

**ENVIRONMENTAL
MANAGEMENT PLAN**

**DOCUMENT
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**ODRA - VISTULA
FLOOD MANAGEMENT PROJECT**



Projekt Ochrony
Przeciwpowodziowej
w Dorzeczu Odry i Wisły



Państwowe
Gospodarstwo Wodne
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ENVIRONMENTAL MANAGEMENT PLAN

CONTRACT 1B.9 "MODERNISATION OF FLOOD EMBANKMENT ALONG THE ŚLĘZOUJŚCIE STREET WITH ROAD INFRASTRUCTURE"



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DOCUMENT DRAFT

ODRA-VISTULA FLOOD MANAGEMENT PROJECT

ENVIRONMENTAL CATEGORY B – ACCORDING TO OP 4.01 WB

WORKS CONTRACT 1B.9

Modernization of the flood embankment along the Ślężoujście Street with road infrastructure

ISSUE	DATE	AUTHORS	VERIFIED BY	CLIENT'S APPROVAL	DESCRIPTION
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TABLE OF CONTENTS

Summary	11
1 Introduction	20
1.1 Odra-Vistula Flood Management Project	20
2 Contract Description	21
2.1 Contract Location	23
2.2 Characteristics of the Contract	24
3 Institutional, legal and administrative conditions	27
3.1 Institutions involved in implementation of the Contract	27
3.2 Binding Polish law acts with regard to the environment	27
3.3 EIA procedure in Poland	27
3.4 World Bank requirements	27
3.5 The current condition of EIA procedures for the Contract	28
3.6 Grievance redress mechanisms	30
4 Description of environmental elements	31
4.1 Land surface and landscape	31
4.2 Climate	32
4.3 Air quality	32
4.4 Soils and grounds	33
4.5 Surface water	34
4.6 Groundwater	34
4.7 Acoustic climate	37
4.8 Nature	38
4.9 Cultural landscape and monuments	39
4.10 Population	39
4.11 Remaining ES issues	40
5 Environmental Impact Assessment – Summary	41
5.1 Land surface and landscape	41
5.2 Climate	42
5.3 Air quality	42
5.4 Soil and grounds	43
5.5 Surface water	44
5.6 Groundwater	45
5.7 Acoustic climate	45
5.8 Nature	46
5.8.1 Protected natural habitats and protected species of plants and animals	46
5.8.2 Protected sites	47
5.9 Cultural landscape and monuments	47
5.10 Material goods	47

ENVIRONMENTAL MANAGEMENT PLAN

CONTRACT 1B.9 "MODERNISATION OF FLOOD EMBANKMENT ALONG THE ŚLĘZOUJŚCIE STREET WITH ROAD INFRASTRUCTURE"

5.11	Health and safety of people	48
5.12	Material and Waste Mangement	48
5.13	Exceptional hazard to the environment	50
5.14	Other hazards related to ES	51
5.15	Cumulative impact	51
5.16	Impact scoping matrix	52
6	Description of mitigation measures	55
6.1	Land surface and landscape	55
6.2	Climate	56
6.3	Air quality	56
6.4	Soils and grounds	57
6.5	Surface water	58
6.6	Groundwater	59
6.7	Acoustic climate	59
6.8	Nature	60
6.8.1	Natural habitats, flora and fauna	60
6.8.2	Protected sites	61
6.9	Cultural landscape and monuments	62
6.10	Organization of the site facility and the construction site	62
6.11	Health and safety of people	63
6.12	Emergency hazards (crisis, emergency situations)	63
6.13	Waste and sewage	65
6.14	Specific requirements for the World Bank's ES policies (environmental and social aspects, including risk of sexual exploitation, sexual abuse and sexual harassment)	65
6.15	Requirements for implementation of action plans in the construction phase	67
7	Description of measures related to environmental monitoring	70
7.1	Environmental monitoring during the works	70
7.1.1	Surface of land, landscape, and soils and grounds	70
7.1.2	Climate and air quality	70
7.1.3	Surface water	71
7.1.4	Groundwater	71
7.1.5	Acoustic climate	71
7.1.6	Nature	71
7.1.7	Cultural landscape and monuments	72
7.1.8	Organization of the site facilities and the construction site, health and safety of people, extraordinary hazards for the environment, waste and wastewater, requirements for implementation of action plans during the construction phase	72
7.2	Monitoring of the environment during the use	72
8	Public consultations	73
8.1	Public consultations on EIA/ZRiD stage	73

ENVIRONMENTAL MANAGEMENT PLAN

CONTRACT 1B.9 "MODERNISATION OF FLOOD EMBANKMENT ALONG THE ŚLĘZOUJŚCIE STREET WITH ROAD INFRASTRUCTURE"

8.2	Public consultations on Environmental and Social Management Framework (2015).....	73
8.3	Public consultations on EMP (2021).....	73
9	Organizational structure of EMP implementation.....	75
9.1	Odra-Vistula Flood Management Project Coordination Unit.....	75
9.2	Project Implementation Unit	75
9.3	Engineer	76
9.4	Contractor.....	77
10	EMP implementation schedule and reporting procedures.....	78
11	Source materials.....	81
12	Appendices	82

Draft for public consultation

LIST OF DEFINITIONS AND ABBREVIATIONS APPLIED IN THIS EMP

Name	Description
BIOZ Plan	Health and Safety Plan developed based upon Article 21a item 4 of the Act of July 7, 1994 – Building Law Act
BGW	Body of Groundwater
BP	World Bank Procedure https://policies.worldbank.org/sites/PPF3/Pages/Manuals/Operational%20Manual.aspx
BSW	Body of Surface Water
BOD ₅	Biochemical oxygen demand during 5 days
CE	Contract Engineer
CEB	Council of Europe Development Bank https://coebank.org/en/
Construction area/ construction site	Construction area/ construction 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 area" and "construction site" are interchangeable terms and are understood in the Conditions of the Contract as "Construction Site"
Contract / Works Contract / Task / Investment	Contract 1B.9 "Modernisation of flood embankment along the Ślężoujście Street with road infrastructure"
Contractor	Company or a legal person implementing Works Contract
Designer	Company or a legal person drawing up the design documentation
EIA	Environment Impact Assessment
EMP	Environmental Management Plan
Engineer / Contract Engineer	Company or legal person providing services of Engineer for the Investor
Environmental Decision (ED)	Decision on environmental conditions
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 that have not occurred in the area in the past
Epidemic emergency	The legal situation introduced in the area in question due to the risk of epidemic with a view to taking up the preventive measures laid down in the Act of 5 December 2008 <i>on preventing and combating infectious diseases in humans</i> (consolidated text in Journal of Laws of 2019, item 1239 as amended)
ES	World Bank Environmental and Social Policy (ES) concerning 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)
ES Guidelines	The World Bank's Environmental, Health, and Safety (ES) Guidelines, General ES Guidelines https://www.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/sustainability-at-ifc/policies-standards/ehs-guidelines
ESMF	Environmental and Social Management Framework

Name	Description
	https://odrapcu.pl/en/project-ovfmp/documents/
FRMP	Flood Risk Management Plan for the Odra river basin
GDOŚ	General Directorate for Environmental Protection
GRM	Grievance Redressal Mechanism. Details of the procedure are discussed in POM, chapter 5.6.8
GUS	Statistics Poland
H&S	Health and Safety
IIS	Investment Information Sheet
IMGW - PIB	Institute of Meteorology and Water Management – National Research Institute
MGR	Major Groundwater Reservoirs
Natural habitats	<p>The concept of <i>natural habitats</i> used in the text refers to the definition of natural habitats and the listing of their types in the Directive of the Council no. 92/43/EEC of 21st May 1992 on conservation of natural habitats as well as wild fauna and flora (OJ EU L 06, 22.07.1992, as amended).</p> <p>(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)</p>
OP	World Bank's Operational Policy https://policies.worldbank.org/sites/PPF3/Pages/Manuals/Operational%20Manual.aspx
ORFP Project / ORFPP	Odra River Basin Flood Protection Project
PAD	Project Appraisal Document for the World Bank approval of a Loan to the Polish Government to implement OVFMP http://documents.worldbank.org/curated/en/320251467986305800/Poland-Odra-Vistula-Flood-Management-Project
PCU / OVFM PCU	Odra-Vistula Flood Management Project Coordination Unit http://odrapcu.pl/
PZW	Polish Angling Association
PIO	Project Implementation Office
PIU	Project Implementation Unit - created within PIO separate organizational unit responsible for the implementation of Works Contract
PIO/ Employer	State Water Holding Polish Waters represented by the Director of Regional Water Management Authority in Wrocław / Project Implementation Office of the Odra – Vistula Flood Management Project
Investor/ Substitute Investor	Road and City Maintenance Authority in Wrocław
POM	Project Operations Manual prepared by the Odra Vistula Flood Management Project Coordination Unit, Wrocław 2021 https://odrapcu.pl/projekt-opdow/popdow-dokumenty/ the binding version is the English one: https://odrapcu.pl/en/project-ovfmp/documents/
PPIS	State District Sanitary Inspector

ENVIRONMENTAL MANAGEMENT PLAN

CONTRACT 1B.9 "MODERNISATION OF FLOOD EMBANKMENT ALONG THE ŚLĘZOUJŚCIE STREET WITH ROAD INFRASTRUCTURE"

Name	Description
OVFM Project / OVFP	Odra-Vistula Flood Management Project
RDOŚ	Regional Directorate for Environmental Protection
Roads authority	Agency responsible for management of public roads in accordance with the Act on public roads
SDF	Standard Data Form: The Standard Data Form (SDF) is a uniform template describing a Natura 2000 site. It is approved by a decision of the European Commission and compulsory for use in all Member States
Species decision	Decision authorizing activities subject to prohibitions applicable to protected animal, plant or fungi species
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 <i>on preventing and combating infectious diseases in humans</i> (consolidated text in Journal of Laws of 2019, item 1239 as amended) of antiepidemic and preventive measures to minimize the effects of the epidemic.
SWH PW	State Water Holding Polish Waters – Regional Water Management Authority in Wrocław
WIOŚ	Provincial Inspectorate for Environmental Protection
Waste MP	Waste Management Plan
WFS	Wrocław Flood System
WMORB / WMP	Water management plan within the Odra River Basin of 22.02.2011 (M.P. 2011 no. 40 item 451)
World Bank (WB) / IBRD	International Bank for Reconstruction and Development http://www.worldbank.org/
ZDiUM	Road and City Maintenance Authority in Wrocław

LIST OF ABBREVIATIONS FOR TITLES OF LEGAL ACTS APPLIED IN THIS EMP

Titles of legal acts quoted within contents of this EMP are given in their abbreviated form. Full titles of legal acts are given in the table below.

Title in the text	Full title (with publication reference)
<i>APC</i>	Act of June 14, 1960 - Code of Administrative Procedure (consolidated text: Journal of Laws of 2021, item 735, as amended)
<i>BIOZ Regulation</i>	Regulation of the Minister of Infrastructure of June 23, 2003 on Information Concerning Safety and Health Protection and Safety and Health Protection Plan (Journal of Laws of 2003, No.120, item 1126)
<i>Construction Law</i>	Act of July 7, 1994 Construction Law (consolidated text: Journal of Laws of 2020, item 1333, as amended)
<i>EIA Act</i>	Act of October 3, 2008 on providing information on the environment and its protection, public participation in the environmental protection, and on environmental impact assessments (consolidated text, Journal of Laws of 2021, item 247, as amended)
<i>EIA Regulation</i>	Regulation of the Council of Ministers of September 10, 2019 on projects likely to have significant effects on the environment (consolidated text, Journal of Laws of 2019, item 1839)
<i>NC Act</i>	Act of April 16, 2004 on nature conservation (consolidated text, Journal of Laws of 2020, item 55, as amended)
<i>Monument Protection Act</i>	Act of July 23, 2003 on monument protection (consolidated text, Journal of Laws of 2021, item 710, as amended)
<i>Water Law</i>	Act of July 20, 2017 – Water Law (Journal of Laws of 2021, item 624, as amended)
<i>Water MP within the Odra River Basin</i>	Regulation of the Council of Ministers of October 18, 2016 on Water Management Plan for waters within the Odra River Basin (Journal of Laws 2016, item 1967)

Summary

This document presents the **draft of Environmental Management Plan (EMP) for public consultation** for the Contract 1B.9 "Modernisation of flood embankment along the Ślężoujście Street with road infrastructure" implemented under the Odra-Vistula Flood Management Project, co-financed by the International Bank for Reconstruction and Development (also referred to as the World Bank) and by the Council of Europe Development Bank, and also by the European Union Cohesion Fund (OPIE 2014-2020) and by the State Budget. After obtaining the World Bank's acceptance for the commencement of publication procedure, the document will be subject to public consultations.

This EMP includes the following elements:

- Brief description of the OVFM Project (Chapter 1.1),
- Description of the Contract, to which this EMP refers to (Chapter 2),
- Institutional, legal and administrative conditions for implementation of the Contract, including binding state legal acts on environmental protection, main stages of the EIA procedure, and the course of EIA procedure for the Works Contract (Chapter 3),
- Description of individual elements of the environment in the area of the Contract (Chapter 4),
- Summary of the environmental impact assessments (Chapter 5),
- Description of mitigation measures to be implemented by the Contractor and by the PIU at the stage of implementing the Contract in order to eliminate or limit the potential adverse environmental impact of the Works Contract (Chapter 6), including a tabulated summary of those measures (Appendix 1– Plan of Mitigation Measures),
- Description of monitoring measures at the stage of developing, implementing and operating the Contract (Chapter 7), including a tabulated summary of those measures (Appendix 2 – Plan of Monitoring Measures),
- Description of the course and of the results of public consultations on the stage of Contract preparation and on the stage of developing this EMP (Chapter 8);
- Description of organizational structure for implementation of the EMP (Chapter 9),
- Implementation schedule and description of reporting procedures (Chapter 10).

Appendices to the EMP for Contract include check lists of the Plan of Mitigation Measures (Appendix 1) and of the Plan of Monitoring Measures (Appendix 2), the list of national legal acts related to environmental protection (Appendix 3), the environmental decisions, resolution, permits, notes (Appendix 4), and drawings showing the location of the proposed Works Contract (Appendix 5), a map with location of the Contract in reference to protected areas and Natura 2000 sites (Appendix 6), a map with location of the Contract in reference to areas under potential flood threat (Appendix 7), a map with location of the Contract in reference to areas excluded from the potential flood threat (Appendix 8), and a map with location of the Contract's elements (Appendix 9).

A basis for the development of this EMP were the following materials: ESMF, PAD, POM, WB operational policies, Investment Information Sheets, decision of the Regional Directorate of Environmental Protection in Wrocław on refusal to initiate proceedings to issue a decision on environmental conditions, decisions of a water permit, opinion of the Conservator, and design documentation.

Need for Contract Implementation

The reason for implementation of the Contract is the need to increase flood safety and limit flood damage in the area situated along the left bank of the Odra River, and to protect developed areas and limit flood damage in the discussed area through reconstruction and sealing of the existing embankment (it will be necessary to demolish this section of the embankment and rebuild it). The embankment section at the same time serves as a public road. In the scope of the Contract, the road will be rebuilt from a road with a pavement made of granite cubes, 3.0 m wide, to street of technical class D, i.e. an access road with a width of 4.5 - 5.5 m and a one-sided walkway, 2.0 m wide.

The Contract comprises extension (the embankment body shall be extended) and modernization (execution of additional technical protections, e.g. anti-filtration protection) of the existing section of the Odra River flood embankment. The current technical condition of the embankment, its parameters and filtration reducing capabilities are insufficient.

The Contract will allow for the reconstruction of a section of the embankment that closes the backwater embankments of the Odra River "Maślice I" (left-bank embankment of the Ługowina River) and "Maślice II" (right-bank embankment of the Ługowina River).

The Works Contract in question was included on List no. 1 under item "ID 1_436_O" of Appendix no. 1 titled "Investments which do not adversely affect the achievement of good status of water or which do not deteriorate the status of water" to the MasterPlan for the Odra River Basin (2014). This contract was also included in item 114 - Appendix No. 1_ Final list of measures of the aFRMP¹ for the Odra basin, Flood Risk Management Plan (action code ANK_1_PL6000_p4BC_31).

Location of Contract

The Contract is located within Dolnośląskie Voivodship, district of the City of Wrocław.

Scope of Contract

The contract entitled: "Modernisation of flood embankment along Ślężoujście Street with road infrastructure" covers the expansion and sealing of a section of the Odra river embankment and the construction of a stand for mobile pumps for the time of a water surge, together with the reconstruction of Ślężoujście Street, a public road, approx. 500 m in length together with the construction of Potokowa Street and internal road 5KDW junctions. As part of the reconstruction, the demolition and construction of the embankment with the widening of its crest and sealing, as well as the demolition and construction of a passage on the Ługowina river (a left-bank tributary of the Odra river) were designed. At the embankment footing, on its water-side, from km 0+157 to km 0+386, a vertical cement-soil barrier will be constructed to a depth of approx. 5 m (to the top of the cohesive soil layer). On the embankment water-side slope, a sealing screen made of bentomat will be constructed in conjunction with this vertical barrier.

Moreover, under the developed Contract it is planned to redevelop or decommission and construct its dependant infrastructure (e.g. embankment exits) and to construct, redevelop, secure or decommission the existing road infrastructure, electrical, telecommunication, tele-technical, water supply and rainwater sewage systems and to construct the Municipal Technology Duct network.

¹ Actualization of Flood Risk Management Plan

The area of the developed Contract at its final stage will be recultivated by top-soiling and sowing with a mixture of grasses. Furthermore - in exchange for felled trees and shrubs - replacement plantings will be made in another location due to a lack of land to make such plantings directly within this Contract.

Current conditions of environmental elements surrounding the Contract

As a result of works done by the team of specialist to identify values of the natural and cultural environment during the development of the EMP and during earlier works associated with the development of environmental documentation (IIS) at the stage of obtainment of administrative decisions, it has been identified that the area located within the Contract implementation boundaries is characterized by the following local and supra-local conditions:

Contract implementation area:

- There are no species of plants under strict protection within the area of direct Contract impact, i.e. the embankment and the directly adjacent area,
- Protected natural habitats were not identified within the Contract area;
- Protected species of amphibians were not identified within the Contract area;
- Protected species of reptiles were not identified within the Contract area;
- Protected species of birds were not identified within the Contract area;
- Protected species of mammals were not identified within the Contract area;
- Neither chiropterologic research was done as a part of Contract preparation nor identification of fungi and lichens;
- The analyzed Works Contract is located beyond the legally protected areas on the basis of the Act of April 16, 2004 on nature protection;
- The analysed Contract is located within intensive prehistoric, medieval and modern settlement, in the area of archaeological site no. 10/9/79-28 AZP (settlement of the Przeworsk culture population, a trace of settlement of the Lusatian culture, a trace of prehistory settlement, a trace of late-medieval settlement). This area is treated as a monument pursuant to Article 3 Item 4, 12 in connection with Article 6 Clause 1 Item 3 of the Act dated 23 July 2003 on the protection and care of historical monuments, thus it is required to conduct rescue archaeological research.

Due to the applied restrictions with regard to land acquisition on the water-side as well as on the land-side of the embankment to be redeveloped, and due to mitigation measures, the works under the Contract will not have significant adverse impact on the environment and on cultural heritage.

This EMP was developed in accordance with the World Bank's operational policy OP 4.01. The EMP includes a plan of measures mitigating adverse environmental impact during the works, as well as a monitoring measures plan. The Plan of Mitigation Measures and the Plan of Monitoring Measures are included in Appendix 1 and Appendix 2 to this EMP.

Summary of the major adverse impacts during implementation of the Contract

Impact on earth surface, soils, and grounds

There will be no significant changes to either the topography or the use of the area as a result of the Contract implementation. After the Contract implementation the majority of the green areas will retain its current use. Minor land acquisition and interference in soil environment will only take place in a strip immediately adjacent to the existing embankment, due to the necessity to remove or at least to move the top layer of soil. The area

will be reinstated to its original condition on completion of the Works. There will be no significant adverse impact on the ground surface as a result of the Contract implementation. The permanent transformation of the ground surface and the landscape will only occur as a result of the necessary felling of selected trees and shrubs in the embanked area and in the area beyond the embankment, in the area of planned embankment body extension. However, those shall be minor modifications in view of general landscape perception.

Impact on air condition and climate

The source of impact of the analyzed Contract on the air will be the works involving construction equipment, vehicles and diesel machines causing emission of gas and dust pollutants, and as a consequence increasing the pollution rate in the air. The range of emission will correspond to the area of construction works and to the route of access roads and technological roads. Its scale will be subject to the number of vehicles and equipment used on the Construction Site, their working time, and also technical condition. It will also depend on the organization of Works (optimization of the use of equipment, performance), as well as the organization of the Construction Site and access roads (route optimization, location of site facilities). The emission shall have local and temporary character. It will completely cease at the completion of construction works. Small spatial reach of the Contract results in the fact that it shall not adversely affect local and regional climate conditions.

Impact on surface and ground waters

The Contract implementation will involve interference in the riverbed of the Ługowina River; due to the introduction of mitigating measures no direct significant impact on surface water is expected. The demolition and construction of a new passover will be associated with a short-term disruption of the water flow of this watercourse, but thanks to the proper organization of works, this flow will be possible all the time.

The impact may only result from failures causing incidental spills of fuel or other harmful substances (oil or grease), as well as from poorly organized water and sewage management, or improper collection and protection of waste, which may cause a release of pollutants into surface water.

Under the planned reconstruction of Ślężoujście Street, in order to collect rainwater off the street and its pavement (i.e. non-penetrating surfaces), it is planned to construct surface drainage elements: street inlets with settling tanks. Rainwater will be discharged through drains to the designed rainwater drainage system DN 250 - 300 mm. Inlet settling tanks will serve the purpose of purification and pre-treatment of rain and snowmelt waters. In addition, a settling tank will be installed at the outlet of the drainage system, which will also pre-treat collected rainwater prior to its discharge into the Ługowina river. Sedimentable pollutants from these facilities will be removed and disposed of by specialised service units.

The Contract will not involve direct discharge of sewage to surface water, will not cause disturbance to normal flow of water in nearby rivers, and will also not change the morphology of watercourses or still water reservoirs.

The Contract will not jeopardize the achievement of environmental objectives for bodies of surface water described within the frame of "Water Management Plan for the Odra River Basin" - Ługowina (PLRW6000231338).

At the stage of the construction works no significant adverse impact on the circulation or quality of groundwater is anticipated. It is not planned to mechanically lower the groundwater level or to carry out works which could significantly affect water conditions, e.g. through significant change in infiltration conditions. The activity which could affect water circulation is e.g. a sectional removal of top-soil, which remains one of the factors affecting infiltration of rainwater. However, the impact on the total hydrogeological condition will be minimal. Emission during the implementation stage of generally little amounts of pollutants to soil and water environment can only occur, when the Contractor fails to meet standard environmental protection requirements applied on the construction stage, e.g. improper storage of waste, improper sewage management at Site Facility, use of motor vehicles and construction machines and devices against their purpose or outside of designated areas (e.g. traffic of vehicles outside of designated roads, parking lots or maneuvering site) or as a result of exceptional events,

such as equipment failure, road accidents, adverse weather conditions or natural disasters. Maintaining environmental protection standards, H&S standards, as well as with the EMP recommendations, will not affect the quantitative and qualitative status of Body of Groundwater – BGW 109 during the Contract implementation. It will not jeopardize reaching the environmental objectives specified for bodies of groundwater under the "Water Management Plan for the Odra River Basin".

