State Water Holding Polish Waters
Regional Water Management Authority in Wrocław

Environmental Management Plan

ODRA-VISTULA FLOOD MANAGEMENT PROJECT

Component 1:
Flood protection of the Middle and Lower Odra

Subcomponent 1B:
Flood Protection on the Middle and Lower Odra

Works contract 1B.1/1 (b):

Rebuilding of the road bridge in Krosno Odrzańskie jointly with access roads

Environmental Category B - as per OP 4.01 WB

FINAL VERSION

Issue	Date	Author	Checked by	Client's Approval
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ODRA-VISTULA FLOOD MANAGEMENT PROJECT
World Bank (WB), Loan Agreement No 8524 EN
Council of Europe Development Bank (BRRE), Framework Loan Agreement No LD 1866
European Union and
State budget

Environmental Management Plan

Component: ***1– Flood protection of the Middle and Lower Odra***
Subcomponent: **1. B - Flood Protection on the Middle and Lower Odra**
Contract: **1B.1/1(b)** ***Rebuilding of the road bridge in Krosno Odrzańskie jointly with access roads***

Environmental Management Plan prepared for the Works Contract implemented by
State Water Holding Polish Waters
Regional Water Management Authority in Wrocław

The authors of the study:
State Water Holding Polish Waters Regional Water Management Authority in Wrocław PIU
Technical support consultant -
Joint Venture Sweco Consulting Sp z o.o./Sweco Nederland B.V./ Artelia Ville & Transport SAS/Artelia Sp. z o.o. / Ekocentrum Sp. z o.o.

Wrocław, July 2020

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List of basic definitions and abbreviations used in the EMP

Name	Description
IBRD / WB	The International Bank for Reconstruction and Development/ the World Bank
PCU / PCU OVFMP	Project Coordination Unit/ Project Coordination Unit of the Odra-Vistula Flood Management Project
BP	Bank *Procedure*[1]
C-ESMP	Contractor's Environmental and Social Management Plan
Environmental decision / DEC	Decision on environmental conditions
Species decisions	Decision authorising activities subject to prohibitions applicable to protected animal, plant or fungi species
Epidemic	The occurrence of a significantly higher number of infections or infectious diseases in a given area than in the previous period or the occurrence of infections or infectious diseases not yet occurring.
ESHS	Management Strategies and Implementation Plans
EMFF	*Environmental and Social Management Framework* for OVFMP[2]
ES	World Bank Environmental and Social - ES policy on environmental and social issues (i.e. environmental protection, health and safety at work and community, gender equality, protection of minors, vulnerable people (including disabled people), sexual harassment, sexual violence, awareness and prevention of HIV / AIDS).
GRM	*Grievance Redressal Mechanism.* Details of the procedurę are discussed in POM
CSO/GUS	Central Statistical Office
Investor / Employer / PIU	State Water Holding Polish Waters in Warsaw represented by the Director of the Regional Water Management Authority Wrocław / Project Implementation Unit of the Odra-Vistula Flood Management Project
BSW	Body of Surface Water
UBSW	Unified Body of Surface Water
PIU	OVFM Project Implementation Unit in PGWWP RZGW in Wrocław
PDS (Project Data Sheet)	Project Data Sheet called: Reconstruction of the road bridge in Krosno Odrzańskie in km 514.1 of the Odra River is implemented as part of the Odra-Vistula Flood Management Project (Rebuilding of the road bridge in Krosno Odrzańskie jointly with access roads)

[1] The World Bank Operational Manual, available at the website: *https://policies.worldbank.org/sites/PPF3/Pages/Manuals/Operational%20Manual.aspx*.

[2] The document is available on the PCU OVFMP website: http://odrapcu2019.odrapcu.pl/popdow_dokumenty/ and on the website of the World Bank, on the website: *http://documents.worldbank.org/curated/en/717671468333613779/Poland-Odra-Vistula-Flood-Management-Project-environmental-and-social-management-framework*.

Name	Description
Consultant / Engineer / Contract Engineer	Company or legal entity providing the Investor with the service of Technical Support Consultant within the OVFMP Project
Contract / Works contract / Task / Investment	Works contract 1B.1/1(b) Rebuilding of the road bridge in Krosno Odrzańskie jointly with access roads
LAMP/MPZP	Local Area Management Plan
EIA	Environmental Impact Assessment
OP	World Bank*Operational Policy*[1]
PAD	*Project Appraisal Document*for POPDO[2] or POPDOW[3]
WMORB / WMP	Water Management within the Odra River Basin (Regulation of the Council of Ministers of 18 October 2016 on the *Water Management within the Odra River Basin*)
PGW WP	State Water Holding Polish Waters
HASP	Health and Safety Plan
OPIE	Operational Programme Infrastructure and Environment
POM	*Project Operations Manual*[4] for OVFMP
LARAP	LAND ACQUISITION AND RESETTLEMENT ACTION PLAN
OVFMP / OVFM Project	Odra-Vistula Flood Management Project
EMP	Environmental Management Plan
RDOŚ	Regional Directorate for Environmental Protection
EIA Report	Report on the Environmental Impact Assessment of the Project
SDF	Standard Data Form: The Standard Data Form (SDF) is a uniform template for describing a Natura 2000 site throughout the European Union. It is approved by a decision of the European Commission and compulsory for use in all Member States
LV network	low voltage power grid
MV network	Medium voltage network power grid

[1] See footnote for BP (World Bank Procedure).

[2] A document available on the World Bank website: *http://documents.worldbank.org/curated/en/552201468145748680/pdf/31771.pdf*.

[3] Document available on the World Bank's website: *http://documents.worldbank.org/curated/en/320251467986305800/Poland-Odra-Vistula-Flood-Management-Project*.

[4] The document is available on the PCU OVFMP website: *http://odrapcu2019.odrapcu.pl/popdow_dokumenty/*.

Name	Description
Natural habitats	The concept of *natural habitats* used in the text refers to the definition of natural habitats and the listing of their types in Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (OJ EU L 206, 22.07.1992, as amended). (The Polish nomenclature of natural habitats is set out in the Regulation of the Minister of the Environment of 13 April 2010 *on natural habitats and species of Community interest and the criteria for the selection of areas eligible for recognition or designation as Natura 2000 sites* (consolidated text in Journal of Laws of 2014, item 1713), the Regulation specifies, inter alia, the types of natural habitats of Community interest which require protection in the form of designation of Natura 2000 sites, with the indication of priority natural habitat types)
State of the epidemic	The legal situation introduced in the area in question in connection with the occurrence of an epidemic with a view to taking up the measures laid down in the Act of 5 December 2008 *on preventing and combating infections and infectious diseases in humans* (unified text: Journal of Laws of 2019, item 1239 as amended) of anti-epidemic and preventive actions to minimise the effects of the epidemic.
Epidemic emergency	The legal situation introduced in the area in question in connection with the occurrence of an epidemic with a view to taking up the preventive measures laid down in the Act of 5 December 2008 *on preventing and combating infections and infectious diseases in humans* (Journal of laws no. 2019 item 1239 as amended)
Construction area/construction site	Construction area / site means places where Permanent Works are to be carried out, including storage and working places where Equipment and Materials are to be supplied, as well as other places indicated in the Contract as being part of the Construction Site. The terms "construction site" and "construction area" are interchangeable terms and are understood in the Terms and Conditions of the Contract as "Construction Site".
IPSW	Integrated Part of the Surface Waters
EU	European Union
EHS Guidelines	The World Bank's Environmental, Health, and Safety (EHS) Guidelines, General EHS Guidelines[1].
WKZ/WMC	Voivodship Monument Conservator
Contractor / Task Contractor / Contractor for Part of the Task	Environmental Management Plan for the Contract for works 1B.1/1 (b) *Rebuilding of the road bridge in Krosno Odrzańskie jointly with access roads*
Road and bridge managing entity	An organizational unit performing duties of managing public roads and maintaining within the meaning of *the Act on Public Roads* or duties of managing non-public roads, including bridge structures.

[1] https://www.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/sustainability-at-ifc/policies-standards/ehs-guidelines

List of abbreviated names of legal acts used in the EMP

The names of the legal acts referred to in the text of this EMP are given in abbreviated form. The full names of the individual legal acts are given in the list below.

Name in the text	Full name (including publication refernce)
Bird Directive/BD	Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (OJ L 288, 06.11.2007)
Habitat Directive/ HD	Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (OJ L 206, 22.07.1992, as amended)
Water Framework Directive (WFD)	Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy (OJ L 327, 22.12.2000, as amended)
EIA Regulation	Regulation of the Council of Ministers of 9 November 2010 on projects likely to have a significant impact on the environment (consolidated text Journal of Laws of 2016, item 71). The above Regulation was revoked by the Regulation Council of Ministers of 10th September 2019 *on ventures that may have significant impact on environment* (Journal of Laws of 2019 item 1839). However, the provisions in force before the entry into force of the repealing Regulation applied to this Task.
EIA Act	The Act of 3 October 2008 on disclosing information on the environment and its protection, public participation in environmental protection and environmental impact assessments (unified text: Journal 2020, item 283 as amended)
Public Roads Act	Act of 21 March 1985 on public roads (unified text Journal of Laws 2020, item 470)
Nature Conservation Act	Act of 16 April 2004 on nature protection (unified text Journal of Laws of 2020 item 55)
Monument Conservation Act	of 23 July 2003 on protection and care of monuments (unified text Journal of Laws of 2020, item 282)
Waste Act	The Act of 14 December 2012 – Waste Act (Journal of Laws of 2020 item 797);
Construction Law Act	The Act of 7 July 1994 – Construction Law Act (unified text Journal of Laws of 2019 item 1186 as amended)
The Environment Protection Law Act	The Act of 27 April 2001 – Environment Protection Law (unified text Journal of Laws of 2019 item 1396 as amended);
The Water Law Act	The Act of 20 July 2001 – Water Law (Journal of Law of 2020 item 310 as amended);

SUMMARY

This Environmental Management Plan (EMP) refers to the Contract for works 1B.1/1 *Rebuilding of the road bridge in Krosno Odrzańskie jointly with access roads.*

This EMP provides, inter alia, the following information:

- brief description of the OVFM Project;
- description of the Task covered by this EMP (Chapter 2);
- characteristics of institutional, legal and administrative conditions of the implementation of the Task, including the current status of the EIA procedures for the Task (Chapter 3);
- description of the individual elements of the environment surrounding of the Task (Chapter 4);
- summary of the impact assessment Environmental task (Chapter 5);
- description of mitigation measures to eliminate or reduce potential negative impact of the Task on the environment (Chapter 6), together with a tabular list of these actions (Appendix 1 to the EMP);
- description of environmental monitoring activities applicable to the Task (Chapter 7), together with a tabular list of these activities (Appendix 2 to the EMP);
- description of the course of public consultations carried out at the different stages of development of environmental documentation for the Task (Chapter 8);
- description of the organisational structure of the implementation of an EMP (Chapter 9);
- a schedule for the implementation of the EMP and a description of reporting procedures (Chapter 10);
- list of source materials cited in the EMP (Chapter 11);
- list of Appendixes to the EMP (Chapter 12);
- Summary of national environmental legislation (Appendix no. 3 to EMP)
- a copy of the decision on environmental conditions issued by the Mayor of Krosno Odrzańskie on 2 March, 2020 for the Task (Appendix No. 4a to EMP),
- a copy of the decision permitting derogations from the prohibitions applicable to protected plant and animal species issued by RDOŚ in Gorzów Wlk. on 15 January 2020 issued for the Task (Appendix No. 4b to EMP),
- a copy of a decision of 9th June 2020 (ref. No.: GN.6220.10.15.2019.MKu) transferring the decision on environmental conditions to the General Director for National Roads and Motorways (Appendix no. 4c to PZŚ),
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- location of the main elements of the Task in relation to protected areas (Appendix 5),
- the location of the main elements of the Task (Appendix 6),
- distribution of natural resources against the background of the elements of the Task (Appendix 7).

Characteristics of the Task

The task concerns the reconstruction of the existing road bridge in km 53+067 of national road No. 29 and the extension of sections of this road in Krosno Odrzańskie. The bridge is located

in km 514+100 of the Odra River. The Project Implementation Unit (PIU) for the Task is the State Water Holding Polish Waters, Regional Water Management Authority in Wrocław.

Scope of the task

Reconstruction of the bridge structure includes raising the existing load-bearing structure of the structure and adding to the existing supports of the bridge structure. The task also includes local extension and adaptation of the road infrastructure to the road bridge being rebuilt. The reconstruction is aimed at ensuring minimum clearance under the structure and enabling effective icebreaking operations on the Odra. In view of the need to ensure continuity of traffic on national road No 29, a temporary bridge will be built for the time of reconstruction of the existing bridge.

Institutional, legal and administrative conditions

The Task, as regards its characteristics, anticipated potential environmental impacts and location in relation to protected areas, shall be carried out in accordance with relevant national environmental legislation and relevant World Bank policies.

Status of administrative procedures for EIA

For the Task in question, in accordance with the requirements of national legislation, the Consultant, acting on behalf of and for the benefit of the Polish Water Holding Polish Waters, obtained a decision on the environmental conditions of the project implementation (environmental decision). The decision on environmental conditions was issued by the Mayor of Krosno Odrzańskie on 2 March 2020. (ref. no. GN.6220.10.13.2019.MKu.). A copy of the decision is attached as Appendix 4a to the EMP.

Condition of environmental elements in the vicinity of the Task

As a result of works connected with identification of natural and cultural assets, it was found that the area of Task implementation and its surroundings are characterized, among others, by the following environmental conditions:

- The planned Task is located within one unit of the Unified Body of Surface Water UBSW Odra from Czarna Struga to Nysa Łużycka with code PLRW6000211739 and within the catchment area of the unified body of groundwater No. 68 with code PLGW600068; the northern part of Krosno Odrzańskie (at the height of Stary Raduszec) is located within the range of the Main Underground Water Reservoir No. 149 Sandr Krosno-Gubin;
- in the area of the Task implementation, the following vascular plant sites were found to be under protection: the floating fern (Salvinia natans) and the water caltrop (Trapa natans*)*. In the area of the investment a protected natural habitat of 3270 flooded muddy river banks with vegetation of *Chenopodion rubri* p.p. and *Bidention* p.p. was found;
- it is possible to have a protected beetle (hermit beetle Osmoderma eremita) and two mussel species (swan mussel Anodonta cygnea, depressed river mussel Pseudoanodonta complanata);
- protected species of amphibians and reptiles can be found in the vicinity of the Task area: the green frogs Pelophylax esculentus complex (Pool frog Pelophylax lessonae,

Marsh frog P. ridibundus, Edible frog P. esculentus), the grass snake Natrix natrix and common toad *Bufo bufo*;

- in the Odra River, due to suitable habitats in the close vicinity of the Task implementation area, the occurrence of protected species of fish: European bitterling Rhodeus amarus, spined loach Cobitis taenia, the stone loach barbatula barbatula;
- the area around the planned Task is inhabited by typical synanthropic species of birds such as the sparrow *Passer domesticus*, the common blackbird *Turdus merula*, the Eurasian collared dove *Streptopelia decaocto*, the great tit Parus major, the white wagtail Motacilla alba, the black redstart Phoenicurus ochruros, the common chaffinch Fringilla coelebs. On the Odra's bank, the little ringed plover *Charadrius dubius* (1 site) and the feeding of the grey heron *Ardea cinerea* and the mallard *Anas platyrhynchos* were found. The most exposed to activities related to the implementation of the Task is the common house martin Delichon urbica colony operating within the bridge. The swallows nest on a metal structure underneath the bridge;
- in the vicinity of the Task area, the European beaver *Castor fiber* and the European otter *Lutra lutra*, the squirrel *Sciurus vulgaris* and the hedgehog *Erinaceus sp.*were found, as well as bats, including three species of bats listed in Appendix II of the Habitat Directive: the western barbastelle Barbastellus barbastellus, the greater mouse-eared bat Myotis myotis, the pond bat Myotis dasycneme;
- The road bridge in Krosno Odrzańskie is a monument within the meaning of the Act of 23 July 2003 on the protection and care of monuments (Journal of Laws 2003 No. 162 item 1568), entered in the register of monuments under No. L600/A by the decision of the Voivodeship Monument Conservator dated 13.08.2013 and is subject to legal protection regardless of its status. The monument is also the spatial layout of the town of Krosno Odrzańskie, within which the planned expansion is located. In the immediate vicinity of the works, about 2 m from the planned Task, there are defensive walls, which are also a monument entered in the listed under the number K.O.K.I-248/61, as well as the house at ul. Bolesława Chrobrego 2 listed in the register of monuments under number 2504;

Potential impact of the Task on environment

Earth surface and landscape

The implementation of the Task will have a moderate negative impact on the land surface and landscape, mainly due to the presence of a temporary bridge and construction site facilities. However, due to their periodical and linear nature and the fact that the task concerns the reconstruction of the existing facility, taking into account the recommendations of the conservator, no significant impact is expected in the long term. Impacts will mainly occur during the implementation phase of the Task, permanent impacts will not occur.

Climate

Due to the local character and the relatively small scope of the Task, no negative impacts on the climate are expected to occur.

Ambient air

Emissions of dust and gas pollutants will occur primarily during the construction phase. During the operation phase, after the completion of construction works, no significant emissions of pollutants into the air are expected.

Soils and land

The reconstruction of the bridge over the Odra River together with the accompanying infrastructure and reconstruction of the road will involve changes in the soil cover in the vicinity of the bridge at the stage of the Task implementation. The expected deterioration of soil conditions will also take place within technological roads and construction facilities. Soil contamination can potentially occur as a result of leakage of operating fluids from construction machinery and transport vehicles. Most impacts will be periodic in nature. At the operation stage of the structure, possible impacts may result from the necessity to carry out maintenance and upgrading works.

Surface waters

The impact on the environmental objects set for the UBSW was assessed as insignificant, limited to the construction period. It may result from a periodic, local increase in suspension concentration, uncontrolled leakage of petroleum substances from working machines (as a result of failure) or a local change in the bank and riverbed structure and, consequently, changes in the habitat conditions in the section covered by the works (change of water flow conditions, course of the riverbed processes and fluvial processes).

Impacts during the implementation phase will be effectively minimised to prevent medium-term impacts on populations of aquatic organisms. The investment constitutes a part of the investment specified in aPGW as "*Renovation and modernization of the free-flowing Odra river regulatory buildings - reconstruction and modernization of regulatory structures– in order to adapt the section of the Odra from Malczyce to the mouth of the Nysa Łużycka to the third (III) class waterway,* (ID A_582_O).

Groundwater

During the implementation phase of the Task consisting in the reconstruction of a road bridge, negative impacts on the unified body of groundwater may potentially occur as a result of pollution emissions. Once mitigation measures are implemented, such risks are not expected to occur. After completion of the works, during the exploitation phase, no impact on the state of the UBGW is expected. The above indicates that the implementation of the investment does not affect the quantity and quality of the UBGW.

Acoustic climate

At the stage of investment implementation, the noise emission will be generated by the operation of machines and heavy construction equipment and the movement of vehicles serving the construction site. The range of noise impact associated with the construction will depend on the type of machines used, the number of machines running simultaneously and their operating time. The sound power level of most construction machines and chain saws is within

the L_{WA} = 105- 115 dB. Noise generated at the stage of investment execution will be dispersed, emitted only during the daytime. At the operation stage, the emission of noise into the air will result from the operation and movement of machines and vehicles necessary for possible upgrading and maintenance work. Emissions will take place at intervals. No change in noise emissions at the operating stage is foreseen compared to the current situation. Therefore, after performing acoustic analyses for the exploitation stage of the project, there is no need to install additional elements limiting noise emission.

Flora, fauna and protected areas

The task will be implemented within the boundaries of Natura 2000 sites Krosno Odra Valley PLH080028 (Special Habitat Protection Area) and Middle Odra Valley PLB080004 (Special Bird Protection Area).

The site and its immediate surroundings have a small habitat patch of 3270 flooded muddy river banks with *Chenopodion rubri* vegetation p.p. and Barbastella p.p., being subject of protection in the Natura 2000 site Krosno Odra Valley PLH080028.

The habitat will be temporarily destroyed (as the result of works performance) on an area of 0.03 ha, which constitutes 0.03% of the habitat resources in the Natura 2000 site. Once the construction is completed, there will be no factors limiting the formation of this community. Due to the fact that the habitat is spontaneous, pioneering and short-lived - it develops during the low water season and maintains one or two seasons, there are no other possibilities to support its development apart from restoring the bank. Due to the above, there is no threat of significant negative impacts on the Natura 2000 site, and the works related to restoration of the character of the river banks will not affect the state of habitat protection and thus the protection objectives of the Natura 2000 site Krosno Odra Valley PLH080028. The river bank revetment works carried out as part of the implementation are carried out on a point (local) basis, therefore there will be no permanent negative impact on the habitat resources. In relation to the area of the Middle Odra Valley PLB080004 no negative impacts on bird species being the subject of protection of the Area were found.

The implementation of the Task will have an impact on protected plant species: *Trapa natans* and Salvinia *natans*. Prior to the work, plant sites at risk of destruction will be moved to other parts of the channel not covered by the work.

The implementation of the Task will result in local, short-term impacts, resulting from the works in the Odra river channel, associated with the scaring of fish and mammal species, the transformation of fish micro-habitat sites in the riverbed. Within the bridge's structure, there are also a nest of common house martin *Delichon urbicum*. Appropriate deadlines and other mitigation measures have been adopted to ensure that the impact on the species population is short-term and limited to the duration of the works. After completion of the works, the common house martins will be able to reoccupy the bridge structure.

Cultural monuments and structures

The road bridge over the Odra River in Krosno Odrzańskie is a monument under conservation protection. The spatial layout of the town of Krosno Odrzańskie from the middle of the 13th century is also under such protection. When applying activities aimed at the protection of

structures and requirements resulting from the arrangements made by the Voivodeship Monument Conservator (including the obligation to ensure archaeological supervision) and general provisions of the Act on the protection of monuments, the implementation of the Task will not involve a significant impact on the monuments and cultural landscape of the area.

As far as the protection of structures is concerned, the implementation of the Task will improve the flood safety of the areas within the city and municipality of Krosno Odrzańskie. In the vicinity of the Task implementation area there are retail and service facilities and residential buildings. On the right bank of the Odra River, above the site, there is a marina for water tourism.

Waste

In connection with the implementation of the planned works, including the reconstruction of the road infrastructure, the existing bridge and the demolition of the temporary bridge after the completion of the works, mainly waste classified as waste from the construction, repair and dismantling of buildings and road infrastructure will be generated. This waste will be generated at the project implementation stage and its volume will be significant. The second group of waste generated at the implementation stage will be municipal waste, but its volume will be small. The likelihood of asbestos-containing waste is negligible, and no asbestos-containing facilities have been identified for the planned work.

Human health and safety

The implementation of the Task does not generate significant threats to human health and safety. They may occur in the event of accidents, catastrophes and other random events (such as pollution leakage, fire, unexploded ordnance or flooding). Increased safety risks are associated with works conducted on the water and in the bank area.

Mitigation and monitoring measures

Chapters 6 and 7 and in the Appendix 1, 2 to EMP describe and present in a table form a set of mitigation and monitoring measures to eliminate or reduce the negative environmental impacts of the Task and to ensure effective implementation of the terms of the EMP. These activities include conditions specified in the environmental decision issued for the Task, as well as additional conditions formulated at the stage of works on the EMP.

Public consultations.

Chapter 8 of the EMP presents an account of public consultations carried out as part of the procedures related to the environmental impact assessment of the planned task, including of:

- public consultations of the Environmental and Social Management Framework Plan for OVFMP (2015);
- public consultation carried out during the environmental decision making stage of the Task (2019);
- public consultation of this Environmental Management Plan (2020).

1. INTRODUCTION

Environmental Management Plan (EMP) for the Contract for works 1B.1/1 (b) *Rebuilding of the road bridge in Krosno Odrzańskie jointly with access roads.*

1.1. ODRA-VISTULA FLOOD MANAGEMENT PROJECT (OVFMP)

The aim of the Odra-Vistula Flood Management Project (OVFMP) is to increase the level of flood protection for people living in selected areas of the Odra and Upper Vistula river basins and to strengthen the institutional capacity of government administration to provide more effective protection against summer and winter floods and flash floods.

