

Environmental Management Plan for the Contract 1A.1 Chlewice-Porzecze. Backwater
embankment of Odra River at Myśla River
and Modernization of Marwicki polder stage I and II



**ZACHODNIOPOMORSKI BOARD OF AMELIORATION AND
HYDRAULIC STRUCTURES in Szczecin**

ODRA-VISTULA FLOOD MANAGEMENT PROJECT - 8524 PL

EMP – ENVIRONMENTAL MANAGEMENT PLAN

**SUB-COMPONENT 1A Flood protection of areas in Zachodniopomorskie
Voivodeship**

Contract 1A.1:

***Chlewice-Porzecze. Backwater embankment of Odra River at Myśla River and
Modernization of Marwicki polder stage I and II***

ENVIRONMENT CATEGORY B – in accordance with WB OP 4.01

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Project Implementation Unit:



Zachodniopomorski Board of Amelioration
and Hydraulic Structures in Szczecin
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ENVIRONMENTAL MANAGEMENT PLAN

**Sub-component 1A Flood protection of areas in Zachodniopomorskie
Voivodeship**

**Contract 1A.1: Chlewice-Porzecze. Backwater embankment of Odra River at Myśla River
and Modernization of Marwicki polder stage I and II**

This Environmental Management Plan applies to Contract 1A.1 Chlewice-Porzecze. Backwater embankment of Odra River at Myśla River and Modernization of Marwicki polder stage I and II covering two structures: a) Chlewice-Porzecze. Backwater embankment of Odra River at Myśla River, b) Modernization of Marwicki polder stage I and II

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List of definitions and abbreviations used in EMP

Name	Description
Consultant/ Engineer	Consultant/Engineer for Zachodniopomorski Board of Amelioration and Hydraulic Structures in Szczecin
Contract/Task	Odra-Vistula Flood Management Project. Works Contract 1A.1 Chlewice-Porzecze. Backwater embankment of Odra River at Myśla River and Modernization of Marwicki polder stage I and II
Contractor	Company or public body executing Contract 1A.1 Chlewice-Porzecze. Backwater embankment of Odra River at Myśla River and Modernization of Marwicki polder stage I and II
EIA	Environmental Impact Assessment
EMF	Environmental Management Framework
EMP	Environmental Management Plan for Contract 1A.1: Chlewice-Porzecze. Backwater embankment of Odra River at Myśla River and Modernization of Marwicki polder stage I and II
ESMF	Environmental and Social Management Framework – for Odra-Vistula Flood Management Project ¹
Environmental Decision	Decision on environmental conditions
GDOŚ	General Directorate for Environmental Protection (<i>Generalna Dyrekcja Ochrony Środowiska</i>)
GZWP	Main Underground Reservoir (<i>Główny Zbiornik Wód Podziemnych</i>)
JCWP	Surface Water Body (<i>Jednolita Część Wód Powierzchniowych</i>)
JCWpd	Groundwater Body (<i>Jednolita Część Wód Podziemnych</i>)
OHS	Occupational Health and Safety
PAD	<i>Project Appraisal Document</i> – For Odra-Vistula Flood Management Project ²
PCU	Project Coordination Unit
PIO	Project Implementation Office - An organizational unit allocated as part of PIU
PIU	Project Implementation Unit – Zachodniopomorski Board of Amelioration and Hydraulic Structures in Szczecin
PIU/Investor/ Employer	Zachodniopomorski Board of Amelioration and Hydraulic Structures in Szczecin
Project	Odra-Vistula Flood Management Project (<i>Projekt ochrony przeciwpowodziowej w dorzeczu Odry I Wisły</i>)

¹ <http://documents.worldbank.org/curated/en/2015/04/24502899/poland-odra-vistula-flood-management-project-environmental-social-management-framework>

http://www.odrapcu.pl/popdow_dokumenty.html

² <http://documents.worldbank.org/curated/en/2015/07/24763021/poland-odra-vistula-flood-management-project>

