, by choosing another deposition site. The organic substances in the suspended material can absorb the available oxygen from the surrounding waters and can temporarily create unsuitable living conditions for many aquatic animals. If the suspended sediments are found in a high concentration and persist through the expansion of the operations, then a diminution of the light intensity in the water can occur and thus the photosynthesis processes specific to algae or other aquatic organisms are affected.

The construction works that will be carried out in the underwater perimeter may have a negative influence on the fauna and flora of the site area. The least affected will be larger mobile animals such as fish, amphibians and reptiles, which may retreat. A more serious impact will be felt by plant organisms, as well as small animals.

The ichthyofaunistic list in the perimeter of the site is very rich, but no species is strictly located in the vicinity of the site. They show great mobility within a wide area of the Danube ecosystem, with abiotic and biotic conditions compatible with the ecological requirements of the fish species. The species are found in catches with variable frequency, some of which are rare or isolated, such as the scobar, mihalts, shal vargat. Migratory species have a variable weight (from rare to high) during the breeding season. 37 species are subject to commercial and/or sport fishing. 6 species are anadromous migrants, with the maximum migration in spring and autumn, respectively. One

species, the eel, is a catadromous migrant. The breeding area (located in the ocean) does not interfere with the reference area. One species has a restricted distribution only in the Danube basin (endemic) – the stone shrike. 3 species are of allochthonous origin and potentially invasive (status still uncertain due to relatively recent and accidental entry from anthropogenic ecosystems into natural water bodies). From the point of view of the preferred breeding habitat, one species is pelagophilous, whose tip is influenced by the turbidity of the water. The others are phytophiles or lithophiles seeking vegetable or hard substrates for reproduction. From the point of view of the habitat in which they look for food, 26 species are benthivore, also looking for food near the substrate, with a varied distribution on the cross-section of the minor bed depending on the granulometry of the substrate, the type of facies and respectively the specific trophic elements available. 6 species are planktivore and their source of food, the plankton, is influenced, among others, by the turbidity of the water, the speed of the current, etc. The young of many species of fish are also planktivorous. Regarding the preference for the current of water, 5 species are stagnophiles choosing slowly flowing areas.

The following species are more sensitive to the regime of dissolved oxygen in the water: the sălăul, the Danube scurvy, the sabața rizeafca, the large oblete, the stone mullet, the fusarul, the rasparul, the morunasul.

The dredging works will have a significant impact on the benthic species that populate the bottom of the port basin, due, first of all, to the mechanical effect on the biocenoses, but also to the disturbance of the water. The pelitic fraction is made up of mineral and organic substances, but also of toxic compounds deposited on the bottom of the water. Locally, in the excavation areas, the biotopes represented by the excavated material will be destroyed, which will damage the biocenoses that populate them. The resuspension of the pelitic fraction can cause disturbances in the functioning of the biocenoses in the adjacent areas. The reduction in the amount of light will generate changes in the populations of macrophyte algae in the harbor basin, reducing the filtering capacity of benthic species (mainly molluscs, which are fixed to the substrate), as well as feeding, for some fish species. Disturbance of the normal functioning of the aquatic ecosystem will also be caused by the noises and vibrations produced during the dredging works, which will remove schools of pelagic fish that frequent the area in search of food. Regarding the phytoplankton, during the execution of the dredging, it is expected that the physical and hydrological conditions of the water will change: the increase of suspensions in the water, the decrease of the light, the production of water turbulence, etc., which will qualitatively and quantitatively change the phytoplankton communities. Following the dredging works, benthic microalgae (microphytobenthos) will be introduced into the water mass and implicitly, in the phytoplankton composition. For these reasons, the phytoplankton composition will be significantly enriched with benthic species, mainly diatoms. Thus, the proportion of diatoms in the work area will increase, especially in the lower layers of the water table.

The reduction of the light intensity, caused by the suspended suspensions in the water, will lead to the qualitative and quantitative change of the phytoplankton in the upper layers of the water. During the entire period of dredging works, the quantities of phytoplankton microalgae will decrease and the dominance of diatoms will increase. The impact on the phytoplankton during the works is temporary, following that, a few months after completion, the phytoplankton community will return to the previous parameters. Regarding the phytobenthos, the major effect of dredging works is the increase of water turbidity, preventing the penetration of light to the benthic algae, reducing the depth to which the algae can still develop. Fine and coarse

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suspensions, deposited on the algae thallus, will prevent photosynthesis, leading to the disappearance of the primary producers. The suspensions deposited on the growing substrates will prevent the attachment of algae, resulting in the reduction of phytobenthic stocks. After the cessation of human activity and the return to natural turbidity conditions, a restoration of algal stocks can be predicted, especially since the works are not permanent, but take place on a small area. Changing the surface of the bottom of the Arapu arm, by displacing a volume of substrate, populated by species of benthic invertebrates (polychaetes, molluscs, gastropods and bivalves, crustaceans, etc.), will have negative effects on zooplankton. Thus, the larvae of benthic species live in the plankton (larvae of polychaete worms, larvae of bivalves and gastropods, etc.). Disturbance (interruption) of the reproductive cycle of benthic species will produce some decrease in them, at least during the dredging period. Also, the qualitative structure of the zooplankton, i.e. the diversity of species, will suffer, in the sense of the decrease in the number of taxa. The reduction of light, as well as the increase of suspensions in the water, will insignificantly alter the quantitative and qualitative structure of phytoplankton organisms (unicellular plant species that live in plankton). Representing the food source for zooplankton, the reduction of the trophic base of zooplankton will indirectly mean the reduction of zooplankton organisms. Directly, these conditions can lead to the suffocation of microscopic animal organisms, either by clogging their respiratory system (copepods, cladocera) or by covering their entire body (rotifers). In turn, the decrease in the numbers of more sensitive species of copepods, cladocera, etc., can lead to changes in the qualitative and quantitative structure of the zooplankton. Being organisms that float freely in the water mass, not fixed to the substrate, zooplankton organisms have the possibility to leave the places of action of the machines, and to reoccupy these spaces after the interruption of the activity. Also, they have short reproductive and life cycles.

During construction works on land, river water can be affected, through rainwater, by polluting substances from the surfaces under construction.

The works that are the subject of this study will not produce a negative impact during the operating period of the Bechet port.

The purpose of the works is that of

- modernization of the Danube mooring front by:
 - the construction of a vertical wharf made of weight blocks with the height of the crown at +7.80 m compared to the local elevation, with the cumulative length $L = 650$ m, the resulting surface $S = 10,918$ m² ;
 - concrete platforms behind the new wharf (new berths 2 – 6), approx. 20 m, with the possibility of placing the 16 t x 32 m Bocsca type gantry cranes, for which beams and running rails have been provided, or other machines established by common agreement with the economic operators that operate in the port and with designer's opinion, $S = 17,222$ sq m;
 - the execution of a floating easement berth, with a length of 75 m, according to the previous specifications
- RO-RO ramp rehabilitation and access roads, including:
 - rehabilitation of the ferry crossing ramp, $S = 4,086$ sqm;
 - rehabilitation and expansion of the ferry crossing pier, $S = 588$ sqm;
 - rehabilitation of precinct roads and platforms in the area of the border crossing point, $S = 12,410$ sq m
- related works, including:

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- dredging/excavations for the execution of the vertical wharf, the easement berth and rehabilitation of the RO-RO ramp ;
- rehabilitation of the navigation signaling system for the entire work .
- providing utilities in the port including:
 - the water supply of the port through its connection to the drinking water network of the city of Bechet, in order to ensure the water necessary for port activity and resupplying ships. Execution of the connection from the main network to the internal supply network, L = 2500 ml;
 - domestic wastewater collection network from the port, including its treatment;
 - rainwater collection network, including its treatment;
 - fire extinguishing installation;
 - the power supply of the port, by connecting to the LEA existing in the area, at the entrance to the port, in order to ensure the electricity consumption of the port operators, the charging of electric cars, as well as the resupply of electricity to the ships stationed in the berths. A new PT and a connection network in length of approx. 1,500 ml;
 - perimeter lighting system and port premises;
 - video surveillance and access control system;
 - demand analysis and the possibility of equipping the port with a fueling point for alternative fuels.

Thus, during the port's operating period, the forecasted increase in activity in the port area will not represent a significant risk of pollution due to bilge water, ballast water or ship waste.

6.6.2 Air environment factor

The sources of atmospheric pollution, characteristic of the construction period, are:

- suspended and sedimentable powders from the execution activities of the designed construction works and from the construction materials used;
- emissions from the combustion of fuels in the engines of some machines (CO, NO_x, SO₂);
- exhaust gases from the machines/means of transport involved in the designed construction activities.

The equipment required for the work will not work simultaneously. In order to limit dust emissions, it is recommended that the machinery be checked from a technical point of view, the roads be moistened during the dry season. The maximum concentrations of polluting substances in the forecasted air will not exceed the CMA values (Maximum Admissible Concentration) and will fall within the range of 0.2-0.5 CMA.

The upper limit of the range is possible to achieve during the construction period, the lower limit during the operation period.

With regard to dust pollution of the air, from the experience of construction sites, it can be appreciated that, in periods without precipitation, the CMA values can be exceeded 2-3 times on the transport routes and in the areas of machinery activity , of 0.5 mg/m³.

By assimilation with traffic on public roads, the concentrations of polluting substances resulting from the activity of machinery and the circulation of means of transport can be included in the following intervals:

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- NO_x 0.04 - 0.08 mg/m³;
- VOC 0.2 - 0.4 mg/m³;
- CO 0.3 - 0.6 mg/m³.

These values can be achieved for short periods of time, in unfavorable weather conditions (wind perpendicular to the road at a speed of 2 m/sec).

On the side of the roads, pollutant concentrations decrease with distance from the source, at 20 - 30 m distance representing 50% and at 50 m, approx. 30% of the maximum ones. At a distance of about 100 m, the concentrations of pollutants in the air are negligible, meaning below 10% of the concentration.

The most unfavorable situation is the one in which all the machines are in operation, which is excluded, due to the fact that the machines necessary for carrying out the work will not work simultaneously.

To limit dust emissions, it is recommended that the roads be moistened during dry periods. It is also recommended that the machinery and means of transport used be in good technical condition.

It is estimated that in the port premises the maximum concentrations of polluting substances in the air forecast will not exceed the maximum admissible concentration values (CMAs) and will fall within the range of 0.2 - 0.5 CMAs. The upper limit of the interval is possible to achieve during the construction period as well as during the operation period and the minimum limit is reached during the operation period.

With regard to dust pollution of the air, from the experience of construction sites, it can be appreciated that in periods without precipitation, on traffic routes, means of transport and in the areas of machinery activity, the concentration values can be exceeded 2-3 times maximum admissible of 0.5 mg/m³.

Areas of dust/particle pollution are limited in extent. According to US-EPA AP42, particles with a diameter greater than 100 pm are deposited in a short time, the deposition area not exceeding 10 m from the edge of the road. Particles with a diameter between 30 pm and 100 pm are deposited up to 100 m on the side of the road and, respectively, suspended powders are deposited at distances greater than 100 m and can exceed the area of the berth. It is difficult to make an assessment of air pollution with dust, the amounts and distances of their deposition depending on the nature of the roadway (asphalt, concrete, earth), the nature of the transported materials, the meteorological conditions.

Emissions of harmful compounds resulting from internal combustion engines are relatively low, both in concentration and in mass flow rates, which will have a significant harmful effect on the environment. The impact on human settlements will be negligible, because the distance from the objective to the nearest inhabited areas is approximately 1,000 m.

During the operation period of the objective, there are no sources of air pollution that would produce a significant impact

6.6.3 Forecasting the impact of climate change

The impact of climate change on the project is evaluated globally for the entire life of the project, both for the execution stage of the works and during the operation period.

Despite all the global efforts to reduce GHG emissions, the average global temperature will continue to rise in the next period, requiring urgent measures to adapt to the effects of climate change.

Just as economic sectors and human activities have proven to be negatively influenced by climate change, the inland waterways transport sector is influenced by global warming.

In the field of transport on inland waterways, the main effects of climate change are related to:

- the prolonged periods of drought in correlation with the increase in water demand and the increase in extreme temperatures - the decrease in the level of the Danube;
- periods of flooding caused by torrential rains and long-lasting heavy precipitation - the rise in the level of the Danube.

The impact of climate change on water bodies consists of seasonal changes in runoff, the occurrence of low flow situations and water shortages with the possibility of becoming more severe, the occurrence of more abundant and more frequent precipitation, both locally and regionally, but which are not relevant for the frequency and magnitude of floods and changes regarding biodiversity and aquatic and terrestrial ecosystems.

Increasing the level of risk associated with climate change can lead to the following effects:

- affecting navigability on the Danube during periods of drought and low flows;
- damage to hydrotechnical structures during floods;
- the modification of the bottom of the river bed as a result of the significant transport of sediments during the floods;
- damage to banks and ecosystems by erosion processes during flood periods;
- the increase in maintenance costs, unforeseen.

The potential impact of climate change on the activities during the execution and operation of the works, depending on its characteristics, will be:

- nature of the impact: negative;
- type of impact : direct;
- impact reversibility : reversible;
- expanding the impact : on the common Romanian-Bulgarian sector of the Danube;
- impact duration : temporary, in periods with extreme weather conditions;
- probability of impact : likely;
- impact magnitude : low magnitude;
- cross-border nature of the impact : no cross-border impact will be generated on the project in the Republic of Bulgaria.

Considering that the impact of climate change on the project will not be significant, it is not necessary to provide the project with measures to avoid, reduce or improve the significant impact on climate change.

The main measures to reduce the impact of climate change on the project, provided in the project, during the period of operation of the works are:

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- the careful phasing of the dredging works so that they do not overlap with periods conducive to the production of floods caused by torrential rains and long-lasting heavy precipitation;
- interruption of activities in case of extreme weather phenomena (storm, floods, fog, frost);
- the protection and assurance of the executed works, of the equipment and machinery in safe areas, in case of floods.

6.6.4 Prediction of the impact on the soil

From an environmental point of view, the "soil" factor, in the case of the objective analyzed to modernize the port of Bechet, is irrelevant. All the rehabilitation and modernization work of the port are carried out in its premises, built almost 100 years ago.

The port platform as a entire represents an artificial, humanized ecosystem, consisting of fillings, buildings, concrete platforms, roads and railways.

The dynamic penetration tests intercepted on the first 3 - 4 m a filling material resulting from the development works of the port area, then a layer of weakly cohesive material represented by a sandy dust, with a thickness of about 3 m.

In the port area, there are no known exceedances of the concentrations of polluting substances in the soil or cases of accidental pollution. Consequently, it is estimated that the polluting substances are located in the vicinity of normal values according to the provisions of *Order 756/1997 for the Regulation on the assessment of environmental pollution*.

It can be appreciated that the activities carried out in the port so far have not caused soil pollution.

The excavation works expected in the execution stage will only have a mechanical impact on the soil, in the area of the bank, without favoring the occurrence of erosion or seepage. The works designed for the modernization of the port (sewage network, restoration of the wall) ensure adequate protection of the soil, including in case of accidental discharge of some polluting substances.

The possible sources of soil pollution during the construction period are:

- uncontrolled storage of waste and construction materials;
- the activities carried out for the development of the investment objective;
- accidental spills of petroleum products from vehicles and machinery.

The main soil pollutants from construction activities specific to the site organization are:

- petroleum products that may end up in the soil as a result of accidental losses due to technical failures;
- powders and construction material waste resulting from material transport processes, etc.;
- noxious emissions (NO_x, SO₂, dust) from car traffic.

6.6.5 Prediction of the impact on biodiversity

Even if the rehabilitation and modernization work of the port infrastructure that are the subject of this study will be carried out on the surface of the Natura 2000 sites, these works will not permanently occupy additional areas of land, especially in the area of the banks of the Danube River in the area of the Bechet port (as mentioned and in the previous chapters where the works that are the object of this project are described in detail).

For the location of the site organization, the material warehouses, the parking lots for the machines and vehicles used during the execution of the works, the surfaces in the port area will be used (concreted, humanized areas, currently used for port activities).

The described works will require dredging works in the wharf area (for arranging the vertical wharf of the mooring front), works that will be carried out between May and March, outside the reproduction period of the fish species that can be found in the port area.

The works in the project present a risk of short-term insignificant negative influence on the water quality of the Danube River, on aquatic species but also on aquatic habitats through changes only during the execution period. Thus, this negative impact has an indirect influence on the food chain and will remove the birds and mammals that feed here. Excavation works have the potential to disrupt aquatic ecosystems by temporarily altering (only during the work) aquatic habitats, leading to the temporary loss of vegetation. Also, during the execution of the works, the accidental losses of hydrocarbons from the machines used for the execution of the works can lead to changes in the quality of the waters in the area of execution of the works.

Aquatic organisms can also be directly affected by the quality of the body of water, especially in the section where the dredging / development of the vertical wharf is carried out. During the period of execution of the works, the upheaval of the bed has as a result a negative impact on the life stages of the fish in the area of execution of the works. The effects consist in reducing the quality of breeding, feeding and sheltering habitats. Reducing water clarity and visibility reduces the ability of aquatic organisms to find food, reproduce and escape predators, eliminates potential food sources such as: insects and aquatic invertebrates, either through habitat loss or their plugging.

Also, during the execution period of the excavation/dredging works, the turbidity of the water will increase, with the direct and immediate result of decreasing the penetration of sunlight into the water, to the detriment of photodependent organisms. Another direct effect of the excavation/dredging works consists in increasing the concentration of suspended matter, reducing the light intensity in the water, thus affecting the photosynthesis processes specific to algae and other aquatic organisms found in the body of water (Danube River).

As for the more mobile swimming organisms, the effects are reduced due to their ability to avoid the area of increased turbidity. Another form of impact on the aquatic fauna is manifested by its withdrawal to less favorable areas, but it is estimated that this impact will be local and only during the execution period of the works.

From the analyzed data regarding the habitats and faunal species listed in the standard forms of the analyzed Natura 2000 sites, *ROSCI0045 Coridorul Jiului* and *ROSPA0023 Confluenta Jiu – Danube*, as was mentioned in the previous sub-chapters, 2 species of mammals can occasionally be found in the project area: 1355 *Spermophilus citellus*, 1352 *Lutra lutra* and 2 avifaunistic species: A122 *Crex crex* and A075 *Haliaeetus albicilla*.

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Analyzing the potential negative impact of the project on the Natura 2000 sites, the following aspects were found, correlated with the key parameters:

- ✓ The specifics of the works in the project do not directly or indirectly affect the functionality of the habitats necessary for faunal species, because they refer to works in the anthropized area of Bechet port, without disturbing the areas with vegetation (areas with habitats) that represent places of rest, feeding and typical reproduction Natura 2000 sites.
- ✓ The integrity of the habitats necessary for fauna species will be maintained and will continue to provide the necessary territory for shelter, reproduction and feeding for species of conservation interest, without affecting the size of the populations. Likewise, there will be no functional fragmentation of the habitats of faunal populations.
- ✓ Permanent surfaces from the surface of the Natura 2000 sites will not be occupied. The surfaces occupied by the organization of the site are insignificant compared to the size of the sites and in addition, the surfaces in the port area (humanized surfaces) will be occupied (during the execution of the works) without affecting other areas of outside the port area.

