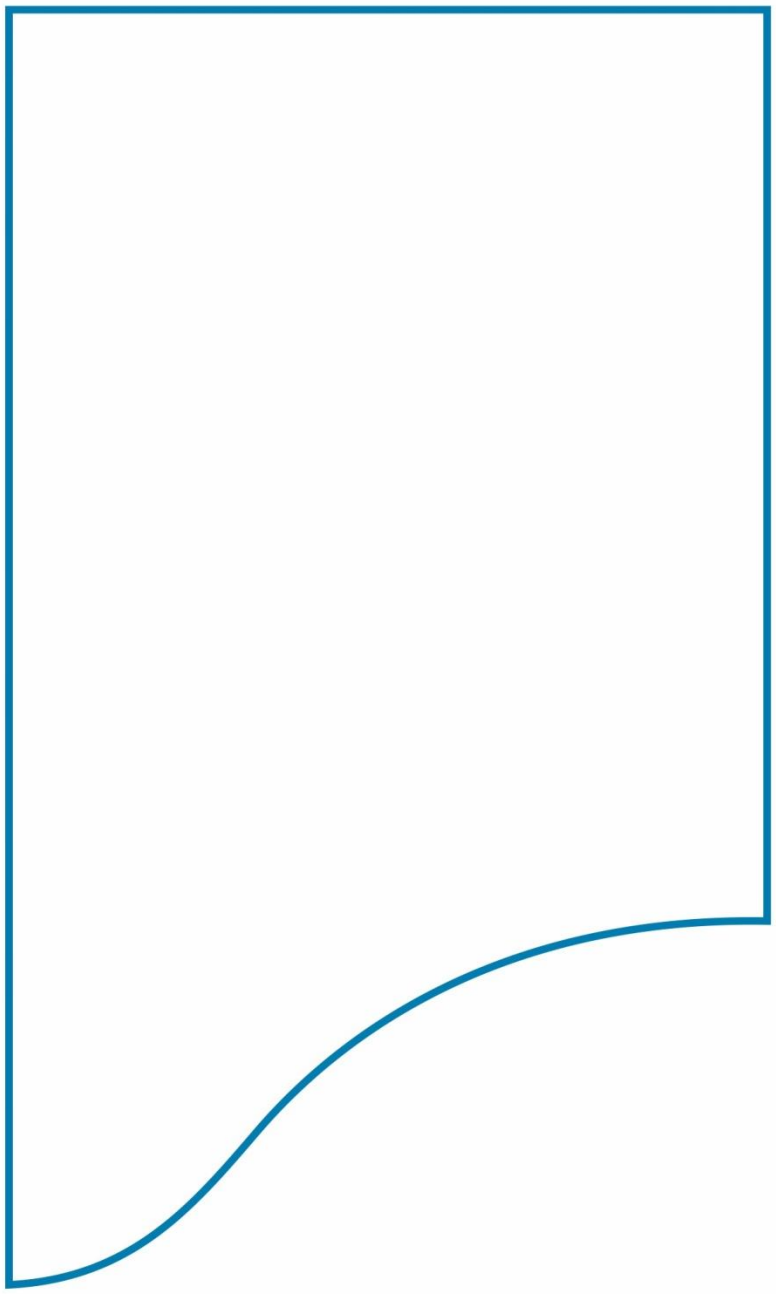
ENVIRONMENTAL MANAGEMENT PLAN



ODRA-VISTULA FLOOD MANAGEMENT PROJECT

Projekt Ochrony Przeciwpowodziowej w Dorzeczu Odry i Wisły

Państwowe Gospodarstwo Wodne **Wody Polskie**

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ENVIRONMENTAL MANAGEMENT PLAN

DRAFT VERSION

ODRA-VISTULA FLOOD MANAGEMENT PROJECT

PROJECT IMPLEMENTATION UNIT - IN ACCORDANCE WITH WB OP 4.01

COMPONENT 2:

Flood protection of the Kłodzka Valley

SUBCOMPONENT 2B:

Passive protection

WORKS CONTRACT 2B.2/2
2B.2/2 Flood protection of Bystrzyca Dusznicka River Valley and Kamienny Potok Facilities: Szczytna, Polanica-Zdrój and Duszniki-Zdrój

ISSUE	DATE	AUTHOR	REVIEWER	CLIENT'S APPROVAL	DESCRIPTION
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PROJECT IMPLEMENTATION UNIT:

State Water Holding Polish Waters represented by the director of the
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DOCUMENT PREPARED BY:

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Project Coordination Unit of the Odra-Vistula Flood Management Project
Technical Assistance Consultant Joint Venture Sweco Polska Sp z o.o., Sweco Nederland B.V

ODRA-VISTULA FLOOD MANAGEMENT PROJECT:

World Bank (WB), Loan Agreement no. 8524 PL
Council of Europe Development Bank (CEB), Framework Loan Agreement no. LD 1866
State Budget

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List of basic definitions and abbreviations used in the EMP

Name	Description
aPGW	Update of the Oder River Basin Management Plan (*Regulation of the Council of Ministers of 18 October 2016 on the Oder River Basin Management Plan*)
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.
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).
GDDKiA	General Directorate For National Roads and Motorways
GRM	*Grievance Redressal Mechanism* . Details of the procedure discussed in POM
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
JCWP/UBSW	Unified Body of Surface Water
JCWPd/UBUW	Unified Body of Undergroud Water
JRP/PIU	OVFM Project Implementation Unit in PGWWP RZGW in Wrocław
PDS (Project Data Sheet)	Project Data Sheet

[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	Contract for works 2B.2/2 Flood protection of Bystrzyca Dusznicka River Valley and Kamienny Potok
MPZP/LAMP	Local Area Management Plan
Facility	Venture constituting one of three elements of the Contract 2B.2/2: Duszniki Zdrój, Szczytna, Polanica-Zdrój
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 of 22.02.2011 (M.P. 2011 nr 40 item 451)
PGW WP	State Water Holding Polish Waters
HASP	Health and Safety Plan
PMŚ/SME	State Monitoring of Environment
OPIE	Operational Programme Infrastructure and Environment
POM	*Project Operations Manual*[4] for OVFMP
LAAP	Land Acquisition Action Plan
OVFMP / OVFM Project	Odra River Basin Flood Protection Project
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

[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 antidepidemic 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 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) preventive measures
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".
SBSW	Integrated Body of the Surface Waters
EU	European Union
ES Guidelines	The World Bank's Environmental, Health, and Safety (EHS) Guidelines, General EHS Guildelines[1].
WKZ/VMC	Voivodship Monument Conservator
Contractor / Task Contractor / Contractor for Part of the Task	Company or legal person implementing the Contract for works 2B.2/2 Flood protection of Bystrzyzca Dusznicka River Valley and Kamienny Potok
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 f Ministers of 9th November 2010 o*n ventures that may have significant impact on environment* (Journal of. of Laws of 2019 item 1839).
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 of 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	Act of 14 December 2012 on waste (unified text 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 *2B.2/2 Flood protection of the Bystrzyca Dusznicka River valley and the Kamienny Potok River (passive protection)*.

This EMP provides, inter alia, the following information:

- brief description of the OVFM Project;
- description of the Contract covered by this EMP (Chapter 2);
- characteristics of institutional, legal and administrative conditions of the implementation of the Contract, including the current status of the EIA procedures for the Contract (Chapter 3);
- description of the individual elements of the environment surrounding of the Contract (Chapter 4);
- summary of the impact assessment Environmental Contract (Chapter 5);
- description of mitigation measures to eliminate or reduce potential negative impact of the Contract 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 Contract (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 Contract (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)
- Copies of the decisions on environmental conditions Issued by the Regional Environmental Protection Director in Wrocław: decision dated 28 October 2020 (reference no. : WOOŚ.420.21.2020.AP.19) for the Duszniki-Zdrój facility - Appendix 4a, decision of 13 November 2020. (Ref. no.: WOOŚ.420.19.2020.AP.20) for the Szczytna Facility - Appendix 4b, and decision of 30 October 2020. (Ref. no.: WOOŚ.420.16.2020.AP.18) for the Polanica-Zdrój facility.
- location of the main elements of the Contract in relation to protected areas (Appendix 5),
- the location of the main elements of the Contract (Appendix 6).

Characteristics of the Contract

The Contract covers the construction, reconstruction and repairs of regulating structures, together with buildings technically and functionally related to them, located in the riverbed of the Bystrzyca Dusznicka river, the Podgórna stream and the Jarzębnik stream in the area of the Duszniki-Zdrój commune, in the riverbed of the Bystrzyca Dusznicka river and the Kamienny Potok river in the area of the Szczytna commune and in the riverbed of the Bystrzyca Dusznicka river in the area of the Polanica Zdrój commune and partially in the Kłodzko commune, within Szalejów Górny, in the sections:

- Bystrzyca Dusznicka at the section from about km 25+817 to about km 30+260 (Duszniki-Zdrój Facility),
- Bystrzyca Dusznicka at the section from about km 20+270 to about km 24+800 and the Kamienny Potok river from the mouth (0+000) to about km 2+500 (Szczytna Facility),
- Bystrzyca Dusznicka river at the section from about 14+025 km to about 16+980 km and at the section from about 12+390 to about 12+600 km (Polanica Zdrój Facility).

Scope of the Contract

Contract 2B.2/2 includes:

- construction of the by-pass channel together with the construction of a bridge providing access to the buildings of the Museum of Paper Industry, construction of a bridge or culvert under the district road no. 3301D (Sprzymierzeńców Street in Duszniki-Zdrój), construction of a bridge in the course of the municipal road which is an extension of Bystrzycka Street with the development of a bipartite river channel in the area of the mouth of the channel to Bystrzycka Dusznicka on the section from about 25+819 to about 26+156, as well as reconstruction of the bridge in the course of the municipal road in order to adjust its light to the new width of the bipartite river channel,
- construction, reconstruction and renovation of regulatory structures together with facilities related to them technically and functionally, i.e.:
    - sectional adaptation and insurance of the main river channel to the passage of flood waters with a probability of exceeding approx. p=10%, together with securing the estuarial sections of existing tributaries (Podgórna stream),
    - reprofiling of existing regulation walls and slope reinforcements by cleaning and filling in joints, filling in stone losses, levelling (raising) the level of the crown of the wall, reinforcement of the body of the wall by execution of a band (offset), consisting of an excavation in the bottom of the channel and then execution of a concrete levelling compound under the foot of the wall.
      In addition, reprofiling is understood as the execution of works to adapt the existing walls/bank protection to the flow of flood waters with a probability of occurrence of p=10%. The work includes the levelling or raising of existing walls and bank protection to accommodate floodwater with a probability of occurrence of p = 10%;
    - construction of new regulating walls and slope reinforcements,
    - demolition of destroyed regulating walls and slope fortifications,
    - repair and rebuilding of bank protection,
    - repair and rebuilding of the regulating walls
    - sectional construction of a new wall, leaving the old one as the so-called lost formwork,
    - reconstruction of the regulating walls in the place and along the route of the existing ones (damaged, to be demolished), consisting in local excision of trees and bushes, removal of the humus layer, excavation of the bottom of the channel at the base of the slopes, execution of the reinforced concrete structure of the wall, filling the space behind the wall from the land side with soil, execution of the stone facing of the wall from the land side. The area behind the crown of the wall will be covered with top soil and seeded with native grass mixture,
    - sectional reinforcement of the existing walls by means of a band (offset), consisting in making an excavation in the bottom of the channel at the base of the wall, and then making a concrete screed under the foot of the wall,

- ichthyological improvement of the channel by rebuilding two barrages: in km 27+048; in km 27+421 and weir in km 27+522 for semi-natural rapids in the form of ramps made of boulders and stones with an inclination of about 1:25 or milder.
- reconstruction of seven barrages and weirs into seminatural stone rapids on the Bystrzyca Dusznicka river (Szczytna Facility),
- reconstruction of the barrage in km 15+498 into a rapid (Polanica-Zdrój Facility),
- o reconstruction of three barrages and weirs into seminatural stone rapids on the Kamienny Potok River
- construction of four buttresses on the Bystrzyca Dusznicka River (Szczytna Facility),
- local strengthening of the slope with a wedged stone rip rap. The works will consist in local felling of trees and shrubs, removal of the top soil layer, scarping, laying out the geotextile and laying boulders with a diameter of 0.5-1.0 m, wedged with the stone fraction of 0.2-0.5 m. The slope above the bedrock should be covered with top soil and sown with a mixture of native grasses,
- unblocking of the channel at the point of constriction and within the bridges, by removing gravel and alluvium dumps; dumps will be removed mechanically or manually at the point of constriction of the channel where they hamper the flow of the flooding water. The excavated material will be used on the construction site. If this is not possible, in whole or in part, it will be treated in accordance with the applicable waste handling regulations,
- construction of anti-rubble dams in km 16+815, 29+308, 30+206 in order to protect the area of the towns of Polanica-Zdrój and Duszniki-Zdrój from rock rubble and tree trunks,
- channel maintenance consisting in cleaning the outlet section of the Jastrzębnik stream,
- felling of trees and shrubs that interfere with the scope of the work.
- stabilisation of the longitudinal profile by local use of wooden shorts. The crown of the buttresses will not protrude above the ordinate bottom, which will allow to maintain the morphological continuity of the channel,
- reconstruction of the bridge in km 23+539 Bystrzyca Dusznicka, consisting in dismantling the existing bridge building and building a new one in its immediate vicinity,
- shaping and reconstruction of the area adjacent to the bridge in km 23+539 of Bystrzyca Dusznicka, through the execution of, among others, new invasions, pavements and reconstruction of the existing utility networks,
- local removal of deposits from the river channel.
- restoration of the estuary section of the Szklarska Woda Stream, in the scope of cleaning and filling in joints and stone losses,

- building an emergency bottom drainage water intake in km 1+302 of the Kamienna Stream for fire-fighting purposes,
- repair of a stone bridge in km 0+704 of the Kamienny Potok (Szczytna Facility),
- construction of a flood protection embankment in the area of the sewage treatment plant in Polanica-Zdrój,
- construction of a storm water drain outlet in km 14+173 of the Bystrzyca Dusznicka (Polanica-Zdrój Facility).

Institutional, legal and administrative conditions

The Contract is carried out in accordance with relevant national environmental legislation and relevant World Bank operational policies and standards.

Status of administrative procedures for EIA

For the Contract 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 for the investment performance (hereinafter environmental decision). The environmental decisions were issued for each facility separately by the Regional Environmental Director in Wrocław: dated: 28 October 2020 (reference no.: WOOŚ.420.21.2020.AP.19) for Duszniki-Zdrój, 13 November 2020 (Ref. no.: WOOŚ.420.19.2020.AP.20) for the Szczytna Facility and 30 October 2020. (WOOŚ.420.16.2020.AP.18) for the Polanica-Zdrój Facility. Copies of the decision can be found as Appendices 4a , 4b and 4c to the EMP.

Condition of environmental elements at the site and in the vicinity of the Contract

The area of Contract implementation and its surroundings are characterized, among others, by the following environmental conditions stated during the nature inventory:

- The area is located in the Eastern Sudety macro-region, in the mesoregions: the Kłodzko Valley, the Bystrzyckie Mountains, the Orlickie Mountains and the Stołowe Mountains. It is characterized by a very varied terrain relief, which is mostly mountainous in character, and partly highlands;
- The Bystrzyca Dusznicka drainage basin comprises fragments of the following geological-tectonic units: the mid-Sudetic depression with the Nysa Kłodzka trench, the Orlicko-Bystrzyckie crystalline basin and the Kłodzko metamorphic;
- The area covered by the Contract belongs to the bioclimatic region VI (mountainous and sub-mountain area);
- Due to natural, climatic and infrastructural conditions, the area of the Duszniki-Zdrój and Polanica-Zdrój facilities have the status of a spa area; there are also consequences for the conditions of construction work and transport during the execution of the Contract,
- In terms of air quality, the greatest problem in the area of the works is exceeding the permissible number of days with exceedances of the target level of ozone. High concentrations of particulate matter PM10 and benzo(a)pyrene, observed especially in the heating period, are also a problem;
- The Contract implementation area is located within UBSW Bystrzyca Dusznicka from the source to Kamienny Potok, code RW6000712183, UBSW Bystrzyca Dusznicka from Kamienny Potok to Wielisławka, code RW6000512188. Their condition in 2017

and 2018 was assessed as bad; the implementation of the Contract will not cause deterioration of this status. It also does not threaten achievement of environmental objectives set for the analysed unified part of water bodies. However, the planned activities will ensure a locally permanent improvement of ichtyofauna migration conditions within the *Bystrzyca Dusznicka* UBSW *from Kamienny Potok to Wielisławka;*

- The Contract implementation area is located within UBUW No. 125, code PLGW6000125. Its qualitative and quantitative status was assessed as good. It is not at risk of failing to meet environmental objectives;
- The following forms of nature protection have been identified at the site and in the vicinity of the Contract area:
    - Park Narodowy Gór Stołowych (Stołowe Mountains National Park), (The Contract is located entirely within its buffer zone),
    - Protected Landscape Area Bystrzyckie and Orlickie Mountains, (The Contract is located entirely within its buffer zone)
    - Natura 2000 site Góry Stołowe PLB020006,
    - Natura 2000 site Góry Stołowe PLH020004,
    - Natura 2000 site Orlickie Mountains PLH020060, (The Contract is located partially within its buffer zone)
    - Natura 2000 site Piekielna Dolina near Polanica PLH020010,
    - 23 nature monuments (trees);
- There are no nature reserves, landscape parks, documentation sites, ecological sites or nature and landscape complexes within 5 km of the planned works;
- During the conducted nature inventory, the following were found:
    - 11 habitat types from Annex I of the Habitats Directive, including two priority types;
    - 10 protected species of vascular plants, 2
    - 4 species of bryophytes,
    - 3 species of Marchantiophyta,
    - 12 species of lichen,
    - 1 red algae;
- No legally protected species were recorded among aquatic macroinvertebrates. However, invertebrate teams showed significant species diversity;
- 8 species of protected insects were found (large copper, dusky large blue, scarce large blue - all those listed in Annex II of the Habitats Directive, as well as buff-tailed bumblebee, red-tailed bumblebee, common carder bee, shrill carder bee and garden bumblebee) and one representative of mollusca fauna species- Roman snail;
- In the analysed area, there are 7 species of representatives of ichthyofauna: alpine bullhead, European bullhead, brook lamprey, stone loach, brook trout, Eurasian minnow and perch.
- In the area of implementation and in the vicinity of the Contract, 8 species of representatives of herpetofauna were found: 3 species of amphibians (grey toad, grass frog, water frog) and 5 species of reptiles (sand lizard, common lizard, grass snake, deaf adder, common European adder);
- The ornithophauna of the area is represented by 10 protected species of birds (white wagtail, grey wagtail, white-throated dipper, common kingfisher, Euroasian golden oriole, river warbler, whinchat, corn bunting, Euroasian wryneck, common pochard) , including one (common kingfisher) listed in the Annex I to the Birds Directive;

- Protected mammals are represented by 8 species of bats (II and/or IV Annex of the Habitats Directive) and otter, European beaver (both species listed in II Annex of the Habitats Directive), mole, stoat and edible dormouse;
- In the vicinity of the Contract area (up to 2 km) there are 35 monuments protected under *the Act of 23 July 2003 on the protection and care of monuments*.

Potential impact of the Task on environment

Earth surface and landscape

The implementation of the investment will have a minimal impact on the ground surface during the implementation phase. These impacts will be associated with the temporary occupation of the ground surface along the watercourses. No permanent change of the ground surface is planned, except for the sections of the channels where the following are planned: shaping the shoreline, building a slope and bottom fortification, conversion of transverse partitions into a brilliant one, shaping a bipartite channel, building a relief canal and anti-rubble dams, as well as renovation, construction or demolition of bridge structures and building an access road to the dam. In selected locations it will be necessary to carry out permanent seizures of land adjacent to the riverbeds for the purpose of the works. The principles of permanent and temporary seizures will be specified in detail in the Land Acquisition Action Plan for Contract 2B.2/2.

Due to the small total length of these sections and the small scope of interference with the current shape of the ground surface, their impact is not significant on the scale of the analysed area.

Implementation of the Contract will not cause permanent changes in the landscape. Impacts will be temporary and will be related to the presence of construction facilities, technological roads, equipment and machinery necessary to carry out the works, as well as temporary storage sites for materials generated during demolition works and removal of material deposited in the riverbed and local tree and shrub felling. Impacts on landscape values at the stage of exploitation will not be significant, especially in places where the barrage and hydrotechnical structures are heavily damaged, these activities may have positive impact on landscape aesthetic values. Transformation of barrages and weirs into seminatural rapids will also have a positive impact on landscape values.

Climate

The implementation of the Contract will not affect the climate and climate change neither at the implementation nor the operational stage.

Air quality

At the Contract implementation stage, there will be negative impacts on the sanitary condition of the air (exhaust and dust emissions). These will be short-term and time-varying impacts associated with earthworks and machinery as well as transportation of materials and people. The impacts will be limited to the working hours of the machines and will cease when the work is completed. No emissions of pollutants into the air at the operating stage are expected.

Soils and land

Impacts on soils and land will be associated with direct interference with river channel sediments, alluvial soils (point and selected river sections covered by the works), temporary transformation of the land surface and changes in soil structure on land occupied temporarily

(process roads, construction facilities). During the course of the work, a potential threat is soil contamination as a result of equipment failure and leakage of oil-derivative substances from working machines. No significant changes in soil and water conditions and soil productivity are expected to occur in the temporary occupation areas after the completion of the construction phase and after proper land reclamation (clearing and levelling the site, spreading of topsoil, sowing).

Surface waters

With regard to the planned also in the Contract type of renovation and reconstruction works, which do not interfere with the shape of the river channel and elements of the bank zone, most of the impacts on the individual parameters taken into account during the assessment of the ecological status do not have lasting effects.

Permanent changes in the Bystrzyca Dusznicka and Kamienna Stream channels concern the sections where they are planned; shaping of the shoreline, construction of a slope and bottom fortification, conversion of transverse partitions into a brilliant one and construction of a river divider, shaping of a bipartite channel, construction of a relief channel and anti-rubble dams, as well as renovation, construction or demolition of bridge structures and construction of an access road to the dam. Some of the above activities, such as the construction of the rapids, will have a positive impact on biological and hydromorphological conditions within the UBSW.

For UBSW Bystrzyca Dusznicka from the source to Kamienny Potok RW60007121839 the total length of the watercourse covered by the Contract is 4.94 km (32.8%), while for UBS Bystrzyca Dusznicka from Kamienny Potok to Wielisławka - 1.3 km (9.92%). The Contract may also have a slight indirect impact on Nysa Kłodzka from Biała Lądecka to Ścinawka RW6000812199 located below the UBSW, related to the possibility of increasing the flow of suspended solids into its waters during the implementation phase.