The project consists of five Components:

Component 1 - Flood Protection of Middle and Lower Odra River, including:

Subcomponent 1A - Flood protection of areas in Zachodniopomorskie voivodship;

Subcomponent 1B Flood – Flood Protection on the Middle and Lower Odra;

Subcomponent 1C Flood – Flood protection of Słubice city.

Component 2 - Flood protection of the Kłodzko Valley, including:

Subcomponent 2A - Active protection;

Subcomponent 2B - Passive protection.

Component 3 - Flood Protection of Upper Vistula, including:

Subcomponent 3A - Flood protection of Krakow and Wieliczka;

Subcomponent 3B - Flood protection in Sandomierz and Tarnobrzeg;

Subcomponent 3C - Passive and active protection in the Raba River basin;

Subcomponent 3D - Passive and active protection in the San river basin.

Component 4 - Institutional strengthening and upgrading of the forecasting system

Component 5 - Project Management and developing further studies

Detailed information and additional documents concerning the OVFM Project are available on the website of the Project Coordination Unit for the Odra-Vistula Flood Management Project (http://odrapcu2019.odrapcu.pl/) and on the website of the World Bank(http://documents.worldbank.org/curated/en/docsearch/projects/P147460).

1.2. FLOOD PROTECTION OF MIDDLE AND LOWER ODRA RIVER (COMPONENT 1 OVFMP)

Component 1 of OVFMP called *Flood protection in the Middle and Lower Odra* is aimed at protecting against flooding by strengthening protection against summer and winter floods within the settlements along the Odra.

3 Sub-Components will be implemented under the Component 1:

Subcomponent 1A - Flood protection of areas in Zachodniopomorskie voivodship;

Subcomponent 1B - Flood Protection of the Middle and Lower Odra;

Subcomponent 1C - Flood protection of Słubice city.

Sub-Component 1B consists of the following tasks:

- 1B.1/1(a) Reconstruction of river control infrastructure on Odra River. Adaptation to the conditions of Class III roadway, along the section from Ścinawa to the mouth of Nysa Łużycka – stage II,
- **1B.1/1(b) Rebuilding of the road bridge in Krosno Odrzańskie jointly with access roads**

  The Task implementation is aimed at ensuring minimum clearance under the bridge structure in order to run effective icebreaking operations on the Odra. The works are compatible with the parts of the OVFM Project carried out within the so-called Border Odra,
- 1B.2. Modernization works on boundary sections of Odra River, to provide good condition for ice –breaking,
- 1 B.3/1 Stage I - Construction of docking-mooring infrastructure for ice-breakers,
- 1B.3/2 Stage II - Construction of docking-mooring infrastructure on the Lower Odra River and the border and new marking of the navigation route.
- 1B.4/1. Improvement of flood water-flow in winter from Dąbie Lake
- 1B.4B/2. Dreding of Klucz-Ustowo ditch
- 1B.5/1. Bridge reconstruction to ensure minimum clearance - railway bridge in km 733.7 of Regalica river in Szczecin.
- 1B.5/2. Bridge reconstruction to ensure minimum clearance - road bridge in km 2.45 of the Warta River in Kostrzyn upon Odra.
- 1B.5/3. Bridge reconstruction to ensure minimum clearance - railway bridge in km 615.1 of the Odra River in Kostrzyn upon Odra.
- 1B.6. Flood protection: Nowa Sól and below Krosno Odrzanskie 1B.6/1. Nowa Sól stage I and II, 1B. 6/ 2. Wężyska - Chlebowo.
- 1B.7. WFS Widawa- the rebuilding of the flood management system of the municipality of Czernica, Długołęka, Wisznia Mała and Wrocław.
- 1B. 8 Flood – Protection of Krosno Odrzańskie.

2. TASK DESCRIPTION

2.1. TASK LOCATION

From the administrative point of view, the task planned for implementation is located in the city of Krosno Odrzańskie, in the municipality of Krosno Odrzańskie (Lubuskie Voivodeship).

Road bridge, located in km 53+067 of national road no. 29 (ul. [Street] Trakt Książęcy in Krosno Odrzańskie), which runs from the state border with Germany in Słubice to Połupin near Krosno Odrzańskie (to DK 32), is a crossing of the Odra River. The bridge is managed by GDDKiA, branch in Zielona Góra.

The bridge is located on the Odra Waterway, which is administered by the State Water Holding Polish Waters RZGW in Wrocław. The bridge is located in km 514+100 of the Odra River. In the Appendix 5a to EMP presents the location of the individual elements of the Task.

Fig. 1Schematic location of the Task 1B.1/1(b).

2.2. CHARACTERISTICS OF THE TASK

The scope of the Task includes reconstruction of the existing road bridge in order to ensure minimum clearance under the structure and enable effective icebreaking action on the Odra

River and adaptation of the existing crossing in possible aspects[1] to the conditions set by the Regulation of the Minister of Transport and Maritime Economy of 30 May 2000 on *technical conditions to be met by road engineering structures and their location*. The minimum required clearance under the object, above the Highest Seawater (WWŻ), is 5.25 m and must be maintained throughout the entire width of the fairway. In addition, the task also includes local extension and adaptation of the road infrastructure to the road bridge being rebuilt. The reconstruction of the bridge in Krosno Odrzańskie is connected with other activities carried out within the OVFM Project.

In view of the need to ensure continuity of traffic on national road No 29, a temporary bridge will be built for the time of reconstruction of the existing bridge. The construction of a temporary bridge is necessary due to the lack of a practical alternative to the adopted traffic organisation. The nearest bridge over the Odra River is located within the S3 road (tens of kilometres away; a detour through Zielona Góra) and there is no possibility to make a detour traffic. Other places for the location of the temporary bridge cannot be realised due to the lack of road connections with the possibility to place the crossing. Due to the layout of the road network, the technology of the works and the historic character of the bridge, it is not possible to carry out the works in such a way as to enable traffic through the reconstructed bridge during the works. Without a temporary bridge, the town of Krosno Odrzańskie remains without an internal connection. The detailed scope of work will be established in the Maintenance Conservation Works Programme.

The following scope of work is planned under the Task:

- construction of a temporary bridge with access roads,
- raising the existing load-bearing structure of the bridge structure,
- building up the existing supports for the bridge structure,
- extension of national road No 29 in the section covered by the study,
- extension of the intersection of national road no. 29 with ul. [Street] Podgórna and ul. [Street] Nadodrzańska,
- reconstruction of the intersection of national road no. 29 with ul. [Street] Murna and ul. [Street] Słoneczna,
- construction of retaining walls on access roads to the bridge,
- a sectional strengthening of the slopes of the Odra River,
- construction/ reconstruction of sidewalks and footpaths,
- rebuilding individual exits,
- execution of road and pedestrian safety elements,
- reconstruction of the existing LV power grid,
- reconstruction of the existing MV power grid,
- reconstruction of existing road lighting,
- reconstruction of the existing telecommunications network,

[1] Due to the fact that the bridge in Krosno Odrzańskie has been granted conservation protection, the works performed will not achieve all technical parameters required for this type of structure (e.g. required permissible load of GP class road, distance of drainage axis from the edge).

- reconstruction of the existing water supply system including the mains,
- correction of roadway drainage, including reconstruction of the existing rainwater system,
- reconstruction of the discharge sanitary sewer,
- reconstruction of the general sewage system,
- reconstruction of the district heating network,
- the reconstruction of the gas pipeline.

Phot. 1 The existing bridge in Krosno Odrzańskie.

The location of the elements of the Task is presented in Appendix 5b to the EMP.

2.3. TYPE OF TECHNOLOGY

2.3.1. BRIDGE BEING REBUILT

EXISTING STATE

The road bridge in question is located in km 53+067 of national road No. 29 (Trakt Książęcy) in Krosno Odrzańskie (km 514+100 of the Odra River), being the only crossing of the Oder River in Krosno Odrzańskie and within a radius of several dozen kilometres. The nearest crossings are located about 36.5 km above Krosno Odrzańskie, within the S3 expressway in Cigacice and about 46.5 km below Krosno Odrzańskie, within the A2 motorway in Świecko.

The structure was built in 1905 by the Beuchelt & Co. Bridge and Steel Construction Factory replacing the earlier wooden crossing, located below, obliquely to the riverbed. The bridge,

which was damaged during the warfare, was rebuilt, and it was also modernized and repaired several times to increase its load capacity and durability. The structure is under strict conservation protection on the basis of the entry in the register of monuments of Lubuskie Voivodeship of 13.08.2013, entry number L-600/A.

The structure is a road bridge with a drive down, with a three-span, trussed and rivetted steel structure, based on four massive supports: two abutments and two pillars, situated in the river current.

Two-beam bridge superstructure, with a drive down. Main lattice girders with curved chords, more than doubling the height above the intermediate supports, three-spanning, with a static scheme of a continuous hinged beam, in a gerber's system. End support spans, with a support overhang of 15.51 m and a total length of 62.52 m (dimensions in axes of lattice girder bars). The hanging span with a the length of 38.50 m was completely reconstructed after the war damage. The axial spacing of the main girders is 7.45 m, the bracing of the main girders is provided by the bottom cross-beams with a tin plate structure, the top, above the pillars, portal gates with a sophisticated architecture, which is a characteristic architectural accent of the crossing. Main truss girders, post and cross girders, in the N-shape, with two-branch bars connected by bracing (crossbars and support posts) and solid-walled (other posts and chords).

The structure has double-sided, external lattice grating paving supports, limited by original historical balustrades. The bridge is occupied by a roadway with a bituminous surface limited by curbs, pedestrian walkways are located on supports. Roadway width is 6.00 m, pavement width 2×2.00 m.

Massive supports, stone, with a concrete core, directly set up, in a cover of wooden sheet piling walls, partly with reinforcement of the ground with wooden piles and by soil replacement. The bridge's structure is a cross-beam-rail scaffolding with originally trough-filled sheets, after the renovation carried out in 1998, partially replaced by a reinforced concrete collaborating plate.

Fig. 2 A diagram of the existing bridge in Krosno Odrzańskie.

The main technical and utility parameters of the existing structure are as follows:

- load class according to PN-S-10030:1985 — D (200 kN)
- theoretical spans length — L_t = 47.01 + 69.52 + 47.01 m
- clearance length of the sailing bay — L_0 = 67.15 m (at WWŻ level)
- width of the navigable gauge — $L_Ż$ = 36.80 m (as determined by A.10)
- length of superstructure — L_1 = 166.50 m
- total length of the structure (with wings) — L_2 = 171.15 m
- total width of the span — B = 11.98 m

– bevel angle	$\alpha = 90°$
– construction height (outer span)	$h_{k1} = h_{k1} = h_{k3} = 1.13$ m
– construction height (middle span)	hk2 = 0.97 m
– WWŻ ordinate (Kronstadt 86)	$H_{WWŻ}$= 41.06 m above sea level.
– minimum bottom ordinate span)	$H_{k,min}$ =44.87 m above sea level. (in the middle of the $H_{k,min}$ = 44.79 m above sea level. (on the th. of water fairway)
– constr. bottom elevation above	WWŻ h_{min} = 3.73 m
– roadway width	B_j = 2x3.00 m
– pavement width	B_{ch} = 2x2.00 m
– technical road class	GP 1x2

DESIGN STATUS

Increasing the vertical clearance above to min. 5.25 m, in order to carry out effective icebreaking actions, it requires reconstruction of the existing bridge structure, construction of retaining walls limiting access fills and execution of additional works related to the implementation of the investment, including the construction of a temporary detour bridge and additional supports and technological elements enabling the execution of works.

The reconstruction of the existing, historic permanent bridge includes an increase in the span structure by 1.84 m with simultaneous renovation and reinforcement, as well as the reconstruction and reinforcement of the existing supports in order to adjust the height to the changed facility's new structure. The following works will be carried out as part of the reconstruction of the facility:

- demolition of surfaces and third party devices, disassembly of elements of equipment intended for decommissioning,
- raising the span structure to the assumed level, i.e. by 1.84 m,
- disassembly of bearings,
- reconstruction of supports and wings including the disassembly of stone bossages of the upper parts of the supports, construction of the superstructure of supports and wings in reinforced concrete technology with stone lining reproducing the original layout of bossages, reassembly of the bossages crowning the supports, including the bearing bed blocks,
- reinforcement of the foundation of the rebuilt supports by making perimeter sheet piling walls from steel sheet piles with a reinforced cap beam,
- insulation of ground parts of abutments and wings,
- protection of exposed support and wing surfaces by hydrophobization and in case of abutments and wings additionally by anti-graffiti coating,
- cleaning, repair, anti-corrosion protection, maintenance and reassembly of bearings together with their rectification,
- setting of bays on spans,
- reinforcement of selected elements of the span structure,
- Strengthening of the railings,
- cleaning and anti-corrosion protection of the steel structure of the spans,
- tight drainage system,

- installation of the expansion joint,
- laying insulation and surface on the structure,
- channel's slope reinforcement: on the left bank, the reconstruction of the bank protection dismantled to enable the reconstruction of the abutment wings, on the right bank in the area of the bridge, in a section approx. 27 m above and 37 m below the structure (included in the description of retaining structures),
- new lighting on the object partly modelled on the historical one, partly with luminaires discreetly integrated in the fields of lattice girders,
- installation of third party devices in protective tubes: power and teletechnical cables,
- installation of navigation signs in a system adapted to the width of the fairway.

The basic technical and utility parameters of the structure <u>after the reconstruction</u> are as follows (boldly, the parameters that are changed):

– load class according to PN-S-10030:1985	**C (300 kN)**
– theoretical spans length	L_t = 47.01 + 69.52 + 47.01 m
– clearance length of the sailing bay	L_0 = 67.15 m (at WWŻ level)
– width of the navigable gauge	**$L_{Ż}$ = 50.00 m** (as determined by the signs A.10)
– length of superstructure	L_1 = 166,50 m
– total length of the structure (with wings)	L_2 = 171,15 m
– total width of the span	B = 11,98 m
– bevel angle	α = 90°
– construction height (end span)	$h_{k1} = h_{k1} = h_{k3}$ = 1.13 m
– construction height (middle span)	h_{k2} = 0.97 m
– WWŻ ordinate (Kronstadt 86)	$H_{WWŻ}$= 41.06 m above sea level.
– minimum bottom ordinate	**$H_{k,min}$** =46.71 m a.s.l. (in the middle of the span) **$H_{k,min}$ = 44.79 m a. s. l.** (on the th. of water fairway)
– constr. bottom elevation above WWŻ	**h_{min}** = 5.35 m
– roadway width	B_j = 2x3.00 m
– pavement width	B_{ch} = 2x2.00 m
– technical road class	GP 1x2
–	

2.3.2. RETAINING STRUCTURES

EXISTING STATE

At present, the access to the bridge from the north side is carried out at ground level, access on the south side in a small fill that does not need to be limited by retaining structures.

DESIGN STATUS

Due to the increase in the number of access roads to the facility and the lack of possibility to make fills with a safe slope inclination, access roads limited by retaining walls were designed. Retaining walls will be located on both sides of the river, on the sections where the elevation

of the above ground level makes it impossible to build classic road embankments with slopes of safe inclination. Angular, reinforced concrete retaining walls construction, direct foundation. A total of six wall sections were designed: four parallel to the river on the right bank (two in the course of ul. [Street] Bolesława Chrobrego, two in the course of ul. [Street] Nadodrzańska) and two perpendicular to the river on the left bank (within Trakt Książęcy). The structures will be made on both sides of each of the access roads, in the area of the designed roundabout with a turnout in the direction of ul. Podgórna. In the area of the northern abutment of the bridge, the riverbed slope will be additionally strengthened on a section of about 27 m above and 37 m below the bridge, whose task will be to protect the retaining structures against washing away. Slope inclination 1:1.5, reinforcement made of granite cubes 150/170 mm on cement and sand mortar, with joint filling with cement mortar. The reinforcement will be supported by a concrete foundation 300x1200 mm, additionally insured on the channel side with a 50 cm thick stone riprap. The topping of the reinforcement at the contact with the wall is a 0.50 m wide horizontal shelf.

The basic technical and utility parameters of the designed walls are as follows:

- load class according to PN-S-10030:1985 — A (500 kN)
- height of walls variable within — $h \approx 0.5 \div 3.5$ m
- length in extension (ul. (Chrobrego) — L_1 = 42,2 m (from the river channel side)
  L_2 = 41.6 m
- length in extension (ul. Nadodrzańska) — L_3= 76.8 m (from the river channel side)
  L_4 = 55.2 m
- length in extension (Trakt Książęcy) — L_5 = 69.4 m
  L_6 = 66.8 m

2.3.3. TEMPORARY BRIDGE

In order to maintain continuity of traffic during the reconstruction of the main bridge, it is planned to erect a temporary detour bridge located on the upper water side, obliquely to the riverbed and to the existing permanent structure. The structure of the facility is foldable, three-span, freely supported, with a drive down. Main lattice girders, connected at the bottom by cross-beams, with additional girder in the axis of the structure. Roadway platform made of system panels, laid on crossbars and additional stringers. Pedestrian walkways, located on supports, outside lattice girders, on both sides of the building. Combination of spans and assembly by longitudinal sliding from the left-hand edge.

The spans are based on four supports of different construction. Extreme supports (abutments) will be made of reinforced concrete road slabs, laid on access fills, limited by tight walls from anchored steel sheet piles, stiffened with beams. Intermediate supports (pillars), located in the current, will be made of pipe piles driven into the bottom of the river, topped with caps of rolled steel beams. Intermediate supports will be additionally insured with cut-off walls made of steel sheet piles.

Temporary lighting will be installed on the bridge and bypass power and teletechnical cables will be suspended.

The main technical and utility parameters of the structure are as follows:

– load class according to PN-S-10030:1985	C (300 kN)
– theoretical spans length	L_t = 42.59 + 60.96 + 51.73 m
– clearance length of the sailing bay	L_0 = 54.71 m (lim. by cut-off wall)
– width of the navigable gauge	LŻ = 30,00 m (as determined by A.10)
– length of superstructure	L = 155.78 m
– total width of the span	B = 12,73 m
– bevel angle	α = 81°
– construction height	h_k = 0.95 m
– WWŻ ordinate (Kronstadt 86)	$H_{WWŻ}$= 41.06 m above sea level.
– minimum bottom ordinate	$H_{k,min}$ =45.06 m a.s.l. (in the mid. span)
– constr. bottom elevation above	WWŻ h_{min} = 4.00 m
– roadway width	B_j = 2x3.00 m
– pavement width	B_{ch} = 2x1.50 m

2.4. DESCRIPTION ROAD WORKS SOLUTIONS

The road infrastructure, which is the subject of this study, has been designed to adapt to the reconstruction of an existing road bridge to provide minimum clearance to ensure effective icebreaking action.

The detailed scope of the study includes:

- extension of the national road no. 29 (ul. [Street] B. Chrobrego / ul. [Street] Trakt Książęcy) at the section from km 52+953.84 to km 53+374.03 (global chainage DK29), i.e. at a length of about 420m, the width of the roadway is 7.00m, the width of the roadway on the bridge - 6.00m,
- surface works on national road no. 29 (ul. B. Chrobrego) a section from km 52+907.88 to km 52+953.84 i.e. the length of approx. 46m,
- extension of municipal road No 101658F (ul. Nadodrzańska) from km 0+000.00 to km 0+092.80, i.e. at a length of about 93m, the width of the roadway is about 6.00m,
- extension of municipal road No 101659F (ul. Podgórna) from km 0+000.00 to km 0+054.12, i.e. at a length of about 54m, the width of the roadway is about 8.00m,
- extension of municipal road No 101603F (ul. Murna) from km 0+000.00 to km 0+018.30, which is about 18m long, the width of the roadway is about 9.00m,
- extension of municipal road No 101654F (ul. Słoneczna) from km 0+000.00 to km 0+051.49, i.e. at a length of about 51m, the width of the roadway is about 6.00m,
- extension of the existing crossroads of the national road no. 29 with the municipality road no. 101658F (ul. Nadodrzańska) and the municipality road No 101659F (ul. Podgórna) at km 53+053.87 (global chainage DK29),
- extension of the existing crossroads of the national road no. 29 with the municipality road no. 101654F (ul. Słoneczna) and the municipality road No 101603F (ul. Murna) at km 53+323.36 (global chainage DK29),
- construction/reconstruction of sidewalks,
- construction of temporary detour.

Intersection of national road no. 29 with ul. [Street] Nadodrzańska and ul. [Street] Podgórna was designed as a sewered crossroads with circular traffic (roundabout) with a priority for vehicles travelling on the roundabout. Intersection of national road 29 with ul. [Street] Murna and ul. [Street] Słoneczna was designed as a four-arm crossroads partially sewered with priority for vehicles travelling on national road No. 29.

2.5. DESCRIPTION OF NETWORKS SUBJECT TO REBUILDING

2.5.1. CONSTRUCTION AND RECONSTRUCTION OF SANITARY NETWORKS

The designed sanitary networks are located mainly in the right-of-way. As part of the reconstruction of the sanitary networks, app.:

Rainwater sewer designed PP/PE/PVC pipes:

- DN600; L=60lm,
- DN300; L=472lm,
- DN250; L=41lm,
- DN200; L=274lm.

Sanitary sewerage and general-purpose PP/PE/PVC pipes:

- Dz225; 378lm,
- Dz160; 111lm,
- DN600; L=35m,
- DN500; L=21lm,
- DN400; L=11lm,
- DN200; L=39lm.

Water supply system (including the mains) PE and spun cast iron pipes:

- Dz400; L=136lm,
- Dz315; L=366lm,
- Dz250; L=663lm,
- Dz225; L=52lm,
- Dz110; L=233lm,
- Dz50; L=24lm,
- Dz32; L=70lm,

PE pipes gas network:

- Dz225; L=46lm,
- Dz160; L=153lm,
- Dz63; L=14lm
- Dz25; L=17lm.

Lengths and diameters of the network may change to a small extent when approving design documentation with the network operators.

Due to the fact that the majority of the network is located in the road strip of the reconstructed streets, the reconstruction of the surface is planned only in the section of the water supply system in the area of ul. Murna, stormwater drainage (to the W1 outlet), mains and sanitary sewage system in the area of the square and ul. [Street] Słoneczna and a fragment of the sewage system in ul. [Street] Podgórna. Length of the pavement restoration approx. 340 lm with a width

of 4m. In addition, the need to reconstruct the surface (about 600m^2) will be in the area of the drive pit (to be drilled under the bottom of the river) in the area of ul. [Street] Słoneczna,

2.5.2. CONSTRUCTION AND RECONSTRUCTION OF ROAD LIGHTING

For the Project in question, it is planned to build lighting for the target as well as for the temporary bridge and all minor roads with crossings, as well as to illuminate pavements and pedestrian crossings.

The road lighting will be designed in accordance with the regulations and standards and guidelines received from the voivodeship conservator.

The location of the poles, their height and the type and power of the luminaires will be selected based on computer simulations performed in the calculation program.

The silhouette and type of poles and luminaires will be selected according to the design guidelines of the owner/manager of lighting and the voivodeship conservator.

Astronomical clocks will be used to switch the lighting on and off without the need for time corrections due to seasonal variations.

The designed lighting will be supplied by means of cables with a cross-section adapted to the expected load from the lighting cabinets. The lighting will be designed to provide effective primary and secondary electric shock protection (automatic power off).

2.5.3. LV AND MV POWER GRID

Conflicting MV cable lines will be rebuilt outside the conflicting area in accordance with the issued rebuild conditions. The cross-section of the designed cable line sections will be adapted to the existing load, while the ends of the designed MV cables will be connected to the existing ones by cable joints.

Existing LV cable lines in conflict with the designed road system are to be rebuilt. The cross-section of the designed cable line sections will be adapted to the existing load, while the ends of the designed LV cables will be connected to the existing ones by cable joints.

Existing LV and MV cable lines will be over excavated at the sites of lowering of the area.

In the area of intersections with the designed road system and the designed (or existing) ground utilities, LV and MV cable lines will be secured with the appropriate type of casing pipes.

Conflicting LV l. poles will be rebuilt outside the conflict area using spun concrete pole with the top strength of the column adapted to the line mechanical loads.

2.5.4. TELECOMMUNICATIONS NETWORK

In the area of the study, there were conflicts between the ground telecommunication lines and owned by telecommunications operators with the planned road system.