The works that will be carried out have a temporary insignificant negative impact on Natura 2000 biodiversity, during the excavation/dredging, rehabilitation and redevelopment of Bechet port (as described in detail in the previous chapters). In the long term the impact will be positive.

During construction and operation, the proposed works will not exert current or future negative pressures on Natura 2000 sites and will not impede specific conservation measures, both on and off site. The individuals of the species identified as possibly present in the area of the location of the objective and/or in the vicinity, especially during the warm season, are in small numbers compared to the dimensions of the site, their populations being dispersed throughout the site area. A few specimens may rarely appear in the project area.

6.6.6 The prediction impact on the landscape

As stated in the previous chapters, in the port area the landscape is humanized, the area being a platform similar to an industrial platform, where the land is concrete, showing degradation.

The construction period represents a stage with a limited duration and it is considered that the natural balance and the landscape will be restored after the completion of the works. Consequently, during the execution period, it is not necessary to redo the landscaping.

The land on which the designed works are located is used exclusively for port activities. The proposed constructions do not change the destination or the land use category ("construction yards" - Cc). In the project area, there are no natural areas used for recreational purposes (forests, green areas, parks in forested areas, campsites, bodies of water) that will be affected by the construction of the objective.

By carrying out the planned works, the natural landscape of the area will not change significantly. On the harbor platform, the landscape changes will also be insignificant. There will be lighting poles that will improve the aesthetic appearance of the port premises.

All these represent constructions at the level of the land, without implications on the landscape. Finally, it can be appreciated that, from the point of view of changing the current landscape, the effects of the projected works will be minor and of a quantitative nature; from a qualitative point of view, the final impact will be positive through the sanitation and systematization works of the area. The restoration of the current wall, the execution of the water supply installations and the sewage network, all these are elements that do not significantly change the current landscape. It is

appreciated that no measures are necessary to reduce the impact on the landscape, the impact being insignificant and for some aspects, even positive.

6.6.7 The impact of the project on the socio-economic environment

The revitalization of the activity of the port of Bechet in the perspective of the following years will have beneficial effects both economically and socially for the population and the local economic activity, first of all, but also for the economic units and their workers with activity in other more distant areas but who use the port and the Danube for transport the products.

The increase in port traffic will ensure new jobs in the port and in related port services. Achieving this objective will have the effect of attracting existing local resources into the economic circuit and capitalizing on them, with the use of local labor. For economic units that use water transport and port services, the lower costs of water transport (2-3 times lower compared to road transport and equivalent to rail transport), will contribute to reducing the prices of products delivered to the beneficiary's gate and increasing the competitiveness of the respective units.

In perspective, all these activities for the population will have beneficial effects, both economic and social, for the residents of the area but also for those from other areas.

During the execution of the works, the number of jobs in the area will increase, this being an important aspect of the social and human factor with the prospect of increasing the number of jobs even after the completion of the works and the intensification of capacity in the port area.

6.6.8 Impact on archaeological areas, cultural heritage

The location of the works that are the subject of this memorandum is at a distance of approximately 2,500 m from the nearest housing area, so that both during the execution of the works and during the operation period, the population of the housing area adjacent to the objective will not be affected.

Also, as specified in the previous chapters, in the area of the site where the works will be carried out, there are no other objects of interest that would be endangered during the execution of the works or after their implementation.

The minimum distance to the nearest areas of cultural interest is 3500 m, these being located outside the port area so that the works proposed to be carried out will not cause material damage to them.

6.7 The interaction between the effects generated by the project on each environmental factor

The interactions between the effects generated by the project on the environmental factors, respectively the secondary effects (the reaction that the effects on one environmental factor can have on another environmental factor) were analyzed.

The secondary effects generated by the implementation of the project that is the subject of this report are presented in the table below.

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The environmental factor	The interaction factor	Description of the interaction
Air	The health of the population	The emissions of sedimentable dusts and other atmospheric pollutants and the temporary change in air quality in the location of the site organization and the work fronts can affect the health of the workers. All the necessary measures will be adopted to reduce the impact on the air (periodic checking of the machines, spraying of the work fronts), and the workers will be equipped with individual protective equipment, so that the health status of the workers or the people who transits the analyzed area
	Biodiversity	Deposits of sedimentable powders can affect the flora (modification of the processes of photosynthesis / plant respiration), but their concentrations are low, and the effects will disappear after the first rain, the impact on biodiversity will not be significant. No protected habitats were identified in the project location and in its immediate vicinity
	Surface water	The sedimentable powders generated by the works may end up in the waters of the Danube, but the concentrations of these pollutants are low, the quality of the water body will not be affected and implicitly there will be no impact on the aquatic species of flora and fauna
	Soil	The sedimentable dusts can settle on the soils in the vicinity of the work fronts, but since they do not contain toxic substances, the impact on the soil will not be significant
Noise	The health of the population	The workers, the people who transit or carry out their activity in the analyzed area, may be affected by the increase in the intensity or duration of the noise. In order to reduce noise emissions, modern construction technologies and equipment (equipped with noise detectors) will be used, legal rest hours will be respected and no work will be done at night, and in the event that the measurements reveal exceeding the maximum level of noise, additional sound-absorbing panels will be installed
	Fauna	The increase in noise level and the presence of machinery and workers may disturb the fauna in the site area. Fauna specimens will move to similar habitats in the vicinity of the site, so that the population of the species will not be reduced (the only change recorded being the relative density of the species in the site), the impact on the fauna will not be significant
	Biodiversity	Land handling will lead to an increase in the concentration of sedimentable dust, but since this impact is temporary, the fauna will not be significantly affected

In the table below, the interactions between the effects determined by the execution of the works that are the subject of this environmental impact assessment study report are presented in matrix form.

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Matrix of interactions	soil	The water	Air	Noise and vibrations	Biodiversity	Landscape	The health of the population	Cultural heritage
soil								
The water			x		x			
Air		x			x		x	
Noise and vibrations					x		x	
Biodiversity		x	x	x				
Landscape							x	
The health of the population				x		x		
Cultural heritage								

6.8 Cumulative impact

Based on the information displayed on the website of the Dolj Environmental Protection Agency, at the time of the preparation of this environmental impact assessment study, there were no decisions of other projects proposed to be carried out in the bordering area of the site.

The analyzed project falls under the scope of the Convention on environmental impact assessment in a cross-border context, adopted in Espo on February 25, 1991, ratified by Law no. 22/2001, with subsequent additions.

According to the plan for the area (attached), the location of the objective is located on the bank of the Danube - Bechet port area.

The distance to the Bulgarian bank of the Danube is approximately 0.500 km. The works proposed to be carried out by this project will not affect the water quality of the common water body with the Bulgarian area (Danube River) which could create a potential cross-border impact, the distance being 500 m, the works are carried out in stages, they are of short duration and provide only a limited area near the shore for the arrangement of the vertical wharf).

Also, dredging works are carried out during the operation period of the port, they are periodic works that ensure navigation on the Danube so that the impact during the execution period of the works will not be greater than that expected during the normal operating periods of the port (either the Romanian one or the one from the neighboring country – Bulgaria).

Also, the executed works, car traffic will not generate a significant increase in noxious emissions, which will affect the surrounding area. Added to this aspect is the fact that the distance from the work area to the neighboring shore, of 500 m, significantly reduces the concentrations of noxious emissions, so that the impact of the works proposed to be carried out and which concern the rehabilitation and redevelopment of Bechet port will have an impact insignificant negative impact

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on the neighboring area - Bulgaria, and the population of the residential area of the Bulgarian city of Rahova will not be affected.

6.8.1 Description of the current state

6.8.1.1 Temperature

In general, the climate is characterized by hot and dry summers and cold winters. Average annual temperatures are between 11-12°C, decreasing from upstream to downstream. The absolute minimum air temperatures were -30°C, and the absolute maximum temperatures recorded exceeded 40°C. The table below (table no. 10) shows the average monthly temperatures, the average annual temperature and the annual amplitude recorded between the years 1901-2000 and respectively for the year 2021 at the meteorological stations Calafat and Turnu Magurele⁷.

Table no. 11 - Air temperature (monthly and annual average) in the years 1901-2000, respectively 2021 at Calafat and Turnu Magurele stations

Weather station	Year	January	February	March	April	May	June	July	August	September	October	November	December	Annual average	Annual amplitude
		Monthly average (°C)													
Calafat	1901/2000	-1,4	0,6	5,7	11,9	17,4	21	23,3	22,8	18,2	11,9	5,7	1,0	11,5	24,7
	2021	2,1	3,6	6,1	10	17,6	22,9	26,7	25,5	18,8	10,0	7,3	3,9	12,9	24,6
Turnu Magurele	1901/2000	-2,3	0,3	5,6	12,2	17,6	21,3	23,3	22,5	18,1	11,8	5,7	0,5	11,4	25,6
	2021	2,4	3,2	4,8	9,9	17,7	21,5	26	25,2	18,2	10,1	7,4	3,0	12,5	23,6

In Table no. 11 shows the absolute maximum and absolute minimum monthly and annual temperatures recorded in the years 1901-2000, respectively 2021 at the meteorological stations Calafat and Turnu Magurele.

Table no. 12 - Absolute maximum and absolute minimum monthly and annual temperatures recorded in the years 1901-2000, respectively 2021 at the two stations Calafat and Turnu Magurele

According to the Statistical Yearbook and considering the fact that there is no weather station in Bechet, and the data are collected from the closest weather stations to the location

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Weather station	Year	January	February	March	April	May	June	July	August	September	October	November	December	Absolute maximum	Absolute minimum
		Monthly maximum (°C)													
Calafat	1901/2000	20,5/1993	22,4/1990	27,6/1952,1994	34,5/1985	36,6/1969	39,5/1908	43,2/2000	41,3/1945	39,8/1946	31,6/1991	25,9/1970	21,2/1989	43,2/2000	-
	2021	13,7	21	21	25,8	31,8	39,3	40	41,1	34,1	24,2	17,3	17,1	41,1	
		Monthly minimum (°C)													
	1901/2000	-29,2/1947	-24,6/1950	-15,7/1963	-3,0/1912	1,6/1952	6,2/1962	9,0/1913	7,3/1904	-1,3/1977	-6,2/1988	-16,2/1988	-21,8/1948	-	-29,2/1947
	2021	-7	-7,5	-5,8	-0,4	4,3	9,1	15,1	9,4	24	28	12	23	-7,5	
Turnu Magurele		Monthly maximum (°C)													
	1901/2000	18,0/1983	24,1/1995	29,6/1951	34,2/1985	38,8/1950	38,2/1957	43,2/1987	41,4/1952	40/1946	36,4/1952	26,7/1963	22,0/1903	43,2/1987	-
	2021	15,6	20,6	19,6	25,5	30,4	37,2	39,3	40,4	32,9	23,1	23,1	17,6	40,4	-
		Monthly minimum (°C)													
	1901/2000	-30,2/1942	-26,0/1950	-22,2/1929	-4,6/1923	0,5/1938	5,0/1911	9,0/1974	6,6/1981	-2,5/1977	-5,8/1988	-18,2/1993	-25,0/1933	-	-30/2015
2021	-30	-26	-22,2	-4,6	0,5	5	9	6,6	4,4	-1,1	-2,1	-8,2	-	-10,7	

6.8.1.1 Precipitation

Average annual precipitation in the regions adjacent to the Danube River fluctuates significantly - between 500 mm and 600 mm. The maximum level of precipitation is recorded in June, while their minimum level is recorded in February and there are some elements of transition (a secondary maximum in autumn and a secondary minimum in summer).

The annual average of the amounts of precipitation decreases from upstream to downstream, and the absolute maximum amounts of precipitation in an interval greater than 24 hours have exceeded 150 mm.

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The table below shows the amounts of average monthly and average annual precipitation recorded in the period 1901-2000 and respectively in the year 2021 at the Calafat and Turnu Magurele meteorological stations.

Table no. 13 - Average monthly and annual average precipitation amounts recorded in the years 1901-2000 and 2021, respectively, at the meteorological stations Calafat and Turnu Magurele

Weather station	Year	January	February	March	April	May	June	July	August	September	October	November	December	Annual average
		Monthly average (mm)												
Calafat	1901/2000	39	36,1	37	47,8	60	63,2	46,4	36	39,3	47,1	52	48,9	532,8
	2021	11,8,8	8,2	80,8	34	62,6	30,4	36,2	2,6	15	103,4	22,6	66,5	581,1
Turnu Magurele	1901/2000	68,6	32,3	87,4	26,6	103,6	49,8	88,6	39,8	57,2	88,3	83,8	0,1	726,1
	2021	89,4	3,4	88,2	49,6	86,4	46,7	16,2	29,7	4,8	99,4	33,6	40,5	587,9

6.8.1.2 Fog and atmospheric inversion phenomena

The fog observed along the entire Danube valley is mainly caused by temperature inversions (inverse temperature drop coefficient). Inversions occur most frequently in the months of November, December, January and February.

6.8.1.1 Winds

The direction of the wind is influenced by the river valley, with a predominant frequency from west and east (20-25%) between Bechet and Turnu Magurele. Atmospheric calm has variable values that depend on the local relief and the orientation of the valley: 46.7% in Drobeta-Turnu Severin, 49.2% - Calafat, **54.7% in Bechet**, 34.4% in Turnu Magurele, 38.2% in Giurgiu, 18.8% in Calarasi.

6.8.1.2 The freezing phenomenon

The layers of ice along the Bulgarian sector of the Danube river can be seen during the winter - from December to March.

On average, ice lasts for 91 days, and drift ice for 74 days. The average annual probability of occurrence of the phenomenon in the Bulgarian part of navigation is 82%.

The specific position of the hydroelectric power station at Portile de Fier, which narrows the channel, has an essential influence on the formation of ice along the Lower Danube.

Free ice drifting in the Middle Danube is limited. Upstream of the Iron Gates, a new layer of ice forms in the local meteorological conditions and in the conditions of a reduced speed of the water current. In the spring, usually after 8 days after the ice begins to melt, the Danube river is completely free of ice.

6.8.2 The potential impact during the execution period of the works

Considering the specificity of the activities that will be carried out in order to rehabilitate and modernize the infrastructure of the port and the use of modern machines, equipped with engines whose emissions will comply with the legislation in force, it is estimated that, during the execution period of the works, there will be no impact significantly, in terms of the production of greenhouse gases (GHG), on climate change.

The potential impact of the activities during the execution of the works on the climate, depending on its characteristics, will be:

- nature of the impact: negative;
- type of impact: direct;
- impact reversibility: reversible;
- impact expansion: local, limited to the area of the work fronts in Bechet port;
- duration of the impact: temporary, during the execution of the works;
- probability of impact: certain;
- impact magnitude: low magnitude;
- the cross-border nature of the impact: there will be no cross-border impact on the climate in the project area, in the Republic of Bulgaria.

Considering that the impact on the climate during the execution of the works is not a significant one, it is not necessary to provide by the project measures to avoid, reduce or improve the significant impact on the climate.

The main measures to reduce the impact on the climate provided for in the project, during the execution of the works are:

- the use for the construction activities of the proposed structures and the realization of dredging activities, of modern machines, equipped with engines whose emissions will comply with the legislation in force (reduction of the production of greenhouse gases);
- the use of vehicles for the transport of materials / personnel with low emissions to reduce the production of greenhouse gases.

6.8.3 The potential impact during the operating period

During the operating period, the main impact on climate change is related to GHG emissions, as a result of the increase in commercial transport traffic on the Danube in the Bechet port area.

The European Commission promotes the transport system on inland waterways, considering that it is mainly characterized by reliability, energy efficiency and high transport capacity.

Transport on inland waterways is a competitive alternative to road and rail transport, being an "environmentally friendly" alternative in terms of energy consumption and the level of noise generated. In addition, transport on inland waterways ensures a high degree of safety, especially with regard to the transport of dangerous goods.

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The potential impact of the activities during the period of operation of the works on the climate, depending on its characteristics, will be:

- nature of the impact: negative;
- type of impact: direct;
- impact reversibility: irreversible;
- expanding the impact: at the local level;
- duration of the impact: permanent, during the development of naval traffic on the Danube, in the port area;
- probability of impact: certain;
- impact magnitude: low magnitude;
- cross-border nature of the impact: no cross-border impact will be generated on the climate in the area of the Republic of Bulgaria.

Considering that the impact of the project on climate change will not be significant, it is not necessary to provide measures to avoid, reduce or improve the significant impact on climate change.

The main measures to reduce the impact on climate change foreseen in the project, during the period of operation of the works are:

- use for dredging activities, modern dredges, equipped with engines whose emissions will comply with the legislation in force, with a direct effect on reducing the production of greenhouse gases.

6.8.4 Climate change mitigation

The project that is the subject of this presentation memo aims to rehabilitate and modernize the port infrastructure in Bechet port, in order to develop the activity in this port. The development of cargo traffic in the port of Bechet is mainly conditioned by the operating conditions of the cargo, the conditions for the ships to stay, the facilities that the port infrastructure can offer in any season and the connection of the port with the local and national road network. The rehabilitation of the existing berths and the transition from walled quays to vertical quays will lead to the development of cargo traffic in the port.

Along with the rehabilitation and modernization of the port infrastructure, optimal working conditions and the running of specific activities under normal conditions will be ensured.

At the same time, with the development of the activity in the Bechet port area, the naval traffic will also intensify, thus reducing the car traffic of goods.

Based on the traffic analysis (comparison between car traffic and naval traffic in the Bechet port area), as can be seen from the tables below (extracted from the traffic analysis) CO₂ tons emissions (the only significant emissions that are generated by car traffic and, respectively, naval traffic and which can be estimated based on traffic and estimated fuel consumption) is decreasing, so that at the level of the reference year it will decrease from 3466 tons of CO₂/year to 1114 tons of CO₂/year .

Calculation of the carbon footprint (tons of CO₂ emissions) was performed based on the following input data:

- traffic forecast, in the scenarios Without Project and With Project, according to the results of the Traffic Study

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- unit emissions and fuel consumption, according to *Jaspers Project Appraisal Guidance (June 2023)*
- CO₂ equalization in tons of oil equivalent (respectively, 2.5 tons of CO₂ = 1 TEP), according to *EIB Carbon Footprint Methodologies, 2023*.

According to the results, in the perspective year 2030 (5 years of operation), the total amount of TEP will be reduced from 1,386 TEP/year to 446 TEP/year, following the diversion of traffic from the road mode to the naval mode, following the implementation of the project.

As stated previously, the implementation of this project aims to develop from an economic point of view and implicitly also the activity carried out in the Bechet port area. Considering that through naval traffic there will also be a positive impact through the reduction of greenhouse gas emissions (carbon dioxide in the present case), an intensification of naval traffic and an increase in cargo transport through the port of Bechet is estimated.

6.9 The impact of climate change on the project

6.9.1 The potential impact during the execution period of the works

The impact of climate change on the project is evaluated globally for the entire life of the project, both for the execution stage of the works and during the operation period.

Despite all the global efforts to reduce GHG emissions, the average global temperature will continue to rise in the next period, requiring urgent measures to adapt to the effects of climate change.

