State Water Holding Polish Waters
Regional Water Management Authority in Wrocław

ENVIRONMENTAL MANAGEMENT PLAN

ODRA – VISTULA FLOOD MANAGEMENT PROJECT

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

Works Contract 1B.7:
WFS Widawa – the rebuilding of the flood management system of the communes and municipalities Czernica, Długołeka, Wisznia Mała and Wrocław

Complementary task with ORFPP
Environmental category A – according to OP 4.01 of the World Bank.

FINAL VERSION

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ODRA - VISTULA FLOOD MANAGEMENT PROJECT
The World Bank (WB), Loan agreement no. 8524 PL
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The European Union and
The State Budget

ENVIRONMENTAL MANAGEMENT PLAN

Subcomponent: ***1.B - Flood Protection on the Middle and Lower Odra***
Contract: ***1B.7 - WFS Widawa – the rebuilding of the flood management system of the communes and municipalities Czernica, Długołeka, Wisznia Mała and Wrocław***

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

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TABLE OF CONTENTS

SUMMARY **9**

1. INTRODUCTION **17**

1.1. ODRA RIVER BASIN FLOOD PROTECTION PROJECT (ORFPP) AND ODRA-VISTULA FLOOD MANAGEMENT PROJECT (OVFMP) 17

1.2. RECONSTRUCTION OF THE ODRA-WIDAWA RELIEF CHANNEL (SUBCOMPONENT B3 ORFPP) 18

2. TASK DESCRIPTION **19**

2.1. LOCATION OF THE TASK 19

2.2. CHARACTERISTICS OF THE TASK 19

3. INSTITUTIONAL, LEGAL AND ADMINISTRATIVE CONDITIONS **23**

3.1. INSTITUTIONS ENGAGED IN TASK IMPLEMENTATION 23

3.2. APPLICABLE NATIONAL LEGISLATION CONCERNING THE ENVIRONMENT PROTECTION 23

3.3. EIA PROCEDURE IN POLAND 23

3.4. WORLD BANK'S GUIDANCE 25

3.5. CURRENT STATE OF EIA PROCEDURES FOR THE TASK 26

4. DESCRIPTION OF THE ENVIRONMENT ELEMENTS IN THE SURROUNDINGS OF THE TASK **28**

4.1. SURFACE OF EARTH AND LANDSCAPE 28

4.2. CLIMATE 28

4.3. AIR QUALITY 28

4.4. GEOLOGICAL STRUCTURE 29

4.5. SOILS AND LAND 29

4.6. SURFACE WATERS 30

4.7. GROUND WATER 33

4.8. ACOUSTIC CLIMATE 33

4.9. FLORA AND FAUNA 34

4.10. MONUMENTS OF CULTURE 39

4.11. POPULATION AND TANGIBLE ASSETS 39

5. SUMMARY OF THE ENVIRONMENTAL IMPACT ASSESSMENT **40**

5.1. SURFACE OF EARTH AND LANDSCAPE 40

5.2. CLIMATE 40

5.3. AIR QUALITY 41

5.4. SOIL AND LAND 41

5.5. SURFACE WATERS 42

5.6. GROUND WATER 43

5.7. FLORA AND FAUNA 43

5.8. ACOUSTIC CLIMATE 47

5.9. MONUMENTS OF CULTURE 48
5.10. TANGIBLE ASSETS 48
5.11. HUMAN HEALTH AND SAFETY 48
5.12. EXTRAORDINARY HAZARDS TO THE ENVIRONMENT 49
6. DESCRIPTION OF MITIGATION MEASURES 51
6.1. SURFACE OF EARTH AND LANDSCAPE 51
6.2. CLIMATE 51
6.3. AIR QUALITY 51
6.4. SOIL AND LAND 52
6.5. SURFACE WATERS 52
6.6. GROUND WATER 52
6.7. ACOUSTIC CLIMATE 52
6.8. FLORA AND FAUNA 53
6.9. CULTURAL LANDSCAPE AND MONUMENTS 53
6.10. TANGIBLE ASSETS 53
6.11. HUMAN HEALTH AND SAFETY 54
6.12. EXTRAORDINARY HAZARDS TO THE ENVIRONMENT 54
6.13. WASTE AND SEWAGE 55
6.14. REQUIREMENTS FOR IMPLEMENTATION OF ACTION PLANS IN THE CONSTRUCTION PHASE 56
6.15. REQUIREMENTS RELATED TO EXECUTION OF ENVIRONMENTAL COMPENSATION 58
7. DESCRIPTION OF MONITORING MEASURES 59
7.1. ENVIRONMENTAL MONITORING DURING PERFORMANCE OF WORKS 59
7.2. ENVIRONMENTAL MONITORING DURING OPERATIONAL PERIOD 59
8. PUBLIC CONSULTATIONS 60
8.1. PUBLIC CONSULTATIONS DURING EIA FOR THE ORFPP (2005) 60
8.2. PUBLIC CONSULTATIONS FOR THE ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK FOR THE OVFMP (2015) 60
8.3. PUBLIC CONSULTATIONS AT THE STAGE OF ENVIRONMENTAL PROCEDURES FOR THE TASK (2017) 60
8.4. PUBLIC CONSULTATIONS OF THE ENVIRONMENTAL MANAGEMENT PLAN (2019) 61
9. ORGANISATIONAL STRUCTURE OF EMP IMPLEMENTATION 63
9.1. ODRA-VISTULA FLOOD MANAGEMENT PROJECT COORDINATION UNIT (OVFMP PCU) 63
9.2. PROJECT IMPLEMENTATION UNIT (PIU) 63
9.3. CONSULTANT/ENGINEER 64
9.4. CONTRACTOR 65

10. SCHEDULE OF EMP IMPLEMENTATION AND REPORTING PROCEDURES 66

11. REFERENCE DOCUMENTS 70

12. LIST OF APPENDICES 71

List of key definitions and abbreviations used in the EMP

Name	Description
World Bank / WB	International Bank for Reconstruction and Development / World Bank
PCU / OVFMP PCU	Project Coordination Unit / Odra Vistula Flood Management Project Coordination Unit
BP	Bank Procedure[1]
Environmental decision / DŚU	Decision on environmental conditions
Investor / Employer / PGW WP RZGW Wrocław / JWP	The State Water Holding Polish Waters The Regional Water Management Authority in Wrocław / ORFP Project Implementation Unit
IMiGW - PIB	Institute of Meteorology and Water Management - National Research Institute
JCWP	Surface Water Body
JCWPd	Ground Water Body
PIU	Project Implementation Unit
Consultant/ Engineer / Contract Engineer	Company or legal person implementing the Technical Assistance Consultant function for the Investor under the ORFP Project
Contract/ Works contract/ Task / Investment	Works contract 1B.7 - WFS Widawa – the rebuilding of the flood management system of the communes and municipalities Czernica, Długołeka, Wisznia Mała and Wrocław
LDP	Local Development Plan
EIA	Environmental Impact Assessment
OP	World Bank's Operational Policy[2]
PAD	Project Appraisal Document for ORFPP[3] or OVFMP[4]

[1] Operational Policies and Procedures of the World Bank are presented in The World Bank Operational Manual, available from: *https://policies.worldbank.org/sites/PPF3/Pages/Manuals/Operational%20Manual.aspx*.

[2] See reference for the BP (World Bank Procedure).

[3] The document available at the World Bank's website: *http://documents.worldbank.org/curated/en/552201468145748680/pdf/31771.pdf*

[4] The document available at the World Bank's website: *http://documents.worldbank.org/curated/en/320251467986305800/Poland-Odra-Vistula-Flood-Management-Project*

Name	Description
HAS Plan	Health and Safety Plan
ORFPP/ ORFP Project	Odra River Basin Flood Protection Project
OVFMP/ OVFM Project	Odra - Vistula Flood Management Project
EMP	Environmental Management Plan
RDOŚ	Regional Director for Environmental Protection
PGWdO / PGW	Plan of water management on the Odra River basin area
SCWP	Combined Surface Water Body
EU	European Union
ESHS	Management Strategies and Implementation Plans
C-ESMP	The Contractor's Environmental and Social Management Plan
GUS	Central Statistical Office
Contractor / Task Contractor / Contractor of Part of the Task	Company/legal person performing the Works Contract 1B.7 - WFS Widawa – the rebuilding of the flood management system of the communes and municipalities Czernica, Długołeka, Wisznia Mała and Wrocław.
Road management authority	Organisational unit implementing the responsibilities of the management of public roads in accordance with the act on public roads and the responsibilities of the management of non-public roads.

List of short names for legal acts used in EMP

Names of legal acts cited in the content of EMP are provided in a short form. Full names of legal acts are cited in the list below.

In-text name	Full name (including publication reference)
Birds Directive/BD	European Parliament and Council Directive 2009/147/EC of 30 November 2009 on wild birds protection (EU Official Journal, L 288 of 06.11.2007)
Habitat Directive/HD	Council Directive 92/43/EEC of 21 May 1992 on the protection of natural habitats and wild fauna and flora (EU Official Journal, L 206 of 22.07.1992, as amended.)
Water Framework Directive (FWD)	Directive 2000/60/EC of the European Parliament and Council of October 23rd, 2000 establishing a framework for Community action in the field of water policy (EU Official Journal L 327 of 22.12.2000, as amended)
EIA Regulation	Regulation of the Council of Ministers dated 9 November 2010 on investments that may have considerable impact on environment (consolidated text, Journal of Laws of 2016, item 71)
EIA Regulation of 2004	Regulation of the Council of Ministers dated 9 November 2004 on the types of projects which can significantly affect the environment and specific conditions for qualifying projects to prepare the environment impact assessment report (Journal of Laws of 2004 no. 257, item 2573, as amended)
Act on Public Roads	The Act of 21 March 1985 on Public Roads (consolidated text, Journal of Laws of 2018, item 2068)
Environment Protection Act	The Environment Protection Act of 16 April 2004 (consolidated text, Journal of Laws of 2018, item 1614, as amended)
Monuments Protection Act	Monuments protection and guardianship act of 23 July 2003 (consolidated text, Journal of Laws of 2018, item 2067, as amended)
Waste Act	The Waste Act of 14 December 2012 (consolidated text, Journal of Laws of 2018, item 992, as amended)
Inland Fishing Act	The Inland Fishing Act of 18 April 1985 (consolidated text, Journal of Laws of 2018, item 1476, as amended)
Construction Law Act	The Construction Law Act of 07 July 1994 (consolidated text, Journal of Laws of 2018, item 1202, as amended)
Environmental Protection Law Act	The Environmental Protection Law Act of 27 April 2001 (consolidated text, Journal of Laws of 2018, item 799, as amended)
Water Law Act	The Water Law Act of 20 July 2017 (Journal of Laws of 2017, item 1566, as amended)

SUMMARY

This Environmental Management Plan (EMP) refers to the Works Contract *1B.7 - WFS Widawa – the rebuilding of the flood management system of the communes and municipalities Czernica, Długołeka, Wisznia Mała and Wrocław.*

The following information is presented in particular in this EMP:

- brief description of the ORFPP Project and OVFM Project;
- description of the Task being the subject of this EMP (chapter 2);
- characteristics of the institutional, legal and administrative conditions for the implementation of the Task, including the Current state of EIA procedure for the Task (chapter 3);
- description of the individual elements of the environment in the vicinity of the Task (chapter 4);
- summary of evaluation of environmental impacts for the Task (chapter 5);
- description of mitigation measures, aimed at eliminating or limiting the potential negative environmental impact of the Task (chapter 6), with a table presenting such measures (Appendix No. 1 to EMP);
- description of environmental monitoring measures, valid for the Task (chapter 7), with a table presenting such measures (Appendix No. 2 to EMP);
- description of measures related to the execution and monitoring of environmental compensation, necessary for execution for the Task (chapter 6.15), with a table presenting such measures (Appendix No. 3 to EMP);
- description of the process of public consultations performed at the respective stages of the preparation of environmental documentation for the Task (chapter 8);
- description of the organisational structure for the implementation of the EMP (chapter 9);
- schedule of the EMP implementation and a description of reporting procedures (chapter 10);
- list of reference documents quoted in the EMP (chapter 11);
- list of appendices to the EMP (chapter 12);
- list of national legal acts related to environment protection (Appendix No. 4 to EMP);
- a copy of an administrative decision related to environmental protection, issued for the Task (Appendix No. 5a to EMP),
- a copy of an administrative decision related to water management, issued for the Task (Appendix No. 5b to EMP),
- the location of the main elements of the Task, also in respect of protected areas and limits of surface water bodies (Appendix No. 6 to EMP),
- location of selected natural objects in relation to the location of the main elements of the Task (Appendix No. 7 to EMP).

Characteristics of the Task

The Works contract *1B.7 - WFS Widawa – the rebuilding of the flood management system of the communes and municipalities Czernica, Długołeka, Wisznia Mała and Wrocław* is implemented by PGW PW RZGW Wrocław. The works cover the sectional construction and reconstruction of flood protection embankments of the Widawa River in kilometre from 21+500 to 30+000, the flow improvement of the selected bridge structures and the adaptation of other engineering structures to the flood water flow conditions in order to ensure protection of the areas adjoining the said section of the Widawa River in the Commune of Czernica, Długołęka and Wrocław against a flood wave created in the Widawa Basin.

At the same time, Task implementation ensures protection against the flood created in the area of the Odra river catchment by securing the areas adjacent to the Widawa river from flooding with water transferred from the Odra river to the Widawa river valley considering the concurrent occurrence of the flood flow in the Widawa river valley.

This task is also implemented in accordance by the still valid decisions of the Wrocław Poviat Board no. 45/2013 dated 03.09.2013, no. 47/2013 dated 12.09.2013 and 51/2013 dated 09.10.2013, in which the Poviat Board evaluated positively the WFS Project in the part relating to Component B3, under condition that the Employer will do the analyse and identify the impact of the transfer of flood water of the Odra – Widawa Channel, i.e., among others:

- to prepare an impact assessment of flood water transfer to the areas upstream of the mouth of the Odra – Widawa channel and to perform all the necessary works securing the territory of the Poviat of Wrocław against flooding;
- to analyse the possibility of a safe collection of water from the watercourses falling to the Widawa River above the mouth of the Odra – Widawa (among others Młynówka Kiełczowska, Graniczny Channel, Przerowa, Mrówka) and to perform all necessary works ensuring the collection of water from the said tributaries.

Scope of the Task

The Task is located on the area of three municipalities of Lower Silesia Province: Czernica, Długołęka and Wrocław. The following elements of the flood protection system shall be executed under the task and the other related actions:

- Construction of new flood protection embankments along the right and left bank of the Widawa River with an earth structure with the total distance of 9.73 km;
- Construction of sheet pile walls (flood protection walls) along three sections with a total length of 1.28 km;
- Expansion and sealing of the existing left-bank flood embankment of the Widawa River "Przerowa L" at the distance of 2.23 km together with reconstruction and construction of engineering infrastructure;
- Construction, extension and repair of internal roads and embankment crossings connected with access to hydraulic structures, including:

  - internal roads – the design width of approx. 3.50 m, road widening/passing bays locally to the width of 5.0 m of the lane. The new service roads and those planned to be renovated are designed as having pavement made of crushed stone. The exception is a service road designed as access to the pumping station and stations of mobile pumps within the Mrówka stream (Graniczny Channel), which was designed with bitumen pavement.
  - crossings through embankments and exit ramps from embankments (22 pcs.) with the crest width and road width adjusted to the parameters of the existing road;
- Reconstruction of the Przerowa weir to operate as a flooding gate by:
  - execution of a new weir closure – a gate valve consisting of two parts with the height of 3.0 m (currently 2.0 m)
  - the elevation of the damming structure crest above the flood water level – improvement of the structure class from the 4th to the 2nd class
  - construction of a service footbridge (bridge) below the weir structure – a single-span reinforced concrete slab with a length of 3.0 m
  - reconstruction of the upstream and downstream stations to accommodate them to the new shape of the weir and bridge structure;
- Flow improvement of the road bridge along Rzeczna Street in Kiełczówek by flow improvement of the Widawa Riverbed and construction of new revetments on: the inter-embankment area, slopes of the river banks and road embankment slopes in the region of bridge abutments;
- Flow improvement of the road bridge along Wilczycka Street in Wilczyce by flow improvement of the Widawa riverbed and construction of new revetments on: the inter-embankment area, slopes of the river banks and road embankment slopes in the region of bridge abutments. In addition, a crossing for animals will be made as part of flow improvement;
- Construction of revetments of the Widawa riverbed and the inter-embankment area (slopes and their edges) upstream and downstream of the Kiełczówek weir by improving the flow of the Widawa River and by construction of new revetments;
- Diversion of water from the Mrówka stream (Graniczny Channel) to the Widawa River by means of sectional regulation (130 m), construction of a new outlet section (105 m) and watercourse removal in the place of collision with the planned investment (55 m). In addition, construction of an embankment culvert (two gravity pipelines with the section of 200x200 cm and length of 23 m), stations of mobile pumps and a dry flood reserve reservoir with the area of approx. 1.0 ha and depth of approx. 1.2 – 1.5 m;
- Adaptation of Młynówka Kiełczowska to the designed flood protection system by the construction of a new bed of Młynówka Kiełczowska (approx. 214 m), construction of three embankment culverts on Młynówka, elimination of the Młynówka Kiełczowska sections colliding with the investment (approx. 220 m) and construction of the bed

(approx. 40 m) linking Młynówka Kiełczowska to the bed of Mrówka (Graniczny Channel).