Impact on acoustic climate

The source of the acoustic nuisance on the contract implementation stage may be the construction works involving vehicles and equipment. They may occur only during the daytime, in the area limited to the Construction Site, its immediate vicinity, and roads used for transportation. Those nuisances shall not affect the health of the residents and of the land users; however, they may contribute to disturbance of animals in nearby habitats. There will be no permanent adverse impact changing the acoustic climate. The acoustic nuisance will cease at completion of the construction works.

Nature

Performance of the planned construction works is associated with the impact of Contract on vegetation and fauna. Impact of the Works Contract on fauna shall mainly result from the increased range of noise during the Works Contract implementation, what may cause temporary disturbing and scaring of animals. The most important potential threats to animals during the construction works include the loss of habitats due to land acquisition (habitats of invertebrates, birds, amphibians, reptiles, and mammals), what would be associated with felling of trees, shrubs and low vegetation necessary for the Contract implementation, as well as with direct disturbance of the active layer of soil, which would cause the loss of occupied habitats. Possible impact of the subject Works Contract on amphibian habitats and reptile habitats is related to the temporary limitation of their free migration and deterioration of the quality of the habitat due to interference in the Ługowina River bed (demolition and construction of the passover) and acquisition of land in the embanked area. An indirect impact might be the deterioration of the habitat quality due to possible pollution of some environmental components (soil, air).

The Contract implementation will not cause degradation of the natural layer of the river valley. It will not come to separation of new area of valley habitats from the riverbed. Use of the subject site in the river area and its immediate vicinity will practically not change as a result of Contract implementation. The river sides (of the Odra and Ługowina Rivers) and its surrounding areas will retain their biological functions.

Adverse impact on ichthyofauna is not anticipated due to substantial distance of the Construction Site from the Odra Riverbed. According to information from the Polish Angling Association, the district in Wrocław, the Ługowina River is not a place of fish species appearing.

As a result of implementation of the mitigation measures described in Appendix 1 to this EMP for Contract (Plan of Mitigation Measures), effects of all significant and foreseeable threats to the environment due to the Contract implementation shall be limited.

Impact on the cultural environment, archaeological sites

The analysed Contract, in the scope of planned construction and assembly works, is located within intensive prehistoric, medieval and modern settlement, in the area of archaeological site no. 10/9/79-28 AZP (settlement of the Przeworsk culture population, a trace of settlement of the Lusatian culture, a trace of prehistory settlement, a trace of late-medieval settlement). This area is treated as a monument pursuant to Article 3 Item 4, 12 in connection with Article 6 Clause 1 Item 3 of the Act dated 23 July 2003 on the protection and care of historical monuments, thus it is required to conduct rescue archaeological research as indicated by the Provincial Conservator of Monuments in the letter of March 22, 2019 (reference number WZA.5183.1240.2019, AWZ, rkp 7090-2019).

Health and Safety for People

The analyzed Contract does not generate significant risk for the health and safety of people. It may only occur in case of a failure or other random events, e.g. fire, leakage of pollutions, identification of unexploded shells and misfires, hazard for third parties related to the performance of construction works (e.g. excavations, traffic of machines and vehicles), flood risk, etc. This EMP determines proper conditions to prevent the occurrence of events of those types and to minimize potential effects.

Other ES hazards

Regardless of the ones listed above, such ES related types of issues or hazards as accidents and near misses, cases of sexual harassment or mobbing, cases of labour law violation, cases of sexually transmitted diseases, including HIV/AIDS, and others, may occur during implementation of the Works Contract. This EMP determines relevant conditions to prevent hazards of those types and to efficiently react to the cases of their occurrence.

Cumulative impact

In the area of this Contract, the construction of the "Potokowa Residence" housing estate is currently underway - completion of this investment is scheduled for the first quarter of 2022. This project is not associated with the occurrence of significant emissions or other significant environmental impacts, the scale of which would result in the possibility of significant threats for an abiotic or biotic environment, even in case of simultaneous performance of construction works with planned to realization Contract. Additionally, application of mitigation measures by Contractor in compliance with EMP in force shall allow for avoiding a risk of significant adverse cumulative impact, even in case of simultaneous performance of works in neighboring locations.

Summary of major adverse impact on the Contract's operational stage**Impact on earth surface, soils, and grounds**

In the course of operation there will be no physical interference in the embankment's structure. Periodic mowing of grass on the embankment's slopes and works associated with maintenance and conservation of public road on its crown will be the main maintenance actions. The embankment to be redeveloped shall not form a landscape dominant in terms of height. Implementation of the Contract shall not modify the land function, and shall neither affect the use method for surfaces within its boundaries nor in its vicinity.

Impact on air condition and climate

The only source of unorganized emission on the operation stage shall be diesel engines of the equipment (vehicles, mowers) used during periodic mowing of grass and vehicles traveling on a public road with an intensity resulting from the degree of urbanization of this area (only local traffic to residential areas). Due to the minor scale that emission will not affect the air quality significantly.

Impact on surface water and on groundwater

During the operational stage the Contract will not cause changes to the hydrological regime of Odra or other rivers. The Contract implementation shall not adversely affect the groundwater. Circulation of water shall not change in relation to the current state. The functioning of the flood embankment, including the necessary conservation and maintenance works, will not cause emission of pollutions to the ground and to surface water and groundwater, and will not pose other type of threat to the soil environment and to the water environment.

Acoustic impact

At periodical mowing of plants on slopes of the embankment, minor noise emission shall occur, and its source would be operations of devices applied for the purpose of those works. However, this emission shall not be nuisance. Road traffic will increase slightly due to the construction of an intimate housing estate in this area, while even without the Investment in question, this increase would have occurred. After the completion of the

Contract, the acoustic climate will improve thanks to the reconstruction of the public road surface from cobblestones in poor technical condition to asphalt surface.

Nature

No adverse impact on habitats or protected species of animals is anticipated on the operational stage due to periodic maintenance works, i.e. mowing of grass from embankment slopes or conservation and maintenance of the public road.

Impact on the cultural environment

Utilization of the embankment shall not affect historic objects adversely. The use of embankment itself is a positive impact increasing the safety level for the historic objects located in the areas protected against flooding.

Cumulative impact

The use of embankments shall not cause accumulation of adverse impacts.

Limiting adverse impact and strengthening of favorable impact

Main environmental impacts will take place over the time of the Contract implementation. During that time numerous measures shall be undertaken to mitigate or to eliminate adverse impact (Appendix 1 to the EMP–Plan of Mitigation Measures), aiming at the following:

- protection of the aquatic environment and soil against pollution (the use of efficient mechanical equipment, proper storage and handling of substances harmful to the environment, including oil products, such as fuels, lubricants, etc., provision of site facility and staff facility);
- protection against noise: works conducted only from 06.00 am to 06.00 pm, use of efficient construction equipment;
- removal of trees and shrubs (logging) only in the necessary range beyond the bird hatching season; in case additional logging would be necessary within the hatching period, the works may be performed under ornithological supervision only. In connection with the removal of trees, replacement plantings are planned to be performed on plot 25/3, AM 12, Złotniki precinct;
- application of proper protection of the trees growing close to the works;
- prior to the commencement of earthworks, within the indicated deadline, one shall inspect the occurrence of protected animal species, and the removed topsoil layer shall be placed beyond the work area – for application during reclamation works;
- in case of identifying seasonal migration of amphibians, apply solutions protecting against mortality (due to the works performed and the traffic of vehicles) of animals migrating to and from breeding grounds (e.g. fencing of habitats for amphibians on the side of performance area with fencing and moving the animals to the area beyond the Contract);
- at the stage of Contract implementation monitor barriers or traps, and transfer the animals to the area beyond the Contract.

Essential monitoring

The monitoring measures plan is specified in Appendix No. 2 to the EMP – Plan of Monitoring Measures. For the Contract due to its small scope and location outside the protected areas, the *RDOŚ resolution* was issued to refuse to initiate the procedure to issue a decision on environmental conditions due to the failure to exceed the threshold specified in the EIA Regulation; thus, they do not contain detailed environmental conditions. Two water permits and an opinion of the Provincial Conservator of Monuments were issued for the Contract.

Recommendations regarding environmental protection are included in the justifications of the water permit decisions and the Conservator's opinion. Those guidelines were informed in the *Plan of Monitoring Measures*. The monitoring measures plan will enable ongoing control over the proper implementation of all mitigation measures.

Conclusions from the review of possible social conflict

It is possible that there will be social conflicts arising due to e.g. inconvenience for residents of the surrounding areas mainly on the Contract implementation stage related to adverse impact of the construction works and transport (noise, vibration, air pollution). However, in general, the overriding objective of the Contract, which is the reduction of the flood risk including construction of a stand for mobile pumps during high water rises and improvement of communication conditions (road and pedestrian walkway that currently do not exist), which will be used by local residents, should compensate for any inconvenience during the construction stage. The negative effects of damage to the embankments occurring during the past floods and flooding of the floodplains will justify the economic aspect of the Contract and cause widespread social acceptance of the local authorities, residents, property owners and users of land, where or in the vicinity of which the construction works are or will be performed. The argument for the favorable attitude towards the Contract is also a very small interference in the natural environment.

Legal context of the Contract

This Contract does not qualify as projects that may have a significant effect on the environment, according to the *EIA Regulation*.

Upon the Investor submitted the Project Information Card, the Regional Director for Environmental Protection in Wrocław by the decision dated 25 January 2019 ref. no. WOOŚ.420.202.2018.KK.1 refused to initiate the proceedings on issuing the decision on environmental conditions for the Contract. As indicated in the justification, pursuant to the provisions of *the EIA Act*, the issuance of a decision on environmental conditions takes place prior to obtaining all the decisions listed in an enumerative manner in Article 72 (among which there is a decision on the permit to implement a road investment). Moreover, pursuant to the provisions of the aforementioned Act, obtaining a decision on environmental conditions is required for planned projects which can have significant effects on the environment, listed in *the EIA Regulation*.

The EIA Act provides a definition of the term "project" - it stands for intended construction operations or other interference with the environment involving a transformation or change in the use of land. Also extension, reconstruction or assembly of any implemented or completed project may require an EIA if the conditions specified in *the EIA Regulation* are fulfilled, including among others in case when such intended construction works cover extension, reconstruction or assembly of any implemented or completed project which can significantly impact the environment, apart from cases, when a part of such implemented or completed project, which undergoes changes or arises as a result of extension, reconstruction or assembly, does not reach the thresholds specified in the above-mentioned regulation, if such thresholds were specified.

Taking the above into account, it should be concluded that in order to obtain a decision on environmental conditions it is necessary for such planned works to be qualified as a project which can significantly impact the environment, in line with *the EIA Act* and *the EIA Regulation*. Only the fulfilment of the above-mentioned condition provides material and legal grounds for the competent authority to issue a decision on environmental conditions.

The investment under consideration may be considered as a project in line with Article 3 Clause 1 Item 13 of *the EIA Act*. However, due to its characteristics, i.e. a length of hard-surfaced road < 1 km, reconstruction of distribution water pipelines only, reconstruction of the inclusion of the Maślice II embankment into Ślężoujście

ENVIRONMENTAL MANAGEMENT PLAN

CONTRACT 1B.9 "MODERNISATION OF FLOOD EMBANKMENT ALONG THE ŚLĘZOUJŚCIE STREET WITH ROAD INFRASTRUCTURE"

Street only (together with its sealing and reconstruction of the existing passage on the Ługowina river), it cannot be qualified as a project which can significantly impact the environment, as specified in the EIA Regulation.

Draft for public consultation

1 Introduction

This paper covers the Environmental Management Plan (EMP) for the Contract 1B.9 entitled: "*Modernisation of flood embankment along Ślężoujście Street with road infrastructure*". This Contract has been included in the *Odra-Vistula Flood Management Project (OVFMP)* as a task aiming to eliminate the so-called hot spots (weak points) of flood protection in the city of Wrocław, which have still occurred upon the implementation of a part of the *Odra River Basin Flood Protection Project*, i.e. Re-development of the Wrocław Floodway System. The implementation of the *Odra-Vistula Flood Management Project* is co-financed by the International Bank for Reconstruction and Development (the World Bank) (Loan Agreement no. 8524 PL dated 10 September 2015), the Development Bank of the Council of Europe (Loan Framework Agreement no. LD 1866 dated 24 May 2016), the European Union and the State budget.

1.1 Odra-Vistula Flood Management Project

The main objective of the OVFMP Project is the protection of people living within flood plains in the area of selected parts of river basins of the greatest rivers of Poland – Vistula and Odra – against hazards provided by extreme flooding. The most urgent flood protection tasks were expected for implementation under the OVFMP.

The OVFMP Project consists of the following 5 Components:

- Component 1 – Flood Protection of the Middle and Lower Odra;
- Component 2 – Flood Protection of the Nysa Klodzka Valley;
- Component 3 – Flood Protection of the Upper Vistula;
- Component 4 – Institutional Strengthening and Enhanced Forecasting;
- Component 5 – Project Management and Studies.

Component 1 is divided into the following Subcomponents:

- Subcomponent 1A – Flood Protection of areas in Zachodniopomorskie Voivodeship;
- Subcomponent 1B – Flood protection on the Middle and Lower Odra;
- Subcomponent 1C – Flood protection of Słubice City.

Detailed information about the Project may be found in the Environmental and Social Management Framework published at e.g. websites of the World Bank² and of the Odra Vistula Flood Management Project Coordination Unit³. A detailed description of the Project is also given in the PAD⁴ and in the Project Operations Manual⁵.

The objectives of OVFMP also include the implementation of the Contract 1B.9 "*Modernisation of flood embankment along the Ślężoujście street with road infrastructure*".

The detailed objective of this Contract and complementary to the works carried out as part of the Modernization of the Wrocław Floodway System (part of the already completed ORFP Project⁶, which was also co-financed by

² <http://documents.worldbank.org/curated/en/717671468333613779/Poland-Odra-Vistula-Flood-Management-Project-environmental-and-social-management-framework>

³ <https://odrapcu.pl/en/project-ovfmp/documents/>

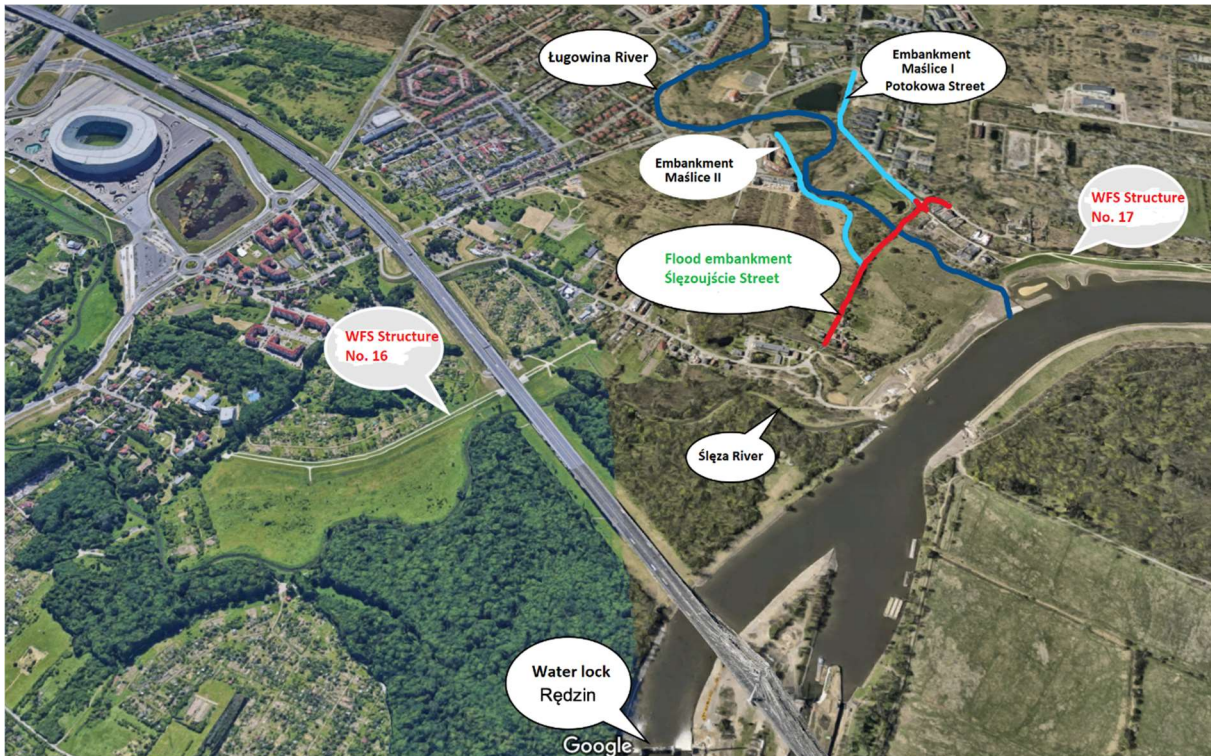
⁴ <http://documents.worldbank.org/curated/en/320251467986305800/Poland-Odra-Vistula-Flood-Management-Project>

⁵ <https://odrapcu.pl/projekt-opdow/popdow-dokumenty/> the binding English version if available at: <https://odrapcu.pl/en/project-ovfmp/documents/>.

⁶ <https://odrapcu.pl/en/project-orfpp/about-project-orfpp/>

the World Bank) is to improve flood safety in areas located in the north-west part of Wrocław (on the left side of the Odra River) between the hydrotechnical facilities rebuilt under Sub-Component B1 Modernization of the Odra embankments, Works contracts:

- Maślice - reconstruction of the embankment (WFS object No. 16)
- Pracze Odrzańskie - reconstruction of the embankment (WFS object No. 17).



Drawing 1. Location of the Contract on the background of completed under ORFPP WFS Contracts no. 16 and no.17.

Source: Application form for the task entitled "Modernisation of flood embankment along Ślężoujście street with road infrastructure"

2 Contract Description

The Contract 1B.9 entitled "*Modernisation of flood embankment along Ślężoujście Street with road infrastructure*" was included in the *Odra-Vistula Flood Management Project* as a complementary task.

The Contract covers the redevelopment of a section of the Odra river flood protection embankment together with the demolition and construction of a passage on the Ługowina river and the construction of a stand for mobile pumps. As the embankment also serves as a public road, the scope of works also includes road works.

The following operations are planned under the Contract:

a) hydrotechnical works

- demolition of the existing embankment and construction of a new one in Ślężoujście Street (the embankment along a section of approx. 500 m, serves both as a flood protection and road embankment, thus it is necessary to seal the embankment by setting up a vertical anti-filtration screen at its base and a slope seal made of bentomat),
- construction of a retaining wall with a length of approx. 50 m,

- demolition of the existing passage on the Ługowina river at km 0+376, the so-called "Ługowina floodgates", and then construction of a new frame passage with a cross-section of min. 2.0 x 2.0m and length of ~27m, together with the installation of flood closures,
- construction of a stand for mobile pumps,
- reconstruction of the inclusion of the Maślice II embankment into Ślężoujście Street together with its sealing,

b) road works

- extension of the municipal public road - Ślężoujście Street from the existing built-up area (from the side of Rędzińska Street) to Potokowa Street
- reconstruction of the junction with Potokowa Street,
- reconstruction of the internal road 5KDW.

Parameters of road routes:

Street 7 KD-D, 5 KD-D (Ślężoujście Street)

technical class D - access road

traffic category KR3

projected speed 50 km/h

semi-circular cross-section - roadway 4.50 ÷ 5.50 m wide

one-sided pavement, 2.20 m wide

Street 6 KD-D, 4KDW (Potokowa Street)

technical class D - access road

traffic category KR2

projected speed 50 km/h

street cross-section - roadway 5.00 m wide

Street 5 KDW

technical class - internal road

traffic category KR1

street cross-section - roadway 5.00 m wide

The total length of the reconstructed roads is approx. 617 m.

c) reconstruction of the conflicting and construction of the new infrastructure or its height adjustment

- reconstruction of distribution (not main) water supply networks:
 - W225 (next to the buildings no. 6-15), supplied from the city, with a hydrant at the end next to the plot no. 23, together with connections to the existing buildings. The network is in good technical condition, does not collide with the designed road system and there are no plans for its reconstruction; if necessary, the height of fittings and hydrants will need to be adjusted.
 - W150 in Potokowa Street, with hydrants and connections to buildings. Due to the changed geometry of the intersection of Ślężoujście Street with Potokowa Street, a section of the water supply line w160 will need to be reconstructed, along with a hydrant and connections to buildings. Planned length of the network reconstruction: ~ 70m. Additionally, it is planned to adjust the height of fittings and hydrants.
- height adjustment of gas network elements:

- g100 in Ślężoujście Street (next to the buildings no. 6-15), together with connections to the buildings, ending "at the level of" plot no. 23. An autonomous reconstruction of the existing gas pipeline to g160 with connections (a separate investment by PSG Sp. z o.o.) and reconstruction of the surface of the existing street is planned. Thus, as part of this road project, no reconstruction of the existing gas pipeline is planned, only adjustment of gas boxes at the connections (on the old or new gas pipeline).
- reconstruction of the sanitary sewerage network only in the scope of height adjustment of the existing chambers in adjustment to the new grade line of Ślężoujście Street:
 - ks250 (next to the buildings no. 6-15),
 - ks200, ks250 (in the area of Potokowa Street)
- construction of a rainwater sewage system:
At present, rainwater from Ślężoujście Street flows superficially into the adjacent area.

It is planned to build street inlets along the entire length of Ślężoujście Street with connection pipes discharging rainwater into the designed stormwater drainage system DN250-DN300. An outlet from the sewerage system to the Ługowina river is projected. A settling tank for suspended solids is planned in front of the outlet to the Ługowina river. The length of the planned stormwater drainage system will be approx. 550m.

- reconstruction and construction of street lighting:

As part of the extension of a road lane in Ślężoujście Street, it is planned to reconstruct the existing and construct a new road lighting system. Under the investment, lighting columns are to be placed on prefabricated reinforced concrete foundations sized 0.32 x 0.32 x 1.1m. In order to lay low-voltage lighting cables, linear ditches 0.6 m deep and 0.4 m wide will be dug within the pavement line, as well as linear ditches 1.1 m deep and 0.4 m wide under the roadways.

- construction of a telecommunications network - Municipal Technological Duct:

Along the entire route of the reconstructed road system, a telecommunications network of the Municipal Technological Duct is scheduled. The construction of this Duct will be made under the Wrocław City Hall standards;

- reconstruction of telecommunications networks:

Reconstruction and protection of the Orange Polska S.A. network within Ślężoujście Street and Potokowa Street, including the reconstruction of copper cables in the sewage system. Colliding sections of the canals and earth cables are scheduled for dismantling.

An overriding objective of Contract is to improve flood safety for the areas within Odra River valley, i.e. for the City of Wrocław, especially due to the observed and forecasted climate changes in Europe.

The Project Implementation Unit (PIU) for the Contract is the President of Wrocław, operating through its organizational unit, which is the Road and City Maintenance Authority in Wrocław with its office at 49. Długa Street, 53-633 Wrocław.