Just as economic sectors and human activities have proven to be negatively influenced by climate change, the inland waterway transport sector is also influenced by global warming.

In the field of transport on inland waterways, the main effects of climate change are related to:

- the prolonged periods of drought in correlation with the increase in water demand and the increase in extreme temperatures - the drop in the level of the Danube;
- periods of flooding caused by torrential rains and long-term heavy rainfall - the rise in the level of the Danube.

The impact of climate change on water bodies consists of seasonal changes in runoff, the occurrence of low flow situations and water shortages with the possibility of becoming more severe, the occurrence of more abundant and more frequent precipitation, both locally and regionally, but which are not relevant for the frequency and magnitude of floods and changes regarding biodiversity and aquatic and terrestrial ecosystems.

Increasing the level of risk associated with climate change can lead to the following effects:

- affecting navigability on the Danube during periods of drought and low flows;
- damage to hydrotechnical structures during floods;
- modification of the bottom of the river bed as a result of the significant transport of sediments during floods;
- damage to banks and ecosystems by erosion processes during flood periods;
- the increase in maintenance costs, unforeseen.

Impactul potential al schimbarilor climatice asupra activitatilor din perioada executie si operare a lucrarilor, in functie de caracteristicile acestuia va fi:

- nature of the impact: negative;
- type of impact: direct;

- impact reversibility: reversible;
- expanding the impact: on the common Romanian-Bulgarian sector of the Danube;
- impact duration: temporary, during periods with extreme weather conditions;
- probability of impact: likely;
- impact magnitude: low magnitude;
- cross-border nature of the impact: no cross-border impact will be generated on the project in the Republic of Bulgaria

Considering that the impact of climate change on the project will not be significant, it is not necessary to provide the project with measures to avoid, reduce or improve the significant impact on climate change.

6.9.2 The potential impact during the operating period

The main measures to reduce the impact of climate change on the project, provided in the project, during the period of operation of the works are:

- the careful phasing of the dredging works so that they do not overlap with periods conducive to the production of floods caused by torrential rains and long-lasting heavy precipitation;
- interruption of activities in case of extreme weather phenomena (storm, floods, fog, frost);
- the protection and assurance of the executed works, equipment and machinery in safe areas, in the event of floods.

6.9.3 Adaptation to climate change

Extreme weather events are increasingly linked to climate change.

Thus, it is necessary to identify the impact of climate change on natural and anthropogenic systems, the vulnerability of these systems as well as the adaptation to the effects of climate change.

Vulnerability involves the analysis of the negative impact of climate change, including climate variability and extreme weather events on natural and anthropogenic systems and depends on the type, amplitude and rate of climate variability to which they are exposed, as well as their ability to adapt.

Vulnerability – the negative impact of climate change, including climate variability and extreme weather events, on natural and anthropogenic systems. Vulnerability depends on the type, amplitude and rate of climate variability to which a system is exposed, as well as its ability to adapt

Adaptation to the effects of climate change is the ability of natural and anthropogenic systems to react to the effects of current or expected climate change, including climate variability and extreme weather events. The purpose of adaptation is to reduce potential damages, to benefit from opportunities and to react adequately to the consequences of climate change, taking into account the fact that society and ecosystems feel the individual and cumulative effect of all these components.

Adapting to the effects of climate change is a complex process, due to the fact that the severity of the effects varies from one region to another, depending on exposure, physical vulnerability, the degree of socio-economic development, natural and human adaptation capacity, health services and mechanisms disaster monitoring.

The challenge for adaptation consists in increasing the resilience of economic and ecological systems and reducing their vulnerability to the effects of climate change. At the same time, the measures adopted in the field of adaptation to the effects of climate change will ensure a maximum benefit of the positive effects generated by the global warming process.

Thus, in order to be able to present the impact that climate change can have on the project that is the subject of this memorandum, the potential extreme events caused by weather or climate change on the project will be analyzed.

The effects of future climate change represent a significant challenge for infrastructure managers, transport operators and other factors involved, who may face a series of factors such as: floods, rising/falling water levels with impact and/or high wind speeds with impact on the conditions of naval transport, floods or erosion of the soil with an impact on land transport or on all the operations carried out on the shore, heat waves with the impact they can have on the health of the population, drought (including the availability and low quality of water and the demand for all greater than water), extreme amounts of precipitation, floods, storms, strong winds, freeze-thaw phenomena, etc.

Next, the main factors that can contribute to climate change will be analyzed (according to *Commission communications - Technical guidelines regarding the immunization of infrastructure to climate change in the period 2021-2027, no. 2021/C 373 /01, Annex D.6.*

❖ Heat waves

Through the proposed project, no new constructions are provided to prevent air circulation in the port and form heat waves. The height level of the constructions will remain the same, so the air circulation even after the rehabilitation of the port will be similar to that of the current moment. Thus, even the population that will carry out its activity in the port area will not feel a negative impact on health.

We also mention the fact that through the implementation of the project there will be no additional sources of emissions of volatile organic compounds or other compounds that contribute to the formation of ground-level ozone. Also, due to the works to be carried out, during the operation period of the port there will not be an additional source that generates heat or absorbs heat, the works building in the rehabilitation of the port platform, dredging, etc.

By restoring the electricity supply network in the Bechet port area (as described in the previous chapters), the lighting in the platform area will be optimized. The works will be performed with high-performance materials / equipment, with low energy consumption, so that, during the operation period, the increase in energy consumption will not be very high. Alternative systems from renewable sources have not been analyzed regarding the provision of electricity in the port area until this moment.

Through the works proposed to be carried out and the activity carried out in the port area, it will not be necessary to use cooling water (no equipment is used that requires water cooling that would lead to an increase in the temperature level in the area of the port platform with negative effects on short, medium and long term).

The activity carried out will be transit of goods, loading / unloading of goods from / in the ships docked in the port - an activity specific to the ports of goods.

For the execution of the port rehabilitation works, the materials used will be specific to this type of work (mineral aggregates) resistant to higher temperatures that do not present the risk of cracks or aging with the passage of time.

According to the data from the specialized literature (*The report of the National Hydrology Administration regarding "Climate changes - from physical bases to risks and adaptation"*), persistent heat waves have become extremely frequent in the last decade, compared to previous periods. In accordance with the data presented in the above-mentioned report. Thus, in the 2021-2050 horizon, there will be an increase in the number of heating days, compared to the 1971-2000 period. The increase in the number of days with an impact generated by heat waves will be more pronounced in the extra-Carpathian regions, in the south, south-east and west of Romania, including in the project area.

The trend regarding the number of days with a minimum temperature above the limit of 20 °C (tropical nights) indicates an increase in Romania. In the area of interference of the project, they were expected to intervene in the period 2021 - 2050 with up to 18 more tropical nights per year, compared to the reference interval - in this case 1971-2000. This type of change causes consequences that cannot be neglected in the case of the health of the population but also of the infrastructure required by this thermal stress.

Therefore, analyzing all the available data, it turns out that the project area will be subjected to gradual increases in temperatures, the increase in average temperature being the result of the increase in minimum temperatures and the increase in the number of days with high temperatures. Therefore, in the project area, there is no question of a decrease in the minimum temperatures, nor of a spectacular increase in the maximum temperatures.

❖ Draught

In Romania, the analysis of trends in the variability of seasonal precipitation shows significant increases in the fall, a fact that is directly reflected in the increasing trends of flows in the respective season.

From the pluviometric aspect, during the period 1901-2000, a general trend of decreasing annual rainfall amounts was highlighted, after 1960, an intensification of the rainfall deficit in the south of the country was also highlighted.

The project area is characterized by low amounts of precipitation and often in torrential regime in summer, as well as frequent periods of drought.

According to the data provided by the National Meteorology Administration, the project area is characterized, rather, by a tendency to decrease the average amounts of precipitation, but also by the alternation of periods of extreme precipitation with periods of drought.

In accordance with the Report of the National Hydrology Administration regarding "*Climate change - from physical bases to risks and adaptation*", the annual amount of precipitation in the project area will continue to decrease in the next 50 years.

However, this trend manifests itself in parallel with the trend of increasing the number of events with extreme precipitation and the amount of precipitation recorded on their occasion.

According to the report prepared by IGSU - Country Report - 2016 -

Conditionality 5.1, the location of the project is in an area with a high risk of drought, as can be seen from the above regarding the evolution of the annual amounts of precipitation.

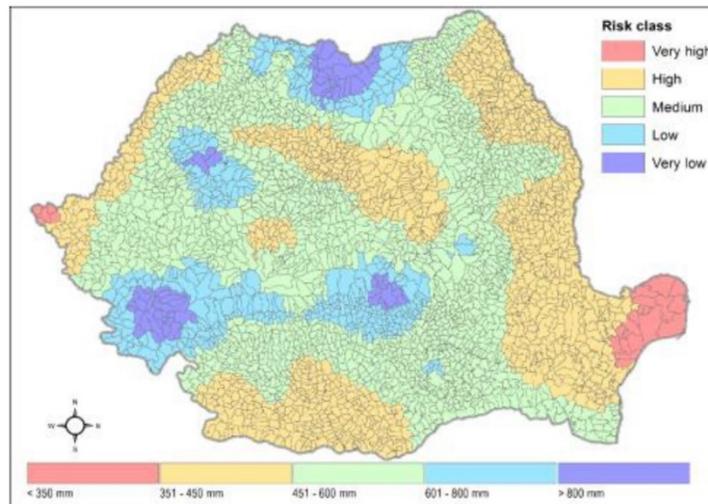


Figure no. 14 – Drought risk map

Through the proposed project, which aims to rehabilitate Bechet port, water consumption in the port area will not increase. The water supply, as mentioned in the project, will be from the public network of the city of Bechet, so that the underground water bodies, from this point of view, will not be affected. Likewise, the activity carried out in the port area, the rehabilitation works proposed to be carried out will not influence the underground water bodies, as is also presented in chapter 14.1.1.

As stated previously, the Bechet port area is at high risk of drought, as can be seen from the above regarding the evolution of the annual amounts of precipitation, so that in extended periods with a lack of precipitation, extreme temperatures, drought, the drop in the level of the Danube will negatively influence the activity in the port area, the ships will not have the optimal depth for docking in the port or even in very rare cases, the low flow of the Danube River can prevent the movement of ships, this being interrupted for short periods of time (until the increase / the return of the level of the Danube).

❖ Vegetation fires, forest fires

The area of the Bechet port (port platform) is a concrete area, without vegetation, forests, shrubs that would present the risk of a fire, so this risk is very low and will not generate a potential impact on climate changes in the project area.

❖ Regimes of floods and extreme precipitation

In general, floods occur as a result of phenomena such as hurricanes, weather systems transiting a region and/or snowmelt. Very dangerous are flash floods, produced by intense precipitation, falling in a short time on a small area. These are also the most difficult to predict.

The reference area of the project is the correspondence of the Danube River, in the area of the project the responsibility rests with the Olt Water Basin Administration.

According to the Flood Management Plan, no significant historical floods were recorded in the city of Bechet. From the available information, notable was the event produced in May 2006 when the Danube meadow between Bechet and Corabia was flooded.

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According to the Maps of areas with potential flood risk (ANAR), the zone is one with the incidence of flooding, presenting risks at 0.1%, 1%, even 10% probability, as shown in the figures below.

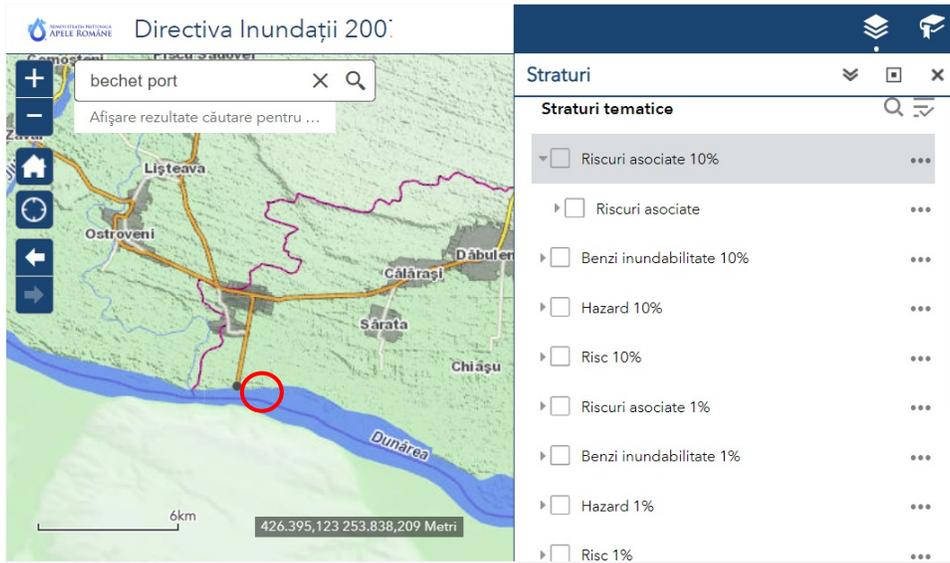


Figure no. 15 - Bechet port area

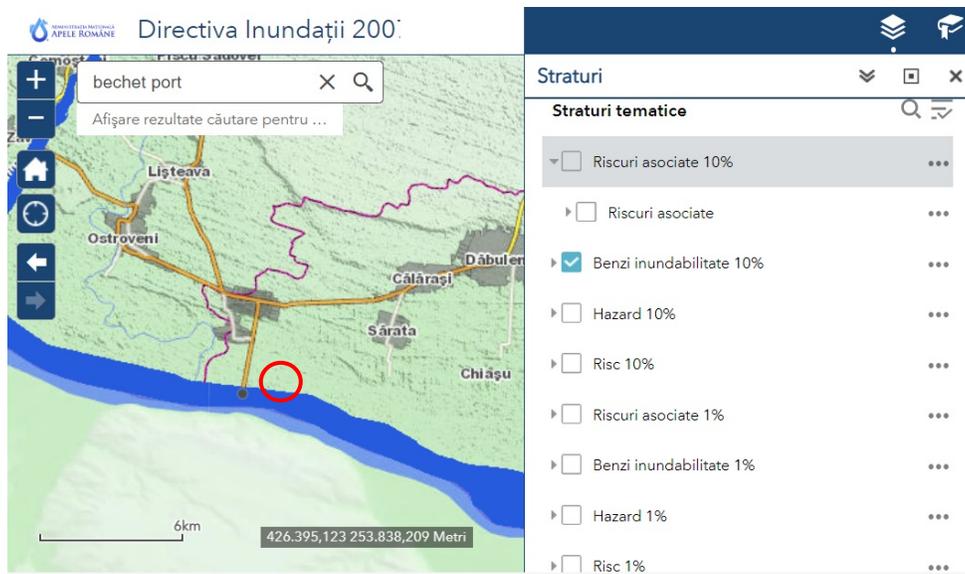


Figure no. 16 – Port Bechet area at risk of presenting flood zones at 10% risk

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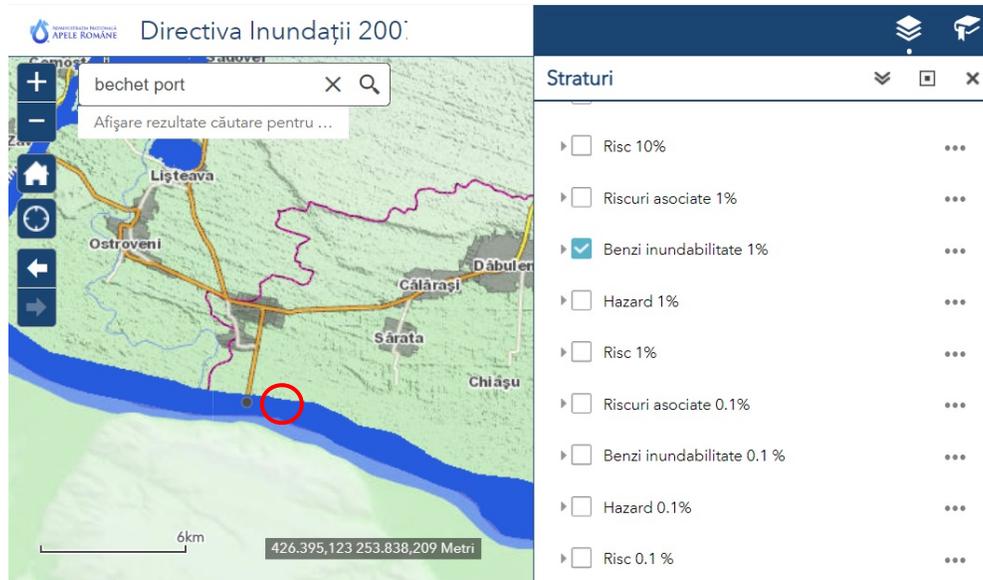


Figure no. 17– Port Bechet area at risk of presenting flood zones at a risk of 1%

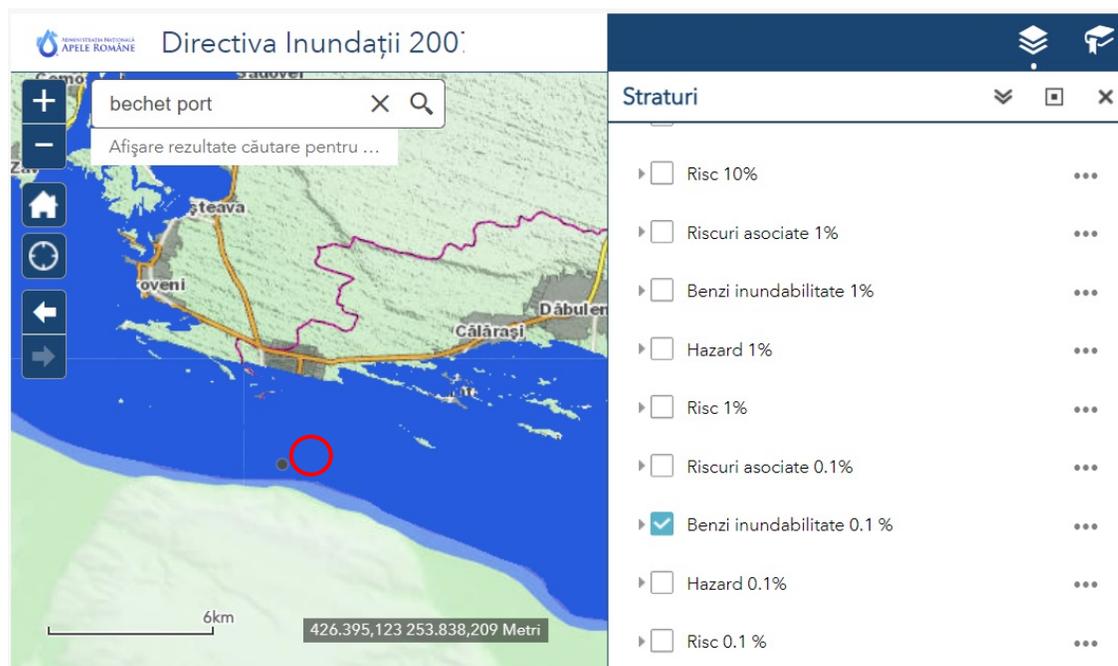


Figure no. 18 – Port Bechet area with risk of presenting flood zones at a risk of 0.1%

The existing dikes in the Bechet area, as has been observed over time, are resistant and have not led to risks of landslides, landslides or other incidents that could cause material damage or loss of human life in the area.