- Flood protection of service buildings on plot No. 313 precinct Wilczyce (former Sielska Zagroda);
- Extension, reconstruction or relocation of the existing public roads, incl. Wilczycka Street, Topolowa Street, Rzeczna Street. The technical parameters of the reconstructed sections will be adapted to the parameters of the existing roads;
- Solution for a collision with the existing land infrastructure, i.e. water supply and sewage disposal systems, fuel pipeline Ostrów Wielkopolski – Wrocław, gas systems, teletechnical and electrical systems. The land infrastructure facilities colliding with the planned route of the embankments will be reconstructed or relocated according to the conditions agreed with owners or management authorities;
- Partial disassembly - interrupting the continuity of the existing flood protection embankments and dikes:
  - interrupting the continuity of the right-bank flood embankment/dike from approx. km 27+500 to approx. km 28+000 of the Widawa River,
  - interrupting the continuity of the left-bank flood embankment/dike from approx. km 26+100 to approx. km 27+100 of the Widawa River;
- Construction of ditches and drainage systems, maintenance or renovation of the existing drainage ditches and removal of the sections of ditches colliding with the investment. Approx. 3.8 km of new ditches or drainage systems is planned altogether under the Task. Subject to maintenance will be about 2.2 km of the existing drainage ditches. The drainage ditches colliding with the investment will be removed along sections with the total length of 0.8 km;
- Construction of 6 water reservoirs being a compensation for the water ponds/water reservoirs destroyed under the investment;
- The execution of replacement plantings of high vegetation (planting trees and bushes, restoration of patches of the riparian forest habitat 91F0) constituting natural compensation for trees and bushes not planned for felling in connection with the construction of new sections of embankments.

The task, according to the scope prescribed in the environmental decision, also includes the scope of works, already implemented by another Contractor, related to the renovation of the Kiełczówek gate weir, i.e.:

- renovation of the weir's concrete structure (abutments, pillars, threshold, footbridge with stairs);
- renovation (replacement) of a steel structure of the main closures of the weir with hoisting mechanisms;
- renovation of the stilling basin and the downstream apron downstream of the structure;
- performance of demolition works of the existing bank reinforcements;

- execution of slope revetments in the near-the-weir zone from the headwater and tailwater side;
- construction of revetments of slopes of the Widawa River banks upstream and downstream the weir;
- construction of revetments on the inter-embankment area;
- flow improvement of the Widawa River bed;
- execution of an access road to the weir with a manoeuvring yard;
- the necessary felling of trees and bushes together with grubbing, clearing and tidying up the area of the facility.

The works will not form part of the scope of works planned for performance by the future Contractor of this works Contract.

Institutional, legal and administrative conditions

The Task, with regard to its characteristics, expected potential environmental impacts, and location in respect of protected areas, will be implemented in accordance with relevant national regulations on environmental protection in this regard and in accordance with relevant *Operational Policies and Bank Procedures* relating to environment protection, cultural resources and resettlement (in particular *OP/BP 4.01*, *OP/BP 4.04*, *OP/BP* and *OP/BP 4.11*, *OP/BP 4.12*).

Status of administrative procedures in scope of the EIA

The Task was covered by the national proceedings on the environmental impact assessment. On 29 December 2017, the Director of RDOŚ in Wrocław issued a decision on environmental conditions for the Investment entitled: "*WFS Widawa – the rebuilding of the flood management system of the communes and municipalities Czernica, Długołeka, Wisznia Mała and Wrocław*" (reference no.: WOOŚ.4233.2.2017.ŁCK.27).

Condition of environment elements in the surroundings of the Task

As a result of works related to identification of natural and cultural environment values, it has been determined that the area of the implementation of the Task and its surroundings is characterised by the following environmental conditions, among others:

- the planned works will be situated within the limits of four surface water bodies (JCWP): *Widawa from the Michalice reservoir to Oleśnica*, code PLRW60001913659, *Widawa from Oleśnica to Dobra*, code PLRW60001913679, *Graniczny Channel* code PLRW600023136769, *Oleśnica from Boguszycki Stream to the Widawa*, code PLRW600019136699 and within the ground water bodies (JCWPd), code PLGW6000093;
- in the area of Task implementation and in its direct surrounding, 1 protected species of plants, 77 protected species of animals and 2 types of natural habitats listed in Annex I of the Habitats Directive have been confirmed;
- in the area of Task implementation, there is a Natura 2000 site Grędzińskie Forests PLH02008, the Task overlaps with this area across approx. 0.7 ha. In the further position

the following Natura 2000 sites are located: Grądy Odrzańskie PLB020002, Grądy w Dolinie Odry PLH020017 (situated approx. 2.3 km from the Task implementation limits) and Szczytnicki Landscape Park (situated approx. 2.7 km from the Task implementation limits);

- in the surroundings of the place where works are implemented, two immovable monuments are situated, entered into the register of monuments, a palace complex in Śliwice in the commune of Długołęka (about 170 m from the designed embankment) and a mill complex in Wieściszowo in the commune of Czernica (about 80 m from the planned embankment).

Summary of the environmental impact assessment

Surface of earth and landscape

The Task implementation is related with local transformation of the earth surface, mainly along the route of the planned new flood protection embankments and directly in the vicinity of the base of the planned and modernised embankment of the Widawa River. Local changes to the existing landscape of the river valley will occur. However, as a result of the adopted location of the embankments along the inclination edge of the river valley, the landscape system of the central part of the Widawa River valley will be preserved following the Task completion.

Climate

Implementation of the Task does not have an impact on the climate condition. In addition, measures related to the restoration of greenery in the surroundings of the Task have a positive effect on the local climatic conditions.

Atmospheric air

The impact of Task implementation on the air quality is limited in time to the construction phase and is not significant.

Soil and land

The performance of works will cause local impact on the condition of soil and land with a small scale and intensity. The impacts are similar to those described for the land surface and landscape. The soils directly along the new embankment of the river will be subject to transformation. The soils in the area of the modernised embankment were already transformed in the past. In the other places, where temporary land occupation will take place, measures will be applied mitigating impact on soils.

Surface waters

Works outside the beds of watercourses will be mainly carried out under the Task. Some of the works will however directly interfere with the bank slopes of the Widawa River and will also include a sectional relocation of the bed of Młynówka Kiełczowska. At the scale of particular JCWPs, the changes do not cause significant transformations in hydromorphological and biological conditions of JCWPs. The investment scope covered by the Task was included in the *Master Plan for the Odra river basin* in Appendix no. 2, List no. 1 *Investments having no negative impact on the achievement of good condition of water or which do not deteriorate the condition of water*, in item 578, ID 3_252_O *Modernisation of flood protection dykes of the Widawa River in the communes of Czernica and Długołęka*.

The project is not included in the updated plan of water management on the Odra river basin area (hereinafter: PGW) adopted with the Regulation of the Council of Ministers dated 18 October 2016 (Journal of Laws of 2016, item 1967). It was, however, included in the Flood risk management plan for the river basin of Odra, adopted with the Regulation of the Council of Ministers dated 18 October 2016 (Journal of Laws of 2016, item 1938).

Ground water

Owing to the scope and character of works, the Task does not generate adverse impacts on the condition of ground water.

Acoustic climate

The Task shall not cause negative impacts related to noise emission on areas under acoustic protection. The impact of Task implementation on the acoustic climate of the surrounding areas will be limited in time (only to the phase of construction) and will be of local character only.

Flora and fauna

Task implementation will cause insignificant, negative impacts on 2 types of natural habitats and 11 protected species of animals existing on the area of the planned works or in its direct vicinity. The impacts, resulting most of all from the necessary land occupation, cutting of trees and bushes and presence of people, construction machinery and equipment, do not constitute a significant hazard for local and national populations of protected species.

The Task does not have significant adverse impact on Natura 2000 sites, as well as on other protected areas. The works will be executed partly along the limits of the Natura 2000 site Grędzińskie Forests PLH020081 and will not cause significant interference in natural habitats and habitats of species subject to protection at the site.

The impacts on protected species of animals and plants have a small scale and intensity.

Monuments of culture and tangible assets

The conducted works will not interfere directly in buildings and other structures listed in the commune register of monuments and/or in the register of monuments, in connection with this, at the stage of implementation and operation of the Task, there are no significant adverse impacts on this type of buildings or structures. Implementation works will be conducted within archaeological sites. The works within their limits will be carried out in line with the conditions specified in the works permit issued by a relevant Provincial Monument Conservator.

It may be necessary to perform archaeological rescue surveys at the stage of works performance if previously unknown sites or objects of historical value are found.

Human health and safety

Task implementation does not generate essential threats to human health or safety. They may occur in the event of an emergency, catastrophes and other random events (such as, e.g.: contamination spillage, fire, discovery of unexploded shells, flood).

Mitigation, compensation and monitoring measures

Chapter 6 and 7 and Appendix No. 1, 2 and 3 of the EMP describe and present in a table a set of mitigation, compensation and monitoring measures aimed to limit or eliminate adverse

impacts of Task implementation on the environment and ensuring the effective implementation of the EMP conditions. The measures contain both, the conditions specified in the administrative decision issued for the Task, as well as and conditions formulated at the stage of developing the EMP.

Public consultations

Chapter 8 of the EMP presents a description of public consultations carried out under the environmental impact assessment procedure for the planned Task, including in:

- public consultations during EIA for the ORFPP (2005);
- public consultation for the Environmental and Social Management Framework for the OVFMP (2015);
- public consultations performed at the stage of issuing the environmental decision for the Task (2017);
- public consultations for this Environmental Management Plan (2018) – this description will be added to the final version of the EMP text after conducting a procedure of making the EMP draft publicly known and after completing the public consultations of this EMP.

1. INTRODUCTION

This Environmental Management Plan (EMP) refers to the Works Contract 1B.7 - *WFS Widawa – the rebuilding of the flood management system of the communes and municipalities Czernica, Długołeka, Wisznia Mała and Wrocław.*

1.1. ODRA RIVER BASIN FLOOD PROTECTION PROJECT (ORFPP) AND ODRA-VISTULA FLOOD MANAGEMENT PROJECT (OVFMP)

The goal of the Odra River Basin Flood Protection Project (ORFPP) is the protection of population on the floodplains of the valley of the upper and middle Odra River against hazards caused by extreme floods.

The project consists of three investment components, the two most important of which cover the construction of the flood protection reservoir Raciborz Dolny (**Component A**) and the modernisation of Wrocław Floodway System (**Component B**). The unit directly responsible for the implementation of the Component B (from 1st January 2018) is PGW WP RZGW Wrocław. It should be noted that until 31 December 2017, the Lower Silesia Board of Amelioration and Water Structures in Wrocław was a body responsible for implementation of Subcomponents B1 and B3 (constituting an element of Component B). The implementing agency has changed as a result of the Water Law act amendment.
The Odra-Vistula Flood Management Project (OVFMP) is aimed at increasing the flood protection level of people living in selected areas of the Odra river basin and the Upper Vistula river basin as well as institutional strengthening of governmental administration in the scope of ensuring more effective protection against summer floods, winter floods and flash floods.
The project has five components (including three investment components and two institutional/organizational components):
Component 1 – *Flood Protection of the Middle and Lower Odra*):
Component 2 – *Flood Protection of the Nysa Kłodzka Valley*):
Component 3 – *Flood protection of the Upper Vistula*)
Component 4 – *Institutional Strengthening and Enhanced Forecasting*)
Component 5 – *Project Management and Studies*.
Detailed information and additional documents concerning the ORFP Project and OVFM Project are available from the website of the Odra-Vistula Flood Management Project Coordination Unit (*http://www.odrapcu.pl*) and from the World Bank's website[12].

[1] http://projects.worldbank.org/P086768/odra-river-basin-flood-protection?lang=en&tab=overview

[2] http://documents.worldbank.org/curated/en/docsearch/projects/P147460

1.2. RECONSTRUCTION OF THE ODRA-WIDAWA RELIEF CHANNEL (SUBCOMPONENT B3 ORFPP)

Subcomponent B3 of the ORFPP entitled *Reconstruction of the Odra-Widawa relief channel* constitutes an element of a comprehensive flood protection system for the City of Wrocław and neighbouring communes, implemented under the so-called Wrocław Floodway System Modernisation.

Two Works Contracts were executed under Subcomponent B3 of the ORFPP:

Contract B3-1 – Section: Odra – Widawa Weir – to the railway bridge (Krzywoustego Street);

Contract B3-2 – Widawa River from the railway bridge (Krzywoustego Street) to the confluence with the Odra River.

Both Works Contracts have been completed. Works Contract B3-2 has been completed in October 2018, the Defects Notification Period started in November 2018 (excluding one facility put into use earlier, i.e. the Pęgowski Bridge, for which Defects Notification Period began on 24/05/2017). Works Contract B3-1 has been completed in May 2017. Defects Notification Period for this Contract also was completed, runs only the warranty period for built bridges (3 years of warranty).

Additionally, as a complementary task under Subcomponent 1.B of the OVFMP, it is also planned to implement Works Contract 1B.7 – "*WFS Widawa – the rebuilding of the flood management system of the communes and municipalities Czernica, Długołeka, Wisznia Mała and Wrocław*", for which this EMP was developed.

2. TASK DESCRIPTION

2.1. LOCATION OF THE TASK

Regarding the administrative division, the Task planned for implementation is situated on the area of the commune of Wrocław, Długołęka and Czernica, in the Poviat of Wrocław, in Lower Silesia Province.

The construction and extension of flood protection embankments will secure against flood the areas situated along the Widawa river at the section from km 21+500 to km 30+000, i.e. the areas situated in the communes of Czernica, Długołęka and Wrocław.

About 2.2 km to the west and south-west and about 1 km to the south of the planned embankments, buildings of the city of Wrocław are situated, and to the west and south-west of the river, within 2.6 – 3.6 km, there are industrialised districts of Wrocław. Apart from Wrocław, the following towns are situated in the area of the planned Task on the right bank of the river: Wilczyce, Kiełczów and Śliwice (commune of Długołęka), and on the left bank of the river: Wilczyce, Kiełczówek (commune of Długołęka) and Krzyków and Wieściszów - a hamlet of Nadolice Wielkie village (commune of Czernica).

2.2. CHARACTERISTICS OF THE TASK

The following elements shall be executed under the Task "*1B.7 - WFS Widawa – the rebuilding of the flood management system of the communes and municipalities Czernica, Długołeka, Wisznia Mała and Wrocław*":

- Construction of new flood protection embankments along the right and left bank of the Widawa River with an earth structure with the total distance of 9.73 km. The inclination of slopes along all the sections is designed as identical, the inclination of the upstream slope is 1:3, and the inclination of the downstream slope is 1:2.5. The body of flood protection embankments and the subsoil underneath will be sealed with a vertical anti-filtering membrane or a sealing (anti-filtering) screen laid on the embankment slope from the upstream side. Topsoiling and sowing with mixture of grasses is planned as surface protection of the embankments slopes.