The planned changes in the corridor are not so significant as to reduce the assessment of the ecological status of the UBSW under consideration and threaten the achievement of the environmental objectives set for the water bodies under consideration. The planned actions will ensure local sustainable improvement of migration conditions of ichtyofauna within UBSW *Bystrzyca Dusznicka from Kamienny Potok to Wielisławka.*

Groundwater

The works connected with the planned investment will not change the existing water relations in the area of its implementation and adjacent areas. At the implementation stage, groundwater pollution may occur as a result of rainwater and snowmelt run-off from the construction site, inappropriate storage of construction materials, inappropriate location of construction facilities and lack or poor organisation of sanitary facilities, water pollution by oil-derived substances leaking from construction machinery in poor technical condition or as a result of their failure. After completion of the works, at the operational stage, no impact on the quantitative and chemical status of UBGW is expected.

Natural habitats

At the Contract implementation stage, negative impacts on three habitat types are expected to occur in the area of all Facilities: 3260, 6430 and 91E0. Within the Polanica-Zdrój Facility, it

is also possible to have a minor negative impact on habitat 9110. The impacts will mainly result from the direct destruction of habitats during the works.

During the exploitation phase, negative impacts on habitats 3260 and 91E0 as well as 6430 and 3220 may occur.

Flora

Negative impacts on protected and/or rare species of vascular plants, mosses, marchantiophyta, lichens and red algae are expected at the implementation stage.

During the exploitation phase, negative effects on protected and/or rare species of vascular plants and marchantiophyta may occur.

Fauna

The implementation of the works planned under the Contract will affect the living conditions of ichthyofauna by changing the physicochemical nature of waters and flow, including the supply of slurry. There may also be direct mechanical destruction of fish and lampreys and their habitats during channel works. Impacts will only affect the construction phase and will cease several hours after the completion of the works. Therefore, they will not be significant for the local populations of these species. During the exploitation phase, there will be positive sustainable impacts on improving migration conditions for fish and lampreys.

Negative impacts on 6 species of invertebrates are expected to occur at the Contract implementation stage as a result of temporary restriction of feeding grounds. No negative impacts on invertebrates are expected during the Operational phase.

Negative impacts on amphibians and reptiles are anticipated during the implementation phase. These impacts will be associated with a potential increase in the incidental mortality of individuals as a result of increased vehicle traffic in the working area and a temporary reduction in feeding grounds. No negative impacts are expected during the Operational phase.

The impacts on ornithofauna during the implementation phase are primarily related to the scaring and disturbance of bird species directly related to the river channel and habitats found on coastal slopes, but also to the loss of feeding grounds and breeding sites under bridges, in cut trees and in the development of the river channel. Negative effects may include: white wagtail, grey wagtail, white-throated dipper, common kingfisher, river warbler, Eurasian wryneck and spotted flycatcher.

At the operational stage, moderate impacts will result from the simplification of the channel morphology and reduction of breeding sites. They will apply to the white wagtail, grey wagtail, white-throated dipper, common kingfisher.

At the stage of the Contract implementation, negative effects on otter, European beaver, mole, stoat and edible dormouse and bat species are expected. Small mammals may accidentally die during the passage of vehicles (construction stage). The effects will also result from scaring and disturbing individuals, and in the case of bats also from the deterioration of habitat conditions as a result of felling trees and shrubs. At the operational stage, negative impacts on the otter resulting from hindering the establishment of burrows on the banks are expected.

Natura 2000 Sites

The possibility of reversable negative impacts on objects of Natura 2000 sites is foreseen Orlickie Mountains PLH020060 (habitat type 91E0) and Piekielna Valley near Polanica PLH020010 (habitats 3220, 3260, 6430, 91E0, oasis species 1163 European bullhead, 1096 brook lamprey). In the case of the Natura 2000 area of Stołowe Mountains PLH020004, a temporary moderate negative impact at the implementation stage is possible. Planned as part of the reconstruction of the path of migration of ichthyofauna through the opening of partitions in Bystrzyca Dusznicka and Kamienny Potok will contribute to the improvement of communication between the Natura 2000 area Piekielna Dolina near Polanica PLH020010 and the area of the Stołowe Mountains PLH020004, in which the European bullhead and white-finned head and brook lamprey are protected objects. This will therefore have a significant positive impact on the cohesion and integrity of the designated Natura 2000 sites.

Other protected Areas

The scope of the planned works has not been found to have a negative impact on the objectives of the protection of the Stołowe Mountains National Park and to generate the threats listed in the Park's protective tasks. Negative impact in the form of disturbing and disturbing protected animal species is also possible within the Bystrzyckie and Orlickie Mountains Protected Landscape Area. The works will be carried out in the vicinity of natural monuments - possible negative impacts.

Due to the significant distance from the boundaries of the works, it is not expected that the works will affect other forms of nature protection.

Acoustic climate

At the Contract implementation stage there will be negative impacts in the form of noise emissions. These will be short-term and time-varying impacts, mainly related to the operation of machinery and heavy construction equipment and the movement of construction vehicles. Hydro-technical structures covered by the scope of the Contract do not generate noise, therefore their operation does not permanently affect the acoustic condition of the environment of adjacent areas, except for the periods of channel maintenance works.

Cultural monuments

The planned works will not pose a significant threat to objects listed as protected on the basis of their entry in the register or records of historical monuments. The exception is the Museum of Paper Industry in Duszniki Zdrój, which - due to its location in the direct vicinity of the Bystrzyca Dusznicka riverbed - is potentially exposed to negative impacts. The planned construction of a by-pass channel to protect the Museum from flooding, along with associated works, will interfere with the area within the boundaries of the protected site, but will not affect the Paper Industry Museum.

At the operational stage, a positive impact on historic buildings is expected due to the reduction of the flood risk level.

Tangible goods

The impact on material goods at the stage of construction works will mainly result from the execution of works and the movement of vehicles and machines in built-up and inhabited areas. There is a potential risk of risk during demolition works related to, among other things, the reconstruction of the regulation walls and the foundation of new facilities (regulation wall).

These works pose the following risks for the buildings located in their vicinity. The effect of the implementation of the Contract will be more effective protection of material assets located in floodplains (including, above all, urban development and infrastructure) in the event of flooding.

Human health and safety

Impacts of the task at the implementation stage will be impacts typical of medium-sized construction sites. These will be: noise emissions, air emissions and traffic nuisance (related to heavy traffic). These impacts will be temporary (limited to the construction period) and will not cause permanent changes in air quality and acoustic climate parameters. The impact on human health and safety is expected to change in terms of improving flood safety.

Waste

It is estimated that about 8200 m^3 of construction, repair and dismantling waste and 34300 $m^3$of earth and excavated materials will be generated, including about 5400 m^3 of material from the Bystrzyca Dusznicka and Kamienny Potok channels. If the waste generated is properly handled and managed, the construction process will not have a negative impact on the environment during the implementation phase.

Cumulative and transboundary impacts

The implementation of all tasks included in the assessment of cumulative impacts, mentioned in the chapter 5.14, does not pose a threat to the condition of the UBSW concerned, as well as to the USUW No. 126, nor to the achievement of the WFD environmental objectives referred to in Articles 57 and 59 of the Water Law. The prerequisite is the application of the correct technical solutions and the envisaged minimisation measures.

The Contract, due to the nature of the impacts generated and its location, does not pose a risk of cross-border impacts. It is not possible for possible impacts to extend to areas within the borders of the Czech Republic that are several to dozen kilometres away.

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 (2021).

1. INTRODUCTION

This Environmental Management Plan (EMP) refers to the Works Contract *2B.2/2 Flood protection of the Bystrzyca Dusznicka and Kamienny Potok valleys*

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 THE KŁODZKO VALLEY (COMPONENT 2 OVFMP)

Component 2 of OVFMP called *Flood protection of the Kłodzko Valley* aims to reduce the existing flood risk in the problem area (hot spot) of the Kłodzko Valley.

According to the provisions of PZRP and aPGW, as part of the Odra-Vistula Flood Management Project (OVFMP), Component 2 consists of two sub-components:

1. Subcomponent 2A - active protection:
   - 2A.1/1 Construction of a "Boboszów" - dry flood management reservoir on the Nysa Kłodzka river,

- 2A.1/2 Construction of Roztoki Bystrzyckie dry flood control reservoir on Goworówka Stream,
- 2A. 2/ 1 Construction of the "Krosnowice" dry flood control reservoir on the Duna Stream,
- 2A.2/1 Construction of the "Szalejów Górny" dry flood control reservoir on the Bystrzyca Dusznicka river;

2. Subcomponent 2B - Passive protection:
   - 2B.1/1 Flood protection of Nysa Kłodzka River Valley,
   - 2B.2/1 Flood protection of the Biała Lądecka and Morawka river valleys,
   - **2B.2/2 Flood protection of the Bystrzyca Dusznicka and Kamienny Potok rivers.**

Task 2B.2/2 consists of three Facilities:

1) Task 2B.2/2 Flood protection of the Bystrzyca Dusznicka and Kamienny Potok rivers - Duszniki-Zdrój facility.
2) Task 2B.2/2 Flood protection of the Bystrzyca Dusznicka River and the Kamienny Potok River - the Szczytna Facility.
3) Task 2B.2/2 Flood protection of the Bystrzyca Dusznicka and Kamienny Potok rivers - Polanica-Zdrój Facility.

2. TASK DESCRIPTION

2.1. CONTRACT LOCATION

The planned Contract is located within the river channel of the Bystrzyca Dusznicka and Kamienny Potok rivers and in their immediate vicinity within the boundaries of:

- the city of Duszniki-Zdrój, in the following cadastral areas: Centrum, Zdrój i Lasy,
- the city of Polanica-Zdrój - cadastral districts of Centrum, Zdrój, Nowy Zdrój, Stary Zdrój, Piekielna Góra city of Polanica-Zdrój,
- Kłodzko municipality - cadastral district Szalejów Górny,
- towns and municipalities of Szczytna, within the range of cadastral districts: Szczytnik, Nowe Miasto and Szczytna.

These areas are located in the district of Kłodzko, Lower Silesian Voivodeship.

The sections covered by the study include:

- Bystrzyca Dusznicka river on sections: from approx. 12+390 to approx. 12+600, from approx. 14+025 km to approx. 16+980 km, from approx. 20+270 km to approx. 24+800 km and from approx. 25+817 km to approx. 30+260 km,
- Kamienny Potok River on the section from the mouth (0+000) to km 2+500.

2.2. CONTRACT QUALIFICATION

Planned construction works under this Contract qualify as an investment in flood protection structures within the meaning of the Act of 8 July 2010 on special principles of preparation for the implementation of investments in the field of flood protection structures (Journal of Laws of 2019, item 933) (Flood Special Act).

Pursuant to Article 2 (1) of the Flood Special Act, the following categories of works are to be carried out within flood protection structures: construction, reconstruction and renovation of regulatory structures together with facilities related to them technically and functionally.

The planned duration of the works covered by the Contract is 15 months.

2.3. TYPE OF TECHNOLOGY

DESIGN ASSUMPTIONS

The planned design solutions are generally renovation and reconstruction. They consist in improving the technical condition of the existing adjustment structure of the channel and consolidating the course of the channel in the plan as well as in the longitudinal profile. Design solutions were determined using typical types of insurance for mountain river areas.

Basic design assumptions:

- making the river channel more accessible in ichthyological terms by eliminating transverse barriers;

- securing the cities of Duszniki-Zdrój and Polanica-Zdrój against damage to regulatory and bridge buildings caused by the transport of boulders and rubble during the passage of the flood wave on the Bystrzyca Dusznicka River;

- securing the Museum of Paper Industry in Duszniki-Zdrój against flooding with a probability of p=1%;
- ensuring the durability and stability of the cross-sections and longitudinal section of the river channels, by carrying out the renovation of reinforcements;
- increasing the capacity of the channel by rebuilding the bridge in km 23+539 of Bystrzyca Dusznicka with local correction of the channel route;
- enhancing flood protection of bank areas with particular regard to built-up areas and transport routes.

The achievement of the above objectives shall be designed by:

- demolition of damaged and construction of new regulation walls along the river banks;
- reconstruction of the regulating walls in the place and along the route of the existing ones (damaged, intended for demolition) consisting in local cutting down of trees and shrubs, removing the layer of top soil, making a trench in the bottom of the channel, making a reinforced concrete structure of the wall, filling the space behind the wall with soil from the land side, making a stone lining of the wall from the river side. The area behind the crown of the wall will be covered with top soil and sown with a mix of native grass species;
- sectional reinforcement of the existing walls by means of a seawall (flooring), consisting in making an excavation in the bottom of the channel, and then making a concrete screed under the foot of the wall,
- local strengthening of slopes on the edges with wedge-shaped stone rip-rap. The works will consist in local felling of trees and shrubs, removal of the top soil layer, scarping, laying geotextile, laying stone boulders with a diameter of ϕ 0.5-1.0 m, wedged with the ϕ 0.2-0.5 m fraction. The slope above the bedrock shall be covered with top soil and sown with a mixture of native grasses;
- re-profiling of existing regulation walls and slope reinforcements by cleaning and supplementing the joints, filling in the defects of stone;
- local disposal of the spoil;
- felling of trees and shrubs that interfere with the scope of the work,
- construction of a flood embankment protecting the municipal sewage treatment plant in Polanica-Zdrój;
- channel maintenance consisting in cleaning the outlet section of the Jastrzębnik Stream to the Bystrzyca Dusznicka River;
- reconstruction of the bridge in km 23+539 Bystrzyca Dusznicka, that shall consist in dismantling the existing bridge building and building a new one in its immediate vicinity;
- reconstruction of bottom protection together with the execution of threshold structures in the area of the Papermaking Museum in order to reduce bottom erosion;
- renovation of the lower station of the H-23 barrage in km 15+498 of Bystryzca Dusznicka by making buttress in the lower station, filling the bottom with a stone bedspread creating sharp;
- renovation of the outlet section of the Podgórna Stream to the Bystrzyca Dusznicka over a length of approx. 15 m;
- demolition of the remains of the closed bridge In km 27+685 of Bystrzyca Dusznicka;
- demolition of the damaged bridge in km 30+206 of Bystrzyca Dusznicka;

- stabilisation of the longitudinal profile by using wooden buttresses. It is planned that the crown of the buttresses does not raise above the ordinate bottom, which allows to maintain the morphological continuity of the river;
- ichthyological clearance of Bystrzyca Dusznicka and Kamienny Potok through the use of clever ones on significant barrages and weirs, made in the form of a slope with a slope of approx. 1:25;
- shaping and rebuilding the areas adjacent to the bridge in km 23+539 of Bystrzyca Dusznicka by means of new invasions, pavements and reconstruction of the existing utility networks;
- construction of 3 anti-rubble dams in km 16+815, 29+308 and km 30+206 of the Bystrzyca Dusznicka river together with accompanying facilities in order to protect Duszniki-Zdrój and Polanica-Zdrój against rock material and woody debris carried by flood waters. The construction of the dams is planned to be open-work in order to ensure the continuity of debris transport in the riverbed and ecological/ichtilogcal flow capacity;
- construction of the by-pass channel (in the area of the Museum of Paper Industry) together with the construction of a bridge providing access to the buildings of the Museum of Paper Industry, as well as formation of a bipartite channel in the area of the by-pass channel outlet to the Bystrzyca Dusznicka in the section from km 25+819 to 26+156
- construction of a bridge or culvert under the district road No. 3301D (Sprzymierzeńców Street in Duszniki-Zdrój),
- construction of a bridge in the course of the municipal road which is an extension of Bystrzycka St.,
- reconstruction of the bridge along the municipal road in km 25+919 on Bystrzyca Dusznicka;
- sectional building of a new wall, leaving the old one as the so-called "formwork lost in Polanica-Zdrój.

DETAILED SCOPE OF WORKS

I. Scope of works on the Bystrzyca Dusznicka River within the Duszniki-Zdrój Facility

Repair and restoration works (length of one-side carried out works - regarding the right- or left-hand bank slope):

- construction of walls on a section of approx. 665 m,
- reprofiling of walls on a section of approx. 3200 m,
- demolition and reconstruction of walls on a section of approx. 450 m,
- superstructure of walls on a section of approx. 160 m,
- formation of a bipartite channel on a section of approx. 400 m,
- construction of coastal protection on a section of approx. 165 m,
- preparation of the area above the debris dam on the section of approx. 115 m,
- conversion of 2 barrages and weir into a stone rapids with a slope of approx. 1:25,
- reconstruction of the footbridge in km 28+381,
- renovation of barrage in km 26+580,
- demolition of the bridge in km 27+685,
- renovation of the outlet section of the Podgórna stream,
- channel maintenance consisting in cleaning the outlet section of the Jastrzębnik stream.

Construction of anti-rubble dams

As part of the works, it is planned to build 2 anti-rubble dams on the Bystrzyca Dusznicka River above the city of Duszniki-Zdrój. The construction of the dam is planned to be executed in a mesh-stone form. Due to the construction of the anti-rubble dam at 30+206 km, it is necessary to dismantle the bridge in km 30+169 (currently closed and collapsed) and rebuild it below the dam.

By-pass channel

It is planned to by-pass channel with a length of approx. 355 m at the Papermaking Museum along with the construction of 3bridges along the existing roads and the reconstruction of the existing bridge in km 25+919 below the mouth of the by-pass channel to Bystrzyca Dusznicka. The channel will lead the water continuously – there will be a current distribution between the currently existing channel and the built channel.

II. Scope of works on the Bystrzyca Dusznicka River within the Szczytna Facility

Repair and restoration works in Bystrzyca Dusznicka (length of one-side carried out works – regarding the right- or left-hand bank slope):

- reprofiling of walls on a section of approx. 480 m,
- demolition and reconstruction of walls on a section of approx. 360 m,
- renovation of the reconstruction of bank protection on the section of approx. 1950 m,
- reconstruction of 7 barrages and weirs into semi-natural stone rapids,
- reconstruction of the bridge in km 23+539 of Bystrzyca Dusznicka
- construction of four buttresses,
- renovation of the outlet section of the Szklarska Woda stream L=95m, in the scope of cleaning and restoration of jointing and stone losses.

III. Scope of works on the Kamienny Potok River within the Szczytna Facility

Repair and restoration works on the Kamienny Potok River (length of one-side carried out works - regarding the right- or left-hand bank slope):

- reprofiling of walls on a section of approx. 1970 m,
- demolition and reconstruction of walls on a section of approx. 100 m,
- renovation of the reconstruction of bank protection on the section of approx. 1060 m,
- reconstruction of three barrages and weirs into semi-natural stone rapids,
- construction of an emergency bottom drainage water intake at km 1+302 of Kamienny Potok for fire-fighting purposes emergency,
- repair of a stone bridge.

III. Scope of works on the Bystrzyca Dusznicka River within the Polanica-Zdrój Facility

- reprofiling of existing regulation walls and reinforced slopes, by cleaning and supplementing the joints, filling in the defects of stone,
- sectional in km from 15+028 to 15+085 - building a new wall, leaving the old one as the so-called lost formwork,
- sectional reinforcement of the existing walls by means of a band (an offset), consisting of a trench in the bottom of the channel, and then a concrete screed under the foot of the wall,
- felling of trees and shrubs that interfere with the scope of work,

- local removal of deposits from the river channel,
- installation of the sewage outlet for storm water sewage system in km 14+173,
- reconstruction of the H-23 barrage into the rapid,
- construction of anti- anti-rubble dams in km approx. 16+815

The planned works together cover the following lengths of the Bystrzyca Dusznicka river channel:

- total length of the section covered by the works on the right bank of the Bystrzyca Dusznicka only: 348 m,
- total length of the works section on the left bank of the Bystrzyca Dusznicka only: 290 m,
- length of the section where works will be carried out simultaneously on both sections: 2175 m.

Anti-rubble dam construction

As part of the works, it was planned to build an anti-anti-rubble dam on the Bystrzyca Dusznicka River above the city of Polanica-Zdrój (16+815 km). The construction of the dam is planned to be of open-work design to allow the movement of aquatic organisms and some debris during periods when there are no flood events.

Construction of a flood embankment

As part of the works, it is planned to build a flood embankment in the area of the sewage treatment plant in Polanica-Zdrój.

2.3.1. WORKS EXECUTION CONDITIONS AND BACK-UP FACILITIES REQUIREMENTS

Works within the Duszniki-Zdrój, Szczytna and Polanica-Zdrój Facilities, for reasons of economy of execution time, may be carried out simultaneously, while observing the principle of starting works from the top of each section (except for works carried out point-by-point, on small sections such as smart, works within bridges, flood embankment). The temporal and spatial shift of works involving their implementation from the top to the bottom of the river for each of the facilities will ensure the maximum possible distance between the places of simultaneous work in both facilities (this applies to linear works within the bank slopes of the river).

The implementation of the Contract will be limited in space to the river channel of Bystrzyca Dusznicka and Kamienny Potok and their tributaries, covered by the scope of the Contract and their immediate surroundings. Due to the terrain, it is usually a strip not exceeding a width of approx. 10 – 20 m from the bank line.

Works related to the reconstruction, demolition, re-profiling and renovation of regulatory structures, as well as the removal of rubble, due to the possible limitations in the availability of space directly along the river channel (existing buildings, trees and shrubs, other infrastructure facilities overflowing directly to the river channel) will have to be carried out in a "from water" technology, using a microexcavator. For this purpose, it is planned each time to build a temporary cofferdam in the river channel, built of natural material, e.g. sandbags. These bags must be made of tear-resistant material, which will protect the river channel from washing away sand and sanding of the space between stones and gravel (it will prevent changes in the character

of the bottom important for ichthyofauna and aquatic invertebrates). Immediately after the work area has been separated (before the water is pumped out), fish and lampreys will be caught under the supervision of an ichthyologist and they will be relocated to another part of the channel not affected by the works.

In the separated part, the equipment used for the implementation of works along the river bank fortifications will be moved. The separated part of the channel will be lined with fascine mattresses in the machine traffic lane in order to reduce the direct impact on the river bottom (running out, violating the bottom structure, contamination by oil-derivatives).

The works will be carried out in short alternating sections. The sections of the above-mentioned fencing of the channel with cofferdams will be limited on one side and adjusted to the scope of works on the length of approx. 15 ÷ 50 m. After completion of works within the works section of one bank escarpment (the escarpment module for works), the works zone will be shifted to the opposite escarpment (applies to cases where in a given river section both bank escarpments are covered by works) or in case of wall works (concreting of the body of the wall) on the same bank, to every other module in order to stage the works. Such a method of conducting works will limit the time during which given fragments of the riverbed will be deprived of water.

Construction facilities and technological roads and squares should be located outside the inter-embankment area, outside areas covered with high greenery (trees, shrubs), within identified natural habitats and habitats and places of occurrence of protected species. These facilities shall be used for storing building materials and top soil, garaging and refuelling machines, ongoing repairs and maintenance of machines and equipment, storage of fuels and oils, location of social facilities (building crew room, portable sanitary cabins with full equipment) and waste containers as well as the ongoing cleaning of vehicles from dirt, mud, etc.. The construction site and all technological roads on which machines and cars will move should be covered with concrete road slabs on ballast. A sorbent station should be located in the vicinity of the machinery parking and refuelling area for the elimination of oil spillages and spills, including their removal from the water in case of failure of equipment working in separate areas of the channels (previously drained). Any site selected by the Contractor for the location of construction backup facilities and the route of technological roads must be agreed with the Contractor's team of environmental experts and submitted to the Engineer for approval.