❖ Storms and gusts of wind

Wind is the climatic element that best reflects the influence of the general circulation of the atmosphere.

According to the Report of the National Meteorological Administration (2015): "Climate change - from physical bases to risks and adaptation", wind speed shows major changes in the long-term

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evolution. Decreases in the annual average wind speed were recorded in proportion of 93% in all the stations in Romania. The available data lead to the conclusion that there will be a reduction in the average wind speed in the reference area of the project.

Regarding extreme wind speeds (storms, tornadoes), "*Tornadoes in Romania*" (B. Antonescu, A. Bell - 2014) shows that in the project area they are possible, but they do not represent a characteristic of the location.

In the Bechet port area, from the available data, there are no known cases of extreme storms, gusts of wind that could endanger the activity in the port area or that could affect utility networks (electricity, water, etc.) in the Bechet port area.

❖ Landslides

In the Bechet port area, there is no danger of landslides. The existing constructions are stable, they were based on geotechnical studies, so the risk is very low.

❖ Sea level rise, storms, waves, coastal erosion, hydrological regimes and saline intrusion

The project area will not be influenced by sea level rises, sea storms, coastal erosion, etc.

❖ Cold waves

The average air temperature shows exclusively increasing trends throughout the year. According to the data released by the National Meteorological Administration, in October 2023, a temperature of 35 degrees was recorded at the Bechet weather station (the maximum since October 2023), above the maximum recorded at this station in October of 33.8 degrees in 1991. An important feature of October 2023 was the large number of summer days.

Compared to the multi-year average temperature for the period 1961-2022 (figure below) where the average temperature was in the range of 10-12 degrees in the Bechet area, record temperatures were recorded this year.

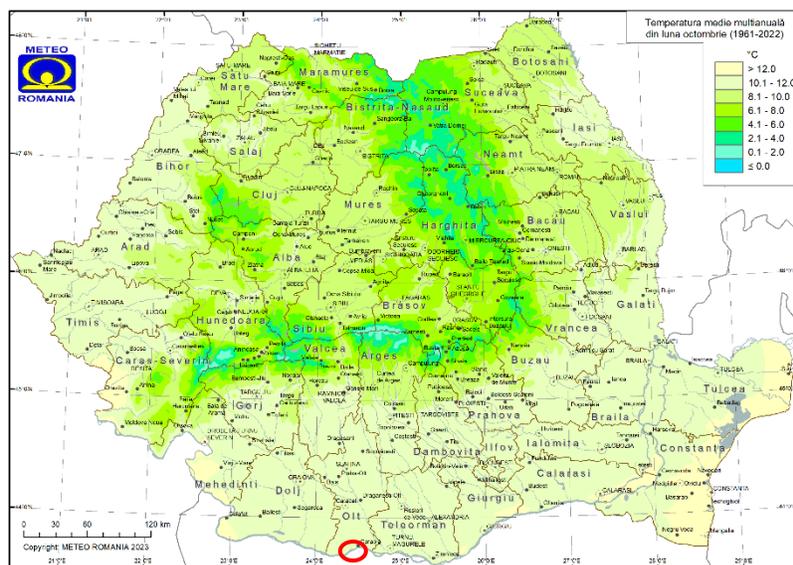


Figure no. 19 – Multiannual average temperature in October (1961 -2022)

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The data available in the *Statistical Yearbook of Romania 2022* for the weather stations closest to the Bechet port area and for which climatic data were recorded, Turnu Magurele (approx. 74 km downstream from Bechet) and Calafat (approx. 87 km upstream from Bechet) , are presented in the tables below.

Tabelul nr. 14 – Temperaturii medii lunare si anuale (statia meteo Turnu Magurele)

Temperatura medie a aerului (lunara si anuala)													
Perioada	Ian	Feb	Mar	Apr	Mai	Iun	Iul	Aug	Sept	Oct	Nov	Dec	Annual
1901 - 2000	-2,3	0,3	5,6	12,2	17,6	21,3	23,3	22,5	18,1	11,8	5,7	0,5	11,4
2021	2,4	3,2	4,8	9,9	17,7	21,5	26,0	25,2	18,2	10,1	7,4	3,0	12,5
Temperature maxima si minima (lunara si anuala)													
Perioada	Ian	Feb	Mar	Apr	Mai	Iun	Iul	Aug	Sept	Oct	Nov	Dec	Annual
Anul	1983	1995	1951	1985	1950	1957	1987	1952	1946	1952	1963	1903	1987
Maxima	18,0	24,1	29,6	34,2	38,8	38,2	43,2	41,4	40,0	36,4	26,7	22,0	43,2
2021 -max	15,6	20,6	19,6	25,5	30,4	37,2	39,3	40,4	40,0	36,4	26,7	22,0	43,2
Anul	1942	1950	1929	1923	1938	1911	1974	1981	1977	1988	1993	1933	1942
Minima	-30,0	-26,0	-22,2	-4,6	0,5	5,0	9,0	6,6	-2,5	-5,8	-18,2	-25,0	-30,0
2021 -min	-10,7	-9,4	-5,9	-2,5	4,1	8,9	13,9	10,4	-2,5	-5,8	-18,2	-25,0	-30,0

Tabelul nr. 15– Temperaturii medii lunare si anuale (statia meteo Calafat)

Temperatura medie a aerului (lunara si anuala)													
Perioada	Ian	Feb	Mar	Apr	Mai	Iun	Iul	Aug	Sept	Oct	Nov	Dec	Annual
1901 - 2000	-1,4	0,6	5,7	11,9	17,4	21,0	23,3	22,8	18,2	11,9	5,7	1,0	11,5
2021	2,1	3,6	6,1	10,0	17,6	22,9	26,7	25,5	18,8	10,0	7,3	3,9	12,9
Temperature maxima si minima (lunara si anuala)													
Perioada	Ian	Feb	Mar	Apr	Mai	Iun	Iul	Aug	Sept	Oct	Nov	Dec	Annual
Anul	1993	1990	1952/1994	1985	1969	1908	2000	1945	1946	1991	1970	1989	2000
Maxima	20,5	22,4	27,6	34,5	36,6	39,5	43,2	41,3	39,8	31,6	25,9	21,2	43,2
2021 - max	13,7	21,0	21,0	25,8	31,8	39,3	40,0	41,1	34,1	24,2	17,3	17,1	41,1
Anul	1947	1950	1963	1912	1952	1962	1913	1904	1977	1988	1988	1948	1947
Minima	-29,2	-24,6	-15,7	-3,0	1,6	6,2	9,0	7,3	-1,3	-6,2	-16,2	-21,8	-29,2
2021 - min	-7,0	-7,5	-5,8	-0,4	4,3	9,1	15,1	9,4	5,0	-0,3	-1,9	-6,9	-7,5

It is observed that the data recorded at the Turnu Magurele weather station do not vary significantly compared to those recorded at the Calafat station, which means that the trends are considered valid for the project location as well.

Analyzing the extreme temperatures recorded in 2021 compared to the data from the last 30 years (1990 – 2020), the same trends can be found from the analysis of the data published in the Statistical Yearbook of Romania. Therefore, we cannot talk about maximum temperatures above the historical maximums, but we can see an increase in the minimums and, implicitly, **about a general trend of warming and reducing the risk of frost.**

For the project that is the subject of this memo, the materials provided are of high quality that can withstand low or high temperature, so there will be no risk in periods when there could be cold waves, despite the trend that results from the one presented previously.

Also, as already stated, the project is based on a geotechnical study carried out on the site so that when designing the works, the location of utility supply networks (especially those that provide water supply) took into account the maximum frost depth, so the laying of the pipes is below this depth to reduce the risk of interruption of the water supply due to frost.

The port activity will be temporarily interrupted in situations where the phenomenon of ice on the shore occurs, a phenomenon that can prevent ships from docking at the shore, or, where there are such situations, the movement of ships on the Danube.

❖ Freeze-thaw damage

There is no such risk, considering that the tiles proposed to be used for the rehabilitation work are good quality materials, resistant to temperature differences.

❖ The vulnerability of people and assets to climate change

Based on all the data, information and conclusions presented in this memorandum regarding the type of works proposed to be carried out, the impact they may have on the environmental factors, the climatic factors in the Bechet port area, the impact the project may have on the climatic conditions as well as the impact of climatic factors on the project, we can mention the fact that:

- in the event that floods occur in the Bechet port area as a result of heavy rains, etc., there is a risk of flooding in the area. According to the maps made available by ANAR, the flood zones extend to the area behind the port platform, so both the population that carries out its activity in the port area, as well as the companies for which goods are brought to the port area, transport ships can be affected, etc. this risk is low considering long-term climate trends
- another potential source of impact could be the drought, which leads to the lowering of the Danube's level leading to the impossibility of mooring ships in the port area, perhaps even to the impossibility of naval traffic until the water level returns to levels that facilitate naval traffic. This impact can be translated into a socio-economic impact both on the port's economy and on the population that carries out its activity in the port area, of the companies that depend on the traffic of goods from the port.

It should be mentioned that although these risks exist, the probability of bias is low and most importantly, they do not depend on the works proposed to be carried out in the port area (they are not influenced by the works proposed to be carried out, by the activity carried out, by the materials used, etc).

6.10 Impact in exceptional operating periods

The exceptional operating periods involve situations in which, due to the lack of long periods of time, the level of low precipitation will lead to a low water level on the Danube which will prevent

the operation of naval transport under normal conditions, or situations in which the very high water level can lead to accidents, so ships are recommended to remain moored at the wharf.

In the event that the low water level does not allow the ships to operate in optimal conditions, they will stay in the quay area. The estimated impact is of an economic-financial nature (shipping activity will not be able to be carried out, there will be no goods transactions, etc.). Regarding the impact generated on the environmental factors, it will be insignificant, as there are no activities, noxes will be generated from the operation of the ships, the ships will not be loaded / unloaded).

The same aspect can be mentioned for the periods when the water levels of the Danube are increased - the operation of the ships will not be able to take place and they will remain anchored at the shore / wharf. In these situations, the impact will also be financial (due to the lack of activity), but in this situation, pollution can also be registered if the increased water level could flood the ships (a situation with a low probability of occurrence) which could lead to affecting the water quality in the port area. For these situations, the accidental pollution plan implemented by the beneficiary (and approved by the SGA representatives) will be applied, which will provide for the collection of possible spills of oil products by using the absorbent dams provided, the collection of floating bodies, etc.

7 Description of the forecasting methods used to identify and evaluate the effects on the environment, including details on the difficulties

The environmental impact report was prepared in compliance with the provisions of Law no. 292 /2018 regarding the assessment of the impact of certain public and private projects on the environment and order no. 269/ 2020 on the approval of the general guide applicable to the stages of the environmental impact assessment procedure and other specific guides for different fields and categories of projects.

The appropriate assessment study was developed in compliance with the provisions of the Methodological Guide regarding the appropriate assessment of the potential effects of plans or projects on natural areas protected by community interest, approved by Order no. 1682 /2023 with subsequent amendments and additions.

Also, the provisions of the following guidelines were respected:

- Assessment of plans and projects significantly affecting Natura 2000 sites Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC.

The information necessary to carry out the studies was taken from

- annual report on the state of environmental factors at the level of Dolj county for the year 2022
- the updated management plan of the Jiu watershed
- land development plan
- statistical data from the Directorate of Statistics Dolj
- analysis reports provided by the National Meteorological Administration
- specific conservation objectives established by the National Agency for Protected Natural Areas for ROSCI0045 Jiulsui Corridor and respectively ROSPA0023 Jiu - Danube Confluence

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- reports on the state of conservation of species and habitats according to article 17 of the Habitats Directive and article 12 of the Birds Directive
- movements in the field in the project location and in its vicinity.

Assessment methodology

The choice of assessment methodology was made taking into account the scale and specifics of the project, which involves the realization of a naval infrastructure objective. The methodologies applied in other similar projects were also taken into account. When selecting the methodology for assessing the impact on biodiversity, the specific conservation objectives established by the National Agency for Natural Protected Areas (ANANP) were taken into account for each species and habitat of community interest present in the two natural areas of community interest in the area of incidence of the project (ROSCI0045 Corridor Jiulsui and respectively ROSPA0023 Confluence Jiu - Danube). Also, the changes generated by the project that can generate forms of impact (significant / insignificant, positive / negative) were evaluated.

The impact of project implementation on each parameter established by ANANP for each species and habitat of community interest was assessed, taking into account the target value.

Also, the existing pressures at the level of each protected natural area were analyzed. The impact on the parameters and target values established by ANANP, as well as on the integrity of the protected natural areas intersected by the project and that may be affected by the project, was assessed.

Analysis of alternatives

The assessment of project alternatives was carried out by means of a multicriteria analysis. The applied environmental criteria were: the impact on environmental factors during construction and operation (impact on air, soil, water, the level of generated noise), the impact on flora and fauna during construction and operation (the number of flora species potentially affected, the number of potentially affected fauna species, the number of affected breeding and shelter sites), negative impact on protected areas, Natura 2000 and other sensitive environmental areas (wetlands, forests, etc.): the number of protected natural areas crossed, the number of protected habitats traversed, the surface occupied within the protected natural area and the surface occupied by protected natural habitats or protected species.

The assessment of the project alternatives was carried out by identifying the forms of impact and presenting the advantages and disadvantages for each analyzed alternative.

An advantage is the lack of an impact or a lesser impact, and a disadvantage is an additional form of impact or a more extensive impact.

Identifying and quantifying effects

The methodology proposed in the study proposes a differentiation between the concept of "effect" and that of "impact". The effects refer to the changes caused to the physical environment as a direct consequence of the causes (changes) generated by the project (both in the construction and in the operation stage). The effects represent the changes brought to the physical environment by the construction works, as well as by the operation of the project. These may include changing the configuration of the land, generation of waste, emissions of pollutants.

Impacts represent the changes made to environmental factors, as well as the structure and functions of Natura 2000 species and habitats. Both direct forms of impact (e.g. loss of habitats, mortality of some species of fauna) and indirect (e.g. alteration of aquatic habitats) were evaluated

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as a result of the discharge of untreated or improperly treated water, contaminated with petroleum products), both for the construction and operation periods.

The identification of the effects involved the following steps:

- analysis of all works proposed within the project;
- identification of all activities resulting from the development of the port platform;
- identifying all the changes (effects) that occur in the physical and socio-economic environment as a result of the implementation of the project.

The effects were quantified based on:

- the information provided by the designer (affected surfaces, spatial location of works, quantities of raw materials and construction materials, volumes of works, etc.)
- information obtained from field visits;
- information obtained from specific conservation objectives;
- calculations based on agreed methodologies (eg: calculations of atmospheric emissions made according to EMEP/EEA);
- estimates based on the experience of similar projects or provided in profile guides.

Identification of forms of impact

The identification of the forms of impact was made based on the list of effects, by identifying the changes that may occur at the level of sensitive receptors as a result of any effect generated by the project. For example, air pollutant emissions can generate impact both on air quality and on the health of the population, on biodiversity (flora and fauna) or on the climate. In the impact identification stage, all the causal links between the identified effects and the potential impacts are listed without analyzing the probability of occurrence of the impacts or their magnitude.

Impact prediction

It represents a qualitative and quantitative assessment of the forms of impact. The parameters considered for the impact assessment are:

- project stage (construction, operation, closure and decommissioning);
- type of impact (positive, negative);
- the nature of the impact (direct, secondary, indirect);
- cumulative potential (yes/no);
- spatial expansion (local, zonal, county, regional, national, cross-border);
- duration (short term, medium term, long term);
- frequency (accidental, intermittent/sporadic, periodic, permanent, one-time/temporary);
- probability (uncertain, improbable, likely, very likely);
- reversibility (reversible, irreversible).

The table below shows the parameters taken into account when evaluating the impact.

Assessment parameter	The variables of the assessment parameters	Description of the characteristics of the assessment parameters variables
Impact type	Positive	The changes contribute to improving the condition / reaching the objectives of the analyzed component

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Assessment parameter	The variables of the assessment parameters	Description of the characteristics of the assessment parameters variables
	Negatives	The changes contribute to the worsening of the condition / failure to achieve the objectives of the analyzed component
The nature of the impact	Direct	The main form of impact produced by the occurrence of an effect
	Secondary	The form of impact generated by a direct impact
	Indirect	The form of impact that appears not due to an effect generated by the project but to some activities that are encouraged to produce a consequence of the project
Cumulative potential	Yes	The impact has the potential to generate, together with other effects/impacts from the same project or from different projects, greater changes at the level of the analyzed environmental component
	Not	There is no risk that this impact will produce, along with other impacts, greater changes at the level of the environmental component
Spatial extension	Local	The impact is manifested at the level of a single territorial administrative unit
	AREA	The impact is manifested at the level of several territorial administrative units in the same county
	County	The impact is manifested at the level of the entire county
	Regional	The impact is manifested at the level of the region (several counties)
	National	The impact produces changes felt at the level of the entire country
	Border	The impact is manifested on the territory of some neighboring countries
term	Short term	The impact is manifested only during the construction of the project or only for a maximum of 1 year
	Medium term	The impact manifests itself during construction and for a short post-construction period or a maximum of 2-3 years
	Long term	The impact manifests itself over several years
Frequency	Accidentally	The impact is manifested only as a result of an accident (accidental pollution)
	Intermittent	The impact occurs repeatedly/discontinuously, with an unknown frequency
	Periodic	The impact manifests itself repeatedly, with a known frequency
	Permanent	The impact manifests continuously after the moment of appearance

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Assessment parameter	The variables of the assessment parameters	Description of the characteristics of the assessment parameters variables
	Temporary / one time	The impact is manifested only once in one of the stages of the project. Most often associated with a short duration
Probability	Uncertain	The probability of producing the impact is unknown, most certainly it will not occur
	Unlikely	The probability of producing the impact is low - it is possible to occur
	Probable	The probability of producing the impact is high - it is very possible to occur
	Very likely	Impact production is safe
Reversibility	Reversible	After the impact disappears, the affected component can return to its initial conditions
	Irreversible	The impact does not allow the return to the initial conditions of the affected environmental component

Whenever possible, the prediction of impacts is carried out quantitatively and can be expressed in surface units (hectares) or time (number of years), but also with the highlighting of changes occurring at the level of the studied component / sensitive receptor (decrease/increase in population, number of affected inhabitants, etc.).

In the assessment process, as far as possible, redundancies were eliminated, that is, when two effects lead to the same form of impact on the same surface and in the same time interval, the effect was maintained, which may also include the other redundant effects (e.g. removal of vegetation, soil compaction and structural changes to the soil leading to the alteration of habitats on the same surface).

Assessment of impact significance

The assessment of the significance of the impact was carried out based on the following two criteria:

- the sensitivity of the area and the components in the study area;
- the magnitude of the changes proposed through the implementation of the project.

The sensitivity and magnitude were established for each environmental factor potentially affected by the project, mentioned in the EIA Directive: water (surface and under soil), air, soil, geology, biodiversity, climate, population, human health, material assets, heritage cultural, landscape.