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Name	Description
RDOŚ	Regional Directorate for Environmental Protection (<i>Regionalna Dyrekcja Ochrony Środowiska</i>)
Roads authority	Organizational unit implementing the responsibilities of the management of public roads in accordance with the Act on public roads
SHPA	Special Habitat Protection Areas Natura 2000
SHPP	Safety and Health Protection Plan prepared in compliance with the Building Law Act of 7 July 1994
SCI	Site of Community Interest
Structure	A material scope allocated in terms of functions, which constitutes a part of Task 1A.1 Chlewice-Porzecze. Backwater embankment of Odra River at Myśla River and Modernization of Marwicki polder stage I and II
PIEP	Provincial Inspectorate for Environmental Protection (<i>Wojewódzki Inspektorat Ochrony Środowiska</i>)
World Bank (WB)	International Bank for Reconstruction and Development
ZZMiUW	Zachodniopomorski Board of Amerlioration and Hydraulic Structures in Szczecin (<i>Zachodniopomorski Zarząd Melioracji i Urządzeń Wodnych w Szczecinie</i>)

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 presented in the table below.

Name	Description
Bird Directive	European Parliament and Council Directive 2009/147/EC of 30 November 2009 on wild birds protection (EU Official Journal, L 288 of 6.11.2007)
e.p.a.	Act of 3 October 2008 on providing information on environment and its protection, public participation in the environmental protection and Environmental Impact Assessments (consolidated text, Journal of Laws of 2016, item 353, as amended)
FWD	Framework Water Directive – European Parliament and Council Directive 2000/60/EC of 23 October 2000 establishing the frameworks for community activity within the scope of water policy (EU Official Journal, L 327 of 22.12.2000, p. 1, as amended)
Habitat Directive	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 22.7.1992, p. 7, as amended.)
n.e.p.a.	Act of 16 April 2004 on environmental protection (consolidated text, Journal of Laws of 2015, item 165, as amended)

EXECUTIVE SUMMARY

This document presents Environmental Management Plan (EMP) for the Contract 1A.1 Chlewice-Porzecze. Backwater embankment of Odra River at Myśla River and Modernization of Marwicki polder stage I and II, hereinafter called the Task, implemented within the Odra-Vistula Flood Management Project, co-financed by the International Bank for Reconstruction and Development (the World Bank).

This EMP includes the following elements:

- Abbreviated description of the Odra-Vistula Flood Management Project,
- Abbreviated description of the Contract to which this Environmental Management Plan is applicable,
- Institutional, legal and administrative conditions with listing of public administration bodies participating in issuing administrative decisions at the stage of preparing the Task to be implemented, valid acts of the Polish law regarding environmental protection, main stages of the EA procedure, as well as presentation of the World Bank guidelines, and the current state of the EA procedure for the Task covering Contract 1A.1,
- General specification of the status of respective environmental elements on the Task implementation area and in its vicinity,
- Summary of the environmental assessment included in the environmental impact reports for the above mentioned elements of the environment, including the impact of the Task on environment in the context of the Water Framework Directive,
- Set of mitigation measures to be carried out by the Contractor and PIU at the Task implementation stage with reference to respective environmental elements. Mitigation measures are presented in the Table in Appendix No 1 to the EMP,
- The set of monitoring measures at the preparation, construction and operation stage of the Task. Monitoring measures are presented in the Table in Appendix No 2 to the EMP,
- Procedure and result of public consultations at the stage of developing Environmental Management Framework for the Task and at the stage of developing this EMP,
- Organisational structure of implementing EMP, implementation schedule and reporting procedures.

The Appendices to EMP also include copies of administrative decisions, referring to environmental protection, issued for particular structures implemented within the Task and graphic Appendices - a location map of the planned Task (Appendix No 5), map

presenting location of protected areas in relations to the elements of the Task (Appendix No 6), a map of potential flood risk areas (Appendix No 7) and areas excluded from potential flood risk (Appendix No 8).