In order to eliminate earth conflicts, it is designed to reconstruct and secure existing telecommunications networks by means of:

- construction of new sections of the underground cable ducting outside the conflict area with a total length of about 655.0m,
- construction of new sections of fiber optic cables in the designed cable duct system,
- construction of new sections of copper cables in the designed cable duct system,
- securing the existing sections of the cable duct system by means of split casing pipes type HDPE-D Φ160,
- protection of existing sections of cable and earth cables by means of split casing pipes type HDPE-D Φ110.

The depth of the sewage system is such that the smallest cover calculated from the top surface of the sewage system to the surface level is 0.7 m. In the section of the bridge structure being rebuilt, the sewerage system must be installed on the supporting elements of the bridge structure.

For the duration of the bridge reconstruction works, the construction of a 4-hole cable duct made of HDPE Φ110 type pipes laid on a temporary bridge object is planned.

2.5.5. PROCESS CHANNEL

Within the scope of the study, it is planned to build a technological duct in the form of a cableduct (KTu) made of 1 casing pipe type HDPE Ø110/6.3 and 3 optical fibre pipes type RHDPE Ø40/3.2 and 1 prefabricated bundle of microducts e.g. 7xØ10 together with reinforced concrete cable wells type SKR-2.

At the points of transition under the road, the process channel (KTp) should be made of 2 casing pipes (HDPE Ø110/6.3 and HDPE Ø160/9.1), of which 3 RHDPE Ø40/3.2 and 1 pre-fabricated bundle of microducts, e.g. 7xØ10, should be installed in one of them (Ø160).

In the section of the bridge structure being rebuilt, the sewage system should be installed in the form of 3 HDPE Ø110 pipes on the supporting elements of the bridge structure.

The total length of the designed process channel is about 420.0m.

2.6. TYPE OF TECHNOLOGY

2.6.1. ENGINEERING STRUCTURES

A detailed technology and organization design and work schedule will be prepared by the Contractor depending on the equipment and human potential, and will be subject to approval by the Contract Engineer. Below, there is a list of possible variants of work execution suggested by the Designer, with the decision on the final shape of the adopted technology being made by the Contractor and in agreement with the Contract Engineer. The technology and work organisation design prepared by the Contractor and approved by the Engineer, as well as the work schedule must take into account all the conditions resulting from the provisions of the Contract and the administrative arrangements and decisions issued, in particular the decision on environmental conditions, the water law permit and the decision on the building permit / permit for the execution of the road investment.

The expected duration of works related to Task 1B.1/1 (b) is about 22 months.

The expected duration of works related to Task 1B.1/1 (b) is about 22 months. The preliminary framework schedule of works is included in the table below.

Item No	Works elements	Start	Dura-tion	Completion
1	Construction of temporary bridge supports including fills	01/03/2021	90	30/05/2021
2	Putting together and sliding of the tempo-rary bridge	30/04/2021	60	29/06/2021
3	Installation of temporary bridge equipment	29/06/2021	30	29/07/2021
4	Implementation of the road system for ac-cess to the temporary bridge	29/06/2021	45	13/08/2021
5	Rebuilding of existing bridge	13/08/2021	425	12/10/2022
6	Construction of retaining walls on access roads to the structure	13/08/2021	270	10/05/2022
7	Fills and road layout for access to the struc-ture	01/03/2022	210	27/09/2022
8	Finishing works	27/09/2022	75	11/12/2022
9	Dismantling the temporary bridge	15/01/2023	45	01/03/2023
10	Dismantling the temporary bridge supports	01/03/2023	60	30/04/2023
11	Demolition of access roads to the temporary bridge	15/03/2023	30	14/04/2023
12	Ramming for waterworks	30/04/2021	90	29/07/2021
13	Relocation of utilities, construction of new network sections	02/04/2021	617	10/12/2022
14	Occupancy permit	01/05/2023	21	22/05/2023

BRIDGE BEING REBUILT

The main element of the work is lifting the load-bearing structure of the bridge by 1.84 m and settling it on the rebuilt supports. There are two options for carrying out the works: lifting in the axis of the structure, without transverse displacement, and lifting with the substructure shifted towards the bottom water at a distance that allows the work at the supports to be carried out freely.

In both variants it will be necessary to build appropriate mounting supports, in the first one only under the existing structure, in the second one also outside it, with a suitable track for the horizontal shift of the load bearing structure. The second option of carrying out the works is technologically more difficult as far as the construction of the spans themselves is concerned, as additional stiffening and reinforcement of the structure will be necessary, but it makes it much easier to carry out the reconstruction of the supports themselves, in particular the reinforcement of the foundations. The assembly supports are proposed to be made as yokes from pipe piles driven into the bottom of the riverbed, braced with top braces of rolled steel profiles. It is also possible to support the lifted spans on the rebuilt supports, but this requires the development of appropriate mounting stools and reinforcement of the support batches on which they will be placed. Possible mounting tracks for lateral displacement from rolled or welded steel beams.

In order to shorten the implementation time, works related to the renovation and reinforcement of the span structure should be carried out on technological supports, in parallel with the reconstruction and reinforcement of the supports.

Strengthening the foundation of the supports with steel sheet piling, sunk into the bottom of the channel using the vibration-free (pressed) method. Works related to reconstruction of supports and strengthening of foundations carried out in the river current will be carried out with the use of floating means such as barges and pushers, anchored rigidly in the zone of the works.

RETAINING STRUCTURES

The designed retaining structures will be placed directly, in places with soil replacement or reinforcement. Foundation excavations of smaller depth, located far from the active roadway, will be made as bulk excavations, with walls of safe gradient, deeper excavations or located in the vicinity of the active roadway in a casing of steel sheet pile walls, if necessary braced or anchored. The technological design for securing and draining the excavations will be developed by the Contractor and approved by the Contract Engineer. The performance of earthworks in the area of the existing underground utilities requires the supervision of the administrators of those utilities and the execution of daylighting. Work in the immediate vicinity of active utility networks should be carried out manually

TEMPORARY BRIDGE

It is planned to build a temporary bridge with a folding structure, assembled from small-sized lattice elements, based on military type constructions. Thanks to this, the integration and assembly of the structure in question is possible without the use of heavy equipment, requiring a large construction site, using only human force and small equipment such as jacks and hand

winches. The Contractor will independently organise a team of employees to carry out the works. It is not assumed that a separate housing base for employees is needed. The number of employees will vary over time during the period of work, depending on the types of works carried out.

The spans will be integrated on the right bank, in the axis of the planned temporary crossing, and due to lack of sufficient space in the assembly zone, gradually pushed from the southern abutment towards the northern one. The construction of the span enables its assembly by sliding, with the possible use of launching nose in the support part and ballasting the integrated part. Due to the shape of the temporary road level with longitudinal and central access inclination within the horizontal current span, it is necessary to adjust the position of the bridge span to the designed road level. During overlap, the span structure is made as a continuous, hinge-less one, after being put in the target position, the upper pins are unfastened, the structure is transformed into a continuous hinge-less one and the ends of the extreme spans are lowered into abutments.

The technology of making intermediate supports identical to that proposed for the technological supports for lifting the rebuilt bridge. Additionally, the supports will be insured with sheet piling walls made of steel sheet piles. The walls are immersed with the use of car cranes and vibrators, placed on floating means, anchored in a channel, or by means of the vibration-free method, by pressing.

Abutments and access roads in anchored sheet pile walls. The walls, especially in the vicinity of existing buildings, should be driven using the vibration-free method.

Due to the location of the end auger bore jacking pit of the reconstructed water supply system in direct proximity to the bridge's northern abutment and the significant pit of the chamber's bottom in relation to the level of driving the sheet piles of the abutment of the bridge, the construction of the northern abutment P1 **is possible only after the drilling works are completed and the auger bore jacking pit is backfilled.** Until then it is possible to make the remaining supports for the temporary bridge (P4 to P2) and to merge and overlap the span structure up to and including the support P2. Until the exploitation is completed and the northern abutment is liquidated, the walls of the drilling chamber **must absolutely remain in the ground** as an additional protection of the adjacent sheet piling wall of the abutment.

2.6.2. ROAD LAYOUT INCLUDING INFRASTRUCTURE

As far as road infrastructure is concerned, it is assumed that national road No. 29 will be extended on a section of about 420 m, two crossings will be extended, pavements/ pedestrian tracks will be rebuilt, as well as individual exits will be rebuilt.

DK29 intersection (ul. [Street] Bolesława Chrobrego / ul. [Street] Trakt Książęcy) from ul. [Street] Nadodrzańska and ul. [Street] Podgórna was designed as a crossroads with sewage system with circular traffic (roundabout). DK29 intersection (ul. [Street] Trakt Książęcy) from ul. [Street] Murna and ul. [Street] Słoneczna was designed as a four-entry intersection partially with sewage system. At the pedestrian crossing within the national road No. 29, an island was designed to divide the road, limited by 2 m wide curbs. Other necessary elements of the road

infrastructure and network (power, gas, heating, etc.) located in this area and necessary for reconstruction or relocation will also be constructed.

Order of works - first of all, a temporary detour will be built to connect the temporary bridge over the Oder River with the existing national road No 29. After the road and pedestrian traffic is diverted to a temporary detour, construction of the target road system will begin. This will be done in stages with the partial introduction of shuttle traffic on national road No 29. Once the works are completed, road and pedestrian traffic will be restored to the existing bridge structure.

2.6.3. TYPE OF DRAINAGE OF THE BRIDGE AND ROAD SYSTEM

The drainage of water from the reconstructed road system and bridge facility was designed by building and rebuilding a stormwater drainage system. The route of the designed channels has been adjusted to the planned land use and the existing and planned utilities. The planned investment due to the already existing network of works and yards, will have little impact on the change in the degree of surface sealing and will not increase the amount of water drained from the hardened surfaces.

Rainwater from the bridge facility will be connected to the designed sewage sections.

KD1 Channel - On the southern side of the bridge, a stormwater drainage new system was designed on the section of ul. Trakt Książęcy, ul. [Street] Słoneczna and ul. [Street] Murna with discharge to the Odra river. Before the outlet of the sewage system to the river, a pre-treatment system for stormwater was designed, including a settling tank and separator.

KD2 Channel- On the northern side, a new stormwater drainage system was designed. The area of the roundabout, bridge and section of ul. [Street] Bolesława Chrobrego drain was designed to drain through a new rainwater collector with a discharge to the river. Before the outlet, a pre-treatment system was designed, including a settling tank and a separator.

KD3 Channel - As part of the investment, the reconstruction of the stormwater drainage system designed upon the order of the Municipality of Krosno Odrzańskie. The reconstruction covers the section from ul. Podgórna together with the pre-treatment devices (settling tank and separator) and the outlet to the Odra River.

Before the outlets to the Odra River, the rainwater drainage systems (separator + settling tank) have been designed on the sections of the stormwater drainage system, which enable the pre-treatment of rainwater to the parameters required under Article 17 of the Regulation of the Minister of Maritime Economy and Inland Navigation of 12.07.2019 *on substances particularly harmful to the aquatic environment and the conditions to be met for the introduction of sewage into waters or into the ground, as well as for the discharge of rainwater or snowmelt into waters or into water facilities*.

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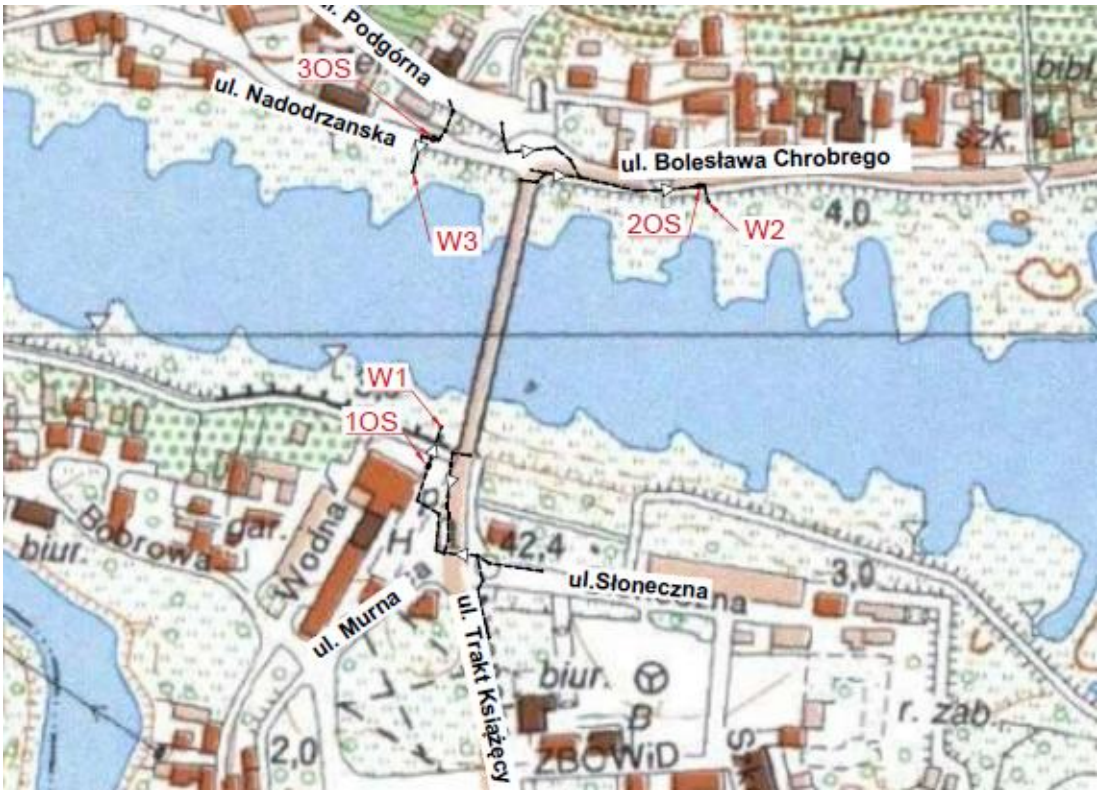

Fig. 3 Rainwater drain scheme.

The operation of the pre-treatment equipment must comply with the guidelines of the manufacturer of the equipment and the conditions of the water permit.

Waste accumulated in the treatment devices - code 13 05 08* (separators and settling tanks/sand traps) (waste catalogue subgroup 13 05 or additionally 19 08) are subject to processing (neutralization) as waste hazardous to the environment, in accordance with the provisions of the Act of 14 December 2012 *on waste* (Journal of Laws of 2015, item 21)

In the existing state, the drainage of the bridge is carried out through bridge gullies with direct discharge to the river, which makes it impossible to treat rainwater. The planned drainage system, due to the use of the treatment equipment, will affect the state of the environment in terms of reducing the amount of petroleum substances and mineral suspended matter discharged into the Odra River.

2.6.4. WORKING CONDITIONS AND BACK-UP FACILITIES REQUIREMENTS

Following Construction works due to their nature, organisation or location poses pose particular risk to human health and safety.

- works that pose a risk of being buried in the ground or falling from a height:
  - excavations with vertical walls without bracing more than 1.5m and excavations with a safe slope inclination more than 3.0m deep,
    - risk of burial under earthfalls during excavations for the road body, stormwater drainage, underground networks, rainwater treatment facilities, foundations, etc., during the entire period of work,

    - works, where there is a risk of falling from a height over 5.0m
        - during the construction and dismantling of engineering structures and electrical networks, during the entire construction period,
    - works performed using cranes:
        - in the construction and dismantling of engineering structures, reconstruction of overhead power networks and construction of road lighting,
- construction works involving the action of chemical substances or agents endangering human safety and health, and in particular:
    - works carried out at temperatures below -10°C,
    - demolition works of the underground technical infrastructure network including asbestos coverings,
    - related to the possibility of inhalation of toxic fumes, including paint solvents,
    - related to the possibility of flammable gases penetrating the telecommunication lines of the cable ducts,
- construction works that poses a risk of workers drowning:
- demolition of existing buildings located on the Odra River,
    - assembly of structural elements of engineering structures on watercourses and works carried out near flowing waters,
- construction works carried out in wells and other enclosed spaces:
    - when performing the stormwater drainage and rainwater treatment units, during the entire period of the works,
    - when carrying out the works in the vicinity of the active land development,
- construction works for the assembly heavy prefabricated elements whose weight exceeds 10Mg:
    - in the execution of the engineering facilities and the cleaning equipment assembly, during the entire period of the works,
    - when making the foundations of street lighting, mounting lighting poles,
    - when laying the foundations of the LV poles,
    - in the construction of prefabricated cable wells.

The Contractor is obliged to ensure that the personnel do not perform work in dangerous conditions, harmful to health and not meeting the relevant sanitary requirements.

The Contractor shall provide and maintain all safety, social and equipment and appropriate clothing to protect the life and health of persons employed on the site and to ensure public safety.

For the safety of works on the construction site, it is necessary to:

- prepare the works organization plan,
- construction facilities and hazard areas (excavations, utilities, etc.) should be secured by a fence and marked with visible information boards,
- it is prohibited to set up workstations under overhead power lines,
- it is not allowed to perform works under active overhead power lines at a distance shorter than specified in separate regulations,
- electricity distribution boxes shall be protected against unauthorized access,

- weight handling hooks and ropes shall be certified,
- excavations above 1.0 m should be secured,
- workers on the construction site should be equipped with reflective vests and protective helmets,
- workers on the construction site must have up-to-date health checks to allow them to work on the equipment,
- workers on the construction site working on the Odra River should be equipped with life jackets. The Contractor shall provide floating means and personnel trained in water rescue,
- operators of construction equipment must have the required qualifications,
- construction equipment should have up-to-date technical tests,
- there should be a portable first aid kit on the construction site.

The construction site must be properly marked and in particular:

- access roads leading to the site must not be blocked,
- there must be designated protection zones and marked with warning signs,
- work with cranes and mobile cranes must be preceded by marking out and securing hazardous areas,
- all work areas where work will be carried out at night should be illuminated with light of min. 100 Lux

2.6.5. LAND OCCUPATION

Temporary occupations will be implemented in accordance with the contents of the Land Acquisition and Resettlement Action Plan for Task 1B.1/1 (b)[1] and the Operational Policy of the World Bank OP. 4.12[2]. The LARAP contains a detailed list of activities and procedures related to land acquisition for the implementation of the Task. Activities related to the acquisition of land for the purposes of investment implementation are also carried out in accordance with the procedures set out in the LARPF (Land Acquisition and Resettlement Policy Framework[3]). Reservations and comments on the resettlement plan, as well as any reservations regarding the implementation of resettlement in accordance with Polish law, shall be qualified as complaints and applications. *Grievance Redressal Mechanism*). This mechanism also covers the filing and management of any complaints that may be made in the course of the project by persons and

[1] Link to download the LARAP (document in preparation)

[2] https://policies.worldbank.org/sites/ppf3/PPFDocuments/090224b0822f89db.pdf

[3] http://odrapcu2019.odrapcu.pl/doc/OVFMP/Ramowy_dokument_dotyczacy_Przesiedlen_i_Pozyskiwania_Nieruchomosci.pdf

entities affected by any of its impacts. This issue was discussed in detail in the POM for the OVFM[1]Project.

The acquisition of properties is necessary in connection with the following scope of activities within the reconstruction of road infrastructure designed to adapt to the reconstruction of the existing road bridge:

- extension of the intersection of national road no. 29(ul. [Street] B. Chrobrego / ul. [Street] Trakt Książęcy) at the section from km 52+942.24 to km 53+362.41 (global chainage DK29),
- extension of municipal road No 101658F (ul. Nadodrzańska) from km 0+000.00 to km 0+092.80,
- extension of municipal road No 101659F (ul. Podgórna) from km 0+000.00 to km 0+049.95,
- extension of municipal road No 101603F (ul. Murna) from km 0+000.00 to km 0+051.49,
- extension of municipal road No 101654F (ul. Słoneczna) from km 0+000.00 to km 0+018.30,
- extension of the existing crossroads of the national road no. 29 with the municipality road no. 101658F (ul. Nadodrzańska) and the municipality road No 101659F (ul. Podgórna) at km 53+042.26 (global chainage DK29),
- extension of the existing crossroads of the national road no. 29 and the municipality road no. 101654F (ul. Słoneczna) and the municipality road No 101603F (ul. Murna) at km 53+311.73 (global chainage DK29),
- building walkways,
- reconstruction of the existing individual exits in ul. [Street] B. Chrobrego/ Trakt Książęcy,
- reconstruction of the existing individual exits in ul. [Street] Podgórna,
- liquidation of the existing public exit in the course of ul. [Street] Nadodrzańska.

Designed reconstruction of two intersections, i.e. intersection no. 1 DK29 with ul. [Street] Nadodrzańska and ul. [Street] Podgórna and the intersection no. 2 DK29 with ul.[Street] Murna and ul. [Street] Słoneczna will require the acquisition of 13 plots of land, including for the 2. - implementation of the investment will have a significant impact (assuming the share of permanent occupations >20%).

In the case of one property, i.e. plot 128; cadastral district 2; Krosno Odrzańskie, which is owned by the State Treasury in the GDDKiA management board, as a result of the works carried out, part of the plot in question will be transferred to the municipality.

Implementation of the Task requires changes to the existing right-of-way. For the plots where the State Treasury (GDDKiA, PGW Polish Waters) does not have the right to dispose of the property for construction purposes, it will be necessary to expropriate them partially under the Act *on Special Rules for Preparation and Implementation of Investments in Public Roads* (unified text Journal of Laws of 2018, item 1474 as amended)

Activities not involving the acquisition of properties

The land which does not require taking over the property ownership right for the benefit of the State Treasury and which is necessary to carry out the investment will require temporary occu-

[1] http://odrapcu2019.odrapcu.pl/doc/POM_PL.pdf

pation of 30 plots, 12 of which are private. Part of the properties is necessary to carry out construction works, location of construction facilities and part of it is necessary to carry out design works on municipal roads, without the need to permanently occupy the properties.

In accordance with the provisions of LARAP, at the stage of project preparation and its implementation, mitigation measures will be applied, the aim of which is to limit and compensate for all negative socio-economic effects of project implementation.

2.7. TREES AND SHRUBS FELLING

In connection with the implementation of the necessary scope of work, it is necessary to cut down about 50 pieces of trees and 683 m^2 of shrubs, with 8 tree specimens belonging to invasive and alien species in the national flora. Other species to be cut down include: blackthorn, European ash, small-leaved linden, northern white-cedar, sycamore, European spruce, common privet. The most valuable group of trees are small-leaved lime trees 15 pcs with a breast height of about 200 cm. The detailed scope of the trees to be felled will be determined at the stage of detailed design work, so the exact number of trees and shrubs to be felled may be reduced. The greenery occurring in the place of the planned works is a typical urban greenery, not representing a greater natural value. There are no trees and shrubs within the inter-embankment area and bank slopes that need to be cut down in connection with the project. Thus, forest natural habitats within the meaning of Annex I of the Habitats Directive will not be removed.

In order to ensure that the loss of greenery and local biodiversity (mainly habitats of common bird species) will not be lost as a result of the investment, replacement plantings will be made in a 3:1 ratio, i.e. three trees/shrubs will be planted for each tree/shrub felled (this measure has been included in detail in item 16 of the Appendix 1 to EMP).

3. INSTITUTIONAL, LEGAL AND ADMINISTRATIVE CONDITIONS

3.1. INSTITUTIONS INVOLVED IN THE TASK

The Investor of the Task is the State Water Holding Polish Waters in warsaw represented by the Director of Regional Water Management Authority in Wrocław, ul. [Street] C. K. Norwida 34, 50- 950 Wrocław, acting for and on behalf of the State Treasury.

Additionally, during the construction and operation phase, the implementation of the Task may require the involvement of public administration bodies at central, regional and local level. For the ongoing coordination of the implementation of the Project by PIU, an organizational unit of the Project Coordination Unit of the Odra-Vistula Flood Management Project was established.

3.2. NATIONAL ENVIRONMENTAL LEGISLATION IN FORCE

According to Polish law, the investment process in the field of environmental protection is regulated by several acts and regulations. A list of selected basic legal acts related to the above mentioned thematic scope and in force during the works on the EMP was presented in Appendix 3 to the EMP. The number and content of the legal acts listed therein may be subject to change, together with changes in national environmental legislation. In any case, the Contractor shall be obliged to comply with all current legal regulations applicable in Poland throughout the term of the Contract.