According to the Contract Works schedule, the planned Contract's implementation time is about 12 months.

2.1 Contract Location

Planned Contract 1B.9 is located in Poland, within Dolnośląskie Voivodship, in the area of the City of Wrocław (District of the City of Wrocław).

Location of Contract is presented on a figure given below (Drawing 2) and in graphical Appendix no. 5 – Map with Contract Location.



Drawing 2. Contract Location

Source: IIS

The area of Contract covers forest and meadow land with low and high greenery (shrubs and clumps, rows of trees). There currently are (in accordance with extracts from land registers): permanent pastures (PsIV, PsV), land with trees and shrubs (LzIV, Lz-PsIV) and arable land (RIIIb, RIVa, RIVb), various areas (Tr), land under flowing surface water (Wp), land under standing surface water (Ws), roads (dr), ditches (W) and construction areas (Bp, Bi).

2.2 Characteristics of the Contract

The planned Contract is included at the List no. 1 under "ID 1_436_O" in Annex no. 1 entitled "*Investments with no negative impact on the achievement of good water status or deterioration of water conditions*" to the Master Plan for the Odra River Basin Area (2014)⁷. It is also indicated in the Flood Risk Management Plan in Appendix 1 titled "*Final list of measures / Flood risk management plans for the Odra river basin*" in Item 114. This document has currently been undergoing public consultation. Its adoption for implementation by the regulation of the Council of Ministers is planned for the 1st / 2nd quarter of 2022.

The Contract in question covers the reconstruction and extension of the left embankment of the Odra river together with its connection to the backwater embankments within the Ługowina river (Maślice I and Maślice II). This embankment fulfil and will continue to fulfil the function of flood protection for the following floodplains:

⁷ Master Plans for the Vistula and Odra basins area are based on the arrangements with the European Commission, which led to the Poland's adoption of the "Action Plan for strategic planning in water management" (Resolution of the Council of Ministers dated 2 July 2013 no. 118/2013).

Such Master Plans complemented the valid water management plans since their update in 2015, and then their results in terms of investments having or likely to have an impact on the status of water bodies, were transferred to the updated water management plans (adopted by the Regulation of the Council of Ministers of 18 October 2016. [Journal of Laws, item 1967]).

two large housing estates of Maślice and Pracze Odrzańskie in Wrocław. At the same time, the embankment also serves as a public road for Ślężoujście Street and will do so in the future. This Contract aims to increase a level of flood protection of the behind-embankment area.

Although the ordinate of the embankment crest is safe, its construction is inadequate to fulfil flood protection functions - the structure built in 1903 is "worn out", with outdated construction technology (loose embankment), lacking stability and tightness. Moreover, the structure is made of permeable soils which cannot be compacted to the parameters required by the current technical standards for hydraulic embankments holding flood protection functions. As there is no effective technical method to ensure an appropriate degree of compaction of the embankment (its body and subsoil), its comprehensive reconstruction is required, along with the construction of a new flood protection closure of the Ługowina river.

As part of the reconstruction and extension of the embankment, the existing embankment is scheduled⁸ to be demolished and a new one constructed, along with its sealing by means of a vertical anti-filtration barrier made at the embankment base plus slope sealing. On the embankment water-side slope, a sealing screen made of bentomat will be constructed in conjunction with this vertical barrier. There are plans to demolish the existing passage and construct a new one on the Ługowina river at km 0+376 of its course. A stand for mobile pumps will be constructed on the redeveloped embankment crest. Hydraulic works will be conducted within approx. 500 m. The length of the reconstructed roads is approx. 626 m.

The works will be performed between the mid-embankment and the behind-embankment. The location of all the facilities will remain in the same places where they are today.

The primary scope of such works will cover earthworks related to the demolition and construction of the embankment. They will mainly include:

- removal of the top layer of soil (humus) off the slopes and the line of land adjacent to the embankment in order to separate humus from the soil which the embankment has currently been built of; humus will be used for finishing works and land reclamation;
- demolition of granite blocks and substructure under the municipal road, Ślężoujście Street, located at the embankment crest;
- demolition of the existing embankment;
- demolition of the culvert and construction of a new one;
- construction of a barrier in the ground;
- execution of earth-based embankment in layers with the compaction of soil layers to the designed level;
- placement of bent-mats;
- completion of embankment;
- placement of a transition layer made of mineral soil;
- placement of a top-soil (humus) layer with a mixture of grasses sown;
- organisation of the construction site: places for storing materials / dug-out soil, preparation of technological roads for construction vehicles and social facilities for construction workers;
- performance of road works;
- reconstruction of colliding locations and construction of new infrastructure or its height adjustment.

⁸ The characteristics of the Works Contract set out in this Environmental Management Plan are given for reference only and do not replace the design documentation. The Contractor is obliged to perform the works in line with the design documentation and the Technical Specifications applicable to individual industry fields.

The communication system within the embankment is made by a public, municipal road, Ślężoujście Street. Currently, it is a road with a granite block surface, from which rain and snowmelt waters flow freely onto the surrounding area. Once the embankment is widened, the street with a sealed surface and a one-sided pavement will be rebuilt, thus it will be necessary to build a rainwater sewage system to collect rain and snowmelt waters. These waters will be treated in a settling tank prior to being discharged into the receiving body, i.e. the Ługowina river.

As a result of increasing the embankment cross-section (its widening) local reconstruction or protection works within the infrastructure such as: power lines, tele-technical lines, gas, water supply, sewage and heating systems will be necessary. All intersections and exits with Ślężoujście Street will also be rebuilt.

The above-mentioned elements of the Contract and their location are presented graphically in Appendix 10 to the EMP.

Draft for public consultation

3 Institutional, legal and administrative conditions

3.1 Institutions involved in implementation of the Contract

The institution responsible for the Contract implementation/co-financing under OVFMP is State Water Holding Polish Waters in Warsaw represented by the Director of Regional Water Management Authority in Wrocław with its office at 34. C. K. Norwida Street, 50-950 Wrocław, acting for and on behalf of the State Treasury.

The investor/ the substitute investor for the Contract is President of Wrocław on behalf of which the Road and City Maintenance Authority in Wrocław (ZDiUM) operates. This unit is responsible for the development of project documentation and obtaining the required administrative decisions, the development of documents required by the operational policies of the World Bank (e.g. EMP), selecting the Works Contractor, and then carrying out investment supervision until the completion of the Contract 1B.9 in accordance with the procedures and standards functioning in OVFMP.

Additionally, on the stage of performance and of operation, implementation of the Contract may require involvement of public administration units on central, regional, and local levels. For the purpose of ongoing coordination for Project implementation the Odra-Vistula Flood Management Project Coordination Unit was assigned.

3.2 Binding Polish law acts with regard to the environment

In accordance with the Polish Law the investment process related to environmental protection remains a subject of several acts and regulations. A summary of selected, basic legal acts binding in case of environmental protection has been presented in Appendix 3 to this EMP – List of national legal acts related to environmental protection. The number and contents of legal acts given in Appendix 3 may be modified along with adjustments to environmental protection provisions valid in the territory of Poland. The Contractor is also obliged – except for application of rules determined under this EMP – to apply valid provisions of law in the scope of environmental protection.

3.3 EIA procedure in Poland

The description of the EIA procedure in Polish legislation is included in the Environmental and Social Management Framework (ESMF) published on the i.a. web pages of the World Bank (WB)⁹ and of the Odra-Vistula Flood Management Project Coordination Unit¹⁰.

3.4 World Bank requirements

The discussed Contract shall be co-financed by the International Bank for Reconstruction and Development (World Bank). As a consequence, the conditions of its implementation, with regard to environmental protection, are compliant with the following policies of the World Bank¹¹:

- OP 4.01 – on the environmental impact assessment,
- OP 4.04 – on natural habitats, and
- OP 4.11 – on the physical cultural resources.

⁹<http://documents.worldbank.org/curated/en/717671468333613779/Poland-Odra-Vistula-Flood-Management-Project-environmental-and-social-management-framework>;

¹⁰ <https://odrapcu.pl/projekt-opdow/o-projekcie-popdow/>

¹¹ <https://policies.worldbank.org/sites/PPF3/Pages/Manuals/Operational%20Manual.aspx>

The Bank requires Environmental Assessment (EIA) of projects proposed for Bank support to ensure that they do not have, or mitigate potential negative environmental impacts. The EIA is a process where reach and type depend on the nature, scale, and potential environmental impact of the proposed project. The EIA evaluates a project's potential environmental impact in its area of influence; examines project alternatives; identifies ways of improving project selection, siting, planning, design, and implementation by preventing, minimizing, mitigating, or compensating for adverse environmental impacts and enhancing positive impacts; and includes the process of mitigating and managing adverse environmental impacts throughout project implementation. The EIA takes into account the natural environment (air, water and land); human health and safety; social aspects; and cross-border and global environmental aspects. The Borrower is responsible for carrying out the EIA and the Bank advises the Borrower on the Bank's EIA requirements.

The Bank classifies the proposed projects into three major categories, depending on the type, location, sensitivity, scale of the project and the nature and magnitude of its potential environmental impacts.

- **Category A:** The proposed project is likely to have significant adverse environmental impacts that are sensitive, diverse, or unprecedented. These impacts may affect an area broader than the site or facilities subject to physical works.
- **Category B:** The proposed project's potential adverse environmental impacts on human population or environmentally important areas – including wetlands, forests, grasslands, or other natural or semi-natural habitats – are less adverse than those of Category A projects. These impacts are site specific; few if any of them are irreversible; and in most cases mitigation measures can be designed more readily than Category A projects.
- **Category C:** The proposed project is likely to have minimal or no adverse environmental impacts.

As regards categories A and B, EIA has to allow for public consultation with public affected by the implementation of the project and with NGOs in the scope of environmental aspects of implementation of the Project. The Borrower initiates consultation at the earliest possible stage and the consultation continues throughout entire implementation of the project.

Detailed description of the aforementioned World Bank policies is included in the Environment and Social Management Framework ESMF published on the i.e. websites of the World Bank and of the Odra-Vistula Flood Management Project Coordination Unit.

The Contract 1B.9 is an element of a category B Project which does not generate a significant adverse environmental impact, and all negative effects of the Project are reversible.

3.5 The current condition of EIA procedures for the Contract

The contract does not qualify for either of the two groups of projects, i.e.:

1. projects which can always significantly affect the environment, or
2. projects which can potentially significantly affect the environment, or

under the meaning of the classification resulting from the *EIA Regulation*. Its scope and scale of impacts led the Regional Director for Environmental Protection in Wrocław, upon the Investor submitted the Investment Information Sheet, to issue a decision dated 25.01.2019, ref. no. WOOŚ.420.202.2018.KK.1 refusing to initiate the proceedings on issuing a decision on environmental conditions. As the RDOŚ indicated in the justification, quotation (...) pursuant to the provisions of *the EIA Act*, the issuance of a decision on environmental conditions takes place prior to obtaining all the decisions listed in an enumerative manner in Article 72 (among which there is a decision on the permit to implement a road investment). Moreover, pursuant to the provisions of the aforementioned Act, obtaining a decision on environmental conditions is required for planned projects which can have significant effects on the environment, listed in *the EIA Regulation*.

The EIA Act provides a definition of the term "project" - it stands for intended construction operations or other interference with the environment involving a transformation or change in the use of land. Also extension, reconstruction or assembly of any implemented or completed project may require an EIA if the conditions specified in *the EIA Regulation* are fulfilled, including among others in case when such intended construction works cover extension, reconstruction or assembly of any implemented or completed project which can significantly impact the environment, apart from cases, when a part of such implemented or completed project, which undergoes changes or arises as a result of extension, reconstruction or assembly, does not reach the thresholds specified in the above-mentioned regulation, if such thresholds were specified.

Taking the above into account, it should be concluded that in order to obtain a decision on environmental conditions it is necessary for such planned works to be qualified as a project which can significantly impact the environment, in line with *the EIA Act* and *the EIA Regulation*. Only the fulfilment of the above-mentioned condition provides material and legal grounds for the competent authority to issue a decision on environmental conditions.

The investment under consideration may be considered as a project in line with Article 3 Clause 1 Item 13 of *the EIA Act*. However, due to its characteristics, i.e. a length of hard-surfaced road < 1 km, reconstruction of distribution water pipelines only, reconstruction of the inclusion of the Maślice II embankment into Ślężoujście Street only (together with its sealing and reconstruction of the existing culvert on the Ługowina river), it cannot be qualified as a project which can significantly impact the environment, as specified in *the EIA Regulation*. (...)

The Investment Information Sheet was prepared upon field reconnaissance of the Contract site by a team of specialists with appropriate professional background and experience. A classic nature inventory was not prepared in terms of collection, analysis and presentation of information on the natural environment and its elements, which would form grounds for the assessment of the impact on them. However, it is worth emphasising that the detail and scope of the collected data made it possible to characterise the Contract and its impacts on the environment which raised no doubts of the Environmental Protection Authority running the proceedings.

A copy of the aforementioned resolution was included in Appendix 4 to the EMP for the Contract - Decisions, resolutions, permits and other documents.

The environmental impact assessment procedure for the Contract proceeded as follows:

The Regional Director for Environmental Protection in Wrocław received an application submitted by Ms Dorota Wolińska-Janosz, a representative of the Road Management and Maintenance Authority in Wrocław acting on behalf of the Investor, i.e. the President of Wrocław, dated 17.12.2018 regarding the issuance of a decision on environmental conditions for the implementation of the project consisting in the extension of Ślężoujście Street from Rędzińska Street to Potokowa Street in Wrocław.

The Regional Director for Environmental Protection in Wrocław, having examined the case, issued a decision ref. no. WOOŚ.420.202.2018.KK.1 of 25.01.2019 on refusing to initiate proceedings to issue a decision on environmental conditions.

The parties were entitled to lodge an appeal against this decision to the General Director for Environmental Protection through the Director for Environmental Protection in Wrocław within 7 days from the date of its receipt. During the period in question, neither party lodged a complaint.

3.6 Grievance redress mechanisms

All project affected persons (PAPs) will have access to adequate and accessible grievance redress mechanisms. Everyone has the right to file a complaint or motion. Filing complaints or motions is not subject to fees. Furthermore, in accordance with the regulations, the person filing a complaint or request may not be exposed to any damage or allegation on account of such submission.

Complaints and motions may be submitted in written, electronic and oral form to the minutes. They may be submitted directly to the headquarters of:

- Zarząd Dróg i Utrzymania Miasta in Wrocław, mailed to the address (49. Długa Street, 53-633 Wrocław) or via e-mail to: zdium@zdium.wroc.pl.
- PGW WP RZGW in Wrocław, mailed to the address (34. Norwida Street, 50-950 Wrocław) or via e-mail to: JRPWroclaw.OPDOW@wody.gov.pl.
- Directly in the office on the construction site (the address of this office will be announced on the website of the Works Contract before starting work).

Complaints and motions shall be archived by the receiving entity in a separate register, with the dates of their submission, dates of providing answers and the method of resolving.

The complaint or motion will be reviewed immediately, which means that an official notice of how the complaint or request will be handled must be given to the party without undue delay. Such a notice shall include the identification of the entity from which it originates, an indication of how the complaint has been handled and a signature stating the name, surname and official position of the person authorized to handle the complaint or motion.

In the case of a refusal to settle a complaint, the person submitting the complaint or motion shall be informed in an exhaustive manner about the causes for the refusal.

More information on Grievance redress mechanisms employed for projects co-financed from World Bank funds can be found in the Odra-Vistula Flood Management Project Operations Manual (POM)¹² available on the website of the Project Coordination Unit:

<https://odrapcu.pl/en/contact/>

bookmark on this website "Complaints and requests".

¹² <https://odrapcu.pl/en/project-ovfmp/documents/>

4 Description of environmental elements

4.1 Land surface and landscape

According to the physical and geographical regionalisation by Kondracki (2001), the Contract is located in the following physical-geographical units of Poland:

Province: Central European Low (Lowlands)

Sub-province: Central Polish Lowlands (318)

Macro-region: Silesian Lowland (318.5)

Mesoregions: Wrocław Proglacial Valley (318.52)

Oleśnica Plain (318.56).

The area in question is situated in the Wrocław Proglacial Valley and in the southern part of the Oleśnica Plain. The Wrocław Proglacial Valley neighbours the Wrocław Plain in the south and covers the area from Krapkowitz to Lubiąż. Its length is about 100 km and its width reaches 12 km.

The location of the Contract against the background of the physical-geographical units is shown in the figure below (Drawing 3).



Drawing 3. Location of the Contract 1B.9 in reference to physical and geographic units

Source: own materials based upon Kondracki J.: *Geografia regionalna Polski*, Wydawnictwo Naukowe PWN, Warsaw 2001

The Wrocław Proglacial Valley is a major element in the landscape structure of Lower Silesia both because of its considerable area and the fact that it is particularly exposed to the only significant threat in Central Europe due to natural processes, i.e. catastrophic floods. The 1997 flood in the upper and middle Odra basin showed that the maximum extent of flooding during high-level floods in historic times basically coincides with the extent of Holocene river sediments. This means that the valley floor is at risk of flooding across its entire width. This is indirectly evidenced by the micro-structure of the valley floors, consisting of a system of oxbow lakes, paleo-meanders and meander sandbanks, which also determines the local variability of soil cover, vegetation and land use. The groundwater level here often makes it impossible to grow crops. Hence the landscape of the Lower

Silesian proglacial valley is a mosaic of pastures, alders and marshy riparian forests, interspersed with elements of flood control infrastructure.

4.2 Climate

The climate of the region is marked by the characteristics which are typical to transitional climate of mid-latitudes. Clashing oceanic and continental flows cause wide climate variability, which is characterised by frequent changes of weather conditions. In addition there are climatic phenomena such as islands of heat, precipitation as well as bioclimatic diversification which is typical to large urban and industrial agglomerations. They are due to the change of physical characteristics resulting from the manner of management and usage of urban lands.

The Odra river, which dominates the landscape, together with its distributaries, channels, oxbow lakes and floodplains (a total of 54.5 km long within the city limits) forms the key ecological axis of the city's spatial layout in an east-west direction. This feature and 12 islands make Wrocław an exceptional city in Poland in terms of climate. The climatic conditions of the specified area are significantly affected by the Sudety Foothills area and partly the Sudety Mountains in the south and the Trzebnickie Hills in the north. The city's location in the Odra Valley and in the foreland of the Sudety Mountains gives it a thermal advantage, known as the "Wrocław-Opole heat area".

Meteorological conditions for the city of Wrocław in 2020 (Institute of Meteorology and Water Management, 2020):

- average annual temperature - 10.6°C,
- annual precipitation in the region in 2020 - approx. 800 mm
 - anomalies of annual precipitation totals in 2020 relative to the reference period (1981-2010) - at the level of approx. 125%.

4.3 Air quality

Rate of air pollution depends on the volume of emission for emitters located within a particular area, inflow of pollutions from other area, climate and meteorological conditions, and land development and lay of land.

The main source of air pollution within the city is so-called anthropogenic emission resulting from actions of human. Anthropogenic emission includes both: emission from power and industrial plants, as well as low emission from communal units (boiler-plants, individual domestic furnaces, and private plants) and traffic emission.

Main pollution sources in the area of Wrocław are as follows (GIOŚ, 2020):

- Emission of pollutants from the municipal and housing sector (emission of gases and dusts from individual domestic furnaces and boiler-plants forming a central source of heat supply);
- Emission of pollution associated with traffic;
- Local sources (e.g. thermal-electric power station) and neighboring industrial areas: pollutions coming from Wałbrzych and Legnica.

Data given in *Annual Assessment of Air Quality in Dolnośląskie Voivodship – Provincial Report for 2020*, as developed by the WIOŚ Wrocław, proves that:

- average annual concentration of sulphur dioxide (SO₂) in Wrocław and in Dolnośląskie Voivodship in 2020 was on low level. As a consequence, according to the classification adopted for the Dolnośląskie Voivodship, as well as for the Agglomeration of Wrocław, both were qualified to Zone A – zone, where there is no exceedance of acceptable values,

- concentration of nitrogen dioxide (NO₂) exceeds the permissible level only at the measuring station in Wrocław Agglomeration, whereas in case of other stations the concentration is within the standard values; thus, the Agglomeration of Wrocław was qualified to Zone C – zone, where concentration of a given substance exceeds the permissible level;
- concentration of CO – concentration of CO within the voivodship was much smaller than the acceptable level (10 mg/m³), as determined by maximum 8 hours concentration basing upon sliding average. The entire voivodship, along with the Agglomeration of Wrocław, was classified as Zone A;
- concentration of benzene has not exceeded permissible values in any of analyzed stations – the voivodship, along with the Agglomeration of Wrocław, was classified as Zone A;
- Ozone – based upon the results of measurements done from 2016 to 2018 as well as 2020, exceedance of permissible number of days (25 days) with values beyond the acceptable volume of ozone was not identified in the Agglomeration of Wrocław. As a consequence, the Agglomeration of Wrocław was classified to Zone A;
- PM10 – the acceptable frequency of exceeding the permissible level of daily concentration in 2020 was exceeded at most of the measurements station, what formed a basis for qualifying the voivodship, as well as the Agglomeration of Wrocław to Zone C. The tests done proved that year after year (from 2010 to 2020) the average annual concentration of PM10 drops significantly for all measurement stations;
- annual concentration of PM2.5 particulates - at all measurement stations, the annual dust concentrations were lower than the target level, which was classified as zone A in the Voivodeship together with the Wrocław Agglomeration;
- average annual concentration of benzo(a)pyrene of over 1 ng/m³ occurred in case of all measuring stations within the voivodship (Zone C). The area of exceedance includes the Voivodeship together with the Agglomeration of Wrocław. The main reason for occurrence of concentration of benzo(a)pyrene beyond standards is emission associated with individual heating for buildings;
- annual concentration of metals: lead, arsenic, cadmium, and nickel in suspended particulates PM10 in the Agglomeration of Wrocław is on low level not exceeding the permissible rate and the target value. The Agglomeration of Wrocław was classified as Zone A.

In terms of protection of health the Agglomeration of Wrocław exceeds values for the following substances in the air: nitrogen dioxide, suspended particulates PM10, benzo(a)pyrene in suspended particulates PM10.

4.4 Soils and grounds

Currently the area beyond the embankment forms a mosaic of trees, forest areas, meadows (recreation area for residents) and developed sites (housing). However, the embanked area is mainly formed by agricultural land (pastures, meadows and wastelands with local groups of trees and shrubs).

Alluvial soil formed by alluvial sediments is mainly present within Contract. In case of this area we can find light loamy alluvial soils (very fertile) mainly, but there locally are some soil-less sandy sites. Turf peat and boggy soils and glial and loam glial soils were formed in land pits and in holding fluvial terraces.

In accordance with the land register, the areas where Contract is to be implemented are classified as permanent pastures (PsIV, PsV), afforested and shrubbed areas (LzIV, Lz-PsIV) and arable land (RIIIb, RIVa, RIVb), various areas (Tr), and grounds underneath flowing surface waters (Wp), roads (dr), ditches (W) and building areas (Bp, Bi).

4.5 Surface water

The Contract is located in the middle Odra river basin and the area is managed by the SWH PW Regional Water Management Authority in Wrocław. Within the section of the Odra river under consideration, Ślęza and Bystrzyca rivers, its left-bank tributaries, are the largest tributaries. The Ługowina river is definitely a smaller watercourse.