  The flood impact area, depending on the cause of flood, was determined based on a hydraulic model established for the Widawa River at km from 21+500 to 30+000. Parameters of embankments corresponding to class I hydraulic structures were adopted for the sections of the embankments where the flood caused by a backwater effect is more unfavourable (transfer of flood water from the Odra river to the Widawa river). Parameters of embankments corresponding to class II hydraulic structures were adopted for the embankments where the flood caused in the Widawa river basin is more unfavourable;

- Construction of sheet pile walls (flood protection walls) along three sections with a total length of 1.28 km as there is no space for constructing the embankment body (two sections) and as it is necessary to protect the existing tree stand (one section);

- Expansion (extension and raising the embankment body) and sealing of the existing left-bank flood embankment of the Widawa River "Przerowa L" flood protection em-

bankment at the distance of 2.23 km together with reconstruction and construction of engineering infrastructure. The designed works will allow to adapt the existing embankments to the solutions adopted for new sections of embankments so that the whole creates a consistent flood protection system;

- Construction, extension and repair of internal roads and embankment crossings connected with access to hydraulic structures, including:
  - internal roads – the design width of approx. 3.50 m, road widening/passing bays locally to the width of 5.0 m of the lane. The new service roads and those planned to be renovated are designed as having pavement made of crushed stone. The exception is a service road designed as access to the pumping station and stations of mobile pumps within the Mrówka stream (Graniczny Channel), which was designed with bitumen pavement;
  - crossings through embankments and exit ramps from embankments (22 pcs.) with the crest width and road width adjusted to the parameters of the existing road;
- Reconstruction of the Przerowa weir to operate as a flooding gate by:
  - execution of a new weir closure – a gate valve consisting of two parts with the height of 3.0 m (currently 2.0 m)
  - the elevation of the damming structure crest above the flood water level – improvement of the structure class from the 4th to the 2nd class
  - construction of a service footbridge (bridge) below the weir structure – a single-span reinforced concrete slab with a length of 3.0 m
  - reconstruction of the upstream and downstream stations to accommodate them to the new shape of the weir and bridge structure;
- Flow improvement of the road bridge along Rzeczna Street in Kiełczówek by flow improvement of the Widawa Riverbed and construction of new revetments on: the inter-embankment area, slopes of the river banks and road embankment slopes in the region of bridge abutments;
- Flow improvement of the road bridge along Wilczycka Street in Wilczyce by flow improvement of the Widawa riverbed and construction of new revetments on: the inter-embankment area, slopes of the river banks and road embankment slopes in the region of bridge abutments. In addition, a crossing for animals will be made as part of flow improvement;
- Construction of revetments of the Widawa riverbed and the inter-embankment area (slopes and their edges) upstream and downstream of the Kiełczówek weir by improving the flow of the Widawa River and by construction of new revetments;
- Diversion of water from the Mrówka stream (Graniczny Channel) to the Widawa River by means of sectional regulation (130 m), construction of a new outlet section (105 m) and watercourse removal in the place of collision with the planned investment (55 m). In addition, construction of an embankment culvert (two gravity pipelines with the section of 200x200 cm and length of 23 m), stations of mobile pumps and a dry

flood reserve reservoir with the area of approx. 1.0 ha and depth of approx. 1.2 – 1.5 m;

- Adaptation of Młynówka Kiełczowska to the designed flood protection system by the construction of a new bed of Młynówka Kiełczowska (approx. 214 m), construction of three embankment culverts on Młynówka, elimination of the Młynówka Kiełczowska sections colliding with the investment (approx. 220 m) and construction of the bed (approx. 40 m) linking Młynówka Kiełczowska to the bed of Mrówka (Graniczny Channel);
- Flood protection of service buildings on plot No. 313 precinct Wilczyce (former Sielska Zagroda);
- Extension, reconstruction or relocation of the existing public roads, incl. Wilczycka Street, Topolowa Street, Rzeczna Street. The technical parameters of the reconstructed sections will be adapted to the parameters of the existing roads;
- Solution for a collision with the existing land infrastructure, i.e. water supply and sewage disposal systems, fuel pipeline Ostrów Wielkopolski – Wrocław, gas systems, teletechnical and electrical systems. The land infrastructure facilities colliding with the planned route of the embankments will be reconstructed or relocated according to the conditions agreed with owners or management authorities;
- Partial disassembly - interrupting the continuity of the existing flood protection embankments and dikes:
  - interrupting the continuity of the right-bank flood embankment/dike from approx. km 27+500 to approx. km 28+000 of the Widawa River;
  - interrupting the continuity of the left-bank flood embankment/dike from approx. km 26+100 to approx. km 27+100 of the Widawa River;
- Construction of ditches and drainage systems, maintenance or renovation of the existing drainage ditches and removal of the sections of ditches colliding with the investment. Approx. 3.8 km of new ditches or drainage systems is planned altogether under the Task. Subject to maintenance will be about 2.2 km of the existing drainage ditches. The drainage ditches colliding with the investment will be removed along sections with the total length of 0.8 km;
- Construction of 6 water reservoirs being a compensation for the water ponds/water reservoirs destroyed under the investment;
- The execution of replacement plantings of high vegetation (planting trees and bushes, restoration of patches of the riparian forest habitat 91F0) constituting natural compensation for trees, bushes and patches of the natural habitat planned for felling in connection with the construction of new sections of embankments.

Within the scope of this Task, at the stage of obtaining the decision on environmental conditions, the renovation of the Kiełczówek gate weir was also included, covering the execution of the following works:

- renovation of the weir's concrete structure (abutments, pillars, threshold, footbridge with stairs);

- renovation (replacement) of a steel structure of the main closures of the weir with hoisting mechanisms;
- renovation of the stilling basin and the downstream apron downstream of the structure;
- performance of demolition works of the existing bank reinforcements;
- execution of slope revetments in the near-the-weir zone from the headwater and tailwater side;
- construction of revetments of slopes of the Widawa River banks upstream and downstream the weir;
- construction of revetments on the inter-embankment area;
- flow improvement of the Widawa River bed;
- execution of an access road to the weir with a manoeuvring yard;
- the necessary felling of trees and bushes together with grubbing, clearing and tidying up the area of the facility.

The scope of work related to renovation of the Kiełczówek gate weir was already implemented in 2017 and is not a subject of the contract for the Contractor of the Task *"1B.7 - WFS Widawa – the rebuilding of the flood management system of the communes and municipalities Czernica, Długołeka, Wisznia Mała and Wrocław*".

The location of the main elements of the Task is shown in Appendix No. 6a to EMP.

3. INSTITUTIONAL, LEGAL AND ADMINISTRATIVE CONDITIONS

3.1. INSTITUTIONS ENGAGED IN TASK IMPLEMENTATION

The Task Investor is The State Water Establishment Polish Waters, in whose name the Director of RZGW Wrocław occurs. Additionally, at the stage of construction and operation, the implementation of the Task may require involving public administration bodies on the central, regional and local level. For the purposes of current coordination of the Project implementation by the PIU, an organisational unit Odra-Vistula Flood Management Project Coordination Unit has been established.

3.2. APPLICABLE NATIONAL LEGISLATION CONCERNING THE ENVIRONMENT PROTECTION

According to the Polish law, the investment process with regard to environment protection is subject to more than ten acts and regulations. A list of selected basic binding legal acts connected with the above-mentioned thematic scope and valid during the period of works over the EMP is presented in Appendix No. 4 to this EMP. The number and content of legal acts stated there may be changed along with amendments in national regulations. In any case, the Contractor shall be obliged to comply with all the current legal regulations valid in Poland during the hole term of the Contract.

3.3. EIA PROCEDURE IN POLAND

The provisions of the national legislation provide that an environmental impact assessment is required to be carried out for all the projects which, due to their scale, character or size may have a significant environmental impact. Considering a possible impact of various projects, the Polish law classifies projects as follows (according to relevant EU regulations):

- projects which may always have a significant environmental impact – so-called group I projects, for which an EIA is always required,
- projects having a potential significant environmental impact – so-called group II projects, for which a competent authority decides if an EIA has to be carried out, taking into account the project's possible environmental impact.

So-called group III projects are also distinguished. These are projects which do not qualify as group I and II projects, however, may have a potential significant impact on the Natura 2000 sites. A competent authority decides if a project qualifies to this group, taking into account the project's possible environmental impact and impact on Natura 2000 sites. For projects classified as group I and II projects, an environmental impact assessment is conducted in an administrative procedure, ended with issuing a decision on environment conditions of project implementation (otherwise environmental decision). An assessment for group III projects is conducted in an administrative procedure on issuing an administrative decision, which has to be obtained before commencement of project implementation. If the planned project is a group I and III project or a group II and III project, one EIA is then carried out in a procedure for issuing a decision on environmental conditions. Polish regulations also provide that if the

environmental impact of the planned project cannot be thoroughly evaluated during the first EIA, then a new EIA procedure is undertaken at the stage of issuing a building permit or at the stage of a decision on the investment implementation consent (in accordance with the act of 8 July 2010 on special rules concerning the preparation of projects related to flood defences).

Considering that the projects implemented under the Wrocław Floodway System Modernisations are group II and group III projects, an EIA procedure for those projects only is described further. For such projects, a Project Data Sheet (PDS) is an attachment to the application for issuing a relevant decision. It is a document containing project data and it has to be detailed enough so that to allow the competent authority to assess whether the given project may have a negative environmental impact and impacts on Natura 2000 sites, or not.

The competent authority is examining whether the information contained in the PDS is complete and substantive. If the information is incomplete, i.e. it does not allow to assess the project's potential environmental impact and to assess whether it is necessary to conduct a full EIA, the authority has to request the applicant to supplement such information. If information is exhaustive, the competent authority is examining the project thoroughly for a possible negative environmental impact. An opinion of a public healthcare body is requested for this purpose, i.e.the relevant State Sanitary Inspector (for a group II project only), the Regional Director for Environmental Protection (for environmental protection, if RDOŚ itself does not issue a given decision) and an authority competent to issue a legal water assessment (Director of PGW WP RZGW, in scope of a possible negative impact to reach the environmental objectives set for waters).

If, after consultation with specialised bodies, the competent authority concludes that the measures proposed by the investor to mitigate a negative impact on the environment, Natura 2000 sites and on the condition of water are not sufficient or if the project, for other reasons, may have a significant impact on the environment, Natura 2000 sites or on the environmental objectives set for water, the investor is obliged to prepare an EIA report.

After the submission of the EIA report by the investor, the competent authority is examining whether the report contains all necessary information and whether the quality of such information is satisfactory to assess environmental protection conditions, which must be complied with during investment implementation. Consultations are then conducted with a public healthcare body – the relevant State Sanitary Inspector (for group II projects only), RDOŚ (if RDOŚ itself does not issue the decision) and the Director of PGW WP RZGW, as well as public consultations.

The whole society, interested residents and NGOs participate in such consultations. They are notified of the conducted public consultations by announcing the information well in advance in the electronic Public Information Bulletin (at the authority's official website) and by announcing the information in a well visible place, near the place of the planned project implementation. Public consultations last at least 21 days, and their participants may submit their notes, comments and petitions concerning the proposed project to the relevant body. A public debate may also be organised under public consultations – in practice such debates are organised for project causing large social controversies. The EIA Act obliges the competent body to reply to all the notes and petitions in the justification to the decision. The Authority conduct-

ing an administrative procedure, the subject of which is issuing an environmental decision, before issuing the decision makes publicly known the information about the collected evidence in the case, about the possibility to become familiar with its content and about submitting notes and petitions concerning the collected material. The authorities are also obliged to keep an electronic list of environmental information, available for free in the Internet, where information is provided about petitions and decisions connected with environmental protection. Moreover, the general provisions of the Code of Administrative Procedure provide it is obligatory for the authority to take into account information sent by citizens and their organisations concerning a potential environmental impact of the planned project even if such citizens and their organisations do not participate in a procedure in the case.

If an environmental impact report was prepared in the procedure and public consultations were held, then the conditions which must be complied with for investment implementation, as well as the decisions regarding project monitoring, are defined in a decision on environmental conditions or in a decision permitting to implement a group III project. If the EIA report was not prepared and no consultations were held, the decision does not have to contain special environmental protection conditions. In the case, however, where the authorities assessing a given project for necessity to conduct an environmental impact assessment, have defined environmental protection conditions in their opinions, such have to be included in the issued environmental decision.

The correctness of the issued administrative decisions is controlled in the case where any party to the procedure is not satisfied with the decision issued and appeals against it. Such a control is conducted by a body of higher instance, and then by an independent and autonomous administrative court.

3.4. WORLD BANK'S GUIDANCE

The Task under consideration is co-financed by the World Bank, the conditions of its implementation with regard to environmental protection are consistent with the following Operational Policies and Bank Procedures of the World Bank, including in particular the following policies and procedures: OP/BP 4.01 (on environmental impact assessment), OP/BP 4.04 (on natural habitats), OP/BP 4.11 (on cultural resources) and *OP/BP 4.12* (on resettlement). The source texts of the above-mentioned policies and procedures can be found in the document titled *The World Bank Operational Manual*[1].

The Bank requires that an Environmental Assessment is carried out for the submitted projects to ensure that they have no negative environmental impact, or that such potential impact will be mitigated through appropriate measures. The Environmental Assessment is a process, the scope and type of which depends on the character, scale and a potential environmental impact of the examined investment. Potential environmental risks resulting from project implementation and the project's effect on the impact area are evaluated during the Environmental Assessment; alternative options of the investment are considered. Methods are identified to im-

[1] Website: https://policies.worldbank.org/sites/PPF3/Pages/Manuals/Operational%20Manual.aspx.

prove the investment selection, localisation, planning, designing and implementation by preventing, minimising, mitigating or compensating adverse environmental effects and by strengthening positive effects. Part of the assessment is also a process of mitigating and managing adverse environmental effects during investment implementation. The Environmental Assessment covers the natural environment (air, water, land), human health and safety, social, cross-boundary and global aspects. The Borrower is responsible for conducting the Environmental Assessment, and the Bank advises the borrower on internal requirements in this field.

The Bank allocates the investment to one of three main categories, depending on its type, location, sensitivity, reach, character and size of a potential environmental impact:

- Category A: The project proposed may have potential considerable environmental impact in a diverse or precedence manner. The reach of such impacts may extend beyond the area or structures on which works are performed;

- Category B: Potentially adverse impacts of the project proposed on people or areas significant from the environmental point of view (including swamps, grasslands or other natural and semi-natural habitats) are less disadvantageous than impacts of category A investments. Impacts are also specific to a given habitat, if any exist, however, some of them are irreversible. In majority of cases it is easier to identify mitigation measures than for category A investments;

- Category C: The project proposed will probably have a minimum adverse environmental impact, or no impact will exist.

With respect to projects of category A and B, the Environmental Assessment needs to include consultations with the community impacted by the investment and with NGOs in terms of environmental aspects of investment implementation. The borrower starts consultations as early as possible and continues them throughout the entire project implementation period. An environmental assessment of the ORFP project was completed in 2005 in the document titled *Odra River Basin Flood Protection Project – General Environmental Impact Study, Main Report*, which contained e.g. the Environmental Management Plan for the ORFPP. A detailed analysis of a potential environmental impact of the Subcomponent B3 was added to the document in 2012. Another detailed assessment was made in 2017, as a supplement to Works Contract 1B.7, which is the subject of the EMP.

3.5. CURRENT STATE OF EIA PROCEDURES FOR THE TASK

EIA procedure for Works Contract 1B.7

For the present Task, in accordance with the requirements of national legislation the Consultant, acting on behalf of and for the Lower Silesia Board of Amelioration and Water Structures in Wrocław, has obtained a decision on environmental conditions of project implementation (environmental decision).

In accordance with the classification in the *EIA Regulation*, the Task was classified as group II, i.e. as projects likely to have significant impact on the environment, for which, prior to issuing a decision on environmental conditions, it may be required to conduct an environmental impact assessment.

The Regional Director for Environmental Protection in Wrocław was a competent body to issue an environmental decision for the investment activities concluded in the *Works contract 1B.7*. On 9 February 2017 the Consultant, on behalf of the Investor, submitted an application for issuing a decision on environmental conditions for a project entitled: *WFS Widawa – the rebuilding of the flood management system of the communes and municipalities Czernica, Długołeka, Wisznia Mała and Wrocław.* RDOŚ Wrocław, after requesting the State Poviat Sanitary Inspector in Wrocław for an opinion on the necessity to carry out an environmental impact assessment for the planned project, and after performing its own analyses concerning the potential scale and intensity of environmental impacts, issued the Decision concerning the necessity to carry out a project environmental impact assessment for the planned project on 21 April 2017. The authority, after submission by the Consultant, on behalf of the Investor, of the *Environmental Impact Report* on 11 August 2017, with the supplements of 26 October 2017, has resumed the procedure on issuing the environmental decision.

Then, after requesting an opinion of the State Poviat Sanitary Inspector in Wrocław (it was found that some of the conditions included in the RDOŚ opinion cannot be considered for legal and administrative reasons) and after analysing the collected evidence, RDOŚ Wrocław, with the Announcement of 2 November 2017, made information about the planned project publicly available.

RDOŚ Wrocław, before issuing the environmental decision, also informed the parties to the proceedings that the entire evidence had been collected for issuing the decision on environmental conditions for the project, and about the possibility of expressing one's opinion as to the collected evidence. No party submitted comments or applications to the proceedings. The authority issuing the environmental decision has evaluated potential environmental impacts and hazards connected with project implementation and operation by analysing the collected evidence. Adequately to the results of the conducted recognition of potential environmental impacts, the authority issuing the environmental decision has defined the conditions of project implementation and operation which are to ensure environment protection against negative environmental impact of the investment.

The procedure for issuing a decision on environmental conditions, during which an environmental impact assessment was conducted, was completed by issuing the decision of the Regional Director for Environmental Protection in Wrocław of 29 December 2017 on environmental conditions (ref.: WOOŚ.4233.2.2017.ŁCK – a copy of the decision is provided in Appendix No. 5 to EMP).