3.3. EIA PROCEDURE IN POLAND

The description of the environmental impact assessment procedure in force in the Polish legislation is included in *the Environmental and Social Management Framework Plan (ESMF*), published, among others, on the websites of the Project Coordination Unit of the Odra [1] River Basin Flood Protection Project and the World[2]Bank.

3.4. WORLD BANK GUIDELINES

This Task is co-financed by the World Bank and the conditions for its implementation in the field of environmental protection are consistent with the Bank's Operational *Policies* and *Procedures* in the field of environmental protection, including among others policies and procedures *OP/BP 4.01* (concerning environmental impact assessment), *OP/BP 4.04* (concerning natural habitats), *OP/BP 4.11* (concerning cultural resources). The source texts of these policies and procedures can be found in *The World Bank Operational Manual*[3]and their descriptions are presented, among others, in the *Environmental and Social Management Framework Plan (ESMF*).

[1] On the website: *http://odrapcu2019.odrapcu.pl/popdow_dokumenty/*

[2] On the website: *http://documents.worldbank.org/curated/en/717671468333613779/Poland-Odra-Vistula-Flood-Management-Project-environmental-and-social-management-framework*

[3] On the website: *https://policies.worldbank.org/sites/PPF3/Pages/Manuals/Operational%20Manual.aspx*.

3.5. EIA PROCEDURE FOR TASK 1B1/1 (B)

For the Task in question, in accordance with the requirements of the national legislation, the Investor i.e. State Water Holding Polish Waters obtained a decision on environmental conditions (environmental decision). No environmental impact assessment report was prepared as part of the environmental decision procedure.

In accordance with the classification included in *the EIA Regulation*, the Task was included in group II, i.e. projects which may potentially significantly affect the environment, for which an environmental impact assessment may be required before the decision on environmental conditions is issued.

The competent authority for issuing the environmental decision for investment activities included in *Task 1B1/1 (b)* was the Mayor of Krosno Odrzańskie. On 12 August 2019 the Consultant on behalf of the Investor submitted an application for the environmental decision for the project: On 27 August 2019 (ref. No.: GN.6220.10.3.2019.MKu) by the notice, the parties were informed of the opening of the administrative procedure for issuing a decision on environmental conditions for the project.

The authority by the letter dated 15 October 2019 (ref. No.: GN.6220.10.4.2019.MKu) called on the applicant to complete the Project Information Card. It was completed on 23 October 2019. The Mayor of Krosno Odrzańskie asked for an opinion on the need to carry out an environmental impact assessment for the planned project to the State District Sanitary Inspector in Krosno Odrzańskie, the Minister of Maritime Economy and Inland Navigation and the Regional Director of Environmental Protection in Gorzów Wielkopolski. The Minister for Maritime Economy and Inland Navigation in his/her opinion of 12 November 2019. (Ref. no.: DOK.DOK2.9750.35.2.2019.SL PW.104250) stated that for the above mentioned project there is no need to conduct an environmental impact assessment, at the same time indicating the necessity to specify the requirements indicated in their opinion in the decision on environmental conditions.

Regional Director of Environmental Protection in Gorzów Wielkopolski in a letter dated 15 October 2019. (ref. no. WZŚ.4220.478.2019.AN) expressed the opinion that for the above mentioned project it is not necessary to conduct the environmental impact assessment, indicating the conditions necessary to determine the environmental conditions in the decision. He/she then maintained their position by letter dated 15 November 2019. (ref. no. R.4220.586.2019.AN).

State District Sanitary Inspector in Krosno Odrzańskie in the sanitary opinion of 8 November 2019. (NS-NZ-771/R-3-34/2019) stated the need to conduct an environmental impact assessment for the aforementioned project.

The Mayor of Krosno Odrzańskie, after the analysis of the application and the evidence gathered so far in the case in question, including the above mentioned opinion, and taking into account jointly the conditions referred to in Art. 63 par. 1 of the Act of 3rd October 2008 on EIA, considered it necessary to conduct the environmental impact assessment of the project in question and to prepare a report on the environmental impact assessment of this project and the decision of November 27, 2019. (ref. no.: GN.6220.10.7.2019.MKu) stated the need for an environmental impact assessment for the project.

According to Art. 63 par. 5 of the Act of October 3, 2008 on EIA, if the obligation to assess the environmental impact of the project on the environment for the planned project which may potentially significantly affect the environment was stated by way of a decision of the body competent to issue the decision on environmental conditions, this body issues a decision to suspend the proceedings on issuing the decision on environmental conditions until the applicant submits the report on environmental impact of the project. The Mayor of Krosno Odrzańskie by virtue of a decision of 27 November 2019 suspended the proceedings in question until the Investor submits a report on the environmental impact assessment of the project.

On 9 December 2019 the State Water Holding Polish Waters filed a complaint against the decision of the Mayor of Krosno Odrzańskie imposing on the Applicant the obligation to conduct the environmental impact assessment for the planned project. The Mayor by the letter dated 16 December 2019 (ref. No.: GN.6220.10.9.2019.MKu) transferred the case file to the Local Government Appeal Board in Zielona Góra. By the decision of 07 January 2020, the following ref. no.: SKO-6581/293-S/19 The Local Government Appeal Board revoked the appealed decision in its entirety and referred the case back to the body of first instance. The authority resumed the suspended proceedings and then re-examined the collected evidence taking into account the conditions set out in Article 63 of the EIA Act. After the analysis of the submitted documents, the Mayor of Krosno Odrzańskie issued a decision of 2 March 2020 on environmental conditions (the mark: GN.6220.10.13.2019.MKu.). This decision defines the environmental conditions for the implementation of the Task. A copy of the decision is attached as Appendix 4a to the EMP. On the basis of the Agreement of 12 September 2019 concluded between PGW WP RZGW in Wrocław and GDDKiA, the environmental decision was assigned (transferred) to GDDKiA. Pursuant to Annex 1 of January 28th 2020 to the Agreement of 12th September 2019, PGW WP RZGW in Wrocław is obliged to **perform the obligations arising from the content of the environmental decision** for the Project.

Within the framework of the prepared **Project Data Sheet (PDS/KIP)**, the possibility of impacts on particular components of the environment was analysed, including environmental objectives set for surface water bodies, areas under protection and plant and animal species under protection, as well as natural[1]habitats. During the procedure to issue an environmental decision, arrangements were also made with the environmental authorities during which issues related to the potential impact of the project and the identification of appropriate mitigation measures were clarified and detailed. No public consultation of the document was carried out in the framework of the procedure that ended with the environmental decision (in accordance with the procedure provided for by national legislation). Consultations will be carried out for the draft Environmental Management Plan for Contract 1B.1/1 (b). In the course of the consultation, all persons and entities concerned will have the opportunity to express their views and submit comments on the content of the document.

The **Project Data Sheet** contains a set of mitigation measures related to the protection and prevention of environmental pollution during the works. **The Environmental Management Plan** extended the scope of mitigation measures to include issues related to the organisation and equipment of storage yards, requirements related to the management of earth masses, and the clarification of rules relating to waste management. There are also measures to ensure

[1] This information is contained in the chapter 5 of PDS (KIP)

appropriate safety conditions during the works, requirements for the staff responsible for implementation and supervision of the conditions set out in the EMP, as well as requirements for ESHS documents to be developed by the Contractor.

3.6. DECISION ALLOWING DEVIATIONS DEROGATIONS FROM THE PROHIBITIONS IN RELATION TO PROTECTED SPECIES

By the application of 10 December 2019 the Consultant, on behalf of the Investor, applied to the Regional Director for Environmental Protection in Gorzów Wielkopolski for a permit to deliberately tear off and damage, destroy habitats, keep and possess species, i.e. the floating fern *Salvinia natans*, water caltrop *Trapa natans* and deliberately prevent access to shelters and destroy the habitat and 60 nests of *Delichon urbicum*.

Regional Director for Environmental Protection in Gorzów Wielkopolski by decision of 15 January 2020. (ref. no. WPN-I.6401.1.2020.KS) allowed the Investor to perform activities in relation to plant and animal species under strict species protection. The permit is valid from 1 August 2020 to 30 December 2021.

At the same time, the Regional Director for Environmental Protection in Gorzów Wielkopolski obliged the Applicant to submit a report on the use of this permit by 31 January in the years 2021-2022. A copy of the RDOŚ decision is included in the Appendix 4b to the EMP. The conditions contained in the above mentioned administrative decision are also included in the Appendix 1 and 2 to EMP.

4. DESCRIPTION OF ELEMENTS OF THE ENVIRONMENT SURROUNDING THE TASK

4.1. EARTH SURFACE AND LANDSCAPE

The planned task is located within the city of Krosno Odrzańskie in km 514+100 of the Odra River. Physically and geographically, Krosno Odrzańskie crosses the Middle Odra Valley mesoregion which is part of the Warciańsko-Odrzańska Valley. From the north it is adjacent to the Torzymska Plain mesoregion, and from the south to the Czerwienska Upland and Lower Bóbr Valley mesoregion.
In the area of Krosno Odrzańskie the glacial valley is the narrowest and is only about 2 km wide.

The bridge and road infrastructure planned for reconstruction is located in the centre of Krosno Odrzańskie and connects its right and left bank part. As far as spatial development is concerned, the vicinity of the planned investment location are the areas of surface water, areas of hydrotechnical structures and equipment, areas of roads and car parks, areas of service and residential development, areas of greenery, areas of public service development, as well as areas of distribution of commercial facilities. Most of the area covered by the Task is located within Zone A of the conservation protection of the historic urban and landscape complex entered in the register of monuments under No. 102 from 1958 and No. 2179 from 1975, and only the northern part is located within Zone B of the conservation protection - the surroundings of the urban system of Krosno Odrzańskie, which is under strict landscape protection.

4.2. CLIMATE

The climate in the area of Krosno Odrzańskie belongs to the zone of temperate climate with transitional features between marine and continental climate. The inflow of Arctic and tropical air masses determines the high variability of weather types during the year. The microclimate of the Odra valley is strongly influenced by the terrain and the course of the Odra valley, as well as the degree of its development. The Odra Valley is a corridor for rapid air exchange. Due to local conditions, there is a variation in both temperature and precipitation within the area in relation to adjacent areas. Due to higher air humidity, fog or cold are more frequent.

The average annual temperature is 9°C and the average annual rainfall is 559 mm. The average daily temperature is the highest in July at 19.1°C, and the lowest in February at -2.1°C. In individual years, the monthly average temperatures may differ from the above mentioned values for a multi-annual data series. The lowest rainfall is observed in February and the highest in July. West and south-westerly winds dominate

4.3. AIR QUALITY

The city of Krosno Odrzańskie is on the list of zones classified as class C due to health protection and areas of exceeding normative concentrations of pollutants in the

benzo(a)pyrene[1]range. Zone C indicates that the concentrations of pollutants found showed values above the level permitted under separate legal regulations (e.g. Quaifying for exceeding in the scope of pollution with sulphur dioxide, benzene, PM10 dust, PM2.5 dust). In the event of such overruns, the following actions will be necessary:

- determination of the exact areas of accepted exceedances,
- development or updating of an air protection programme to achieve appropriate levels of allowed limit values of substances in the air,
- controlling the concentrations of the pollutant in the areas of exceedance and taking action to bring the concentrations down to at least acceptable levels.

In the Krosno Odrzańskie Municipality the annual average target level for the concentration of benzo(a)pyrene in PM10 particulate matter and the long-term target level for ozone for an 8-hour average were exceeded.

PM10 dust

Table 1 Air quality standard for BaP in particulate matter PM10 - parameter exceeded in Krosno Odrzańskie.

Name of the substance	Averaging period	Target annual average level	Deadline for achieving the long-term objective
BaP (PM10)	year	1nµg/m	2013

Ozon (O3)

Table 2 Levels of long-term objectives for ozone in the air - parameter exceeded in Krosno Odrzańskie.

Name of the substance	Averaging period	Level of the long-term objective	Deadline for achieving the long-term objective
Ozon (O3)	Eight hours[2]	120 µg/m[3][3]	2020

In the case of PM10 dust, there may be locally increased emissions at the stage of works implementation, however, the main source of this type of pollution is low emissions, which are not affected in any way by the investment. In the case of PM 10 in the Lubuskie Voivodeship, households are responsible for about 65% of the total emission of this dust (Annual air quality assessment in the Lubuskie Province 2018, WIOŚ in Zielona Góra). BaP, whose source is car

[1] Annual assessment of air quality in Lubuskie Voivodeship 2018. Voivodeship Inspectorate of Environmental Protection in Zielona Góra.

[2] The maximum eight-hour average per calendar year among rolling averages calculated from one-hour averages per day. Each 8-hour average calculated in this way is assigned to the day on which it ends. The first calculation period for each day is from 17:00 on the previous day to 01:00 on that day. The last calculation period for each day is from 1600 hours to 2400 hours on that day of CET.

[3] Level of the long-term objective in view of the protection of human health and plant protection

exhaust, may show an increased concentration in the area of the works, however, the vehicle traffic volume related to the works performed will not be a significant source of BaP emissions.

In the case of ozone, the execution of works will not be a significant factor influencing its increase, due to the fact that the primary source of pollution is transport, the intensity of which is not affected by the execution of the project. Short-term increases in ozone concentrations can occur at high temperatures and high traffic volumes within the temporary bridge over the Odra river.

4.4. GEOLOGICAL STRUCTURE

From the geological point of view, Krosno Odrzańskie is located on the Pre-Sudetic monocline, within the Krosno - Zielona Góra monocline, which is built by Palaeozoic - Mesozoic rock complexes covered with Cenozoic sediments with thickness from 204.5 to 274.4 m. Cenozoic formations are represented by Oligocene, Miocene and Quaternary sediments. The accumulation of Quaternary compositions was connected with the stay of the South-Polish, Central-Polish and North-Polish glaciers and with the accumulation during the Holocene. These are Pleistocene river, lake, stagnant, glacial and water-glacial sediments as well as river, lake, stagnant and Eolian and Holocene sediments.

Three terraces are marked in the morphology: glacial valley, overflowing and floodplain terraces. The oldest and tallest terraces (glacial valley) are located 6-12 m above sea level. of the Odra river, the middle one, are 3-6 m above Odra level. The youngest Holocene river terraces, accumulation terraces, are situated up to 2.5 m above the river and are cut by numerous dry and watered old river beds.

In the area of Krosno Odrzańskie, the Odra flows on the northern side of the glacial valley bottom. Most of the area of the Odra floodplain terraces is located on the southern side of the glacial valley. Flood terraces are built up with grainy sands and fine-grained gravels of grey and light grey, sometimes grey-brown and grey-blue, often with clay and plant remains. The thickness of these tracks reaches 6 m.

4.5. SOILS AND LAND

The area covered by the Task is located within the floodplain terrace of the Odra River, in the vicinity of the riverbed and in the Odra riverbed.

Alluvial soils predominate in the Odra Valley. These are river muds developed on river sands and gravel. The high content of organic matter makes it a fertile soil. These are acidic soils. Muds are characterized by a large variety of physical and chemical properties.

Alluvial and organic soils of the floodplains often show a high degree of pollution, especially in the vicinity to the river channel. Due to their organic matter content, they have a high capacity to absorb heavy metals. These substances may be re-entered into river transport as a result of erosion.

In the place of driving the sheet piling walls strengthening the foundation of the existing bridge, it is planned to remove about 40 to 60m^3 of sediment from the riverbed. There are no plans to remove sediment from the site of the temporary bridge. Only the top soil layer is to be removed

from the inter-embankment area. Prior to the extraction of sediment from the river bed, sediment quality tests will be carried out in order to identify possible (in accordance with national legislation) ways of further sediment management. The Contractor will also develop *a Soil Management Plan,* which will comprehensively present the manner of handling settlements and possibly other soils if, at the stage of the works implementation, there are any soil masses that cannot be managed within the construction site. This document will require the approval of the Contract Engineer prior to the commencement of earthworks (detailed conditions in this respect are presented in item 10 of the Appendix 1 to EMP).

4.6. SURFACE WATERS

The Odra River is 855 km long. Its sources are located on the territory of the Czech Republic in the Odra Mountains (634 m above sea level). The area of the Odra river basin in Poland is 118 015 km2. The planned task is located about 514+100 river km.

Findings from *the Water Management within the Odra River Basin* (PGWdO)

The investment constitutes a part of the investment specified in aPGW as "*Renovation and modernization of the free-flowing Odra river regulatory structures - reconstruction and modernization of regulatory structures– in order to adapt the section of the Odra from Malczyce to the mouth of the Nysa Łużycka to the third (III) class waterway*, (ID A_582_O).

The planned Task is located within one unit of Unified Body of Surface Water (hereinafter UBSW):

- UBSW Odra from Czarna Struga to Nysa Łużycka with code PLRW6000211739,

The location of the Task in relation to the borders of the UBSW is presented in Appendix 5 to the EMP.

Table 3: Assessment of water status of UBSW RW6000211739 in 2017 (PMŚ, WIOŚ).

UBSW name:	**The Odra River from the Czarna Strug to Nysa Łużycka**
Code	PLRW6000211739
Status*	SZCW
Abiotic type*	21
Condition*	Bad
Risk of failure to achieve WFD objectives*	Threatened
Environmental objective set in the WMP*	Good ecological potential Good chemical state
Deadline for achieving good condition*	2027
Derogations*	Extension of the deadline for achieving the environmental target - no technical possibilities

* Information taken from the updated Water Management Plan for the Odra River Basin (source: Regulation of the Council of Ministers of 18 October 2016 on Water Management Plan for the Odra River Basin, item 1967, Warsaw, 6 December 2016).

The WMP indicates a broad justification for the derogation for the UBSW:

- UBSW PLRW6000211739 Odra from Czarna Struga to Nysa Łużycka - no technical possibilities. There is low emission pressure in the UBSW catchment area. The action programme provides for an action: verification of the environmental protection programme for the municipality to identify in detail and, as a result, reduce this pressure so that indicators consistent with values for good condition can be achieved. However, due to the time needed for the implementation of this action, followed by concrete corrective actions, and the time needed for the implemented actions to produce tangible results, a good state of affairs can be achieved by 2027.

Environmental objective for UBSW PLRW6000211739 the Odra River from Czarna Struga to Nysa Łużycka in accordance with Article 38d. of the Water Law Act is:

- protecting these waters and improving their ecological potential and chemical status to achieve good ecological potential and good surface water chemical status and preventing deterioration of their ecological potential and chemical status.

4.7. GROUNDWATER

The Krosno Odrzańskie region is situated in the area of unified body of ground water No. 68 (unified body of ground water PLGW600068). The main drainage base here is the Odra valley flowing almost through the middle of the UBGW. Drainage and groundwater flow into the valley is limited. The water status on the basis of the 2012 and 2016 assessment is good both in chemical and quantitative terms. In terms of assessing the risk of non-compliance with the environmental objectives, the groundwater body is not at risk.

The northern part of Krosno Odrzańskie (at the height of Stary Raduszec) is located within the range of the Main Underground Water Reservoir No. 149 Sandr Krosno-Gubin.

The environmental objectives for this UBSW are:

- achieving good environmental potential,
- ensuring the possibility of migration of aquatic organisms in the section of the significant water course - the Odra River within the UBSW,
- achieving good chemical status

4.8. ACOUSTIC CLIMATE

The source of noise audible in the area and in the closest vicinity of the area of the planned Task is the noise coming from the area of the city of Krosno Odrzańskie and the so-called traffic noise, which is generated by motor vehicles moving on roads and bridges.

Limit values for sound levels shall be determined according to the type of source, type of terrain and reference period. The results of the analysis of local acoustic climate expressed by short-term sound level indicators LAeqD dB(A) and LAeqN dB(A) were based on the Regulation of the Minister of Environment of 14 June 2007 *on permissible noise levels in the environment* (unified text) [Journal of Laws, 2014.112 2014.1025 unified text].

Table 4 of permissible noise levels.

No	Type of terrain	Permissible noise level expressed as A-weighted equivalent sound level in dB.			
		Roads or railway lines [1)]		Other noise generating facilities and activities	
		L_{AeqD} a reference period of 16 hours	L_{AeqN} a reference period of 8 hours	L_{AeqD} A period of reference time equal to 8 least favourable hours of the day in succession as follows	L_{AeqN} Reference time interval equal to the least favourable night hour time
1	(a) Spa protection 'A' areas (b) Hospital areas outside the city	50	45	45	40
2	(a) Housing areas single-family (b) Buildings associated with the permanent or longterm stay of children and young people (c) Care home areas (d) Hospital areas in cities	61	56	50	40
3	a) Multi-family housing and collective housing areas b) Built-up farmstead areas c) Recreation and leisure areas d) Housing and service areas	65	56	55	45
4	Areas in the city centre zone above 100 thousand residents	68	60	55	45

Source: Regulation of the Minister of Environment of 14 June 2007 on permissible noise levels in the environment (unified text Journal of Laws 2014.112

4.9. FLORA AND FAUNA

4.9.1. PROTECTED NATURAL HABITATS

Natural habitats

In the vicinity of the planned Task, one habitat was found to be 3270 flooded muddy river banks with vegetation of *Chenopodion rubri* p.p. and *Bidention* p.p. This habitat type was included in the Regulation of the Minister of Environment of 13 April 2010 on natural habitats and species of Community interest and criteria for the selection of areas eligible for recognition or designation as Natura 2000 sites (Journal of Laws of 2014 item 1713). In 2018 a habitat was found at almost every groin near the bridge (App. 7).This habitat occurs ephemerally as the appropriate fragments of sandy patches are exposed, where the silt on the river bank forms. Habitat patches 3270 occupied small areas on exposed banks between groins. There are no rare or protected species among the species forming the community. No assessment of the conservation status of the natural habitat 3270 based on the conservation status assessment

methodology indicated in the methodological[1]guides was carried out. Habitat identification was made on the basis of expert assessment based on phito-sociological criterion. In the analysed area, plant communities from *Chenopodion fluviatilie*, represented mainly by the *Chenopodietum glauco-rubri* and *Xanthio riparii- Chenopodietum* complexes, qualified as phytosociological identifiers of natural habitat 3270, were found.

4.9.2. PROTECTED FUNGI, PLANT AND ANIMAL SPECIES

Plant cover

The area was the subject of phytosociological research in 2018 and a complementary field study carried out in 2019. The dominant types of plant communities result from the location of the area covered by the Task among urban buildings. It is arranged urban greenery and ruderal vegetation. There are several small-leaved lime trees *Tilia cordata* growing on Trakt Książęcy Street and św. Jana Pawła II Boulevard. A little further (approx. 66 m from the boundaries of the Task) at Jana Pawła II Boulevard (plot no. 150) grows a common oak *Quercus robur* with a circumference of 460 cm, considered a natural monument. The second monumental oak with a perimeter of 420 cm grows in the park, in the immediate vicinity of the Municipal Office building, at 1 Parkowa Street (plot no. 1062), above the slope of the Odra valley (about 145 m from the boundaries of the Task). Most other trees and shrubs are cultivars or species of foreign origin such as the ash maple Acer negundo, the broad-leaved whitebeam Sorbus latifolia , Spruce *Picea sp*. The natural communities overgrow the Odra floodplain terrace. Meadow communities, rushes and slippery areas were formed here. Meadows are simplified and species-poor complexes of wet and fresh meadows. Rushes are reed area growing in several places in the groins and land fields between the groins.

Plant species to be protected

In the vicinity of the Task area there are habitats of two protected plant species: the floating fern *Salvinia natans* and the water caltrop *Trapa natans*. Both species belong to annual plants and their appearance depends on habitat conditions. They inhabit calm waters in bays between groins. The floating fern floats freely on the water surface. It produces ferns that pass the winter. The water caltrop takes root in the bottom and forms leaf rosettes on the water surface. It winters at the bottom in a mule, in the form of spiky nuts.

Table 5: List of protected vascular plant species found in the analysed area.

Species	Protection/threat status/Threat category IUCN[2]	Habitat and number
water caltrop *Trapa natans*	OS, CL(VU), PCKR (EN)/LC	8 positions in the bends between the groins, from several to several hundred individuals.

[1] Nobis A. 2015. Flooded muddy river banks (3270). In: W. Mróz (ed.) Natural habitat monitoring. Methodological guide. Part IV GIOŚ, Warsaw, p. 141- 152.