This is a tributary of the Odra river, joining it at km 261.9 in the housing estate in Maślice Małe, According to the Hydrological Partition Map of Poland (2013), the basin area is $A = 28.577 \text{ km}^2$ and the total length is approx. 17 km. The above data, however, is not consistent with the facts, because as a result of the construction of the Strachowice airport, the southern part of the Ługowina basin area was "cut off" and joined the Ślęza basin. Currently the basin area of the Ługowina river at its estuary is $A = 14.5 \text{ km}^2$.

The Contract is located within the following Body of Surface Water - BSW Ługowina (PLRW6000231338). In conformity with currently binding Water Management Plan for waters within the Odra River Basin (Water MP), as approved by the Regulation of the Council of Ministers of October 18, 2016 (OJ of 2016, item 1967), specificity of BSW in the area of the analyzed Works Contract is as follows:

Ługowina (PLRW6000231338):

- BSW type: a stream or a stream in an area under the influence of peat-forming processes (23),
- Status: heavily modified body of water,
- Is it monitored: yes,
- Assessment of the current status (2016): bad,
- Risk assessment for not obtaining the environmental objective: not threatened,
- Derogations: no,
- Deadline for achievement of good status: 2015,
- Environmental objective: good ecological potential and good chemical status.

Implementation of the planned Contract is not related to the interference in the Odra River Bed, but it has a direct impact on the Ługowina River Bed (demolition of the existing one and construction of a new passage, construction of a rainwater sewage system at Ślęzoujście Street and its introduction into the Ługowina River). Due to the mitigation measures, the Contract therefore does not affect the morphological continuity of the rivers, and it shall also not effect in impact on hydro-morphological and biological elements. The planned works do not involve any condition that can justify derogation nor discharge of sewage to surface water (rainwater and snowmelt introduced from the pavement of Ślęzoujście Street will be cleaned before discharge to the Ługowina River). No impact is expected on the achievement of environmental objectives for mentioned body of surface water.

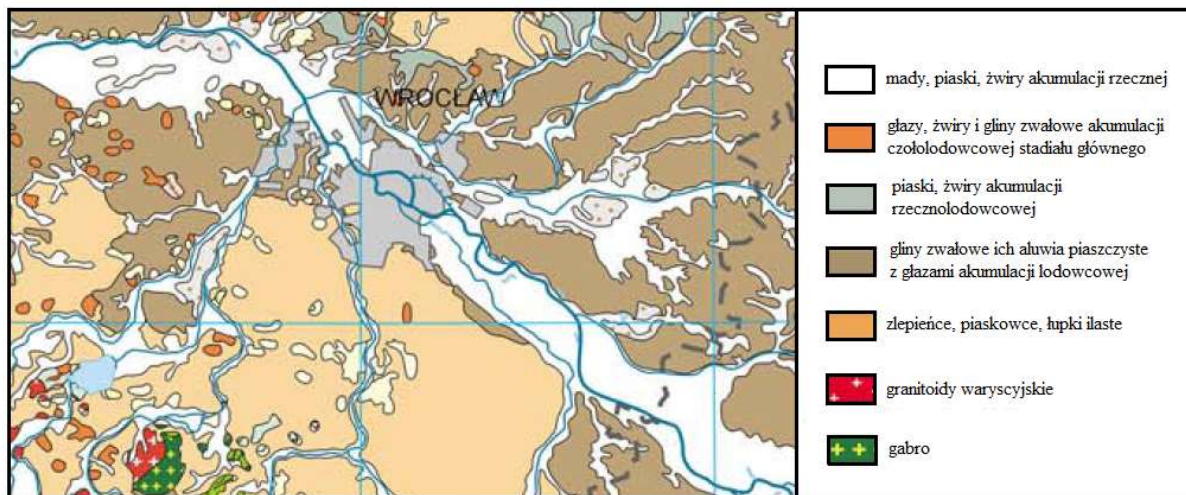
4.6 Groundwater

Geological formation and hydrogeological conditions

The Wrocław region is located at the border of two large geological units. The older one is formed by the Pre-Sudetic Block extending to the north-east of the Sudety Mountains between the Sudety margin fault and the middle Odra faults. This block is formed by a series of Proterozoic-Palaeozoic crystalline rocks exposed on the surface in the form of the Ślęza, Strzegom-Jawor and Strzelin massifs. The second unit is made by the Fore-Sudetic Monocline built of the Permian-Mesozoic series of sedimentary rocks. The boundary between the above units is

formed by the fault area of the middle Odra river. Both these units are covered by a complex of Cenozoic Tertiary and Quaternary sediments.

The today's Odra Valley with its floodplain terraces was finally formed during the Last Glaciation. The Holocene complex is made of sand- and gravel-based floodplain terraces sediments. Medium and coarse sands with admixtures of organic particles dominate here (occasionally layered with silt, fine or clayey sands). Minor hollows or patches of dusty clays can be found here subordinately. Their largest spread occurs at places where at the surface rests a layer of dusty, alluvial mud-based clays with its thickness of around 0,5 m.



Drawing 4. Geological formations in the Odra valley

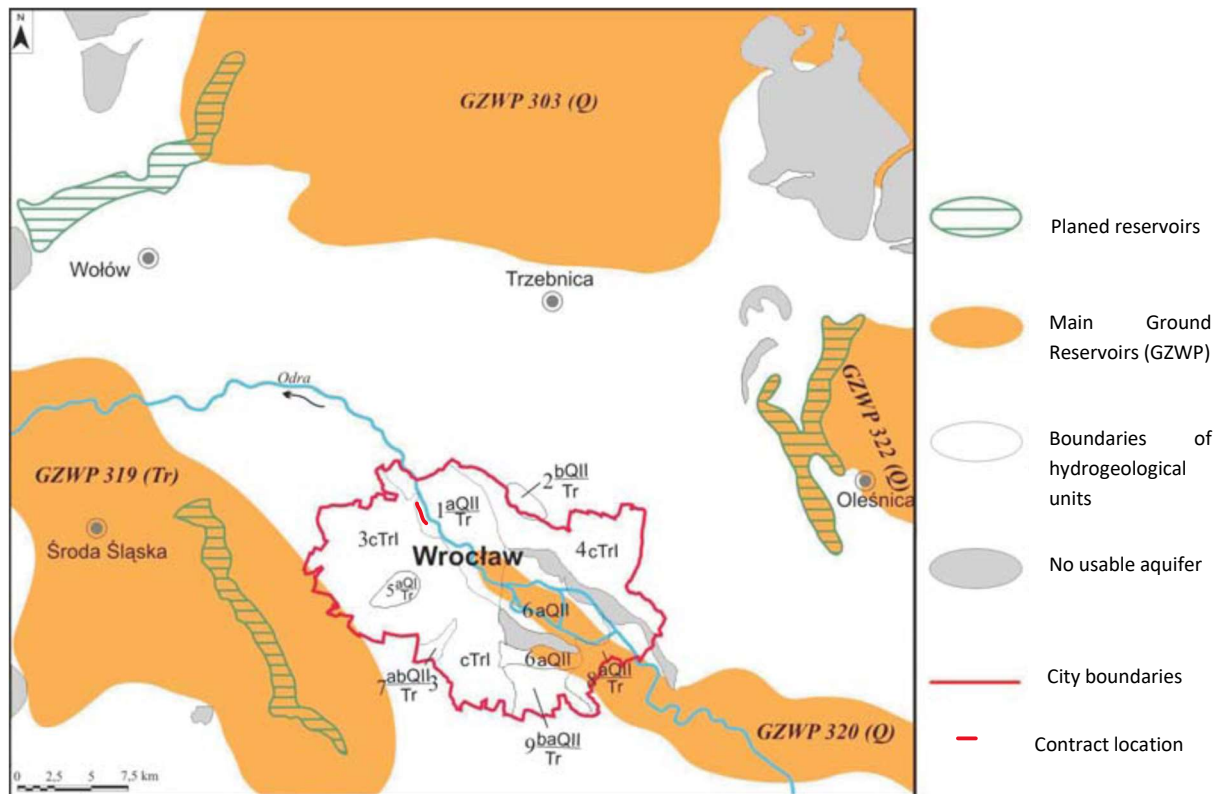
Source: Geological map of Poland

Subsoil research studies and geophysical surveys conducted in 2012 indicate that the embankment body is made by discontinuous sand and clay layers. Within the culvert on the Ługowina watercourse in the embankment there are organic soils with the characteristics of clayey silts. The water permeability levels of soils embedded in the embankment are 4.47 to 5.35 m/day for sands, $3.12 \cdot 10^4$ m/day for clays. A level of soil compaction in the embankment and the subsoil was determined to be at $J_d = 0.50$. The applicable requirements for a level of compaction of hydraulic embankments for class-I and class-II structures is as follows: $J_d \geq 0.95$. Therefore, the embankment and the embankment base do not fulfil the compaction criterion.

The analysed Contract is located beyond the Main Underground Water Reservoirs for the Wrocław area:

- Main Underground Water Reservoir no. 319 - the Prochowice-Środa sub-reservoir;
- Main Underground Water Reservoir no. 320 - the Odra Proglacial Valley;
- Main Underground Water Reservoir no. 322 - the Oleśnica Reservoir (Kleczkowski, 1990; Skrzypczyk, 2004).

Location of the Contract in reference to MGR is presented on the drawing given below.



Drawing 5. Location of the Contract 1B.9 in reference to MGR

Source: *Groundwater in voivodeship capital cities of Poland*, edited by Zbigniew Nowicki, Informator of the State Hydrogeological Service, Warsaw, 2007

Bodies of groundwater

Division of the area of Poland into bodies of groundwater in the process of implementation for the Water Framework Directive is subject to modifications. The current version of the division contains 172 bodies and 3 sub-bodies, and is valid from 12/31/2016. The analyzed Contract is located in the Body of Ground Water BGW 109 (European code: PLGW6000109) the area 4258,3 km².

The Water Management Plan for waters within the Odra River Basin (Water MP), as approved by the Council of Ministers on October 18, 2016 (OJ 2016, item 1967), evaluates the quantitative status and the chemical status for BGW 109 as good. In terms of risk of not achieving environmental objectives under the plan, units no. 109 was defined as not at risk.

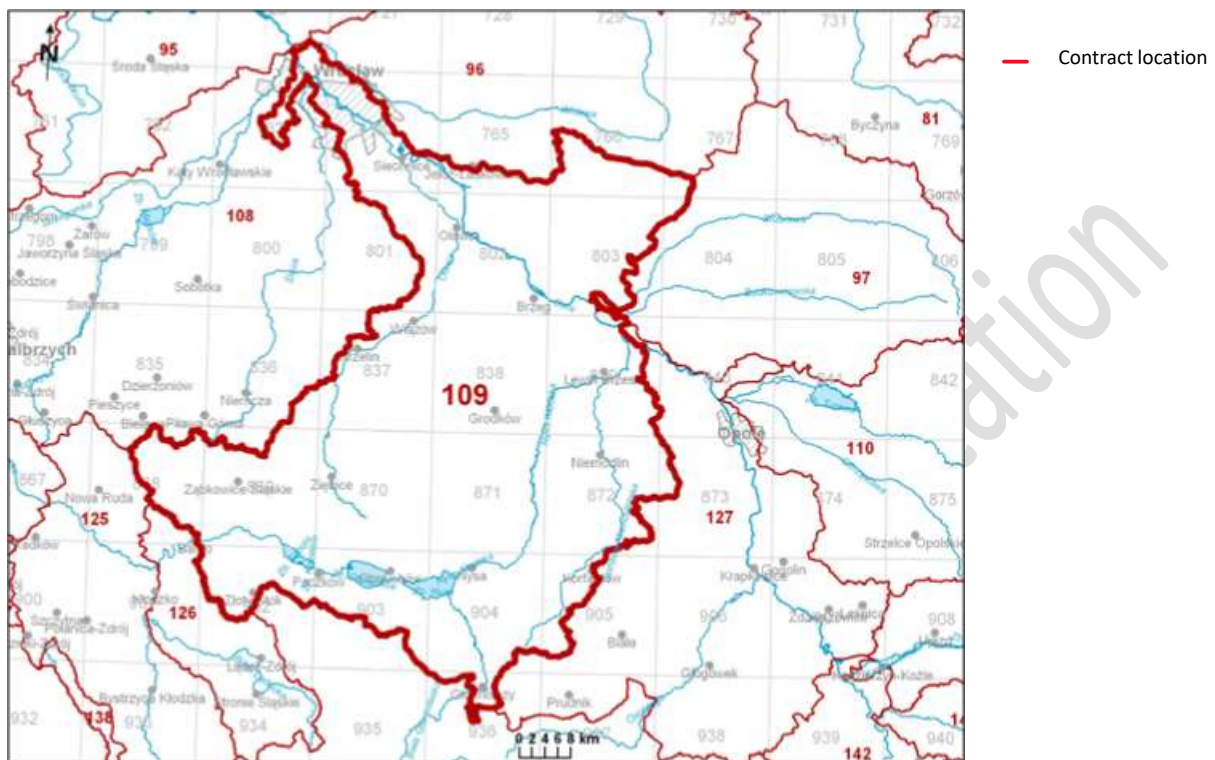
Environmental objective: good chemical status, good quantitative status.

In compliance with provisions under the Water Management Plan for waters within the Odra River Basin the main environmental objectives for BGW are as follows:

- Preventing the inflow or limitation of the inflow of pollutions to groundwater,
- Preventing the deterioration of status for all bodies of groundwater (including reservations listed under the Water Framework Directive),
- Assurance of balance between the intake and the feeding for groundwater,
- Implementation of measures necessary for reversing significant and constant increasing concentration trend for any pollution generated due to human actions.

In order to meet the requirements for the lack of deterioration for status of waterbodies having at least good chemical and quantitative status, the environmental objective for those would be the maintenance of that status.

Location of the Contract in reference to BGW is presented on the drawing given below.



Drawing 6. Location of the Contract 1B.9 in reference to BGW.

Source: pgi.gov.pl

4.7 Acoustic climate

When analyzing the noise source, one may classify it to the following groups:

- Traffic noise: road transport, railway transport,
- Industrial noise: installations and used devices,
- Noise associated with the work environment.

Traffic noise affects the acoustic climate status in the Agglomeration of Wrocław significantly. The acoustic climate in the area of the analyzed Contract 3A.1 is mainly generated by traffic on the following streets: Ślężoujście, Potokowa and Rędzińska.

No noise limits are exceeded in the area of the analyzed Contract.

In general implementation of the analyzed Contract will take place in undeveloped areas or in the vicinity of some residential buildings. At the beginning and end of the reconstructed section the houses are located directly at the embankment base. However, it should be noted that the houses were built after the embankment was constructed. The embankment at the reconstructed section was created ca. 1903. Those objects have to accept short-term impacts during implementation of Contract.

4.8 Nature

Field reconnaissance of the Contract site was performed. It was conducted by a team of specialists with appropriate professional background and experience at the stage of preparation the Project Information Card and during preparation of the Environmental Management Plan. No classic nature inventory was prepared in terms of collection, analysis and presentation of information on the natural environment and its elements; however, it is worth emphasising that the detail and scope of the collected data made it possible to characterise the natural values of the Contract site.

Flora

- there are no species of plants under protection within the area of direct Contract impact, i.e. embankment and directly adjacent area;
- no protected natural habitats were found in the Contract area;
- such invasive species as Canadian goldenrod and late goldenrod were identified within the Contract area,
- the embankment/area beyond the embankment/embanked area is formed by a mosaic of park areas, meadows and pastures, fallow lands, trees and shrubs, forests and urbanized areas;
- the site inspection did not comprise identification of fungi and lichens.

Fauna

- during field research, no protected species of fauna were found within the limits of the occupancy of the area under the planned Contract;
- planned Contract, due to its scope, will not affect negatively on ichthyofauna living in Odra river. According to information obtained from the Polish Angling Association, Wrocław Branch, the Ługowina River is not a place of fish occurrence, including valuable protected fish species. The rebuilt passage will not have a negative impact on the Ługowina River during the implementation, because most days of the year the water levels in this watercourse are minimal, and the Contractor will be required to maintain the flow throughout the entire implementation period and interfere with the shortest possible time and distance at this section of riverbed;
- no amphibians and no reptiles were found during the field research,
- in the area of Contract the occurrence of bird taxons were observed that are connected with the following habitats: groups of trees and area transformed due to anthropogenic activity i.e. arable land, wasteland and developed area. No taxons of protected birds were observed;
- no species of protected mammals have been observed in the area of the Contract. During construction works the animals (boar, roe deer, fox, hare) will be scared and disturbed, but no impact on the numbers of population of those species is expected in the discussed area. At the completion of works this impact shall cease. It should be mentioned that these are wild animals species identified in municipal area, while their natural habitat is forest, field and woodland mosaic and open area;
- No chiropterologic research was done as a part of the site inspection.

Protected areas

The analyzed Contract is located beyond the legally protected areas established under the Act of April 16, 2004 on nature conservation.

The following Natura 2000 areas are located in the vicinity of the Contract:

- Las Pilczycki (PLH020069) at a distance of approx. 0.26 km,
- Dolina Widawy (PLH020036) at a distance of approx. 0.37 km,
- Łęgi nad Bystrzycą (PLH020103) at a distance of approx. 5.65 km,
- Kumaki Dobrej (PLH020078) at a distance of approx. 11.84 km,
- Grądy w Dolinie Odry (PLH020017) at a distance of approx. 12.21 km,
- Łęgi Obrzańskie (PLH020017) at a distance of approx. 15.21 km,
- Jodłowice (PLH020106) at a distance of approx. 16.94 km.

The location of Contract in reference to the protected areas was presented in a map given in Appendix 6 to EMP – *Map with location of the Works Contract in reference to protected areas and to NATURA 2000 sites.*

4.9 Cultural landscape and monuments

The Contract in question is located in the conservation zone OW regarding archaeological monuments established in the current Local Spatial Development Plan, adopted by the Resolution of the City Council of Wrocław No. IX /189/07 of May 17, 2007.

Additionally, the Contract, for the planned construction and assembly works, is located within intensive prehistoric, medieval and modern settlement, in the area of archaeological site no. 10/9/79-28 AZP (settlement of the Przeworsk culture population, a trace of settlement of the Lusatian culture, a trace of prehistory settlement, a trace of late-medieval settlement). This area is treated as a monument pursuant to Article 3 Item 4, 12 in connection with Article 6 Clause 1 Item 3 of the Act dated 23 July 2003 on the protection and care of historical monuments, thus it is required to conduct rescue archaeological research. In connection with the above, it is required to carry out rescue archaeological research, as indicated by the Provincial Conservator of Monuments in the opinion, letter of March 22, 2019 (reference number WZA.5183.1240.2019.AWZ, rkp 7090-2019).

4.10 Population

The planned Contract is a linear Works Contract, which – within its course – is located in the area of City of Wrocław (city with powiat rights) within the Maślice city district. In conformity with data of GUS valid on December 31, 2020¹³ the City of Wrocław is inhabited by 641 928 people, population density is 2,192 people/km².

Basing upon data given in the *Application Form*¹⁴, the estimated number of people protected by embankment in the event of a failure of the embankment at the flow for the Odra river $Q = 3,631 \text{ m}^3/\text{s}$ (based on the failure scenarios prepared on behalf of the Regional Water Management Board in Wrocław - flow Q8) about 30,000 people. This area is part of the Wrocław Agglomeration, with single-family and multi-family residential buildings actively developed in the last 20 years, and in the near future the number of people living in the endangered area will significantly exceed 30,000 as a result of further development of these areas.

¹³ GUS – Demography Database: Results of Current Research: Status and Structure of Population: 2020: Status of Population on December 31: Population in Reference to Gender and Cities: Wrocław.

¹⁴ Application form for the task entitled: "Reconstruction of the flood embankment along Ślężoujście street with road infrastructure"

4.11 Remaining ES issues

ES related issues (i.e. the ones related to environmental, social and health and safety aspects) are regulated in Poland by several provision given in binding legal acts, including e.g. the Act of April 27, 2001 Environmental Protection Law, the Act of October 3, 2008 on providing information on the environment and its protection, public participation in the environmental protection, and on environmental impact assessments, the Act of April 16, 2004 on nature conservation, the Act of April 13, 2007 on preventing of damages to the environment and on repairing them, the Act of December 14, 2012 on waste, the Act of July 20, 1991 on Environmental Protection Inspectorate, the Act of March 14, 1985 on the State Sanitary Inspectorate, the Act of July 7, 1994 Construction Law, the Act of July 20, 2017 Water Law, the Act of June 26, 1974 Labour Code, the Act of April 13, 2007 on the State Labour Inspectorate, the Act of December 3, 2010 on implementation of some provisions of the European Union in reference to equal treatment, the Act of April 23, 1964 Civil Code, the Act of June 6, 1997 Penal Code, and others.

Legal regulations included in those acts are to e.g.:

- assure proper condition for abiotic environment and for biotic environment on site and in the areas surrounding the implemented construction investments;
- assure safety and health of people in reference to implementation of construction investments;
- prevent cases of sexual harassment and mobbing on work sites;
- assure proper social and labour conditions, and payment for the personnel.

Supervision over observing of provisions included in the aforementioned legal acts is performed by e.g. such numerous institutions and state authorities as the: General Directorate for Environmental Protection, Regional Directorates for Environmental Protection, Environmental Protection Inspectorate, State Sanitary Inspectorate, Construction Supervision Authorities (including Provincial Construction Inspectorates and District Construction Inspectorates), State Labour Inspectorate, Ombudsman, Governmental Proxy for Equal Treatment, Governmental Proxy for Rights of the Disabled, Police, and others.

Nonetheless, considering the importance of ES issues and the requirements of international institutions financing the OVFM Project (including the World Bank), this Environmental Management Plan and other documents of the Contract contain numerous detailed conditions to assure the proper implementation of any valid provisions and to keep high proceeding standards in the aforementioned scope.

5 Environmental Impact Assessment – Summary

5.1 Land surface and landscape

Due to implementation of Contract 1B.9 there shall be no significant and permanent adverse changes to the local landscape.

Construction stage

Impact of Contract implementation on landscape and land surface shall only occur at implementation of works requiring the application of construction equipment. Adverse impact on land surface shall be associated with dislocation of soil and – as a result – with transformation of the site under the planned reconstruction/extension of the embankment and the accompanying facilities.

The planned works of reconstruction/extension of embankment shall require small permanent acquisition of adjacent land ie. on the area of interembankment and behind embankment.

Moreover, the performance in the area of Contract shall be connected with temporary land acquisition of a width about 2-5 m for traffic purposes, traffic of machines and equipment, storage of materials, parking lots for machines and construction equipment, waste storage site.

The aforementioned impacts (except for permanent acquisition for the Contract) shall be short-term and reversible, and their scale shall depend on good organization of the construction site. Adverse impact on the performance stage shall not be significant, and – considering the absence of emergency situations – it shall be short-term and reversible.

Changes resulting from the necessary removal of trees and shrubs growing on the embankment body and on 3 m wide land strips at the embankment basis shall be permanent.

For the purpose of performance under Contract a total number of about 277 trees (including 10 trees for sanitary reasons) and 1,983 m² of shrubs shall be removed. Removal of trees along mentioned sections is necessary due to construction and maintenance reasons as according to the Water Law Act Art.176 (1) soil cultivation, planting trees or shrubs on the embankment body and closer than 3 m from the embankment foot shall be prohibited, in order to assure tightness and stability of the flood embankment.