It should also be noted that, the Contractor is obliged to obtain any administrative decisions and permits necessary at the stage of performance of works, if so necessary at the stage of Task execution (e.g. permits for departures from prohibitions in relation to protected species of animals and fungi).

4. DESCRIPTION OF THE ENVIRONMENT ELEMENTS IN THE SURROUNDINGS OF THE TASK

4.1. SURFACE OF EARTH AND LANDSCAPE

The Widawa valley area, at the section along which structures will be implemented the Contract, has hardly varied land morphology, is almost flat, situated on the plain area. The major part of the area is situated between 118 m a.s.l. - 125 m a.s.l. Taking into account the physical-geographical division of Poland (Kondracki 2004), the planned investment will be carried out in the limits of the Oleśnicka Plain mezo-region.

In terms of types of natural landscapes, the investment site belongs to the category of landscape of valleys and depressions, the kind – floodplains of the accumulation valley and category – floodplains on lowlands. The type of natural landscape existing here is distinct for relatively little transformed river valleys. The Widawa River in the Contract implementation area is narrow, the bed width is 6 -10 m. The bottom of the valley consists of arable land, wet meadows, tree- and bush-covered areas, patches of forests and residential development of Wilczyce, Kiełczówek, Śliwice and Krzyków. Upstream the river from Wilczyce to Wieściszów, the landscape of the river valley has more natural features. Extensively used meadows, different types of tree-covered areas are becoming to dominate in the landscape, and the share of arable fields and recreationally developed areas begins to decrease.

4.2. CLIMATE

The Widawa catchment is situated in the zone of moderate warm, transient climate with dominant flow of masses of Atlantic air (masses of polar-sea air). According to the climatic regionalisation of Lower Silesia, the northern part of the Widawa catchment is a relatively cool region of Trzebnice, and the other areas are the warmest region in this part of Poland - the Nadodrzański region. According to the climatic division of Poland (Woś 1999), the area occupying the south-west part of the catchment lies in the Central Lower Silesia Region, and the central part and north-east part in the Southern Region of Greater Poland. The wind seen on the major part of the Widawa catchment reflects the general rules of air mass flows. The dominant winds come from the west.

4.3. AIR QUALITY

The measurements of the Voivodeship Inspectorate for Environmental Protection carried out in 2014 in the region of the planned works have shown that the air pollution background in this region is characterised by low concentrations of sulphur dioxide, about 18% of the permitted value, and average nitrogen dioxide concentrations of 33 to 60% of the permitted value. Slightly higher concentrations of nitrogen dioxide than sulphur dioxide in the air are linked to the location of measuring points near the streets where a higher concentration of vehicle fumes is present. Nitrogen dioxide concentrations were closely correlated to vehicular traffic intensity on such streets. It should be taken into account that the above-mentioned test

points are situated within a certain distance from the performance place of works and in differently urbanised regions.

Wind from the west and south-west is dominant in the proposed the Task area. Therefore, air in this area is potentially influenced by pollutants from the city of Wrocław, and especially from industrialised districts of the city grouped west and south-west to the river within a distance of 2.6 – 3.6 km.

Other potential sources of air pollution are provincial and poviat roads located in the vicinity of the Task implementation sites.

In addition, a planned provincial road will run in the area of the task, routed from the provincial road no. 455 to the national road no. 98 (Bielany – Łany – Długołęka), which will cross the Widawa valley in the eastern part of Kiełczówek. In the heating season, emission from so-called low sources (mainly household hearths) may also be decisive for air pollution in the discussed area. This mainly related to residential buildings clustered in the towns of: Wilczyce, Kiełczów, Kiełczówek, Śliwice, Krzyków situated along the section of the Widawa covered by the investment.

4.4. GEOLOGICAL STRUCTURE

Quaternary formations in the area of Wrocław are mainly connected with the formations of morainic plateaus formed as a complex of tills separated by discontinuous interbeddings of sands and fluvial gravels, created as a result of the Pleistocene glaciations. In the profile there may occur locally also marginal silts, sands and clays, as well as eolian formations of the dune character.

In the area of the planned Task, the subsoil consists of Quaternary sediments of the Holocene and Pleistocene aquifer. The Holocene complex consists of sand and gravel sediments of flood terraces. Medium and coarse sands with admixtures of gravel and organic parts are dominant here, sporadically interbedded by sediments, fine sands and clayey sands. Small lenses or patches of dusty clays are encountered underneath.

The Pleistocene is represented by sandy sediments, sediments of river or fluvioglacial facies and tills of the Middle-Polish Glaciation. Medium and coarse sands dominate in the sand series, always with an admixture of gravel. Moraine deposits are forming a uniform complex of the ground moraine, developed as sandy clays, which are often cohesive with gravel admixtures.

4.5. SOILS AND LAND

Podzol soils, brown soils, black soils and marsh soils prevail in the Widawa river catchment. Very light and light soils are encountered here mostly - 65%, medium and heavy soils account for 35% of all soils. Agricultural suitability complexes of soils and grassland is important information for the value of use and are as follows: very good wheat complex - 15%, good wheat complex - 40%, defective wheat complex - 15%, very good rye complex - 20%, good rye complex - 10%.

4.6. SURFACE WATERS

The Widawa river catchment is situated in the river basin of the central Odra and occupies the area of 1745.92 km². The Widawa is a right-side tributary of the Odra with a length of 103.2 km. The Widawa is a river of lowland character, with small drops and a broad, flat valley, in which conditions were created for development of lowland forests periodically flooded by flood waters. In its upper course, the river flows longitudinally, its valley is weakly developed, and the river bed is partly regulated. From Namysłów, the river changes its direction to latitudinal and flows in a slightly broader valley. In the lower course, from Chrząstawa, it flows parallel to the Odra. It enters the Odra at km 266+900, below the north-west border of Wrocław.

The Oleśnica River, a right-bank tributary with a length of about 45 km, enters the Widawa south of Śliwice, at the stretch covered by the planned Task.

The second largest tributary of the Widawa at the stretch covered by the planned Task is the Mrówka Stream (Graniczny Channel), a left-side tributary of the Widawa, with the length of 13.77 km. It enters the Widawa together with Młynówka Kiełczowska near the village of Wilczyce, below the Wilczycki Bridge. The Mrówka stream catchment covers the area of 33.7 km^2. The watercourse has a melioration function, and constitutes a branching of the Widawa River and in the past, it was one of its natural beds (Widawa was a river flowing in several beds).

The watercourse Młynówka Kiełczowska is flowing through the discussed area, connecting the Widawa with the Mrówka stream, and the Przerowa stream, which is a left-side tributary of the Widawa with the length of 11.35 km (it enters the Widawa outside the Task implementation area).

Two small right-side tributaries also exist here: a tributary from Śliwice and a tributary from Kiełczów. The Widawa River valley is characterised along the discussed section by a very well developed hydrographical network, consisting of, apart from natural watercourses, channels, basic and special melioration ditches and numerous larger and smaller water bodies, especially near Kiełczówek.

The rates of flows in the cross section downstream of the confluence of the Mrówka river (Border Channel) to the Widawa river, corresponding to the adopted probabilities, are as follows:

- base flow with the probability of exceeding equivalent to p=1.0% = 74.3 m^3/s,
- control flow with the probability of exceeding equivalent to p= 0.3% = 89.0 m^3/s.

Findings resulting from the Plan of water management on the Odra River basin area (PGWdO)

The planned Task is situated within the limits of four surface water bodies (hereinafter: JCWP):

- JCWP Widawa from the Michalice reservoir to Oleśnica, code PLRW60001913659;

- JCWP Widawa from Oleśnica to Dobra, code PLRW60001913679,
- JCWP Graniczny Channel, code PLRW600023136769,
- JCWP Oleśnica from Boguszycki Stream to the Widawa, code PLRW600019136699.

The location of the main elements of the Task in relation to the JCWP boundaries is shown in Appendix No. 6c to EMP.

Table 1. Summary of basic information conc. JCWPs, within the Task execution area.

Name of JCWP	Widawa from the Michalice Reservoir to Oleśnica	Widawa from Oleśnica to Dobra	Graniczny Channel	Oleśnica from the Boguszycki Stream to the Widawa
Code	PLRW60001913659	PLRW60001913679	PLRW600023136769	PLRW600019136699
River basin	6000 - Odra	6000 - Odra	6000 - Odra	6000 - Odra
Length [km]	49.16	10.41	13.77	24.55
Status*	Natural	Natural	Natural	Heavily modified
Abiotic type*	19 – sandy and cley-ey lowland river	19 – sandy and clay-ey lowland river	23 – springs and streams on areas being under the impact of peatbog-forming processes	19 – sandy and clay-ey lowland river
Condition*	Poor	Poor	Poor	Poor
Risk of failing to meet FWD* objectives	No risk	No risk	At risk	At risk
Environmental objective defined in PGW*	Good ecological status Good chemical status	Good ecological status Good chemical status	Good ecological status Good chemical status	Good ecological potential Good chemical status
Date of achieving good condition*	2015	2015	2021	2027
Derogation*	None	None	Extension of date of reaching the environmental objective - lack of technical capacity, disproportionate costs	Extension of date of reaching the environmental objective - lack of technical capacity

* Information derived from the updated Plan of water management on the Odra River basin area (reference: Regulation of the Council of Ministers of 18 October 2016 on the Water management plan for the river basin of Odra, item 1967, Warsaw, 6 December 2016).

PGW proposes a comprehensive justification for applying the derogation for the JCWPs:

- JCWP PLRW600023136769 Graniczny Channel - lack of technical capacity, disproportionate costs. Due to low credibility of the assessment and the related lack of possibility to indicate the reasons for failure to reach the good status, it is not possible to plan rational remedial measures. Unjustified costs will be generated if any measures are planned and implemented. As a consequence, measures are planned for the JCWP aimed at recognising the actual ecological status – to perform survey investigative monitoring. If the poor status is found, actions will be introduced after 2 years aimed at identifying the reasons for such status. Such a staged procedure will allow to plan rationally the necessary measures and will ensure their required effectiveness.
- JCWP PLRW600019136699 Oleśnica from the Boguszycki Stream to the Widawa – agriculture pressure and unrecognised pressure exist in the JCWP catchment. All possible measures are planned in the programme of measures, aimed at reducing agricultural pressure so that indicators can be reached consistent with the value for a good status. Measures are also planned in the programme of measures, to conduct a thorough analysis of the pressure to plan actions aimed at reduction of phosphorus, aimed at recognising the pressure, and, as a result, to limit the pressure so that the indicators consistent with the values for a good status are reached. Considering, however, the time necessary to implement the measures, and also the time necessary for the implemented measures to bring measurable results, the good status can be reached until 2027.

Environmental objectives for the particular JCWPs according to Article 38d of the Water Law Act for particular JCWPs:

- to protect, enhance and restore the status of surface water bodies, with the aim of achieving good water status, and to prevent deterioration of their status;

  concerning:

  - PLRW60001913659 Widawa from the Michalice Reservoir to Oleśnica,
  - PLRW60001913679 Widawa from Oleśnica to Dobra,
  - PLRW600023136769 Graniczny Channel;
- to protect such waters and to enhance their ecological potential and chemical status to reach good ecological potential and good chemical status of surface waters, and also to prevent the deterioration of their ecological potential and chemical status;

  concerning:

- PLRW600019136699 Oleśnica from the Boguszycki Stream to the Widawa.

Findings resulting from the Master Plan for the Odra river basin

The investment scope covered by the Task 1 was included in the Master Plan in Appendix No. 2, List no. 1 *Investments having no negative impact on the achievement of good condition of water or which do not deteriorate the condition of water* in item 578, ID 3_252_O Modernisation of flood protection dykes of the Widawa River in the communes of Czernica and Długołęka.

Arrangements resulting from other documents of the strategic character

The project was not included in the updated Water Management Plan for the area of the Odra river basin, adopted with the Regulation of the Council of Ministers dated 18 October 2016 (Journal of Laws of 2016, item 1967). It was, however, included in the Flood risk management plan for the river basin of Odra, adopted with the Regulation of the Council of Ministers dated 18 October 2016 (Journal of Laws of 2016, item 1938).

4.7. GROUND WATER

The investment is located within a JCWPd with the code: PLGW6000093[1], with the area of approx. 4,255 km^2. The JCWPd has a single layer, with the average thickness of 5-30 m. It is situated on the average depth of <200 m (approx. 400 m). It does not run through the border of the river basin area, it does not extend beyond the water region border, nor the state border. According to the current assessment of the analysed JCWPd, its quantity and chemical condition is considered as good. There is no risk for the indicated part of waters not to reach the good quantitative and chemical status. There are no derogations established, either, based on the applicable articles of the FWD.

An environmental objective for the JCWPd according to the Water Law act is to:

- prevent or limit introduction of pollutants there,
- prevent deterioration and enhance their status,
- protect and undertake remedial measures, and also to ensure a balance between abstraction and recharge of the water, with the aim of achieving good water status.

4.8. ACOUSTIC CLIMATE

The source of noise heard in the proposed task area and in its closest surroundings is the noise coming from the Wrocław agglomeration and so-called traffic noise generated by mechanical

[1] In accordance with the classification of ground water bodies valid since 2016, the investment area is situated within the JCWPd GW600096. Due to the lack of monitoring data conc. the water level within the new unit, the classification effective until 2015 was used for this analysis.

vehicles moving on poviat and municipal roads near the task. In addition, a planned provincial road will run in the Kiełczówek weir area, routed from provincial road no. 455 to the national road no. 98 (Bielany – Łany – Długołęka), crossing the Widawa valley in the eastern part of Kiełczówek. Currently, there are no areas with significant noise emissions in the neighbourhood of the works conducted.

4.9. FLORA AND FAUNA

4.9.1. PROTECTED NATURAL HABITATS

There are 2 types of natural habitats in the Task implementation place and in its closest surroundings:

1) 6440 Alluvial meadows (All. *Cnidion dubii*),
2) 91F0 Hardwood ash-elm-oak riparian forests (Ass. *Ficario-Ulmetum minoris*).

Riparian forests, despite the disturbed age and species structure of the tree stand, are relatively well preserved. The layer composition, species composition of particular layers, occurrence of episodic flooding and preservation of natural hydrological processes are having a positive effect on the dynamics of this complexes.

Flood meadows feature the character of molinion meadows of the *Cnidon*, however, characteristic and typical species occur in islands and are scarce. The state of the habitat's preservation is poor. An important value is that the meadow is situated on a flood area.

4.9.2. PROTECTED SPECIES OF FUNGI, PLANTS AND ANIMALS

Protected species of fungi

In the area of Task implementation, no protected species of fungi have been confirmed.

Protected species of plants

In the area of Task implementation and in its direct surroundings there is 1 protected species of plants – mouse garlic *Allium angulosum*. The site of the species is located outside the direct area of works.

Protected species of animals

The occurrence of 77 species of protected animals was altogether confirmed in the place and in the surroundings of the area of works during the environmental stocktaking made in 2017 for the purpose of the document *Environmental Impact Report* [1].

[1] „Environmental Impact Assessment Report of the project: „ WFS Widawa – reconstruction of flood protection systems, the commune of Czernica, Długołęka, Wisznia Mała and Wrocław", prepared in 2017 r. by Hydroprojekt Wrocław Sp. z o.o. under the direction of Dr Jerzy Krajewski

Table 2 Protected species of animals existing in the place of Task implementation and in the surroundings.