[2] https://www.iucnredlist.org/

Species	Protection/threat status/Threat category IUCN[2]	Habitat and number
floating ferns *Salvinia natans*	OS/LC	3 positions in bends between the groins, up to several dozen individuals.

OS - strict species protection, CL[1]- red list, VU vulnerable status, PCKR[2] - Polish Red Book of Plants, EN vulnerable status. Hazard categories by IUCN: LC of least concern, NT nearly threatened, VU exposed, EN of endangered, CR of critical risk.

Invertebrates

The area was not found to be inhabited by protected invertebrate species. The presence of a protected beetle (hermit beetle *Osmoderma eremita*) and two mussel species (swan mussel *Anodonta cygnea*, depressed river mussel *Pseudoanodonta complanata*) is possible. Habitats suitable for protected xylophagous beetles were sought. A few older aged linden trees on ul. Trakt Książęcy and in Jana Pawła II Boulevard do not have any clear bulges, hollows or traces of colonization by such a species as the hermit beetle. However, due to their age, trees can be inhabited by this species. It is difficult to detect such settlement without interfering with the tree trunk. It was therefore considered that, by way of precaution, older trees should be preserved as far as possible during the implementation of the investment. If this is not possible, measures to minimise the loss of protected species should be taken when cutting them down. There is no host plant (great burnet) of *dusky large blue Phengaris nausitous* and scarce large blue *Phengaris telejus*. These species were found in the meadows along the Odra River at a greater distance from the area of planned works. They were not found to be able to enter in the vicinity of the Task area. Inventory of 2017 (Sweco Consulting, 2017) indicates that two species of protected bivalve mussel may be found in the Odra River in its surroundings: swan mussel Anodonta cygne, depressed river mussel Pseudoanodonta complanata). This is due to the presence of suitable habitats: stagnation and plots in inter-groin spaces with muddy bottoms and overgrown with submerged vegetation.

Ichtiofauna

Inventory of 2017. (Sweco Consulting 2017) indicated that the following protected fish species may be present in the Odra River in the vicinity of the Task area:

- European bitterling *Rhodeus amarus* between Bytom Odrzański and Osiecznica there was a large number living in the coastal overgrown parts of the Odra;
- spined loach *Cobitis taenia* between Bytom Odrzański and Osiecznica there was a large number, selects river sites with a weak current and muddy-sandy bottoms, especially overgrown with vegetation submerged in the inter-groin spaces;
- The stone loach *barbatula barbatula* in this section of the Odra River is found in a small number of habitats, mainly in the rapids forming at the damaged fortification

[1] Kaźmierczkowa R. (edit.) 2016. Polish red list of fern and floral plants. Institute of Natural Protection of the Polish Academy of Sciences, Cracow.

[2] Kaźmierczkowa R., Zarzycki K. (ed.) 2001. Polish Red Book of Plants. Institute of Natural Protection of the Polish Academy of Sciences, Cracow.

fragments of the groin tops, a bottom living species looking for hiding places under stones and tree roots.

For the purpose of further analyses, it has been assumed that the above mentioned species are within the range of impact of the Task.

Herpetofauna

Inventory of 2017. (Sweco Consulting 2017) indicates that the following protected amphibian and reptile species may be present in the vicinity of the Task area: the green frogs *Pelophylax esculentus complex* (Pool frog *Pelophylax lessonae,* Marsh frog *P. ridibundus*frog, Edible frog *P. esculentus*), the grass snake *Natrix natrix*. The green frogs and the grass snake are found in the vicinity of the Odra River in the areas of groins, inter-groins fields, as well as in the areas between the embankments in places constantly filled with water, within the old river beds. Field research in 2019 showed that there may also be a common toad *Bufo bufo* in the vicinity of buildings and among urban greenery.

Ornitofauna

The area in the area covered by the task is inhabited by typical synanthropic species such as the house sparrow *Passer domesticus*, the common blackbird *Turdus merula*, the Eurasian collared dove *Streptopelia decaocto*, the great tit *Parus major*, the white wagtail *Motacilla alba*, the black redstart *Phoenicurus ochruros,* the common chaffinch *Fringilla coelebs*. On the Odra's bank, the little ringed plover *Charadrius dubius* (1 site) and the feeding of the grey heron *Ardea cinerea* and the mallard *Anas platyrhynchos* were found. The most exposed to activities related to the implementation of the Task is the common house martin Delichon urbica colony operating within the bridge. The swallows nest on a metal structure underneath the bridge. The observation and evaluation of the common house martin's breeding colony was carried out on the bottom of the window. 08.07.2017 60 occupied nests were identified. On the basis of the inspection, a breeding category C14 (adult bird with faeces or feed for the young in the beak[1]) was assigned to the whole colony.

[1] Sikora A., Rohde Z., Gromadzki M., Neubauer G., Chylarecki P. (2017). Atlas of distribution of breeding birds of Poland 1985- 2004. Bogucki Wyd. Nauk., Poznań.

Teriofauna

In the course of the nature inventory in the discussed section of the Odra River, the occurrence of the European beaver *Castor fiber* and the European otter *Lutra lutra*was found. Above the floodplain, the common squirrel *Sciurus vulgaris* and the hedgehog *Erinaceus sp.* Traces of feeding several beavers were visible on the Odra river bank. Along the river banks in direct proximity to the base of the bridge, markings and otter trails were found. In ul. Bolesława Chrobrego a dead hedgehog was found. A common squirrel inhabits the city park in Krosno Odrzańskie.

Chiropterofauna

The Odra Valley Nature Inventory (Sweco Consulting, 2017) showed the presence of 12 species of bats, including three species listed in Appendix II of the Habitats Directive: the western barbastelle *Barbastellus barbastellus*, the greater mouse-eared bat *Myotis myotis*, the pond bat *Myotis dasycneme*. Barbastella is declared a subject of protection in the Natura 2000 site Krosno Odra Valley PLH080028.

For this group of animals, important habitats are trees and shrubs along the riverbed, vegetation on the river banks, riparian forests located in the interval and on the dyke's air side. It should be assumed that bats wander and feed along the Odra Valley and the riverbed, so they can also be in the immediate vicinity of the bridge.

Table 6: List of protected animal species found in the area under analysis.

Species	Protection species status P/ Threat category IUCN[1]	Habitat and number
Invertebrates		
depressed river mussel *Pseudoanodonta complanata*	OC/-	Stagnation and plots in the inter-groin spaces of the Odra River with muddy bottom and overgrown with submerged vegetation. Found during the 2017 inventory in the nearby areas (Cigacice, Osiecznica), 2.8- 3.2 specimens of unionidae mussels/m2.
Swan mussel *Anodonta cygnea*	OC/LC	
hermit beetle *Osmoderma eremita*	OS, N2000/NT	Potential habitats are older age-old trees along Trakt Książęcy Street and at św. Jana Pawła II Boulvard, in the trunks of decayed trees, with hollows (e.g. lime trees, oaks). No traces of presence or specimens were found.
Fish		
spined loach *Cobitis taenia*	OC, N2000/LC	Low-maintenance and muddy-sandy river beds in particular overgrown with vegetation submerged in the inter-groin spaces. They were numerous, there were 114- 133 specimens per catch.
Amur bitterling *Rhodeus amarus* (*Rhodeus sericeus)*	OC, N2000/LC	Bank parts of the Odra River in particular are overgrown. They were numerous, there were 263- 268 specimens per catch.
Stone loach *Barbatula barbatula*	OC/LC	Habitats of the character of the rapids forming at damaged fragments of strengthening of the groin tops. A bottom living species looking for hiding

[1] https://www.iucnredlist.org/

Species	Protection species status P/ Threat category IUCN[1]	Habitat and number
		places under the stones and roots of trees. There are few, 1- 3 specimens per catch, 0.008 specimen/m².
Amphibians		
European toad *Bufo bufo*	OC/LC	In the greenery accompanying the building several specimens
green frogs *Pelophylax esculentus complex*	OC/-	In the inter-groin fields, in the interval, old riverbeds of the Odra River, several dozen specimens
Reptiles		
grass snake *Natrix natrix*	OC/LC	Several specimens in the Odra bank area
Mammals		
European beaver *Castor fiber*	OC, N2000/LC	Traces of feeding on the Odra's bank, several individuals
hedgehog *Erinaceus sp.*	OC/-	One killed individual in ul. Bolesława Chrobrego
Bats (species were found in the section of the Odra Valley within which the bridge is located: western barbastelle *Barbastellus barbastellus*, the greater mouse-eared bat *Myotis myotis*, the pond bat *Myotis dasycneme*.	OS, N2000/ LC (*Myotis myotis),* NT *(Myotis dasycneme)*	Very likely flights along the Odra Valley.
Birds		
Great tit *Parus major*	OS/LC	A few individuals among the trees and shrubs in the building
The grey heron *Ardea cinerea*	OC/LC	Several individuals feed on the banks of the Odra
Black redstart *Phoenicurus ochruros*	OS/LC	One pair on the right bank
Common blackbird *Turdus merula*	OS/LC	3 - 5 individuals in the tree stands and forest among buildings
Common house martin *Delichon urbica*	OS/-	Under the bridge over the Odra, 60 nests glued to the steel structure
White wagtail *Motacilla alba*	OS?LC	1 pair near the bridge
Eurasian collared dove *Streptopelia decaocto*	OS?LC	A few feeding on the Odra River and among buildings
Little ringed plover *Charadrius dubius*	OS/LC	1 individual at the bank of the Odra
House sparrow *Passer domesticus*	OS/LC	A dozen or so specimens, mainly among buildings
Common chaffinch	OS/-	2 - 3 individuals in the shrubs

Species	Protection species status P/ Threat category IUCN[1]	Habitat and number
Fringilla celebes		

OS - strict species protection, OC - partial species protection, N2000 - species listed in Appendix II of the Habitats Directive or in Appendix I of the Birds Directive (for birds). Hazard categories by IUCN: LC of least concern, NT nearly threatened, VU exposed, EN of endangered, CR of critical risk.

4.9.3. NATURA 2000 SITES

The task, due to its location and scope of works, may potentially affect the following Natura 2000 sites:

- **Krosno Odra Valley PLH080028**

The Krosno Odra Valley Natura 2000 site includes a fragment of the Odra Valley from Cigacice to the Polish-German border. A large part of the area is flooded (between embankments). Old river beds, large complexes of meadow foxtail and Cnidion dubii and fragments of ash and elm riparian forests have been preserved in the area (e.g. the complex. Near Krępa) and willow riparian forests. The final section of the Bóbr River that goes to the Odra River (from the dam weir in Raduszec Stary to the mouth) is a regionally important spawning ground for rheophilous fish, including asp and river lamprey. The refuge also includes a complex of old riparian forests in Krępa near Zielona Góra and well-educated riparian forests near Czana Łacha near Krosno Odrzańskie.

The area is important for the conservation of the habitats and species associated with the great river valley:

8 habitat types from Appendix I of the Habitats Directive, especially meadow complexes (among others, classic Cnidion dubii meadows) and riparian forests. The most valuable type of meadows in the area are often pattern-shaped Molinion meadows, represented mainly by the *Sanguisorbo-Silaetum* and *Galietum borealis*teams. An important element of the river valley vegetation are the communities of riverside therophytes, which constitute habitat 3270. The appearance of patches of this type of vegetation is closely linked to water levels, mainly within the normal riverbed. The most valuable teams representing the habitat belong there: *Rumicetum palustris, Agrostio-Puicarietum vulgaris, Chenopodio-Polygonetum brittingeri* and *Cycero fusci-Limoselletum*. A great geobotanical peculiarity is the water vegetation of old river beds. Quite a common species there is *Salvinia natans*, and the most valuable community is the complex of *Trapetum natantis*.

The area contains 18 animal species from Appendix II of the Habitats Directive. There is one of the few stands of the scarce large blue *Maculinea telejus* on the Lubuskie Land. The sites of *Phengaris teleius and P.nausithous* mark the northern limit of the range of these species. There are strong populations of xylobionts here: Stag beetles *Lucanus cervus* and the great capricorn beetle *Cerambyx cerdo*, as well as the hermit beetle *Osmoderma eremita*.

- **Middle Odra Valley PLB080004**

The area includes the part of the Odra valley from Nowa Sól to the mouth of the Nysa Łużycka river together with the area of the Obrzyca river mouth to the Odra. Much of the area is flooded during high water levels in the Odra River. Numerous old river beds, large complexes of humid meadows, as well as bushes and riparian forests have been preserved here. Among the latter, the most valuable are fragments of ash and elm riparian riparian forests (e.g. the complex near Krępa) and willow riparian forests Ostoja is the most important area in Poland for the occurrence of the red and black kite, as well as many species of water and mud birds and agriculturally developed river valley typical of the open landscape. There are at least 18 bird species from Appendix I of the Birds Directive, 2 species from the Polish Red Book (PCK). During the breeding period, the area is inhabited by at least 1% of the national population of the following bird species: black kite (PCK), red kite (PCK), European honey buzzard, common grasshopper warbler and Eurasian penduline tit; corn crake and garganey occur at relatively high densities. The objects of protection in the area are: A038 whooper swan *Cygnus cygus*, A039 Bean goose *Anser fabalis*, A053 mallard *Anas platyrhynchos*, A055 garganey *Anas querquedula*, A056 Northern Shoveler *Anas clypeata*, A072 European honey buzzard *Pernis apivorus*, A073 black kite *Milvus migrans*, A074 Red kite *Milvus milvus*, A081 Marsh harrier *Circus aeruginosus*, A122 Corncrake *Crex cre*x, A196 whiskered tern *Chlidonias hybridus*, A198 white-winged tern *Chlidonias leucopterus*, A229 Common Kingfisher *Alcedo atthis*, A238 Middle Spotted Woodpecker *Dendrocopos medius*.

The location of the main elements of the Task in relation to Natura 2000 sites is presented in Appendix 5 to the EMP.

4.9.4. OTHER PROTECTED AREAS

Other forms of nature protection are located in the vicinity of the area covered by the Task, without interfering with it. Two natural monuments located in the vicinity, the peduncle oak at Jana Pawła II Boulevard, 66 m away, and the peduncle oak in the park at ul. Parkowej 1,145 m away from the area covered by the task. The Krosno Odra Valley Protected Landscape Area is located 1 km from the Task area.

4.10. CULTURAL MONUMENTS

The road bridge in Krosno Odrzańskie is a monument within the meaning of the Act of 23 July 2003 on the protection and care of monuments (Journal of Laws 2003 No. 162 item 1568), entered in the register of monuments under No. L600/A by the decision of the Voivodeship Monument Conservator dated 23 July 2003. 13.08.2013 and is subject to legal protection regardless of its status. The monument is also the spatial layout of the town of Krosno Odrzańskie, within which the planned expansion is located. In the immediate vicinity of the works, 2 meters from the planned Task, there are defensive walls, which are also a monument listed in the register under the number K.O.K.I-248/61, as well as the house at ul. [Street] Bolesława Chrobrego 2 entered in the register of monuments under number 2504. In the distance of up to 500 m from the borders of the planned Task there are additionally 29 historical buildings.

4.11. POPULATION AND MATERIAL GOODS

The structure implemented under the Contract is located in Krosno Odrzańskie municipality, in Krosno County, Lubuskie Voivodeship. The urban-rural municipality of Krosno Odrzańskie has 17 784 inhabitants, while the town of Krosno Odrzańskie has 11 319 inhabitants (CSO/GUS 2019). In the sorrounding of the work sites are the historical city walls (along ul. Słoneczna and Trakt Królewski). In the vicinity of the worksites there are also service facilities such as a pharmacy and a hotel on the southern side of the bridge at ul. Trakt Królewski. On the left bank of the river, outside the worksite, about 100 m from the temporary bridge there is a tourist marina on the Odra River. Also along the right bank of the river, various material goods are located in the vicinity of the worksites. These include residential and service buildings along Nadodrzańska and Bolesława Chrobrego streets. The implementation of the works does not directly interfere with built-up areas

5. POTENTIAL IMPACT OF THE TASK ON ENVIRONMENT

5.1. EARTH SURFACE AND LANDSCAPE

The implementation of the Task will have an impact on the land surface and landscape, mainly due to the presence of a temporary bridge and construction facilities. However, due to their periodical and linear nature and the fact that the task concerns the reconstruction of the existing facility, taking into account the recommendations of the conservator, no significant impact is expected in the long term. Impacts will mainly occur during the implementation phase of the Task, permanent impacts will not occur. No significant changes in the landscape at the operational stage are expected.

5.2. CLIMATE

Due to the local character and the relatively small scope of the Task, no negative impacts on the climate are expected to occur.

Greenhouse gas emissions

During the implementation phase of the Task, construction machines and transport vehicles will be the main source of emissions to air. At the construction stage, as a result of burning fuels by construction machinery, combustion gases will be emitted, including carbon dioxide, which is classified as greenhouse gases. These impacts will be minor, limited to the immediate vicinity and time of occurrence and will cease when the works are completed. Dust emissions are also foreseen (excavation, top soil removal, building materials, etc.). Due to the periodic and spot nature of the Task, no accumulation of pollutants and thus no significant impact on air quality is expected.

No change in emissions compared to current levels at the operating stage is expected due to the projected lack of impact of the reconstruction of the bridge on car traffic within it.

Proofing the Task to the negative phenomena accompanying climate change

The reconstruction of the bridge will increase the resilience of the structure to the risks of climate change, in particular as regards to resistance to flooding and ice float hazards. By implementing the main objective of the bridge reconstruction (increasing the minimum clearance), the working conditions of icebreakers will be improved and thus the risk of jamming floods will be reduced. In this context, the implementation of the Task represents a climate change adaptation option for buildings at risk of potential jamming floods.

5.3. AIR QUALITY

Emissions of dust and gas pollutants will occur primarily during the construction phase. During the operation phase, after the completion of construction works, no significant emissions of pollutants into the air are expected.

The main source of pollution emissions at the construction stage will be fuel combustion during the operation of construction machinery and transport of construction materials. At this stage, the main compounds emitted to the atmosphere will be: nitrogen oxides, carbon oxides,

hydrocarbons and dust particulate matter (suspended dust). A potential source of dust emissions to the air is also the transport of bulk materials from the loading points to the work areas. Periodically, earthworks within dried soils can lead to an increase in dusting. The largest, temporary concentrations of pollutants can be observed at a distance of several dozen metres from the works site. The resulting pollutants will be dispersed in the atmosphere as the distance from the place of emission increases. The emission of pollutants into the atmosphere during the construction phase will be short-term and reversible. It will not lead to significant or permanent environmental impacts.

5.4. SOILS AND LAND

The reconstruction of the bridge over the Odra River together with the accompanying infrastructure, including temporary bridge, and reconstruction of the road will involve changes in the soil cover in the vicinity of the bridge at the stage of the Task implementation. The expected deterioration of soil conditions will also take place within technological roads and construction facilities. Soil contamination can potentially occur as a result of leakage of operating fluids from construction machinery and transport vehicles. Most impacts will be periodic in nature. At the operation stage of the structure, possible impacts may result from the necessity to carry out maintenance and upgrading works.

In the place of droving the walls strengthening the foundation of the existing bridge, it is planned to remove about 40 to 60 m^3 sediment from the riverbed. There are no plans to remove sediment from the site of the temporary bridge. Only the top soil layer is to be removed from the inter-embankment area.

The handling of riverbed extracted sediments must take into account the *Environmental, Health and Safety Guidelines for Ports, Harbours, and Terminals*[1]. The Contractor will develop *a Soil Management Plan*, which will specify the rules for handling the soil and sediments extracted from the riverbed during the works (the scope of the document is specified in detail in the Appendix 1 EMP, item 10). During the works at the river bottom, the Contractor will also monitor the concentration of suspended matter and dissolved oxygen in accordance with the detailed conditions specified in item 118 of the Appendix 2 to EMP If the value is less than 5 mg O_2/l, the work will be stopped for a minimum of 2 hours and less than 3 mg O_2/l for a minimum of 24 hours. The oxygen concentration should be measured in the middle of the water column - about 1.0 m below the surface.

These concentration values of the suspension 200 and 400 mg/l are given in the literature - overview in: WWF-UK, Review of UKTAG Proposed Standard For Suspended Solids, August 2007, APEM REF: 410242 WWF-UK, Final Report[2]. These values are taken, for example, in England and Canada as: high risk to fish (> 200 mg/l) and unacceptable risk to fish (> 400 mg/l). The value of oxygen concentration below which works interruptions should be introduced should be additionally corrected - the limit value should be 5 mg/l (instead of 4 mg/l). The values of 5 mg/l (breaks in works) and 3 mg/l (stopping work until the next day) are dictated

[1] https://www.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/sustainability-at-ifc/publications/publications_policy_ehs-portsharborsterminals

[2] https://www.deq.idaho.gov/media/903180-review-uktag-proposed-standard-suspended-solids-2007.pdf

by the general oxygen requirements of the fish: less than 5mg/l - stress conditions, less than 3 mg/l - respiratory disturbance, risk of mortality).

5.5. SURFACE WATERS

In the phase of implementation of the Task consisting in reconstruction of the road bridge in Krosno Odrzańskie, negative impacts on the condition of surface water bodies will be related to the works carried out in the Odra riverbed and the bank zone.

Activities, including bridge reconstruction and construction as well as demolition of a temporary bridge, may affect the chemical state of the waters of the UBSW concerned, causing periodic and local increase of suspended solids concentration in water. Surface water may also be exposed to uncontrolled spills of petroleum substances from operating and garaged machines. In order to protect the water, the machines and vehicles will be parked in a designated hardened and insulated yard. Therefore, it can be considered that the probability of their contamination is very low.

According to the adopted concept, a temporary bridge is to be built. Its outermost spans will be pushed from the banks, additionally the bridge will be based on temporary pillars made of steel pipes driven into the bottom of the Odra River. In addition, technological roads will be built under the existing bridge, related to the reconstruction of the bridge. The effect of these activities will be a change in the bank structure and the structure of the bottom in the section covered by the works, which is about 200 m long, which is not significant in the scale of the whole UBSW. This may change the conditions of water flow and the course of the trough and fluvial processes. It will also change the habitat conditions in the section covered by the works. During the works, the fauna will be disturbed and the flora will be mechanically destroyed. The habitat of the water caltrop *(Trapa natans*) and the potential habitat of the floating farn *(Salvinia natans*) will be destroyed. As these macrophytes are not on the list of indicator species in the MMOR method for the assessment of the ecological status/potential of flowing waters, their loss will not affect the deterioration of the ecological potential of the UBSW. However, they will be moved to a place not covered by robots.

All of these impacts will be local and temporary in nature, associated with the execution of the works. They will be observed on a section of UBSW of about 200 m in length and will not affect the biological, hydromorphological and chemical parameters on the scale of the entire UBSW, which is a strongly altered body of water of poor condition. After completion of the works, at the operational stage, no impacts on the state of UBSW other than the previous ones are expected. The adverse impact of rainwater entering directly from the bridge to the Odra riverbed will be limited (after the investment is completed, properly treated water will be discharged).

The main factors of the impact of the investment on the quality elements of UBSW include:

A. Impacts occurring during the implementation phase:
    - Increase of suspended solids concentration in the water in places where works are carried out in the riverbed (direct impact) and in the bank zone (indirect

impact). This results in reduced water transparency and deterioration of light conditions for macrophytes and phytobenthos, as well as deterioration of water quality parameters and reduction of ichthyofauna and benthic macro-vertebrates (indirect impacts).

- Mechanical destruction of plant communities (destruction of the water caltrop habitat *(Trapa natans*) and the potential habitat of the floating farn*(Salvinia natans*)) as well as mechanical damage, disturbing and disturbing animals (direct impacts).
- Elimination of natural morphological elements in the riverbed and in the bank zone (direct impacts).
- Temporary change of water flow conditions and the course of trough and fluvial processes during works in the channel zone (direct impacts).

B. Impacts occurring after completion of construction works (operation stage):
   - Change of the bottom and bank structure (direct impacts), resulting in a change of local habitat conditions in the section covered by the works (indirect impact), which may cause changes in the composition of macrophytic and phytobenthic communities as well as benthic macro-vertebrates and ichthyofauna (indirect impacts).
   - Possible influence on the values of hydromorphological indicators:decrease in the degree of hydromorphological diversity (WRH), increase in the degree of hydromorphological transformation (WPH), increase in the value of hydromorphological indicator m4 for UBSW (indirect impacts).
   - Reduction of flow resistance, resulting in an increase in speed at a given flow rate (indirect impact).
   - Favourable change in the dynamics of the intake water flow as a result of increasing the capacity of the bridge (direct impact).