2.3.2. LAND OCCUPATION

Part of the works will be carried out under conditions of temporary (or permanent) occupation of private land located adjacent to the rivers.

Temporary occupations will be implemented in accordance with the contents of the Land Acquisition Action Plan for Task 2B.2/2 [1] and the Operational Policy of the World Bank OP. 4.12[2] and in accordance with the procedures set out in the LARPF (Land Acquisition and Resettlement Policy Frameworks[3]) The LAAP contains a detailed list of activities and procedures related to land acquisition for the implementation of the Task.

[1] Link to the LAAP (the document in being prepared)

[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

Reservations and comments on the resettlement plan, as well as any reservations regarding the implementation of resettlement in accordance with Polish law, are classified as complaints and motions (*Grievance Redressal Mechanism*). This mechanism also covers the submission and management of any complaints that may be made in the course of the implementation of a project by persons and entities affected by any of its impacts. This issue is discussed in detail in the POM for the OVFM Project[1].

In selected locations, it will be necessary to carry out permanent seizures on land adjacent to riverbeds for the purpose of carrying out works within the scope of individual Facilities. The principles of permanent and temporary seizures will be specified in detail in the Land Acquisition Action Plan for the Contract 2B.2/2.

In accordance with the provisions of LAAP, at the stage of project preparation and during its implementation, mitigation measures will be applied, the aim of which is to limit and compensate for all negative socio-economic consequences of the Contract's implementation, including possible loss of property by PAPs.

2.4. TREES AND SHRUBS FELLING

In connection with the implementation of the necessary scope of work, it is necessary to cut down trees and shrubs. The detailed scope of tree and shrub felling will be determined at the stage of detailed design works.

It is assumed that not all trees and shrubs indicated in the EIA Reports will be cut down. Mitigation measures provide for the possibility of preserving specific specimens at the stage of carrying out works by using appropriate technology and organisation of works, carried out under the ongoing supervision of environmental experts. In places where there is no direct collision of existing trees and shrubs with the areas of works, in order to limit the scope of felling, the works will be carried out in the riverbed (after drainage and fish catching from the area allocated for works).

In the area protected by the Voivodeship Monuments Conservator (e.g. the area of the Paper Mill in Duszniki-Zdrój), the restoration of vegetation will take place based on the relevant decisions and agreements with the WKZ/VMC.

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

3. INSTITUTIONAL, LEGAL AND ADMINISTRATIVE CONDITIONS

3.1. INSTITUTIONS INVOLVED IN THE CONTRACT

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, C. K. Norwida Street 34, 50-950 Wrocław, acting for and on behalf of the State Treasury.

Additionally, during the construction and Operational 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 i.e. the Project Coordination Unit of the Odra-Vistula Flood Management Project, in Wrocław, which is institutionally part of PGW WP, was established.

3.2. NATIONAL ENVIRONMENTAL PROTECTION 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 Contract 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*).

Under Contract 2B.2/2 there will also be a Grievance Redressal Mechanism. Objections and comments to the resettlement plan and any objections to the implementation of resettlement in

[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*.

accordance with Polish law shall be qualified as complaints and requests. This mechanism also covers the submission and management of any complaints that may be submitted in the course of the implementation of the Task by persons and entities covered by any of its impacts (concerning, inter alia, real estate buyouts, temporary seizures of real estate and compensation). This issue is discussed in detail in the POM for the OPDOW Project[1].

3.5. EIA PROCEDURE FOR THE CONTRACT 2B. 2/ 2

In accordance with the provisions contained in the Regulation of the Council of Ministers of 10 September 2019 on projects that may have a significant impact on the environment, the planned investment, i.e. *Contract 2B.2/2 Flood protection of the Bystrzyca Dusznicka river valley and the Kamienny Potok river (passive protection)* is a project that can potentially have a significant impact on the environment.

For the Contract in question, in accordance with the requirements of the national legislation, the Investor obtained a decision on environmental conditions (environmental decision). Three environmental impact assessment reports were prepared as part of the environmental decision procedure:

- Environmental impact report for the *Task 2B.2/2 Flood protection of the Bystrzyca Dusznicka river valley and the Kamienny Potok river - Duszniki-Zdrój Facility, July 2020;*
- Report on the environmental impact of the project for the *Task 2B.2/2 Flood protection of the Bystrzyca Dusznicka river valley and the Kamienny Potok river - Szczytna Facility, July 2020;*
- Environmental impact report for the *Task 2B.2/2 Flood protection of the Bystrzyca Dusznicka river valley and the Kamienny Potok river - Polanica-Zdrój facility, July 2020.*

The competent authority for issuing the environmental decision for investment activities included in *Contract 2B.2/2 (b)* was the Regional Environmental Protection Director in Wrocław. On 10 March 2020, (Polanica-Zdrój Facility) and 19 March 2020. (Duszniki-Zdrój and Szczytna Facilities), the Investor applied to the Regional Director of Environmental Protection in Wrocław for a decision on environmental conditions for the above-mentioned projects and for giving them immediate enforceability.

Data on applications for issuing a decision on environmental conditions have been included in a publicly available list of data on documents containing information on the environment and its protection (http://www.ekoportal.gov.pl/) under the number: 96/2020 for the Duszniki-Zdrój Facility, 94/2020 for the Szczytna Facility and 86/2020 for the Polanica-Zdrój Facility.

Regional Director for Environmental Protection in Wrocław by the notices: of 23 March 2020., ref. no. WOOŚ.420.21.2020.AP (Duszniki-Zdrój facility), ref. no.: WOOŚ.420.19.2020.AP (Szczytna Facility) and of 16 March 2020, ref. no.: WOOŚ.420.16.2020.AP (Polanica-Zdrój Facility) informed the parties to the proceedings, among others, about the initiation of administrative proceedings regarding the issuance of a decision on environmental conditions for the above-mentioned investment, authorities competent to issue a decision, as well as the

[1] http://odrapcu2019.odrapcu.pl/

opportunity to read the case files and submit comments and motions at each stage of the proceedings.

In the course of the proceedings, the Regional Director of Environmental Protection in Wrocław, by letters of 16 and 23 March 2020, requested an opinion on the need to carry out environmental impact assessments of the planned facilities, and in the event of such a need, on the scope of environmental impact reports to: Minister of Maritime Economy and Inland Navigation and to the State District Sanitary Inspector in Kłodzko.

State District Sanitary Inspector in Kłodzko in the decision of 6 April 2020, ref. no.: NS-ZNS-72-16/AZ/20 (Duszniki-Zdrój Facility), by decision of 9 April 2020, ref. no.: NS-ZNS-72-19/AZ/20 and in the decision of 3 April 2020, ref. no.: NS-ZNS-72-15/AZ/20 expressed an opinion on the lack of need for environmental impact assessments.

Minister for Maritime Economy and Inland Navigation in the letter of 7 April 2020, ref. no.: DOK.DOK2.9750.1.14.2020.SW (Duszniki-Zdrój Facility), of 9 April 2020, ref. no.: DOK.DOK2.9750.1.18.2020.AS (Szczytna Facility) and of 2 April 2020, ref. no.: DOK.DOK2.9750.1.9.2020.AS (Polanica-Zdrój Facility) applied to the Regional Director for Environmental Protection in Wrocław for a request to the applicant to supplement the Project Information Sheets.

The authority by the letter dated 17 April 2020, ref. no.: WOOŚ.420.21.2020.AP.6 (Duszniki-Zdrój Facility) and WOOŚ.420.19.2020.AP.6 (Szczytna Facility) and by letter of 8 April 2020, ref. no.: WOOŚ.420.16.2020.AP.7 (Polanica-Zdrój Facility) called on the investor's representative to supplement the PDS to the extent indicated by the Minister of Maritime Economy and Inland Navigation.

In connection with supplementing the documentation, the Regional Director of Environmental Protection in Wrocław by letters of 13 May 2020, ref. no.: WOOŚ.420.21.2020.AP.7 (Duszniki-Zdrój facility), dated May 18, 2020, ref. no.: WOOŚ.420.19.2020.AP.7 (Szczytna facility) and by letters of 23 April 2020, ref. no.: WOOŚ.420.16.2020.AP.8 and of 4th may 2020, ref. no.: WOOŚ.420.16.2020.AP.9 (Polanica-Zdrój Facility) submitted the supplementary evidence to the Minister of Maritime Affairs and Inland Navigation. Then, the Regional Director for Environmental Protection in Wrocław by letters of 18 May 2020, ref. no. WOOŚ.420.21.2020.AP.8 (Duszniki-Zdrój facility), dated 18 May 2020, ref. no.: WOOŚ.420.19.2020.AP.8 (Szczytna Facility) and of 18 May 2020, ref. no.: WOOŚ.420.16.2020.AP.10 (Polanica-Zdrój facility), requested another opinion on the need to carry out environmental impact assessments of the planned projects or to maintain the above-mentioned position to the State District Sanitary Inspector in Kłodzko.

The Minister for Maritime Economy and Inland Navigation in the opinions: dated: 29 May 2020, ref. no.: DOK.DOK2.9750.1.14.2020.SW (Duszniki-Zdrój Facility), of 5 June 2020, ref. no.: DOK.DOK2.9750.1.18.2020.AS (Szczytna Facility) and of 21 May 2020, ref. no.: DOK.DOK2.9759.1.9.2020.AS (Polanica-Zdrój Facility) stated that there is no need to carry out an assessment of the impact of the above-mentioned projects on the environment, pointing at the same time to the need to take into account the conditions and requirements specified in the above-mentioned opinions in decisions on environmental conditions.

- For the Duszniki-Zdrój Facility, the State District Sanitary Inspector in Kłodzko issued their stand after the statutory deadline, which, in accordance with the applicable regulation of

Art. 78 (4) of the EIA Act, is treated as no objections. For Szczytna and Polanica-Zdrój Facilities, however, he maintained the position expressed in the decisions of 9 April 2020, ref. no.: NS-ZNS-72-19/AZ/20 and of 3 April 2020, ref. no.: NS-ZNS-72-15/AZ/20 on the lack of need for an environmental impact assessment.

- The Regional Director of Environmental Protection in Wrocław analysed the collected documentation in terms of the provisions of Article 63 (1) of the aforementioned Act. Taking into account the information contained in PIS, it considered that the investment projects in question could have a significant impact on the environment and therefore require an environmental impact assessment. In view of the above, on 26 June 2020, (Polanica-Zdrój Facility) and on 3 July (Duszniki-Zdrój and Szczytna Facilities), the authority issued decisions (ref. no. WOOŚ.420.16.2020.AP.11, ref. no.: WOOŚ.420.21.2020.AP.10 and ref. no.: WOOŚ.420.19.2020.AP.9 on the obligation to carry out environmental impact assessments and determined the scope of reports on the impact of the projects on the environment.

Pursuant to the decision of RDOŚ on the necessity to carry out the environmental impact assessment, the investor's attorney submitted Environmental Impact Reports for individual Facilities included in the scope of Task 2B.2/2.

After analysing the above-mentioned Reports and the submitted documentation, the Regional Director of Environmental Protection in Wrocław by letters of 13 August 2020, ref. No.: WOOŚ.420.21.2020.AP.15 (Duszniki-Zdrój Facility), ref. no.: WOOŚ.420.16.2020.AP.15 (Polanica-Zdrój Facility) and by letter of 31 August 2020, ref. no.: WOOŚ.420.19.2020.AP.15 (Szczytna Facility) called the investor's attorney for completion. The documentation submitted in the case, including the reports, was supplemented in accordance with the requests of the authority conducting the proceedings for issuing environmental decisions.

On 10 September 2020 (ref. no.: WOOŚ.420.21.2020.AP.16 – Duszniki-Zdrój), 23 September 2020 (ref. no.: WOOŚ.420.19.2020.AP.17 – Szczytna Facility) and 10 September 2020 (ref. no.: WOOŚ.420.16.2020.AP.15 – Polanica-Zdrój Facility) the Regional Director of Environmental Protection in Wrocław issued Announcements on joining the procedure of public participation in the ongoing administrative proceedings on issuing environmental decisions for the Projects. Within the deadline for public participation in the procedure for issuing environmental decisions for the respective Facilities, the Regional Director for Environmental Protection in Wrocław did not receive any comments or applications from the public. Neither did the Investor register any applications or remarks concerning the environmental proceedings. No non-governmental organisation also applied for participation in the environmental decision making procedures.

On the basis of the analysis of the collected materials and after carrying out appropriate public consultations, the Regional Director of Environmental Protection in Wrocław issued:

- A decision on the on environmental conditions of 28 October 2020 for the investment entitled „Tasks 2B.2/2 Flood protection of the Bystrzyca Kłodzka river valley and the Kamienny Potok river (passive protection) - Duszniki-Zdrój Facility” in Option 1 (ref. no.: WOOŚ.420.21.2020.AP.19).
- A decision on the on environmental conditions of 13 November 2020 for the investment entitled "Tasks 2B.2/2 Flood protection of the Bystrzyca Kłodzka River valley and the Kamienny Potok River (passive protection) - Szczytna Facility" in variant 1 (ref. no.: WOOŚ.420.19.2020.AP.20).

- A decision on the on environmental conditions of 30 October 2020 for the investment entitled „Tasks 2B.2/2 Flood protection of the Bystrzyca Kłodzka river valley and the Kamienny Potok river (passive protection) - Polanica-Zdrój Facility" in Option 1 (ref. no.: WOOŚ.420.16.2020.AP.18).

In addition, the Regional Director of Environmental Protection in Wrocław decided that giving immediate enforceability to decisions is necessary, thus accepting the investor's application. Decisions are therefore immediately enforceable in further administrative proceedings even before they have become final.

4. DESCRIPTION OF ELEMENTS OF THE ENVIRONMENT SURROUNDING THE CONTRACT

4.1. EARTH SURFACE AND LANDSCAPE

The analysed area is located in the Eastern Sudety macro-region, in the mesoregions: The Kłodzko Valley, the Bystrzyckie Mountains, the Orlickie Mountains and the Stołowe Mountains. It is characterized by a very varied terrain relief, mostly of mountainous character, partly also of highland character.

The Contract is located within the valley of the Bystrzyca Dusznicka and Kamienny Potok rivers. In their upper sections, water flows between boulders and rock blocks. Valleys of streams supplying the rivers are usually narrow, deeply cut into the ground. The Bystrzyca Valley over a significant length is a natural border between the Stołowe Mountains and the Bystrzyckie Mountains. It is characterized by very diverse morphology and large falls. Due to the nature and geomorphological forms, the Bystrzyca Dusznicka valley is divided into two distinctly different sections: a breakthrough section in the western part and a section in the central and eastern part of the analysed area. The breakthrough section in the western part separating the Stołowe Mountains is a typical epigenetic breakthrough, prepared in sandstone bossages, where the bottom of the valley has been significantly narrowed and is limited on both sides by steep slopes. The width of the valley bottom is 50-70 m, and at the bottom there is one floodplain, which reaches a height of 1-3 m. The central and eastern sections of the Bystrzyca Dusznicka river valley have a different character. The width of the valley increases to 200-300 m. The floodplain at the bottom of the valley has a more even profile - it rises about 2-4 m above the average water level in the river. The river on this section has partially occurring higher floodplains. These are erosion and accumulation floodplains, built on a rock pedestal, poorly marked in the morphology of the area. It creates breakthrough sections separating the Bystrzyckie Mountains from the Stołowe Mountains massif. It is characterized by very diverse morphology and large falls. The bottom in the spring sections is rocky, locally there are rock debris, rocky deposits. Within the village, the channel has been regulated and is heavily transformed.

In the built-up area of Dusznik-Zdroj, the river channel of Bystrza Dusznicka and the area adjacent to it are characterized by diverse landscape values. In the part adjacent to the Spa Park, these values are not high, which is mainly due to poor technical condition of the channel control structures (cavities, washings). The highest landscape values are characterized by a section close to the natural state, located above Dusznik-Zdroj and a section located in the city center at Zdrojowa Street. The high landscape values on this urban section were mainly determined by architectural and urban factors, the state of greenery, the range of view and the low degree of devastation.

On the sections of Bystrzyca Dusznicka and Kamienny Potok located in the built-up area of Szczytna, the river channels of both rivers are characterized by low landscape values. This state of affairs is mainly due to the lack of access to the channel (buildings adjacent to the river, fences and bushes) and the poor technical condition of the channel regulatory structures (cavities, washings). The highest landscape values have a section of the Kamienny Potok above Szczytna. The river is characterized by a state similar to the natural one. It flows through the combe (V-shaped) valley. The slopes, made of soil, stones and boulders, have a varied slope

(from mild to steep). The channel is characterized by a significant variety of natural hydromorphological elements, such as rapids, stagnant, overgrown boulders and rock outcrops, channel outwashes with plants, as well as shore toppings with plants. The channel is wooded on both banks, in the coastal zone there is a forest. Woods are accompanied by natural elements such as hanging branches, exposed roots on the shore, as well as fallen trees and small and thick wood rubble present in the channel. Both on the slopes and in the coastal zone there is a complex structure of vegetation.

The lowest landscape values are also characterized by a section of Kamienny Potok located in the centre of Szczytna. The coastal zone in the 100 m buffer is completely urbanised. The Stream on this section has features of poor hydromorphological condition. This is due to a very strong transformation of the channel, which is regulated over the entire length and strengthened with a retaining wall. There are no hydromorphological elements in it, indicating the diversity of the longitudinal profile and natural morphological elements. Coastal greenery is neglected. Poor technical condition of regulatory structures also causes a decrease in landscape values.

In the built-up area of Polanice-Zdrój, the channel of the Bystrzyca Dusznicka River and the area adjacent to it are characterized by diverse landscape values. In the spa part adjacent to the Spa Park, these values are higher than in other built-up areas. This was mainly due to architectural and urban factors. Low landscape values of the remaining sections located in built-up areas are mainly due to the lack of access to the river (buildings adjacent to the water course, fences and bushes) and poor technical condition of the channel regulatory structures (cavities, washings). On sections located in areas with loose residential buildings, the landscape values are higher and the highest are characteristic for the sections located outside the built-up area, having a state similar to the natural one.

4.2. CLIMATE

The Contract Area is located in the south-western part of the Kłodzko Land, within the valley of Bystrzyca Dusznicka and Kamienny Potok. Most of the area is located in the bioclimatic region VI "submontane and mountain". Due to natural, climatic and infrastructural conditions, this area is a spa. The climate here is milder (low and moderately stimulating) compared to other regions of the Kłodzko Region. Microclimatic conditions vary depending on the terrain.

The average annual air temperature in Duszniki-Zdrój is 6.4 °C. The warmest month is July at an average temperature of 15.4 °C, and the coldest month is January with an average temperature of 4 °C. The average annual rainfall is 665 mm. The highest rainfall occurs in July (94 mm), while the lowest in January (29 mm). South and westerly winds dominate.

The average annual air temperature for Polanica Zdrój is 7.3°C. The warmest month is July with an average temperature of 16.4°C, while the coldest month is January with an average temperature of -3.2°C. The average annual rainfall is 605 mm. The greatest amount of rainfall occurs in July (88 mm). The lowest precipitation is recorded in January (24 mm).

The average annual air temperature in Szczytna is 6.8 °C. The warmest month is July, with an average temperature of 15.8 °C, and the coldest month is January, with an average temperature of -3.7 °C. The average annual rainfall is 637 mm. The most precipitation falls in July (91 mm). The lowest precipitation is recorded in January (27 mm).

Due to natural, climatic and infrastructural conditions, the area of Duszniki-Zdrój and Polanica-Zdrój is a health resort/spa. The climate here is milder (low and moderately stimulating) compared to other regions of the Kłodzko Region. Mild winters and fairly warm, sunny summers are characteristic.

4.3. AIR QUALITY

In the study *Air quality assessment in the Lower Silesian Voivodeship in 2018*. (GIOŚ, Regional Department of Environmental Monitoring in Wrocław) it was indicated that in the Task area in 2018 there were exceedances of air quality standards in the field of benzo (a)pyrene BaP) and ozone (O_3). The conducted measurements of PM10 dust pollutants at the measuring point located in Polanica-Zdrój also showed exceedances of standards and poor air quality, in accordance with the CAQI scale[1]. The main sources of air pollution in the region include:

- low based emissions in heating seasons (households and municipal facilities),
- industrial emissions (operators introducing gases and dust into the air and paying environmental charges),
- car emissions (for roads and the immediate vicinity).

The protection zones in the area of the Contract implementation include zone A of health resort protection in Duszniki-Zdrój and A and B in Polanica-Zdrój.

4.4. GEOLOGICAL STRUCTURE

The basin of Bystrzyca Dusznicka includes fragments of the following geological and tectonic units: Intrasudecka depression with the ditch of Nysa Kłodzka, the crystalline core of the orlicko-bystrzycki, the metaphorphic unit of the Klodzki;

The Interdudetian (Intersudetian depression) is a large tectonic unit built of a series of sedimentary units of several thousand metres of thickness, limited on three sides by older units, significantly elevated from it. It is composed of lower carboniferous formations in the central parts of the unit, probably joining the upper Devonian, upper Corboniferous and Lower Perm, and an incomplete series of Upper Perm and Buntsandstein and Upper Cretaceous formations.

The majority of the Intersudetian basin in the Bystrzyca Dusznicka catchment area is occupied by the Batorowa basin built of Upper Cretaceous formations. Geographically, Batorowa basin includes Stołowe Mountains and Dusznik lowering.

The Cretaceous plate of the Batorowa basin area is not heavily deformed. The most important deformation zones include the Czerwona Woda offset zone and the associated Obniżenie Czerwonej Wody located in the catchment area of Kamienny Potok. This structure, having the character of a narrow tectonic ditch, creates a stream valley along the regional watershed.

The ditch of Nysa Kłodzka is an independent tectonic unit and constitutes a south-eastern extension of the Intersudetian basin. It is a vast pit limited by offsets, filled with chalk sediments (from the top Cenomanian to cognac): sandstones, marls, siltstone and clays. These works are deposited on the rocks of the orlicko-śnieżnicka dome.

Bystrzycko-orlicki crystallic unit is built by various types of gneiss and micaceous shale, amphibolites, leptinites, crystalline limestones and quartzites, metamorphized in the metamorphic facies.

[1] https://www.airqualitynow.eu/pl/about_indices_definition.php

In addition, among the crystalline rocks of the Bystrzyskich Mountains, intrusive rocks of the lamprofirs (minette, kersantite) and porphyry are widely disseminated. They are found in zones of tectonic disorders in both the infra- and supracrustal series.

Both series are intersected by two off-set systems. The older system – pre- Cretaceous - includes off-sets with a direction similar to the parallel, and the younger system, alpine - offsets created after Cretaceous with a course similar to the meridian.

The Kłodzko massif (Kłodzka metamorphic unit) is made of amphibolites, metagabras and plagioclass magnets metamorphized in the metamorphic facies, and metaryllites, greens, phyllites and Mid-Devonian limestones transformed into a green facies. This unit builds only a small fragment of the Bystrzyca Dusznicka catchment area in the estuary section.

Quaternary formations in the analysed area consist mainly of Pleistocene sediments developed in the form of peristaltic weathering covers, which occur in the pericardial zones of the hills, and Pleistocene and Holocene sediments of river terraces and influx cones - sands, gravels, muds with a maximum thickness of about 40 m.