	Species	Protection status
Invertebrates		
1.	Hermit beetle *Osmoderma eremita*	DS II, OŚ
2.	Capricorn beetle *Cerambyx cerdo*	DS II, OŚ
3.	Flower beetle *Protaetia aeruginosa*	OŚ
4.	Ophiogomphus cecilia *Ophiogomphus cecilia*	DS II, OŚ
5.	Large Copper *Lycaena dispar*	DS II, OŚ
6.	Thick shelled river mussel *Unio crassus*	DS II, OŚ
	Ichthyofauna	
7.	Bitterling *Rhodeus amarus*	OCz, DS II, IV
8.	Spined loach *Cobitis taenia*	OCz, DS II, IV
	Herpetofauna	
9.	Common frog *Rana temporaria*	OCz
10.	Moor Frog *Rana arvalis*	OS
11.	Pool Frog *Pelophylax lessonae*	OS, DS IV
12.	Water Frog *Pelophylax kl. esculentus*	OCz
13.	Common toad *Bufo bufo*	OCz
14.	European Green Toad *Bufotes viridis*	OŚ, DS IV
15.	Smooth Newt *Lissotriton vulgaris*	OCz
16.	Great Crested Newt *Triturus cristatus*$^{+}$	OS, DS II
17.	European Fire-bellied Toad *Bombina bombina*$^{+}$	OS, DS II
18.	European Tree Frog *Hyla arborea*	OS, DS IV
19.	Common Spadefoot *Pelobates fuscus*	OCz, DS IV
20.	Sand lizard *Lacerta agilis*	OCz
21.	Viviparous Lizard *Zootoca vivipara*	OCz
22.	Grass snake *Natrix natrix*	OCz
23.	Slowworm *Anguis fragilis*	OCz
24.	Common European Adder *Vipera berus*	OCz
	Avifauna	

	Species	Protection status
25.	Common Kingfisher *Alcedo athis*	OŚ, DP I
26.	Common Crane *Grus grus*	OŚ, DP I
27.	Little Ringed Plover *Charadrius dubius*	OŚ
28.	Lapwing *Vanellus vanellus*	OŚ
29.	Common Snipe *Gallinago gallinago*	OŚ
30.	Collared Flycatcher *Ficedula albicollis*	OŚ, DP I
31.	European Pied Flycatcher *Ficedula hypoleuca*	OŚ
32.	Common Redstart *Phoenicurus phoenicurus*	OŚ
33.	River Warbler *Locustella fluviatilis*	OŚ
34.	Common Stonechat *Saxicola torquata*	OŚ
35.	Whinchat *Saxicola rubetra*	OŚ
36.	Red-backed Shrike *Lanius collurio*	OŚ, DP I
37.	Barred Warbler *Sylvia nisoria*	OŚ, DP I
38.	Common Rosefinch *Carpodacus erythrinus*	OŚ
39.	Ortolan Buntin *Emberiza hortulana*	OŚ
40.	Thrush Nigthingale *Luscinia luscinia*	OŚ
41.	Lesser Spotted Woodpecker *Dendrocopos minor*	OŚ
42.	Middle Spotted Woodpecker *Dendrocopos medius*	OŚ, DP I
43.	Black Woodpecker *Dryocopus martius*	OŚ, DP I
44.	European Green Woodpecker *Picus viridis*	OŚ
45.	Eurasian Wryneck *Jynx torquilla*	OŚ
46.	Hooded Crow *Corvus corax*	Ocz
47.	Northern Goshawk *Accipiter gentilis*	OŚ
48.	Common Buzzard *Buteo buteo*	OŚ
49.	Eurasian Hobby *Falco subbuteo*	OŚ
50.	Western Marsh-harrier *Circus aeruginosus*	OŚ
51.	Grasshopper Warbler *Locustella naevia*	OŚ
52.	European Penduline Tit *Remiz pendulinus*	OŚ
53.	Sedge Warbler *Acrocephalus schonabaenus*	OŚ

	Species	Protection status
54.	Great reed warbler *Acrocephalus arundinaceus*	OŚ
55.	Eurasian Reed Warbler *Acrocephalus scirpaceus*	OŚ
56.	Marsh warbler *Acrocephalus palustris*	OŚ
57.	Whinchat *Saxicola rubicola*	OŚ
58.	Yellow Wagtail *Motacilla flava*	OŚ
59.	Grey Wagtail *Motacilla cinerea*	OŚ
60.	Hoopoe *Upupa epops*	OŚ
61.	Kestrel *Falco tinnunculus*	OŚ
62.	European Turtle Dove *Streptopelia turtur*	OŚ
Teriofauna		
63.	Common Pipistrelle *Pipistrellus pipistrellus*	DS IV, OŚ
64.	Nathusius' Pipistrelle *Pipistrellus nathusii*	DS IV, OŚ
65.	Soprano Pipistrelle *Pipistrellus pygmaeus*	DS IV, OŚ
66.	Western Barbastelle *Barbastella barbastellus*$^{+}$	DS II, OŚ
67.	Greater mouse-eared Bat *Myotis myotis*$^{+}$	DS II, OŚ
68.	Daubenton's Bat *Myotis daubentonii*	DS IV, OŚ
69.	Hedgehog *Erinaceus sp.*	OCz
70.	Ermine *Mustela erminea*	OCz
71.	Least Weasel *Mustela nivalis*	OCz
72.	European Beaver *Castor fiber*$^{+}$	DS II, OCz
73.	European otter *Lutra lutra*$^{+}$	DS II, OCz
74.	European Water Vole *Arvicola amphibius*	OCz
75.	Harvest Mouse *Micromys minutus*	OCz
76.	Common Shrew *Sorex araneus*	OCz
77.	European Mole *Talpa europaea*	OCz

Explanations to the table:

DS II/ IV - the species listed in Appendix II or /and Appendix IV of the Habitats Directive.

OŚ - the species subject to strict species protection under national legislation.

OCz - the species subject to partial species protection under national legislation.

DP I - the species listed in Appendix I of the Birds Directive.

4.9.3. NATURA 2000 SITES

The task, due to its location and scope of works, may have potential impact on the following Natura 2000 sites:

- **Grędzińskie Forests PLH020081**

The Natura 2000 site Grędzińskie Forests (protected areas of valuable natural habitats), with the area of 3087.5 ha, is situated in Lower Silesia Province, commune of Długołęka, Bierutów, Czernica, Jelcz-Laskowice. The entire area is lying in the Widawa valley and areas adjacent to the river.

The most important natural asset of the examined area is an extensive area of forests with numerous reserves and with separations made of old trees. The occurrence of 7 Natura 2000 natural habitats has been confirmed here. Among them, oak-elm-ash riparian forests are dominating (91F0). Another very important habitat are riparian and riverside forests (91E0), representing a priority type of the habitat. This area is an important refuge of Molinion meadows (6410) and low-land and mountain fresh meadows used extensively (6510), which are rich in species. Certain parts of the Task implementation area are located along the limits of the Natura 2000 site.

- **Widawa Valley code PLH020036**

The Natura 2000 site Widawa Valley (the area of valuable natural habitat protection), with the area of 1310.2 ha, covers part of the city of Wrocław, and is stretching by the lower section of the Widawa River, all the distance to the estuary and then along the Odra River (km 261 - km 269) and along the Rędziński Forest (within the administrative limits of Wrocław). Despite closeness to a large urban agglomeration (Wrocław) above-mentioned area is a very important refuge of fauna connected with natural forests of river valleys. The area, covering the estuary section of the Widawa, is situated west of the planned Task and approx. 14 km away from implementation area.

- **Grądy Odrzańskie PLB020002**

The Natura 2000 Grądy Odrzańskie (the area of valuable species of birds protection) site with the area of 19999.3 ha encompasses a 70 km section of the Odra valley between Narok in Opolskie Province and Wrocław. The existence of 113 species of breeding birds has been found here. The site is located approx. 2.5 km from the place where works are carried out.

- **Grądy w Dolinie Odry PLH020017**

The Natura 2000 Grądy w Dolinie Odry (the area of valuable natural habitat and animals species beyond birds protection) site with the area of 8348.9 ha is situated in the Odra valley between Wrocław and Oława. One of the bigger forest complexes (broadleaved forests and riparian forests) in the Odra Valley exists here. The site is located approx. 2.3 km from the place where works are carried out.

The location of the main elements of the Task in relation to Natura 2000 sites' boundaries is shown in Appendix No. 6b to EMP.

4.9.4. OTHER PROTECTED AREAS

Szczytnicki Landscape Park

The Szczytnicki Landscape Park was established to protect areas from the regions of so-called Large Island and Opatowicka Island in Wrocław. It is situated approx. 2.5 km west of the planned task. Valuable natural and cultural sites are located there (Szczytnicki Park with Japanese Garden, Wroni Park, Opatowicka Island); water-bearing areas of Oława; sites with cultural importance (Zoological Garden, Centennial Hall, Olympic Stadium, Morskie Oko Swimming Place) and interesting architectural sites.

4.10. MONUMENTS OF CULTURE

Two forms of monuments protection exist along the section of the Widawa valley covered by the Task, i.e. based on an entry to the "Register of monuments of properties of Lower Silesia Province" prepared by the National Heritage Institute, according to data from 2016, and establishment of protection in local spatial development plans. No hydraulic or traffic structures situated at the discussed section of Widawa, which are subject of this EIA, are subject to conservatory protection.

In the surroundings of the planned task, two immovable monuments are situated, entered into the register of monuments, i.e. a palace complex in Śliwice in the commune of Długołęka (about 170 m from the designed embankment) and a mill complex in Wieściszowo in the commune of Czernica (about 80 m from the planned embankment).
There are 16 archaeological sites located along the footprint and neighbourhood of the planned flood protection embankments (Appendix No. 6d to EMP).

4.11. POPULATION AND TANGIBLE ASSETS

The structures implemented within the Task are located in the communes of: Długołęka, Czernica situated in the Poviat of Wrocław, and in the municipality of Wrocław. The population of the Długołęka commune is 28,501 people, of the Czernica commune 13,856 people (GUS 2015), Wrocław municipality 637,683 people (GUS 2016).

The town of Kiełczówek (Czernica commune) with population of 198 people and the town of Krzyków (Czernica commune) with population of 320 people (GUS 2011) are situated closest to the planned works.

The majority of the task implementation area is situated outside the direct neighbourhood of developed areas. Certain sections of works will be carried out near developed areas.

5. SUMMARY OF THE ENVIRONMENTAL IMPACT ASSESSMENT

5.1. SURFACE OF EARTH AND LANDSCAPE

The construction of the proposed Task will involve a number of impacts on the surface of earth (removal of topsoil layer, execution of excavations, construction of embankments, grading and strengthening of banks along the selected sections of the Widawa, land levelling, storage of materials, traffic of machinery and vehicles), as a result of which a direct (local) impact will occur, to a smaller or higher degree, on the surface of earth and landscape.

The basic works related to investment execution, as part of which geomechanical changes to the surface of earth will occur, includes the construction of new flood protection embankments with an earth structure. The existing public roads colliding with the planned investment will have to be relocated and reconstructed in connection with the construction of embankments, and service roads will have to be constructed routed along the embankments and also flood protection walls along the chosen distance.

The works will not cause any significant effects on the landscape conditions prevailing in the Widawa valley. The extension of the flood embankment on the left side of the Widawa bed will involve works on the existing structures. The performance of works will cause temporary changes until vegetation is restored. The construction of new sections of flood protection embankments will cause a temporary deterioration of landscape conditions – until topsoiling and restoration of the biologically active area within their limits is completed. The adopted localisation solutions for flood protection embankments will ensure that the current character of the Widawa valley will be maintained, will not cause the narrowing of the valley and will not adversely impact the important landscape values.

5.2. CLIMATE

Due to the character of the Task, it is not envisaged that that investment will have an adverse impact on the climatic conditions of the Widawa valley in the phase of execution of works as well as at the stage of Task operation.

Emission of greenhouse gasses

In the construction stage, carbon dioxide, which qualifies to greenhouse gases, shall be emitted as a result of fuel combustion in building machines. The impacts will be substantial in immediate vicinity but temporary in nature and will cease following the completion of works. At the operational stage of the Task, the sources of emission of pollutants to the air will be due to the maintenance works carried out once or twice a year including grass mowing with diesel mowers on the crest and embankment slopes and passages through a service road with vehicles with staff controlling the embankment condition, which may occur few times per year. Short-term emissions are also possible during of a flood situation and starting mobile pumps supplied with generator sets within the balance reservoir on the Mrówka stream. The emissions at the stage of Task operation will be therefore periodical, small and will not exceed the admissible air quality standards.

Resistance of the Task to negative phenomena accompanying climate changes

The task was designed in accordance with valid hydraulic regulations which consider extreme events occurring in the environment connected with climate changes. The Task execution, by improving flowing conditions of flood water, will enhance the flood protection of the towns situated in the Widawa valley and will thus contribute to limitation of negative consequences of the phenomena accompanying climate changes.

5.3. AIR QUALITY

The emission of dirt, dust and gas will be present, first of all, during the construction stage. In the operation phase, after the completion of construction works, substantial emission of pollutants into the air is not anticipated.

The main sources of emission of pollutants at the construction stage will be combustion of fuels during operation of construction machines and transport of materials. At this stage, the main compounds emitted to the air will be: nitrogen oxides, carbon oxides, hydrocarbons and dust particles (suspended solids). The potential source of dust emission to the air is also transportation of powdery materials on sections from the place of loading to the areas of works performance. Periodically, earth in the area of dried grounds may lead to increased dusting. The largest, temporary concentrations of pollutants will be observed at a distance of a few dozen meters from the place of works. The generated pollutants along with the distance from the place of emission will be dispersed in the air. Emission of pollutants into the air at the construction stage will be short-term and reversible. It will not result in significant or permanent environmental impacts.

5.4. SOIL AND LAND

Hazards for soil are associated with emergency situations, such as leakage of petrol derivatives in consequence of which the soil can be contaminated locally. Engine-powered machines and vehicles used during performance of earthworks will be a potential source of pollutants, as well as back-up facilities where machines and vehicles may be fuelled and where oil derivative substances may be stored.

The execution of works is also related to removal of the top soil layer (topsoil removal), and in the places of temporary occupancy this will be restored following completion of the works. The basic works related to investment execution, as part of which geomechanical changes to the surface of earth will occur, includes the construction of new flood protection embankments with an earth structure. The pressure of earth masses of the constructed embankments on the soil will cause increased soil compaction, reducing space between the soil particles, as a result of which the soil loses partially or completely its absorption ability. The general deterioration of the soil structure caused by compacting will limit the growth of roots and has an adverse effect on water retention ability, fertility, biological activity and durability. The same adverse consequences affecting the soil properties and soil degradation exist due to storage of different materials directly on the surface of soil and storing them this way for longer. Impacts on the condition of soil at the scale of the entire Task are of small intensity.

5.5. SURFACE WATERS

The results of the following current document were used in the preparation phase of this EMP and when elaborating the scope of mitigation measures: *Expert opinion for assessing the Project's effect/impact on the water protection objectives in the meaning of Article 4.1 in conjunction with Article 4.7 of the Water Framework Directive.*

Biological elements of water quality

The works conducted in the river bed will only be carried out along short sections in the direct neighbourhood of the bridges on the Widawa River whose flow is being improved and in the immediate vicinity of the weirs: Kiełczówek and Przerowa. The works will cause the destruction of aquatic vegetation in the riverbeds along certain stretches and temporary deterioration of occurrence conditions of aquatic organisms (because the slurry content in water will increase). Impacts on species of fish resulting from the execution of works will be temporary, will not deteriorate the migration conditions of fish and will not cause the existence of their mortality. Over a few growing seasons following the completion of the works, the vegetation will be restored as a result of the natural recolonisation process from the section situated above the place of works.

It is also necessary to partly liquidate a bed of Młynówka Kiełczowska and to construct a new section of the bed to transfer water to Widawa. A new section of the bed will be designed and constructed in a way ensuring availability of riverbed habitats for aquatic plants and species of animals. As a result of construction of flood protection embankments, the section of Młynówka Kiełczowska at a distance of approx. 1.25 km will remain in the outer embankment zone. Appropriate embankment culverts have been designed to ensure constant biological flow in the watercourse. The construction of flood protection embankments necessitates the liquidation of one water body and the partial backfilling of two other smaller water bodies.

Due to its scale and the scope, the works do not generate significant impacts on biological water quality elements.

Hydromorphological elements of water quality

The works are not changing the existing hydrological conditions in the Widawa River and its tributaries covered by the Task. A balance reservoir with the area of 1 ha will be built on the Mrówka Stream, which will locally result in increased water storage. In normal conditions, water will run off freely from it to the Widawa through the bed of the Mrówka stream. The reservoir will be filled with water in the event of flood water flow. After filling, in the period of high water, the embankment culvert will be closed, and then opened for low water.

As part of nature compensation, several small water ponds will also be constructed, in total area of water surface not smaller than 0.6 ha, which will have a positive effect on valley storage.

Changes to the morphology of beds of watercourses at the scale of the entire Task will take place along certain sections only. The main part of works will be carried out outside the beds of watercourses, and in large distance from the bed in case of the Widawa River. At the scale

of particular JCWPs, such impacts are small and do not cause significant changes of morphological conditions.

Physiochemical elements of water quality

Impacts on physiochemical elements will be mainly related to the task implementation phase. In connection with works consisting of flow improvement of bridges in the river bed and local revetment of banks near hydrotechnical structures, some amount of sediments will be delivered. This may increase the concentration of general slurry, and thus have an effect on parameters related to oxygen conditions. Such impacts, however, will be short-term and so insignificant that will not change substantially the evaluation of physiochemical elements of the analysed JCWPs. At the stage of operation, the Task will not generate impact on such elements of water condition.

Project execution, due to the scope of works, their scale and task location, will not cause substantial adverse impacts on the quality elements of surface waters and on the possibility of reaching the environmental objectives within the set times for particular JCWPs, in the area of which they will be carried out.

5.6. GROUND WATER

In the task implementation phase, the earthworks connected with the execution and drainage of excavations, may cause local, small, short-term changes in ground water levels, which, after completion of works, will stabilise on the original level.

A potential, negative impact on ground water in the construction phase of the planned task (in case of an emergency situation) may be leakages of oil-derivative substances from the working and parked machines and cars and any leaking oil when filling the machines.