The impact on the state of the elements of the UBSW state assessment is also analysed below:

It affects macrophytes and phytobenthos:

- Reduction of water transparency and deterioration of light conditions as a result of increased suspended solids concentration in the water during the works (implementation stage/indirect imp.);
- The change of habitat conditions in the section covered by the works - strengthening of slopes at abutments and changing the bottom substrate in the area of bank strenghtening and driving the pillars into the bottom may cause transformations in the composition of macrophytes and phytobenthos (implementation stage / indirect imp.;
- Mechanical destruction of plants (implementation stage/direct imp.);
- The habitat of the water caltrop*(Trapa natans*) and the potential habitat of the floating fern *(Salvinia natans*) will be destroyed (implementation phase / direct imp.).

Effects on benthic macro-vertebrates:

- Mechanical damage to animals (implementation stage/direct imp.);

- Scaring of the fauna (implementation phase/direct)
- Deterioration of living conditions of benthic invertebrates as a result of increased suspended matter concentration in water during the works (implementation stage/direct imp.);
- The change of habitat conditions in the section covered by the works - strengthening of the slope and the change of the bottom substrate in the area of river bank revetment, strengthening of the slope at abutments may cause transformation of the composition of macro-vertebrates (implementation stage / indirect imp.).

The impact on ichthyofauna:

- Notification of the fauna (implementation stage/direct imp.);
- Deterioration of living conditions of ichthyofauna as a result of inflow of suspended matter to waters during the works (implementation stage/direct imp.);
- The change of habitat conditions in the section covered by the works - strengthening of the slope and the change of the bottom substrate in the area of bank revetment - will be restored for the operational stage (indirect imp.)

Impact on hydromorphological elements:

- Deterioration of the structure of the bank zone on the reinforced section (implementation stage/ implementation stage / direct impact);
- Liquidation of natural morphological elements in the bank zone (implementation stage/direct impact);
- Reduction of the degree of hydromorphological diversity (WRH) (operational stage / indirect impact);
- Increasing the degree of hydromorphology (WPH) transformation (operational stage/indirect impacts);
- Increase of the value of the hydromorphological index m4 for UBSW (operational stage / indirect impacts);
- Reduction of flow resistance, resulting in an increase in speed at a given flow rate (operation stage/indirect impacts);
- Possible temporary change of water flow conditions and the course of channel and fluvial processes (work in the channel zone) (implementation stage/direct impacts

Impact on physicochemical elements:

- Periodic and local increase of suspended solids concentration in water (implementation stage/direct impacts);
- Exposure to uncontrolled spills of petroleum substances from working and garaged machines (implementation stage/direct impact);
- As the cleaning of the construction elements will take place outside the investment area, no contamination of water with cleaning or anti-corrosion substances is expected.

The impact on water will occur at the stage of Task implementation. It will be local and periodical. No significant impacts on biological and hydromorphological parameters are

expected to occur on the whole UBSW. The implementation of the Task will not pose a threat to the achievement of the environmental objectives of the UBSW due to the lack of significant impacts on the biological, morphological and physico-chemical parameters of the waters on the scale of the entire surface water body of *the Odra River from Czarna Struga to Nysa Łużycka* stretching along the section of the Odra River of about 50 km.

5.6. GROUNDWATER

During the implementation phase of the Task consisting in the reconstruction of the road bridge in Krosno Odrzańskie, negative impacts on the condition of groundwater bodies will be related to the works carried out in the Odra riverbed and in the bank zone.

At the stage of the Task implementation, the groundwater table may be temporarily and locally lowered, which will be caused by performing the necessary drainage of the excavations during the works. Groundwater may also be exposed to uncontrolled spills of petroleum substances from working and garaged machines. As in the case of surface waters, their pollution is very unlikely to occur, and the implementation of the Task will implement appropriate mitigation measures to minimise the risks and effects of such events.

After completion of the works, at the operational stage, no impact on the quantitative and qualitative status of UBGW is expected.

5.7. FLORA AND FAUNA

5.7.1. PROTECTED NATURAL HABITATS

The implementation of the Task will result in negative impacts on 1 habitat type:

1) 3270 Flooded muddy river banks

The task will be implemented in the area where there is a small patch of natural habitat 3270 lying in the Natura 2000 site Krosno Odra Valley PLH080028 (subject of protection). The habitat will be temporarily destroyed on an area of 0.03 ha out of 115.22 ha found in the Natura 2000 site (0.03% of the resources). There will be no factors limiting the formation of new patches of this habitat after construction is completed. The impact of the implementation of the Task on the natural habitat is not significant from the point of view of conservation of its resources in the Odra Valley, nor in the scale of the Natura 2000 site.

5.7.2. PROTECTED FUNGI, PLANT AND ANIMAL SPECIES

In the implementation area and in the immediate vicinity of the Task no protected fungi species were found.

Protected plant species

The implementation of the task will have an impact on the water caltrop *Trapa natans* and floating ferns *Salvinia natans* (temporary occupation of habitats, damage to plants or their spore

forms). The temporary bridge will temporarily occupy the anchovy habitat and potential Salvini habitat. Also the reconstruction of the bridge may have an impact on the habitats of species (crossings, occupation of the site). In order to protect local populations of these species before the works are carried out, these plants will be moved to other parts of the trough not covered by the by the works.

Protected animal species

Invertebrates

Potential hermit beetle Osmoderma eremita habitats are found in the vicinity of the task area and if these trees are not removed, there is no threat to this species. Work at the temporary and permanent bridge may have a local impact on protected bivalve mussels species (these areas will be resettled once the work is completed).

Fish and lampreys

The implementation of the Task will cause local, short-term impacts, resulting from the works in the Odra riverbed, related to scaring of fish, destruction of fry habitats and contamination with suspended matter. Impacts will only affect the construction phase and will subsidise after a few/dozen hours from the completion of the works (refers to the period of installation of bridge construction elements in the river bed). Therefore, they will not be significant for the local populations of these species.

Amphibians and reptiles

At the stage of the Task implementation, local impacts on herpetofauna (green frogs, grass snake snake) are possible.

The conduct of works also poses a threat of increased mortality of amphibians during periods of seasonal migration (in connection with the conduct of construction works and the movement of vehicles and machinery operating the site). The Task as a whole is of a minor nature, as no amphibian habitat water bodies will be destroyed.

Birds

The most exposed to activities related to the task is the common house martin *Delichon urbica*. The swallows start their nests (about 60 nests) on a metal structure underneath the bridge. During the period of the works, the common house martins will not be able to establish nests. These conditions will be restored when the work is completed.

Mammals (except bats)

The implementation of the Task will be a direct threat to *Erinaceus* spp. hedgehogs, and an indirect threat to beaver and otter. Hedgehogs may accidentally die during the passage of vehicles (stage of construction works and road operation). The beaver and the otter will be scared during the works. With appropriate minimisation solutions to ensure safe migration of animals within the bridge, the impacts generated by the Task are not relevant to local populations of species.

Bats

The work will also have an impact on bats. Studies at bridges in Wrocław, (Urban R. 2009) show that most bats prefer to fly under the bridge (mouse-eared bats, Pipistrellus), house bats and common noctules fly both under and over the bridge. Before starting work, check if the area under the bridge is not used by bats as a resting place. Depending on the results of the inspection, the recommendations of the chiropterologist should be followed.

5.7.3. NATURA 2000 SITES

The area covered by the Task lies within two Natura 2000 sites. An analysis was carried out for the planned Special Protection Area for Natura 2000 Krosno Odra Valley PLH080028 and the Special Protection Area for birds Natura 2000 Middle Odra Valley PLB080004. The occupied area is partly located in two Natura 2000 sites and these are transformed lands intensively used as a bridge, hardened road, urbanized areas. The part of the area covered by the Task located in both areas is a bridge crossing the Odra River and Natura 2000 sites on the length of about 170 m and a temporary bridge on the length of about 200 m located nearby.

As part of the environmental impact assessment of the Task, the possibility of negative impact on the following Natura 2000 sites was analysed:

- **Krosno Odra Valley PLH080028**
- **Middle Odra Valley PLB080004**

There is one protected natural habitat (3270) within the area and in the vicinity of the planned Task, recognized as a subject of protection in the Natura 2000 site Krosno Odra Valley PLH080028. The implementation of the Task will interfere with the patches of the habitat and contribute to its direct destruction. There will be no factors restricting the regeneration of this habitat once construction is completed. The area covered by the implementation of the Task constitutes small fragments, insignificant for the protection of natural habitats being the subject of protection in Natura 2000 sites, and will not cause fragmentation of habitats.

The area of habitats of species such as the European beaver, the European otter, the common goat, the rosary, which are the subject of protection of area PLH080028, and the cross-breed, which is the subject of area PLB080004, will also be temporarily reduced. Assuming a 50 m buffer from the area covered by the task, it will be a total of about 3 ha of occupied area of potential habitats of the species. These habitats are common on the Odra. The occupied areas are small and do not threaten the presence of protected objects and communications between habitats.

No disruption of populations of key protected animal species in Natura 2000 sites is expected. The implementation of the Task does not require occupation of the habitats of key species in the areas. The beaver in the occupied section does not have suitable places to settle and feed. As there is no trees and shrubs. It can only use the area for migration. There will be no obstacle to this happening during the works. Other species (goat, pink-headed duck) will not be exposed to significant loss of habitats and significant behavioural disturbance, either.

5.7.4. OTHER PROTECTED AREAS

The implementation of the Task does not generate negative impacts on other protected areas (Krosno Odra Valley Protected Landscape Area), which are at least 1 km away from the Task

implementation site. Impacts resulting from the implementation of the Task have only temporary and local character.

5.8. ACOUSTIC CLIMATE

At the stage of investment implementation, the noise emission will be generated by the operation of machines and heavy construction equipment and the movement of vehicles serving the construction site. The range of noise impact associated with the construction will depend on the type of machines used, the number of machines running simultaneously and their operating time. The sound power level of most construction machines and chain saws is within the L_{WA} = 105- 115 dB.
Noise generated at the stage of investment execution will be dispersed, emitted only during the daytime.
The closest residential buildings exposed to the adverse impact of the works are located in the vicinity of the planned Task. The increased noise emission is only related to the stage of implementation, i.e. a short period of time, limited to the execution of necessary works. Periodic nuisance related to noise emission will disappear with the completion of individual stages of works.

An acoustic analysis of the planned investment, taking into account the traffic forecast for 2035, was carried out in order to examine whether the permissible noise intensity standards will not be exceeded at the stage of exploitation of the project. The acoustic analysis shows that the permissible levels of environmental noise will be maintained and there is no need for acoustic screens along the length of the right-of-way of the section of DK29 covered by the works within the Task. Thus, there is no need to correct the demarcation lines due to acoustic conditions. The building placed on plot of land No. 1080 is located at the border of the right-of-way strip and therefore, in accordance with Article 114(4) of the Environmental Protection Law, it is required to ensure appropriate acoustic conditions inside. Taking into account the results at the point located at the building façade on the plot of land 1080, i.e. L_{AeqD}=64.5 dB (daytime) and L_{AeqN}=60.8 dB (night time) and the estimated acoustic insulation of the building partitions, it was stated that the requirements of the standard PN-B-02151-2:2018-01 Building acoustics - Protection against noise in buildings - Part 2 will be met: Requirements for permissible sound level in rooms.

The following input data were adopted for the calculation:

- traffic speed as for developed areas - 50 km/h in the daytime and 60 km/h at night for both vehicle categories (light and heavy vehicles). 30 km/h for the time of day and night and both categories of vehicles on the proposed roundabout,
- wearing course of the surface with normal noise - asphalt concrete 4 cm thick,
- traffic volume for 2035:

Table 7 Forecast traffic volume and structure for DK29 in 2035 for the day and night time

Day (6^{00}-22^{00})				Night (22^{00}-6^{00})			
Number of light vehicles	**Number of heavy vehicles**	**Total**	**Share of heavy vehicles [%]**	**Number of light vehicles**	**Number of heavy vehicles**	**Total**	**Share of heavy vehicles**
3981	352	4333	**8.1**	487	80	567	**14.1**

Access roads to DK29 are being rebuilt as part of the investment, i.e. Ul. [Street] Podgórna, ul. [Street] Nadodrzańska, ul. [Street] Murna and ul. [Street] Słoneczna are characterised by such a low traffic volume that the isolines at 61 and 65 dB and 56 dB at night are invisible in their area.

In connection with the results of the acoustic analysis, there is no need to construct acoustic screens in the area of the investment and to correct the demarcation lines due to the acoustic conditions.

5.9. CULTURAL MONUMENTS

As part of the Task, the road bridge over the Odra River, which is a monument, will be rebuilt. The town's spatial layout from the mid-13th century is also protected as a monument. According to the local zoning plan, both zones are required to "preserve the historic geometry of the street courses, with their irregular width, variable width of the roadway and cobbled and stone surface". When applying activities aimed at the protection of material goods and requirements resulting from the arrangements made by the Voivodeship Monument Conservator (including the obligation to ensure archaeological supervision) and general provisions of the Act on the protection of monuments, the implementation of the Task will not involve a significant impact on the monuments and cultural landscape of the area.

5.10. STRUCTURES

As far as the protection of structures is concerned, the implementation of the Task will improve the flood safety of the areas within the city and municipality of Krosno Odrzańskie. In the neighbourhood of the construction sites and the routes of vehicles serving the work it is possible that there will be impact on the buildings located in the vicinity.

Waste

In connection with the implementation of the planned works, including the reconstruction of the road infrastructure, the existing bridge and the demolition of the temporary bridge after the completion of the works, mainly waste classified as waste from the construction, repair and dismantling of buildings and road infrastructure will be generated. This waste will be generated at the project implementation stage and its volume will be significant. The second group of waste generated at the implementation stage will be municipal waste, but its volume will be small. The volume of waste containing asbestos will be negligible.

Appropriate mitigation measures will be implemented to ensure proper waste management/recycling.

5.11. HUMAN HEALTH AND SAFETY

The impact on human health and safety during the implementation of the Task may be related, among others, to the following factors:

- increased noise emissions,
- pollution by petroleum-based substances,
- access of unauthorized persons to the area of construction works,
- the occurrence of elevated water levels and flood water flow that pose a threat to the works area and adjacent areas,
- transportation of materials and soil masses, elements of the bridge construction by water and / or transport of bulky elements by land,
- carrying out works within the waters and the bank slope areas in close proximity to water,
- change of traffic organization for the construction period (in particular, traffic organization using a temporary bridge).

Detailed selection of equipment units for the purpose of performing the Works covered by this Task is left to the discretion of the Contractor, after prior consultation with the Engineer. Equipment, machines or tools which do not guarantee compliance with the quality requirements of Works, health and safety regulations and HASP regulations and which may cause damage to the existing infrastructure and elements of buildings and land development will not be admitted to Works by the Engineer.

The operation of floating equipment, the performance of work using it, as well as the movement of workers in the immediate vicinity of the riverbed, also pose a risk to the health and life of those performing the work. Therefore, it is important to ensure that workers have adequate equipment to protect their health and life during the execution of works (including appropriate fall protection equipment) and to develop and implement appropriate safety procedures when carrying out the works.

During the implementation of the Task, the generated emissions of pollutants into the air and noise will be of a local character, limited to the area of work. The works will be carried out in the riverbed and directly on its bank, which means that they will not pose a threat to the health of people living in built-up areas located in the area of the Task implementation sites. It should be emphasized that the works related to the reconstruction of the bridge will be carried out outside the residential areas. In the area of housing development, works connected with reconstruction of the road system will be carried out.

5.12. EMERGENCY HAZARDS (CRISIS AND EMERGENCY SITUATIONS)

The implementation and operation of the planned Task entails the possibility of the following emergencies which may cause extraordinary environmental hazards.

Leakage of petroleum substances

During the construction phase, an emergency situation may occur, resulting in leakage of petroleum substances from vehicles, construction machinery, tanks, etc., resulting in contamination of surface water and/or soil. Leakages can potentially occur during the movement of vehicles and machines, as well as at parking and fuelling points. During the course of the works, the risk of an emergency situation will be minimised by ensuring that appropriate procedures and measures are in place to limit losses in the event of environmental damage.

Fire or explosion of flammable substances

During the construction phase, an emergency situation related to the occurrence of a fire may occur (e.g. due to equipment failure, personnel negligence, explosion of flammable substances, lightning strike, etc.). The occurrence of such a situation poses a threat to both the Contractor's personnel and the environment. Nevertheless, in order to minimize such situations, among other things, only equipment in proper technical condition will be used and properly operated and maintained.

Finding unexploded ordnance

At the stage of the earthworks and other construction works, hazardous materials of military origin may be found, such as unexploded ordnance and unexploded shells (e.g. fuses, missiles, aerial bombs, artillery and rifle cartridges, armour plating, grenades, all types of mines, explosives charges, scrap metal containing residual explosives, etc.). The task will be carried out in such a way as to eliminate the risk of any danger to the Contractor's staff and local residents. Procedures will be developed in case of such a situation and appropriate personnel will be involved (sapper's supervision).

Sudden water rush, flooding

A potential situation posing a threat to the environment and human health and safety at the stage of works is also the occurrence of a sudden increase in the table of water in the river. The Contractor should monitor on an ongoing basis the hydrological situation in the catchment areas of the Odra River in zones that may result in increased water levels in the area of works. During the period of high water levels or jamming floods, the Contractor's equipment and elements of construction facilities may be located within the river bed and in the bank zone. Therefore, procedures will be developed in case of such a situation.

Storms and hurricanes

The occurrence of extreme weather conditions such as storms and hurricanes is potentially dangerous for the conditions under which the work is carried out, and thus for the safety and health of people and the environment. Some of the works will be carried out within or in close proximity to high greenery.

Possibility of failure during operation

The emergency situation in the operation of a rebuilt bridge may be mainly road accidents, which are a source of uncontrolled leakage of substances from transport vehicles. As a result of collisions, accidents or road accidents, tanks and vehicle installations may become unsealed, from which operating fluids or fuels may be released.

Epidemiological risk

In the event of an epidemic, there may be threats to the health and life of the Contractor's employees and the Employer's and Engineer's staff as well as to the construction process.

Regulation of the Minister of Health of 20 March 2020 on *declaring the state of the epidemic on the territory of the Republic of Poland* (Journal Of Laws item 491 as amended) in the period from 20 March 2020 until further notice, in the territory of the Republic of Poland a state of epidemics in connection with SARS-CoV-2 virus infections was announced.

5.13. CUMULATIVE AND TRANSBOUNDARY IMPACTS

In the environmental impact assessment procedure, issues related to cumulative impact were analysed. According to the information contained in the justification of the decision on environmental conditions issued for the Task (see Appendix 4a), the cumulative impacts were considered in particular in the context of the tasks carried out on the Odra River within the framework of the Odra-Vistula Flood Protection Project, but taking into account other planned investments, which impacts could potentially accumulate with the investment included in Task 1B.1/1 (b):

1. **Revitalization of the lower part of the city including the streets: Grobla, Bobrowa, pl. Prusa, Żeromskiego, Wodna, Rybaki** (total length approx. 1470 m, area approx. 3.5 ha, plot reg. no. 5/2, 55, 56/1, 56/2, 56/3, 4, 49, 33, 30/3, 34, 48, 56, 47, 68/13, 68/25, 64/2, 66, 117/1 cadastral district 002 Krosno Odrzańskie[1] - creating new routes of pedestrian and bicycle communication, rebuilding the existing road infrastructure, changing the aesthetics of the surroundings and giving the area a recreational, social, cultural, educational, economic and tourist function.

The investment will be implemented in the area of impact of the planned Task. In the case of simultaneous construction works, the expected accumulation of impacts in terms of air emissions and noise. Possible occurrence of accumulation of impacts on protected animal species, also being the objects of protection of Natura 2000 sites Krosno Odra Valley PLH080028 and Middle Odra Valley PLB080004 (as regards disturbing and disturbing animals). However, due to the works carried out in urban areas located outside the areas with key functions for the integrity of Natura 2000 sites, there is no threat of significant negative impacts on the objects of protection of Natura 2000 sites.

2. **Construction of a ring road of Krosno Odrzańskie in the course of national road No. 29** along with reconstruction of the existing technical infrastructure facilities, protection of agricultural and forest areas and protection of cultural[2]assets. The construction of a bridge over the Odra River will contribute to increasing the comfort of road users and city residents.

[1] http://bip.wrota.lubuskie.pl/ugkrosnoodrzanskie/zamowienia_publiczne/284/198/REWITALIZACJA_CZESCI_DOLNEGO_MIASTA_OBEJMUJACEGO_ULICE_3A_GROBLA_2C_BOBROWA_2C_PLAC_PRUSA_2C_ZEROMSKIEGO_2C_WODNA_2C_RYBAKI/

[2] Technical-Economic-Environmental Study with elements of the Programme Concept (STEŚ-R) together with materials for the decision on environmental conditions for the investment entitled.: Construction of the ring road of Krosno Odrzańskie within the national road No. 29. Transprojekt Gdański.

The implementation of the investment, depending on the selected variant, may lead to an accumulation of impacts on local and regional populations of protected species of fauna and flora and Natura 2000 sites Krosno Odra Valley PLH080028 and/or Middle Odra Valley PLB080004, as well as the ecological corridor Middle Odra Valley GZK-19. Development of STEŚ[1]is planned for August 2020.

Flood protection of the city of Krosno Odrzańskie[2] - refers to the construction of 9 new ring embankment, retaining walls and mobile flood protection systems with a total length of 5,926.3 m and the extension or reconstruction of four by-pass channels together with the installation of anti-backflow flaps on the existing rainwater drainage network with a total length of 2,757.8 m. This task is carried out within OVFMP to protect the city of Krosno Odrzańskie against flooding. On 27 February 2017, the Regional Director of Environmental Protection in Gorzów Wielkopolski issued an environmental decision (ref. no.: WZŚ.4233.1.2016.AN).

The implementation of the investment may lead to an accumulation of impacts on local and regional populations of protected species of fauna and flora and Natura 2000 sites Krosno Odra Valley PLH080028 and/or Middle Odra Valley PLB080004, as well as the ecological corridor Middle Odra Valley GZK-19. However, these impacts are not severe enough to threaten the proper conservation status of the Natura 2000 sites. In the course of the environmental impact assessment for the project *Flood protection of Krosno Odrzańskie*, no threat of a severe negative impact on the protected areas and the protected species of plants, fungi and animals was found.

Cumulation is also expected in terms of impacts on land surface and landscape, air emissions and noise. Both Contracts will be executed in a similar period of time, therefore the stage of execution of works will be properly coordinated by the Consultant Engineers of individual contracts (mainly concerning the area of temporary bridge crossing on the left bank of the Odra River).

3. **1B.1/1 (a). Rebuilding the control structures of the Odra River - adjusting it the class III waterway, along the section from Ścinawa to the mouth of Nysa Łużycka – stage II**. - rebuilding of the groins. The location of potential construction facilities (one of the main ones) in the existing port in Krosno Odrzańskie was planned.
The implementation of the investment may lead to an accumulation of impacts on local and regional populations of protected species of fauna and flora and Natura 2000 sites Krosno Odra Valley PLH080028 and/or Middle Odra Valley PLB080004, as well as the ecological corridor Middle Odra Valley GZK-19. Cumulation is also expected in terms of impacts on air emissions and noise. No risk of severe negative impacts on Natura 2000 sites was identified

Analysis of the cumulative effect on the status of surface water bodies and the impact on the achievement of environmental objectives referred to in Articles 56, 57, 59 and 61 of the Water Law

https://www.gddkia.gov.pl/pl/a/31388/Spotkanie-informacyjne-w-sprawie-budowy-obwodnicy-Krosna-Odrzanskiego

[1] https://www.gddkia.gov.pl/pl/a/31277/DK29-Obwodnica-Krosna-Odrzanskiego

[2] Programme concept of the investment to protect the city of Krosno Odrzańskie against flooding - update. Biuro Projektów Inżynierii Środowiska i Melioracji Ekoprojekt sp. z o. o. in Zielona Góra.