Under the Contract, replacement planting will be made on the land plot no. 25/3, Map Sheet 12, Złotniki precinct. The scope of works includes: planting of 273 deciduous trees; planting of 7221 shrubs; forming 1312 m² of lawns based on meadow sowing and 5013 m² of other lawns; mowing, tidying and clearing the area by removing young self-seeded trees and shrubs and removing concrete slabs and asphalt pavement remnants (about 20 m²); collection of debris and construction waste within the entire planting area.

The works are planned at the existing objects, and therefore the expected range of changes to the landscape is minor. Effects of the works for the landscape structure shall be local. After completion of the planned construction works the site covered by earthworks and the adjacent land – transformed due to e.g. the traffic of machines and means of transport, etc. – shall be cleared and reinstated to the proper condition.

Operational stage

No new adverse impact shall be generated on the Contract's operational stage. Functioning of the Works Contract shall allow for the transfer of water through the Odra river-bed and Ługowina river-bed in a manner not posing hazard to adjacent land in case of high water levels. Impact on the land surface may however be associated with an emergency situation (damage of the embankment) or with the occurrence of water levels causing catastrophic flood. Assuming "regular" operations of the Contract in accordance with the assumed objectives, impact on the land surface shall not occur.

In order to limit the impact of works on land surface and on landscape during implementation of the Contract, one shall implement mitigation measures described in Appendix 1 to the EMP for Contract 1B.9 – Plan of Mitigation Measures, items in the table: 3, 5, 6, 7, 8, 9, 11, 12, 13, 14, 16, 17, 22, 26, 28, 44, 45, 93, 94, 95.

5.2 Climate

Temperature. The average annual air temperature in Wrocław is 9.0 °C. The average monthly temperature of the coldest month (January) is - 4.0°C, the warmest month (July) - 18.8°C. The growing season lasts 226 days on the average and it is among the longest in Poland.

Atmospheric precipitation. Wrocław is characterized by low atmospheric precipitation. Atmospheric precipitation occurs on 167 days a year, while its average annual precipitation of the period of 1901-2000 is 583 mm. Snow cover remains on average 35 days a year.

Month	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
Temperature, °C	-4 ÷ 3	-3 ÷ 4	0 ÷ 9	6 ÷ 14	10 ÷ 20	14 ÷ 22	15 ÷ 25	15 ÷ 24	11 ÷ 19	6 ÷ 14	2 ÷ 7	-2 ÷ 4
Rainfall, mm	31	30	38	36	48	69	79	64	52	42	42	38

Source: World Meteorological Organization

Construction stage

Implementation of Contract 1B.9 shall not cause changing of local climate neither during the construction works nor after handing over for use. Due to maintenance of the present embanked area and interembankment area, air humidity shall not be changed, which is strictly connected with vicinity of surface water and floodplains.

Operational stage

Significant modification of micro-climate parameters is not expected on the Contract operational stage; thus it is not necessary to implement additional mitigation measures. However, some measures shall be implemented during the works (e.g. removal of plants) and they may affect such elements of climate as e.g. insolation associated with the presence of vegetation, or air humidity. It shall however be an impact of a minor scale.

A potential permanent change in the context of local climate shall result from increased flood safety (reduced risk of flood occurrence), and limitation of the flood risk would allow for avoiding its consequences, one of which may be creation of local climate due to local adjustments to water relations.

Adaptation of the Contract 1B.9 to adverse phenomena associated with climate change

Reconstruction of the flood embankment was designed in accordance with applicable hydrotechnical regulations, which take into account extreme weather phenomena related, among others, to with climate change (this is regulated by the relevant provisions on the design, construction and operation of hydrotechnical facilities). In addition, the implementation of the Contract will improve the flood protection of collapses along the banks of the Odra and the estuary section of the Ługowina and thus will contribute to reducing the effects of negative phenomena accompanying climate change.

5.3 Air quality

Construction stage

Emission of gaseous and dusty pollutants shall occur on the construction stage mainly, when works will require the use of heavy equipment, diesel vehicles and machines, causing emission of gaseous and dusty pollutants, and consequently an increase of pollution level in the air. It will be unorganized emission, the range of which will

correspond to the area of construction works and routing of the access and technological roads. It will have localized and periodic character. It will cease completely on completion of works.

Main factors affecting the air during the construction phase are as follows:

- Dust produced at operations of machines and devices executing the earthworks,
- Combustion gases produced by engines of working machines and means of transport,
- Dust generated during deliveries of materials and their storage.

Size of the emission will depend on the number of diesel vehicles and machines used for the construction and on their working time. The work organization (optimization of equipment utilization, work efficiency, etc.) will be important for the reduction of emission, as well as the organization of site facilities and access roads (optimization of routes, location of site facilities). Additional possible ways to reduce emission are related to keeping the equipment and vehicles in good technical condition, and compliance with environmental and work safety standards. To minimize the adverse impact on air it is advised to sprinkle dirt roads and yards with water (reduction of dusting) or even to suspend the works in dry and windy weather conditions.

Deliveries of construction materials shall not cause changes to the current general condition of air. Due to cyclicity of deliveries, emission within access and temporary roads shall practically have no meaning and shall not cause exceedance of standard values beyond traffic routes.

Operational stage

At the operational stage, the Contract will not generate a high level of pollutant emissions into the air. The operation of the flood protection facilities and safeguards does not produce such pollutant emissions. However, pollutant emissions will be generated by vehicles moving along Ślężoujście Street, which will be rebuilt and used at the embankment crest. However, it is a local municipal road with no transit traffic. This road provides access to housing areas and the number of vehicles moving along it will not change from the present level. Potential increase in traffic may be generated by newly built-up areas, e.g. the Potokowa Residence housing estate, but this increase would take place regardless of the implementation of this Project.

The source of periodic unorganized emission will also be the fuel combustion from vehicles on Ślężoujście Street as a part of maintenance and control of the embankment's condition, or work of diesel lawnmowers curing the embankment's slopes. However, due to the scale that emission will have no significant impact on the quality of air.

One shall assume that the construction stage shall not result in permanent adverse changes to the air environment.

In order to limit the impact of works on the quality of air during implementation of the Contract, one shall implement mitigation measures described in Appendix 1 to the EMP for Contract 1B.9 - Plan of Mitigation Measures, items in the table: 65, 66, 67, 68, 69, 71.

5.4 Soil and grounds

Construction stage

The Contract 1B.9 will have impact on soil environment only during construction period, just like in the case of majority of other environmental components. Execution of proposed construction works will involve the necessity to remove topsoil, or to excavate trenches for the embankment's reconstruction elements. An additional area will also be acquired for the embankment's construction/extension, as well as for access roads (roads will be demolished on completion of works and the area will be reinstated to its original condition). Apart from the above, there will be no interference in soil layer.

The use of land shall be locally changed (e.g. small, permanent acquisition within adjacent areas). Due to the range of works and exclusion of biologically active sites, that impact would be local and would not effect in significant deterioration of soil condition within that area.

Risks for soils are mainly associated with the occurrence of such emergency situations as leakage of oil derivatives, which may result in local contamination of the ground. That impact shall be local.

At keeping the environmental protection and H&S standards there should not be a significant impact and deterioration of soil quality due to implementation of the Contract. Adverse impact connected with temporary removal of soil during the earthworks performed shall be temporary. After completion of the works the site shall be cleared and reinstated by the Contractor.

Operational stage

At the operation stage, the Contract will not generate impacts on soil and grounds.

In order to limit the impact of works on the status of soils and grounds during implementation of the Contract one shall implement mitigation measures described in Appendix 1 to the EMP for Contract 1B.9 - Plan of Mitigation Measures, items in the table: 13, 16, 17, 19, 20, 21, 22, 23, 24, 46, 47, 48, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 70, 71, 72, 73, 74, 93, 94, 95.

5.5 Surface water

Construction stage

Implementation of Contract 1B.9 shall neither be related to interference in the Odra river bed. The Contract shall not exert impact on morphological continuity of the river, and it shall also not affect hydro-morphological and biological elements of the river. The planned works shall not modify the volume and dynamics of flow in the Odra River, and acquisition of additional sites within the embanked area shall be minor.

However, the implementation of the Contract involves interference within the Ługowina river bed. The planned works in the river bed will consist of demolishing the existing passage and constructing a new one holding the same parameters but of a safe and modern design. As the Contract consists in the redevelopment of the existing passage only, it will not affect the anthropogenic transformation of the natural section of the Ługowina river, hence it will not affect the morphological continuity of the river, nor will it result in a permanent impact on its hydro-morphological, biological and physicochemical elements. The Contract in question will not pose any threat to the achievement of the environmental objectives set for the Surface Water Body in the basin of which it will be implemented. The Contract will not involve water intake but will involve the discharge of rain and snowmelt waters off the sealed surface of Ślężoujście Street into the Ługowina river. Currently, there is also a public road at the embankment crest, but rain and snowmelt waters run off in an unorganised manner, directly from the road area onto the surrounding area. Thanks to the organised system of drains collecting rainwater and snowmelt equipped with collecting chambers with settling tanks and the construction of a settling tank for suspended solids at the river outlet, such waters will be pre-treated prior to their discharge into the environment, hence the project will have a positive impact on the surrounding environment. In summary, the Contract will not affect the quantitative and qualitative conditions of surface waters (the amount of rainwater will be minor, it will not affect the flow balance of the Ługowina river) and will not pose any threat to the achievement of the environmental objectives for the surface water body, and thanks to the construction of the organised rainwater drainage system the impact on the environment will improve in relation to the present conditions. Sludge (sediments) from chambers and settling tanks will be periodically removed and taken away by a specialised service unit of the Road Administrator.

Impact during the construction works may result from penetration of substances harmful to the environment, i.e. increased suspension volume in the discharge, leak of fuel or other substances used during the construction works. One shall undertake any measures to remove adverse effects of the event then. Also the occurrence of a

flood wave during the construction process may result in washing the embankments out and in deterioration of the surface water quality. However, due to incidental character of the discussed cases, they should not be considered for the general status of water.

Domestic sewage and minor volume of technological wastewater shall be produced during the construction process. Wastewater shall be collected in tight tanks and successively handed over to the treatment plant. The planned works shall also result in generation of a small amount of waste, domestic waste mainly, and they should be collect selectively and dispose of in a legal manner. Assuming the correct course of works, the analyzed Works Contract shall not result in the production of hazardous waste posing a risk of deterioration to the water quality.

Operational stage

The use of embankment shall not change the surface water quality. Their quality may be at risk due to potential accident or breakdown of vehicle/vehicles moving along Ślężoujście Street, but it is considered random and extraordinary, while the reconstruction of the street will improve traffic safety, so the probability of such events decreases.

In order to limit the impact of works on the status of water during implementation of the Contract one shall implement mitigation measures described in Appendix 1 to the EMP for Contract - Plan of Mitigation Measures, items in the table: 11, 12, 13, 14, 15, 16, 17, 19, 46, 47, 48, 49, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 70, 71, 72, 73, 74. During the operation of the Contract, the measure described in Appendix 1 to the EMP for Contract 1B.9 should be implemented - Plan of Mitigation Measures item in the table: 96.

5.6 Groundwater

Construction stage

The implementation of the Contract 1B.9 will not affect the hydraulic dependencies between the river and the behind-embankment, as the anti-filtration barrier (planned under the Contract) will be made in sections and will not cause a complete cut-off of water migration, only their privileged filtration paths will be eliminated and/or flow path - extended. The Contract will not involve water intake or discharge of sewage into the ground. Rain and snowmelt waters discharged to surface waters will be adequately pre-treated and therefore they will not affect the quantitative and qualitative levels of ground waters and will not pose any threat to the achievement of the environmental objectives for the Surface Water Body.

Operational stage

The operation of the embankment will not change the quality of underground waters. Their quality may be at risk due to potential accident or breakdown of vehicle/vehicles moving along Ślężoujście Street, but it is considered random and extraordinary, while the reconstruction of the street will improve traffic safety, so the probability of such events decreases.

In order to limit the impact of works on the status of groundwater during implementation of the Contract one shall implement mitigation measures described in Appendix 1 to the EMP for Contract - Plan of Mitigation Measures, items in the table: 11, 12, 13, 15, 16, 17, 19, 46, 47, 48, 49, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 70, 71, 72, 73, 74. During the operation of the Contract, the measure described in Appendix 1 to the EMP for Contract 1B.9 should be implemented - Plan of Mitigation Measures item in the table: 96.

5.7 Acoustic climate

Construction stage

A potential source of noise would be machines and devices operating on site and means of transport during the performance phase. The noise sources shall be mainly concentrated in the area of the construction site and within site facility. Impact on acoustic climate shall be short-term and local, and shall cease at the completion of works. The small exceedance of permissible noise values can occur in the area of the closest housing (adjacent

to the base of the embankment – it is connected with one single-family residential building, in other cases the buildings are located more than 100 m from the site related to the reconstruction of the embankment). The noise associated with truck deliveries may to a minor extent affect the area's acoustic climate. Nonetheless, it shall be emphasized that deliveries of materials during the construction process shall be temporary, and the noise generated during deliveries of materials may be omitted.

In case of the works performed within the embanked area, the standard noise value shall not be exceeded for areas located just beyond the flood embankment. In some sections the works shall be performed in the area beyond the embankment, and operations of heavy equipment shall be done on the embankment crest within the entire length of the embankment. As a consequence, within the area beyond the embankment the acoustic background shall locally exceed the permissible value. Those cases would be local and shall not cause irreversible changes to the environment.

Operational stage

During the use of the planned embankment the impact on acoustic climate shall not occur. There may be temporary impact in the form of noise emission during mowing of plants growing on slopes of the embankment and during work of mobile pumps pumping out the water from the Ługowina River to the interembankment of the Odra River.

As it was already indicated in the previous chapters, a public road, Ślężoujście Street is located on the crest of the embankment. Ślężoujście Street is a local, communal road with little traffic (only access to residential areas). The traffic noise after the completion of the Contract will decrease because at the moment the street has a surface made of granite blocks, which are heavily used up, ultimately the asphalt surface will be much quieter.

In order to limit the impact of works on the status of acoustic climate during implementation of the Contract one shall implement mitigation measures described in Appendix 1 to the EMP for Contract 1B.9 - Plan of Mitigation Measures, items in the table: 14, 61, 62, 63, 64, 65.

5.8 Nature

5.8.1 Protected natural habitats and protected species of plants and animals

Construction stage

Performance of the planned construction works is related to impact on vegetation and fauna within the Contract implementation area. A method assumed for works implementation minimizes the impact, and limits it to effects to the vegetation directly colliding with the Contract. Herbaceous plants shall be destructed and trees and shrubs placed in the area of construction and extension shall be logged. All trees in the direct vicinity of the works performed (not intended for cutting) will be protected against damage. It is expected to log about 277 trees (including 10 trees for sanitary reasons) and about 1,983 m² of shrubs within the framework of the Contract. These cuttings will be compensated by replacement planting. The replacement planting will be made on the plot no. 25/3, Map Sheet 12, Złotniki precinct (at Wielkopolska Street in Wrocław). The area on which the plantings will be planted will have to be tidied up before the commencement of these works (by clearing up the concrete slabs and asphalt pavement - on an area of approx. 20 m², removing the remains of debris and other construction waste). Plantings should be made in accordance with the designed species trees and shrubs as well as gardening practice (in accordance with the Compensation Greenery Project on plot 25/3, AM-12, Złotniki precinct, volume PW06 / 02).

Impact of the Contract on fauna shall mainly result from the increased range of noise during implementation of Contract, what may cause temporary disturbing and scaring of animals. If protected species of fauna are found, prior to the commencement of works, it will be necessary to take measures to protect them. Any such measures, such as catching and moving them, may be performed only after obtaining an appropriate decision from the

Regional Director of Environmental Protection in Wrocław allowing for derogations from the protection of species of animals.

Contract shall exert a direct impact on soil fauna through interference in the soil structure during reconstruction of the embankment and during the development of technological roads; however, those would be reversible and short-term effects. Furthermore, reinstatement of a natural soil cover within that site shall – with a lapse of time – reproduce previous plant groups and fauna due to the natural succession.

Operational stage

Adverse impact on plants and animals shall cease to a great extent in the operational phase. It is related to the expected reinstatement of the work site to its original condition, while keeping the previous use of land among other Ślężoujście Street.

In order to limit the impact of works on the status of flora and fauna during implementation of the Contract one shall implement mitigation measures described in Appendix 1 to the EMP for Contract 1B.9 - Plan of Mitigation Measures, items in the table: 11, 12, 13, 14, 15, 20, 21, 22, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 50, 94.

5.8.2 Protected sites

The planned Contract 1B.9 is located beyond protected sites. There is no risk of any adverse effect of the Contract on the subject of protection for the Natura 2000 site (the nearest site is located about 0.26 km away from the subject Contract).

5.9 Cultural landscape and monuments

Construction stage

The analysed Contract is located within intensive prehistoric, medieval and modern settlement, in the area of archaeological site no. 10/9/79-28 AZP (settlement of the Przeworsk culture population, a trace of settlement of the Lusatian culture, a trace of prehistory settlement, a trace of late-medieval settlement). This area is treated as a monument pursuant to Article 3 Item 4, 12 in connection with Article 6 Clause 1 Item 3 of the Act dated 23 July 2003 on the protection and care of historical monuments. In connection with the above, it is required to carry out rescue archaeological research, as indicated by the Provincial Conservator of Monuments in the opinion, letter of March 22, 2019 (reference number WZA.5183.1240.2019.AWZ, rkp 7090-2019).

Operational stage

At the operational stage, the Contract will not generate impacts on cultural landscape and monuments.

In order to limit the impact of works on the cultural landscape and on historic objects during implementation of the Contract one shall implement mitigation measures described in Appendix 1 to the EMP for Contract 1B.9 - Plan of Mitigation Measures, items in the table: 83, 84, 85.

5.10 Material goods

Construction stage

In case of protection for the material goods, implementation of Contract 1B.9 shall improve flood safety for the City of Wrocław (in the Maślice and Pracze Odrzańskie City districts). Temporary, minor impact on buildings placed in a small distance may occur in vicinity of construction site and delivery routes.

Operational stage

No adverse impact on the material goods was identified after Contract realization. The reconstruction of the embankment will result in securing the property and, in an extreme case, also the lives of 30,000 people living in the area that is currently at risk of being flooded by flood waters of the Odra River.

5.11 Health and safety of people

Construction stage

The designed Contract shall temporarily effect in deterioration of the life quality and standard for inhabitants whose houses are located in the immediate vicinity of the construction site; however, that shall be a short-term and reversible impact. Due to the works noise emission would increase in vicinity of performance site, and air dusting would increase locally too a small extent, and – as a result of intensive traffic of vehicles – emission of combustion gases shall raise. Objects located in the area of the initial section of Ślężoujście Street (in the immediate vicinity of the works) and buildings located at Potokowa Street (over 100 m from the site of the reconstruction of the embankment), shall suffer the greatest impact. Furthermore, intensive traffic of delivery vehicles may deteriorate the comfort of traffic participants, and construction equipment applied for construction of embankment may generate vibrations. It shall however be emphasized that those impacts would be temporary and limited, and they shall cease at the completion of construction stage.

Operational stage

The operational stage is related to the positive impact on people and their properties. The main objective of Contract is to protect people and their material goods against flooding at high water levels. Functioning of the Contract shall improve the sense of security in case of people living in the areas located in Wrocław in City districts Maślice and PRacze Odrzańskie.

5.12 Material and Waste Mangement

Construction stage

The estimated demand for raw materials / materials is:

- cement about 10 tons
- aggregate about 5,200 tons
- embankment ground approx. 95,000 tons
- concrete curbs approx. 850 m
- stone resistors approx. 450 m
- stone cubes of approx. 38 m²
- concrete cubes approx. 145m²
- asphalt about 250 tons
- DN250 sanitary sewer, approx. 600 m long
- DN200, DN300 gravity channels and DN150 house drains made of PP or PE SN8 with a total length of approx. 350 m
- sewerage chambers made of prefabricated elements with a diameter of Ø1000mm
- lighting cable approx. 560 m
- prefabricated foundations
- lighting poles
- LED lighting fixtures
- anti-filtration barrier: sheet steel piling or barrier made in CDMM (continuous deep mixing method) technology - average depth approx. 5 m, total length approx. 500 m
- prefabricated elements of the culvert - concrete volume of about 70 m³
- anti-flood lock (steel gate valve or swing check valve with a minimum size of 2.2 x 2.2 m)

The estimated fuel demand is:

The average demand of diesel oil for the operation of all simultaneously operating machines and means of transport will be on average 250 l / h

The estimated energy demand is:

- electric: / 15 kW
- thermal: / 0.00 / GJ / MJ.

Materials and fuels should be stored at the construction site or storage yard, separately for each type of material and in a way that protects against contamination or loss of properties and technical parameters. These places must be secured against access by third parties.

Typical construction, renovation and demolition waste (including soil and sediments) is expected to be generated. It is also possible to generate waste related to the operation of mechanical equipment and construction machinery powered by combustion engines, including hazardous waste. During the works, municipal waste will be generated within the construction site facilities.

Expected amount and type of waste generated at the construction stage:

- soil from excavations (road pavement construction, rainwater sewage system, sanitary sewage system, water supply network, telecommunication networks, power, cable and lighting networks (code 17 05 04): 50,000 m³ (approx. 105 thousand Mg)
- waste cables (code 17 04 11) approx. 1 Mg
- concrete waste and concrete debris from demolition of power and lighting networks, sewage networks - wells, culvert (code 17 01 01) (approx. 230 Mg)
- humus (code 17 05 04): 1 000 m³ (approx. 30 thousand Mg)
- plastic waste from the reconstruction of the teletechnical and water sewage system (code 17 02 03), the total amount will not exceed 1 Mg
- materials from the demolition of the existing pavement (code 17 01 81): 1200 m³ (approx. 2400 Mg)
- wastes from demolition of cast iron water pipes (code 16 01 17), stoneware pipes (code 16 01 19) about 25 Mg
- packaging waste: paper and cardboard (code 15 01 01), plastics (code 15 01 02), metals (code 15 01 09) will be present in relatively small amounts, their estimated total amount will not exceed a few Mg,
- household waste, in accordance with statutory requirements and standards already adopted on construction sites, will be collected selectively into containers intended for this purpose and collected by an authorized company on the basis of a concluded contract,
- wood from removed trees (code 17 02 01): several dozen Mg.

At the construction stage, the waste generated during the performance of the Contract should be:

- a) segregated and stored selectively in sealed containers or in separate and adapted places, in conditions preventing dusting and dispersing of light fractions and their negative impact on the environment;
- b) ensure gradual waste reception by entities authorized to handle it;
- c) it is prohibited to store any materials, soil and construction waste near tree trunks;
- d) hazardous waste should be segregated and stored separately in special sealed containers placed in the sealed, paved area that is marked and secured against access by third parties, until it is handed over to entities authorized to handle it;

e) domestic waste should be collected on the compacted (paved) area on the site in sealed septic tanks, content of which will be handed over to entities authorized to handle it.