The sensitivity and magnitude classes are presented in the sections dedicated to each environmental factor (sensitive receptor).

The sensitivity classes and the magnitude classes do not allow the ad litteram framing of all the situations encountered in the project assessment, but they certainly provide a framework for guiding how to use the "expert opinion" for all the identified forms of impact.

The impact classes used in the report are:

- significant impact (negative / positive);
- moderate impact (negative / positive);
- low impact (negative / positive);

- without impact (where it is estimated that no changes will occur at the level of the environmental factor or their level is undetectable).

The assessment of the level of significance is carried out using the matrix presented in the table below, as follows.

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The meaning of the impact		The magnitude of the change										
		Very big negative	Big negative	Moderate negative	Small negatives	Very few negatives	No change	Very small positive	Small positive	Moderately positive	Big positive	Very positive
The sensitivity of the area	Very big	Significantly negative	Significantly negative	Significantly negative	Moderately negative	Moderately negative	No impact	Moderately positive	Moderately positive	Significantly positive	Significantly positive	Significantly positive
	Big	Significantly negative	Significantly negative	Moderately negative	Moderately negative	Reduced negative	No impact	Reduced positive	Moderately positive	Moderately positive	Significantly positive	Significantly positive
	Moderate	Significantly negative	Moderately negative	Moderately negative	Reduced negative	Reduced negative	No impact	Reduced positive	Reduced positive	Moderately positive	Moderately positive	Significantly positive
	Classified	Moderately negative	Moderately negative	Reduced negative	Reduced negative	Reduced negative	No impact	Reduced positive	Reduced positive	Reduced positive	Moderately positive	Moderately positive
	Very small	Moderately negative	Reduced negative	Reduced negative	Reduced negative	Reduced negative	No impact	Reduced positive	Reduced positive	Reduced positive	Reduced positive	Moderately positive

The legend

Color code	The meaning of the impact	Necessary measures
	Reduced negative	Avoidance/reduction measures are not required, but measures can be provided to ensure that the negative impact is kept to a minimum
	Moderately negative	Mitigation measures are required
	Significantly negative	In the situation where effective reduction measures cannot be provided (so that the residual impact is insignificant), measures must be adopted to avoid the occurrence of the impact (modification of the proposed location, modification of the proposed technical/technological solution, etc.) or compensation measures
	No impact	It's not necessary
	Reduced positive	This is not the case, but measures can be applied that can lead to the expansion/multiplication of the effects
	Moderately positive	
	Significantly positive	

Cumulative impact assessment

The assessment of the cumulative impact was achieved by going through the following stages:

- identification of important existing and/or proposed projects in the project implementation area;
- analyzing the probability that these projects have similar implementation terms to the analyzed project;
- analyzing the probability that these projects generate forms of cumulative impact (contribute with additional effects and/or synergistic effects with the analyzed project);
- quantifying the forms of cumulative impact: habitat loss, habitat alteration, habitat fragmentation, disruption of species activity or reduction of population numbers
- evaluating the significance of the cumulative impact.

The cumulative impact assessment process involves the analysis of the other projects (implementation period, spatio-temporal dynamics, quantification of impacts, etc.).

Given that there are uncertainties regarding these characteristics, quantitative estimation of the cumulative impact is difficult. Consequently, the assessment of the cumulative impact was carried out on the basis of the impact significance assessment matrix.

Measures to prevent / reduce / eliminate the impact

For all forms of impact where the possibility of a moderate or significant impact was identified, measures to prevent / reduce / eliminate the impact were proposed.

Avoidance measures were considered those that can eliminate or drastically reduce the probability of a significant impact, and mitigation measures were considered those that, by reducing the magnitude of the changes, can ensure a reduction in the significance of the impact (from significant to moderate or from moderate to low).

The proposed measures for each analyzed environmental factor can be found in chapter 8

Residual impact

The residual impact is a prediction of the significance of the impact under the conditions of implementation of the avoidance and reduction measures. Conventionally, in the study, a high level of efficiency of each proposed measure was considered (efficiency to be tracked through the monitoring program).

The assessment of the residual impact was carried out on the basis of the impact significance assessment matrix using the sensitivity and magnitude classes for each analyzed environmental factor.

Monitoring

The proposed monitoring program took into account two main requirements:

- the need to evaluate the effectiveness of measures to avoid and reduce the impact;
- the need to ensure that the predicted level of impacts will not be exceeded through the construction and operation of the project.

The systematic monitoring during the execution of the works and the ex-post assessment of the effects and/or impacts resulting from the construction and operation of the project offer the opportunity to identify if the forecasted impact develops/does not develop as it was foreseen, so that take remedial measures, as the case may be.

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Also, monitoring allows the consideration of additional or unforeseen relevant information (eg climate changes or cumulative impact), which also allows the implementation of remedial measures.

Analysis of the project's vulnerability to climate change

The analysis of the project's vulnerability to climate change was carried out, based on the requirements of the guide developed by the General Directorate for Climate Policies (DG Climate) within the European Commission - "Guidelines for Project Managers: Making vulnerable investments climate resilient", of the guide "Climate change and major projects" developed by the European Commission.

According to the guide, the following steps were taken to assess the project's vulnerability to climate change

- ❖ the identification of the project's sensitivity to climate variables – involved the identification of the project's sensitivity in relation to a series of climate variables and climate-related side effects/risks. The sensitivity of the project in relation to climate variables was evaluated from the point of view of the project components, namely: goods and processes, inputs (water, energy, others), outputs (products, markets, buyers' demand) and transport links;
- ❖ project exposure assessment – the analysis of the project's exposure to current and future climate conditions was carried out;
- ❖ vulnerability analysis – consisted in the identification of climatic variables/hazards that may have an impact on the project, based on the sensitivity and exposure of the project, both for current and future conditions. This was achieved with the help of a matrix, using the formula **Vulnerability = Sensitivity * Exposure** ;
- ❖ risk assessment - was carried out based on the analysis of vulnerabilities by identifying the risks and opportunities associated with high and medium vulnerabilities. This consisted in evaluating the probability and magnitude of the consequences of the effects associated with the hazards identified in stage 2, as well as evaluating the importance of the risk for the success of the project
- ❖ identification of adaptation options - consisted in the identification of those measures that respond to the vulnerabilities and risks identified in the previous stages;
- ❖ the assessment of adaptation options - was carried out from the point of view of costs for each of the proposed measures.

The sensitivity analysis involves identifying the sensitivity of the project in relation to a series of climatic variables and secondary effects / hazards regarding the climate. The sensitivity of the project in relation to climate variables must be realized at the level of components, respectively: goods and processes, inputs (water, energy, etc.), outputs (products, markets, consumer requirements) and transport links.

In accordance with the provisions of the guidelines, the following sensitivity classes were used:

- high sensitivity: climate variables / climate-related hazards can have a significant impact on goods and processes, inputs, outputs and transport links;
- medium sensitivity: climate variables / climate-related hazards may have a minimal impact on goods and processes, inputs and outputs or other transport links;
- low sensitivity: climate variables / climate-related hazards may have minimal impact on goods and processes, inputs and outputs or other transport links;

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- no sensitivity: climate variables / climate-related hazards do not impact project components.

The exposure analysis must be carried out from the point of view of current and future climatic conditions. It is also important to identify and understand the intensity and frequency of different exposures to the effects of climate change for projects with different geographic locations.

Vulnerability analysis consists in identifying climate variables or climate-related hazards that may have an impact on the project, taking into account sensitivity and exposure, both for current and future conditions.

The vulnerability analysis was carried out using the matrix in the table below, in which

$$\text{Vulnerability} = \text{Sensitivity} \times \text{Exposure}$$

The vulnerability classification matrix looks like this:

		Exposure			
		Free	Low	Average	high
Sensitivity	Free				
	Low				
	Average				
	high				

Vulnerability				
---------------	--	--	--	--

Risk analysis is done using data on the variables to which the project has medium and high vulnerability. The probability and magnitude of the consequences of the effects associated with the vulnerabilities identified in the 2nd stage are analyzed. The matrix used for risk analysis is detailed in the table below.

			Magnitude of Consequences (M)				
			Insignificant	Minor	Moderate	Major	calamitous
			1	2	3	4	5
The probability of occurrence	rare	1	1	2	3	4	5
	Unlikely	2	2	4	6	8	10
	Moderate	3	3	6	9	12	15
	Probable	4	4	8	12	16	20
	Almost sure	5	5	10	15	20	25

The identification of options for adaptation to climate change consists in the identification of those measures that reduce the vulnerabilities and risks identified in the previous stages.

Description of difficulties

The main difficulties encountered during the realization of the environmental impact report were caused by

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- obtaining information on the state of the environment in the project location. Numerous field visits were necessary so that the data obtained were relevant (especially in the case of biodiversity it was necessary to monitor the site for a long period, so as to capture all the species that use the site for feeding / reproduction / shelter / passage / migration);
- the establishment of environmental protection measures that ensure the protection of all environmental factors, but can be respected by the project beneficiary / the executor of the works / the people who transit the analyzed area
- planning the works so that the execution time is as short as possible, but the local flora and fauna are not affected.

The evaluation of the impact on which the interventions proposed by this project are further analyzed based on the matrices above. Based on this analysis, the sensitivity and magnitude of the impact identified through the analysis carried out in this report will be highlighted. Based on this analysis, it will be possible to identify the measures to prevent / reduce the identified impact.

8 Description of the measures envisaged to avoid, prevent, reduce or, if possible, compensate for any significant negative effects on the environment identified

8.1 Measures to reduce the impact on water

The works proposed and which are the subject of this study contribute to the rehabilitation of the port infrastructure in the Bechet port area so that the surface waters do not require additional protection measures except during the execution of the works in order to reduce dust emissions that could reach the surface of the water. This is achieved through the care of the Contractor who will execute the works in periods of low wind intensity and will use execution methods that reduce dust emissions.

Among the mentioned potential sources of pollution, those that lead to the increase of turbidity in the river waters are inevitable. The other sources can be eliminated or limited by managerial measures. For example, within the organization of the workplace, the builder has the obligation to ensure the location of ecological WCs.

To reduce or eliminate the effects of these sources, it is recommended that:

- the platforms for the storage of materials (aggregates, cement, binders, and other types of materials) to be closed or covered and provided with guard perimeter trenches so that there is no danger of scattering in the atmosphere and deposition of fine particles on the soil and in water. This eliminates the risk of these particles infiltrating the soilwater through rainwater, or draining into the water of the Danube.
- the proper maintenance of machinery and the performance of oil changes from machinery in special stations for such operations because oils and fats are very polluting. Fuels and chemicals must be stored in sealed cells.
- it is recommended to systematize the entire surface of the organization of the work point, so that all the rainwater can be pre-purified mechanically so that the water resulting from the washing of the equipment in the rain and which may contain traces of petroleum products does not reach the surface water (Danube River)
- the teams of workers, at the end of the program, are responsible for cleaning the platform, collecting and storing household waste in bins. In this way, the risk of surface water pollution is reduced and even eliminated

- the provision of absorbent dams or other equipment designed to retain petroleum products from possible leaks (representing fuel losses from their operation)
- for the works to be carried out on land, organizational measures are the only ones able to minimize the impact of these works on surface waters.

Through the measures proposed above, as well as those proposed below, it is considered that the impact of the construction period on the works will be minimal, without implications in the future.

8.2 Measures to reduce the impact on the air

To reduce the impact of air pollution, the following measures are recommended:

- the use of high-performance, adequate vehicles/means of transport that comply with EURO standards;
- periodic verification of the technical condition of equipment and means of transport;
- periodic sprinkling of access ways, in order to reduce dust pollution (where applicable);
- the use of tipper trucks covered with a tarpaulin for the transport of powdery materials, susceptible to wind entrainment/scattering;
- the use of tarpaulins is also indicated for the temporary protection of some deposits from the action of the wind;
- dust pollution monitoring.

8.3 Measures to reduce the impact on the soil

During the construction of the objective:

- the spaces proposed in the project to be temporarily affected by the works will be limited to the minimum necessary, will be marked in the field and their strict compliance will be monitored;
- modern construction equipment and technologies will be used, so that the emissions of polluting substances are limited;
- construction materials and waste will be stored in specially arranged spaces recommended within the site organization;
- the concrete and asphalt needed to carry out the construction works will not be prepared on the project site, but will be procured from authorized centers in order to reduce the emissions of atmospheric pollutants and the noise level;
- all containers for chemicals and lubricants (eg, solvents, hydraulic fluid, forming oil, etc.) used on site shall be stored in tubs/trays of steel or other approved material of appropriate volume;
- in case of accidental spills of fuel or chemical substances on the construction site, the works around the spill will be interrupted, the source will be stopped and the services of a company specialized in depollution will be called upon;
- construction materials and waste will be transported in vans equipped with means of protection against their scattering on traffic routes, in compliance with the legal norms in force;
- checking and repairing machines will be done only in specialized centers;

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- it is strictly forbidden to carry out repairs on construction equipment on the construction site, in order to avoid fuel and lubricant leaks on the soil;
- vehicle wheel cleaning areas will be installed at the entry/exit points of the construction site to reduce the number of transported sediments and avoid affecting the spaces in the vicinity of the project site;
- in order to prevent the risk of accidental pollution or combat the effects of accidental pollution, the measures proposed in the plan to prevent and combat accidental pollution will be followed, so that the affected surface is limited and the pollution is remedied.

During the operating period:

Considering the fact that the specific works of the port platform will take place only in the port area, there will be no sources of soil pollution in the concrete area.

8.4 Measures to reduce the impact on biodiversity

It is estimated that the investment will have an insignificant impact on the species present in the project area due to the specifics of the works, which will be carried out on some degraded, heavily anthropized land belonging to the port platform administrator (CN APDF SA Giurgiu). After the completion of the works, no negative impact on biodiversity is estimated, the area related to the port platform will be rehabilitated and will lead to the improvement of environmental conditions in the area, both for the human factor and for the species looking for food and passage.

In order to prevent the impact associated with the construction period and certain hazards, on biodiversity of community importance, in general, the following measures are recommended:

- M1. Prohibition of the capture, expulsion and destruction of faunal species by the personnel performing the works;
- M2. Periodic inspection (and especially before the start of the execution of the works) in order to detect faunal specimens of community interest that may be in or occasionally transit the area;
- M3. Carrying out activities within the perimeter on the surfaces specified in the project (strictly necessary) without occupying additional land spaces;
- M4. Prohibiting the location of production bases, site organizations, borrow pits on the territory of protected areas or near them;
- M5. Collection of materials resulting from cleaning works and waste management according to legal requirements;
- M6. Avoiding the occurrence of accidental fuel leaks from machinery;
- M7. It is forbidden to locate the organization in the perimeter of protected natural areas;
- M8. Collaborating/supporting the administration of the site where the works will take place, in order to maintain the favorable state of conservation of the area and species of community importance;
- M9. Compliance with established access routes;
- M10. The execution of repair works of the machines used, oil changes, or other operations necessary for the proper functioning of the machines and means of transport used during the execution of the works, in places specially arranged for this purpose;
- M11. Drawing up a plan for the prevention of accidental pollution and appointing a person responsible for the protection of environmental factors;

- M12. The species of amphibians, reptiles, avifaunistics, mammals in the project implementation area will be monitored.

A summary of the conclusions is presented by completing the following table:

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Table no. 16- Conclusions of the appropriate assessment

PP component description	ANPIC affected	Affected species/habitats	Conservation objectives/ parameters affected	Types of impact, including cumulative	Mitigation measures	Residual impact	The chosen alternative solution	Imperative reasons of major public interest	Compensatory measures	Other aspects
Work execution stage	ROSCI0045 Jiu Corridor / ROSPA0023 Jiu - Danube Confluence	Species of mammals, fish, birds	Area of terrestrial habitats with natural vegetation around breeding habitats The area of the species' habitat	Insignificant negative (change of destination of other land surfaces)	M2, M3, M4, M7, M8, M9, M10	Insignificant negative	It's not necessary	It's not necessary	It's not necessary	It's not necessary
			Distribution of species (in the sense of their moving to quieter areas)	Insignificant negative (increased noise level during the execution of the works)	M2, M3, M4, M5, M6, M7, M8, M9, M10, M11, M12	Insignificant negative	It's not necessary	It's not necessary	It's not necessary	It's not necessary

8.5 Proposed measures to reduce the impact on the health of the population

The objectives regarding the reduction of the population's exposure to noise and polluting substances are met by the measures considered for the environmental factors noise, water and air. Another way to reduce the impact on the population and public health is to locate the project in an area at a distance greater than 0.500 km from the residential area. Thus, for the studied area, the nearest residential area is approximately 2,500 km from the project site, a sufficient distance for the population not to feel the effects of the noise and vibrations produced during the construction stage. In the period after construction, there will be no sources of pollution of any environmental factor, as the works are proposed to be carried out on the port platform.

In order to prevent and ameliorate the pollution of human settlements in the bordering area of the project, of the access roads to/from the analyzed perimeter, during the transport of the materials, for the entire duration of the execution of the designed construction works, it is necessary to cover the tippers with tarpaulins during the transport of the materials that generate dust and/or their wetting; sprinkling of materials in the deposition area and the roadway (access parking lots in the work perimeters and in the outside areas); restricting the speed of dump trucks to 25-30 km/h.

8.6 Measures to reduce the impact on cultural, ethnic conditions and cultural heritage

It is not necessary to adopt measures to reduce the impact on cultural and ethnic conditions and cultural heritage, because they will not be affected.

The works will be carried out outside the residential area, in an area where there are no heritage objectives that need to be protected.

8.7 Measures to reduce the impact of climate change

Extreme weather events are increasingly linked to climate change.

Thus, it is necessary to identify the impact of climate change on natural and anthropogenic systems, the vulnerability of these systems as well as the adaptation to the effects of climate change.

Vulnerability involves the analysis of the negative impact of climate change, including climate variability and extreme weather events on natural and anthropogenic systems and depends on the type, amplitude and rate of climate variability to which they are exposed, as well as their ability to adapt.

Vulnerability – the negative impact of climate change, including climate variability and extreme weather events, on natural and anthropogenic systems. Vulnerability depends on the type, amplitude and rate of climate variability to which a system is exposed, as well as its ability to adapt

Adaptation to the effects of climate change is the ability of natural and anthropogenic systems to react to the effects of current or expected climate change, including climate variability and extreme weather events. The purpose of adaptation is to reduce potential damages, to benefit from opportunities and to react adequately to the consequences of climate change, considering that society and ecosystems feel the individual and cumulative effect of all these components.

Adaptation to the effects of climate change is a complex process, due to the fact that the severity of the effects varies from one region to another, depending on exposure, physical vulnerability, degree of socio-economic development, natural and human adaptation capacity, health services and mechanisms disaster monitoring.

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The challenge for adaptation consists in increasing the resilience of economic and ecological systems and reducing their vulnerability to the effects of climate change. At the same time, the measures adopted in the field of adaptation to the effects of climate change will ensure a maximum benefit of the positive effects generated by the global warming process.

Thus, in order to be able to present the impact that climate change can have on the project that is the subject of this memorandum, the potential extreme events caused by weather or climate change on the project will be analyzed.