4.5. SOILS AND LAND

The Bystrzyca Dusznicka valley is dominated by leached and acidic brown soils, covering over 40% of the area. Alluvial soils cover 16.44%, spodic soils about 2.64% of the valley area. In terms of granulometry, medium clays (> 20%) and heavy clays (about 14%), dusts and light clays (about 7%) dominate. Clays and loesses cover from 2-5.6% of the valley area. Organic soils account for a small share (Żyszkowska 2007).

The area of Duszniki-Zdrój commune is dominated by brown, proper and brown acidic soils, mostly overgrown by forests. The substrate of these soils are mostly weathered formations of sandstones, granites and metamorphic rocks. The river muds occur only in the depression at the confluence of the valleys of Bystrzyca Dusznicka, Kamienny Potok and Czarna Woda. Soils of the 4th agricultural land class dominate in the commune, accounting for 35% of arable land. Top-class (II) soils occupy only 2% and class III 23% of arable land. 39% of arable land is soils with low grades V and VI (Stec 2013).

There are soils of relatively low agricultural usefulness in the Polanica-Zdrój commune. In the southern and central parts, mountain soils were formed from the mother rocks of sandstones and marls, as well as their eluvium and sloping clays. Lowland soils were formed in the lower area, made of medium dusty clays, often on a skeleton of varied agricultural suitability. In the valleys light and medium fed soils were formed.

The agricultural usefulness of soils in the town and municipality of Szczytna is not high. These are mainly poor or scarce soils. These are mountain soils occurring as: brown leached soils, brown acidic soils, less frequently podzol soils, lowland soils and upland soils: podzol soils and brown soils, and valley soils, which fed soils, mountain fed soils, mursh soils, gley soils (POŚ 2004).

4.6. SURFACE WATERS

Bystrzyca Dusznicka is a left-bank tributary of Nysa Kłodzka (Fig.1). Its length is 35 km. The catchment area is 198.52 km². The main tributaries are: Młynówka, Wapienny Potok, Biały Potok, Elizówka, Jastrzębnik, Cicha, Kamienny Potok, Rogoziniec. The sources are located in the Orlickie Mountains, near the village Zieleniec. On the section from the sources to Dusznik-Zdroj, the river separates the Orlickie Mountains and the Bystrzyckie Mountains. It forms several breakthrough sections, e.g. between Szczytna and Polanica-Zdrój (Bystrzyckie Mountains) and between Szalejów Górny and Szalejów Dolny (Kłodzka Basin). Within the village (e.g. Polanica Zdrój), the channel is regulated, walled with stone cladding, while residential and service buildings and road infrastructure are directly adjacent to the channel zone.

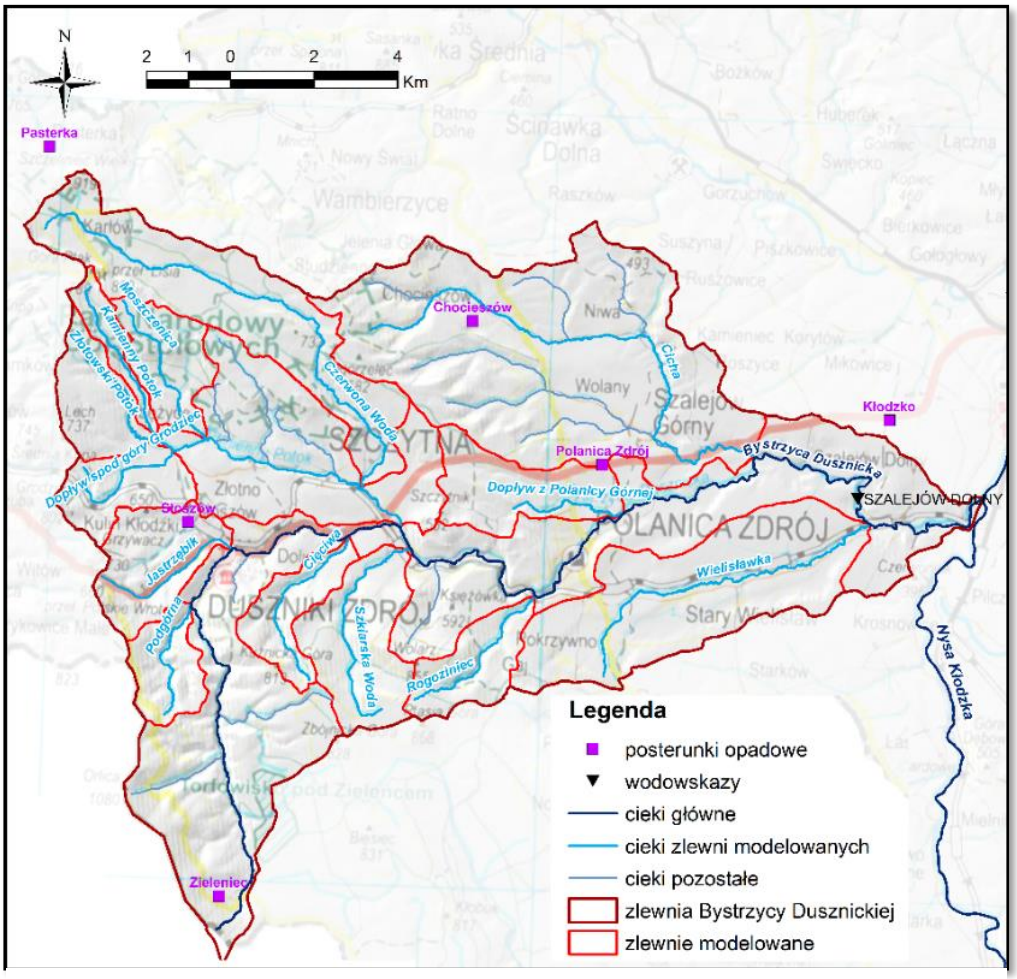

Fig. Bystrzyca Dusznicka1 catchment area against the background of hydrographic division (own elaboration based on KZGW data)

Due to environmental conditions, including large terrain declines, dynamic fluvial processes dominate the channel. Side erosion dominates on straight sections and in the vicinity of bridge structures. Within natural obstacles, such as tree trunk blockages, sandstone boulders, etc. erosion undercuts are created in the bank zone. Curly sections are dominated by lateral erosion confined to the outer shore. Erosion also occurs in the contact zone of the natural and strengthened shore. As a result, the following are formed: valley landslides, bottom dredges, erosion niches, stone deposits, bottom washout. Within the town, the channel is regulated, bricked with stone cladding, while residential and service buildings and road infrastructure are directly adjacent to the channel zone.

Kamienny Potok is a tributary of Bystrzyca Dusznicka with a length of 11.8 km and a catchment area of 51.36 km^2. Its sources are located in the Stołowe Mountains at an altitude of 778.00 m above sea level, above Łężyce. The mouth to Bystrzyca Dusznicka is located in Szczytna. The valley of the stream is V-shaped, forming steep slopes. In the spring areas Kamienny Potok does not develop a typical channel, it begins within the flat impermeable surfaces of narożnik and Skalniak, within the wetland zone (including the Batorowskie Peat Bogs, Długie and Krągłe Wetlands). The valley is characterized by a clear asymmetry of the river basin associated with the geology and tectonics of the substrate - the cracking system causes the disappearance of watercourses and the escape of water into the massif (Pulinowa 1989). On a large part of the section between Złotno and Szczytna, the stream flows through wooded areas, through a natural channel with little changed morphology and various habitats of fish and macroinvertebrates. A significant transformation of the morphology of the creek bed is related to the construction of bridges, access footbridges to the property, steps and barrages and weir. Within Szczytna, the banks were regulated and strengthened with stone cladding. Residential buildings are adjacent to the river channel zone. The channel on this section is characterized by poor hydromorphological condition. This is due to a very strong transformation of the channel, which is regulated over the entire length of the section. The substrate of the bottom consists of coarse and fine gravel, and stones are also present. The bottom is profiled, there are water barrages. In places of their occurrence, the bottom is strengthened. There are no hydromorphological elements in the channel, indicating diversity of the longitudinal profile and natural morphological elements.

The Contract is located within two bodies of surface water:

- UBSW Bystrzyca Dusznicka from the source to Kamienny Potok, code RW60007121839,
- UBSW Bystrzyca Dusznicka from Kamienny Potok to Wielisławka, code RW6000512188.

UBSW Bystrzyca Dusznicka from Kamienny Potok to Wielisławka represents abiotic type 5 - silicate high stream with fine-grained substrate - western. These are streams of moderate current and bottom substrate composed of fine gravels (akal) and sands (psammal), with moderately cool, well oxygenated water. The flora and fauna of these environments is associated with sandy and gravel bottom substrate. The analysed body of water has the status of a heavily changed UBSW.

UBSW Bystrzyca Dusznicka from the source to Kamienny Potok represents abiotic type 7 - carbonate high stream with coarse substrate. These are streams with a significant fall and high current speed and cool and well oxygenated water. The bottom substrate is mostly composed of stones and gravels. The diversity of habitats is determined by the presence of oversized boulders and wood rubble, forming hideouts for aquatic organisms. The body of water has the status of a natural UBSW.

The assessment of the state of UBSW was carried out within the SME in 2017 at the measuring and control point Bystrzyca Dusznicka - above Dusznik (for UBSW Bystrzyca Dusznicka from the source to Kamienny Potok) (Tab. 16) and at the measuring and control point Bystrzyca Dusznicka - outlet to Nysa Kłodzka (for UBSW Bystrzyca Dusznicka from Kamienny Potok to Wielisławka) (Tab. 1). The water status of both UBSWs in 2017 was assessed as poor.

Table 1 Status of UBSW according to SME from[1] 2017 and characteristics of UBSW based on aPGW.

Classified UBSW name:	**Bystrzyca Dusznicka from the source to Kamienny Potok**	**Bystrzyca Dusznicka from Kamienny Potok to Wielisławka**
Classified UBSW code	RW60007121839	RW6000512188
Measurement point code	PL02S1401_3141	PL02S1401_1233
Name of the measuring point	Bystrzyca Dusznicka - above Dusznik	Bystrzyca Dusznicka - outlet to Nysa Kłodzka
Length of UBSW, km	15.05	71.20
Abiotic type	7	**5**
UBSW Status	NAT	SZCW
Class of biological elements: **Fitobentos**	I	III
Class of biological elements: **Macrophytes**	I	II.
Class of biological elements: **Benthic macrovertebrates**	I	I
Class of biological elements: **Ichtiofauna**	II.	III
Class of biological elements	II.	III
Hydromorphological element class	II.	II.
Class of physicochemical elements (groups 3.1 to 3.5)	psd	psd
Physico-chemical element class - specific synthetic and non-synthetic impurities (group 3.6)	II.	II.
ENVIRONMENTAL STATUS	MODERATE (Class III)	MODERATE (Class III)
CHEMICAL STATUS	BELOW GOOD	BELOW GOOD
ASSESSMENT OF UBSW STATUS	POOR WATER STATUS	POOR WATER STATUS
Environmental objective set in the aPGW*	very good ecological condition, good chemical condition	good environmental potential good chemical condition
Deadline for achieving good condition	2015	2021
Risk of failure to achieve WFD objectives	Threatened	Threatened

[1] [1] http://www.gios.gov.pl/pl/stan-srodowiska/monitoring-wod (Assessment of the status of water bodies of rivers and dam reservoirs in 2017 - 2018).

Derogations	4(7) - Justification: Flood protection of **Bystrzyca Dusznicka** River Valley and Kamienny Potok	4(4)-1 - No technical impossibility 4(7) - Justification: Flood protection of **Bystrzyca Dusznicka** River Valley and Kamienny Potok

The environmental objectives for UBSW Bystrzyca Dusznicka from its source to Kamienny Potok (RW60007121839) are to achieve very good ecological and chemical condition. The environmental objectives for UBSW Bystrzyca Dusznicka from Kamienny Potok to Wielisławka (RW6000512188) are to achieve good ecological potential and good chemical status.

Information on protected areas indicated in §16 sec. 32 of the Act of 20 July 2017 - Water Law

Table 2 Areas protected under the Water Law Act designated within UBSW Bystrzyca Dusznicka from the source to Kamienny Potok (RW60007121839) and UBSW Bystrzyca Dusznicka from Kamienny Potok to Wielisławka (RW6000512188)

Protected areas designated in accordance with §16 point 32 of the Act of 20 July 2017. - Water Law:	UBSW Bystrzyca Dusznicka from its source to Kamienny Potok RW60007121839	UBSW Bystrzyca Dusznicka from Kamienny Potok to Wielisławka RW6000512188
Bodies of water intended for the abstraction of water for supply purposes to the public in water intended for human consumption	YES	YES
Uniform bodies of water intended for recreational purposes, including bathing	NO	NO
Areas sensitive to eutrophication caused by pollutants from municipal sources, understood as enrichment of water with biogens, in particular nitrogen or phosphorus compounds, causing accelerated growth of algae and higher forms of plant life, resulting in undesirable disturbance of biological relations in the aquatic environment and deterioration of the quality of these waters	YES	YES
Areas intended for the protection of habitats or species referred to in the provisions of the Act of 16 April 2004 on Nature Conservation, for which the maintenance or improvement of water status is an important factor in their protection	YES	YES
Areas intended for the protection of aquatic species of economic importance	NO	NO

Source: Own elaboration based on the aPGW database.

4.7. GROUNDWATER

According to the regionalization of fresh groundwater, the area of the mountain part of the catchment area of Nysa Kłodzka is located within a hydrogeological region called the Sudety region XIV, including the subregion of the inner Sudety XIV1, a mountain province.

According to the division into groundwater bodies, this area is located within the Odra province in the Sudety subregion within the groundwater body no. 125 with the code PLGW6000125 (according to the applicable division into 172 uniform parts) (Fig. 2).

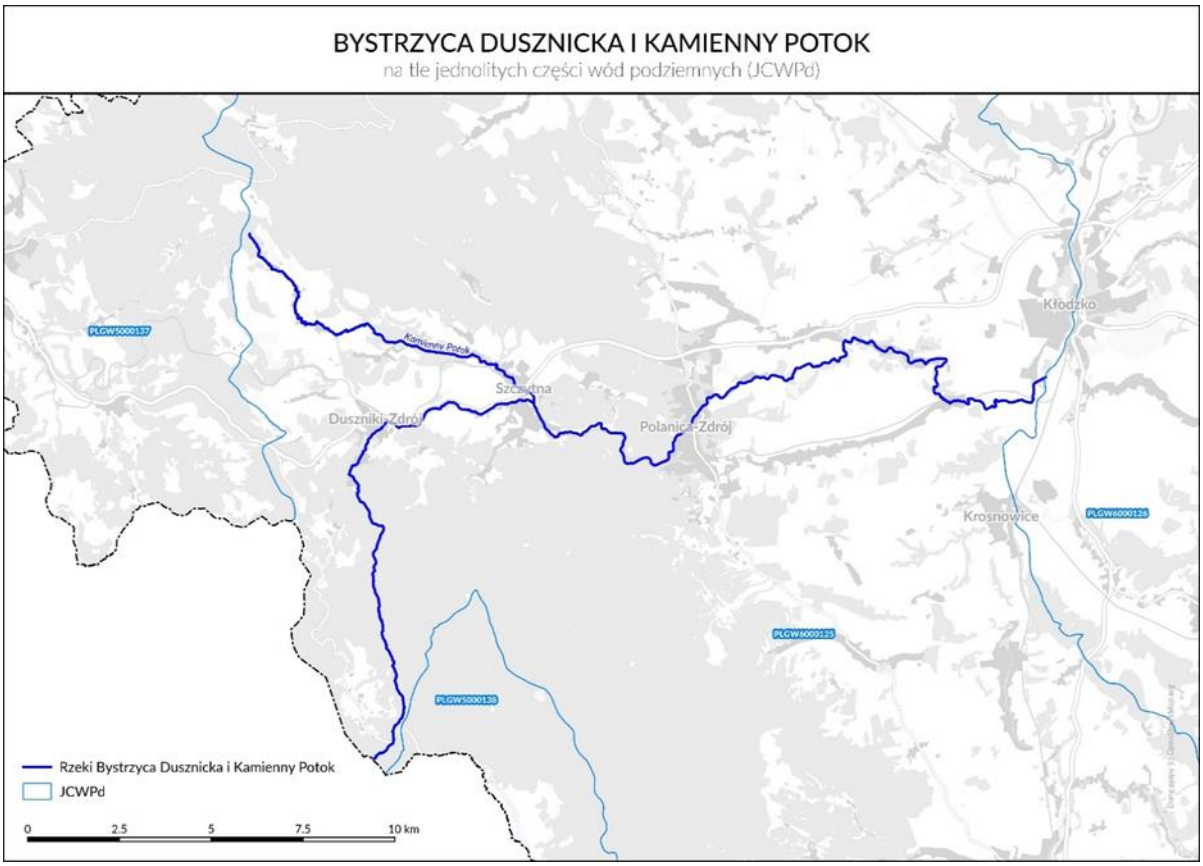

Fig. Bystrzyca Dusznicka and Kamienny Potok2 rivers against the background of uniform bodies of groundwater in force from 2016 to 2021 (own elaboration based on KZGW data).

The qualitative and quantitative condition of UBUW No. 125 was assessed as good. It is not at risk of failing to meet environmental objectives.

In the area of the Bystrzyca Dusznicka catchment area within the impact of the Task, there is the Main Groundwater Reservoir No. 341 Niecka Sudety-internal Kudowa-Zdr.-Bystrzyca Kłodzka. General characteristics are presented in Table 18.

4.8. ACOUSTIC CLIMATE

In the area of the Duszniki-Zdrój Facility, within 100 m from the boundaries of the investment works, there are 108 residential buildings, 2 schools and 15 classified in the category of hospital buildings and medical care facilities. The area in Duszniki-Zdrój is located in health resort zone "A". According to the Local Spatial Development Plan for the town of Duszniki-Zdrój, for the spa protection zone "A"[1] in the field of noise protection, admissible noise levels are determined in separate regulations for the whole area covered by the local plan - as for the protection zone "A" - the spa.

[1] Resolution No. XLVI/238/14 of the Town Council in Duszniki-Zdrój of 31 March 2014 on adopting a local spatial development plan for the town of Duszniki-Zdrój for the area of spa protection zone "A".

The municipality of Szczytna is mainly covered by the areas of housing and housing-services development. There are 217 residential buildings in the close vicinity of the planned Task. In the distance of approx. 50 m from conducted works on the Kamienny Potok River there is a Public Kindergarten in Szczytna. At the distance of approx. 55 m from km 2+000 of the Kamienny Potok river there are buildings of the School Complex in Szczytna.
Within the area of the Polanica-Zdrój Site, in the close vicinity of the works planned under the Contract, there are 173 residential buildings. In the range there are also 2 hospital buildings. Sanatorium "Uzdrowiska Kłodzkie S.A." and the already closed building of the "Hospital for Plastic Surgery SPZOZ". At a distance of 95 m from the planned works in the riverbed of the Bystrzyca Dusznicka there is a Public Kindergarten No. 1. The area of the planned works within the bank slopes of the Bystrzyca Dusznicka is located beyond the border of the "A" health resort protection zone, designated in accordance with the current Study of Conditions and Directions of Spatial Development of Polanica-Zdrój. The whole area is located within the border of health resort protection zone "B".
Limit values for sound levels shall be determined according to the type of source, type of terrain and reference period (Table 3). 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].

Table 3 Permissible noise levels in the environment.

	Permissible noise level in [dB]	
Type of terrain	**LAeq D interval period of reference time equal to 8 least favourable hours of the day in succession as follows**	**LAeq D interval period of reference time equal to 8 least favourable hours of the day in succession as follows**
a) Spa protection zone "A" (b) Hospital areas outside the city	45	40
a) Single-family housing areas b) Building developments associated with the permanent or long-term stay of children and young people c) Social care home areas d) City hospital areas	50	40
a) Multi-family housing and collective housing areas b) Built-up farmstead areas c) Recreational and recreational areas d) Residential and service areas	55	45

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

On the basis of available research data concerning works connected with reconstruction of road systems it may be stated that at the distance of 50 m from the boundary of the works the permissible levels of noise in the environment are exceeded irrespective of the nature and scope of the performed works. The values of the equivalent sound level exceed 55 dB(A). This means that it may be necessary to apply measures minimizing the negative impacts on the acoustic climate associated with installation of portable acoustic screens, listed in Appendix No. 1 to the EMP.

4.9. FLORA AND FAUNA

4.9.1. PROTECTED NATURAL HABITATS

Based on the conducted nature inventory, 11 natural habitats from Annex I of the Habitats Directive were found :

- 3220 Pioneering vegetation on the stones of mountain streams,
- 3260 Lowland and sub-mountain rivers with common water-crowfoot communities (*Ranunculion fluitantis*),
- 6210 Xerothermic grasslands (*Festuco-Brometea*),
- 6430 Mountain herbs (*Adenostylion alliariae*) and river herbs (*Convolvuletalia sepium*),
- 6510 Extensively used lowland fresh meadows (*Arrhenatherion*),
- 8220 Rock walls and silicate cliffs with communities *with Androsacion vandelii,*
- 9110 Acid beech (*Luzulo-Fagenion*),
- 9130 Fertile beech (*Dentario glandulosae-Fagenion, Galio odorati-Fagenion*),
- 9170 Central European and sub-continental oak-hornbeam forest *(Galio-Carpinetum and Tilio-Carpinetum*),
- 9180* Javorines and maple-lime forests on slopes and slopes *(Tilio plathyphyllis-Acerion pseudoplatani*),
- 91E0* Willow, poplar, alder and ash forests *(Salicetum albo-fragilis, Populetum albae, Alnenion glutinoso-incanae*, spring alder).

Table 4 Summary list of natural habitats inventory.

Item No	Habitat type (code)	Number of patches found			Total area [ha]
		Duszniki-Zdrój	Szczytna	Polanica-Zdrój	
1.	3220	-	-	-	0.03
2.	3260	Bystrzyca Dusznicka over the entire analysed length			16.31
3.	6210	-	1	-	1.09
4.	6430	1	2	2	0.38
5.	6510		1	1	1.82
6.	8220	1	-	1	0.32
7.	9110	-	-	1	0.69
8.	9130	1	-	-	0.25
9.	9170	-	1	3	0.81
10.	9180*	1	-	1	0.35
11	91E0*	3	5	5	11.27

**Priority habitat*

4.9.2. PROTECTED FUNGI, PLANT AND ANIMAL SPECIES

53 protected and/or rare species of vascular plants, mosses, marchantiophyta, macroalgae and lichens were recorded at the place of implementation and surrounding the planned works (Table 5).

Table 5 Protected and/or rare species of vascular plants, bryophytes, lichens, marchantiophyta and macroalgae inventoried on the site and in the immediate vicinity of the works.