If the generated waste is handled correctly and properly managed, the construction process will not have a negative impact on the environment at the implementation stage. An area will be designated at the construction site facilities to accommodate holders and containers for temporary storage of waste, depending on their type, including special sealed containers for the storage of hazardous waste. Waste will be transferred on a regular basis to the means of transport of entities authorized to transport waste and managed further on the basis of waste classification carried out at the stage of works implementation.

The soils excavated from work sites (including earth masses from outside the watercourse riverbed and sediments from the watercourse riverbed) will be managed at the construction site if they meet the technical and environmental parameters (classified as uncontaminated soils). If this is not possible, in whole or in part, they will be managed in accordance with the applicable waste regulations. The Contractor is also obliged to prepare documents such as: *Waste Management Plan* and *Soil Management Plan*, in which the way of dealing with soil will be presented in detail and will be subject to approval by the Contract Engineer before commencement of works generating waste and soils.

Operational stage

Potential waste generation at the operational stage of the Contract will be related to the maintenance and servicing works. No significant amounts of waste is expected to be generated.

Only small amounts of road maintenance waste will be generated at this stage, such as:

- street cleaning (code 20 03 03)
- waste from sewage chambers (sedimentation tanks for inlet wells) (code 20 03 99).

At the operational stage, waste will also be generated related to the operation of street equipment, e.g. consumable bulbs in luminaires (LED technology). This waste will be disposed of as part of the ongoing maintenance of the public road and its negative impact on the environment is not expected.

In terms of sediments collected as part of rainwater treatment, as part of the planned reconstruction of the road, it is planned to build rainwater treatment devices, such as: sedimentation tanks on road inlets, a sedimentation tank on the overflow reservoir and a dirt trap on the drainage channel. Sediments from all these devices will be removed and utilized by specialized services.

5.13 Exceptional hazard to the environment

Hazard associated with contamination of the environment may occur on both: the implementation stage, as well as on the operational stage, e.g.: identification of unexploded shells and misfires, failures of embankment, or failure of machines during the works.

Due to the possible accommodation of a flood wave during the performance, the Contractor shall be obliged to organize and establish detailed rules of proceeding in case of the discussed event.

The Contractor is obliged to perform the works under sapper supervision, which includes constant inspection and clearance of the site from dangerous military items, including their treatment.

The most likely event, which may occur during the performance, is leakage of substances from machines and vehicles operating within the site. Constant inspections of the machines and proper organization of the site and site facility shall be assured to remove the contamination as soon as possible.

The proper performance and use, and observation of rules of proper organization for the works and observation of the law would allow for providing full safety for the construction site and for the environment.

5.14 Other hazards related to ES

Implementation of Contract 1B.9 may relate to numerous impacts related to ES issues (i.e. environmental, social and health and safety aspects). Except for the issues discussed above in Chapters 5.1-5.12, the following additional issues or hazards related to that subject may occur during implementation of Contract, e.g.:

- Accidents and near misses, including participation of people associated with implementation of the Contract and/or of third parties;
- Cases of such unacceptable behavior on work sites as sexual harassment or mobbing;
- Cases of intentional or unintentional violation of labour law's provisions, including the ones associated with social conditions and labour conditions, and with payment to the personnel;
- Cases of infections with sexually transmitted diseases, including HIV/AIDS, resulting from the lack of knowledge on preventing and controlling infections of that type;
- Epidemiological risk, among others cases of infections by coronaviruses.

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 personnel, as well as to the construction process. The state of epidemic was announced by the Regulation of the Minister of Health of March 20, 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 March 20, 2020 until further notice, in the territory of the Republic of Poland in connection with SARS-CoV-2 virus infections.

Due to significant social effects of those hazards, this Environmental Management Plan and other documents of the Contract contain numerous detailed conditions to prevent and efficiently react in case such event occurs, and to assure proper implementation of any provisions of national legislation in that scope (see e.g.: Chapter 6.14).

5.15 Cumulative impact

In addition to this Contract implemented as part of the OVMF Project, the construction of a housing estate "Potokowa Residence" is being carried out in this area. The planned completion date for this construction is the 1st quarter of 2022. Works under this Contract are planned for implementation in the years 2021-2022 (implementation period 1 year).

None of the aforementioned contracts is associated with the occurrence of significant emission or other significant environmental impact, scale of which would cause possible occurrence of significant threats to abiotic environment or to biotic environment, even in case of simultaneous performance of construction works. Additionally, application of mitigation measures by Contractor in compliance with EMP document shall allow for avoiding a risk of significant adverse cumulative impact, even in case of simultaneous performance of works in neighboring locations.

5.16 Impact scoping matrix

Construction stage

Impact Category	Physical Resources											Natural Resources					Other				
	Land Surface and landscape	Climate	Air quality	Soil and grounds	Surface water	Hydrology	Groundwater	Acoustic climate (noise)	Cultural landscape and monuments	Material goods	Waste management	Natural habitats	Protected species of plants and animals	Species Diversity	Wildlife Movement	Protected Areas	Ecosystem Fragmentation	Health and safety	Exceptional hazard	Resettlement	Other hazards ES
Hydrotechnical part - co-financed by the World Bank																					
Site Preparation	-1	0	0	-1	-1	0	0	-1	0	0	-1	0	0	0	0	0	0	-1	0	0	-1
Trees and shrubs removal	-1	0	0	0	0	0	0	-1	0	0	0	0	0	0	0	0	-1	0	0	0	0
Humus layer removal	-1	0	-1	-1	0	0	0	-1	-1	0	0	-1	0	0	0	0	0	0	-1	0	0
Excavations	-1	0	-1	-1	0	0	0	-1	-1	0	-1	0	0	0	0	0	0	-1	-1	0	0
Profiling and compacting the base	-1	0	-1	-1	0	0	0	-1	0	0	0	0	0	0	0	0	0	-1	0	0	0
Construction of an embankment	0	0	-1	0	0	0	0	-1	0	0	0	0	0	0	0	0	0	-1	0	0	0
Strengthening of slopes' of embankment	0	0	0	0	0	0	0	-1	0	0	0	0	0	0	0	0	0	0	0	0	0
Humus layer lay out and sowing grass	+1	0	+1	+1	+1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

ENVIRONMENTAL MANAGEMENT PLAN

CONTRACT 1B.9 "MODERNISATION OF FLOOD EMBANKMENT ALONG THE ŚLĘZOUJŚCIE STREET WITH ROAD INFRASTRUCTURE"

Construction of the anti-filtration barrier	0	0	-1	0	0	-1	0	-1	0	0	-1	0	0	0	0	0	0	-1	0	0	0
Demolition of the culvert	-1	0	-1	0	-1	-1	0	-1	0	0	-1	0	0	0	-1	0	0	-1	0	0	0
Concrete works	-1	0	-1	-1	-1	-1	0	-1	0	0	-1	0	0	0	0	0	0	-1	0	0	0
Retaining walls made of gabion baskets	0	0	0	0	0	0	0	-1	0	0	0	0	0	0	0	0	0	0	0	0	0
Strengthening slopes and the bottom of the watercourse	0	0	-1	0	-1	-1	0	-1	0	0	-1	0	0	0	-1	0	0	0	0	0	0
Road part - financed by the Investor's own funds																					
Demolition of road elements	-1	0	-1	-1	0	0	0	-1	0	0	-1	0	0	0	0	0	0	-1	0	0	-1
Execution of the foundation and construction layers	0	0	-1	0	0	0	0	-1	0	0	-1	0	0	0	0	0	0	-1	0	0	0
Rebuilding the networks	-1	0	0	-1	0	0	0	0	-1	0	-1	0	0	0	0	0	0	-1	0	0	0
Construction of rainwater drainage	-1	0	0	-1	-1	0	0	-1	-1	0	-1	0	0	0	0	0	0	-1	0	0	0
Road marking, pavement, protective barriers	0	0	0	0	0	0	0	-1	0	0	0	0	0	0	0	0	0	+2	0	0	0
Construction of road lighting	0	0	0	0	0	0	0	0	0	0	-1	0	0	0	0	0	0	+2	0	0	0

Legend: 0 = no impact; -1= Minor negative impact; -2= Significant negative impact; +1= Minor positive impact; +2= Significant positive impact

ENVIRONMENTAL MANAGEMENT PLAN

CONTRACT 1B.9 "MODERNISATION OF FLOOD EMBANKMENT ALONG THE ŚLĘZOUJŚCIE STREET WITH ROAD INFRASTRUCTURE"

Operational stage

Impact Category	Physical Resources											Natural Resources					Other				
	Land Surface and landscape	Climate	Air quality	Soil and grounds	Surface water	Hydrology	Groundwater	Acoustic climate (noise)	Cultural landscape and monuments	Material goods	Waste management	Natural habitats	Protected species of plants and animals	Species Diversity	Wildlife Movement	Protected Areas	Ecosystem Fragmentation	Health and safety	Exceptional hazard	Resettlement	Other hazards ES
Hydrotechnical part - co-financed by the World Bank																					
Mowing slopes	+1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Operation of the culvert	0	0	0	0	0	+2	0	0	0	0	0	0	0	0	0	0	0	+2	+2	0	0
Road part - financed by the Investor's own funds																					
Operation of a public road	0	0	-1	0	0	0	0	+2	0	0	0	0	0	0	0	0	0	+2	0	0	0
Lighting functioning	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	+2	0	0	0
Rainwater drainage	0	0	0	0	+2	0	+1	0	0	0	+1	0	0	0	0	0	0	0	0	0	0

Legend: 0 = no impact; -1= Minor negative impact; -2= Significant negative impact; +1= Minor positive impact; +2= Significant positive impact

NOTE: The planned mitigation and monitoring measures have been grouped according to the environmental elements affected by Contract 1B.9.

6 Description of mitigation measures

In order to limit adverse impact of the planned Contract on the environment, Appendix 1 to this EMP provides a set of mitigation measures, which shall be implemented prior to, during, and after performance of the construction works.

The mitigation measures were developed based upon the following documents:

- Investment Information Sheet with amendments titled: "Reconstruction of the flood embankment along the Ślężoujście Street with road infrastructure". December 2018;
- Decision of the Regional Director for Environmental Protection in Wrocław of January 25, 2019, reference number: WOOŚ.420.202.2018.KK.1 for the Contract consisting on the expansion of Ślężoujście Street from Rędzińska Street to Potokowa Street in Wrocław;
- Decision of the Director of the Regional Water Management Authority in Wrocław of the water permit for the construction of water facilities of March 11, 2019, reference number: WR.RUZ.421.169.2018.RR.UL;
- Decision of the Director of the Regional Water Management Authority in Wrocław of the water permit for locating new buildings in areas of high flood risk of June 25, 2019, reference number: WR.ZUZ.5.421.37.2019.PG;
- Opinion of the Provincial Office for the Protection of Monuments of March 22, 2019, reference number: WZA.5183.1240.2019.AWZ, rkp7090-2019.

The mitigation measures were moreover developed based upon the following documents:

- World Bank policies:
 - OP/BP 4.01 – on environmental impact assessment,
 - OP/BP 4.04 – on natural habitats,
 - OP/BP 4.11 – on physical cultural resources.
- Odra-Vistula Flood Management Project – Project Operations Manual, Wrocław 2021.
- Odra-Vistula Flood Management Project – Environmental and Social Management Framework, April 2015.

Mitigation measures cover such elements of the environment as: land surface and landscape, air quality, soils and grounds, surface water and groundwater, acoustic climate, cultural heritage and nature. They are associated with detailed guidelines for the Contractor, which need to be implemented prior to, during, and after implementation of the Contract.

A summary and general characteristics of main categories of mitigation measures were provided below, with a division into particular environmental components.

The mitigation measures described below are related to the performance in the entire area of Contract 1B.9 (Chapter 6.8.1 and Chapter 6.9).

6.1 Land surface and landscape

Implementation stage

In reference to the issue of direct impact on land surface and on landscape, it shall be only exerted on Contract implementation stage. The land transformation shall be noticeable too the highest extent then.

In order to limit adverse impact of Contract on land surface and on landscape mitigation measures were established, and their implementation was planned during performance of the construction works, and also prior to their commencement. The performance stage shall be preceded with works associated with preparation of the Works Contract implementation site, including e.g. preparation of storage yards for construction materials, site facilities, etc., and setting-out, preparation (and agreement with road administrators) of delivery routes for machines and vehicles.

Locations of temporary acquisition (technological roads, yards, site facility, storages sites for construction materials, parking lots and others) should be placed and developed in accordance with the guidelines of the Contractor's environmental supervision, as approved by the Engineer.

Machines and vehicles may move only within technological roads and maneuvering yards within the site. Order should be kept within the construction site and proper organization of the works should be assured.

The most important mitigation measures are as follows:

- Delivery of materials should be done using existing public roads running in vicinity of the planned Contract and using technological roads, with maximum possible application of the existing road network, outside the area of valuable habitats;
- Storage sites for materials, site facility, and parking lots for the equipment and for machines shall be located in places of the lowest environmental value, including rules of minimization for acquisition of land and for transformation of its surface;
- The site facility shall be hardened and equipped with sanitary facilities;
- The area of the planned Contract shall be cleared after completion of the works;
- The area of works and land adjacent to the construction site shall be reinstated to proper conditions due to e.g. the traffic of machines and means of transport.

In accordance with valid standards and at keeping environmental protection rules in conformity with the conditions determined in relevant decisions, the performance shall minimize adverse impact of Contract on the soil environment.

Mitigation measures related to the protection of land surface and landscape were listed in Appendix 1 to the EMP for Contract 1B.9 – Plan of Mitigation Measures, items in the table: 3, 5, 6, 7, 8, 9, 10, 11, 12, 14, 15, 16, 17, 23, 50, 93, 94, 95.

Operational stage

During the operational stage no adverse impacts on the ground surface and on landscape are anticipated. Grounds located in the area beyond the embankment will be protected against flooding, as a result of which the existing land use can be safely carried out in this area.

6.2 Climate

The Contract will not cause significant change to local climate at any work stage under Contract. Due to lack of negative impacts on climate it was stated that no mitigation measures were necessary.

6.3 Air quality

Implementation stage

The impact of Contract on the air will take place only at the construction stage, during the execution of works using heavy equipment, and diesel vehicles and machines. It will be unorganized emission, the range of which will correspond to the area of construction works and to the course of access and technological roads. It is

recommended to apply e.g. the following mitigation measures to reduce/eliminate the adverse Contract impact on the air quality:

- Equipment used on the implementation stage shall be fully efficient and meet the legal requirements to protect against the emission of dusts and gases to the air,
- Loose materials and aggregate necessary for the planned works shall be properly protected against outblowing and excessive dusting during transportation, storage, and embedding,
- Access roads shall be kept in proper cleanliness,
- One shall limit the operational time of diesel engines, construction machines and vehicles, and reduce traffic velocity for vehicles within the site.

Detailed recommendations for mitigation measures related to air protection are shown in Appendix 1 to EMP for Contract 1B.9 – Plan of Mitigation Measures, items in the table: 65, 66, 67, 68, 69, 71.

Operational stage

During the operational stage of the embankment the only source of temporary and unorganized emission of pollutants into the air will be combustion of fuel by vehicles and machines (e.g. lawn mowers) used for maintenance and inspection of condition of the embankment. That emission shall not have a significant impact on the air quality, and therefore there is no need for introduction of mitigation measures concerning protection of air during the operational stage. Regardless of this, a public road will be used on the crown of the embankment, the commune road – Ślężoujście Street - the traffic load will remain low and will be a source of unorganized emission of pollutants into the air related to the passage of passenger vehicles, the traffic of which will be regulated by the relevant road traffic regulations.

6.4 Soils and grounds

Implementation stage

Contract will affect the soil environment only on the construction stage. This will result from the necessity to remove or disturb the top layer of soil layer on the slopes of the embankment, as well as on technological routes and at places of the embankment body demolition and excavations for elements of embankment and passage constructions.

The most important mitigation measures are as follows:

- Prior to the commencement of earthworks under Contract one shall remove about 15 cm thick layer of top-soil, that shall be used for further area restoration;
- In case of failure polluting the ground, one shall immediately remove the polluted soil layers and hand them over to a specialized company having relevant permits for business actions related to the dangerous waste management;
- During the performance one shall apply efficient equipment only to protect the soil against pollutions;
- One shall arrange a station with sorbent for removal of potential leakage and spills of oil derivatives within locations designated for fueling and parking of vehicles and machines;
- Sites for service and fueling of vehicles shall be sealed on the subbase side using insulation materials assuring protection for the soil;
- Fueling should be done using mobile or fixed fuel distribution stations having relevant protection, e.g. a station with sorbent to remove leakage and spills of oil derivatives to the ground.

Additional measures mitigating impact on soils include the following: ban to repair equipment and machines, to change oil and to fuel and store fuels as well as ban to park machines within the Odra and Ługowina embanked areas and within environmentally valuable areas determined by the Contractor's environmental supervising team.

Ongoing regular inspections of technical condition of vehicles and construction equipment will be carried out during the construction stage, and the site will be provided with sorbents enabling quick neutralization of possible spills or leaks of harmful substances.

After completion of the construction works the expanded embankment will be covered with a layer of top-soil (the slopes of the embankment), and the ground will be sown with native grass mix in a way which would limit the surface erosion to minimum.

Mitigation measures related to protection of land are shown in Appendix 1 to EMP for Contract 1B.9 – Plan of Mitigation Measures, items in the table: 13, 14, 16, 17, 19, 20, 21, 22, 23, 24, 46, 47, 48, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 70, 71, 72, 73, 74, 93, 94, 95.

Operational stage

During the operational stage there will be no adverse impact of the embankment on the soil environment. There is no need for introduction of mitigation measures concerning protection of soil and ground during the operational stage.

6.5 Surface water

Implementation stage

Measures to protect surface water are coherent with measures to protect against contamination of soils and the ground (in reference to the proper organization of works and locations of temporary acquisition, and providing them with relevant sorbent).

Limitation of nuisance and adverse impact of Contract on the implementation stage is associated with the proper performance of works. In order to meet requirements related to the protection of environment the commencement of construction works shall be preceded with a detailed plan and a schedule of works addressing relevant protection including solutions for the technology of demolition and construction of a new passage of the Ługowina River.

In case of the Contract implementation stage a hazard for the ground and water environment may occur due to an uncontrolled emission of liquid pollutions caused by unpredictable events (failures, collisions), and also due to e.g. improper storage of waste, improper sewage management or improper application of single vehicles and machines and construction devices.

One shall keep the site clean and shall assure the proper organization of works. One shall apply materials which would not be harmful for the environment or would remain neutral only for the purpose of performance.

One shall apply a proper drainage system for excavations in the area of excavations, which would assure keeping them dry – without water pits.

In case of oil derivatives' leakage to surface water the Contractor is obliged to assure immediate mechanic collection of oil derivatives from the surface of water, and also to apply proper sorbent. Site facility must be equipped with relevant volume of sorbent throughout the Contract implementation period.

For the time of construction works the Contractor shall develop a flood protection plan, which shall be agreed with the Engineer. That plan shall include a reference to the time of evacuation or protection of construction equipment and the occurrence of particular hydro-meteorological situation.

Occurrence of adverse impact on the status of BSW established within the Contract implementation area is not expected.

Mitigation measures related to protection of water are shown in Appendix 1 to EMP for Contract 1B.9 – Plan of Mitigation Measures, items in the table: 11, 12, 13, 14, 15, 16, 17, 19, 46, 47, 48, 49, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 70, 71, 72, 73, 74.

Operational stage

No risk for surface water will occur on the operational stage of the embankment. Operations, including constant maintenance of the reconstructed flood embankment, would not cause emission of pollutions to the ground and to surface water. As a consequence, it is not expected to implement mitigation measures for protection of surface waters on the operational stage of the embankment.

The road operation will be regulated by road traffic regulations. The discharge of rainwater and snowmelt into the environment from the tight surface of the road and the pedestrian pavement will be organized and safe due to the construction of a rainwater sewage system equipped with wells with sedimentation tanks and a sedimentation tank. It is necessary to clean the settling tanks regularly.

The mitigation measures in the field of water protection are listed in Appendix 1 to the EMP for the Contract 1B.9 - Plan of Mitigation Measures, items in the table: 96.

6.6 Groundwater

Implementation stage

Measures to protect groundwater are coherent with measures to protect against contamination of soils and the ground, and also surface water (in reference to the proper organization of works and locations of temporary acquisition, and providing them with relevant sorbent).

No significant impact on the water and soil environment is foreseen, in particular such an intended impact as e.g.: intake of groundwater, lowering the level of groundwater, or other type of change in water relations.

Mitigation measures related to protection of water are shown in Appendix 1 to EMP for Contract 1B.9 – Plan of Mitigation Measures, items in the table: 11, 12, 13, 14, 15, 16, 17, 19, 46, 47, 48, 49, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 70, 71, 72, 73, 74.

Operational stage

During the use of embankments there will be no hazard for the groundwater. The hydro-geological regime or the flow will not change during the operational stage, in comparison to the current condition. Function, including ongoing maintenance of reconstructed flood embankment, will not cause emission of pollutants to soil or groundwater.

In terms of road functioning, it is necessary to apply analogous mitigating measures as indicated in chapter 6.5.

6.7 Acoustic climate

Implementation stage

Acoustic nuisance may occur only on the implementation stage, as a result of execution of construction works with the use of motor vehicles and equipment. This will be a temporary inconvenience (only during the daytime) and will be limited to the construction site and its vicinity as well as to roads used for deliveries associated with the construction process. The impact shall be short-term and ceaseable. It is expected to implement the following mitigation measures:

- Construction works shall be carried out in a daytime, i.e. from 6:00 am to 10:00 pm where housing is close to the embankment,
- Construction equipment applied during the works should be fully technically efficient and shall be specified by low noise emission.

Mitigation measures related to reduction of noise emission are summarized in Appendix 1 to EMP for Contract 1B.9 – Plan of Mitigation Measures, items in the table: 14, 61, 62, 63, 64, 65.

Operational stage

The noise emission during the operational stage of the embankment will not exceed the value admissible by law. There will be a commune road on the crown with little local traffic load. Its operation will be governed by road traffic regulations. There is no need for introduction of mitigation measures concerning acoustic protection during the operational stage.