The environmental objectives for the analysed UBSW are:

- good environmental potential;
- possibility of migration of aquatic organisms in the section of the significant water course - the Odra within the UBSW
- good chemical condition.

According to the Regulation of the Council of Ministers of the Republic of Poland dated 18 October 2016 on the Water Management within the Odra River Basin (Journal of Laws of 2016, item 1967) and the Regulation of the Council of Ministers of 18 October 2016 on the adoption of the Flood Risk Management Plan for the Odra River Basin District (Journal of Laws of 2016, item 1938) within the area of the analysed UBSW Odra from Czarna Struga to Nysa Łużycka with code RW6000211739. The following investments are planned:

1. Renovation and Modernisation of the free-flowing Odra river control buildings - reconstruction and Modernisation of the control buildings - in order to adapt the section of the Odra from Malczyce to the mouth of the Nysa Łużycka river to the third class of the waterway - the investment has been defined as an undertaking that may not achieve the good potential of UBSW RW6000211739.
2. Flood protection of the city of Nowa Sól. Stage II Nowa Sól-Pleszówek - the investment may have an impact, but it will not result in not achieving the good water potential of UBSW RW6000211739.
3. Flood protection of the areas below the town of Krosno Odrzańskie, Wężyska-Chlebowo, construction of the left side embankments of the Odra River, the commune of Maszewo, Gubin, Krosno Odrzańskie, increasing the valley retention by extending the embankments in km 528.6÷532.0 of the Odra River, i.e. liquidation of the damaged left embankment and construction of a new flood protection embankment (together with accompanying elements) on the section of 5.5 km, between the villages of Wężyska-Chlebowo.

These investments are located outside the area of impact of the Task in question. Thus, no significant cumulative, permanent impacts are expected on the biological and physicochemical elements of the UBSW assessment. However, the implementation of these investments may lead to the accumulation of impacts on the condition of hydromorphological elements on the scale of the whole UBSW. As most of the activities will be carried out on sections already regulated, the impact on the hydromorphological indicator m4 will not be significant. However, cumulative impacts may result in a decrease in the Hydromorphological Diversity Index (WRH) and an increase in the Hydromorphological Conversion Index (WPH) on the scale of the whole UBSW. Cumulative impacts may also affect the dynamics of water flow in the Odra riverbed. Impacts on hydromorphological elements will depend on the adopted detailed scope of work, however, this impact may occur as a result of the implementation of other projects, analysed in the context of cumulative impacts with this investment.

The project is located in the Republic of Poland. The distance to the border with Germany is about 38 km. Due to the distance from the national border, the local nature of the impacts generated by the project of cross-border nature will not occur.

6. DESCRIPTION OF MITIGATION MEASURES

In order to limit the negative impact of the planned Task on the environment, Appendix no. 1 to the EMP provides the list of mitigation measures to be taken by the Contractor. These activities were developed on the basis of the conditions contained in the environmental decision in force issued for the Task, with the supplement of additional conditions established at the stage of preparation of the EMP. A summary of the main categories of mitigation measures is presented below, broken down into individual environmental components discussed in chapters 4 and 5 of the EMP.

6.1. EARTH SURFACE AND LANDSCAPE

The basic forms of negative impact of the planned Task on the ground surface and landscape are presented in Chapter 5.1.

To limit these impacts, the following mitigation measures have been introduced in Appendix 1 to the EMP:

- 1, 2, 3 (01 - Requirements concerning the location and area limitations for temporary occupations),
- 6(02- Requirements concerning the communication service of the Task implementation area.),
- 8, 9 (03 - Organisation of the construction site, construction facilities, warehouses and storage yards),
- 19, 20 (06 - Requirements for felling and protection of trees and shrubs).
- 42 (07- Requirements for conservation of protected natural resources).

6.2. CLIMATE

In the case of the Task, no mitigation measures were found to be necessary for the protection of local climatic conditions (measures related to air quality protection have been introduced - chapter 6.3). This task simultaneously prevents and mitigates the effects of extreme weather events.

6.3. AIR QUALITY

The basic forms of negative impact of the planned Task on air quality are presented in chapter 5.3. To limit these impacts, Appendix 1 to the EMP introduces mitigation measures under the following headings: 46, 57, 58, 59 (08 - Environmental pollution prevention requirements).

6.4. SOILS AND LAND

The basic forms of negative impact of the planned Task on soils and lands are presented in chapter 5.4.

To limit these impacts, the following mitigation measures have been introduced in Appendix 1 to the EMP:

- 8, 9 (03 - Organisation of the construction site, construction facilities, warehouses and storage yards)
- 10, 11, 12 (04 - Requirements for management of soil masses),
- 13, 14 (05 - Principles of top soil handling and land reclamation),
- 44, 46, 47, 48, 49, 50, 51, 52, 60, 61 (08 - Environmental pollution prevention requirements),
- 63, 64, 65, 67, 68, 69, 70 (09 - Waste treatment requirements).

6.5. SURFACE WATERS

The basic forms of negative impact of the planned Task on surface waters are presented in chapter 5.5.

To limit these impacts, the following mitigation measures have been introduced in Appendix 1 to the EMP:

- 8, 9 (03 - Organisation of the construction site, construction facilities, warehouses and storage yards),
- 10, 11, 12 (04 - Requirements for management of soil masses),
- 44, 45, 46, 47, 48, 49, 50, 51, 52, 60, 61, 62 (08 - Environmental pollution prevention requirements),
- 63, 64, 65, 67, 68, 69, 70 (09 - Waste treatment requirements),
- 93 (13 - Requirements for the protection of human health and safety).

6.6. GROUNDWATER

The impact of the planned Task on groundwater is analysed in Chapter 5.6. The task does not generate negative impacts on the state of groundwater. Preventive measures relating to the protection of groundwater against pollution are listed in Appendix 1 to the EMP. Mitigation measures for the reduction of impacts on groundwater are those specified for the protection of soils and land and surface water (in accordance with Chapter III.2). 6.4 . and 6.5)

6.7. ACOUSTIC CLIMATE

The basic forms of negative impact of the planned Task on the acoustic climate are presented in Chapter 5.8.

To limit these impacts, the following mitigation measures have been introduced in Appendix 1 to the EMP: 46, 53, 54, 55, 56 (08 - Environmental pollution prevention requirements).

6.8. FLORA AND FAUNA

6.8.1. NATURAL HABITATS, FLORA AND FAUNA

The basic forms of negative impact of the planned Task on natural habitats, flora and fauna are presented in Chapter 5.7.

To limit these impacts, the following mitigation measures have been introduced in Appendix 1 to the EMP:

- 4 (01 - Requirements relating to the location and area limitation for temporary occupations),
- 8, 9 (03 - Organisation of the construction site, construction facilities, warehouses and storage yards),
- 15, 16, 17, 18, 19, 20, (06 - Requirements for felling, planting and protection of trees and shrubs),
- 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, (07 - Requirements for conservation of protected natural resources),
- 44 (08 - Environmental pollution prevention requirements),
- 71, 72, 73 (10 - Requirements for containment and eradication of invasive plant species),
- 74, 75, (11 - Rules of conduct of works in the Odra riverbed),
- 104 (15 - Specific policy requirements of the ES World Bank).

In particular in sec. 7 Requirements for conservation of protected natural resources Appendix 1 to EMP, a number of mitigation measures have been developed relating to the organisation of works, protection of valuable natural sites adjacent to the work areas and appropriate control of work sites by experts of the Contractor's environmental team. Thus, the natural resources in the place and surroundings of the works after the completion of the works do not suffer any permanent deterioration in terms of natural value as they currently represent. It should be borne in mind that the river valley is an environment subject to natural variability and therefore the distribution of natural habitats and species may differ from year to year.

6.8.2. PROTECTED AREAS

The mitigation measures adopted for natural habitats and protected plant and animal species also apply to the protection of natural values of protected areas. A set of mitigation measures for the protection of protected areas is presented in Appendix 1 to the EMP (the items indicated in chapter I of the PAP). 6.8. 1).

6.9. CULTURAL LANDSCAPE AND MONUMENTS

The basic forms of negative impact of the planned Task on the cultural landscape and monuments are presented in Chapter 5.9.

To limit these impacts, the following mitigation measures have been introduced in Appendix 1 to the EMP: 76, 77, 78 (12 - Requirements for the protection of cultural monuments).

6.10. TANGIBLE GOODS

The basic forms of negative impact of the planned Task on the cultural landscape and monuments are presented in Chapter 5.10. To limit these impacts, the following mitigation measure is introduced in Appendix 1 of the EMP: 6, 7(02- Requirements concerning the communication service of the Task implementation area.),

Issues related to land acquisition or change in land use, as well as acquisition of land for temporary occupancy, are discussed in detail in the *Property Acquisition and Resettlement Action Plan* (LARAP) for this Task.

6.11. HUMAN HEALTH AND SAFETY

The basic forms of negative impact of the planned Task on human health and safety are presented in chapter 5.11.

In order to limit these impacts, Appendix 1 to the EMP introduces mitigation measures in items 5, 6, 7 (02 - Requirements for communication service of the task area), 79 - 93 (13 - Requirements for human health and safety), 104 - 112 (15 - Specific requirements of ES World Bank policies).

6.12. EMERGENCY HAZARDS (CRISIS, EMERGENCY)

Crisis situation

In the event of an emergency, the competent services must be notified first:

Service	**Telephone No.**
Emergency number from a mobile phone	112
Police	997
Fire Brigade	998
Ambulance	999

Flood

The equivalent of an industrial accident in relation to this Task can be considered to be the occurrence of high water levels or the occurrence of flooding, within the riverbed. Before the commencement of the works, the Contractor will prepare an appropriate plan of proceedings in

case of such events*(Flood Protection Plan for the construction site*) and obtain the Engineer's approval for its contents. This document will describe, among other things, the procedures to be followed in the event of such phenomena (see chapter 6.14). The condition related to the necessity to draw up such a document is included in item 91 in Appendix 1 to the EMP

Storms and hurricanes

The Contractor is responsible for ensuring safety in the area of Task implementation. The procedure to be followed in case of extreme weather conditions will be included in the HASP prepared by the Contractor (see chapter "Extreme weather conditions"). 6.14.). The requirement for the Contractor to develop the HASP and obtain the Engineer's approval for its content is specified in item 81 in Appendix 1 to the EMP.

Leakage of petroleum substances

Another type of extraordinary hazard is the leakage of petroleum substances into water or soil. In order to reduce the risk of environmental pollution, appropriate preventive measures will be implemented relating, inter alia, to the appropriate organisation and equipping of construction sites and facilities, equipping the sites of possible spills with appropriate sorbents and ongoing monitoring of the condition of used construction equipment. In the event of possible spillage of petroleum products, containment measures must be taken and removed immediately. If contaminated soil layers are present, they must be managed in accordance with the applicable regulations. mitigation measures to protect the soil and water environment are set out in Appendix 1 to the EMP (see chapter 6.4-6.5).

Findings of unexploded ordnance

The works will be carried out in the Odra valley, at selected locations of the river channel. Due to the fact that during World War II military operations were carried out in the vicinity of these areas, it is possible to find unexploded ordnance in the course of construction works, such as: fuses, missiles, aerial bombs, artillery and rifle cartridges, armour plating, grenades, all types of mines, explosive charges, scrap containing remnants of explosives and others.

The Employer did not inspect the work site for the presence of unexploded ordnance. In connection with the above, the Contractor is obliged to ensure, during the earthworks, the supervision of sappers (the supervision of sappers of the Contractor) consisting in current checking and clearing the area of dangerous objects of military origin together with their disposal.

In case of finding unexploded ordnance during the works, the Contractor should immediately stop the work and evacuate the employees and notify the supervisor, the police, the Engineer and PIU.

Under no circumstances (except for sapper's supervision of the Contractor and the specialist sapper's unit) may unexploded ordnance be lifted, dug up, buried, transferred or thrown into fire or into places such as rivers, channels, old river beds, ditches, etc.

The mitigation measures relating to the risks of unexploded ordnance and unexploded shells found are set out under the following headings in the table in Appendix 1 to the EMP: 89, 90 (13- Human health and safety requirements).

Fire

The Contractor is responsible for fire protection in the area of Task implementation. The detailed procedure in case of fire will be included in the HASP prepared by the Contractor (see chapter 6.14.). The requirement for the Contractor to develop the HASP and obtain the Engineer's approval for its content is specified in item 81 of Appendix 1 to the EMP (13 - Requirements for ensuring human health and safety).

Navigation accident

Taking into account the specificity of the works, a potential threat is also a collision of vessels used during the Task. Guidelines for waterway safety / prevention of navigation accidents are contained in item 92 (cat. M - Requirements regarding extraordinary environmental hazards) in the App. 1 to EMP Additionally, in item 93 (cat. L - Requirements for the protection of human health and safety) the Contractor was obliged to carry out the certificate research of bottom cleanliness in the area of the rebuilt bridge in order to ensure that in connection with the execution of the Task, in particular the demolition works, no obstacles were created that would endanger the safety of the vessels.

Epidemiological risk

If an epidemiological threat or epidemic emergency state is in force during the execution of works, the Contractor shall be obliged to act in accordance with legal requirements, in particular the Act of 5 December 2008 *on preventing and combating infections and infectious diseases in humans* (unified text: Journal of Laws of 2019, item 1239, as amended), all obligations resulting from the announcement of an epidemic or a state of emergency and relevant World Bank guidelines. The Contractor's actions should reduce the risk of spreading the infection both to the Contractor's staff as well as to the Employer and the Engineer and the local community. The guidelines for dealing with an epidemiological emergency or epidemic state are contained in item 146 (cat. S - Guidelines for dealing with the case of a state of epidemics or a state of emergency in the course of works) in the App. 1 to EMP

Notwithstanding the above, in accordance with item 112 (cat. L - Requirements for the protection of human health and safety) will implement an awareness-raising programme on the spread of communicable diseases (e.g. COVID 19).

6.13. WASTE AND WASTE WATER

Mitigation measures for waste management are the following items in Appendix 1 to the EMP: 69– 70 (09 - Waste treatment requirements),

The mitigation measures for waste water treatment are described in item 68 in Appendix 1 to the EMP (09 - Requirements for waste treatment).

In the place where the walls reinforcing the foundation of the existing bridge are driven, it is planned to remove about 40 to 60 m^3 sediments from the riverbed, which after quality testing will have to be properly managed as waste. There are no plans to remove sediment from the site of the temporary bridge. From the area between the embankments, only the layer of top soil is planned to be removed, which will be reused. The handling of riverbed extracted sediments must take into account the *Environmental, Health and Safety Guidelines for Ports, Harbours,*

and Terminals[1]. The Contractor will develop *a Soil Management Plan*, which will specify the rules for handling the soil and sediments extracted from the riverbed during the works (the scope of the document is specified in detail in the Appendix 1 EMP, item 10).

Table 8 Estimated quantities of waste that will be generated during the works.

Type of waste	Total measured quantity	Unit
Rubble from the demolition of the support parts	150	m3
Rubble from the demolition on the bridge pavement	164	m3
Waste from road slabs and angled walls from demolition of a temporary bridge	9	m3
Steel scrap from demolition of temporary bridge supports	33188	kg
Asphalt surface	1 023	Mg
pavement made of concrete pavers -	2733	m^2
pavement made of stone pavers	452	m^2
breakstone	3 263	Mg
dismantling of the edges	905	linear meter
gravel	267	Mg

6.14. REQUIREMENTS FOR THE IMPLEMENTATION OF ACTION PLANS DURING THE CONSTRUCTION PHASE

In order to ensure the proper organisation of the conduct of works, as well as the proper implementation of the conditions set out in the Appendix 1 and 2 in the Environmental Management Plan, the Contractor is obliged to develop and obtain the Engineer's approval and then implement the following documents as elements of **the Contractor's Environmental and Social Management Plan (C-ESMP)**:

- *Site organisation plan*, which should include, inter alia, elements such as:
    - Location of the construction site facilities
    - Management of the construction site facilities

[1] https://www.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/sustainability-at-ifc/publications/publications_policy_ehs-portsharborsterminals

- Safety of the construction site facilities
- Technological roads, including mandatory planned temporary site occupations,
- Environment protection within the site facilities.

- *The traffic organisation plan for the duration of the works, which should be compliant with:*
  - technical specifications,
  - road managers' requirements for transport and conditions of use.

- *The waste management plan* should contain, inter alia, the following main elements and the detailed guidelines contained in Appendix 1 to the EMP:
  - Encountered and predicted kinds and volumes of waste,
  - Manners of preventing negative impact of the waste on environment,
  - Manners of waste management with taking into account collection, transportation, recover and treatment of waste,
  - Type of waste generated (inter alia, waste from construction, renovation and dismantling of buildings and road infrastructure - including soil from polluted areas, hazardous waste, municipal waste, waste containing asbestos) and the method of their storage and disposal.
- *Quality assurance plans* for particular categories of works and other activities of the Contractor (depending on the needs, including the Engineer's requirements), which should include, among others::
  - Information on the planned organisation of the execution of a given category of works or activities;
  - Information on the conditions of implementation of a given category of works or activities included in the PMP;
  - Information on possible other ways of preventing the negative environmental impact of a given category of works
- *Flood protection plan* for the *construction site* for the duration of the works, which should include such elements as
  - Monitoring hydrological and weather situation \,
  - Conditions for allowing surge flows in the period of works performance,
  - The rules of work for the Contractor’s team in the period of flood risk,
  - Basic duties of the members of the Company Flood Protection Team,
  - List of people having certain positions in the period of flood risk,

- List of equipment and transportation means needed to conduct rescue actions,
- Instructions for the proceedings during surges.

- *The plan for dealing with uncontrolled emissions (leakage) of petroleum products,* which should contain, inter alia, elements on how to deal with spillage of chemical and petroleum products, i.e:
  - The mode of equipment with appropriate materials in relation to the anticipated hazards and substances,
  - Alarm and notification mode of individual services,
  - The procedure to limit spillage,
  - The procedure for dealing with sorbent materials.

- *ES Code of Conduct for Contractor Personnel* (Code of Conduct ensuring the implementation of measures to address environmental and social risks related to the implementation of the Task, including the risks of sexual exploitation, sexual abuse and sexual harassment).
  The Contractor shall submit the ES Code of Conduct containing provisions defining the obligations of the Contractor selected as a result of the contract award procedure, in particular with respect to environmental protection, social, health and safety issues, in accordance with the template, after it has been signed (on each page) together with the tender. It therefore acknowledges the need to apply its requirements during each phase of the contract.
  The Code of Conduct forms part of the measures to address the environmental and social risks associated with the implementation of the Task, including the risks of sexual harassment and mobbing, as well as discrimination on the basis of gender. Applies to all personnel of the Contractor, workers and other employees in the area of Task implementation. It also applies to the personnel of each Subcontractor and any other personnel assisting the Contractor in performing the Task.

- *ES Management Strategies and Implementation Plans* (management strategies and implementation plans for environmental, social, health and safety risks), which include elements such as:
  - description of actions taken to manage risks;
  - description of materials used, equipment, management processes, etc., which will be carried out by the Contractor and its subcontractors in order to minimize risk.

The Contractor is obliged to submit for approval of the Engineer and then to implement **the Contractor's Environmental and Social Management Plan (C-ESMP),** in accordance with the Terms and Conditions of the Sub-Clause 4.1 SC, containing, among others, agreed Management Strategies and ES Implementation Plans, the Contractor's Code of Conduct for Contractor's Personnel (ES) and the Environmental Management Plan (EMP) will constitute a binding part of C-ESMP. The Contractor shall not be entitled to modify the provisions and conditions set out in the EMP. The Contractor shall review the C-ESMP plan

periodically and update it in accordance with the requirements of the Contract to ensure that it includes actions suitable for the Works. The updated C-ESMP is submitted to the Engineer for inspection. The procedures for reviewing the C-ESMP and updating it are as described in Subclause 4.4.1 SC.

- *The Health and Safety Plan* (HASP)**,** which should include, inter alia, the following elements:
    - Indication of the elements of plot or area management that may create risk for people; s safety and health.
    - information on anticipated threats occurring during the execution of construction works, specifying the scale and types of threats and the place and time of their occurrence, including the to the environment:
    - Information on the separation and marking of the construction site according to the type of hazard;
    - Information on how to instruct employees before carrying out particularly dangerous works;
    - Determining how to store and move dangerous materials, articles, substances and preparations on the site;
    - Indication of technical and organisational measures to prevent dangers resulting from the performance of construction works in areas of special health hazards or in their vicinity, including those ensuring safe and efficient communication, enabling rapid evacuation in the event of fire, breakdown and other hazards;
    - Indication of the place where construction documentation and documents necessary for proper operation of machines and other technical devices are stored.
    - information on solving problems related to COVID-19 (attention should also be paid to the other information on carrying out work in pandemic conditions specified in the App. 1 and 2 to EMP).

The Contractor, when preparing the aforementioned documents, the shall take into account relevant operational policies of the World Bank concerning health, environment and safety rules, including EHS Guidelines. These documents must be approved by the Engineer before implementation, who then also monitors their correct implementation.

The Contractor will also conduct training on the terms and conditions of implementation of the EMP for the Contractor's managerial and engineering staff, as well as regular training of Employees in the field of occupational health and safety, raising awareness in the field of combating sexual harassment and mobbing.

When preparing the aforementioned documents, the Contractor shall take into account relevant operational policies of the World Bank concerning health, environment and safety rules. These documents must be approved by the Engineer before implementation, who then also monitors their correct implementation. The requirement to develop and obtain acceptance of the contents of the above mentioned documents was indicated in items 106 in Appendix 1 to the EMP.

6.15. SPECIFIC REQUIREMENTS FOR ES WORLD BANK POLICIES (ENVIRONMENTAL AND SOCIAL ASPECTS, INCLUDING RISKS OF SEXUAL EXPLOITATION, SEXUAL ABUSE AND SEXUAL HARASSMENT)

The implementation of the Task is related to the need to meet a number of ES requirements (environmental, social, health and safety aspects), which are regulated by national regulations governing environmental protection, health and safety at work and labour law. The institutions and bodies of the state supervise their observance. In particular, as regards compliance with occupational health and safety regulations and labour law, the state health and labour inspection authorities are authorised to control the activities of entrepreneurs, including on construction sites. However, given the high priority given by the World Bank to ES requirements, the terms and conditions of contracts co-financed by the World Bank loan impose obligations to ensure the implementation of existing legislation. Special attention is given to issues such as:

- Protection of juveniles employed in the execution of the Contract.
- Eliminate inappropriate forms of behaviour of persons employed under the Contract (including sexual harassment and mobbing).
- Ensure the safety and health protection of the persons employed in the performance of the Contract, including the provision of health and safety services required by law.
- To ensure proper social and employment conditions for employees employed in the performance of the Contract (including fair pay conditions).

A list of issues in the form of requirements for the Contractor related to the ES WB policies is presented below. It should be emphasized that the ES requirements and conditions specified for the Contractor and its employees also apply to the Contractor's Subcontractors and their employees or Subcontractors.

- The Contractor shall conduct training and implement an awareness-raising programme to combat sexual harassment and mobbing. These activities will be carried out during the entire term of the Contract including the period of reporting defects at least every second month. These will take the form of information, education and awareness-raising campaigns.
- The Contractor shall inform the Consultant immediately of all reported cases and suspicions of sexual harassment and mobbing.
- The Contractor will inform all persons employed on the construction site about the possibility of lodging complaints about working and pay conditions and will deliver an information leaflet with the necessary information about lodging complaints and requests, in which it will ensure that there are no repercussions for the person lodging the problem. The content of the leaflet will be agreed with the Consultant.
- The Contractor shall inform the Consultant about all accidents involving employees and third parties in accordance with the procedure provided by the Consultant. In the event of an accident, the Contractor shall take all actions that they are obliged to take under applicable laws, such as the Construction Law and the Labour Code.