Filtration may take place in the subsoil under the planned embankments during the flow of high water and locally the hazard of hydraulic cut-throughs on the outer-embankment zone. The body of flood protection embankments and the subsoil underneath will be sealed with a vertical anti-filtering membrane or a sealing (anti-filtering) screen laid on the embankment slope from the upstream side. In order to ensure possible contact of ground water between the inter-embankment zone and outer-embankment zone, a vertical anti-filtering membrane, as well as a sealing screen in the underground part will be anchored in such a way that they do not reach the layer of impermeable grounds. Such solution will allow the free flow of ground water in the river valley, thus extending the filtration path. By executing the membranes, the ponding of ground water will take place on the outer-embankment zone in periods of strong rainfall, which may lead to the formation of local damped areas and stagnation of water on the land surface. The network of melioration ditches in the outer-embankment zone will prevent the negative consequences of such phenomena.

5.7. FLORA AND FAUNA

5.7.1. PROTECTED NATURAL HABITATS

Task implementation will cause negative impacts on 2 types of natural habitats:

1) 6440 Alluvial meadows (*All. Cnidion dubii*),
2) 91F0 Hardwood ash-elm-oak riparian forests (*Ass. Ficario-Ulmetum minoris*).

The planned embankment, at the section between the town of Wilczyce and Kiełczówek, is running through a patch of riparian forest. As a result of construction of embankment, part of the natural habitat 91F0 – Oak-elm-ash riparian forests *Ficario-Ulmetum* will be destroyed (the patch situated outside the limits of protected areas). The impact on the habitat under another considered location/option of flood protection embankments would be higher, for this reason an alternative with smaller overall impact was chosen.

Indirect impacts may occur however in relation to patches of the habitat situated within the Natura 2000 site Grędzińskie Forests PLH020081. Certain sections of embankments will be located within approx. 40-50 m from riparian tree stands within Natura 2000 site limits.

The left bank of the Widawa River "Przerowa L" will be modernised, which adjoins, along certain sections, the patches of alluvial meadows. No direct destruction of patches will occur in this place, but direct vicinity of conducted works causes a risk of accidental interference with the patches of the habitat (dilapidation, storage of building materials and humus, etc.).

5.7.2. PROTECTED SPECIES OF FUNGI, PLANTS AND ANIMALS

In the area of Task implementation and its direct surrounding no protected species of fungi have been confirmed.

Protected species of plants

The site of the protected mouse garlic is located outside the implementation and impact area of works.

Protected species of animals

Invertebrates

In the construction phase, negative impact on species of invertebrates is connected mainly with the cutting of trees inhabited by Great Capricorn. 3 sites of the species be destroyed. In relation to other species of invertebrates, impacts will relate to the depletion of habitat resources, they will not, however, destroy the trees occupied by protected species (as in case of Hermit Beetle) or interference will only relate to potential sites of species, hence it cannot be said they will be destroyed, and only potential habitats will be disrupted.

In case of Thick Shelled River Mussel, the impact will be connected with interference in the species habitat – the bed of Młynówka, and the change of its course in the estuary section. However, if flow is maintained along the stretch locating through the riparian forest between Wilczyce and Kiełczów, the species habitat will be preserved.

Fish and lampreys

Task implementation will cause local, short-term effects, resulting from works in the river beds, associated with the startling of fish, destruction of fry and contamination with suspension. The impacts will be associated with two protected species of fish (Bitterling, Spined Loach) and the short parts of riverbed i.e. where the works will be conducted directly within riverbed, slopes and their edges of Widawa River (bridges along Wilczycka Street and Rzec-

zna Street, construction of new revetments on slopes in the neighbourhood of the Kiełczówek and Przerowa weir). The impacts will only relate to the phase of task reconstruction and will disappear after a few/a dozen or so hours after completion of works. Hence, they will not have a significant effect for the local populations of such species.

Amphibians and reptiles

One water pond will be destroyed in the construction phase, and partially two water bodies colliding directly with the route of the planned embankments, which represent breeding sites of 5 species of amphibians. The estuary section of the Mrówka stream will also be destroyed, which is a habitat of one species of amphibian and one species of reptile.

The performance of works also causes the hazard of higher mortality of amphibians in periods of seasonal migration (in connection with the performance of construction works and traffic of building site service vehicles and machinery).

At the scale of the entire Task, permanent impacts on species of amphibians are small. The most valuable water bodies will remain intact in connection with investment execution.

In respect of the species of reptiles, the investment will not cause significant negative impacts. One water body will be destroyed, being the place where Grass snake occurs. In case of other species, impacts are of the indirect nature and will be connected with the traffic of vehicles, and in the proximity of the habitats of reptiles, with the possible occurrence of periodical, higher mortality of animals.

Birds

Task execution will not cause significant impacts on species of birds. The adopted localisation solutions for the route of flood protection embankments ensure the maximum possible limitation of removal of precious patches of forests and bushes. The planned embankments will be situated on the peripheries of inclination in riverbed of the Widawa River and the majority of habitats important for birds will be located within the limits of the mid-embankment zone, such as: riparian forests, meadows, water bodies, bogginess. Task implementation generates negative impacts for 11 species of birds. The scale of such impacts in relation to local resources and a national population of particular species is small. The impact includes the destruction of singular sites of bird species in the place where flood embankments are located and/or disturbing the species on the sites directly adjoining the place where works are performed.

Mammals (excluding bats)

In the construction phase, the Task will not generate significant impacts in relation to species of mammals. A local impact only relates to species using water habitats (beaver, otter, European water vole). Impacts will be generated due to the necessity to make local changes to bank slopes of the river in the places of flow improvement of bridges within Rzeczna Street and Wilczycka Street and in the direct neighbourhood of the Kiełczówek and Przerowa weir. Works in those places will involve, in particular, cutting of trees and bushes, which will deteriorate the quality of habitats of the above-mentioned species. If appropriate mitigation measures are applied, ensuring safe migration of animals within the bridge area, the impacts generated by the Task are irrelevant for the local population of species.

Bats

In the construction phase, it is planned to improve the flow capacity of the bridge within Rzeczna Street, which is a daytime shelter of at least two species of bats: Daubenton's bat and Red bat. The works conducted in the period when the bridge is occupied by bats will startle the animals.

The clearance of trees with hollows, with broken trunk and branches and with loose bark, on the area of the riparian forest, will cause the loss of some of potential shelters of bats used during the activity (spring-summer) and hibernation period (a localisation alternative of flood protection embankments with smaller interference with trees stands valuable for bats was chosen).

5.7.3. NATURA 2000 SITES

The possibility of negative impact on the following Natura 2000 sites was analysed for the environmental impact assessment:

- **Grędzińskie Forests PLH020081**

One protected natural habitat (91F0) exists on the area and near the planned task, considered to be subject to protection on the Natura 2000 site, Grędzińskie Forests PLH020081. The implementation of the task will not interfere in the patches of the habitat and will not lead to its direct destruction. The occurrence of indirect impacts is possible, linked to the proximity of the flood protection embankment construction works and the necessity of renovating a forest road running through the patch of the habitat; the road will be used as a technological road for site service. In relation to species of animals subject to protection on this area, no adverse impacts have been observed, either.

In the operation phase, the Task will not generate new impacts on the objects of protection of the Natura 2000 site. The location of flood protection embankments will not cause disturbances in natural habitats and in the habitats of the species which depend to a different degree on the occurrence of high water levels in the Widawa River. The key natural habitats and habitats of species in the task execution area such as riparian forests or water bodies will function in the conditions the same as until now.

- **Widawa Valley PLH020036**

Due to a large distance from the place of performance of works and the local character of impacts generated by the Task, this will not have an impact on the protection of the Natura 2000 site Widawa Valley, PLH020036. The implementation of the Task does not have an adverse impact on maintaining ecological continuity between the areas situated in the Widawa valley.

- **Grądy Odrzańskie PLB020002**

The impacts generated during performance of works do not reach beyond the direct vicinity of the areas of works. For this reason, the implementation of the Task does not impact the protection of the Natura 2000 site Grądy Odrzańskie PLB020002.

- **Grądy w Dolinie Odry PLH020017**

The impacts generated during performance of works do not reach beyond the direct vicinity of the areas of works. For this reason, the implementation of the Task does not impact the protection of the Natura 2000 site Grądy w Dolinie Odry PLH020017.

5.7.4. OTHER PROTECTED AREAS

The implementation of the Task does not generate adverse impacts on the natural and cultural assets Szczytnicki of the Landscape Park. The site is situated approx. 2.5 km from the place of performance of works, and the impacts caused as a result of Task implementation will only be temporary and local.

5.8. ACOUSTIC CLIMATE

In the construction phase of the planned task work in spring-summer months will be carried out either 12 hours a day or in a two-shift system, and in late autumn and in winter in a one-shift system. Both, in summer and in winter, works will be carried out in daytime only, between 6 a.m. and 10 p.m.

The emission sources of noise will be the traffic of trucks (transport of personnel, transport of earth masses for embankment construction, delivery of construction materials, delivery of concrete) and work of machines (bulldozers, excavators, loaders, rollers, vibro-hammers, lifts) and different equipment.

The car transport connected with the construction phase of the task will periodically deteriorate the acoustic climate in the vicinity of their traffic routes. This will cause some burdens for the local residents living along the routes of such vehicles.

The basic works connected with embankment construction will consist of constructing the successive layers of the hydraulic embankment and graded the crest and slopes along the whole distance of the embankment. Structural elements in form of steel sheet pile walls using a vibro-hammer suspended on a mobile crane will be made on two sections instead of earth embankments. The existing “Przerowa L” embankment will be extended by widening and raising the embankment body. The soil representing the embankment body will be compacted with layers.

The performance of works may cause periodical deterioration of acoustic conditions within areas adjacent to the places of works and routes of construction site service vehicles. The nearest residential buildings are located locally 30-100 m from the conducted works. The Contractor before the commencement of construction works with the participation of the Engineer will prepare an inventory of the condition of the existing development of the areas located in the immediate vicinity of the Construction Site along with photographic documentation. In the event of damage, they will be compensated.

The operation of machinery and equipment and passages of vehicles will not take place simultaneously. One machine will operate most often along one section with the simultaneous passage of a vehicle, and works relating to embankment construction will be moving gradually along its route. Apart from the basic erection of flood protection embankments, other earthworks, construction works and demolition works will be performed in various locations and at different times. The emitted contaminations will be dispersed during the works conducted by

the working machines and passing vehicles along a large distance (c.a. 12.96 km). As a result, the noise emission along the particular sections of the constructed embankments will be local and short-term.

Given the planned scope and nature of works, their performance place and area, management of the areas adjacent to the embankment, permitted noise levels may be temporarily exceeded at the construction stage of the planned task at daytime on the acoustically protected areas (single-family houses and farm buildings). The nuisance will be of periodical character, typical for construction works, and will relate to the investment implementation period only and will end upon its completion.

5.9. MONUMENTS OF CULTURE

The palace complex in Śliwice inscribed into the register of monuments and subject to conservator protection is situated within the distance of about 170 m from the planned embankment construction. Given the type and method of the conducted works, and most of all their distance (ca. 170 m) from the palace complex in Śliwice, the works will not be a risk for this monument.
The mill complex in Wieściszów subject to conservator protection and inscribed into the register of monuments is situated within the distance of about 80 m from the planned route of embankment construction. In the task construction phase, given the type and method of the conducted works, and most of all their distance (ca. 80 m) from the mill complex in Wieściszów, the works will not pose a risk for this monument.

The planned new flood protection embankments will run in the vicinity of or will coincide with the occurrence of discovered archaeological sites, for this reason works will be carried out after obtaining relevant consents from Provincial Monuments Conservator and execution of activities indicated by him (see item 70-72 of Appendix No. 1 to EMP).

5.10. TANGIBLE ASSETS

As regards the protection of tangible assets, the execution of the Task will improve flood safety to the areas within the municipalities covered by the scope of the Task. In the neighbourhood of the construction sites and the routes of construction site service vehicles, it is also possible that there will be impacts on the buildings located in the vicinity. The construction of new sections of embankments will involve temporary occupancy of land, mainly arable land. After Task implementation, the land can be used as until now mainly.

5.11. HUMAN HEALTH AND SAFETY

Impact on health and safety of people in the course of the Task implementation may be associated, among others, with the following factors:

- increased noise emission,
- contamination with oil substances,
- access of unauthorised persons to the area of construction works,

- occurrence of increased water levels and flows of flood water creating a hazard for the area of works and adjacent areas,
- transport of materials and soil masses,

5.12. EXTRAORDINARY HAZARDS TO THE ENVIRONMENT

The following emergency situations likely to cause extraordinary hazards to the environment may occur due to the implementation and operation of the planned Task.

Leak of petrol derivatives

An emergency situation may occur at the stage of construction, as a result of which a leakage of oil derivative substances from vehicles, construction machinery, reservoirs etc. will occur, causing contamination of surface water and/or land surface. Such leakages may potentially occur during the traffic of vehicles and machinery, as well as in storage and fuelling sites.

Fire or explosion of flammable substances

An emergency situation may occur at the stage of construction connected with the occurrence of fire (e.g. due to equipment failure, personnel's negligence, explosion of flammable substances, lightning stroke, etc.).

Finding unexploded shells

Hazardous military materials such as unexploded ordnance and duds may be found during the construction period when earthworks and other construction works are carried out.

Sudden flood swelling, flood

A potential situation causing a threat to environment, health and safety of people at the stages of works performance is also the sudden increase of water level in the river. The Contractor should continuously monitor a hydrological situation in the Widawa basin and Odra basin in the zones likely to cause higher levels of water in the works area.

Strong winds and hurricanes

The occurrence of extreme weather phenomena such as strong winds and hurricanes are potentially dangerous phenomena for the conditions of conducting works, hence for the safety and health of people and environment. Some of the works connected with the construction of new embankments of the Widawa river will be carried out within the area of or in direct proximity to high greenery.

Potential failure of flood embankment at the operation stage

Flood embankment operation is associated with a potential risk of water overflow through the embankment crest or of breaking the embankment due to the occurrence of an exceptionally strong and long-lasting impoundment of river water causing long-term flooding of the inter-embankment zone areas or exceptional increase of water level in the inter-embankment zone. Specific design and technical solutions applied for the planned flood protection embankments are employed to limit the risk of occurrence of such disasters, in accordance with valid design guidelines for hydraulic structures (in particular special dimensions of flood protection embankments, appropriate selection of materials for embankment construction, application of required membranes, works technology provid-

ing the necessity of specific compaction of the embankment, etc.). Considering the above safeguards and the fact that the embankments were designed according to hydraulic data characterising the scale of flows existing in rivers on this area in calculation periods, it can be concluded that the discussed hazard is potential only and that the probability of its occurrence is negligible.

6. DESCRIPTION OF MITIGATION MEASURES

In order to limit the adverse impacts of the planned Task on the environment, a set of mitigation measures valid for the Contractor is given in Appendix No. 1 to EMP. The measures have been established based on the conditions included in the valid environmental decision issued for the Task, supplemented by additional conditions agreed at the stage of EMP preparation. A summary of the key categories of mitigation measures is given below, according to particular components of the environment discussed in chapters 4 and 5 of EMP.

6.1. SURFACE OF EARTH AND LANDSCAPE

The basic forms of the planned Task's negative impact on land and landscape are presented in chapter 5.1.

For such impacts, the following mitigating measures were introduced in Appendix No. 1 to EMP:

- 1, 2 (01 – Requirements related to localisation and limitation of area of temporary occupation),
- 7 (02 - Requirements concerning the traffic system of the Task implementation area),
- 11 (03 - Organisation of the site, back-up facilities, warehouses and storage yards),
- 42 (06 - Requirements for felling and protecting trees and shrubs).

6.2. CLIMATE

In the case of the Task, mitigation measures with regard to the protection of local climate conditions (a measure was introduced for protection of the air quality – chapter 6.3) have not been found necessary. The task at the same time prevents and mitigates the consequences of extreme weather phenomena. The planting of trees and bushes planned as part of the nature compensation, contribute directly to maintaining the local micro-climate conditions in the surroundings of the places where works are implemented.

6.3. AIR QUALITY

The basic forms of the planned Task's negative impact on the air quality are presented in chapter 5.3. In order to limit such impacts, the following mitigating measures were introduced in Appendix No. 1 to EMP: 61, 62, 63 (10 - Requirements concerning the prevention of environmental contamination).

6.4. SOIL AND LAND

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

For such impacts, the following mitigating measures were introduced in Appendix No. 1 to EMP:

- 34, 35, 36 (05 – Topsoil handling principles and land reclamation),
- 44, 45, 46, 47, 48, 49, 50, 51 (07 – Requirements concerning waste management),
- 64, 65, 66, 67 (10 - Requirements concerning the prevention of environmental contamination).