Item No	Spices name	Number of posts			Total estimated resources
		Duszniki-Zdrój	Szczytna	Polanica-Zdrój	
Vascular plants					
1	*Allium ursinum* Wild garlic	4	-	1	630-1360 sp.
2	*Aruncus sylvestris* Goat's beard	15	1	9	454 – 1245 sp.
3	*Batrachium fluitans* River water-crowfoot	Bystrzyca Dusznicka all the whole length			Difficult to determine
4	*Galanthus nivalis* Snowdrop	-	1	1	62-150 sp.
5	*Leucoium vernum* Spring snowflake	3	-	-	113-250 sp.
6	*Lilium martagon* Martagon lily		1	1	7-15 sp.
7	*Lonicera periclymenum* European honeysuckle	-	1	-	11-50 sp.
8	*Primula elatior* Oxlip	5	9	5	165-605 sp.
9	*Pyrola minor* Snowline wintergreen	-	1	-	11-50 sp.
10	*Trollius europaeus* Globeflower	1	-	-	51- 100 sp.
Mosses					
1	*Buckiella undulata* Waved Silk-moss	-	-	1	Difficult to determine
2	*Calliergonella cuspidata* Pointed Spear-moss	2	-	-	22-100
3	*Campylopus flexuosus* Rusty Swan-neck moss	-	-	1	Difficult to determine
4	*Climacium dendroides* Tree moss	1	-	-	11-50 sp.
5	*Dicranum scoparium* Broom fork-moss	4	-	9	> 174-700 sp.
6	*Dicranum polysetum* Dicranum polysetum	-	-	3	Difficult to determine
7	*Eurhynchium angustirete* Eurhynchium angustirete	-	-	5	Difficult to determine
8	*Homalia trichomanoides* Blunt Feather-moss	-	-	1	> 17– 61 sp.
9	*Hygroamblystegium fluviatile* Brook-side Feather-moss	-	1	-	6-10 sp.
10	*Hygroamblystegium tenax* Fountain Feather-moss	-	-	1	Difficult to determine
11	*Hylocomnium splendens* Glittering woodmoss	1	-	6	> 101-250 sp.
12	*Leucobryum glaucum* Large White-moss	1	-	7	> 11-50 sp.

Item No	Spices name	Number of posts			Total estimated resources
		Duszniki-Zdrój	Szczytna	Polanica-Zdrój	
13	*Leucobryum juniperoideum* Smaller White-moss	-	-	9	Difficult to determine
14	*Orthotrichum striatum* Lewinskya striata	-	1	-	1-5 sp.
15	*Pleurozium schreberi* Red-stemmed feather-moss	1	-	**8**	> 101– 250 sp.
16	*Pseudoscleropodium purum* Neat Feather-moss	-	-	**1**	Difficult to determine
17	*Rhytidiadelphus squarrosus* Springy Turf-moss	-	1	**4**	> 6-10 sp.
18	*Sphagnum capillifolium* Acute-leaved Bog-moss	-	-	1	Difficult to determine
19	*Sphagnum girgensohnii* Girgensohn's Bog-moss	1	-	2	> 11– 50 sp.
20	*Sphagnum palustre* Blunt-leaved Bog-moss	1	-	1	> 6– 10 sp.
21	*Sphagnum squarosum* Spiky bog-moss	-	-	1	Difficult to determine
22	*Thamnobryum alopecurum* Thamnobryum alopecurum	-	-	3	Difficult to determine
23	*Thuidium tamariscinum* Thuidium tamariscinum	-	-	6	Difficult to determine
24	*Ulota bruchii* Bruch's Pincushion	1	-	-	1-5 sp.
25	*Ulota crispa* Crisped Pincushion	5	-	1	> 30- 120 sp.
Marchantiophyta					
1	*Bazzania trilobata* Greater whipwort	-	-	7	Difficult to determine
2	*Frullania dilatata* Dilated scalewort	-	-	1	Difficult to determine
3	*Plagiochila asplenioides* Greater Featherwort	2	1	3	8-20 sp.
Lichens					
1	*Bryoria fuscescens* Pale-footed Horsehair	6	-	-	6 – 30 sp.
2	*Cetraria islandica* Island moss	-	-	1	Difficult to determine
3	*Evernia divaricata* Evernia divaricata	1	-	-	1-5 sp.
4	*Evernia prunastri* Oakmoss	5	-	-	65 – 165 sp.
5	*Hypogymnia tubulosa* Hypogymnia tubulosa	3	-	-	1-15 sp.
6	*Peltigera praetextata* Peltigera praetextata	-	-	1	Difficult to determine
7	*Pleurosticta acetabulum* Pleurosticta acetabulum	2	-	-	7-15 sp.
8	*Ramalina farinacea* Ramalina farinacea	5	-	-	30 – 115 sp.
9	*Ramalina fastigiata* Ramalina fastigiata	3	-	-	33 – 150 sp.
10	*Tuckermannopsis chlorophylla* Tuckermannopsis chlorophylla	5	-	-	> 45– 205 sp.
11	*Usnea filipendula* Fishbone beard lichen	2	-	-	2 – 10 sp.
12	*Usnea sp.*	1	-	2	> 1– 5 sp.

Item No	Spices name	Number of posts			Total estimated resources
		Duszniki-Zdrój	Szczytna	Polanica-Zdrój	
	Usnea sp.				
13	*Usnea hirta* Usnea hirta	2	-	-	1 – 5 sp.
14	*Usnea subfloridana* Usnea subfloridana	12	-	-	22 – 105 sp.
Red algea					
1	*Hildenbrandia rivularis* Hildenbrandia rivularis	-	-	7	7 – 35 sp.

FAUNA

INVERTEBRATES

Among the aquatic macroinvertebrates at the inventory sites in Bystrzyca Dusznicka (research from 2017), i.e. between Szczytna and Dusznika-Zdroj (UWB Bystrzyca Dusznicka from its sources to Kamienny Potok), as well as at 3 sites located in the works of JCWP: Szalejów Górny (research from 2017) and Kamienny Potok and Czerwona Woda (research from 2018), no legally protected species were recorded.

The analysed sections of the Bystrzyca Dusznicka valley and Kamienny Potok within the Szczytna Facility are inhabited by 8 species of protected invertebrates. Two species of butterflies are particularly valuable. On two meadows lying near watercourses, Dusky large blue butterfly *Phengaris nausithous* and Scarce large blue butterfly *P. teleius* were found. Five species of bumblebee *Bombus sp*. (Red-tailed *B. lapidarius*, Garden *B. hortorum*, Shrill Carder Bee *B. sylvarum*, Common Carder Bee *B. pascuorum*, Buff-Tailed *B. terrestris*) were found almost everywhere in the area. In the immediate vicinity of the works for the Polanica-Zdrój Facility, the only site of the protected butterfly species – the Large copper *Lycaena dispar*. The protected species of entomofauna within the Duszniki-Zdrój Facility are represented by two species from the genus *Bombus*: Red-tailed Bumblebee *B. lapidarius* and Buff-Tailed Bumblebee *B. terrestris*. Among the representatives of malakofauna, the occurrence of the Roman snail *Helix pomatia* snail has been reported.

ICHTIOFAUNA

As a result of the natural inventory in Bystrzyca Dusznicka, 4 species of fish covered by partial protection were found: Stone Loach *Barbatula barbatula*, Siberian Bullhead *Cottus poecilopus*, European Bullhead *Cottus gobio*, Brook Lamprey *Lampetra planeri*.

Other species of Eurasian minnow *Phoxinus phoxinus* and River trout *Salmo trutta fario* are not protected by species.

HERPETOFAUNA

3 species of amphibians were found in the area of the Contract: European toad *Bufo bufo*, Common frog *Rana temporaria*, Edible frog *Rana esculenta* and 5 species of reptiles: Viviparous lizard *Zootoca vivipara*, Sand lizard *Lacerta agilis*, Adder *Vipera berus*, Grass snake *Natrix natrix*, Slowworm *Anguis fragilis* subject to legal protection.

ORNITOFAUNA

The results of the natural inventory indicated the presence of 9 species of birds subject to protection: White Wagtail *Motacilla alba*, Grey Wagtail *Motacilla cinerea*, White-Throated Dipper *Cinclus cinclus*, Common kingfisher *Alcedo atthis*, Eurasian Golden Oriole *Oriolus oriolus*, River Warbler *Locustella fluviatilis*, Whinchat *Saxicola rubetra*, Corn bunting *Emberiza calandra*, Eurasian Wryneck *Jynx torquilla* and 1 hunting species – Common pochard *Aythya ferina*. Common kingfisher *Alcedo atthis* is a species from Annex I of the Birds Directive.

TERIOFAUNA

In the area of the planned Contract, 5 species of mammals under legal protection were found, of which 2 species were listed in Annex II. Habitats Directive, i.e.: European otter *Lutra lutra*, European beaver *Castor fiber*.

CHIROPTEROFAUNA

Within the river channel, forest areas adjacent to the river channel, as well as in the surroundings of trees and buildings, the occurrence of 8 species of bats subject to legal protection and listed in Annex II or IV of Directive 92/43/EEC, i.e.: Daubenton's Myotis *Myotis daubentonii*, Brown long-eared Bat *Plecotus auritus*, Western Barbastelle *Barbastellus barbastellus*, Particoloured Bat *Vespertilio murinus*, Natterer's Bat *Myotis natteri* bat, Common Pipistrelle *Pipistrellus pipistrellus*, Lesser Horseshoe Bat *Rhinolophus hipposideros.*

4.9.3. NATURA 2000 SITES

The list of protected Natura 2000 sites located in and around the Contract site is summarised below:

- Natura 2000 site Stołowe Mountains PLB020006
- Natura 2000 site Stołowe Mountains PLH020004
- Natura 2000 site Orlickie Mountains PLH020060
- Natura 2000 site Piekielna Dolina near Polanica PLH020010

The location of the Facilities in relation to Natura 2000 sites and other forms of nature protection are presented in Appendix 5 to the EMP.

4.9.4. OTHER PROTECTED AREAS

NATIONAL PARKS

Part of the works provided for under the Contract will be carried out in the buffer zone of the Stołowe Mountains National Park. However, the closest boundary of the Park itself is about 2.5 km from the sites of the planned works.

NATURE RESERVES

The nearest nature reserve „Peat bog near Zieleniec" is located at a distance of approx. 5 km from the places of the planned works, i.e. outside the impact of the Task.

LANDSCAPE PARKS

The Contract is planned to be carried out outside the reach of landscape parks. There are no landscape parks in the vicinity up to 5 km from the Contract implementation areas.

PROTECTED LANDSCAPE AREA

Part of the works provided for under the Contract will be carried out in the Protected Landscape Area of the Bystrzyckie and Orlickie Mountains.

NATURE AND LANDSCAPE COMPLEX

There are no natural and landscape complexes within 5 km of the planned works.

ECOLOGICAL SITES

There are no ecological sites within 5 km of the planned works.

NATURE MONUMENTS

In the vicinity of the Contract area there are 24 natural monuments. All monuments are trees, concentrated mainly in the area of spa parks in Polanica-Zdrój and Duszniki-Zdrój. Individual objects are listed in the table below.

Table 10. List of natural monuments in the vicinity of the Contract implementation area

Item No	Nature Monument	Description	Location and distance from Bystrzyca Dusznicka
1	*Tilia cordata* Small-leaved lime	3-trunk tree	In the Spa Park on the lawn next to a colorful fountain, plot no. 165, approx. 79 m from the channel.
2	„Jan Kazimierz" *Tilia cordata* Small-leaved lime	A single tree. Tree trimmed, one live branch left.	In the Spa Park next to the spa hospital, plot no. 172, at the channel.
3	*Tilia cordata* Small-leaved lime	A single tree, a cavity deep in the trunk at height of 1.8 m, trunk decay.	In the central part of the Spa Park at the spa hospital, plot of land no. 165, approx. 56 m from the channel.
4	*Fagus sylvatica* European beech	A single tree.	In the Spa Park near Chopin's Manor House, plot no. 165, approx. 7 m from the channel.
5	„Wieniawski" *Fagus sylvatica* European beech	A single tree. Displacement in the parietal part, dry in the crown approx. 20%.	In the northern part of the Spa Park on the lawn at the foot of the slope, at the height of the Sanatorium, plot no. 165, approx. 26 m from the channel.
6	*Tilia cordata* Small-leaved lime	A single tree.	In the northern part of the Spa Park, at Wojska Polskiego, plot no. 165, approx. 49 m from the channel.
7	western red cedar *Thuja plicata (Thuja gigantea)*	Single tree	Polanica Zdrój, ul. [Street] is located at Fabryczna Street, at property plot no. 12, approx. 258 m from Bystrzyca Dusznicka
8	White poplar *Populus alba*	Single tree	Polanica Zdrój, on the square, at the corner of ul. [Street] Warszawska and Harcerska about 185 m from the channel of the Bystrzyca Dusznicka plot, plot no. 281/2.
9	common juniper *Juniperus communis*	Single tree, 1 of 3 trunks broken	Polanica Zdrój, in the municipal cemetery at ul. [Street] Kłodzka, approx. 168 m from the Bystrzyca Dusznicka river channel
10	Small-leaved lime *Tilia cordata*	Decay in both trunks, trunks partially empty in the middle	Polanica Zdrój, in a forest complex, less than 30 m southwest of the end of ul. [Street] Różana, about 257 m from the Bystrzyca Dusznicka river channel. 513/9
11	Common oak *Quercus robur*	Single tree	Polanica Zdrój, in a forest complex, at the southern edge of the buildings, ul. [Street] Jaśminowa, approx. 249 m from the Bystrzyca Dusznicka river channel, plot no. 58
12	western red cedar *Thuja plicata (Thuja gigantea)*	Single tree	Polanica Zdrój, approx. 10m from ul. [Street] Warszawska, at the height of the plot no. 2, about 260 m from the Bystrzyca Dusznicka river channel, plot no. 58
13	Sycamore maple *Acer pseudoplatanus*	Single tree	Polanica Zdrój, about 50 m southeast of ul. [Street] Matuszewski at the back of the building at the car park, approx. 208 m from the Bystrzyca Dusznicka river channel, plot no. 328.
14	western red cedar *Thuja plicata (Thuja gigantea)*	Single tree	Polanica Zdrój, in the central part of the Spa Park, by the wall of the building, in the vicinity of two other monumental thujas, approx. 190 m from the Bystrzyca Dusznicka river channel, plot no 328.
15	western red cedar *Thuja plicata (Thuja gigantea)*	Single tree	Polanica Zdrój, in the central part of the Spa Park, by the wall of the building, in the vicinity of two other monumental thujas, approx. 190 m from the Bystrzyca Dusznicka river channel, plot no 328.
16	western red cedar *Thuja plicata (Thuja gigantea)*	Single tree	Polanica Zdrój, in the central part of the Spa Park, by the wall of the building, in the vicinity of two other monumental thujas, approx. 190 m from the Bystrzyca Dusznicka river channel, plot no 328.

Item No	Nature Monument	Description	Location and distance from Bystrzyca Dusznicka
17	western red cedar *Thuja plicata (Thuja gigantea)*	Single tree	Polanica Zdrój, in the central part of the Spa Park at ul. [Street] Matuszewski, approx. 232 m from the Bystrzyca Dusznicka river channel, plot no. 326/2.
18	eastern hemlock *Tsuga canadensis*	Single tree	Polanica Zdrój, in the central part of the Spa Park near the intersection of ul. [Street] Matuszewski with the main avenue of the park, approx. 246 m from the Bystrzyca Dusznicka river channel, plot no. 324.
19	European larch *larix decidua*	Single tree	Polanica Zdrój, in the central part of the Spa Park near the intersection of ul. [Street] Matuszewski with the main avenue of the park, approx. 260 m from the Bystrzyca Dusznicka river channel, plot no. 322.
20	western red cedar *Thuja plicata (Thuja gigantea)*	Single tree	Polanica Zdrój, in the Central Park, by the reservoir with a fountain, about 183 m from the Bystrzyca Dusznicka river channel, plot. no. 326/2.
21	lawson's *cypress Chamaecyparis lawsoniana*	A single tree. 3% dry branches	Polanica Zdrój, in the Spa Park near the wall at ul. [Street] Parkowa , about 229 m from the Bystrzyca Dusznicka river channel, plot no. 326/2.
22	Black poplar *Populus nigra*	Single tree	Polanica Zdrój, in the Park Szachowy, by the path leading to the fountain, about 284 m from the Bystrzyca Dusznicka river channel, plot no. 341.
23	Black poplar *Populus nigra*	Single tree	Polanica Zdrój, in the Park Szachowy, by the path leading to the fountain, about 273 m from the Bystrzyca Dusznicka river channel, plot no. 341.
24	western red cedar *Thuja plicata (Thuja gigantea)*	A single tree, about 10% of the dry crown branches.	Szczytna, ul. [Street] Wolności, at an altitude of 42, about 18 m from Kamienny Potok

Source: Own study on the basis http://geoserwis.gdos.gov.pl/mapy/

ECOLOGICAL CORRIDORS

The Task Area is located near the borders of two ecological corridors (Jędrzejewski et al. 2012):

- Bystrzyckie Mountains GKZ-8B,

- Góry Stołowe GKZ-8A.

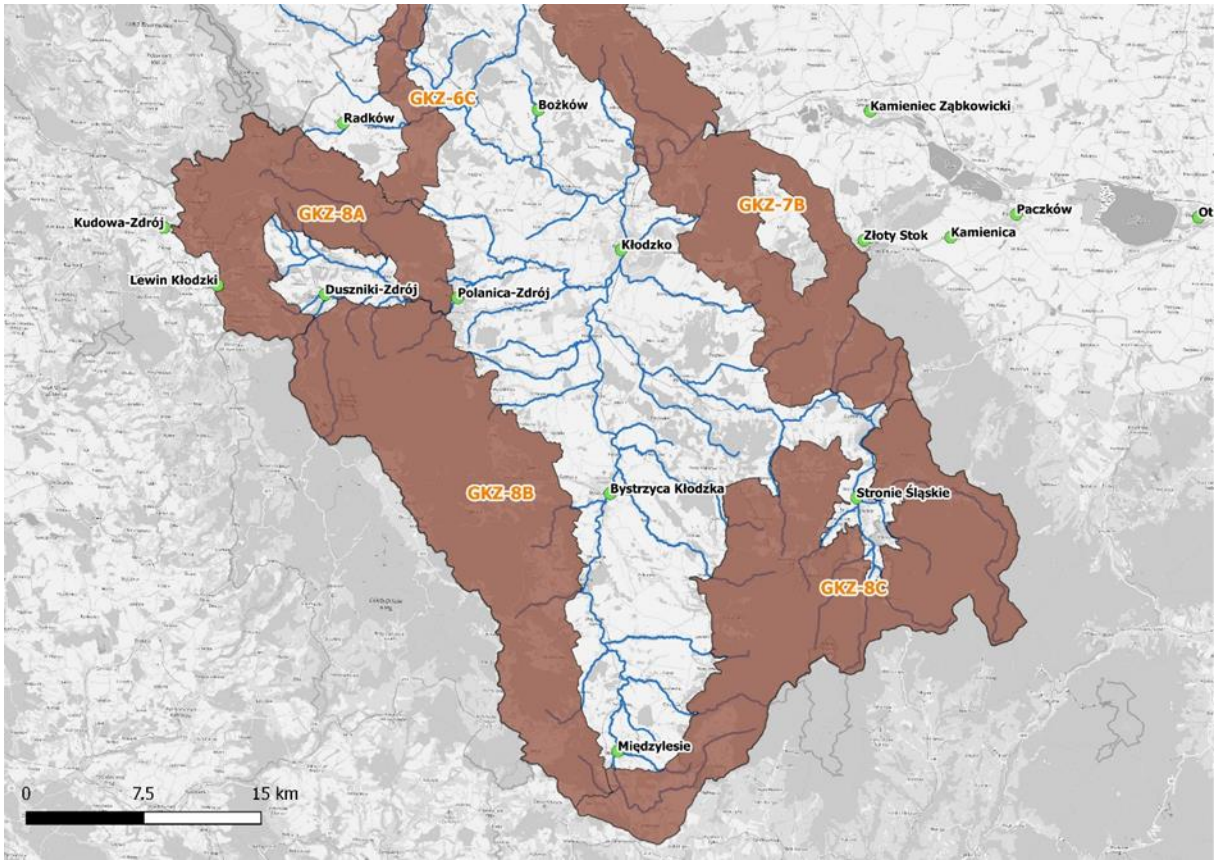

Figure.3 Schematic course of ecological corridors within the Kłodzko Land (Jędrzejewski et al. 2012)

The network of these corridors is important for the population of large forest mammals and the cohesion of forest and wetland habitats on a national and continental scale.

The section of Bystrzyca Dusznicka from Nysa Kłodzka to the estuary of Wielisławka was considered to be particularly important for maintaining morphological continuity and as a section particularly important for Atlantic salmon and sea trout.

4.9.5. CULTURAL MONUMENTS

The table below presents a list of monuments protected under the Act of 23 July 2003 *on the protection and care of monuments* (Journal of Laws of 2003 No. 162, item 1568), located in the vicinity of the Contract implementation site (up to 0.5 km).