- The Contractor shall ensure equal pay for employees performing the same work without taking into account gender, sexual orientation or age, and the Contractor shall not persecute or discriminate against persons employed under the Contract on the basis of gender, sexual orientation and age.
- The Contractor, in accordance with the possibilities and conditions and the Polish provisions of the Labour Code, satisfies the living and social needs of employees in the workplace;
- The Contractor is obliged to facilitate the improvement of professional qualifications of employees.
- The Contractor may employ only such a juvenile employee who is at least 15 years old, has completed at least eight years of primary school and has presented a medical certificate stating that the work of a given type does not threaten their health.
- The Contractor will employ a health and safety specialist with qualifications and professional experience in accordance with Polish labour law.

Therefore, the table of mitigation measures in the App. 1 to PZŚ (item 123 - 131, cat. R - Specific requirements of ES World Bank policies), there are detailed conditions for the Contractor, covered by the monitoring and reporting obligation during the Task implementation period. It should be stressed, however, that the Contractor is obliged to apply and observe all provisions of the Labour Code and will act in accordance with the ES Code of Conduct

6.16. REQUIREMENTS RELATED TO THE IMPLEMENTATION OF NATURE COMPENSATION

In accordance with the conditions included in the environmental decision issued for the Task, the implementation of the investment does not require the execution of natural compensation, both at the national level and those related to the occurrence of significant negative impacts on Natura 2000 sites.

7. DESCRIPTION OF MONITORING MEASURES

7.1. ENVIRONMENTAL MONITORING DURING THE PERIOD OF WORKS IMPLEMENTATION

Attachment No. 2 to the EMP provides a set of monitoring measures applicable to the Task Contractor. These activities were developed on the basis of the conditions contained in the environmental decision issued for the Task, with the addition of additional conditions established at the stage of preparation of the EMP.

The monitoring activities listed in Appendix 2 to the EMP belong to two categories:

- monitoring the implementation of mitigation measures listed in Appendix 1 to the EMP (item 1- 112 of Appendix 2 to the EMP),
- conducting environmental monitoring (items 113- 118 of Appendix no. 2 to EMP).

7.2. ENVIRONMENTAL MONITORING DURING OPERATION

No environmental monitoring is needed at the operational stage.

8. PUBLIC CONSULTATIONS.

8.1. PUBLIC CONSULTATION OF THE ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK PLAN FOR OVFMP (2015)

The draft document entitled Environmental and Social Management Framework Plan (ESMF) for the OVFM Project (including Component 1, which includes, inter alia, this Task) was subject to a public consultation procedure, conducted in accordance with the operational policy of the World Bank OP 4.01. Public consultations were to enable the public to familiarise with the document and ensure a possibility of submitting comments, questions and motions to its reading. Documentation of the public consultation process of the above mentioned document is available on the website of the Project Coordination Unit of the Odra River Basin Flood Protection Project[1].

8.2. PUBLIC CONSULTATION AT THE ENVIRONMENTAL PROCEDURES PHASE OF THE TASK (2019)

Consultations with the public at the stage of issuing the environmental decision for this Task were conducted by the Mayor of Krosno Odrzańskie.

By the announcement of 27 August 2019, the following ref. no.: GN.6220.10.3.2019.MKu), the Mayor of Krosno Odrzańskie announced the initiation of administrative proceedings and made public information about the planned project. Anyone interested in the investment concerned could consult the entire case file from 28 August 2019 to 10 September 2019. (inclusive). Anyone could also submit motions and proposals on the planned investment through various means of communication. No comments or motions were made in the ongoing proceedings within the time limit set.

The above mentioned notice was also made public by: announcement on the notice board in the seat of the Krosno Odrzańskie Town Hall and by placing the Public Information Bulletin of the Krosno Odrzańskie Town Hall on the website.

Then, by the announcement of 27 November 2019, (ref. no.: GN.6220.10.8.2019.MKu), the Mayor of Krosno Odrzańskie informed about issuing a decision imposing an environmental impact assessment for the above mentioned project and suspended the said proceedings until the Applicant submits the report on the environmental impact of the project. The above mentioned notice was made public by: announcement on the notice board in the seat of the Krosno Odrzańskie Town Hall and Radnica and by placing the Public Information Bulletin of the Krosno Odrzańskie Town Hall on the website. Anyone interested in the investment covered by the proceedings could consult the whole documentation of the case within 14 days from the date of publication. Anyone could also submit motions and proposals on the planned investment through various means of communication. No comments or motions were made in the ongoing proceedings within the time limit set.

Then, by the announcement of 14 February 2020, (ref. no.: GN.6220.10.12.2019.MKu), the Mayor of Krosno Odrzańskie published information about the issuance of the decision ref. no.

[1] http://www.odrapcu.pl/popdow_dokumenty_RPZSiSS.html.

GN.6220.10.11.2019.MKu of 14 February 2020 undertaking ex officio suspended proceedings for the issuance of a decision on environmental conditions of the consent for the implementation of the above mentioned project. The above mentioned notice was made public by: announcement on the notice board in the seat of the Krosno Odrzańskie Town Hall and by publishing the Public Information Bulletin of the Krosno Odrzańskie Town Hall on its website. Anyone interested in the investment covered by the proceedings could consult the whole documentation of the case within 14 days from the date of publication. Anyone could also submit motions and proposals on the planned investment through various means of communication.
No comments or motions were made in the ongoing proceedings within the time limit set.

On 2 March 2020 Mayor of Krosno Odrzańskie issued a decision on environmental conditions for the project included in EMP (ref. no. GN.6220.10.13.2019.MKu). This decision has been made public by means of a notice in a manner similar to that of the notice of initiation of the public participation procedure.

8.3. PUBLIC CONSULTATION OF THE EMP (2020)

The draft document was subject to the public consultation procedure carried out in compliance with the World Bank operational policies (*OP 4.01*.)

In view of the current situation of the COVID-19 epidemic, the action plan for the publication of the Environmental Management Plan takes into account the World Bank's Technical Note "Public Consultation and Stakeholder Engagement in World Bank Supported Activities, in the event of restrictions on public meetings". The public consultation on the draft the EMP for Task 2A.1/1 was (b) conducted in the period from 10 June to 02 July 2020 (thus lasting 15 working days). Therefore, an electronic version of the document, together with the Public Consultation Notice, is available on the website:

- State Water Holding Polish Waters, Regional Water Management Authority in Wrocław;
- Town Hall in Krosno Odrzańskie;
- Project Coordination Unit of the Odra-Vistula Flood Management Project.

Detailed information on a possibility of reading draft EMP and a possibility of filing motions and comments, including contact details (e-mail, phone number) was published in the local press. The announcement was published on 9.06.2021 in both paper and electronic edition of a week “Tygodniowa” as well as in the electronic edition of Gazeta Lubuska The published Announcement also contains information about the date of the planned webinar concerning the draft of EMP and information on how to take part in the webinar was provided. On the website of PGW WP RZGW in Wrocław, the news section contains detailed information and instructions on how to join the webinar.

An information poster containing information about the conducted public consultations was also hung in Krosno Odrzańskie (9 information posters in total). The information poster also contains information about the planned webinar and the possibility to ask questions and make comments by phone.

During the period of public consultations of the draft EMP, two calls were made, but it did not concern environmental issues but the acquisition of property. In this respect, the relevant specialists of the Consultant Team, responsible for matters related to the acquisition of property, have contacted the interested parties.

Prior to the webinar, direct invitations were also sent out to identified stakeholders (local governments, administrations, social organisations and associations related with the region or/and dealing with environment protection) by traditional mail and e-mail an invitation to participate in the public consultation and a direct link to participate in the webinar. In total, individual invitations were sent out to 36 entities.

The meeting was organized through Microsoft Teams application. This program allows you to organize and conduct a webinar, with the possibility of sharing, among other things, a presentation or a screen view, as well as switching between several speakers and asking questions by participants in a chat (only in writing) and answering them by the speakers. Participants are only required to have access to the Internet and a web browser - no other program is required to install on their computer to join the webinar.

A webinar was held on 2 July 2020 from 17.00-19.00 via a publicly accessible internet platform. The webinar was attended by a total of 11 people, including representatives of the Consultant, OVFMP Project Coordination Unit and the Employer. During the webinar, the scope of works related to the implementation of Task 2B.1/1(b) and was discussed, as well as the environmental conditions of their implementation. The webinar was saved in the form of a recording, during the course of the seminar, the participants raised questions in the form of a chat, but they did not directly concern environmental issues and did not affect the content of the EMP.

9. ORGANISATIONAL STRUCTURE OF THE IMPLEMENTATION OF AN EMP

The task which is the subject of the present EMP is implemented within the framework of the Odra-Vistula Flood Management (see chapter 1), co-financed by the World Bank, the Council of Europe Development Bank (CEB), the Cohesion Fund and the state budget. In relation to the above, the structure of supervision over the implementation of an EMP must comply with both Polish law and the requirements of the World Bank.

9.1. PROJECT COORDINATION UNIT OF THE ODRA-VISTULA FLOOD MANAGEMENT PROJECT (PCU OVFMP)

The overall coordination of the implementation of the individual EMPs within the Project is the responsibility of the Project Coordination Unit (PCU), which functions as an organisational unit within the structures of the National Water Management Authority (KZGW), which is an organisational unit of the State Water Management Polish Waters. The The Scope tasks of PCU OVFMP include, among others:

- Management of tasks of Project Implementation Units (PIU/JRP) and Project Implementation Units (PIU/JWP), within the scope of tasks included in the Projects,
- Technical assistance and support to the PIU/JRP and PIU/JWP in the implementation of the tasks of the Projects, including the application of World Bank procedures on procurement, environmental protection and social issues,
- Preparation of annual work programmes for the Projects and evaluation of their progress,
- Supervise the work of the Projects and evaluate their progress,
- Ongoing control and monitoring of funds allocated for the implementation of the Projects and participation in the management of funds of the Projects,
- Reporting, including preparation and submission of quarterly reports on the implementation of the Projects to the World Bank, the CEB and the Steering Committee.

9.2. PROJECT IMPLEMENTATION UNIT (PIU/JWP) AND PROJECT IMPLEMENTATION UNIT (PIU/JRP)

The entity directly responsible for the implementation of the Contract and monitoring the progress of its implementation will be the Project Implementation Unit (PIU/JWP), i.e. State Water Holding Polish Waters Regional Water Management Authority in Wrocław.

In connection with the implementation of the ORBFM Project in the PIU/JWP structure, the Project Implementation Unit (PIU/JRP) was separated, which is a separate organizational unit and it is supervised by the President of the State Water Holding Polish Waters. Such a structure is transparent and has a very high decision-making level, which increases the effectiveness of Project implementation. As part of the supervision over the implementation of the EMP, the PIU performs the following tasks:

1) monitoring the progress of the implementation of the EMP;
2) financial management and accounting;

3) drawing up the necessary reports for monitoring and coordinating the implementation of the EMP by all services involved in the implementation of the EMP;

The scope of duties of PIU employees related to supervising the implementation of the EMP is as follows:

- managing, coordinating and supervising the implementation of the EMP by the Consultant and the Contractor;
- direct supervision over the correct implementation of the Contract;
- cooperation with PCU;
- exercising administrative and legal supervision over the implementation of the PAP;
- verification of the Reports and reporting on the implementation of the EMP prepared by the Consultant and the Contractor;
- exercising financial supervision over the implementation of the EMP;
- supervision over the correctness of the application of formal procedures in the implementation of the EMP, resulting from, among others, the requirements of the Contract, *Construction Law Act*, *Environmental Protection Act* and other relevant administrative decisions and legal acts.

The PIU/JRP employs appropriate specialists responsible for the implementation of EMP and other ESHS issues. The structure of this team may be as follows:

- Head of the Environmental and Property Team,
- Chief Specialist
- Senior Specialist.

In the organisational structure of the PIU/JRP, there were also positions of specialists for technical public procurement, legal, financial, property and resettlement and international cooperation.

9.3. CONSULTANT/ENGINEER

The role of the Consultant/Engineer is to support PIU/JWP (PGW WP RZGW in Wrocław) in the effective execution of the entire investment process - from preparation of the investment to its settlement.

The Consultant/Engineer was selected using the QCBS method (Selection based on quality and price), in accordance with the *"Guidelines for the Selection and Employment of Consultants by World Bank Borrowers"*.

In accordance with the planned structure of the Engineer - Technical Support Consultant team, at the stage of works implementation, the Engineer's Team (supervision inspectors in cooperation with the environmental team, coordinated by the Key Environmental Expert, real estate team) will supervise the proper performance of construction works and the observance and implementation of the EMP and ESHS provisions. In the Engineer's Team, implementation activities are coordinated by the Key Environmental Expert and additional environmental management expert staff (1- 2 people). In accordance with the scope of activities specified in the Technical Support Consultant Contract, the Engineer-Consultant will be obliged to ensure that the team composition is such that it can properly supervise the implementation of the EMP through, among other things

- monitoring the implementation of the EMP;
- monitoring the activities of the Contractor;
- checking the quality of construction works performed by the Contractor and built-in construction products, and in particular preventing the use of defective construction products and those not approved for use in construction;
- representing the Investor on the construction site by controlling the compliance of its execution with the design and the implementation permit, environmental protection regulations and technical knowledge rules;
- supervising all environmental issues through environmental specialists and other Engineer personnel;
- continuous monitoring of the correct implementation of measures to mitigate negative environmental impacts;
- carrying out additional tests when it is necessary to verify the Contractor's reports;
- identifying problems resulting from the harmful environmental impact of construction works and presenting proposals to solve these problems;
- checking and acceptance of construction works that are covered or disappearing, as well as preparation and participation in the acceptance activities of finished construction works and their handing over for use;
- confirmation of actually performed works and removal of defects, and, at the request of the Investor, , control of construction settlements.

Social issues will be monitored during the execution stage by property team of the Consultant, coordinated by the key property expert, who will work closely with the team of construction supervision inspectors.

9.4. CONTRACTOR

In order to carry out the construction works, a Contractor will be selected who will be responsible for the implementation of EMP. The obligations of the Contractor in this respect include

- conducting construction works in accordance with the rules set out in EMP, contract terms and project documentation, in accordance with applicable laws and requirements of administrative decisions issued for the Task;
- implementation of the Engineer's recommendations (including specialists in environmental supervision and the investor's supervision inspector) concerning the implementation of the EMP;

- ensuring that a HASP, a Waste Management Plan, a Quality Assurance Plan, a Flood Protection Plan for the construction site for the duration of the works and a Site Organization Plan are prepared before the construction starts (as elements of the Construction Environmental and Social Management Plan - C-ESMP);
-
- to submit for the Contract Engineer's approval the ES Code of Conduct and ES Management Strategy and Implementation Plans described in the bidding documentation, developed at the bidding stage, and to verify these documents as a result of the Engineer's periodic recommendations;
- Maintaining construction documentation;
- preparation of monthly reports and review reports;
- preparing environmental reports;
- applying to the Investor for changes in the design solutions, if it is justified by the need to increase the safety of the construction works or to improve the construction process as far as the implementation of EMP is concerned.

The Contractor's team will appoint a EMP Coordinator, a person to coordinate and supervise the activities related to the implementation of the EMP. Throughout the whole Contract implementation period, the Contractor shall ensure the participation of environmental experts, as required. The work of the team of experts will be coordinated by the Contractor’s EMP Coordinator.

The Contractor also has a Health and Safety Specialist in their Team, available throughout the Contract period, who is also responsible for the implementation of other EZHS issues not included in the EMP.

10. SCHEDULE FOR THE IMPLEMENTATION OF EMP AND REPORTING PROCEDURES

The implementation of an EMP allows the parties involved in the preparation, implementation and supervision of the Task for:

- identification of the various environmental aspects that have a significant impact on the state of the environment, so that they can be controlled, corrected, reduced, but thus have an economic impact;
- correction of unfavourable consequences of works in progress for the benefit of the environment and financial results;
- defining the objectives and tasks to be implemented within the framework of the adopted environmental policy, covered by the EMP, which require investment and bring measurable effects;
- identification and elimination of potential hazards and breakdowns, prevention and removal of environmental effects that may be associated with them and entail disproportionate in relation to costs preventive losses;
- rational use of nature's goods, with minimal environmental losses and optimal cost generation.

Moreover, the implementation of recommendations and actions resulting from the EMP may reduce or even eliminate the risk in the Contract, in particular:

- the risk of omitting environmental protection issues in the process of Task implementation by the Contractor;
- risk of escalation of protests of the local society as a result of the Contractor's failure to comply with the Engineer-approved works technologies and environmental procedures;
- the risk of additional environmental penalties;
- the risk of incurring additional environmental damage.

Bearing in mind the importance of the issues determining environmental and social conditions, the following procedures for the implementation of the EMP are envisaged:

- before selecting the Contractor, the Employer shall submit a draft EMP to the World Bank for opinion and acceptance for public consultation;
- the EMP will then be subject to public consultation;
- the public consultation will be followed by the completion of the EMP and the final version will be submitted to the World Bank for approval;

- after the approval of the EMP by the World Bank, the final document will be included in the bidding documentation for the selection of the Contractor;

- All activities of the Contractor shall be reported at regular intervals (monthly), in paper and electronic form, with regard to the obligations arising from the EMP and other contract documents. These reports will be subject to approval by the Engineer.

Environmental monitoring in terms of impact of the task on the environment consists, among others, of

1. Control of the performance of construction works related to the Task execution under the supervision of a team of environmental experts appointed by the Contractor for the Contract execution period.

2. The team of environmental experts of the Contractor carries out activities including, but not limited to:

- review and ongoing inspection of the area covered by the construction and hydrotechnical works prior to their commencement, as well as inspections during construction and during the Defect Notification Period, together with the preparation of appropriate reports, which are the documentation for the proper performance of environmental supervision and, at the same time, information on the proper implementation of mitigation measures,

- formulating and submitting to the Engineer conclusions on the need to undertake mitigation measures (including their implementation) necessary to mitigate the adverse effects of the Task on natural habitats and species and species subject to legal (species) protection, unforeseeable and/or not revealing at the stage of establishing the conditions for the implementation of the Task in question within the framework of the procedure aimed at issuing a decision on environmental conditions. The measures may be implemented only after the approval of the Engineer,

- obtaining, if necessary, the needed permits to derogate from the prohibitions on the protection of species of plants, fungi or animals in accordance with the principles and procedures laid down in the Act on Nature Conservation,

- conducting reporting in the form of periodic reports (not less frequently than every month).

3. The Contractor will appoint specialists in the following fields: phytosociologist, dendrologist, entomologist, ichthyologist, herpetologist, ornithologist, mammalogist, chiropterologist. The aforementioned specialists must have proven experience in this field and have an environmental or related education. One member of the Contractor's team of the environmental team may represent a maximum of two of the above mentioned natural specialisations.

At the stage of work implementation, it is planned that the Contractor will prepare collective reports on environmental monitoring, confirmed by specialists from the Contractor's team of environmental experts, approved by the Engineer's environmental supervision. The detailed scope of the report will be determined by the Engineer (start report, periodical - monthly, quarterly, special, final), they will also determine the dates of their execution. During the period of execution of the works and possibly in the Defects Notification Period, monitoring will be carried out by the Contractor. The Contractor of the works till 31st January, in the years 2021-2022, is also preparing the report on the execution of the decision of RDOŚ in Gorzów Wielkopolski dated January 15, 2020. (Ref. No.: WPN-I-6401.1.2020.KS), this report is completed in the scope of activities carried out by the Employer and transferred to RDOŚ. The Contractor will prepare a monitoring report and submit it to the Employer. After the Reporting Period, if necessary, the monitoring will be taken over by the Employer and will be carried out by the end of the monitoring period set out in the EMP.

The Project reporting system will be based on monthly reports submitted by the Contractor to PIU via the Engineer and monthly reports by the Engineer. As part of monthly reports or as a separate document, monthly reports on EMP implementation (Contractor and Engineer) will also be prepared. On this basis, collective quarterly reports will also be prepared.

PIU will submit quarterly reports to PCU in the part concerning the tasks to be performed. They will contain the required set of information and descriptions to enable the preparation of the Project quarterly report by PCU. Moreover, especially in case of problems with the implementation of the Task, the PCU will expect the PIU to provide statements and data on a monthly basis.

The following reporting procedures have been established:

1) Reporting:
    a) reports (start, monthly, quarterly, final) prepared by the Contractor,
    b) submission of reports required by administrative decisions (implementation of the derogation decision concerning protected plant and animal species) to the Engineer,
    c) review and verification of reports by the Engineer,
    d) submitting the approved report from points a), b) and c) to the Employer (for information),
    e) submitting the quarterly report of PIU to PCU.
2) Archiving
    a) Contractor: 1 copy of each report in electronic form for 5 years from the date of completion of the Contract,
    b) Engineer: 1 copy of each report in electronic form for 5 years from the date of completion of the Contract,
    c) Employer: 1 copy of each report in electronic form for 5 years from the date of completion of the Contract.
3) Evaluation - ongoing assessment of the results of the implementation of the planned actions resulting from the EMP. Ongoing analysis of the documentation (Contractor's Reports) by the Engineer. Providing the Employer with reliable information on the

course of the construction process with particular emphasis on the implementation of measures to reduce the negative impact on the environment and recommendations resulting from environmental decisions.

PCU also prepares reports to the World Bank on a quarterly basis.

It's planned:

- *ex-ante* evaluation: Report before the start of the Contract (Engineer's Report),
- ongoing evaluation: Engineer’s quarterly reports,
- *ex-post*evaluation:
  - ✓ Report after the completion of the Contract (Final Report on EMP drawn up by the Contractor and the Engineer),
  - ✓ Report on EMP after the defects notification period, prepared by the Engineer.

11. LIST OF SOURCE MATERIALS

1) Project Information Sheet Information Sheet for "Extension of the national road no. 29 under the task entitled: "Reconstruction of the road bridge in Krosno Odrzańskie in km 514.1 of the Odra River is implemented as part of the Odra-Vistula Flood Management Project "Task 1B.1/1 (b)", prepared in 2019 by Sweco Consulting Sp. z o.o. ul. Franklina Roosevelta 22, 60- 829 Poznań, under the supervision of Wojciech Lewandowski.
2) Decision on environmental conditions of 2 March 2020, issued by the Mayor of Krosno Odrzańskie, for the project entitled: "Reconstruction of the road bridge in Krosno Odrzańskie in km 514.1 of the Odra River is implemented as part of the Odra-Vistula Flood Management Project "Contract 1B. 1/ 1(b)" (ref. GN.6220.10.13.2019.MKu)
3) The decision of the Regional Director for the Environmental Protection in Wrocław of 15th January 2020 allowing to perform activities in relation to plants and animals species covered by species protection (reference number: WPN-I.6401.1.2020.KS).
4) Regulation of the Regional Director for Environmental Protection in Gorzów Wielkopolski and Regional Director of Environmental Protection in Wrocław of 13 July 2017 on establishing the Natura 2000 site Middle Odra Valley PLB080004.
5) SDF for Natura 2000 site Krosno Odra Valley PLH080028.
6) Sweco Consulting 2017 the reconstruction Reconstruction and modernization of river control infrastructure on the Odra River. Adjusting to the conditions of the water way, along the section from Ścinawa to the mouth of Nysa Łużycka – STAGE II. Results of the nature inventory. 2017. Sweco Consulting Sp. z o.o. Appendix 1 hereto the Environment Impact Assessment Report.

12. LIST OF APPENDICES

Appendix 1. Plan of mitigation measures.

Appendix 2. Plan of monitoring measures.

Appendix 3. Summary of national environmental legislation.

Appendix 4. Copies of administrative decisions (4a Decision on environmental conditions of 2 March 2020, issued by the Mayor of Krosno Odrzańskie, for the project entitled: Expansion of national road no. 29 as part of the task entitled: "Reconstruction of the road bridge in Krosno Odrzańskie in km 514.1 of the Odra River is implemented as part of the Odra-Vistula Flood Management Project" "Task 1B.1/1 (b)" (ref. no. GN.6220.10.13.2019.MKu).

4b Copy of the Decision of the Regional Director for Environmental Protection in Gorzów Wielkopolski of 15 January 2020 authorising the performance of activities with respect to plant and animal species under strict species protection (reference no.: WPN-I.6401.1.2020.KS).

4c A copy of a decision of 9th June 2020 (ref. no.: GN.6220.10.15.2019.MKu) transferring the decision on environmental conditions to the General Director for National Roads and Motorways.

Appendix 5. Map of the location of the Task against the background of protected areas.

Appendix 6. Map of location of main elements of the Task.

Attachment 7. Map of natural resources location against the background of the elements of the Task.