The effects of future climate change represent a significant challenge for infrastructure managers, transport operators and other factors involved, who may face a series of factors such as: floods, rising/falling water levels with impact and/or high wind speeds with impact on the conditions of naval transport, floods or erosion of the soil with an impact on land transport or on all the operations carried out on the shore, heat waves with the impact they can have on the health of the population, drought (including the availability and low quality of water and the demand for all greater than water), extreme amounts of precipitation, floods, storms, strong winds, freeze-thaw phenomena, etc.

Next, the main factors that can contribute to climate change will be analyzed (according to *the Commission's Communication - Technical guidelines regarding the immunization of infrastructure to climate change in the period 2021-2027, no. 2021/C 373 /01, Annex D.6.*

❖ The heat waves

Through the proposed project, no new constructions are provided to prevent the circulation of air in the port and to form heat waves. The height level of the constructions will remain the same, so the air circulation even after the rehabilitation of the port will be similar to that of the current moment. Thus, even the population that will carry out its activity in the port area will not feel a negative impact on health.

We also mention the fact that through the implementation of the project there will be no additional sources of emissions of volatile organic compounds or other compounds that contribute to the formation of soil-level ozone. Also, due to the works to be carried out, during the operating period of the port there will not be an additional source that generates heat or absorbs heat, the works building in the rehabilitation of the port platform, dredging, etc.

By restoring the power supply network in the Bechet port area (as described in previous chapters), the lighting in the platform area will be optimized. The works will be performed with high-performance materials / equipment, with low energy consumption, so that, during the operation period, the increase in energy consumption will not be very high. Alternative systems from renewable sources have not been analyzed regarding the provision of electricity in the port area until this moment.

Through the works proposed to be carried out and the activity carried out in the port area, it will not be necessary to use cooling water (no equipment is used that requires water cooling that would lead to an increase in the temperature level in the area of the port platform with negative effects on short, medium and long term).

The activity carried out will be transit of goods, loading/unloading of goods from/in the ships docked in the port – an activity specific to the ports of goods.

For the execution of the port rehabilitation works, the materials used will be specific to these types of works (mineral aggregates) resistant to higher temperatures that do not present the risk of cracks or aging with the passage of time.

According to data from the specialized literature (*Report of the National Hydrology Administration on "Climate changes - from physical bases to risks and adaptation"*), persistent heat waves have become extremely frequent in the last decade, compared to previous periods. In accordance with the data presented in the above-mentioned report. Thus, in the 2021-2050 horizon, there will be an increase in the number of heating days, compared to the 1971-2000 period. The increase in the number of days with an impact generated by heat waves will be more pronounced in the extra-Carpathian regions, in the southern, southeastern and western areas of Romania, including in the project area.

The trend regarding the number of days with a minimum temperature above the limit of 20 °C (tropical nights) indicates an increase in Romania. In the area of interference of the project, they were expected to intervene in the period 2021 - 2050 with up to 18 more tropical nights per year, compared to the reference interval - in this case 1971-2000. This type of change causes consequences that cannot be neglected in the case of the health of the population but also of the infrastructure required by this thermal stress.

Therefore, analyzing all available data, it turns out that the project area will be subjected to gradual increases in temperatures, the increase in average temperature being the result of the increase in minimum temperatures and the increase in the number of days with high temperatures. Therefore, in the project area, there is no question of a decrease in the minimum temperatures, nor of a spectacular increase in the maximum temperatures.

❖ Drought

In Romania, the analysis of trends in the variability of seasonal precipitation shows significant increases in the fall, a fact that is directly reflected in the increasing trends of flows in the respective season.

From the pluviometric point of view, during the period 1901-2000, a general trend of decrease in the annual amounts of precipitation was highlighted, after 1960, an intensification of the precipitation deficit in the south of the country was also highlighted.

The project area is characterized by low amounts of precipitation and often in torrential regime in summer, as well as frequent periods of drought.

According to the data provided by the National Metrology Administration, the project area is characterized, rather, by a tendency to decrease the average amounts of precipitation, but also by the alternation of periods of extreme precipitation with periods of drought.

According to the Report of the National Hydrology Administration on " *Climate changes - from physical bases to risks and adaptation* ", the annual amount of precipitation in the project area will continue to decrease in the next 50 years.

However, this trend manifests itself in parallel with the trend of increasing the number of events with extreme precipitation and the amount of precipitation recorded on their occasion.

According to the report prepared by IGSU - Country Report - 2016 -

Conditionality 5.1, the location of the project is in an area with a high risk of drought, as can be seen from the above regarding the evolution of the annual amounts of precipitation.

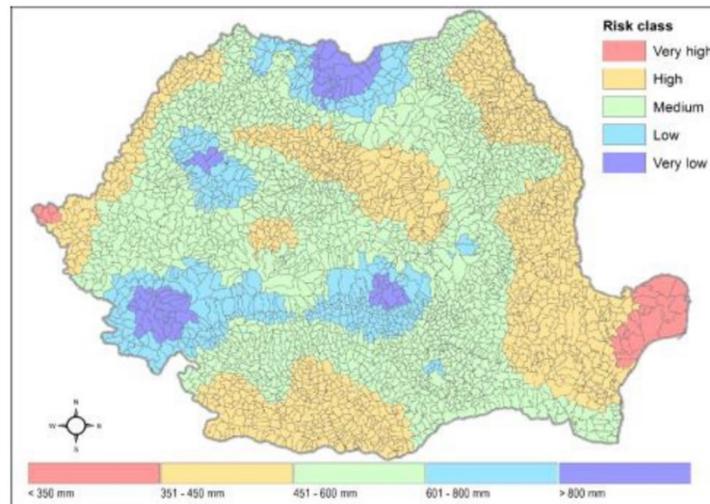


Figure no. 20– Drought risk map

Through the proposed project, which aims to rehabilitate Bechet port, water consumption in the port area will not increase. The water supply, as mentioned in the project, will be carried out from the public network of the city of Bechet, so that the undersoil water bodies, from this point of view, will not be affected. Likewise, the activity carried out in the port area, the rehabilitation works proposed to be carried out will not influence the undersoil water bodies, as is also presented in chapter 14.1.1.

As stated previously, the Bechet port area is at high risk of drought, as can be seen from the above regarding the evolution of the annual amounts of precipitation, so that in extended periods with a lack of precipitation, extreme temperatures, drought, the drop in the level of the Danube will negatively influence the activity in the port area, the ships will not have the optimal depth for docking in the port or even in very rare cases, the low flow of the Danube River can prevent the movement of ships, this being interrupted for short periods of time (until the increase / the return of the level of the Danube).

❖ Vegetation fires, forest fires

The area of the Bechet port (port platform) is a concrete area, without vegetation, forests, shrubs that would present the risk of a fire, so this risk is very low and will not generate a potential impact on climate changes in the project area.

❖ Regimes of floods and extreme precipitation

In general, floods occur as a result of phenomena such as hurricanes, weather systems transiting a region and/or melting snow. Very dangerous are flash floods, produced by intense precipitation, falling in a short time on a small area. These are also the most difficult to predict.

The reference area of the project is the correspondence of the Danube River, in the area of the project the responsibility rests with the Olt Water Basin Administration.

According to the Flood Management Plan, no significant historical floods were recorded in the city of Bechet. From the available information, notable was the event produced in May 2006 when the Danube meadow between Bechet and Corabia was flooded.

According to the Maps of areas with potential flood risk (ANAR), the zone is one with the incidence of flooding, presenting risks at 0.1%, 1%, even 10% probability, as shown in the figures below.

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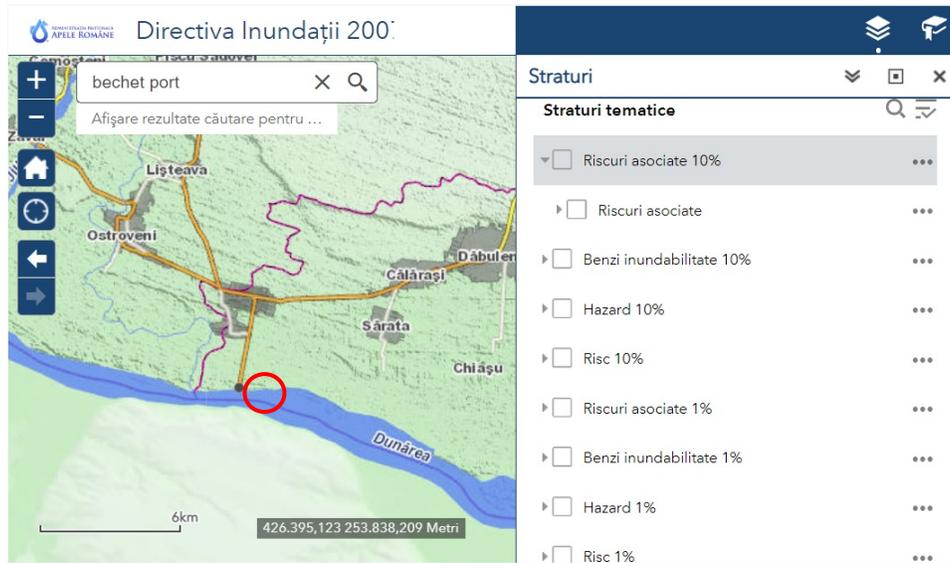


Figure no. 21- Bechet port area

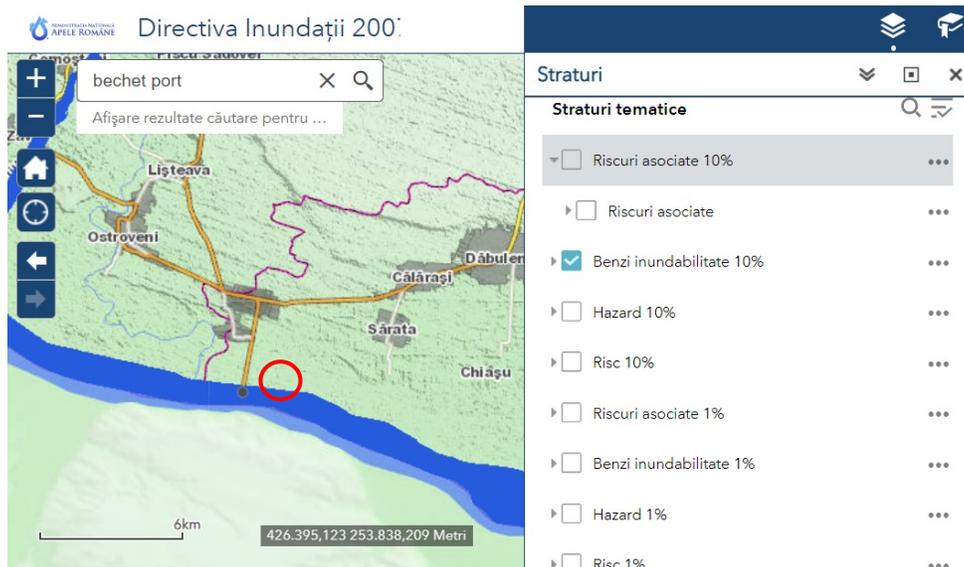


Figure no. 22– Port Bechet area with a risk of presenting flood zones at a risk of 10%

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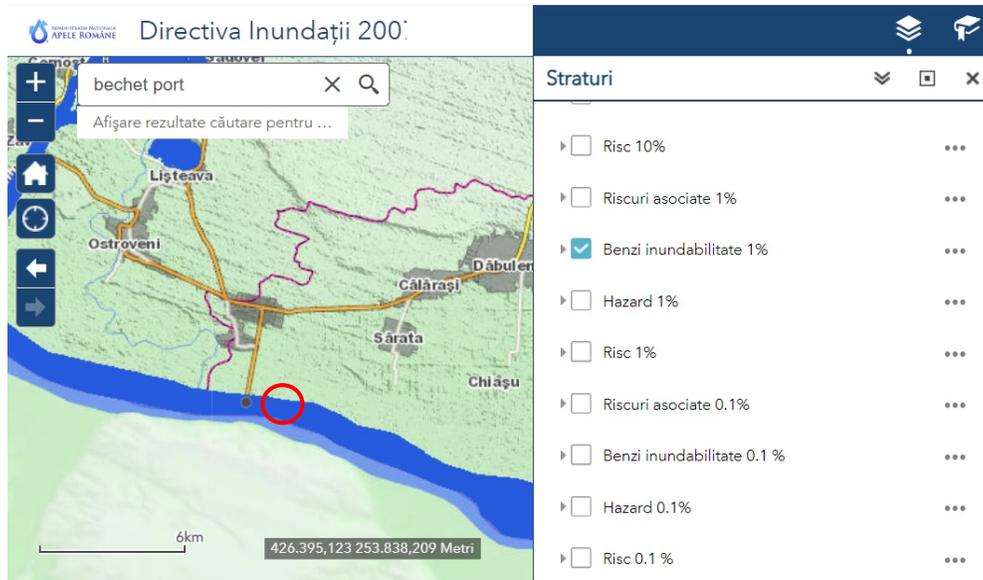


Figure no. 23– Port Bechet area with risk of presenting flood zones at a risk of 1%

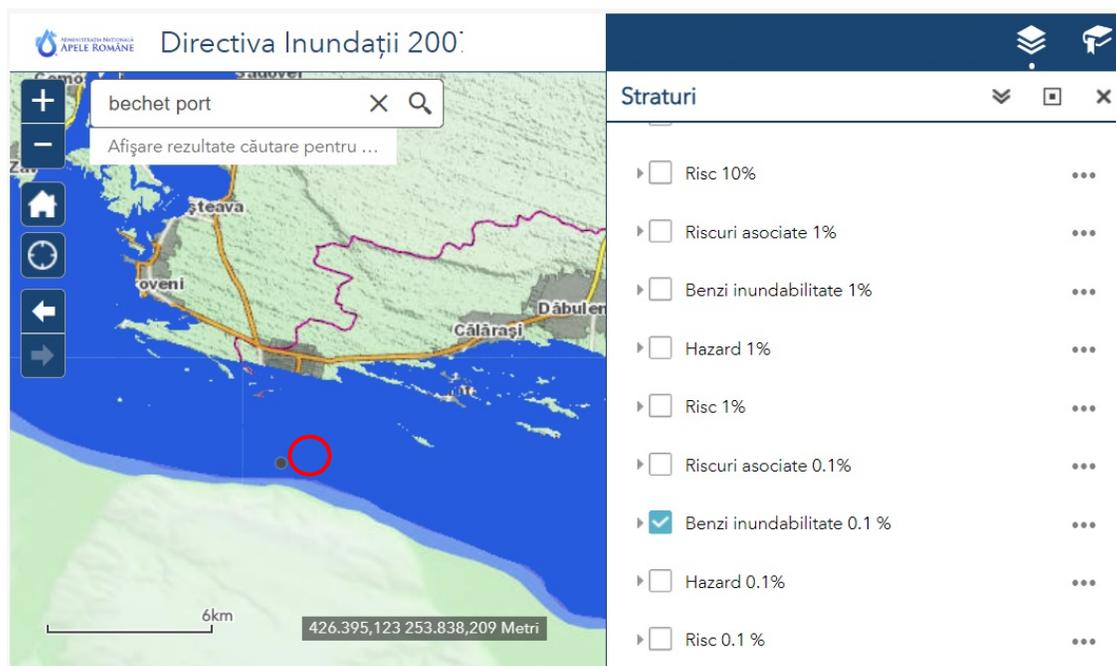


Figure no. 24– Port Bechet area with risk of presenting flood zones at a risk of 0.1%

The existing dikes in the Bechet area, as has been observed over time, are resistant and have not led to risks of landslides, landslides or other incidents that could cause material damage or loss of human life in the area.

❖ Storms and gusts of wind

Wind is the climatic element that best reflects the influence of the general circulation of the atmosphere.

According to the Report of the National Meteorological Administration (2015): "*Climate changes - from physical bases to risks and adaptation*", wind speed shows major changes in the long-term evolution. Decreases in the annual average wind speed were recorded in proportion of 93% in all

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the stations in Romania. The available data lead to the conclusion that there will be a reduction in the average wind speed in the reference area of the project.

Regarding extreme wind speeds (storms, tornadoes), "*Tornadoes in Romania*" (B. Antonescu, A. Bell - 2014) shows that they are possible in the project area, but do not represent a characteristic of the location.

In the Bechet port area, from the data available, there are no known cases of extreme storms, gusts of wind that would endanger the activity in the port area or that would affect utility networks (electricity, water, etc.) in the Bechet port area.

❖ Landslides

In the Bechet port area, there is no danger of landslides. The existing constructions are stable, they were based on geotechnical studies, so the risk is very low.

❖ Sea level rise, storms, waves, coastal erosion, hydrological regimes and saline intrusion

The project area will not be influenced by sea level rises, sea storms, coastal erosion, etc.

❖ Cold waves

The average air temperature shows exclusively increasing trends throughout the year. According to the data released by the National Meteorological Administration, in October 2023, a temperature of 35 degrees was recorded at the Bechet weather station (the maximum since October 2023), above the maximum recorded at this station in October of 33.8 degrees in 1991. An important feature of October 2023 was the large number of summer days.

Compared to the multiannual average temperature for the period 1961-2022 (figure below), where the average temperature was in the range of 10-12 degrees in the Bechet area, record temperatures were recorded this year.

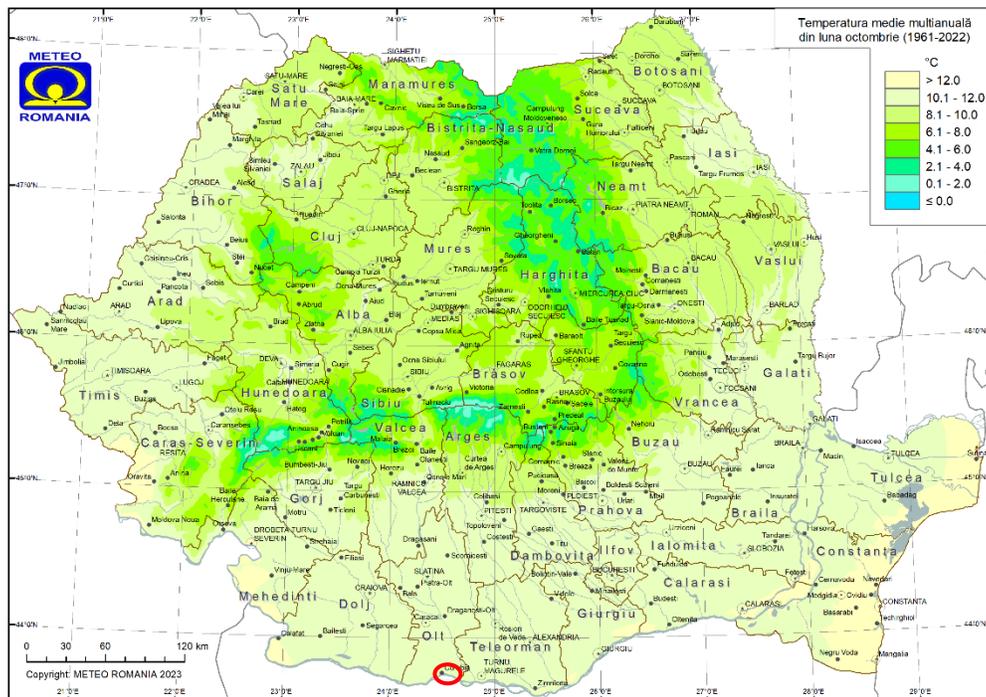


Figure no. 25– Multiannual average temperature in October (1961 -2022)

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The data available in *the Statistical Yearbook of Romania 2022* for the weather stations closest to the Bechet port area and for which climatic data were recorded, Turnu Magurele (approx. 74 km downstream from Bechet) and Calafat (approx. 87 km upstream from Bechet), are presented in the tables below.