Table 12. List of monuments in the vicinity of the Contract implementation site

Item No	Monument	Chronology	Address	Distance [m]
1	Paper mill and its surroundings 336 of 1956-11-06; A/2073 of 2010-04-19	beg. 18th cent.	Duszniki-Zdrój	0
2	The parish church of Peter and Paul 742 from 1960-09-19; A/1716/742 from 2010-03-12	17th cent.	Duszniki-Zdrój	about 155 m;
3	House 629/Wł of 1976-05-22; A/4073/629/Wł of 2010-11-04	17th cent.	Duszniki-Zdrój	about 140 m;

Item No	Monument	Chronology	Address	Distance [m]
4	House 628/Wł of 1976-05-22; A/4074/628/Wł of 2010-11-04	17th cent.	Duszniki-Zdrój	about 185 m;
5	House 624/Wł of 1976-05-22; A/4075/624/Wł of 04/11/2011	18th cent.	Duszniki-Zdrój	about 180 m;
6	House 626/Wł of 1976-05-22; A/4076/626/Wł of 2010-11-04	Second half. of 19th cent.	Duszniki Zdrój	about 180 m;
7	House 627/Wł of 1976-05-22; A/4077/627/Wł of 2010-11-04	18th cent.	Duszniki-Zdrój	about 200 m;
8	Town hall, currently a residential house 1460 from 29/11/1965; A/4081/1460 from 04/11/2010	16th cent.	Duszniki-Zdrój	about 215 m;
9	House 1461 from 29/11/1965; A/4082/1461 from 04/11/2010	17th cent.	Duszniki-Zdrój	about 260 m;
10	House 1305/WL 1990-05-04; A/4085/1305/WL 2010-11-04	3rd quart.. of 19th cent.	Duszniki-Zdrój	about 265 m;
11	House 1306/Wł of 1990-05-04' A/4086/1306/Wł of 2010-11-04	the end of the 19th century.	Duszniki-Zdrój	about 300 m;
12	House 1462 from 29/11/1965; A/4084/1462 from 04/11/2010	Second half. 18th cent.	Duszniki-Zdrój	about 280 m;
13	House 1307/WL 1990-05-04; A/4080/1307/WL 2010-11-04	1900	Duszniki-Zdrój	about 290 m;
14	The Evangelical Church currently Polish Catholic Church of Our Lady of the Rosary 1390/Wł of 12/11/1993; A/4054/1390/Wł of 02/11/2010	1845- 1846	Duszniki-Zdrój	about 340 m;
15	City 369 from 25/11/1956; A/2567/369 from 22/07/2010	1324	Duszniki-Zdrój	0
16	House 1308/Wł from 1990-05-04, A/4079/1308/Wł from 2010-05-04	1910	Duszniki-Zdrój	about 50 m;
17	Pensjonat Słoneczna 1386/WL 21/07/1993; A/4078/1386/WL 2010-11-04	1900 -1910	Duszniki-Zdrój	about 60 m;
18	House 1464 of 29/11/1965 A/4088/1464 of 2010-11-04	1715	Duszniki-Zdrój	0
19	Theatre. of Fryderyk Chopin 5: 1458 of 27/11/1965 A/4071/1458 of 2010-11-04	of 19th cent.	Duszniki-Zdrój	about 9
20	Hospital 988/Wł of 22/02/1984; A/4087/988/Wł of 2010-11-04	1831	Duszniki-Zdrój	about 235 m;
21	Forge 1459 of 27/11/1965	17th cent.	Duszniki-Zdrój	The property does not exist
22	Chapel on the Hill of the Hermitage 1781 from 15/08/1966; A/4070/1781 from 04/11/2010	18th cent.	Duszniki-Zdrój	about 290 m;
23	The villa next to the Fryderyk Hotel 166/A/03 of 2003-07-10	1862	Duszniki-Zdrój	about 130
24	Spa Park 1166 / WŁ of 28/03/1986	beg. of 19th cent.	Duszniki-Zdrój	0

Item No	Monument	Chronology	Address	Distance [m]
	A/4072/1166/Wł			
25	Residential building 1463 from 29/11/1965; A/4083/1463 from 04/11/2010	1598	Duszniki-Zdrój	about 275 m;
26	Lime and chestnut tree alley 1166/Wł of 28/03/1986; A/4072/1166/Wł of 2010-11-04	Date unknown	Duszniki-Zdrój	about 30 m;
27	Cemetery	18th cent.	Szczytna	about 45 m;
28	The parish church of John the Baptist	turn of the 18th and 19th centuries.	Szczytna	about 70 m;
29	House	1711	Szczytna	about 25 m;
30	Castle	1831- 1837	Szczytna	about 500 m;
31	Park	no data available	Szczytna	about 470 m;
32	Spa house 1413/Wł of 1994-08-29, 429/1413/Wł of 2005-04-28	1911	Polanica-Zdrój	Several dozen metres
33	Spa Theatre 1412/Ł of 1994-08-29, 494/1412/Ł of 2005-04-28	1925	Polanica-Zdrój	Several dozen metres
34	The parish church of the Assumption of the Blessed Virgin Mary 1400/Wł of 07/03/1994, 490/1400/Wł of 2005-04-28	1910	Polanica-Zdrój	Several dozen metres
35	City 681/Wł of 08/12/1977, 489/681/Wł of 2005-04-28	14th cent.	Polanica-Zdrój	Several dozen metres

Source: own compilation based on data from National Heritage Institute https://mapy.zabytek.gov.pl/nid/

4.11. POPULATION AND MATERIAL GOODS

The section of Bystrzyca Dusznicka below km 25+900 flows through a natural floodplain with a large wooded area. Then, from the bridge in km 25+919 to km 28+500, the Bystrzyca Dusznicka river channel is included in the retaining walls and flows through the built-up area of Duszniki-Zdrój. Above km 28+770, the river flows through less urbanized areas with meadows and trees.

The Bystrzyca Dusznicka river channel in km 20+280 ÷ 24+800 is partially built-up with regulating walls, occurring in urbanised sections and in the vicinity of road and bridge infrastructure.

The Bystrzyca Dusznicka river channel in km 12+390 ÷ 16+980 is located in the area of the Polanica-Zdrój Facility. In km 12+390÷ 14+025 the river bed runs through non-urbanised areas. In the section in km 12+390÷ 12+750 on the left bank, there is a sewage treatment plant.

In km 14+025 ÷ 16+280, the channel runs through the urbanized centre of Polanica-Zdrój. On this section there are numerous footbridges and bridges. In km 16+280 ÷ 16+980, the channel runs through less urbanized areas of Polanica-Zdrój. In the area of the bridge, barrages and buildings, the edges of the channel are insured with a stone wall or gabions. Above km 16+810, the river channel is surrounded by forest areas.

The estuary section of Kamienny Potok with a length of approx. 400 m flows through a natural floodplain area, where there are meadows and small riparian trees. Then, from the bridge along the course of the national road 8, located approx. km 0+500 to km 1+500, the Kamienny Potok

river channel is included in the regulation walls and flows through the area where the communication infrastructure and buildings of Szczytna are directly adjacent to the river channel. In km 1+500 to 2+000, the river channel of Kamienny Potok runs through highly urbanized.

In the analysed area, up to 100 m from the borders planned under the Contract, there are approx. 500 residential buildings, schools, kindergartens, hospitals, hotels and tourist service places, other services (gastronomy, commerce, small services), cultural facilities, sports and recreation facilities, spa facilities. The population density in the municipality of Duszniki-Zdroj was, on average, 208 people per 1 km^2 in 2018 For Szczytna and Polanica-Zdrój, it was 55 and 369 people, respectively.

5. POTENTIAL IMPACT OF THE CONTRACT ON ENVIRONMENT

5.1. EARTH SURFACE AND LANDSCAPE

Implementation phase

The implementation of the Contract in question will have a minimal impact on the ground surface during the construction phase. These impacts will be related to the temporary occupation of the land surface along the river channels of watercourses in connection with, among others, the construction facilities and technological roads. After completion of the works, the yards, facilities and technological roads will be demolished and the ground surface affected during construction will be reclaimed. Therefore, it will be a short-term impact and will cease with the completion of construction works. The scale and type of the Contract will not cause mass soil movements of the ground at the implementation stage.

The implementation of the Contract will also affect changes in the landscape. These changes will be caused by the presence of construction facilities, technological roads, equipment and machines needed to carry out the works, as well as heaps arising during demolition works and removal of material deposited within the channel. These changes and transformations to the landscape will be temporary, related to the nature of the works being carried out, and upon completion the landscape will be restored to its pre-completion condition.

Operational phase

Works related to the renovation and maintenance of the channel will not cause a permanent change in the ground surface. Permanent changes will only apply to sections where it is planned to:

- shaping of the bipartite channel,
- bottom reinforcement,
- construction of bank-side protection,
- construction of a by-pass channel,
- construction of anti-rubble dams,
- sections on which the reconstruction of two barrages and weir into a smart one is planned, as well as the renovation or demolition of bridge structures.

Implementation of the Contract will not cause mass movements of the earth. Activities in the river channel, including the renovation, re-profiling and reconstruction of shore reinforcements, will reduce the likelihood of possible landslides created as the result of the undercutting of the river channel edges by the river.

Local fellings of existing trees and bushes, overgrowing slopes and the bank zone are related to the implementation of the Contract. Depending on their scope, they can have a negative or positive impact on landscape values. Greenery, access to the watercourse and the associated view range are criteria for assessing landscape values in the impression curve method, associated with trees and bushes. Appropriate shaping of greenery can therefore positively affect the assessment of the landscape.

Measures included in the Contract will be carried out within a strongly transformed channel and will be of a repair and repair nature. Reinforcements of the bank slopes of the river channel will be made of materials previously used in this type of work, so after the completion of the works, the Bystrzyca Dusznicka and Kamienny Potok river channel will continue to maintain

the character of „post-German" regulatory buildings. The impacts on landscape values on these sections will therefore not be significant. In addition, the technologies used to execute the works will aim at ensuring that the reinforcements made at the stage of exploitation constitute biologically active surfaces. In places where coastal fortifications and hydrotechnical structures are heavily damaged, these activities will have a positive impact on the aesthetic values, especially within the area of spa buildings, causing an increase in the value of the landscape. Impacts during the exploitation phase are therefore permanent and have a positive effect on landscape values.

5.2. CLIMATE

Implementation phase

The planned task will not affect the climate and climate change. The main issues related to climate change focus on issues such as greenhouse gas emissions, direct emissions and indirect emissions related to energy demand, the effectiveness of the solutions applied. During the construction phase, as the result of combustion of fuels in cars and machines the following will be emitted: carbon dioxide and nitrogen oxides, classified as greenhouse gases, as well as particulates (soot, fumes, ash). During the implementation of the investment, there will be energy demand related, for example, to the functioning of the construction facilities. Electricity consumption will indirectly result in the emission of carbon dioxide and water vapour (greenhouse gases) into the atmosphere in the places of its production. Due to the local character of the impacts of the Contract, all emissions mentioned above do not affect the climate and its changes

Operational phase

At the operational stage, the Contract will not affect the climate and climate change. Planned hydrotechnical facilities will not be a source of greenhouse gas emissions. Emissions to air are also not expected, except for emissions from machinery and equipment during maintenance work, no significant electricity demand.

The works carried out during the construction, operation and decommissioning phases of the planned Contract will not cause any climatic phenomena leading to microclimate change in the area of reconstructed and constructed hydrotechnical facilities.

5.3. AIR QUALITY

Implementation phase

At the stage of the Contract implementation, two types of emissions to air are expected to occur:

- exhaust emissions resulting from the operation of machinery and heavy construction equipment and the movement of vehicles transporting construction and demolition materials,
- unstructured dust emissions resulting from the operation of construction machinery and the movement of vehicles, as well as the movement of earth masses and spoil.

During the period of felling trees and shrubs, during earthworks and construction, the source of air pollution of the exhaust nature will be construction machines and vehicles transporting raw

materials and materials needed to perform individual works. This emission will be local (moving along with the change of the site of the works), disorganized, reversible (will cease when works cease) and its magnitude at this stage is difficult to estimate.

The main source of emissions of dust pollutants into the air may be earthworks related to removal of humus, demolition of existing infrastructure, pavement hardening, as well as felling trees and shrubs and transport of building materials. Dust emissions during this type of work are disorganized, depending not only on the amount of material removed and transported, but mainly on meteorological conditions and soil moisture. The level of emissions is therefore difficult to estimate. Atmospheric aerosol formed in mechanical processes belongs to coarse dust fractions, which are quickly deposited and do not have a significant impact on the environment and human health.

It is expected that at the implementation stage of the Contract, due to its linear nature and dispersion of pollutant-generating works, will not have a significant negative impact on the environment and the impact will be limited to the immediate vicinity of the work sites. All the impacts mentioned are of short-term and reversible nature and will cease upon completion of the works. Appropriate mitigation measures, as detailed in the Appendix 1 to the EMP, are provided to reduce these impacts.

Operational phase

Hydrotechnical structures included in the scope of the Contract do not generate emissions of pollutants into the air. Works performed as part of the operation will require episodic maintenance activities (e.g. repairing damage to control walls) and will not be related to significant pollutant emissions. At the emission of noise into the air will result only from the operation and movement of machines and vehicles necessary for performance of maintenance work. Emissions will take place at average annual intervals and will not be emissions distinguishing from the background of pollutant emissions to the environment.

Therefore, they will be short-term and reversible impacts that will cease once the maintenance works are completed. To mitigate these impacts, appropriate mitigation measures are provided as detailed in the Appendix 1 to the EMP.

5.4. SOILS AND LAND

Implementation phase

Due to the area and scope of the planned works, the impact on soils and soils will be related to direct interference with channel sediments, alluvial soils, temporary transformation of the ground surface (excavations) and changes in the soil structure on temporarily occupied soils (technological roads, construction sites). On the access roads to the channel at the place of work and in the coastal zone of the renovated sections, the structure of the tuberous soil will be violated as a result of compaction by the working equipment. Earthworks carried out in the channels in the vicinity of hydrotechnical facilities and bridges will lead to violation of the structure of soils and soils also on sections of access roads. In the zone of bank slopes, in the places where the works are carried out, the soils will be covered with fascine mattresses to reduce direct impact on the river channel.

During the course of the work, a potential threat is soil contamination as a result of equipment failure and leakage of oil-derivative substances from working machines.

These will be reversible impacts lasting until the land reclamation is completed. Appropriate mitigation measures, described in detail in the Appendix 1 of the EMP, are provided to reduce these impacts.

Operational phase

No significant changes in soil and water conditions and soil productivity are expected to occur in the temporary occupation areas after the completion of the construction phase and after proper land reclamation.

5.5. SURFACE WATERS

5.5.1. STATUS OF UBSW AND ENVIRONMENTAL OBJECTIVES

Based on the conducted impact analyses on all elements of the water status assessment, taking into account the impacts at the implementation and operational stage, it was found that the Contract implementation is related to the following impacts on the elements of the status of surface water bodies:

1.Biological elements

- Macrophytes and photoobentos
  - Mechanical destruction of plants (implementation stage, direct impact);
  - Deterioration of light conditions due to increased concentration of suspended solids in water during the works (implementation stage, indirect impact);
  - Possible conversion of the composition of macrophytes and phytobenthos as a result of reversible changes in habitat conditions in the sections covered by the work (exploitation phase, indirect impact);
  - Liquidation of habitat fragments in reinforced slopes (operational stage, direct impact), as well as permanent change of habitat conditions in the fish pass zone;
  - It is also possible to have a positive impact on the development of macrophytes and phytobenthos as a result of increasing the sunlight of the channel by cutting down trees on slopes (operational stage, indirect impact).
- Benthic macrovertebrates
  - Scaring of fauna, mechanical damage/destruction of animals (implementation stage, direct impact);
  - Deterioration of living conditions of benthic invertebrates as a result of increased suspended matter concentration in water during the works (implementation stage, indirect impact);
  - Possible transformations in the composition of macroinvertebrates due to reversible or segmentally permanent (slope reinforcement sections, fish pass zone) changes in habitat conditions on the sections covered by the works (operational stage, indirect impact);
  - Positive impact of the fish pass and rapids on the migration of organisms, using appropriate technical solutions (operational stage, direct impact).
- Ichtiofauna
  - Scaring of fauna, mechanical damage/destruction of animals during work (implementation stage, direct impact);

- Deterioration of the living conditions of fish due to an increase in the concentration of slurry in water and changes in the flow conditions during the works (implementation stage, indirect impact), which is particularly dangerous during spawning and incubation of eggs;
- Possible transformations of ichthyofauna composition due to reversible changes in habitat conditions on the sections covered by the works (operational stage, indirect impact);
- Positive impacts on fish migration (operational stage, direct impact);

- Positive permanent impact of clearing modernized barrages and weirs for migration of fish and lampreys (operational stage, direct impact).

2.Hydromorphological elements

- Possible temporary change of water flow conditions and the course of channel and fluvial processes during the work in the channel zone (implementation stage, direct impact);
- Liquidation of natural morphological elements in the channel (implementation stage, direct impact), resulting in a reduction in the degree of hydromorphological diversity – reversible, because natural hydromorphological elements, especially those associated with the accumulative activity of water, will be reconstructed as a result of naturally occurring channel processes (operational stage);
- Section modification of channel in cross section (use stage, direct impact);
- In the initial Operational phase, a reduction in flow resistance, resulting in an increase in speed at a given flow rate (operation stage, direct impact), a segmental permanent change in flow conditions (operation stage, indirect impact);
- Increase of the flow capacity of UBSW, which will reduce the value of the Hydromorphology Transformation Index (operational stage, direct meshes);
- Reduction of the number of oversized grains (boulders) from the balance of dragged debris transport and the granulometry titre of the bottom substrate below the dam - reduction of the number of oversized boulders, below the dams (operational stage). It concerns the flow of flood waters, i.e. waters with a probability of occurrence approximately once every hundred or two hundred years (Q10, Q20);Simplifying the structure of vegetation on coastal slopes and in the coastal zone, as well as the removal of natural morphological elements associated with tree cover from the channel, such as: hanging branches, thick and small wood rubble (operational stage, direct impact).

3.Physical and chemical elements

- Periodic and local increase of suspended solids concentration in water (implementation stage, direct impact);
- Exposure to uncontrolled spills of petroleum substances from working and garaged machines (implementation stage, direct impact);
- Start-up of small fractions, growth of biogenic substances in waters (implementation stage, indirect impact).

With regard to the planned repair and reconstruction works, which do not interfere with the shape of the river channel and bank zone, most of the above mentioned impacts do not cause permanent effects. Most of them relate to the implementation phase and cease after its

completion. Appropriate mitigation measures, as detailed in the Appendix 1 of the EMP, are provided to mitigate these.

Permanent changes in the channels of Dusznicka and Kamienny Potok concern the sections on which adjustment of the bank line and sectional strengthening of the banks are planned, reconstruction of transverse partitions into a rapids, construction of the by-pass channel and bipartite channel and anti-rubble dams.

Regulating works within UBSW Bystrzyca Dusznicka from the source to Kamienny Potok RW60007121839 are planned on sections with a total length of 2.6 km, which is approx. 17.3% of UBSW. In the case of UBSW Bystrzyca Dusznicka from Kamienny Potok to Wielisławka RW6000512188, the total length of the sections will be approx. 4.3 km, which is approx. 6% of the length of JUBSW.

The planned works will be carried out in channels strongly transformed in the past and will be mainly renovation, will not permanently affect the hydromorphological condition of Bystrzyca Dusznicka and its tributaries. These activities, which are passive protection activities, will not pose the risk of failure to achieve the environmental objectives set for UBSW (and UBUW), provided that appropriate technical solutions are applied and hydrotechnical facilities are properly operated (e.g. debris barrier, rapids).

Potential negative cumulative impacts of the works carried out as part of the above-mentioned 3 facilities in Bystrzyca Dusznicka will be significantly minimized by restoring ecological patency for the section of the river from the Polanica border to the mouth of the Kamienny Potok and clearing the partitions in its lower course. There will be a cumulative positive impact of planned works related to the clearance of certain transverse structures on fish migration.

5.5.2. ENVIRONMENTAL OBJECTIVES FOR PROTECTED AREAS INDICATED IN §16 POINT 32 OF THE ACT OF 20 JULY 2017. - WATER LAW

Protected areas indicated in §16 section 32 of the Act of 20 July 2017. - Water Law designated within UBSW*Bystrzyca Dusznicka from the source to Kamienny Potok* and UBSW *Bystrzyca Dusznicka from Kamienny Potok to Wielisławka*, on which the Task is located, is presented in chapter 4.6.

- UBSW RW60007121839 and RW6000512188 are uniform bodies of water intended for the intake of water for the supply of water to the population. In view of the above, the environmental objective is to meet the requirements set out for water to supply the population with water intended for human consumption. These requirements are currently set out in the Regulation of the Minister of Maritime Affairs and Inland Navigation of 29 August 2019 on the requirements to be met by surface waters used to supply the population with water intended for human consumption (Journal of Laws of 2019, item 1747). It should be stated that the Contract does not cause permanent effects (concerning the operational stage) on the state of the physicochemical elements of UBSWor on the ability of its waters to self-treat. On the other hand, the impacts that can be identified at the implementation stage are local and short-term (limited to the construction period) and mainly concern the increase in the concentration of slurry in the waters in the area of the works. This impact will cease after the completion of the works. During the execution of construction works, there is also a potential risk of contamination of waters with petroleum substances due to the use of mechanical

equipment in the channel and coastal zone. This risk will be effectively minimized by the application of mitigation measures in the field of water protection, such as: the use of efficient machinery and equipment, equipping construction sites with sorbents in the event of leakage of petroleum derivatives, in the case of emission of petroleum pollutants to waters, immediate action to prevent the spread of pollution and immediate removal of pollution from the water surface, location of construction facilities outside the coastal zone, securing garages and repairs of machines with pollution of groundwater and surface water with refueled or drained oil. In view of the above, there is no significant, permanent threat to the environmental objectives set for the water abstraction body for the supply of water to the population.

- UBSW RW60007121839 and RW6000512188 are located in an area sensitive to eutrophication caused by pollutants from municipal sources. In Poland, for the purposes of implementing Directive 91/271/EEC on urban wastewater treatment, it was assumed that the entire territory of the country is sensitive to eutrophication caused by pollutants from municipal sources. Since social and household sewage will be generated only at the stage of the Contract implementation and will be discharged to portable toilet tanks and received by entities holding appropriate permits in the field of sewage management, the Contract will not affect the achievement of the objectives of these areas.
- UBSW RW60007121839 and RW6000512188 are located within areas intended for the protection of habitats or species referred to in the provisions of the Act of 16 April 2004 on Nature Conservation, for which the maintenance or improvement of water status is an important factor in their protection: PN Gór Stołowych, Góry Stołowe PLB020006, Góry Stołowe PLH020004, Grodczyn i Homole near Dusznik PLH020039, Piekielna Dolina near Polanica PLH020010, OCHK108 Góry Bystrzyckie and Orlickie.
- UBSW RW60007121839 and RW6000512188 are not uniform bodies of water intended for recreational purposes. Nor are they located in an area intended for the protection of aquatic species of economic importance. Therefore, it is not expected that the impact of the Contract on the achievement of the environmental objectives of these areas will occur.

5.6. GROUNDWATER

Implementation phase

The works connected with the implementation of the Contract will not change the existing water relations in the area of its implementation and adjacent areas.

At the stage of the Contract implementation, the main causes of groundwater pollution may be:

- rainwater and snowmelt run-off from the construction site,
- inappropriate storage of building materials,
- pollution of waters by oil-derived substances leaking from construction machinery as a result of their failure.

The possibility of moving pollutants, along with rainwater, from the ground surface to groundwater largely depends on the thickness of layers of poorly permeable formations isolating the aquifer. Generally, after the implementation of minimizing measures in the scope of limiting the possibility of water and soil pollution, construction works will not cause negative impacts on the quantitative and qualitative state (changes in the chemistry and hydrodynamics of waters) of groundwater.

Operational phase

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

5.7. FLORA AND FAUNA

5.7.1. PROTECTED NATURAL HABITATS

At the Contract implementation stage, negative impacts on three habitat types are expected to occur in the area of all Facilities: 3260, 6430 and 91E0. Within the Polanica Facility, it is also possible to have a weak negative impact on habitat 9110. Impacts will mainly result from direct destruction of habitat fragments during implementation of the works, which are permanent impacts. Appropriate mitigation measures, as detailed in the Appendix 1 of the EMP are provided to reduce these impacts.

At the operational stage, it is possible to have negative impacts on habitats 3260 and 91E0 (all Facilities), as well as 6430 (Polanica-Zdrój and Szczytna Facilities) and 3220 (Polanica-Zdrój Facility). These impacts may occur when dams are not operated properly and allow excessive accumulation of debris and consequently damming of water above the dams.

5.7.2. PROTECTED FUNGI, PLANT AND ANIMAL SPECIES

Protected plant species

At the implementation stage, negative impacts on protected and/or rare vascular plant species (wild garlic, goat's beard, river water-crowfoot, spring snowflake, snowdrop, oxlip, snowline wintergreen, martagon lily), mosses (broom forkmoss, leucobryum moss, Girgensohn's bogmoss, *Ulota bruchii* Hornsch., *Ulota crispa* (Hedw.), *Hygroamblystegium fluviatile*, *Rhytidiadelphus squarrosus*), Marchantiophyta (*Plagiochila asplenioides*), lichens (*Bryoria fuscescens*, *Evernia divaricata*, oakmoss, *Hypogymnia tubulosa*, *Pleurosticta acetabulum*, *Ramalina farinacea*, *Ramalina fastigiata*, *Tuckermanopsis chlorophylla*, fishbone beard lichen, Usnea subfloridana) and Rhodophyta (*Hildenbrandia rivularis*). The impacts will mainly result from the direct destruction of individuals (irreversible impact) and habitats of species during the implementation of the works and the potential deterioration of the physicochemical properties of waters during the implementation of the works (reversible impacts that cease upon completion of the works). Appropriate mitigation measures, as described in detail in the Appendix 1 of the EMP, are envisaged to limit them.