6.8 Nature

6.8.1 Natural habitats, flora and fauna

Implementation stage

Performance of the planned construction works is associated with impact of Contract on vegetation and fauna of that area. Due to the works performed, the following mitigation measures are expected:

- The works performed within the Contract implementation period shall be done under supervision of the environmental experts' team;
- Storage site for materials, site facility, and parking lots for the equipment and for machines shall be located in place/places of the lowest environmental value (outside valuable habitats, outside the areas of medium and high ornithological value, outside habitats of amphibians);
- Any work associated with reconstruction of the embankment shall be done only within the boundaries of the designed Contract area;
- The trunks of trees growing within the works lane or in the direct vicinity, that can be exposed to mechanical damage, shall be protected at least to the height of 1.5 m from ground level;
- It is banned to store any materials or set new transport roads within 1 m from tree trunks and shrubs;
- Due to the hatching period for birds the logging of trees and shrubs shall be scheduled for autumn and winter (the works shall be performed from October 1 until the end of February). If necessary, it is acceptable to perform the additional logging in the hatching period provided that an ornithological supervision would be done;
- The works in vicinity of roots and trunks shall be done manually. One cannot leave rootage uncovered for a long time, so its overdrying would be avoided. In case of damaging a tree, the Contractor shall immediately perform necessary curing actions limiting effects of the damage under supervision of its own environmental supervisor;
- It is required to inspect vehicles and construction machines in terms of their technical efficiency. In case of machine failure, any leaks of operating fluids and fuel shall be neutralized with a proper volume of absorbent, which would be stored at the site facility;
- The site facility, where machines and trucks shall operate, shall be protected;
- Parts of site facility – tightly insulated from the ground – shall be set out for servicing and fueling of the machines;

- Waste produced during the performance shall be segregated and stored selectively in containers or on sites separated and adapted for the purpose, in conditions preventing dusting and blowing away light fractions and their adverse impact on the environment;
- Successive taking over of waste by units authorized for their further treatment shall be assured;
- Prior to the commencement of earthworks within a particular area one shall inspect it in relation to the occurrence of protected animal species (e.g. amphibians, reptiles, birds). Identified specimens shall be transferred to the area beyond the Contract site to the location having similar habitat conditions and placed in such a distance from Contract that the animals would not be able to return to the site until the completion of works. The earthworks shall be performed under the Contractor's environmental supervision;
- All the works in the vicinity of amphibians' breeding habitats identified ongoingly by the environmental supervision may be performed only when herpetological fencing that protects the Contract area against migration of amphibians is used. In case of their identification the amphibian specimen shall be without delay caught and transferred to substitute habitats existing at the safe distance. The list of such habitats shall be indicated by the Contractor in the application for derogation from prohibited activities against the protected species. Prior to spring seasonal migration of amphibians the area of works in the vicinity of passage and water course shall be surrounded with the temporary herpetological fencing.

During migration the amphibians gathering at the fencing shall be caught and transferred to the area beyond the construction site, i.e. to a site opposite to the one, where amphibians were identified. After the completion of works the temporary fencing shall be removed. In case when works are performed in places where amphibians live from March to October, the adult specimen, eggs and larvae shall be caught and transferred basing on the decision of the RDOŚ in Wrocław for derogations from bans regarding protected species of amphibians. Potential burying of the habitats shall be performed in autumn and in winter (November – February);

- The construction site and excavations shall be kept dry during the project and during the performance;
- The excavations shall be protected against falling down of small animals;
- For land reclamation after the Works Contract - should be used mixes of grass and other species of native plants shall be applied for the development of the planned assignment, and their regular mowing shall be assured;
- If the environmental supervision identifies additional amphibian habitats that were not recognized earlier and are in collision with the works, one shall apply to the competent Authority for a consent for habitat damaging. Works connected with removal of amphibians' breeding habitats shall be performed only from the beginning of November till the end of February.

Mitigation measures related to protection of natural environment are shown in Appendix 1 to EMP for Contract 1B.9 – Plan of Mitigation Measures, items in the table: 11, 12, 13, 14, 15, 20, 21, 22, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 50, 94.

Operational stage

Adverse impact on the natural environment is not anticipated on the operational stage.

6.8.2 Protected sites

Due to the location of Contract 1B.9 in a huge distance from the existing Nature 2000 Site it is not expected to implement additional mitigation measures.

6.9 Cultural landscape and monuments

Implementation stage

Prior to the commencement of works, an action consisting in carrying out archaeological rescue research has been planned throughout the entire Contract area. Such research may be carried out after obtaining a permit from the Lower Silesian Heritage Conservator.

If any objects that might be monuments or archaeological artefacts are discovered during the construction works, according to the Act of July 23, 2003 on the Protection of Monuments, the Contractor is obliged to stop the works in the place of finding, secure the place and report it to the Provincial Heritage Conservator in Wrocław, while notifying the Employer and the Engineer at the same time. Further works in this area will resume and then will be carried out strictly in accordance with the provisions of the relevant decision issued by the Conservator.

Mitigation measures related to the cultural environment are shown in Appendix 1 to EMP for Contract 1B.9 – Plan of Mitigation Measures, items in the table: 83, 84, 85.

Operational stage

Adverse impact on monuments and archaeological sites is not anticipated on the operational stage. As a consequence, no mitigation measures were foreseen.

6.10 Organization of the site facility and the construction site

During the performance under Contract the Contractor, by its own effort, will acquire the area for site facility establishment and storage yards respecting the requirements and conditions of the World Bank regarding compensation. Any approval for temporary acquisition must be preceded by a site inspection in terms of its impact on particular environmental elements.

Location of the site facility should take into account environmental aspects, including the following:

- favorable soil conditions, geological structure, vegetation coverage and groundwater level for the environment;
- convenient road access, and access to power supply and water supply for social purposes, and favorable location in relation to developed areas;
- exclusion of the embanked area and protected natural habitats, the areas of medium and high ornithological value and amphibians and beavers habitats as potential locations for that site.

In addition, the Contractor has to prepare the construction site organization plan which, apart from the location of the site facility, will indicate the conditions of its development, including: the location of parking lots for the construction equipment and other vehicles, the method of soil and water protection against contamination with substances harmful to the soil environment and groundwater, the method of draining rain water, the location of the storage site for construction materials, and the places for municipal and dangerous waste storage.

From the environmental and social point of view, the site facility is a place of potentially adverse impact, due to a risk of contamination of land surface, soil, groundwater, and air as a result of accumulation of waste, building materials, as well as hazardous materials (i.e. fuel, oil), and also concentration of activities including the use of trucks and heavy equipment (loading, unloading, transportation).

The site facility should comply with H&S regulations valid in Poland and in the European Union regarding provision of sealed septic tanks for collection of sewage, and management of solid waste and sewage.

Mitigation measures related to organization of site facility and storage yards are shown in Appendix 1 to EMP for Contract 1B.9 – Plan of Mitigation Measures, items in the table: 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 36, 48, 50, 51, 52, 53, 54, 55, 56, 58, 59, 73.

6.11 Health and safety of people

Ensuring protection of human health and life in the case of flooding is the main goal for the implementation of the subject Contract. The Contractor will be also responsible for implementation of the activities related to protection of health and safety of people during the construction stage. These activities will be the basis for securing the necessary technical means, ensuring proper organization of works, as well as fire protection, medical care and preventive care.

The Contractor's H&S supervision shall be responsible for adequate marking of construction site according to applicable laws. This marking shall be regularly controlled, in the case of destruction or theft of marking the Contractor shall promptly rebuild or supplement it. The Contractor shall be responsible for any damage to the bulk objects, structures, roads, elements of technical facilities (ditches, culverts, transmission networks), as well as information boards, historic objects, etc., caused by the Contractor or its subcontractors during the execution of works. That liability shall relate to an obligation of repairing any damage at own expense.

The Contractor shall be obliged to agree with road management authorities on the traffic organization and on the works security plan, and to subsequently organize the traffic in accordance with the agreed plans (marking and securing the site and marking of de-tours and recommended road signage related to the change of traffic organization, etc.). The Contractor shall respect the legal limitations of speed and loads per vehicle axle during deliveries of materials and equipment to and from the construction site. The Contractor shall also obtain all necessary permits from the authorities for transportation of non-standard loads and shall constantly inform the Engineer about each case of such a delivery.

The Contractor shall provide training on rules of and conditions under the EMP for the managing staff and for the engineering and technical personnel (before the commencement of the Works, and then it will conduct them cyclically, e.g. once a quarter).

Mitigation measures related to human health and safety are shown in Appendix 1 to EMP for Contract 1B.9 – Plan of Mitigation Measures, items in the table: 4, 6, 7, 9, 10, 46, 68, 75, 76, 77, 78, 79, 80, 81, 82.

6.12 Emergency hazards (crisis, emergency situations)

Crisis situation

In the case of emergency, in the first place, the competent services should be notified:

- Emergency number (all services) – 112;
- Police – 997;
- Fire Brigade – 998;
- Medical Emergency – 999.

The procedure of interaction and informing the parties of the Contract will be described in the Contractor's Manual provided by the Engineer to the Contractor prior to the commencement of the works. The indicated Manual will include contact details (including e-mail), taking into account the personnel status of the Engineer's, Contractor's and PIO's structure assigned to the implementation of the Contract.

The Contractor's obligation is to prevent hazards in the first place, and in the event of their occurrence, to mitigate their effects. The basic hazards are characterized below, however the list of hazards given is open and does not exhaust the risk of other hazards, not listed in the EMP.

In the event of any emergency, the Contractor is obliged to immediately notify the relevant services as well as the Employer, Engineer and OVFM Project Coordination Unit.

Flood

The occurrence of flood during the construction works on reconstruction of the existing embankment is a real extraordinary threat to the environment resulting from the character of the described Contract.

During accommodation of a flood wave there should be no vehicles, construction equipment, building materials, or mobile objects/elements used for the works on the riverside of the embankment. For the duration of construction works, Flood Management Plan should be provided, specifying the relation between the time of commencement of the evacuation or protection of the equipment and the occurrence of a certain hydro-meteorological situation. This plan must be approved by the Engineer. The Contractor will be obliged to establish communication with IMGW-PIB to receive current information on weather forecast. In case of a warning on high water level, the Contractor shall immediately notify the Engineer and the Employer, and shall undertake appropriate actions according to the procedures described by the Flood Management Plan.

Mitigation measures related to flood protection are shown in Appendix 1 to EMP for Contract 1B.9 – Plan of Mitigation Measures, item in the table: 80.

Windstorms and hurricanes

The Contractor is responsible for ensuring safety in the area of the Contract implementation. The procedure to be followed in the event of extreme weather phenomena will be included in the BIOZ Plan prepared by the Contractor (see chapter 6.15). The requirement for the Contractor to develop a BIOZ plan and obtain approval from the Engineer for its content is specified in Appendix 1 to EMP for Contract 1B.9 – Plan of Mitigation Measures, item in table 75.

Leakage of oil derivatives

A common type of extraordinary risk to the environment on the construction site is the leakage of oil derivatives causing pollution of soil, ground or groundwater. However, for this purpose appropriate preventive measures are provided, relating to appropriate organization of sites and site facility, constant control of the condition of applied construction equipment, and also technical measures allowing for neutralization of the effects of such an event in the form of sorbents available at site facilities.

In case of the leakage one shall immediately remove its source and effects, and contaminated soil layers shall be properly treated in a manner safe for the environment.

Mitigation measures related to the protection of ground and water environment are shown in Appendix 1 to EMP for Contract 1B.9 – Plan of Mitigation Measures, items in the table: 56, 57, 59, 60.

Identification of unexploded shells and misfires

In the event of discovering unexploded shells or misfires, the Contractor shall immediately stop the works at a given site, evacuate the workers and notify the police, a licensed sapper unit and then the Engineer and the PIU. It is strictly forbidden to dig unexploded shells or misfires out, bury them, touch them, and especially to raise them, transfer them, throw them to the fire or to such locations as rivers, channels, oxbow lakes, ditches, etc.

The Investor has not inspected the construction site in terms of the presence of unexploded shells or misfires.

The Contractor is obliged to ensure the sapper supervision throughout the performance of earthworks (Contractor's sapper supervision), which would include an on-going inspection of the site in terms of unexploded shells or misfires presence, and – if necessary - clearance of the site from hazardous objects and their proper treatment.

Mitigation measures related to sapper supervision are shown in Appendix 1 to EMP for Contract 1B.9 – Plan of Mitigation Measures, items in the table: 76, 82, 87, 90.

Fire

The Contractor is responsible for fire protection in the implementation area of the Contract. Detailed procedure in case of fire will be contained in the BIOZ Plan prepared by the Site Manager.

Epidemiological risk

If an epidemiological threat or epidemic emergency state is in force during the works execution, the Contractor will be obliged to comply with the legal requirements, in particular the Act of 5 December 2008 *on preventing and combating infections and infectious diseases in humans* (consolidated text: Journal of Laws of 2019, item 1239, as amended), all obligations arising from the declaration of an epidemic or a state of emergency and relevant guidelines of the World Bank. The Contractor's actions should reduce the risk of spreading infection both to the Contractor's staff, as well as the Employer and the Engineer and the loyal community. The guidelines for dealing with an epidemiological emergency or an epidemic state are contained in Appendix 1 to EMP for Contract 1B.9 – Plan of Mitigation Measures, item in the table: 107.

Notwithstanding the foregoing, the Contractor, in accordance with item 106 in Appendix 1 to EMP for Contract 1B.9 will implement an awareness-raising program on the spread of infectious diseases (eg HIV-AIDS, diseases caused by coronaviruses).

6.13 Waste and sewage

The waste management shall be implemented in conformity with provisions of the Act of December 14, 2012 on waste. One of the significant rules related to the construction works comprising reconstruction of a flood embankment is a ban to store waste within the embanked area. The waste, as well as soil and other materials shall also not be stored in vicinity of trees, which would not be removed. On the other hand, one of general and universal rules forming a basis for rational waste management is the rule of minimization for produced waste volume, and the Contractor shall be obliged to implement it throughout the construction works. Furthermore, the Contractor shall be obliged to segregate the waste produced and to secure its successive reception by authorized recipients. On the temporary storage stage one shall secure proper containers and separate, mark, and properly prepare sites designated for that purpose in a way preventing dusting and blowing light fractions out, and rinsing of substances harmful to the natural environment out by precipitation water. A special supervision shall be performed over hazardous waste management. In case of identifying illegal waste storage site, such locations shall be cleared through removal of waste and their transportation to the treatment site prior to the commencement of works.

The construction site must be equipped with sealed sanitary facilities to collect wastewater. Sewage should be transported to a sewage treatment plant by authorized recipients.

Guidelines for waste and sewage management are contained in Appendix 1 to EMP for Contract 1B.9 – measure – Plan of Mitigation Measures, items in the table: 19, 70, 71, 72, 73, 74, 75.

6.14 Specific requirements for the World Bank's ES policies (environmental and social aspects, including risk of sexual exploitation, sexual abuse and sexual harassment)

Exemplary forms of additional hazards associated with ES issues (other than the ones discussed previously in Chapters 5.1-5.12) were presented in Chapter 5.13.

The Contract implementation is related to the need to meet a number of ES requirements (environmental and social aspects including risk of sexual exploitation, sexual abuse and sexual harassment, work safety), which are regulated by national regulations governing environmental protection, health and safety at work and labour law. Their observance is supervised by state institutions and bodies. In particular, with regards to the occupational

health and safety regulations and labour law, the state health and safety inspection bodies and the state labour inspection are authorised to control the activities of entrepreneurs, including those on construction sites. However, due to the high importance of the ES requirements for the World Bank, the terms of the contracts subsidized by the World Bank loan impose obligations to ensure the implementation of regulations in force. Special attention is paid to such issues as:

- Protection of minors employed in the implementation of the Contract;
- Elimination of inappropriate conduct of persons employed in the implementation of the Contract (including sexual harassment and mobbing);
- Ensuring the safety and health protection of persons employed in the implementation of the Contract, including the provision of health and safety services required by the law;
- Ensuring proper social and employment conditions for employees employed in the implementation of the Contract (including fair pay conditions).

Below, there is a list of issues, in the form of requirements for the Contractor, related to ES WB policies. It should be noted that the ES requirements and conditions set for the Contractor and its employees also apply to the Contractor's subcontractors and their employees or subcontractors.

- The Contractor will provide training and implement an awareness-raising programme to prevent sexual harassment and mobbing. These activities shall be carried out throughout the entire term of the Contract, including the guarantee and warranty defect notification period at least every quarter. These will take the form of information, educational and awareness-raising campaigns.
- The Contractor shall immediately inform the Engineer of all cases of reported and suspected sexual harassment and mobbing.
- The Contractor shall inform all employees on the construction site about the possibility of lodging complaints about working and pay conditions and will provide an information leaflet with the necessary information on how to lodge complaints and requests, in which it will ensure that there are no repercussions for a person reporting a problem. The content of the leaflet will be agreed with the Engineer.
- The Contractor shall inform the Engineer about all accidents involving employees and third parties. In the event of an accident, the Contractor shall take all actions to which the Contractor is obliged by the applicable laws, such as the Construction Law and the Labour Code, among others.
- The Contractor shall ensure equal pay for employees executing the same work without taking into account gender, sexual orientation or age, and such persons employed for the Contract shall not be persecuted or discriminated against on the basis of gender, sexual orientation or age.
- The Contractor shall, as far as possible in accordance with the possibilities and conditions and the Polish provisions of the Labour Code, satisfy the living and social needs of employees in the workplace.
- The Contractor shall make it easier for employees to improve their professional qualifications.
- The Contractor may employ only such an employee who is at least 18 years old, has completed at least eight years of primary school and has submitted a medical certificate stating that the work in question does not put at risk his or her health.
- The Contractor shall employ a health and safety specialist with qualifications and professional experience in accordance with the Polish labour law.

In connection with the above, in order to prevent hazards associated with ES issues, except for the measures listed in Chapters 6.1-6.13, Appendix 1 to the EMP implements additional detailed mitigation measures to e.g.:

- prevent accidents and near misses on work site and in other places related to the implementation of the Contract (e.g. items 97, 98, 99, 100 and others listed in Chapters 6.11 and 6.12);
- combat such unacceptable behavior on work site as cases of sexual harassment or mobbing (e.g. items 101, 102, 106);
- assure proper social conditions, and labour conditions and payment to the personnel engaged in implementation of the Contract, in compliance with the law (e.g. items 103, 104);
- assure proper procedures for ongoing information provision on issues and hazards associated with the aforementioned subject (e.g. item 105).

The above-mentioned conditions applicable to the Contractor will be reported by him throughout the entire period of the Contract implementation.

However, it should be stressed that the Contractor shall be obliged to apply and observe all provisions of the Labour Code and WBGs Environmental, Health and Safety (EHS) Guidelines¹⁵.

6.15 Requirements for implementation of action plans in the construction phase

In order to ensure the proper organization of the works, as well as to proper implementation the conditions set out in Appendix 1 and 2 in the Environmental Management Plan, the Contractor should develop numerous documents necessary for the performance and subsequently obtain approval of the Engineer for them. The documents are as follows:

- *Construction site organization plan*, which should contain such elements as e.g.:
 - location of the site facilities,
 - development of the site facilities,
 - protection of the site facilities,
 - service roads, including mandatory planned temporary plot occupations,
 - environmental protection on the site facilities, technological roads and yards.
- *Traffic organization plan* for the duration of the works, which should be compliant with:
 - technical specifications,
 - road managers' requirements for transport and conditions of use.
- *Waste management plan* (Waste MP), which should contain such elements as e.g.:
 - encountered and predicted types and volumes of waste,
 - means of preventing adverse impact of waste on the environment,
 - means of waste management considering collection, transportation, recovery and treatment of waste,

¹⁵ The guidelines are published on the World Bank's internet service at:
https://www.ifc.org/wps/wcm/connect/Topics_Ext_Content/IFC_External_Corporate_Site/Sustainability-At-IFC/Policies-Standards/EHS-Guidelines/ and
<https://www.ifc.org/wps/wcm/connect/29f5137d-6e17-4660-b1f9-02bf561935e5/Final%2B-%2BGeneral%2BEHS%2BGuidelines.pdf?MOD=AJPERES&CVID=jOWim3p>

- type of generated waste (e.g. waste from construction, renovation and dismantling of buildings and road infrastructure - including soil from polluted areas, hazardous waste, municipal waste, asbestos-containing waste) and method for its storage.
 - *Quality assurance plan/plans*, which should contain such elements as e.g.:
 - works performance organization,
 - organization of traffic at the construction site, including marking of the works,
 - H&S and environmental protection,
 - list of working teams,
 - scope of duties of the key personnel,
 - quality control,
 - laboratory tests.
 - *Flood protection plan for the site* for the performance time, which should contain such elements as e.g.:
 - monitoring of hydrological and meteorological conditions,
 - conditions for accommodation of flood flows during the performance,
 - the rules of work for the Contractor's team in the period of flood risk,
 - basic duties of the managing staff during the flood risk,
 - list of managing staff in the period of flood risk,
 - list of equipment and transport means needed to conduct rescue actions.
 - *BIOZ Plan*, which should contain such elements as e.g.:
 - indication of plot or land development elements, which may create a risk to safety and health of people,
 - information concerning expected hazards that could occur during the performance, defining the scale and types of hazards and the place and time of occurrence, including reference to the natural environment,
 - information on designation and marking for construction work sites, according to the type of hazard,
 - information on the method of training for the employees prior to the commencement of particularly hazardous works,
 - determining the method of storing and transport of hazardous materials, goods, substances and preparations at the construction site,
 - indication of technical and organizational means of safeguarding against hazards connected with the construction works in increased health risk zones, or in their immediate vicinity, including means of safe and efficient communication allowing for quick evacuation in the case of fire, failure, and other hazards,
 - indication of the storage location for construction site's documentation and documents necessary for proper operation of machines and other technical devices.
 - *Plan for dealing with uncontrolled emission (leakage) of petroleum substances*, which should include, inter alia, elements on how to deal with spillage of chemical and petroleum substances, i.e. .:
-

- the mode of equipping with appropriate materials in relation to the anticipated hazards and substances,
- the mode of alerting and notifying of individual services,
- the procedure to limit spillage,
- the mode for dealing with sorbent materials.

At developing the aforementioned documents the Contractor shall include e.g. provisions of the decision on environmental conditions (and of other administrative decisions related to the environmental protection, if applicable), conditions determined in the EMP and in the WBG's Environmental, Health and Safety (EHS) Guidelines¹⁶, and binding provisions of the state law.

These documents must be approved by the Engineer before implementation, who then also monitors their correct implementation. The requirement to develop and obtain acceptance of the content of the above-mentioned documents are indicated in item 75 in Appendix No. 1 to the EMP. These issues are subject to reporting by the Contractor.

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

¹⁶ See: footnote in Chapter 6.14.

7 Description of measures related to environmental monitoring

Appendix 2 to this EMP provides a set of monitoring measures binding for the Contractor. The measures were developed based upon conditions/guidelines included in valid administrative decisions issued for Works Contracts under Contract, along with additional conditions established on the stage of developing the EMP.

7.1 Environmental monitoring during the works

Prior to the commencement of works the Contractor should develop an own Plan of Monitoring Measures that should be correlated with the Plan of Monitoring Measures of the Engineer and of other institutions involved in the Contract execution. The plan should focus on such environmental elements as: land surface and landscape, climate, air quality, soils and grounds, water, acoustic climate, nature (habitats, flora, fauna), cultural landscape and monuments, organization of the site facilities and the construction site, health and safety of people, extraordinary hazards for the environment, waste and wastewater, requirements for implementation of action plans in the construction phase.

7.1.1 Surface of land, landscape, and soils and grounds

Monitoring for the subject Contract shall comprise the following elements:

- Location of temporary acquisition beyond the environmentally valuable areas indicated by the Contractor's environmental supervision;
- Location of roads, yard, parking lots, etc., including limitation of impact on vegetation and on surface of land, and their proper protection and equipping;
- Observation of traffic regulations by vehicles on established technological roads;
- Overview of materials/building materials applied for the extension/reconstruction, so they would not contain substances particularly harmful to the water environment in the form of dissoluble compounds;
- Inspection of protection for excavations;
- Proper reinstatement of temporary acquisition sites;
- In case of emergency (e.g. leakage of oil, grease from the construction equipment to the ground, spilling of substances hazardous to the environment in storage locations) one shall undertake mitigation measures (replacement of the ground, inclusive).