Table no. 17– Average monthly and annual temperatures (Turnu Magurele weather station)

Average air temperature (monthly and yearly)													
Period	January	February	April	April	May	June	July	August	September	October	November	December	Annual
1901 - 2000	-2.3	0.3	5.6	12.2	17.6	21.3	23.3	22.5	18.1	11.8	5.7	0.5	11.4
2021	2.4	3.2	4.8	9.9	17.7	21.5	26.0	25.2	18.2	10.1	7.4	3.0	12.5
Maximum and minimum temperatures (monthly and yearly)													
Period	January	February	April	April	May	June	July	August	September	October	November	December	Annual
The year	1983	1995	1951	1985	1950	1957	1987	1952	1946	1952	1963	1903	1987
Maximum	18.0	24.1	29.6	34.2	38.8	38.2	43.2	41.4	40.0	36.4	26.7	22.0	43.2
2021 - max	15.6	20.6	19.6	25.5	30.4	37.2	39.3	40.4	40.0	36.4	26.7	22.0	43.2
The year	1942	1950	1929	1923	1938	1911	1974	1981	1977	1988	1993	1933	1942
Low	-30.0	-26.0	-22.2	-4.6	0.5	5.0	9.0	6.6	-2.5	-5.8	-18.2	-25.0	-30.0
2021 - min	-10.7	-9.4	-5.9	-2.5	4.1	8.9	13.9	10.4	-2.5	-5.8	-18.2	-25.0	-30.0

Table no. 18– Average monthly and annual temperatures (Calafat weather station)

Average air temperature (monthly and yearly)													
Period	January	February	April	April	May	June	July	August	September	October	November	December	Annual
1901 - 2000	-1.4	0.6	5.7	11.9	17.4	21.0	23.3	22.8	18.2	11.9	5.7	1.0	11.5
2021	2.1	3.6	6.1	10.0	17.6	22.9	26.7	25.5	18.8	10.0	7.3	3.9	12.9
Maximum and minimum temperatures (monthly and yearly)													
Period	January	February	April	April	May	June	July	August	September	October	November	December	Annual

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The year	1993	1990	1952/1994	1985	1969	1908	2000	1945	1946	1991	1970	1989	2000
Maximum	20.5	22.4	27.6	34.5	36.6	39.5	43.2	41.3	39.8	31.6	25.9	21.2	43.2
2021 - max	13.7	21.0	21.0	25.8	31.8	39.3	40.0	41.1	34.1	24.2	17.3	17.1	41.1
The year	1947	1950	1963	1912	1952	1962	1913	1904	1977	1988	1988	1948	1947
Low	-29.2	-24.6	-15.7	-3.0	1.6	6.2	9.0	7.3	-1.3	-6.2	-16.2	-21.8	-29.2
2021 - min	-7.0	-7.5	-5.8	-0.4	4.3	9.1	15.1	9.4	5.0	-0.3	-1.9	-6.9	-7.5

It is observed that the data recorded at the Turnu Magurele weather station do not vary significantly compared to those recorded at the Calafat station, which means that the trends are considered valid for the project location as well.

Analyzing the extreme temperatures recorded in 2021 compared to the data from the last 30 years (1990 - 2020), the same trends can be found from the analysis of the data published in the Statistical Yearbook of Romania. Therefore, we cannot talk about maximum temperatures above the historical maximums, but we can see an increase in the minimums and, implicitly, about a **general trend of warming and reducing the risk of frost.**

For the project that is the subject of this memo, the materials provided are of high quality that can withstand low or high temperature, so there will be no risk in periods when there could be cold waves, despite the trend that results from the one presented previously.

Also, as already stated, the basis of the project is a geotechnical study carried out on the site so that when designing the works, the location of the utility supply networks (especially those that provide water supply) took into account the maximum frost depth, so the laying of the pipes is below this depth to reduce the risk of interruption of the water supply due to frost.

The port activity will be temporarily interrupted in situations where the phenomenon of ice on the shore occurs, a phenomenon that can prevent ships from docking at the shore, or, where there are such situations, the movement of ships on the Danube.

❖ Freeze-thaw damage

There is no such risk, considering that the tiles proposed to be used for the rehabilitation work are good quality materials, resistant to temperature differences.

❖ The vulnerability of people and assets to climate change

Based on all the data, information and conclusions presented in this memorandum regarding the type of works proposed to be carried out, the impact they may have on the environmental factors, the climatic factors in the Bechet port area, the impact the project may have on the climatic conditions as well as the impact of climatic factors on the project, we can mention the fact that:

- in the event that floods occur in the Bechet port area as a result of heavy rains, etc., there is a risk of flooding in the area. According to the maps made available by ANAR, the flood zones extend to the area behind the port platform, thus both the population that carries out its activity in the port area, as well as the companies for which goods are brought to

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the port area, transport ships can be affected , etc. this risk is low considering long-term climate trends

- another potential source of impact could be the drought, which leads to the lowering of the level of the Danube, leading to the impossibility of docking ships in the port area, perhaps even to the impossibility of naval traffic until the water level returns to levels that facilitate naval traffic. This impact can be translated into a socio-economic impact both on the port's economy and on the population that carries out its activity in the port area, of the companies that depend on the traffic of goods from the port.

It should be mentioned that although these risks exist, the probability of bias is low and most importantly, they do not depend on the works proposed to be carried out in the port area (they are not influenced by the works proposed to be carried out, by the activity carried out, by the materials used, etc).

8.8 General measures to reduce the impact on the environment

Along with the measures presented previously, for the protection of all environmental factors (water, air, soil, subsoil, biodiversity, landscape, socio-economic environment, cultural heritage) the following measures will be adopted, without taking into account the site organization that does not the object of this documentation:

- Storage of construction materials
 - construction materials will be transported only with watertight means of transport and will be stored in specially arranged spaces to avoid pollution of environmental factors;
 - material warehouses will be delimited, fenced and covered to avoid the entrainment of particles by precipitation or wind. Also, the degradation of construction materials will be avoided
 - aggregates will be stored only on concrete platforms, with compartments for each type of aggregate. The platforms will have slopes and drainage channels;
 - the concrete and asphalt needed to carry out the works will not be prepared on the project site, but will be procured from specialized centers in order to reduce the emissions of atmospheric pollutants and the noise level;
 - the workers will wear protective equipment and will respect the rules for labor protection in all operations of transfer, loading, unloading of construction materials;
 - the exploitation roads within the construction site will be permanently maintained and will be sprinkled periodically in order to avoid the emissions of sedimentable dust
- Management of hazardous substances
 - all dangerous substances will be stored only in specially arranged places (secure storages) to which only specially designated persons will have access;
 - all used varnishes and paints will be stored in warehouses within the site organization. The warehouses will be permanently kept locked, and only certain specially designated people will have access to them. In the vicinity of the warehouses, the use of fire sources is strictly prohibited, and the warehouses will be periodically ventilated;
 - the additives will be stored in the original packaging, in dry rooms, and after use, the containers in which the additives and paints were delivered will be returned to

the distributors / manufacturers or will be disposed of through a specialized company.

8.9 Monitoring plan

For a correct assessment of the impact that the project execution period had on the environment, a scan will be made (by monitoring environmental factors) before the start of the works.

Monitoring of the site before the start of work to determine the current state of the environment includes the analysis of the following parameters:

- ❖ for soil: the concentration of heavy metals and hydrocarbons from the location of the port platform - where possible, as well as the site organization (at the time when the location for this will be chosen)
- ❖ for air: the concentration of SO_x, NO_x, NH₃, total dust in suspension and sedimentable dust in the project site;
- ❖ the noise level in the port location (the limit of residential areas is located at a distance of more than 3 km, so monitoring is not necessary);
- ❖ for surface water: determination of the turbidity of the body of water (Danube) in the port location area;
- ❖ for biodiversity: identification of all species of flora and fauna from the project site (including those observed in migration or nesting in the vicinity of the project site).

These determinations will be used as witness samples, to determine the initial state of the environment on the analyzed location.

During the construction works, it is necessary to monitor all environmental factors by taking samples from the work fronts and the site organization. It is recommended that during construction works, the same monitoring points used to determine the initial state of the environment are used, in order to ensure the representativeness of the data obtained.

During the construction works, the following parameters will be monitored:

- ❖ for air: the concentration of SO_x, NO_x, NH₃, total dust in suspension and sedimentable dust in the perimeter of the site organization and in the work fronts - monthly frequency;
- ❖ to determine the level of noise and vibrations: monthly measurements within each work front;
- ❖ for water: determination of water turbidity in the location, with monthly frequency;
- ❖ for soil: monthly determination of the concentrations of heavy metals and hydrocarbons in the perimeter of the work fronts;
- ❖ waste: keeping records of the amount and types of waste according to GD no. 856/2002, how to eliminate them.

For biodiversity, the proposed monitoring program will highlight the effectiveness of the proposed measures to prevent, avoid and reduce impacts. This is shown in the table below.

For the operating period, monitoring of environmental factors will not be necessary except where they are imposed by the regulatory acts issued for port operators

The monitoring results will be reported annually to the Dolj Environmental Protection Agency and to the other competent authorities.

The beneficiary will comply with all the measures proposed to reduce the potential impact that can be identified as a result of the monitoring activities.

Table no. 19- Program for monitoring measures

Affected ANPIC (code, name)	Conservation objective / species / affected habitat / parameter	Form of impact	Reduction measure	Implementation period	The location of the measure	Monitoring indicators	Measurement units	Monitoring frequency	Monitoring locations	Duration of monitoring	Degree of effectiveness of the measure	Budget	Responsible for monitoring
ROSCI0045	Mammal species, fish	The noise level	M2, M3, M4, M7, M8, M9, M10	Permanent	Work front	The noise level	dB(A)	Monthly	A monitoring point in the work front area	During the entire duration of the execution of the works	Picked up	6000 lei / month	Contractor through the environmental officer
ROSCI0045	Mammal species, fish	Habitat area (feeding, reproduction, etc.)	M2, M3, M4, M5, M6, M7, M8, M9, M10, M11, M12	Permanent	Work front	Surface	Ha	Monthly	Work front area	During the entire duration of the execution of the works	Picked up	15500 lei/month	Entrepreneur through the environmental officer/biodiversity officer
ROSPA0023	The avifaunistic species in the project area	Population size Population distribution	M2, M3, M5, M6, M7, M8, M9, M10, M11, M12	Permanent	Work front	Number of species	Ha	Monthly	Work front area	During the entire duration of the execution of the works	Picked up	15500 lei/month	Entrepreneur through the environmental officer/biodiversity officer

9 Description of the expected significant negative effects of the project on the environment, determined by the vulnerability of the project to the risks of major accidents and/or disasters relevant to the project in question

The risks of major accidents and/or disasters can be determined by both natural and anthropogenic causes. The main natural risks that can generate major accidents and/or disasters are floods, landslides, extreme precipitation. Anthropogenic risks are mainly generated by road accidents or improper handling of construction materials and fuels.

The project does not fall under the SEVESO legislation. Although dangerous chemicals will be used during the execution stage, the risk of major accidents is extremely low.

Hazardous chemicals will only be purchased from authorized operators and the builder's personnel will be trained in the handling of these substances in order to avoid accidents. The provisions of the Safety Data Sheets of each substance sent by the suppliers will also be respected.

9.1 Natural risks (earthquake, landslides, floods)

According to the maps from the national land development plan presented in figures 14-15, the site of Bechet port is located in an area where there is no high risk of earthquakes, landslides, floods or drought.

According to the national land development plan, section V a - natural risk areas: floods, on the analyzed site the maximum amount of precipitation that fell in 24 h (during the period 1901 - 1997) is less than 100 mm.

There is no risk of significant flooding in the location.

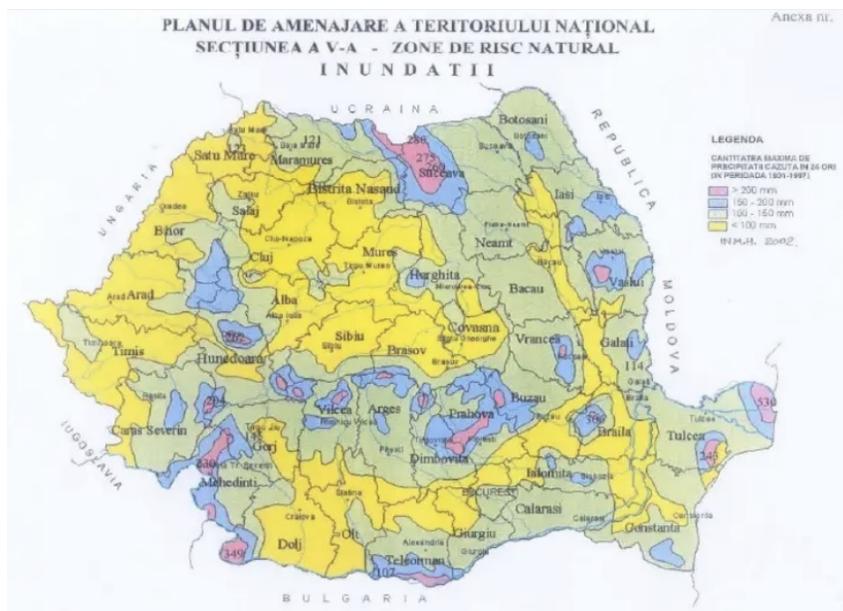


Figure no. 26- The national territory development plan. Areas of natural risk - floods

According to the map in figure 15, the potential for landslides is low, and the probability of landslides is low.

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From a seismic point of view, Romania belongs to a moderate to high seismic zone. However, the site is located in a territory of seismic calm, outside the active areas. From the point of view of seismic macrozoning, the perimeter falls into grade 8₂, corresponding to grades VIII on the MSK scale and with a return period of at least 50 years, according to STAS 11100/1-93 and the map in figure 16.

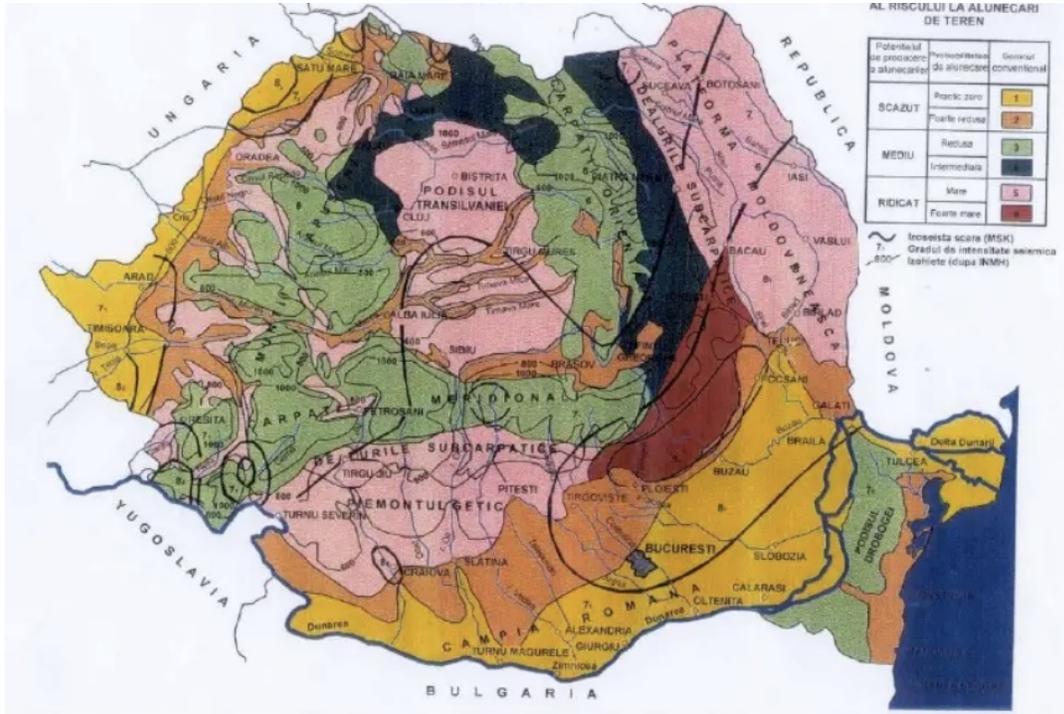


Figure no. 27- Macrozoning of the territory from the point of view of the risk of landslides

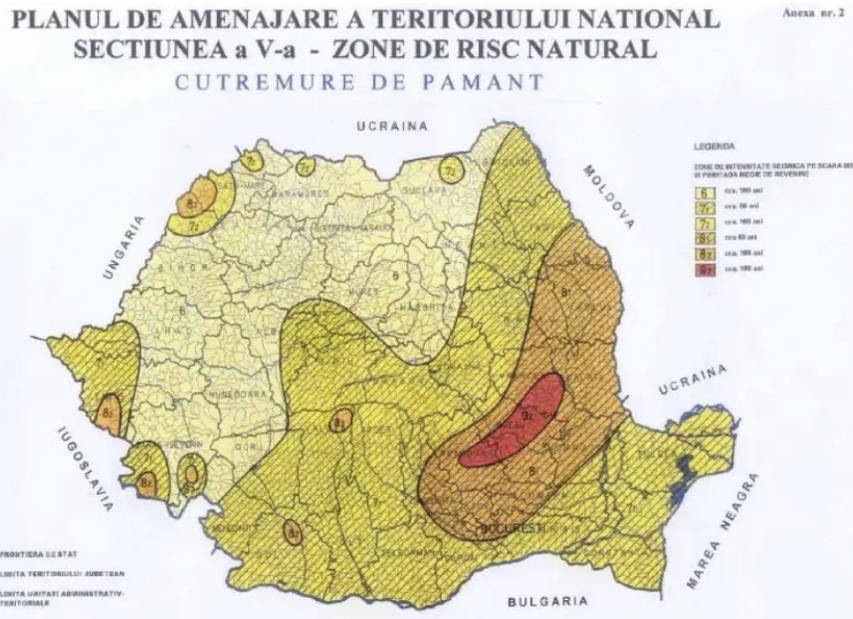


Figure no. 28- The national territory development plan. Areas of natural risk - earthquakes

According to the norm P100-1/2006, the peak value of the soil acceleration for design $a_g = 0.20g$, for earthquakes with the average recurrence interval $IMR = 50$ years, and the value of the control period (corner) of the response spectrum is $T_c = 1,0s$. According to STAS 6054/77 "Foundation

land - MAXIMUM FROST DEPTH - Zoning of the territory of Romania ", in the studied location the maximum frost depth is 70 - 80 cm.