At the operational stage, it is possible to have negative effects on vascular plant species (river water-crowfoot) and lichens (*Bryoria fuscescens*, oakmoss, *Ramalina farinacea* and *Ramalina fastigiata*, *Tuckermanopsis chlorophylla*, *Usnea filipendula* Stirt. and *Usnea subfloridana* Stirt.). Negative effects may occur locally as a result of changes in the geomorphology of the channel below the rubble dams in the event of river obstruction and increased bottom erosion. In the case of tree stands, at the operational stage, it is possible to change the microhabitat conditions within the sites located in the vicinity of anti-rubble dams (appropriate mitigation and minimisation measures are envisaged to reduce and/or completely eliminate such identified impacts).

Protected animal species

Invertebrates

At the stage of the Contract implementation, there are expected to be weak, short-term and reversible negative impacts on 6 species of invertebrates (Roman snail, Red-tailed bumblebee, Garden bumblebee, Shrill Carder Bee, Common Carder Bee, Buff-Tailed bumblebee) resulting from the temporary boundary of feeding grounds. No negative impacts on invertebrates are expected during the Operational phase.

Fish and lampreys

The implementation of the works planned under the Contract will affect the living conditions of ichthyofauna by changing the physicochemical nature of waters and flow, including the supply of slurry. There may also be direct mechanical destruction of fish and lampreys and their habitats during channel works. Impacts will only affect the construction phase and will cease several hours after the completion of the works. Therefore, they will not be significant for the local populations of these species. At the operational stage, there will be positive permanent impacts on the migration of fish and lampreys, related to the clearing of transverse partitions.

Amphibians and reptiles

At the implementation stage, negative, weak to moderate effects on amphibians and reptiles (Common toad, Common frog, Grass snake, Adder) are expected. These impacts will be associated with a potential increase in the incidental mortality of individuals as a result of increased vehicle traffic in the working area and a temporary reduction in feeding grounds. No negative impacts are expected during the Operational phase.

Birds

The impacts on avifauna during the Contract implementation phase are primarily related to the scaring and disturbance of bird species directly related to the riverbed and habitats found on coastal slopes, but also to the loss of feeding grounds and breeding sites under bridges, in cut trees and in the development of the riverbed. Negative effects may include: White wagtail, Grey wagtail, White-throated dipper, Common kingfisher, River warbler, Eurasian wryneck and flycatchers. At the operational stage, moderate impacts will result from the simplification of the channel morphology and reduction of breeding sites. They will apply to the Grey wagtail, White-throated dipper, Common kingfisher and River warbler.

Mammals

At the stage of the Contract implementation, negative effects on European otter, European beaver, European mole, stoat and edible dormouse and bat species are expected. Small mammals may accidentally die during the passage of vehicles (construction stage). The effects will also result from scaring and disturbing individuals, and in the case of bats also from the deterioration of habitat conditions as a result of felling trees and shrubs. At the operational stage, negative impacts on the otter resulting from hindering the establishment of burrows on the banks are expected.

Most of the above mentioned impacts on fauna are of short-term and reversible nature, ceasing after the completion of the stage of works implementation or when the pre-investment habitat

conditions have recovered. Mechanical accidental destruction of organisms is a permanent impact. Appropriate mitigation measures, described in detail in Appendix No. 1 to the EMP, are provided to reduce all negative impacts.

5.7.3. NATURA 2000 SITES

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

- Natura 2000 site Stołowe Mountains PLB020006
- Natura 2000 site Stołowe Mountains PLH020004
- Natura 2000 site Orlickie Mountains PLH020060
- Natura 2000 site Piekielna Dolina near Polanica PLH020010

Negative impacts on objects of Natura 2000 protection areas Piekielna Dolina near Polanica PLH020010 are possible. Negative impacts at the implementation stage will concern natural habitats (3260, 6430, 91E0) and ichthyofauna species (European bullhead, brook lamprey minnow) and one mammal species (otters). The effects will mainly result from the mechanical destruction of the plant cover at the work sites, local deterioration of the conditions of fish occurrence and anxiety, scaring the otter. These are short-term impacts that will cease once the works are completed. Within the Natura 2000 site, works will only be carried out on a small fragment of several dozen metres. Therefore, there is no threat of permanent significant negative impacts on the subjects of protection of Natura 2000 area. In order to prevent some of the impacts and to reduce the impacts that could not be completely eliminated, appropriate mitigation measures were provided for as described in detail in Appendix No. 1 to the EMP.

At the operational stage, it is possible to have negative impacts on the objects of protection of the area (habitats 3220, 3260, 6430 and 91E0) resulting from the potential destruction of patches during the cleaning of the debris barrier after flooding. This impact will have only a local range and, if it occurs, it will not result in significant negative impacts on the area, nor will its cohesion, understood as the integrity and functionality of the ecological connections within the area, be affected.

In the case of the Natura 2000 area of Stołowe Mountains PLH020004, a temporary moderate negative impact at the implementation stage is possible. The planned reconstruction of the path of migration of ichthyophauna by making 7 partitions in Bystrzyca Dusznicka and 3 - in Kamienny Potok will contribute to the improvement of communication between the Natura 2000 area Piekielna Dolina near Polanica and the area of Góry Stołowe PLH020004, where the European bullhead and brook lamprey are protected objects. This will therefore have a significant positive impact on the cohesion and integrity of the designated Natura 2000 sites.

At the implementation stage, it is also possible to have a negative impact on habitat 91E0 in the Orlickie Mountains PLH020060, however, due to the extent of possible impacts (a small proportion of the entire habitat resources in the Site) there is no risk of significant negative impacts on the Site.

The impact of the works on the Natura 2000 site Góry Stołowe PLB020006 is not expected.

5.7.4. OTHER PROTECTED AREAS

The scope of the planned works has not been found to have a negative impact on the objectives of the protection of the Stołowe Mountains National Park and to generate the threats listed in

the Park's protective tasks. Negative impact in the form of disturbing and disturbing protected animal species is possible within the Bystrzyckie and Orlickie Mountains Protected Landscape Area. This aspect is discussed in more detail in chapter 5.7.2. The works will be carried out in the vicinity of natural monuments - adverse short-term or permanent impacts are possible. For this reason it is foreseen to implement the mitigation measures described in the Appendix Annex 1 of the EMP.

5.8. ACOUSTIC CLIMATE

Implementation phase

At the Contract implementation stage there will be negative impacts in the form of noise emissions. These will be short-term and time-varying impacts, mainly related to the operation of machinery and heavy construction equipment and the movement of construction vehicles. 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. These impacts will have a local reach.

For the purpose of a simplified analysis of the designation of facilities potentially at risk of noise, a range of 100 m from investment works, regardless of their type and emissions, was adopted. In the analysed area, the number of facilities exposed to temporary exceedances of permissible noise standards was found to be 498 residential buildings, 60 hotels and tourist accommodation buildings, 20 hospitals and medical care facilities, 5 schools and research institutions and two kindergarten/nursery buildings. The increased noise emission in the said areas 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.

It is foreseen to inform in advance the owners and/or users of buildings exposed to high noise emission due to the works. In addition, it is envisaged that appropriate information boards will be installed at places and times when works with the risk of high noise emissions will be carried out.

Operational phase

Hydrotechnical structures, included in the scope of the Contract, do not generate noise. Therefore, their operation does not permanently affect the acoustic condition of the environment of the acoustically protected areas described above.

Noise emission will only result from the operation and movement of machinery and vehicles necessary to carry out maintenance work. These will be short-term and local impacts (limited to the places where necessary maintenance works involving heavy equipment are carried out), occurring as required.

5.9. CULTURAL MONUMENTS

Implementation phase

The impact of the proposed Contract on historical objects that are located in close proximity, i.e. 20÷70m will take place at the construction stage, primarily as a result of transport by cars:

- excavation material for the reconstruction of walls and fortifications;
- construction materials for the construction site;
- people to and from the construction site;
- as well as the operation of mechanical equipment (excavators, cranes, compressors) when performing earthworks, concrete and reinforcement works in the channel.

Difficulties related to the impact of road transport, i.e. vibrations, shocks, traffic (dynamic vibrations) will be limited spatially (linear object, works carried out in sections) and temporarily (the construction period of a given section is limited in time and short - depending on the scope of works). Periodic nuisances related to the investment process are not subject to regulation in environmental legislation. Proper organization of the construction site, as well as compliance with health and safety regulations and technically efficient equipment and devices will reduce the above-mentioned nuisances.

The implementation of the Contract does not cause a threat of deterioration of the values and condition of objects considered historic. These impacts will disappear with the movement of the front of the works.

In the case of the Museum of Paper Industry in Duszniki Zdrój, the construction of a by-pass channel with accompanying works is planned to protect the Museum from flooding with a probability of p=1%. The by-pass channel will partially interfere with the area within the boundaries of the protected facility, without affecting the Museum of Papermaking. It will be necessary to implement appropriate architectural solutions in order to maintain the character of the surroundings of the building. Detailed design solutions will be adopted on the basis of arrangements with the Provincial Conservator of Monuments in Wrocław.

The Spa Park and the historic part of Duszniki-Zdrój are located in the spa zone "A". On the section (at 27+130 – 29+840 km of Bystrzyca Dusznicka), among others, works involving the reconstruction of the existing infrastructure (including the reconstruction of walls, footbridge and weir and barrage into a rapid), construction of an anti-anti-rubble dam and renovation of the existing shore insurance were planned. The planned works do not violate the layout of the above-mentioned objects. Detailed design solutions will be adopted on the basis of arrangements with the Provincial Conservator of Monuments in Wrocław.

Appropriate mitigation measures, as detailed in Appendix 1 of the EMP, are provided to reduce all adverse impacts.

Operational phase

At the operational stage, a positive impact on historic buildings is expected due to the reduction of the flood risk level.

5.10. TANGIBLE GOODS

Implementation phase

The impact on material goods, at the stage of construction works, will mainly result from the execution of works and the movement of vehicles and machines in built-up and inhabited areas. Residents and their properties may be exposed to vibrations, noise, dust. Therefore, the minimizing measures were specified, presented in the Appendix no. 1 to the EMP (item 10), where it was indicated that all damages to structures and buildings and other infrastructure

elements resulting from the execution of works by the Contractor or its Subcontractors shall be repaired. In item 91 of the Appendix 1 to the EMP, the necessity of working out a *Detailed Quality Assurance Plan* specifying the principles of documenting the condition of the infrastructure before commencing the works and controlling the possible influence of the works on its condition as a result of emission of vibrations and vibrations was also specified. The condition of the road infrastructure may also deteriorate; however, upon completion of the works it will be restored to its pre-investment condition.

At the stage of the investment implementation, there is a potential risk of occurrence of a threat during demolition works related, among others, to the reconstruction of permanent weirs into a smarter one, the reconstruction of offsets of regulation walls as well as the foundation of new structures (regulating wall) and the reconstruction of the bridge in km 23+539 of Bystrzyca Dusznicka.

In order to protect material goods at the construction stage, the Contractor will be obliged to implement a number of actions minimizing the impact both in the vicinity of the construction site and access roads. The introduction of the above-mentioned measures should minimize the risk of a negative impact on tangible goods in the area of the Contract, therefore, no significant impacts in this respect are expected.

Operational phase

The implementation of the Contract aims, among others, to increase flood protection of bank areas with particular emphasis on built-up areas and communication routes, as well as to protect the cities of Duszniki-Zdrój, Szczytna and Polanica-Zdrój against damage to regulatory and bridge buildings during the passage of the flood wave.

5.11. HUMAN HEALTH AND SAFETY

Implementation phase

Impacts of the Contract at the implementation stage will be impacts typical of medium-sized construction sites.

The main categories of these impacts are:

- noise and vibration emission (operation of construction equipment and machines, transport of materials),
- emissions of pollutants into the air (exhaust emissions from internal combustion engines of machinery and means of transport, dust emissions during earthworks and transport processes),
- traffic nuisance (related to increased traffic of vehicles).

All the above mentioned impacts will be temporary (limited to the construction period and movement of the works site) and will not cause permanent changes in air quality and acoustic climate parameters. Appropriate mitigation measures, described in detail in Annex 1 of the EMP, are provided to reduce their scale and intensity.

In particular, the residents of the property in the vicinity of the Bystrzyca Dusznicka river channel and Kamienny Potok will be exposed to the above impacts.

At the construction stage, the nuisance and intensity of the above-mentioned impacts will be minimized by the use of technical and organizational activities, including:

- time limits for carrying out works related to significant noise emission and in the immediate vicinity of buildings, mainly residential buildings,
- reducing dust emissions from the construction site and means of transport,
- reducing noise and exhaust emissions by using efficient devices and only engines during breaks in work,
- development and agreement of the traffic organization design with the road manager and proper marking and securing of roads in accordance with the aforementioned design.

The implementation of the Contract is planned in accordance with the applicable regulations with a high standard of modernity, it will meet the requirements in the field of occupational health and safety regulations and fire and environmental regulations.

Operational phase

The main benefits of the investment are restoring functionality and/or increasing the reliability of hydrotechnical structures and securing nearby road infrastructure against outwashing, which will improve the safety and protection of human health. The investment will not involve pollutant emissions harmful to people.

Implementation of the Contract is planned in accordance with applicable regulations and high standards. It will meet the requirements for occupational health and safety regulations and fire and environmental regulations. The stage of operation of the Contract will indirectly improve the living conditions of people by reducing the flood risk.

5.12. WASTE

Implementation phase

It is estimated that about 8200 m^3 of construction, repair and dismantling waste and 34300 $m^3$of earth and excavated materials will be generated, including about 5400 m^3 of material from the Bystrzyca Dusznicka and Kamienny Potok channels. It is also possible to generate waste related to the operation of mechanical equipment and construction machines powered by internal combustion engines, including hazardous waste. During the period of works, municipal waste will be generated within the construction site facilities.

If the waste generated is properly handled and managed, the construction process will not have a negative impact on the environment during the implementation phase. At the construction site facilities, an area will be designated within which containers and containers for temporary storage of waste will be placed, depending on their type, including special, sealed containers for storing hazardous waste. Current waste will be transferred to the means of transport of entities authorized to transport waste and further managed on the basis of the classification of waste carried out at the stage of work implementation.

The excavated soil from the worksites (including excavated earth from outside the watercourse and sediments from the watercourse) will be used on site if it meets the technical and environmental criteria (classified as non-polluted soil). If this is not possible, all or part of the waste will be disposed of in accordance with the applicable waste regulations. The Contractor shall prepare documents, such as a *Waste Management Plan* and a *Soil Management Plan*, in which the manner of handling land shall be presented in detail and subject to acceptance by the Contract Engineer prior to commencement of works generating waste and land.

Operational phase

The potential generation of waste at the stage of operation of the Task will be related to the maintenance and maintenance works. No significant amount of waste is expected to be generated.

5.13. EMERGENCY HAZARDS (CRISIS AND EMERGENCY SITUATIONS)

The implementation and operation of the Contract 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 Contract 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 rise, 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 Bystrzyca Kłodzka 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 channel 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

Emergency situations in the operation of renovated hydrotechnical facilities may result from machine failures during maintenance works, which are a source of uncontrolled leakage of petroleum derivatives and oils.

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.

5.14. CUMULATIVE AND TRANSBOUNDARY IMPACTS

CUMULATIVE IMPACTS

Cumulative impacts in the context of flood prevention activities in the problem area (hot spot) Kłodzko Basin.

According to the provisions of PZRP and aPGW, the following projects are part of the Odra-Vistula Flood Management Project (OVFMP):

1. Subcomponent 2A - active protection:
   - 2A.1/1 Construction of a "Boboszów" - dry flood management reservoir on the Nysa Kłodzka river,
   - 2A.1/2 Construction of Roztoki Bystrzyckie dry flood control reservoir on Goworówka Stream,
   - 2A. 2/ 1 Construction of the "Krosnowice" dry flood control reservoir on the Duna Stream,
   - 2A.2/1 Construction of the "Szalejów Górny" dry flood control reservoir on the Bystrzyca Dusznicka river;
2. Subcomponent 2B - Passive protection:
   - 2B.1/1 Flood protection of Nysa Kłodzka River Valley,
   - 2B.2/1 Flood protection of the Biała Lądecka and Morawka river valleys,
   - **2B.2/2 Flood protection of the Bystrzyca Dusznicka and Kamienny Potok rivers.**

Projects located on the site and in the area of impact of the project, the impacts of which may lead to the accumulation of impacts with the planned Contract include primarily other activities within the investment *2B.2/2 Flood protection of the Bystrzyca Dusznicka river and the Kamienny Potok river*, implemented in the catchment area of the Bystrzyca Dusznicka river (passive protection - Duszniki-Zdrój and Polanica-Zdrój facilities), construction of a dry flood control reservoir "Szalejów Górny", as well as maintenance works resulting from the Water Maintenance Plan. In the case of other activities carried out as part of the Odra-Vistula Flood Management Project (OVFMP), there are no cumulative impacts with the Contract that could occur within the Bystrzyca Dusznicka catchment area (in three uniform bodies of water

designated in its catchment area: RW60007121839, RW6000512188, RW60000812199). This is due to the location of other projects within other UBSW.

No cumulative interactions of the Contract with the currently implemented dry flood protection reservoirs "Boboszów", "Roztoki Bystrzyckie" and „Krosnowice" are expected.

Other tasks of Sub-component 2B of the OVFM Project, located in Nysa Kłodzka and Biała Lądecka and the Morawa stream, due to their location and the planned scope of work, at this stage, most of them also do not present a risk of accumulation of negative impacts. In the case of simultaneous implementation of the Contract with some of the planned activities (2A.2/1, 2B.1/1 - Kłodzko Facility, 2B.2/1), there may be a cumulative impact in terms of increase of slurry concentration and deterioration of oxygen conditions in the waters of Nysa Kłodzka, especially within UBSW Nysa Kłodzka from Biała Lądecka to Ścinawka (RW60000812199), which is the lowest UBSW. These impacts will cease upon completion of the work. The cumulative impacts on individual groups of aquatic animals at the implementation stage will not be significant and will be independent of each other.

Therefore, the cumulative impact assessment considered the combined impact of the activities planned under passive protection (Facilities: Duszniki-Zdrój, Szczytna and Polanica-Zdrój) and the construction of a dry flood control reservoir "Szalejów Górny". As part of passive protection and the construction of dry flood protection reservoirs, it is planned to transform watercourses on sections with a total length of about 12 km, which constitutes almost 12% of the total length of the analysed UBSW.

During the implementation of these activities, there will be direct destruction of aquatic plant communities, macroinvertebrate complexes, as well as habitats and individuals of fish. Scaring of fish and other aquatic organisms is also expected. In the case of simultaneous investment, there will be an accumulation of impacts in terms of increasing the concentration of suspension in the waters of Bystrzyca Dusznicka and its tributaries. Indirectly, this will reduce water transparency and light conditions for macrophytes and phytobenthos, as well as the deterioration of water quality parameters and the occurrence of ichthyofauna and benthic macro-vertebrates and temporary restrictions on free migration of aquatic organisms. In case of improper timing of work, spawning of fish may be disturbed. The living conditions of the terrestrial and aquatic animal species will also deteriorate, mechanical damage to the animals by working machines may occur. These impacts will end with the completion of all investments and will be minimised.

At the implementation stage, surface and groundwater pollution may occur as a result of:

- rainwater and snowmelt runoff from the construction site,
- inappropriate storage of building materials,
- improper location of construction facilities and poor organization of sanitary facilities,
- groundwater may be contaminated by oil derivatives leaking from construction machines, being in poor technical condition or as a result of their failure.

The cumulative impact at the operational stage mainly concerns hydromorphological transformations. Since the planned works will be carried out in channels strongly transformed in the past and will be mainly renovation, they will not permanently affect the hydromorphological condition of Bystrzyca Dusznicka and its tributaries. The values of hydromorphological indices m1 and m4 determined for the analysed UBSW are not expected to be affected. However, during the works, natural hydromorphological elements will be eliminated, resulting in a decrease in the Hydromorphological Diversity Index (WRH/HDI),

which is a reversible effect in the medium term (2-5 years). As these activities have been limited to built-up areas and will be implemented on short sections and are reversible, they will not cause a permanent reduction in the assessment of the environmental status/potential of the analysed UBSW. These activities, which are passive protection activities, will not pose the risk of failure to achieve the environmental objectives set for UBSW (and UBUW), provided that appropriate technical solutions are applied and hydrotechnical facilities are properly operated (e.g. Anti-rubble dams, rapids). Works related to the construction of the „Szalejów Górny" reservoir may cause short-term, transient and local lowering of the groundwater table resulting from the need to perform the necessary drainage during cold works and construction works.

Potential negative cumulative impacts of the works carried out under the Contract will be largely minimized by restoring ecological patency for the section of the river from the Polanica border to the mouth of the Kamienny Potok and clearing the partitions in its lower course.

Cumulative impacts with activities resulting from the Water Maintenance Plan (WMP) for the analysed UBSW

All the activities listed in the WMP are maintenance works and are carried out periodically every 3 or 5 years. Some of them will be carried out in the sections covered by the activities within the framework of Contract 2B.2/2, the others - in a small distance from them. In case of simultaneous works in the sections within the range of influence of the Contract, the following cumulative impacts may occur

- increase of suspended solids concentration in the waters of UBSW,
- pollution of surface waters and groundwaters with petroleum substances leaking from construction machines when they are in poor technical condition or as a result of their malfunction
- changes in habitat conditions due to elimination of gullies and hollows in slopes and bottom (decrease of morphological diversity) and removal of silt, roots, fallen trunks, stones, etc. deposited on the bottom of watercourses
- disturbance of aquatic animals and removal of plants from the bottom and slopes.

These impacts will occur locally and periodically.

At the stage of operation of the Task, no significant impacts that may be subject to cumulation with maintenance works are anticipated. Possible accumulation of the effects of maintenance works provided for in the PUW with the impact of the analysed Task may occur primarily at the stage of its implementation, when works will be carried out in the river channel, as well as to a lesser extent - in the initial period of operation (2-5 years), during the regeneration of habitats degraded as a result of works and the replanted patches of *Ranunculus* subgen. *Batrachium*.

Cumulative impacts with activities resulting from the investment "Stone Route in Szczytna – site remediation".

The works planned within the framework of the Contract - Szczytna Facility, concerning the estuarial section of the Kamienny Potok in km 0+000 - 0+414 locally overlap with the investment entitled "Stone Route in Szczytna – site remediation". Although area-wise the Szczytna Facility with the "Stone Route in Szczytna - site remediation" project, their scope is different. The remediation project does not interfere with river channels or water relations of the site. Therefore, no cumulative impacts on the status of the analysed UBSW and UBUW are

expected. In addition, measures will be taken to minimise the possibility of contamination of water courses with dust or toxic substances. At the stage of implementation, if both investments are carried out at the same time, cumulative impacts may occur in terms of increased concentration of suspended solids in the waters of Bystrzyca Dusznicka and Kamienny Potok in the area of Szczytna and below.