6.5. SURFACE WATERS

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

For such impacts, the following mitigating measures were introduced in Appendix No. 1 to EMP:

- 12 (03 - Organisation of the site, back-up facilities, warehouses and stacking yards),
- 45, 46, 47, 48, 49, 50, 51 (07 – Requirements concerning waste management),
- 64, 65, 66, 67, 69 (10 - Requirements concerning the prevention of environmental contamination).

6.6. GROUND WATER

An analysis of the planned Task's negative impact on surface waters is presented in chapter 5.6. The Task does not generate adverse impacts on the condition of ground water. Preventing measures related to the protection of ground water against contamination are put together in Appendix No. 1 to EMP. The mitigation measures to limit the impact on ground water are the measures listed in particular for the protection of soil and land (according to 6.4. and 6.5).

6.7. ACOUSTIC CLIMATE

The basic forms of the planned Task's negative impact on the acoustic climate are presented in chapter 5.7.

For such impacts, the following mitigating measures were introduced in Appendix No. 1 to EMP: 68 (10 – Requirements concerning the prevention of environmental contamination).

6.8. FLORA AND FAUNA

6.8.1. NATURAL HABITATS, FLORA AND FAUNA

The basic forms of the planned Task's negative impact on natural habitats, flora and fauna are presented in chapter 5.8.

For such impacts, the following mitigating measures were introduced in Appendix No. 1 to EMP:

- 3, 4, 5 (01 – Requirements related to localisation and limitation of area of temporary occupancy),
- 8, 9, 10 (03 – Organisation of the site, back-up facilities, warehouses and stacking yards),
- 13-33 (04 – Requirements concerning the protection of protected natural resources),
- 37-43 (06 - Requirements concerning removal of trees and bushes),
- 52, 53, 54 (08 – Requirements concerning prevention of proliferation and elimination of invasive species of plants),
- 55-60 (09 – Principles of carrying out works within beds of watercourses).

6.8.2. PROTECTED AREAS

Mitigation measures adopted for natural habitats and protected species are also applicable to the protection of natural assets of protected areas. A complete set of mitigation measures for protection of protected areas are listed in Appendix No. 1 to EMP (the items indicated in chapter 6.8.1).

6.9. CULTURAL LANDSCAPE AND MONUMENTS

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

For such impacts, the following mitigating measures were introduced in Appendix No. 1 to EMP: 70, 71, 72 (11 – Requirements concerning protection of cultural monuments).

6.10. TANGIBLE ASSETS

The basic forms of the planned Task's negative impact on cultural landscape and monuments are presented in chapter 5.10. For such impacts, the following mitigating measures were introduced in Appendix No. 1 to EMP: 7 (02 - Requirements concerning the traffic system of the Task implementation area).

The matters related to land acquisition or change of their use, as well as land acquisition for temporary occupation, are discussed in detail in the document *Land Acquisition and Resettlement Action Plan* (LA&RAP) for the Task.

6.11. HUMAN HEALTH AND SAFETY

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

Mitigation measures are presented in Appendix No. 1 to EMP to limit such impacts, in items 73-83 (12 - Requirements for ensuring human health and safety).

6.12. EXTRAORDINARY HAZARDS TO THE ENVIRONMENT

Crisis situation

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

Service	Telephone number
Mobile emergency number	112
Police	997
Fire Service	998
Emergency ambulance service	999

Flood

With regard to the Task in question, the occurrence of higher levels of water or flood within the river bed may be considered similar to industrial breakdown. Before commencing works, the Contractor will prepare an appropriate plan of action in the case of this kind of events (*the Construction site's flood management plan*) and will obtain approval of the Engineer for its content. Handling procedures in case of occurrence of such types of events will be described in such document in particular (see 6.14). A condition related to the necessity to prepare this type of document was given in item 76 in Appendix No. 1 to EMP.

Strong winds and hurricanes

Ensuring safety in the area of the Task implementation rests with the Contractor. A detailed procedure in case of extreme weather phenomena is contained in the HASP Plan prepared by the Contractor (see 6.14.). The requirement of HASP plan preparation by the Contractor and obtaining approval from the Engineer for its content is defined in item 75 of the table in Appendix No. 1 to EMP.

Leak of petrol derivatives

Another type of extraordinary hazard is leakage of petrol derivatives to water or to the soil. In order to limit the risk of occurrence of environmental contamination, appropriate preventive

measures will be implemented, relating in particular to appropriate organisation and equipment of sites and site back-up facilities, equipping places of possible leaks with proper sorbents and current control of the condition of used construction equipment. In the event of any spillage of oil derivatives, steps will be taken limiting the spreading of such pollutants, and shall be immediately removed. In the event of presence of contaminated soil layers, they shall be managed in compliance with the applicable legal regulations. The mitigation measures for protection of the water and soil environment specified in Appendix No. 1 to EMP (see chapter 6.4-6.5).

Discovery of unexploded shells

Works will be conducted in the Widawa River valley along the selected stretches of the river bed. Due to the fact that in this area war operations were conducted during War World II, there is a possibility of finding unexploded shells during construction works such as: detonators, missiles, aerial bombs, artillery and rifle bullets, armoured missiles, grenades, mines, explosive materials, scrap containing the residues of explosive materials, etc.

The Employer did not explore the Site in terms of the presence of unexploded shells. For this reason, during earthworks, the Contractor will be obliged to provide sapper's supervision (Contractor's sapper's supervision) for regular checking of and cleaning of land, of hazardous military objects, along with their utilisation.

In the event of discovering unexploded shells during works, the Contractor shall immediately stop the works, evacuate workers and notify the sapper supervision, the police, the Engineer and PIU.

It is strictly forbidden (except for the Contractor's sapper supervision and a specialised sapper unit) to dig out the discovered unexploded shells, raise them, excavate them, bury them, transfer them or throw them to the fire or into such places as river, channel, oxbow lake, ditches, etc.

The mitigation measures relating to hazards connected with unexploded shells have been defined in the following items in Appendix No. 1 to EMP: 82, 83 (12 - Requirements for ensuring human health and safety).

Fire

Fire safety in the area of the Task rests with the Contractor. A detailed procedure in case of fire will be contained in the HAS Plan prepared by the Contractor (see . 6.14.). The requirement of HAS Plan preparation by the Contractor and obtaining approval from the Engineer for its content is defined in item 75 in Appendix No. 1 to EMP (12 - Requirements for ensuring human health and safety).

6.13. WASTE AND SEWAGE

Mitigation measures related to waste management are listed, in particular, in the following items in Appendix No. 1 to EMP: 44-51 (07 – Requirements concerning waste management).

Mitigation measures related to handling of sewage are described in item 50 in Appendix No. 1 to EMP (07 – Requirements concerning waste management).

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

The Contractor, on the basis of specified mitigation measures, determined in the environmental decision and in this EMP, shall prepare, and then obtain the Engineer's acceptance, for the following own documents necessary to perform construction works:

- *Building site organisation design*, which should include, among others, the following elements:
  - Site back-up facilities location,
  - Site back-up facilities development,
  - Site back-up facilities protection,
  - Technological roads, including, obligatorily, planned temporary land occupation,
  - Environment protection within the site back-up facilities.
- *Waste management plan*, which should include, among others, the following main elements and detailed guidelines included in Appendix No. 1 to EMP:
  - Encountered and estimated types and volumes of wastes,
  - Manners of preventing negative impact of the waste on environment,
  - Manners of waste management taking into account collection, transport, recovery and treatment of waste,
  - Type of generated waste and way of its storage.
- *Quality assurance plan*, which should include, among others, the following elements:
  - Works performance organisation,
  - Organisation of traffic at the site together with marking of Works,
  - OH&S and environment protection,
  - List of working teams,
  - Scope of duties of the key personnel,
  - Quality control,
  - Laboratory tests.
- The *construction site's flood management plan* for the time of the works, which should include, among others, the following elements:
  - Monitoring hydrological and weather situation,
  - Conditions for allowing overflows in the period of works performance,
  - The rules of work for the Contractor's team in the period of flood risk,

- Basic duties of the members of the Flood Protection Team,
- List of people with assigned duties in the period of flood risk,
- List of equipment and transport means needed to conduct rescue actions,
- Operating instruction during impoundments.

- *HAS Plan*, which should include, among others, the following elements:
  - Plot or site development elements which may be a hazard to human health and safety,
  - Information related to predicted hazards during the performance of civil works, including scale and type of hazards as well as place and time of their occurrence,
  - Information on separation and marking of places of conducting construction works, according to the hazard type,
  - The method of employee training prior to the commencement of extremely hazardous works,
  - Determining the method of storing and transport of hazardous materials, products, substances and preparations at the construction site,
  - Indication of technical and organisational measures preventing hazards resulting from civil works in health hazard zones or in their vicinity, including measures providing safe and effective circulation enabling emergency evacuation in the case of fire, failure and other hazards,
  - Indication of the storage location of construction documentation and documents necessary for proper operation of machines and other technical devices.
- *Management Strategies and Implementation Plans of ESHS* (management strategies and implementation plans conc. the environmental, social, health risk and safety), containing, among others, the following elements:
  - description of actions taken for risk management,
  - description of the used materials, equipment, description of management processes, etc., to be implemented by the Contractor and its subcontractors to minimise the risk.

The Contractor should continuously submit, for the Engineer's initial approval, additional *Management Strategies and Implementation Plans of ESHS*, as necessary to manage ESHS risk factors and consequences of the implemented works. Such Management Strategies and Implementation Plans jointly form the *Contractor's Environmental and Social Management Plan* (C-ESMP). The C-ESMP will be approved prior to the commencement of the Works (and will concern, e.g. excavations and earthworks).

The Contractor, while preparing the aforementioned documents, shall consider applicable Operational Policies of the World Bank for protection of health and safety and environmental issues. The aforementioned documents, before implementation, must be approved by the Engineer, who will then supervise their correct enforcement. The requirement of preparing and

approving the content of the aforementioned documents is indicated in items 44, 75, 76 in Appendix No. 1 to EMP.

6.15. REQUIREMENTS RELATED TO EXECUTION OF ENVIRONMENTAL COMPENSATION

In accordance with the conditions contained in the environmental decision issued for the Task, works execution requires to perform environmental compensation on the Polish level. Because the compensation measures are not related to the occurrence of substantial adverse impacts on Natura 2000 sites, or a negative impact on the achievability of environmental objectives for surface water bodies. The compensation measures which have to be executed include the restoration of the biodiversity potential of the Widawa valley section influenced by the works included in Works Contract 1B.7.

Nature compensation includes the performance of such measures as:

- restoration of patches of the habitat of oak, elm, ash riverine forests 91F0 within the plots nos.: 1824/194, 1826/195, 1830/198, 1849/211, 2087/212, 2010/152 (precinct of Bystrzyca, commune of Oława) on the area not smaller than 7.2 ha,
- plantings on the area of plot no.: 180/24 (precinct of Siedlec, commune of Długołęka), 5,550 species of local trees,
- plantings of local species of trees on the area of plots nos.: 180/24 (precinct of Siedlec, commune of Długołęka), 232/2, 233/4 (precinct of Borowa, commune of Oleśnica), 730 (precinct of Smolna, commune of Oleśnica) on the area not smaller than 2.85 ha ,
- restoration of several small water reservoirs being the habitats of amphibians, with the total water surface area of not less than 0.6 on the area of plot no. 330 (precinct of Dobrzykowice, commune of Czernica),
- installing two breeding boxes for Grey Wagtail,
- installing two boxes for bats within the construction of the bridges the flow of which is improved under the Task and installing 40 boxes for bats within the trees in the area of or in vicinity of the Task implementation area.

Details of execution of environmental compensation given in Appendix No. 3 to EMP. This Appendix also defines the rules of monitoring of execution of environmental compensation and its further maintenance and monitoring.

The measures related to execution of environmental compensation should be carried out within the Task implementation period, and measures related to the execution of plantings, referred to above, shall be started as soon as possible to enable their timely implementation (the optimum planting period is from September to October).

7. DESCRIPTION OF MONITORING MEASURES

7.1. ENVIRONMENTAL MONITORING DURING PERFORMANCE OF WORKS

In Appendix No. 2 to EMP lists the monitoring measures valid for the Task Contractor. The measures have been established based on the conditions included in the valid environmental decision issued for the Task, supplemented by additional conditions agreed at the stage of EMP preparation.

The monitoring measures listed in Appendix No. 2 to EMP belong to two categories:

- monitoring for implementation of the mitigating measures specified in Appendix No. 1 to EMP (item 1-91 of Appendix No. 2 to EMP),
- performance of nature monitoring (item 92-94 of Appendix No. 2 to EMP).

7.2. ENVIRONMENTAL MONITORING DURING OPERATIONAL PERIOD

During the period of two years since restoring the operation of the Kiełczówek weir according to the provisions of the water permit for this structure, perform monitoring of fish migration along the sections of the following watercourses:

- along the Widawa section downstream and upstream of the weir - before and after Młynówka Kiełczowska relocation,
- on the outlet section of the Mrówka stream (after relocation of Młynówka Kiełczowska),
- on the outlet and initial section of Młynówka Kiełczowska (before and after Młynówka Kiełczowska relocation).

Details of execution of this condition are given in item 92 of Appendix No. 2 to EMP.

8. PUBLIC CONSULTATIONS

8.1. PUBLIC CONSULTATIONS DURING EIA FOR THE ORFPP (2005)

A general environmental impact assessment for the whole ORFPP project was conducted for the first time in 2003 (as part of a feasibility study for the Project), and then was verified by the team of foreign and home consultants. As a result of these works, in 2005 the document entitled Odra River Basin Flood Protection Project – General Environmental Impact Study, Main Report was completed, which contained e.g. the Environmental Management Plan for the ORFPP (as section 8 and 9 of the above-mentioned document). The document was subject to public consultations, which was described in the Project Appraisal Document (PAD).

8.2. PUBLIC CONSULTATIONS FOR THE ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK FOR THE OVFMP (2015)

The draft of the document entitled Environmental and Social Management Framework(ESMF) for the OVFM Project (including Component 2, which covers the present Task) was subject to the procedure of public consultations conducted in accordance with OP 4.01 Operational Policy of the World Bank. Their aim was to enable the public to familiarize itself with the content of that document and ensure the possibility of submitting remarks, questions and motions concerning the content. The documentation of the public consultation process for the abovementioned document is available on the website of the Odra-Vistula Flood Management Project Coordination Unit[1]

8.3. PUBLIC CONSULTATIONS AT THE STAGE OF ENVIRONMENTAL PROCEDURES FOR THE TASK (2017)

Public consultations at the stage of issuing the environmental decision for this task were conducted by the Regional Director for Environmental Protection in Wrocław.

With the announcement of 2 November 2017 (ref.: WOOŚ.4233.2.2017.ŁCK.22), the Regional Director for Environmental Protection in Wrocław made information about the planned project publicly available. Everyone interested in the investment subject to the proceedings, could have familiarised oneself with the whole documentation of the case from 3 November 2017 until 4 December 2017 (inclusive). Everyone could also submit comments and applications regarding the planned investment with different means of communication. No comments and applications were filed in the established time limit for the pending proceedings.

The above-mentioned announcement was also made publicly available by: announcing on the notice board in the office of RDOŚ Wrocław, by posting the announcement on the notice boards in: the Municipal Office of Wrocław, Municipal Office of Długołęka, Municipal Office of Czernica.

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

Before issuing the environmental decision, the parties to the proceedings were informed that the entire evidence had been collected in the case and about the possibility of expressing one's opinion as to the collected evidence. No party submitted any comments or applications to the proceedings.

On 29 December 2017, the Regional Director for Environmental Protection in Wrocław issued a decision on environmental conditions for the investment entitled: WFS Widawa – the rebuilding of the flood management system of the communes and municipalities Czernica, Długołeka, Wisznia Mała and Wrocław (ref.:WOOŚ.4233.2.2017.ŁCK.27). The decision was made publicly available by announcing in the same manner as for the announcement about commencement of the procedure with public participation.

8.4. PUBLIC CONSULTATIONS OF THE ENVIRONMENTAL MANAGEMENT PLAN (2019)

The draft of this document was subject to the public consultation procedure carried out in compliance with the World Bank Operational Policies (*OP 4.01*).

Publication of Environmental Management Plan draft (EMP) commenced in accordance with OP 4.01 on 30th January 2019, when a notice was placed in Gazeta Wrocławska (regional daily newspaper).

The notice invited private individuals, authorities and interested parties to view draft of EMP for the Works Contract 1B.7. EMP draft was published from 30th January 2019 to 19th February 2019 (i.e. for a period of 21 days) on the following websites:

- PGW WP RZGW Wrocław - www.wroclaw.rzgw.gov.pl,
- WFS Project Office – www.odra-wroclaw.pl/aktualnosci,
- Wrocław Municipality – bip.um.wroc.pl,
- Długołęka Community – www.gmina.dlugoleka.pl,
- Czernica Community – www.czernica.pl,
- Odra - Vistula Flood Management Project's Coordination Unit – www.odrapcu.pl.