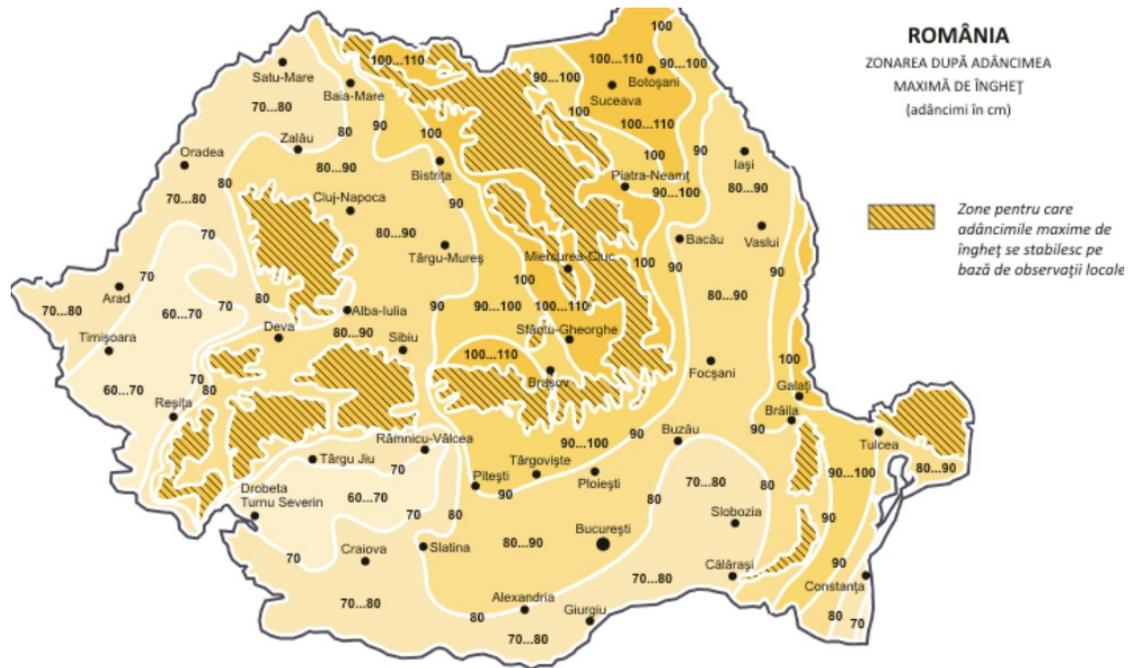


Figure no. 29- Maximum frost depth

9.2 Potential accidents (risk analysis)

During the execution of the rehabilitation and modernization works of the port platform, the following categories of risks may occur:

- the occurrence of delays in the execution of the works, caused by unfavorable weather conditions;
- the non-compliant realization of the project due to technical projects or incomplete execution details or not adapted to the situation;
- the occurrence of work accidents due to the breakdown of construction equipment or the insufficient qualification of employees;
- the occurrence of work accidents due to non-compliance with technology and work rules, poor health during work or the consumption of alcoholic beverages.

If measures are not taken to prevent these risks, accidents may occur during the execution of the works, which will have the following consequences:

- degradation of some parts of the work or even damage to the entire infrastructure;
- minor/fatal injury to workers and people present in the organization of the construction site, the work fronts and on the main access roads to the site;
- breakdown/destruction of machines and vans used for carrying out the works and transporting construction materials;
- the impact of environmental factors (including workers and people carrying out their activities / transiting the project site). To reduce / eliminate these risks, both the measures proposed by this report will be respected.

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During the exploitation period, the main risks are represented by road accidents. Road accidents are generally caused by:

- the state of health / drivers' inattention;
- not adapting the travel speed to the road conditions or to the meteorological conditions
- the technical condition of the vehicles involved in traffic (or the occurrence of malfunctions such as tire explosions).

The effects produced by road accidents depend on the number of vehicles involved in the accident, the speed of travel. In the event that vehicles carrying toxic and dangerous substances are involved in the accident, the impact on the environment can be significant. In these situations, absorbent material will be used as soon as possible (to limit the spread of pollution), and later the services of a company specialized in depollution will be called upon.

9.3 Accident prevention measures

In order to reduce the risk of accidents / negative effects on the environment, during the execution of the works that are the subject of this report, the following measures will be adopted:

- signaling and fencing of the construction site;
- periodic checking and appropriate maintenance of machinery and means of transport;
- hiring qualified personnel and equipping them with personal protective equipment;
- the development of a prevention and intervention plan in case of emergency situations / the occurrence of accidental pollution;
- checking the way of execution of the works, both from the point of view of compliance with the technical project / execution technology, as well as compliance with the execution schedule;
- respecting the dimensions of the transport vehicle and the symmetrical loading of construction materials (to avoid overturning of transport vehicles);
- the presence of workers in the range of action of the excavator bucket is prohibited during the loading of construction materials into the vans that transport the construction materials / excavated soil to / from the project site;
- at the exit from the construction site, cleaning points will be placed for the tires of the machines and vans involved in the construction works, so that there is no loss of materials on the public roads;
- periodic instructions will be given regarding safety and health at work provided for by Law no. 319/2006 with subsequent amendments and additions and by Government Decision no. 1425/2006 regarding the approval of the methodological norms for the application of the Law on safety and health at work no. 319/2006, with subsequent amendments.

9.4 Conclusion

The negative impact of the rehabilitation and modernization works of the port infrastructure in Bechet port will be felt strictly in the project location and only during the construction period. The negative impact is temporary and reversible. Upon completion of the construction works, no residual impact will be recorded.

The species of ichthyofauna and avifauna in the project area will only be affected temporarily during the execution of the works, following that after the completion of the works they will return to their initial state.

The conclusions of the appropriate assessment study

The project "Rehabilitation and modernization of the port infrastructure in the port of Bechet" aims to improve the rehabilitation and modernization of the entire mooring front, the construction of the platforms behind the berths with their connection to the existing road, the rehabilitation of utility networks for the centralized drinking water supply system and the fire ring network, including the installation of external hydrants by connecting this system to the water network of the city of Bechet, all of which are based on the changes in the configuration of the Danube river bed, the intensive exploitation and the impact of climate change in recent years that have led to the destruction of the port infrastructure with effects on activity level.

The development of goods traffic in the port of Bechet is mainly conditioned by the operating conditions of the goods, the conditions for the ships to stay, the facilities that the port infrastructure can offer in any season and the connection of the port with the local and national road network. The rehabilitation of the existing berths and the transition from walled wharfs to vertical wharfs will lead to the development of cargo traffic in the port.

Along with the rehabilitation and modernization of the port infrastructure, optimal working conditions and the running of specific activities under normal conditions will be ensured.

The perimeter in which the alluvial material to be dredged will be discharged into the Danube will be specified by the waterway administrator, respectively the Lower Danube River Administration SA Galati, outside the areas with critical depths for navigation.

Currently, due to the changes in the configuration of the bed and due to an intensive exploitation, correlated with the change of climatic conditions in recent years, there have been phenomena of instability and damage to the existing hydrotechnical constructions.

Considering the current unfavorable conditions in the location and the objectives contained in the Romanian Government program according to the General Transport Master Plan, it is necessary to modernize the operating infrastructure in the port of Bechet, so that technical solutions for rehabilitation and redevelopment have been proposed, works that are the subject of this study

By rehabilitating the infrastructure of Bechet port and bringing the port to the technical-functional parameters of other ports located in the member states of the European Union, port and commercial activities in the area will be relaunched, contributing to regional development.

The main proposed works are:

➤ Modernization of the Danube mooring front, including:

- the execution of a vertical wharf, for which two variants were analyzed, namely: wharf made of weight blocks (variant 1 recommended) or of metal sheet piles (variant 2 alternative), with the height of the crest at +7.80 m compared to the local low water, with the cumulative length $L = 650$ m, the resulting surface $S = 10,918$ sq m.
- Compared to the current situation, where the existing mooring front, with a length of 650 m, is divided into 6 operating berths, in the feasibility study it is proposed to divide the mooring front into 5 berths, each having the recommended length for a river berth, of 130 m, resulting in the same length of the mooring front, of 650 m (5 berths x 130 m/berth). The

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5 berths will be numbered, from upstream to downstream, with numbers 2, 3, 4, 5 and 6. Berth 1 will be a new easement, which will be executed in the the solution berth floating, in upstream of the operating front, for relocating pontoons existing, having L = 75 ml;

- concrete platforms behind the wharf new (new berths 2 – 6), in width of approx. 20 m, with the possibility of placing cranes portico type Bocşa of 16 tf x 32 m, for which there are provided beams and running rails, or other machines established by common agreement with the economic operators that carry out their activity in the port and with the designer's opinion, S = 17,222 sq m;
- the execution of a floating easement berth, with a length of 75 m, according to the previous specifications.

➤ Rehabilitation of RO-RO ramp and access roads, including:

- rehabilitation of the ferry crossing ramp, S = 4,086 sqm;
- rehabilitation and extending the directing breakwater ferry crossing point, S = 588 sqm;
- rehabilitation precinct roads and platform from the area of the border crossing point, S = 12,410 sq m.

➤ Related works, including:

- dredging/excavations for the execution of the vertical wharf, the easement berth and rehabilitation of the RO-RO ramp;
- rehabilitation of the navigation signaling system for the entire work.

➤ Provision of utilities in the port, including:

- water supply of the port through its connection to the drinking water network of the city of Bechet, in order to ensure the water necessary for port activity and resupplying ships. Execution of the connection from the main network to the internal supply network, L = 2500 ml;
- domestic wastewater collection network from the port, including its treatment;
- rainwater collection network, including its treatment;
- fire extinguishing installation;
- power supply of the port, by connecting to the LEA existing in the area, at the entrance to the port, in order to ensure the electricity consumption of the port operators, the charging of electric cars, as well as the resupply of electricity to the ships stationed in the berths. A new PT and a connection network in length of approx. 1,500 ml;
- perimeter lighting system and port premises;
- video surveillance and access control system;
- demand analysis and the possibility of equipping the port with a fueling point for alternative fuels.

The analyzed project is located in the area of Natura 2000 sites of community importance:

- **ROSCI0045 Jiului Corridor and respectively ROSPA0023 Jiu – Danube** that overlap with the areas served by Bechet port (as can be seen from the figure below).

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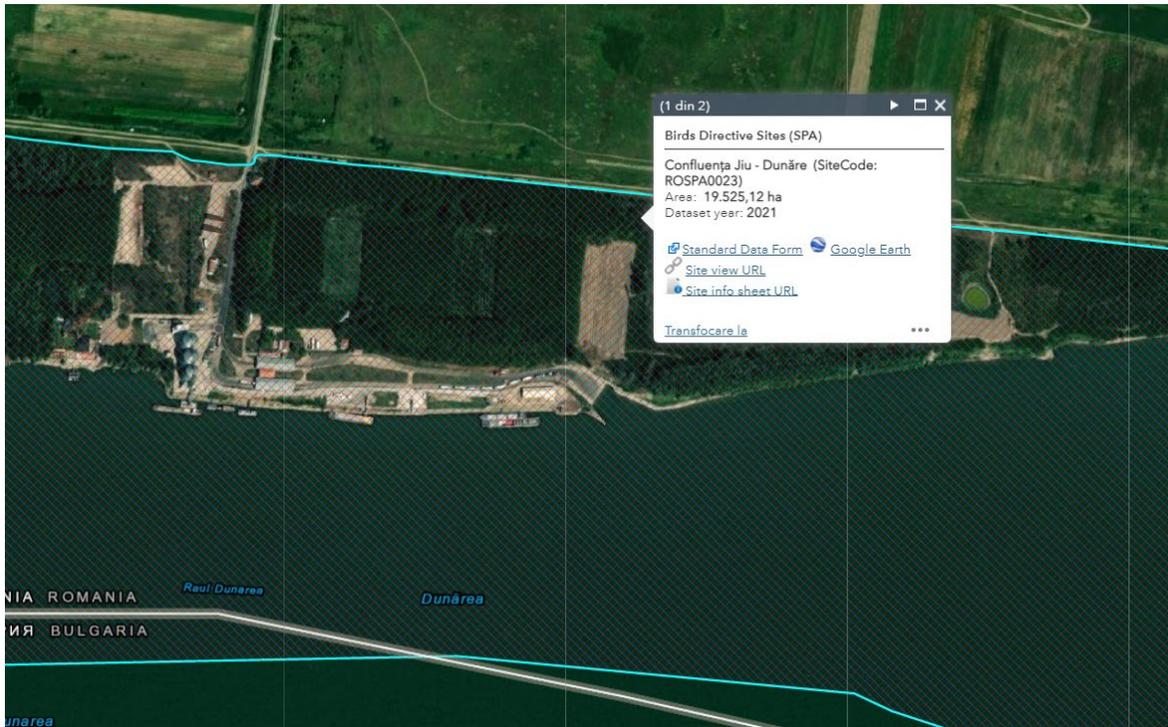


Figure no. 30- Location of the objective and the Natura 2000 areas

Other protected natural areas located both on the territory of Romania and on the territory of the neighboring state, Bulgaria, located at a distance of up to approximately 20 km from the site (as can be seen from the figure below) are:

- **BG0000614 Reka Ogosta** – located on the Bulgarian shore, approximately 3.5 km in the south-west direction from the Bechet port platform
- **BG00000334 Ostrov** identified at a distance measured on the plan of approximately 3.9 km south-east from the Bechet port platform.

The sites located in the project area have a management plan (*Integrated management plan of protected natural areas ROSCI0045 Jiului Corridor, ROSPA0023 Jiu-Danube confluence, ROSPA0010 Bistreț, Drănic fossil site and Zăval Forest - IV.33* approved by MMAP Order no. 1645 / 11 October 2016).

According to the descriptions of the habitats and flora and fauna species in the area, the distribution maps in the management plan, the field observations in the area of influence of the project, none of the habitats mentioned in the standard form of the site of community importance *ROSCI0045 Coridorul Jiului can be found*, this being a concreted and humanized area. However, according to the habitat distribution maps, in the area adjacent to the harbor platform, habitat *92A0 - Gallery forests (javanica) with Salix alba and Populus alba can be found*.

In the project area, the land is specific to industrial areas, anthropized, with ruderal vegetation.

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During the visits to the site, no species were identified among those mentioned in the FS in the area of the site that is the subject of this study and that would be affected by the modernization and rehabilitation of the port infrastructure in Bechet port.

Near the project location, the habitat 92A0 *Zavoaiie with Salix alba and Populus alba* and respectively the distribution area of the species *Lutra lutra*, *Spermophilus citellus*, of the ichthyofauna species *Aspius aspius*, *Zingel zingel*, *Alosa immaculata*, *Gymnocephalus schraetzer*, *Pelecus cultratus*, *Rhodeus sericeus amarus* and avifauna *Aquila pomarina*, *Buteo rufinus*, *Caprimulgus europaeus*, *Ciconia nigra*, *Dendrocopos medius*, *Dendrocopos syriacus*, *Ficedula albicollis*, *Haliaeetus albicilla*, *Crex, crex*, *Lullua arborea*, *Milvus migrans*, *Pernis apivorus*, *Asio otus*, *Columba oenas*, *Columba palumbus*, *Cuculus canorus*, *Erithacus rubecula*, *Falco subbuteo*, *Falco tinnuculus*, *Fringilla coelebs*, *Turdus merula*, *Muscicapa striata*, *Oenanthe oenanthe*, *Oriolis oriolus*, *Phoenicurus phoenicurus*, *Phylloscopus collybita*, *Sylvia atricapilla*, *Sylvia curruca*, *Tursu philomelos*, *Phoenicurus ochruros*, *Delichon urbica*, *Hirundo rustica*.

Through the study, measures are proposed to prevent a significant negative impact in the site area.

The impact of the projected works on the species was realized by analyzing their effects on the criteria that define the favorable state of conservation for the highlighted habitats and species of community importance.

Thus, considering the fact that the works will be located mainly in humanized areas (the area of the port platform - Bechet port without occupying other areas of land outside the site), we estimate that the dynamics and structure of habitats and populations of faunal species will not be negatively influenced by the designed works.

The location of the project works will not directly affect the functionality of community species located near the project. There will be no fragmentation of habitats. Maintaining the integrity of the sites will also provide the necessary territory for shelter, reproduction and feeding for species of conservation interest, without affecting the size of the populations. Also, there will be no functional fragmentation of the habitats of faunal populations.

It is estimated that the investment will have an insignificant impact on the species present in the project area due to the specifics of the works, which will be carried out on some degraded, heavily anthropized land belonging to the port platform administrator (CN APDF SA Giurgiu). After the completion of the works, no negative impact on biodiversity is estimated, the area related to the port platform will be rehabilitated and will lead to the improvement of environmental conditions in the area, both for the human factor and for the species looking for food and passage.

In order to prevent the impact associated with the construction period and certain hazards, on biodiversity of community importance, in general, the following measures are recommended:

- M1. Prohibition of the capture, expulsion and destruction of faunal species by the personnel performing the works;
- M2. Periodic inspection (and especially before the start of the execution of the works) in order to detect faunal specimens of community interest that may be in or occasionally transit the area;
- M3. Carrying out activities within the perimeter on the surfaces specified in the project (strictly necessary) without occupying additional land spaces;
- M4. Prohibiting the location of production bases, site organizations, borrow pits on the territory of protected areas or near them;

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- M5. Collection of materials resulting from cleaning works and waste management according to legal requirements;
- M6. Avoiding the occurrence of accidental fuel leaks from machinery;
- M7. It is forbidden to locate the organization in the perimeter of protected natural areas;
- M8. Collaborating/supporting the administration of the site where the works will take place, in order to maintain the favorable state of conservation of the area and species of community importance;
- M9. Compliance with established access routes;
- M10. The execution of repair works of the machines used, oil changes, or other operations necessary for the proper functioning of the machines and means of transport used during the execution of the works, in places specially arranged for this purpose;
- M11. Drawing up a plan for the prevention of accidental pollution and appointing a person responsible for the protection of environmental factors;
- M12. The species of amphibians, reptiles, avifaunistics, mammals in the project implementation area will be monitored.

A summary of the conclusions is presented by completing the following table:

Table no. 20- Conclusions of the appropriate assessment

PP component description	ANPIC affected	Affected species/habitats	Conservation objectives/parameters affected	Types of impact, including cumulative	Mitigation measures	Residual impact	The chosen alternative solution	Imperative reasons of major public interest	Compensatory measures	Other aspects
Work execution stage	ROSCI 0045 Jiu Corridor / ROSPA 0023 Jiu - Danube Confluence	Species of mammals, fish, birds	Area of terrestrial habitats with natural vegetation around breeding habitats The area of the species' habitat	Insignificant negative (change of destination of other land surfaces)	M2, M3, M4, M7, M8, M9, M10	Insignificant negative	It's not necessary	It's not necessary	It's not necessary	It's not necessary
			Distribution of species (in the sense of their moving to quieter areas)	Insignificant negative (increased noise level during the execution of the works)	M2, M3, M4, M5, M6, M7, M8, M9, M10, M11, M12	Insignificant negative	It's not necessary	It's not necessary	It's not necessary	It's not necessary

prepared,

Raluca Oana MIHALCEA

George CHETREANU

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