CROSS-BORDER IMPACT

The contract, due to the nature of the impacts generated and its location, does not pose a risk of cross-border impacts. The effect of the works carried out under the Task may go beyond the direct places of their implementation, but it will be an impact covering only the impacts scattering down the course of the watercourses. It is not possible for possible impacts to extend to areas within the borders of the Czech Republic that are several to dozen kilometres away.

6. DESCRIPTION OF MITIGATION MEASURES

In order to limit the negative impacts of the planned Contract on the environment, material assets, historical monuments, and first of all on the health and life of the population exposed to the impact of the planned works, Appendix No. 1 to the EMP contains a list of mitigation measures that will be binding for all the participants of the investment process, including mainly the Contractor of the Works. These actions were developed on the basis of conditions included in environmental decisions issued for individual Facilities included in the Contract, with supplementation of additional conditions determined at the stage of preparing the EMP. A summary of the main categories of mitigation measures, broken down into individual environmental components discussed in chapters 4 and 5 of the EMP, is presented below.

6.1. EARTH SURFACE AND LANDSCAPE

The basic forms of negative impact of the planned Contract 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, 3,4 (01 - Requirements concerning the location and area limitations for temporary occupations),
- 9, 10 (04- Requirements concerning the communication service of the Contract implementation area.),
- 17, 18, 19, 20, 21, 22, 23, 24, 25 (07 - Requirements for felling and protection of trees and shrubs).
- 112 (20 – Detailed requirements - Duszniki-Zdrój Facility - for thisFacility only, separate detailed conditions as compared with the remaining Facilities of Contract 2B.2/2 were specified).

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 Contract simultaneously prevents and mitigates the effects of extreme weather events.

6.3. AIR QUALITY

The basic forms of negative impact of the planned Contract 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: 31, 35, 37 (08 - Environmental pollution prevention requirements).

6.4. SOILS AND LAND

The basic forms of negative impact of the planned Contract 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:

- 11, 12, 13 (05 - Requirements for management of soil masses),
- 14, 15, 16 (06 - Principles of top soil handling and land reclamation),
- 26, 27, 28, 29, 30, 35, 36, 37, 38, 39 (08 - Environmental pollution prevention requirements),
- 40, 41, 42, 44, 45 (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:

- 3 (01 - Requirements relating to the location and area limitation for temporary occupations),
- 11, 12, 13 (05 - Requirements for management of soil masses),
- 26, 27, 28, 29, 30, 35, 36, 37, 38, 39 (08 - Environmental pollution prevention requirements),
- 40, 41, 42, 44, 45 (09 - Waste treatment requirements),
- 79 (14 - 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 6.4 . and 6.5)

6.7. ACOUSTIC CLIMATE

The basic forms of negative impact of the planned Contract 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: 32, 33, 34, 35, 37 (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 Contract 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:

- 1, 2, 3 (01 - Requirements relating to the location and area limitation for temporary occupations),
- 17, 18, 19, 20, 21, 22, 23, 24, 25 (06 - Requirements for felling, planting and protection of trees and shrubs),
- 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75 (12 - Requirements for conservation of living nature),
- 46, 47 (10 - Requirements for containment and eradication of invasive plant species),
- 101, 110 (18 - 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.

The part of Appendix 1 devoted to the detailed requirements for the individual Sites (20 - Detailed requirements - Duszniki-Zdrój Facility, 21 - Szczytna Facility, 22 - Polanica-Zdrój Facility) contains activities aimed at preserving the natural resources specific for the individual locations, where the Contract 2B.2/2 will be executed.

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 EMP). 6.8. 1).

6.9. CULTURAL LANDSCAPE AND MONUMENTS

The basic forms of negative impact of the planned Contract 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 (13 - Requirements for the protection of cultural monuments).

6.10. TANGIBLE GOODS

The basic forms of negative impact of the planned Contract 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: 9, 10 (04- Requirements concerning the communication service of the Contract 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 Action Plan* (LAAP) for this Contract.

6.11. HUMAN HEALTH AND SAFETY

The basic forms of negative impact of the planned Contract 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 9,10 (04 - Requirements for communication service of the Contract area), 79 - 90 (14 - Requirements for human health and safety), 91 (15 – Building protection requirements against noise and vibration), 101 - 110 (18 - 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

It is the duty of the Contractor to prevent hazards in the first place, and in case of their occurrence to limit their effects. The basic hazards have been characterized below; however, the list of given hazards is open and does not exhaust the risk of occurrence of other hazards, not listed in the EMP.

In the event of any emergency situation, the Contractor shall immediately notify the relevant services and the Employer, the Engineer and the OVFMP Project Coordination Unit. The procedure for interaction and informing the contracting parties will be described in the Instructions for the Contractor, provided by the Engineer to the Contractor prior to commencement of works. The indicated instruction will include contact details (including e-mail) taking into account the personnel of the Engineer's Structure, the Contractor and the PIU and OVFMP Project Coordination Office assigned to the execution of the Contract.

Flood

The equivalent of an industrial accident in relation to the said Contract can be considered to be the occurrence of high water levels or the occurrence of flooding, within the river channel. 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 90 in Appendix 1 to the EMP

Storms and hurricanes

The Contractor is responsible for ensuring safety in the area of Contract 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 (first of all before works commencement) 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 (Employer) and PCU OVFMP.

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 channels, 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: 88, 89 (14 - Human health and safety requirements).

Fire

The Contractor is responsible for fire protection in the area of Contract 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 (14 - Requirements for ensuring human health and safety).

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 111 (19 - 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, the Contractor shall, in accordance with Item 111 (19 - Guidelines for dealing with an epidemic or epidemic emergency during the execution of the works), implement an awareness programme for 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: 40– 45 (09 - Waste treatment requirements),

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 river channel, 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 river channel 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 river channel during the works (the scope of the document is specified in detail in the Appendix 1 EMP, item 11).

Table 13 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	m^3
Rubble from the demolition on the bridge pavement	164	m^3
Waste from road slabs and angled walls from demolition of a temporary bridge	9	m^3
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

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

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
    - Safety of the construction site facilities
    - Technological roads, including mandatory planned temporary site occupations,
    - Environment protection within the site facilities.
- *A traffic organisation design for the duration of the works, which should be compliant with:*
    - technical specifications,
    - transport requirements of road managers and their 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 contaminated sites, hazardous waste, municipal waste, waste containing asbestos) and the way it is stored and disposed of.
- *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,
    - 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 Contract, 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 Contract 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[1] 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

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

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 Contract 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 101 - 110, 19 - 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 Contract, its implementation is linked with the need to perform compensation measures.

Restoration of nesting sites for wagtails and white-throated dippers

- In the area of the town of Szczytna - under supervision of an ornithologist expert - hang 5 nesting boxes for the white-throated dipper *Cinclus cinclus* and 5 nesting boxes for the wagtail *Motacila cinerea*.
- In the area of the town of Polanica-Zdrój and within 500 m from the administrative borders of the town - under the supervision of an ornithologist expert - hang under bridges 5 nesting boxes for the white-throated dipper *Cinclus cinclus* and 5 nesting boxes for the wagtail *Motacila cinerea*.

If there are no suitable places to put nest boxes under bridges, the boxes should be mounted on retaining walls at a height of not less than 0.3 m from the top edge of the wall. Individual boxes should be placed at a distance of at least 100 m from each other. The type of nest boxes should be agreed with an ornithologist expert.

Stocking with brook trout

If it is necessary to carry out works in the period from October to the end of February, which will cause losses of brook trout spawn in spawning grounds located below the place of works - conduct stocking with brook trout every year during the period of works in cooperation with an ichthyologist expert. Use stocking material from the Nysa Kłodzka basin and the amount of stocking should depend on the assessment of real losses in the population of the species and the amount of stocking material introduced by the fishing user. In addition, ichthyologist in consultation with the fishery user may indicate the need for additional stocking in the year after the completion of the works in order to maintain the population of the species until the recovery of spawning conditions in the section affected by the works.

Hanging of nest boxes for edible dormouse

Due to the disturbance of edible dormouse (Glis glis) habitat fragments, 10 nest boxes for the species should be placed in the area of the proposed anti-rubble dam under supervision and in places selected by a mammalogist expert.

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 Contract 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 1-136 of Appendix 2 to the EMP),
- conducting environmental monitoring (items 122, 123, 124, 134, 135, 136, 145, 146, 147, 148 of Appendix no. 2 to the EMP).

7.2. ENVIRONMENTAL MONITORING DURING OPERATION

At the operation stage, environmental monitoring will be carried out within each of the Facilities included in the Contract 2B.2/2. The detailed scope of the monitoring activities is included in the App. 2 to EMP. The monitoring will primarily include assessment of the condition of natural habitats and hydromorphological conditions of Bystrzyca Dusznicka after completion of the works .

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 Contract) 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].

In the period November-December 2019, public consultations were also conducted in the areas of Duszniki-Zdrój, Szczytna and Polanica-Zdrój (as well as the remaining 6 localities where works in Sub-Component 2B are planned to be carried out), which mainly concerned the scope of the planned works. The consultations took the form of direct meetings with inhabitants, local government representatives and all other persons and entities interested in the OVFM Project in the Kłodzko Land. The meetings were open and materials presenting the scope of works (technical concept stage) were provided in advance to the interested parties.

The participants of the consultation meetings in the vast majority positively assessed the scope and form of organisation of the meetings. They positively evaluated the possibility to learn about the technical concept before the meeting and to make comments and discuss specific solutions during the meeting. Questions, comments and opinions were asked on an ongoing basis. Some proposals were submitted by letter or by e-mail. Residents and representatives of local authorities have submitted a number of proposals for the planned activities. Most of the postulates that fall within the territorial and material scope of the project and do not collide with technical, environmental, architectural or ownership requirements were analysed by the designers and taken into account in further works. In many cases, the works planned for implementation meet the expectations of the local authorities in terms of opening up the cities towards the rivers, while at the same time applying environmentally and architecturally friendly technical solutions. Most of the meeting participants expressed their satisfaction with the fact that Polish Waterways started specific investment activities in the field of improving flood safety in the Kłodzko area. It was also emphasised that the planned works are insufficient and include mainly works related to the maintenance of water and water facilities. The inhabitants of the Kłodzko Land expect the promises to be fulfilled and further actions to be taken in non-urbanised areas and on other tributaries of the Nysa Kłodzka River.

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 Regional Environmental Protection Director in Wrocław. By notices:

- of 23 March 2020 (ref. no.: WOOŚ.420.21.2020.AP) – Duszniki-Zdrój Facility,

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

- of 23 March 2020 (ref. no.: WOOŚ.420.19.2020.AP) – Szczytna Facility,
- of 16 March 2020 (ref. no.: WOOŚ.420.16.2020.AP) – Polanica-Zdrój Facility

Environmental Protection Director in Wrocław announced the initiation of administrative proceedings and made public information about the planned projects. The announcement was made available in the Public Information Bulletin on the website of RDOŚ in Wrocław (www.wroclaw.rdos.gov.pl) in the Public Information Bulletin. Anyone interested in the investment could read the documents at the headquarters of the Regional Director for Environmental Protection in Wrocław at each stage of the proceedings. Anyone could also submit motions and proposals on the planned investment through various means of communication.

Then, by relevant decisions RDOŚ in Wrocław imposed an obligation of conducting an environmental impact assessment for the above mentioned facilities and suspended the said proceedings until the Applicant submits the report on the environmental impact of the project.

On 10 September 2020 (ref. no.: WOOŚ.420.21.2020.AP.16 – Duszniki-Zdrój), 23 September 2020 (ref. no.: WOOŚ.420.19.2020.AP.17 – Szczytna Facility) and 10 September 2020 (ref. no.: WOOŚ.420.16.2020.AP.15 – Polanica-Zdrój Facility) the Regional Director of Environmental Protection in Wrocław issued Announcements on joining the procedure of public participation in the ongoing administrative proceedings on issuing environmental decisions for the Projects.

Data on the application, decision and report have been included in a publicly available list of data on documents containing information on the environment and its protection (www.ekoportal.gov.pl). From 14 September 2020 to 13 October 2020 (Duszniki-Zdrój Facility), from 25 September to 26 October 2020. (Szczytna Facility) and from 14 September 2020 to 13 October 2020. (Polanica-Zdrój Facility) anyone interested could read the application and documentation of the case (including the environmental impact report) at the headquarters of the Regional Directorate for Environmental Protection in Wrocław and submit comments and applications to the proceedings in writing, orally to the minutes or in electronic form to the e-mail address, as well as by other means of electronic communication via the electronic delivery box of this body.

In addition, the announcements were posted on the notice boards at the places of execution of the Contract and communicated by the Mayor of Duszniki-Zdrój, the Mayor of Szczytna, the Mayor of Polanica and the Mayor of Kłodzko Municipality in a customary manner. No comments or motions were made in the ongoing proceedings within the time limit set.

Subsequently, the Regional Director of Environmental Protection in Wrocław issued decisions on environmental conditions: on 28 October 2020 for the Project entitled “Tasks 2B.2/2 Flood protection of the Bystrzyca Kłodzka river valley and the Kamienny Potok river (passive protection) - Duszniki-Zdrój Facility” in Option 1 (ref. no.: WOOŚ.420.21.2020.AP.19), on 13 November 2020 for the Project entitled "Tasks 2B.2/2 Flood protection of the Bystrzyca Kłodzka River valley and the Kamienny Potok River (passive protection) - Szczytna Facility" in Option 1 (ref. no.: WOOŚ.420.19.2020.AP.20) and on 30 October 2020 for the Project entitled “Tasks 2B.2/2 Flood protection of the Bystrzyca Kłodzka river valley and the Kamienny Potok river (passive protection) - Polanica-Zdrój Facility” in Option 1 (ref. no.: WOOŚ.420.16.2020.AP.18).

In a manner analogous to the one described above, the Announcement of 3 December 2020 was also made public. (ref. no.: WOOŚ.420.16.2020.AP.23) issued by RDOŚ in Wrocław, concerning publication of information that RDOŚ in Wrocław issued a Decision (ref. no.: WOOŚ.16.2020.AP.22) on supplementing the content of the environmental decision for the Polanica-Zdrój Facility.

8.3. PUBLIC CONSULTATION OF THE EMP (2021)

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

After the draft of an EMP document has been prepared, its electronic version is placed on publicly available websites and the paper version is available for inspection by interested parties. Detailed information on the possibility to get to know the content of this document and possibilities to lodge motions and remarks (jointly with detailed contact data (e-mail address, venue address where the draft document is available, office hours, telephone numbers) is provided for public information in the local press and on the website of the implementation unit of the Contract being subject to EMP.

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 meeting so far organised as part of the publication of the document in the form of an open debate will be replaced by the organisation of a webinar, i.e. a kind of commercial of webinar conducted and implemented with the use of webcast technology, which enables two-way communication between the meeting leader and participants, using virtual tools. The meeting will be 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.

In connection with the above, the announcement about the publication of the EMP document will contain information about the date and time of the start of the webinar together with an indication that a link will be made available on the Investor's website to join the webinar.

In order to allow questions to be asked during the period of publication of the EMP, a helpline will be launched. The information about the helpline will also be included in the announcement about the publication of the EMP.

Comments from the public that need to be taken into account are introduced into the EMP document

and its final version is being prepared. An EMP in this form is also sent to the World Bank to obtain the "No objection" clause.

9. ORGANISATIONAL STRUCTURE OF THE IMPLEMENTATION OF THE EMP

The Contract 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 OVFMP 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 OVFM 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/JRP 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 ES 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.

As per item 100 of the App. to EMP. the implementation of the EMP will be discussed at periodic (monthly) working meetings and at Construction Meeting. The meetings will be held with the participation of the PIU/JRP teams, PCU OVFMP, the Engineer and the Contractor to discuss and control the implementation of mitigation and monitoring measures.

Minutes of the EMP implementation meetings will be prepared by the environmental expert of the Engineer's Team. The minutes shall be handed over to the PIU/JRP and the Contractor and shall be an annex to the Engineer's monthly report on the implementation of activities defined in the EMP. Notwithstanding the above, current requirements and problems related to implementation of the EMP will be discussed during Construction Meetings.

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 and other issues of ES. 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 Environmental and Social Management Plan of the Contractor (C-ESMP));
- submitting 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.

A Health and Safety Officer shall also be appointed within the Contractor's team, available throughout the Contract period, and shall also be responsible for the implementation of other ES issues not included in the EMP. The Contractor, together with the Consultant, shall identify a person to whom complaints of bullying, discrimination and ill-treatment can be made.

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:

- 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;
- risk of additional environmental penalties;
- 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;
- 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 to the team of environmental experts: phytosociologist, dendrologist, entomologist, ichthyologist, herpetologist, ornithologist, mammalogist, chiropterologist. The above-mentioned specialists must have documented experience in this field, at least 3 projects corresponding in scope to the activities planned under the Contract, i.e. performing environmental supervision of investments (as an alternative and acceptable for the case, practical experience in performing environmental inventories performed as part of preparing environmental impact assessment reports for linear infrastructure projects in road, network or hydrotechnical sectors, or experience in direct preparation of such reports will also be considered) and have education in environmental protection or related fields. One member of the Contractor's environmental team can represent a maximum of two environmental specialisations listed above.

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 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/JWP 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/JRP 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 Data Sheet called: Task 2B.2/2 Flood protection of the Bystrzyca Dusznicka river valley and the Kamienny Potok river (passive protection) - Duszniki-Zdrój facility, prepared in 2020 by Sweco Consulting Sp. z o.o., Franklina Roosevelta Street 22, 60-829 Poznań, under the supervision of Wojciech Lewandowski.

2) Project Data Sheet called: Task 2B.2/2 Flood protection of the Bystrzyca Dusznicka river valley and the Kamienny Potok river (passive protection) - Szczytna facility, prepared in 2020 by Sweco Consulting Sp. z o.o., Franklina Roosevelta Street 22, 60-829 Poznań, under the supervision of Wojciech Lewandowski.

3) Project Data Sheet called: Task 2B.2/2 Flood protection of the Bystrzyca Dusznicka river valley and the Kamienny Potok river (passive protection) - Structure Polanica-Zdrój, prepared in 2020 by Sweco Consulting Sp. z o.o., Franklina Roosevelta Street 22, 60-829 Poznań, under the supervision of Wojciech Lewandowski.

4) Report on the impact of the project on the environment - Task 2B.2/2 Flood protection of the Bystrzyca Dusznicka river valley and the Kamienny Potok river (passive protection) - Duszniki-Zdrój facility, prepared in 2020 by Sweco Consulting Sp. z o.o., Franklina Roosevelta Street 22, 60-829 Poznań, under the supervision of Wojciech Lewandowski.

5) Project Environmental Impact Report - Task 2B.2/2 Flood protection of the Bystrzyca Dusznicka river valley and the Kamienny Potok river (passive protection) - Szczytna facility, prepared in 2020 by Sweco Consulting Sp. z o.o., Franklina Roosevelta Street 22, 60-829 Poznań, under the supervision of Wojciech Lewandowski.

6) Project Environmental Impact Report - Task 2B.2/2 Flood protection of the Bystrzyca Dusznicka river valley and the Kamienny Potok river (passive protection) - Polanica-Zdrój facility, prepared in 2020 by Sweco Consulting Sp. z o.o., Franklina Roosevelta Street 22, 60-829 Poznań, under the supervision of Wojciech Lewandowski.

7) Decision on the on environmental conditions of 28 October 2020 for the Investment entitled „Tasks 2B.2/2 Flood protection of the Bystrzyca Kłodzka river valley and the Kamienny Potok river (passive protection) - Duszniki-Zdrój Facility" in Option 1 (ref. no.: WOOŚ.420.21.2020.AP.19).

8) Decision on the on environmental conditions of 13 November 2020 for the Investment entitled "Tasks 2B.2/2 Flood protection of the Bystrzyca Kłodzka River valley and the Kamienny Potok River (passive protection) - Szczytna Facility" in Option 1 (ref. no.: WOOŚ.420.19.2020.AP.20).

9) Decision on the on environmental conditions of 30 October 2020 for the Investment entitled „Tasks 2B.2/2 Flood protection of the Bystrzyca Kłodzka river valley and the Kamienny Potok river (passive protection) - Polanica-Zdrój Facility" in Option 1 (ref. no.: WOOŚ.420.16.2020.AP.18).

10) SDF for Natura 2000 site Orlickie Mountains PLH020060

11) SDF for Natura 2000 site Góry Stołowe PLB020006.

12) SDF for Natura 2000 sute Góry Stołowe PLH020004.

13) SDF for the Natura 2000 site Piekielna Dolina near Polanica PLH020010.

14) Results of the nature inventory. 2020. Sweco Consulting Sp. z o.o. Appendix 1 to the Environmental Impact Report Task 2B.2/2 Flood protection of the Bystrzyca Dusznicka river valley and the Kamienny Potok river (passive protection) - Duszniki - Zdrój Facility.

15) Results of the nature inventory. 2020. Sweco Consulting Sp. z o.o. Appendix no. 1 to the Environmental Impact Assessment Report Task 2B.2/2 Flood protection of the Bystrzyca Dusznicka river valley and the Kamienny Potok river (passive protection) - Szczytna Facility.

16) Results of the nature inventory. 2020. Sweco Consulting Sp. z o.o. Appendix 1 to the Environmental Impact Report Task 2B.2/2 Flood protection of the Bystrzyca Dusznicka river valley and the Kamienny Potok river (passive protection) - Polanica-Zdrój Facility.

17) Regulation of the Regional Director of Environmental Protection in Wrocław on the establishment of a Protection Tasks Plan for the Piekielna Dolina near Polanica (Official Journal Lower Silesian Voivodeship, item 6246).

18) Regulation of the Regional Director of Environmental Protection in Wrocław on the establishment of a Plan of Protective Tasks for the Orlickie Mountains PLH020060 area (Official Journal of Lower Silesian Voivodeship, item 2814).

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 28 October, 2020 for the Project entitled „Tasks 2B.2/2 Flood protection of the Bystrzyca Kłodzka river valley and the Kamienny Potok river (passive protection) - Duszniki-Zdrój Facility" in Option 1 (ref. no.: WOOŚ.420.21.2020.AP.19).

4b Decision on environmental conditions on 13 November 2020 for the Project entitled "Tasks 2B.2/2 Flood protection of the Bystrzyca Kłodzka River valley and the Kamienny Potok River (passive protection) - Szczytna Facility" in variant 1 (ref. no.: WOOŚ.420.19.2020.AP.20).

4c Decision on environmental conditions on 30 October 2020 for the Project entitled „Tasks 2B.2/2 Flood protection of the Bystrzyca Kłodzka river valley and the Kamienny Potok river (passive protection) - Polanica-Zdrój Facility" in Option 1 (ref. no.: WOOŚ.420.16.2020.AP.18).

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

Appendix 6. Map of location of main elements of the Contract (Appendices: 6a, 6b, 6c).