The notice about public consultations of the EMP draft was also posted on notice boards in the above institutions and on the construction sites.

The printed document was available for review by all interested parties in the period from January 30, 2019 to February 19, 2019 at the seat of the State Water Holding Polish Waters, the Regional Water Management Authority in Wrocław, av. Kochanowskiego 91B, 51-602 Wrocław, from 8:30 am to 2:30 pm on working days.

Each interested person could submit comments and requests regarding the EMP draft in written and oral form at the above-mentioned address or in electronic form to the following e-mail address: jrpwroclaw.opdow@wody.gov.pl. The authority competent to review comments and requests was the PGW WP RZGW in Wrocław. The contact person at PGW WP RZGW in Wrocław was Ms. Joanna Zawisza-Gończ (telephone number +48 71 32-40-946).

Within the 21-day period for submitting queries regarding the publicized draft of the Environmental Management Plan one letter was from a private individual received by PGW WP RZGW in Wrocław and consultations with the Oleśnica Śląska and Oława Forest Districts, as well as with the Długołęka Commune regarding the implementation of environmental compensation took place. These consultations resulted in a change to the content of the EMP (Appendix 3 to the EMP), i.e. clarification of the provisions regarding the places and manner of implementing environmental compensation.

No person appeared at the RZGW headquarters in Wrocław to view the printed document, but there was a significant interest in the electronic version of this document.

After the end of the 21 days period of the publication of the EMP draft, on February 20, 2019 at 6:30 pm at the Primary School in Wilczyce at 15 Wrocławska Street a meeting took place, open to the public, regarding public consultations on the draft of **Environmental Management Plan for the Works Contract 1B.7. WFS Widawa River – the rebuilding of the flood management system of the communes and municipalities Czernica, Długołęka, Wisznia Mała and Wrocław** implemented as part of the Odra - Vistula Flood Management Project.

The meeting in Wilczyce was attended by 27 people affected by the Project, in addition, representatives of local government were also present: an employee of the Czernica Commune, Śliwice Mayor, Wilczyce Mayor, a councillor from the Długołęka Commune. The meeting was also attended by representatives of the units directly involved in the implementation of the OVFMP: Project Implementation Unit from the PGW WP RZGW in Wrocław (OVFMP Project Manager, Deputy Project Manager OVFMP, Environmental Manager, Environmental Specialist) and from Engineer - Consultant Team (including designers, author of EMP, Project Manager and Deputy Project Manager).

The meeting was opened by Deputy Project Manager of the OVFMP, who welcomed the guests and briefly presented the purpose of the meeting. To complete the formalities Consultant representing JV Sweco Consulting Sp. z o.o./ Sweco Nederland B.V. / Artelia Ville & Transport SAS / Artelia Sp. z o.o. / Ekocentrum Sp. z o.o. informed about the meeting plan, asked to sign in to the attendance list and submit questions on the distributed cards. Then the Consultant presented the EMP draft. The purpose and financing of the OVFMP was briefly discussed, information about the Works Contract was presented and the most attention was given to the structure and content of the EMP and its relevance in the implementation of works, as well as how the correct implementation of its provisions will be monitored. While discussing the issues related to the EMP draft, the Consultant paid particular attention to measures minimizing the impact and obligations of the Contractor regarding the principles for their implementation. After the presentation, the participants were encouraged to ask questions.

During the public discussion each participant could submit oral and written comments / remarks on the Draft of EMP to the protocol / report. During the meeting, many additional questions were asked, some required a written response because technical issues had to be analyzed or additional information could be obtained. The questions asked during the meeting concerned issues described in detail in the EMP, they were discussed and explained during the meeting and do not require the completion of the EMP. Questions asked in writing and one letter sent/submitted during the consultation period were also answered in writing.

Remarks and motions handed over during debate were analyzed in terms of necessary adjustments to the final version of the document, and then the amendments were introduced during the final editing of the EMP. After meeting a report was prepared that it was sent to the World Bank.

Final EMP document after obtaining “no objection” clause from WB will be available to interested parties i.e. by publishing on PIU or PCU OVFMP websites and will remain there until the completion of the Works Contract.

9. ORGANISATIONAL STRUCTURE OF EMP IMPLEMENTATION

This Task is complementary to Subcomponent B3 of the ORFPP, whose implementation was ended and it will be realized in the scope of OVFM Project. Accordingly, the structure of supervision over EMP implementation must be compliant with the provisions of the Polish law and the requirements of the World Bank.

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

The overall coordination of implementation of individual parts of the EMP within the framework of the Project is the responsibility of the Project Coordination Unit (PCU), which from 9/01/2018, it is a budgetary unit reporting to the minister competent for water management.

Tasks of the PCU include, among others:

- co-operation with the relevant ministries, the State Water Establishment Polish Waters and other units of central and local administration involved in the implementation of the ORFP Project;
- coordination of activities of individual Project Implementation Units and supporting these units in the implementation of the EMP;
- monitoring and assessment of the EMP implementation progress;
- ongoing co-operation with the World Bank, including preparation of quarterly reports on implementation of the ORFP Project.

9.2. PROJECT IMPLEMENTATION UNIT (PIU)

An entity which is directly responsible for implementing the EMP for the Task and for monitoring the progress in its implementation is the Project Implementation Unit (PIU), i.e. the PGW WP RZGW Wrocław.

In connection with ORFP Project implementation, a Project Implementation Unit (PIU) will be separated in structure, which is a separate organisational unit supervised by the Director of the PGW WP RZGW in Wrocław. Such structure is transparent and has a very highly set decision-making level, which increases the effectiveness of the Project implementation. As part of EMP implementation, the PIU 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 into EMP implementation;

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

- managing, coordinating, supervising over the EMP implementing by the Consultant and Contractor;
- direct supervision of the proper implementation of the Task;
- cooperation with the PCU;
- conducting an administration and legal supervision over EMP implementation;
- verification of Reports on the implementation of the EMP prepared by the Consultant;
- conducting a financial supervision over EMP implementation;
- supervising the proper application of formal procedures during the implementation of EMP, as required, among others, by the requirements of the Contract, Construction Law, Environmental Protection Law and other applicable administrative decisions and legal acts.

9.3. CONSULTANT/ENGINEER

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

The Consultant/Engineer was selected using QCBS method (Quality and cost-based selection), in accordance with the *"Guidelines for Selection and Employment of Consultants by Borrowers of the World Bank"*. In accordance with the scope specified in the Consultant/Engineer Contract, the Consultant/Engineer will be obliged to perform the supervision over EMP implementation, comprising, in particular, the following:

- monitoring of EMP implementation;
- monitoring the Contractor's activities;
- verifying the quality of construction works performed by the Contractor and the incorporated construction materials, in particular preventing the use of defective and not approved construction products;
- representing the Investor in the construction site through supervising the conformity of its implementation with the design and permit to implement, environmental protection regulations and technical knowledge rules;
- supervising all the aspects connected with environmental protection through experts in environmental protection and other Engineer's personnel;
- continuous monitoring of the implementation of measures mitigating a negative impact on the environment;
- conducting additional studies, if it is necessary to verify the Contractor's reports;

- identifying problems resulting from a harmful environmental impact of the implementation of construction works and presenting a proposal for solving such problems;
- checking and accepting construction works to be covered up and concealed, as well as preparing and participating in the acceptance activities for ready construction works and putting them in service;
- confirming actually completed works and eliminating defects upon the Investor's request; controlling the financial settlements of the construction.

9.4. CONTRACTOR

For the purpose of performing construction works, a Contractor will be appointed who will also be responsible for implementing respective EMPs. The Contractor' responsibilities within this scope are as follows:

- perform the construction works based on the principles defined in the EMP, in the contract conditions and in design documentation, in accordance with applicable legal provisions and requirements of administrative decisions issued for the Task;
- carrying out the Engineer's recommendations (including the recommendations of environmental supervision experts and the Investor's supervision) concerning the implementation of EMP;
- ensuring the preparation of a HAS Plan, Waste management plan, Quality assurance plan, the construction site's flood management plan for the time of the works, Building site organisation design and ESHS/C-ESMP;
- keeping the construction site documentation;
- drafting monthly reports and technical inspection reports;
- preparing reports concerning environmental protection;
- apply to the Investor through the Engineer to make changes in the design solutions, if such changes are justified by the necessity to increase the level of safety of implementation of the construction works or to enhance the efficiency of the construction process within the scope related to implementation of the EMP.

10. SCHEDULE OF EMP IMPLEMENTATION AND REPORTING PROCEDURES

The implementation of the EMP enables the parties involved in the preparation, implementation and supervision of the Task to:

- identify different environmental aspects which have a considerable impact on the condition of the environment and therefore to control, correct, and reduce them but which, consequently, generate economic effects;
- rectifying adverse impact 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 EMP, which require expenditure and bring tangible effects;
- identification and elimination of 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 nature's resources, with minimum environmental loss and the optimum generation of costs.

Furthermore, the implementation of recommendations and activities required by EMP may reduce or even eliminate risks involved in the Contract, in particular:

- the risk of neglecting the environmental protection problems during the process of implementation of the Task by the Contractor;
- a risk of the 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 incurring additional losses in the environment.

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

- Before appointment of the Contractor, the Employer will submit a draft of this EMP to the World Bank in order to obtain its opinion and approval to begin public consultations;
- EMP will be then subject to public consultations;
- after conducting public consultations, the EMP will be supplemented and its final version submitted to the World Bank for approval.

- upon approval of the EMP by the World Bank the final document will be included in the Contractor's selection bidding documents.

- Any activities of the Contractor will be reported in regular time intervals (monthly), in the paper and digital version, in view of the obligations arising from the EMP and other contractual documents. These reports will be subject to approval by the Engineer.

Monitoring the environmental impact of the Task consists of:

1. Controlling execution of the construction works related to implementation of the Task under supervision of the environmental team, appointed by the Contractor for the period of implementation of the Contract.

2. The Contractor's environmental team implements activities encompassing, in particular:

- review and ongoing supervision of the area covered by construction and hydraulic engineering works prior to their commencement and controls during the construction project and in the Defects Notification Period along with preparation of relevant reports, constituting documentation of due execution of environmental team and informing, at the same time, about due introduction of mitigation measures,

- forming and reporting motions to the Engineer concerning the needs for undertaking mitigation measures (together with their implementation) necessary to alleviate adverse effects of the Task on the natural habitats and species, and their habitats being the object of interest of the Community and subject to legal (species) protection, which cannot be predicted and/or are impossible to be disclosed at the stage of establishing conditions of implementation of the above-mentioned Task as part of proceedings the purpose of which is to issue the decision on environmental conditions. The measures may be implemented only after approval by the Engineer,

- obtaining, if necessary, the required permissions for departure from the prohibitions connected with protected species of plants, fungi and animals under conditions and procedure specified in the Environment Protection Act.

- keeping reporting in the form of periodical reports (at least monthly).

3. The Contractor shall appoint the following specialists to the environmental team: phytosociologist, entomologist, ichthyologist, herpetologist, ornithologist, theriologist, chiropterologist. The above-mentioned specialists must hold documented experience within an applicable scope and higher education diploma in the field of environment formation or related. One member of the Contractor's environmental team may represent maximally two above-mentioned natural specialisations.

At the works execution stage, it is planned to prepare consolidated reports from monitoring of nature by the Contractor, confirmed by the experts of the Contractor's environmental team, approved by the Engineer's environmental supervision. A detailed report scope shall be defined by the Engineer (commencement report, periodical report - monthly, quarterly, ad-hoc, closure); it shall also define the due dates. Fish migration monitoring in the period of works performance and in the Defects Notification Period will be conducted by the Contractor. The Contractor will prepare a monitoring report and will submit it to the Employer. After the Defects Notification Period, if necessary, monitoring will be taken over by the Employer and will be conducted until the end of the monitoring period set in the environmental decision. A report on the completed monitoring will be submitted to RDOŚ in Wrocław within 3 months after the end of the monitoring.

A report shall also be prepared by the Contractor for the completed nature supervision, which after approval by the Engineer, should be submitted to a body supervising the Natura 2000 site at the date until the last day of each calendar quarter. The last report on implementation monitoring should be prepared within 3 months from the date of completion of the task.

The Project reporting system will also be based on monthly reports submitted by the Contractor to the PIU by the Engineer and Engineer's monthly reports. Monthly reports on EMP implementation (Contractor's or Engineer's) shall be prepared as part of monthly reports or a separate document. Consolidated and quarterly reports will be drawn up on this basis.

The PIU shall supply the PCU with quarterly reports in the part referring to Task implementation. They shall include a required set of information and descriptions enabling the preparation of the Project quarterly report by the PCU. Furthermore, especially in the case of problems with the Task implementation, the PCU shall expect the PIU to submit the statements and data in the monthly periods.

The following reporting procedures are determined:

1) Reporting:
    a) reports (initial, monthly, quarterly, final) drawn up by the Contractor,
    b) the report from the monitoring of ichthyofauna migration prepared according to the condition imposed in the environmental decision issued for the Task and item 92 Appendix No. 2 of EMP,
    c) submission of reports required by the environmental decision (from the completed nature supervision) to the Engineer,
    d) review and verification of the report by the Engineer,
    e) submission of approval report from point a), b) and c) to the Employer (for information),
    f) submission of reports to RDOŚ Wrocław on performance of nature supervision (until the last day of each calendar quarter during performance of works and within 3 months after the end of works),

g) a report on the monitoring of ichthyofauna migration monitoring will be submitted to RDOŚ in Wrocław within 3 months after the end of the monitoring,

h) submission of the PIU's quarterly report to the PCU.

2) Archiving:

a) Contractor: 1 copy of each report in an electronic version form for 5 years from the date of the Contract completion,

b) Engineer: 1 copy of each report in an electronic version form for 5 years from the date of the Contract completion,

c) Employer: 1 copy of each report in an electronic version form for 5 years from the date of the Contract completion.

3) Evaluation – ongoing assessment of results of implementation of the planned activities arising from the EMP. Ongoing analysis of documentation (the Reports of the Contractor) by the Engineer. Providing the Employer with reliable information on the progress of the construction process with a particular focus on implementation of measures mitigating negative environmental impact and recommendations arising from environmental decision.

The PCU shall also prepare quarterly reports and submit them to the World Bank.

The following is planned:

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

11. REFERENCE DOCUMENTS

1) "Environmental Impact Report for the project titled: "WFS Widawa – the rebuilding of the flood management system of the communes and municipalities Czernica, Długołeka, Wisznia Mała and Wrocław", prepared in 2017 by Hydroprojekt Wrocław Sp. z o.o. under the supervision of Dr Jerzy Krajewski.

2) Decision of the Regional Director for Environmental Protection in Wrocław of 29 December 2017 on environmental conditions for the project entitled: WFS Widawa – the rebuilding of the flood management system of the communes and municipalities Czernica, Długołeka, Wisznia Mała and Wrocław (ref.:WOOŚ.4233.2.2017.ŁCK.27).

3) Documentation of the Protection Tasks Plan for the Natura 2000 site Widawa Valley PLH PLH020036.

4) GIS database (natural habitats, species of animals) for the Natura 2000 site Grędzińskie Forests PLH020081.

5) Expert opinion for assessing the Project's effect/impact on the water protection objectives in the meaning of Article 4.1 in conjunction with Article 4.7 of the Water Framework Directive for the project "WFS Widawa – the rebuilding of the flood management system of the communes and municipalities Czernica, Długołeka, Wisznia Mała and Wrocław", Nature Service Wojciech Lewandowski, 2017.

12. LIST OF APPENDICES

Appendix 1. Plan of mitigation measures.

Appendix 2. Plan of monitoring measures.

Appendix 3. Plan of performance and monitoring of environmental compensation.

Appendix 4. List of national legal acts connected with environmental protection.

Appendix 5a. Copy of the Decision of the Regional Director for Environmental Protection in Wrocław of 29 December 2017 on environmental conditions for the project entitled: WFS Widawa – the rebuilding of the flood management system of the communes and municipalities Czernica, Długołeka, Wisznia Mała and Wrocław (ref.:WOOŚ.4233.2.2017.ŁCK.27).

Appendix 5b. Copy of the Decision of the Ministry of Maritime Economy and Inland Navigation of 26 July 2018 on water permit for the project entitled: WFS Widawa – the rebuilding of the flood management system of the communes and municipalities Czernica, Długołeka, Wisznia Mała and Wrocław (ref.: DOK.DOK3.9700.89.2018.JC).

Appendix 6. Location map of the Task (6a Location map of the key elements of the Task, 6b. Location map of the key elements of the Task on the background of the designated protected areas, 6c Location map of the key elements of the Task on the background of JCWP), 6d Location map of the archaeological sites.

Appendix 7. Distribution of selected natural objects in relation to the location of the main elements of the Task.