Monitoring measures related to the protection of land, landscape, soil and ground were indicated in Appendix 2 to the EMP for Contract 1B.9 – Plan of Monitoring Measures, items in the table: 2, 3, 4, 5, 7, 8, 9, 26, 27, 29, 30, 31, 32, 38, 49.

7.1.2 Climate and air quality

It is not necessary to monitor the air quality due to implementation of Contract. It is however necessary to monitor implementation of mitigation measures.

Monitoring measures shall be implemented in the form of visual assessment during site inspections undertaken at least once a week in places which are subject to monitoring, and especially at the site facility and at service roads. Monitoring will relate to the assessment of protection for the area against potential dusting from dirt roads and yards, as well as storage areas and means of transport for loose materials, and also the use of motor vehicles and equipment.

Monitoring measures related to the protection of air quality are indicated in Appendix 2 to the EMP for Contract 1B.9 – Plan of Monitoring Measures, items in the table: 34, 35, 37.

7.1.3 Surface water

Due to the anticipated small scale of Contract impact on surface water there is no need to monitor the quality of water during the construction stage in the usual way, i.e. without the occurrence of unusual events which could cause the pollution. However, one shall monitor proper implementation of measures mitigating the impact on ground and water environment (proper location and protection of yard, parking lots, waste storage sites, fueling sites for vehicles, etc.; providing work sites with neutralization agents for possible leakage of dangerous substances, including oil derivatives, regular cleaning of well settlers in the rainwater sewage system).

Monitoring measures related to the protection of water are indicated in Appendix 2 to the EMP for Contract 1B.9 – Plan of Monitoring Measures, items in the table: 2, 3, 4, 5, 7, 26, 27, 28, 29, 30, 31, 32, 38, 50.

7.1.4 Groundwater

Due to the anticipated small scale of Contract impact on groundwater there is no need to monitor the quality of water during the construction stage in the usual way, i.e. without the occurrence of unusual events which could cause the pollution. However, one shall monitor proper implementation of measures mitigating the impact on ground and water environment (proper location and protection of yard, parking lots, waste storage sites, fueling site for vehicles, etc.; providing work sites with neutralization agents for possible leakage of dangerous substances, including oil derivatives).

However, if such case occurs during works execution (concentrated leakage or surface emission of liquid substance to the environment, e.g. as a result of road accident) it is advisable to conduct water quality tests for the first water-bearing level. The following parameters should be subject to assessment: pH, BOD₅, suspension, turbidity, and concentration of oil derivatives.

Monitoring measures related to the protection of water are indicated in Appendix 2 to the EMP for Contract 1B.9 – Plan of Monitoring Measures, items in the table: 2, 3, 4, 5, 7, 26, 27, 28, 29, 30, 31, 32, 38, 50.

7.1.5 Acoustic climate

The analyzed site is not exposed to excessive constant noise (i.e. everyday heavy traffic, including heavy goods vehicles, operation of industrial plant, etc.). Based on the data from IIS, it is assumed that the Contract, at meeting all requirements and recommendations contained in the Decision on environmental conditions and in the EMP, shall also not cause such nuisance.

The scope of monitoring for noise protection will include checking of time and manner of execution of works using devices that remain sources of the nuisance noise.

In addition, it is recommended to conduct regular inspections of technical conditions of equipment used for construction works in terms of noise emission, and to undertake rational and appropriate actions, adequate to current assessment of the situation in response to any comments or complaints from residents or users of the adjacent land regarding acoustic nuisance, source of which may be related to the Contract implementation.

Monitoring measures related to the protection of acoustic climate are indicated in Appendix 2 to the EMP for Contract 1B.9 – Plan of Monitoring Measures, items in the table: 4, 33, 34.

7.1.6 Nature

The Contractor should provide the environmental team which will monitor the impact of the construction works on habitats, flora and fauna at the stage of the performance. The monitoring should include e.g. checking of adherence to acceptable dates (periods) for carrying out specific type of works (removal of vegetation), control of physical protection of trees not to be logged, as well as control of security measures to protect small animals

(herpetofauna mainly), and control of places conducive to cause danger to animals (depressions, excavations, and other types of traps). Logging of trees with a diameter over 50 cm shall be done under supervision of an expert entomologist and an expert chiropterologist. It is also necessary to monitor the effectiveness of activities related to the removal of invasive plants, if necessary.

Monitoring measures related to the protection of habitats, flora and fauna are indicated in Appendix 2 to the EMP for Contract 1B.9 – Plan of Monitoring Measures, items in the table: 2, 3, 4, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 29, 49.

7.1.7 Cultural landscape and monuments

As indicated in the Plan of Mitigation Measures (Appendix 1 to the EMP for Contract) the Contractor is obliged to carrying out rescue archaeological research. Moreover the Contractor is obliged to follow all the obligations imposed in obtained opinions/permits.

Monitoring measures related to this issue are indicated in Appendix 2 to the EMP for Contract 1B.9 – Plan of Monitoring Measures, items in the table: 44.

7.1.8 Organization of the site facilities and the construction site, health and safety of people, extraordinary hazards for the environment, waste and wastewater, requirements for implementation of action plans during the construction phase

The responsibility of the Contractor is to monitor proper implementation of all mitigation measures related to organization of the site facility and of the construction site, health and safety of people, extraordinary threats to the environment, waste and sewage, and requirements regarding implementation of action plans during the construction phase.

Monitoring measures related to those issues are indicated in Appendix 2 to the EMP for Contract 1B.9 – Plan of Monitoring Measures, items in the table: 2, 4, 18, 26, 27, 29, 30, 31, 32, 36, 37, 38, 39, 40, 41, 42, 43.

7.2 Monitoring of the environment during the use

The necessity to monitor the environment in case of the subject Contract at the operational stage is related to the periodic inspection and cleaning of the settling tanks for the wells and the sedimentation tank located on the rainwater sewage system. Monitoring measures related to those issues are indicated in Appendix 2 to the EMP for Contract 1B.9 - Plan of Monitoring Measures, item in the table: 50.

Implementation of mitigation measures assures limitation of the scale and intensity of potential adverse impact to the performance time only.

8 Public consultations

8.1 Public consultations on EIA/ZRiD stage

Due to the lack of necessity to carry out the EIA procedure for the Contract, which was indicated by RDOŚ in Wrocław (details are described in chapter 3.5), no public consultations were conducted. Public participation was guaranteed at the stage of obtaining a permit for a road investment, when the authority issuing the decision in question, ie. the President of Wrocław, informed the parties about the procedure.

The President of Wrocław did neither receive related remarks nor applications from the parties, the society, and social and ecological organizations.

8.2 Public consultations on Environmental and Social Management Framework (2015)

The draft ESMF was subject to public consultations conducted in accordance with the World Bank's operational policy OP 4.01. Their purpose was to allow the society to acknowledge contents of that document and to assure the possibility of filing potential remarks, enquiries, and applications to its contents.

Documentation on the public consultations process for the ESMF is available on a website of the Odra-Vistula Flood Management Project Coordination Unit¹⁷.

8.3 Public consultations on EMP (2021)

The draft of this document will be subject to the procedure of public consultations conducted in accordance with the operational policy of the World Bank (OP/PB 4.01).

After development of a draft EMP and after obtaining the World Bank's acceptance for the commencement of publication procedure, its digital version is published on the publicly available websites. Detailed information about the possibility to acknowledge the document and submit comments and motions (including contact details – e-mail address, office hours, phone number) is made public in the local press and on the website of unit implementing Contracts discussed under the EMP. After the period of 10 working days from EMP draft's publication a meeting is held for interested (concerned) people.

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 Stakeholders Engagement in World Bank Supported Activities in the event of restrictions on public meetings*'.

The meeting so far organized as part of the publication of the document in the form of an open debate will be replaced by the organization of a webinar, i.e. a type 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 such application as for example Microsoft Teams. The program allows 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.

¹⁷ <https://odrapcu.pl/en/project-ovfmp/documents/>

ENVIRONMENTAL MANAGEMENT PLAN

CONTRACT 1B.9 "MODERNISATION OF FLOOD EMBANKMENT ALONG THE ŚLĘZOUJŚCIE STREET WITH ROAD INFRASTRUCTURE"

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.

Public comments which have to be taken into account are introduced in the EMP and the final document is provided. EMP in this form is also sent to the World Bank for approval, for so-called 'No objection' clause.

Draft for public consultation

9 Organizational structure of EMP implementation

The subject Contract remaining a part of Odra-Vistula Flood Management Project co-financed from the funds of the World Bank, the Council of Europe Development Bank, the European Union Cohesion Fund, and the State budget. Therefore, the structure of supervision over implementation of the EMP must correspond to both: regulations of the Polish law, as well as the requirements of the World Bank.

9.1 Odra-Vistula Flood Management Project Coordination Unit

The overall coordination of implementation of individual EMPs under the OVFMP is the responsibility of the Project Coordination Unit (PCU), which functions as an organizational unit within the structures of the National Water Management Authority (KZGW), which is an organizational unit of the State Water Holding Polish Waters (PGW WP).

The PCU tasks are as follows:

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

9.2 Project Implementation Unit

An entity which is directly responsible for implementation of the EMP for the Contract and for monitoring of the progress of its implementation is the Project Implementation Unit (PIU), i.e. State Water Holding Polish Waters Regional Water Management Authority in Wrocław.

Due to implementation of the OVFMP Project, the Project Implementation Office (PIO) has been designated within the PIU structure (ie. Road and City Maintenance Authority in Wrocław), which is a separate structure supervised by the President of State Water Holding Polish Waters.

The Investor/Substitute Investor is also responsible for substantive supervision and compliance of the Contract implementation with the Bank's procedures within the scope of powers specified in an appropriate agreement regarding the implementation of this Contract. This structure is transparent and has a high decisive level, which increases the effectiveness of the Contract implementation.

As a part of EMP implementation supervision, the PIO fulfils the following tasks:

- monitoring of the EMP implementation progress;
- financial management and bookkeeping;
- preparing required reports for the needs of EMP implementation monitoring and coordination of its execution by all services engaged in the EMP implementation.

The scope of PIO employees' duties connected with the fulfilment of supervision over EMP implementation is as follows:

- managing, coordinating, and supervising the EMP implemented by the Designer, the Engineer, and the Contractor;
- direct supervision over the correct task implementation;
- cooperation with the PCU;
- conducting an administrative and legal supervision over the EMP implementation;
- verifying the Reports and studies on the EMP implementation, as prepared by the Consultant and by the Contractor;
- conducting a financial supervision over the EMP implementation;
- supervising the proper application of formal procedures during the implementation of EMP, as required by the Construction Law, Works Contract, the environmental protection law, and others.

9.3 Engineer

The role of the Engineer is to support the PIU in an effective conduction of the whole Works Contract process.

The Engineer shall be obliged to perform e.g. the supervision over EMP implementation, comprising the following:

- monitoring of EMP implementation by the Contractor;
- monitoring of the Contractor's activities;
- checking the quality of construction works performed by the Contractor and of applied construction products, and especially preventing the usage of construction materials which are defective and not accepted for use in the construction industry;
- representing the Investor on site by performing the control of the compliance of the construction process with the design and with the construction permit/investment project implementation permit, and with regulations related to the environmental protection and technical know-how;
- supervision over all issues related to the environmental protection by specialists experienced in the field of environmental protection (including a key environmental management expert) and by other staff of the Engineer;
- constant monitoring over proper implementation of measures mitigating the adverse environmental impact;
- conduction of additional tests if it would be necessary to verify the reports of the Contractor;
- identifying problems resulting from harmful environmental impact caused by the construction works, and presentation of solutions to those problems;
- verifying and acceptance of construction works being covered or of concealed works, participation in tests and technical commissioning of technical installations and devices, as well as preparation and participation in performing the commissioning activities for finished objects and handing them over for use;
- confirmation of the works factually completed and of the removal of defects, as well as, at the request of the Investor, verification of site's settlements.

NOTE: Due to the small technical and financial scope of the Contract and the extensive experience of the Supervision Inspectors employed in the Road and City Maintenance Authority in Wrocław as an Investor / Investor Substitute, this unit may act as an Engineer if it obtains the relevant approval of the World Bank. In the event of such a deviation from the standard organization of the organizational structure of the EMP implementation, all activities assigned as the Engineer's duties will be performed by a team of Inspectors at ZDiUM.

9.4 Contractor

A Contractor shall be selected for the purpose of performance, and it shall be responsible for implementation of individual EMPs. The Contractor's liabilities in that scope are as follows:

- conducting construction works according to the rules specified in the EMP, in accordance with contract conditions and design documentation, pursuant to applicable legal provisions and requirements of administrative decisions issued for this Contract;
- ensuring the permanent environmental, sapper, and archeological supervision (including a team of expert naturalists listed under Appendix 1 to the EMP);
- ensuring the permanent H&S supervision;
- implementation of the Engineer's recommendations (including the recommendations of Engineer's environmental expert and of the Investor's supervision inspector) concerning implementation of the EMP;
- ensuring – prior to the commencement of works – the preparation among others BIOZ Plan, Waste Management Plan, Quality Assurance Plan/Plans, Flood Protection Plan for the site for the performance time and Construction site organization plan – see also: Chapter 6.15;
- if necessary, the Contractor's environmental team would develop necessary materials and applications for the obtainment of permits/decisions for derogations from bans to protect species of plants, fungi or animals based upon the rules and in the mode specified by the NC Act (of April 16, 2004). The above-mentioned decisions issued by the RDOŚ/GDOŚ are to be requested for by the Contractor. The Contractor's duty is to implement the provisions of obtained decisions for derogations from the protection of species of plants, fungi or animals;
- keeping the construction site records;
- drafting monthly reports and inspection reports (monthly reports, quarterly reports, final report, reports to the RDOŚ/GDOŚ (only in the scope resulting from decisions obtained on the implementation stage, if they would state it necessary to report subject actions));
- preparing reports concerning the environmental protection;
- applying to the Investor for modification of design solutions, if it is justified by a necessity of increasing the performance safety for the construction works or of improving the construction process related to implementation of the EMP;
- repairing the potential faults/defects, which would be notified by the Engineer and/or by the Investor during the works and during the defects, guarantee and warranty notification period. The Contractor is obliged to report any actions implemented to remove the faults/defects. The report shall be filed to the Engineer/Investor.

10 EMP implementation schedule and reporting procedures

Implementation of the EMP shall allow the parties involved in the preparation, performance and supervision of the Contract to:

- identify different environmental aspects which have a considerable impact on the state of the environment, and therefore allow for controlling, correcting, and reducing them, but which consequently generate economic effects;
- rectify adverse consequences of the works conducted during the implementation to the benefit of the environment and financial results;
- determine the aims and tasks performed within the adopted environmental policy, covered by the EMP, which require expenditures and bring tangible effects;
- identify and eliminate prospective hazards and failures, preventing and removing the environmental effects, which may be connected with them and which may entail losses disproportional to the preventive costs;
- reasonably use the natural resources, with minimum environmental loss and optimum generation of costs.

Furthermore, implementation of recommendations and measures required under the EMP may reduce or even eliminate a risk of occurrence of adverse social, environmental and economic events and phenomena related to the Contract, and in particular:

- a risk to ignore the environmental protection issues during the process of performance by the Contractor;
- a risk of escalation of the local community protests as a result of a failure of the Contractor to adhere to technologies for conducting the works and environmental procedures approved by the Engineer;
- a risk of additional environmental penalties;
- a risk of additional damage to the environment.

Taking into account the significance of the aspects specifying the environmental conditions and community conditions, the following EMP implementation procedures are anticipated:

- prior to the selection of the Contractor, the Investor shall submit a draft of this EMP to the World Bank in order to obtain its opinion;
- after obtaining a positive opinion of the World Bank, the EMP shall be consecutively subject to public consultations;
- after the public consultations (and supplementing the document with the consultations report), the EMP shall be updated and submitted in its final version for the approval by the World Bank;
- upon the approval of EMP by the World Bank, the final document shall be attached to the Bidding Documents for selection of the Contractor;
- all activities of the Contractor shall be systematically reported (once a month), both in Polish and as needed in English, in paper and electronic versions, with reference to the obligations required by the EMP and other contractual documents. Those reports shall be subject to the approval of the Engineer.

Furthermore, relevant units involved in implementation of the Contract shall be obliged to fulfil additional obligations related to monitoring and reporting of issues associated with the environmental protection, as determined in administrative decisions issued for the subject Contract (see: Chapter 3.5) and given in Appendix 1 and in Appendix 2 to the EMP for Contract 1B.9 (Plan of Mitigation Measures, Plan of Monitoring Measures).

Monitoring at the works execution stage involves the preparation of summary reports on monitoring of nature by the Contractor, confirmed by the experts of the Contractor's environmental team, approved by the Engineer's

environmental team. Detailed contents of the report shall be defined by the Engineer (commencement report, periodical reports – monthly, ad-hoc, closure); it shall also determine the due dates.

During the implementation of the works and in the defects guarantee and warranty notification period, the monitoring will be carried out by the Contractor. However, after the defects guarantee and warranty notification period, if necessary, the monitoring will be taken over by the Investor / Substitute Investor and will be carried out by the end of the monitoring period set in the EMP.

The Project reporting system shall also base on monthly reports submitted by Contractors to the PIO through the Engineer, and upon Engineer's monthly and quarterly reports. Monthly and quarterly reports on the EMP implementation (Contractor's and Engineer's) shall be prepared as a part of monthly reports or as a separate document.

The PIU shall supply the PCU with quarterly reports in the part referring to tasks implemented by them. They shall contain a required set of information and descriptions allowing for the preparation of the Project's quarterly report by the PCU. Furthermore, especially in the case of problems with the Works Contract implementation, the PCU shall expect the PIU to submit summaries and data in the monthly periods.

The following reporting procedures were established:

1) Reporting:

- a) Reports (monthly, quarterly, ad-hoc, final) shall be developed by the Contractor and/or Engineer,
- b) if required, reports resulting from issued administrative decisions (implementation of derogation decisions regarding protected species of plants and animals) shall be developed by the Contractor,
- c) Report review by the Engineer,
- d) Submission of the report to the Employer (for information),
- e) Submission to the RDOŚ/GDOŚ (only in the scope resulting from issued administrative decisions obtained on the implementation stage, if they would state the necessity of reporting for the subject actions),
- f) Submission of a PIU's quarterly report to the PCU,
- g) Final report on implementation of the EMP prepared by the Engineer (after verification by the PIU and by the PCU, submitted to the World Bank not later than 3 months after the completion of works).

2) Filing system:

- a) the Contractor: 1 copy of each report in an electronic version for 5 years from the date of the Contract completion,
- b) the Engineer: 1 copy of each report in an electronic version for 5 years from the date of the Contract completion,
- c) the Employer: 1 copy of each report in an electronic version for 5 years from the date of the Contract completion.

3) Evaluation:

- a) ongoing assessment of the outcomes of the planned activities implementation which arise from the EMP;
- b) ongoing analysis of documentation (Reports of the Contractor) by the Engineer;
- c) providing the Employer with reliable information on the course of the construction process, with special consideration of the execution of activities limiting the adverse impact on the environment, and recommendations arising from environmental decisions;

- d) development and provision of quarterly reports to the World Bank by the PCU.

The following is planned:

- *ex-ante* evaluation: Report prior to the commencement of the Contract implementation (Engineer's Report),
- ongoing evaluation: Engineer's quarterly reports,
- *ex-post* evaluation:
 - Report upon the completion of the works (final report on implementation of the EMP developed by the Contractor),
 - EMP Report upon expiry of the Defects, Guarantee and Warranty Notification Period drawn up by the Contractor.

Draft for public consultation

11 Source materials

1. Investment Information Sheet with amendments titled: "Modernisation of flood embankment along the Ślężoujście Street with road infrastructure". December 2018.
2. Decision of the Regional Director for Environmental Protection in Wrocław of January 25, 2019, reference number: WOOŚ.420.202.2018.KK.1 for the Contract consisting on the expansion of Ślężoujście Street from Rędzińska Street to Potokowa Street in Wrocław.
3. Decision of the Director of the Regional Water Management Authority in Wrocław of the water permit for the construction of water facilities of March 11, 2019, reference number: WR.RUZ.421.169.2018.RR.UL.
4. Decision of the Director of the Regional Water Management Authority in Wrocław of the water permit for locating new buildings in areas of high flood risk of June 25, 2019, reference number: WR.ZUZ.5.421.37.2019.PG.
5. Opinion of the Provincial Office for the Protection of Monuments of March 22, 2019, reference number: WZA.5183.1240.2019.AWZ, rkp7090-2019.
6. MasterPlan for the Odra River Basin. National Water Management Authority, Warsaw 2014.
7. Architectural and construction design for the assignment titled "Modernisation of flood embankment along the Ślężoujście Street with road infrastructure", Biuro Projektów Dróg i Mostów „BBKS-PROJEKT” Sp. z o.o. 2019.
8. Regulation No. 1217/19 of the Mayor of Wrocław of June 28, 2019 on the protection of trees and the development of green areas in Wrocław (https://www.zzm.wroc.pl/pl/dzialania_zzm,366.html).
9. Regional Geography of Poland, Jerzy Kondracki, Wydawnictwo Naukowe PWN, Warsaw 2001.
10. The state of the environment in the Dolnośląskie Voivodeship. Report for 2020. Inspectorate for Environmental Protection, Wrocław 2020.
11. World Bank Operational Policy OP 4.01 – Environmental Impact Assessment (<http://web.worldbank.org/WBSITE/EXTERNAL/PROJECTS/EXTPOLICIES/EXTOPMANAL/0,,contentMDK:20064724~pagePK:64141683~piPK:64141620~theSitePK:502184~isCURL:Y~isCURL:Y~isCURL:Y~isCURL:Y,00.html>).
12. Environmental and Social Management Framework, final document, April 2015 (<https://odrapcu.pl/en/project-ovfmp/documents/>).
13. Poland – Odra-Vistula Flood Management Project: Environmental and Social Management Framework (<https://odrapcu.pl/en/project-ovfmp/documents/>).
14. Odra-Vistula Flood Management Project – Project Operations Manual, Wrocław 2015 (<https://odrapcu.pl/en/project-ovfmp/documents/>).
15. Website: <https://odrapcu.pl/en/project-ovfmp/>.
16. Website: www.isok.gov.pl/.
17. Geo-service GDOŚ: <http://geoserwis.gdos.gov.pl/mapy/>.

12 Appendices

- Appendix 1. Plan of mitigation measures;
- Appendix 2. Plan of monitoring measures;
- Appendix 3. List of national legal acts related to environmental protection;
- Appendix 4. Decisions, resolutions, permits, notices;
 - Appendix 4a. Decision of the Regional Director for Environmental Protection in Wrocław of January 25, 2019;
 - Appendix 4b. Decision of the water permit of March 11, 2019;
 - Appendix 4c. Decision of the water permit of June 25, 2019;
 - Appendix 4d. Opinion of Provincial Office for the Protection of Monuments of March 22, 2019.
- Appendix 5. Map with location of the Contract;
- Appendix 6. Map with location of the Contract in reference to protected areas and to NATURA 2000 sites;
- Appendix 7. Map with location of the Contract in reference to areas of potential flood hazard;
- Appendix 8. Map with location of the Contract in reference to areas excluded from land of potential flood hazard;
- Appendix 9. Map with location of the Contract's elements.