A basis for preparing this EMP for the Contract 1A.1 is as follows: EMF, ESMF, PAD, WB Operational Policies, environmental impact reports, environmental decisions and design documentation.

Characteristics of the Task

Contract 1A.1 “Chlewice-Porzecze. Backwater embankment of Odra River at Myśla River and Modernization of Marwicki polder stage I and II” comprises of the following structures:

- “Chlewice-Porzecze. Backwater embankment of Odra River at Myśla River” – covering construction of new embankment will be implemented within the meadows and farm land adjacent to Chlewice Village (within the Boleszkowice Commune),
- “Modernization of Marwicki polder stage I and II” – will be implemented within the existing embankments of the Odra River (including their modernization) as well as areas of meadows and rushes in the direct neighbourhood of the existing embankments (within the borders of Widuchowa Commune and Gryfino Municipality).

Location of facilities is presented in the Appendix No 5 to EMP.

Institutional, legal and administrative conditions

The Task, in terms of its characteristics, potential impacts on environment and location in relations to protected areas, is implemented in accordance with relevant national regulations on environmental protection.

Current condition of environmental elements in the surroundings of the Task

As a result of works related to the identification of natural and cultural environmental values conducted by a team of specialists during EA procedure it has been determined that the area of the Task implementation is characteristic for the following internal, local and regional conditions:

- a) Structure “Chlewice-Porzecze. Backwater embankment of Odra River at Myśla River”:
 - Occurrence of 2 rare plant species in the neighbourhood of the planned works,
 - Occurrence of 11 valuable and/or covered by protection species of birds, including 7 further species of animals under strict or partial protection in the neighboring area of the construction site,

- The structure as a whole is implemented within the borders of Special Birds Protection Area Natura 2000 Lower Odra River Valley PLB320003, as well as partially within the borders of the following areas: Site of Community Importance Lower Odra River PLH320037 and Landscape Park Estuary of the Warta River.
- b) Structure “Modernization of Marwicki polder stage I and II”:
- Occurrence of 1 plant species under protection in the neighbourhood of the planned works,
 - Occurrence of 3 valuable and/or covered by protection species of birds in the neighbourhood area in relation to works construction site,
 - The structure is entirely carried out within Natura 2000 Bird Special Protection Area of the Lower Odra River Valley PLB320003³, and partially within the boundaries of the Community Importance Area, Lower Odra PLH320037, and in the immediate vicinity of the Lower Odra River Valley Landscape Park.

Summary of Environmental Impact Assessment

Land area and landscape

In reference to the structure “Chlewice-Porzecze; Backwater embankment of Odra River at Myśla River”, the construction of the new embankment in the open landscape of the Myśla River Valley shall cause little change to landscape. The scale of changes shall be of local nature.

In case of the structure “Modernization of Marwicki polder stage I and II” the implementation shall not cause a change to the function of the area (works include the reconstruction of the existing embankments), shall not impact on the way of land use. The anticipated impacts refer to the zone of land where the surface layer of the soils will be disturbed. After works completion the site shall be reinstated to its original condition.

Climate

Due to a minor spatial scope of the Task in terms of the impact on climatic conditions and lack of any significant interference with the environmental elements which shape a local climate, the Task does not generate any negative impacts within this scope.

³ all Natura 2000 sites have their unique code which identifies site despite translation of its name. First two letter refer to the country name, third to the type of the site (Special Protection Areas or Special Areas of Conservation), fourth and fifth refers to Province and rest is number of the site in certain Province.

Air quality

Emission of pollutants is limited to the stage of the Task implementation; it is of short term and reversible. The implementation of the Task does not result in significant impact on air quality.

Soil and land

In case of the structure “Chlewice-Porzecze; Backwater embankment of Odra River at Myśla River” there shall be local impact on the change of structure and moisture of soil. The new embankment surrounding the Chlewice Village shall not stop flooding of the wetlands regularly flooded by the river waters and other like.

In case of the structure “Modernization of Marwicki polder stage I and II”, due to free nature of underground water the construction of the filtration screen shall not have severe impact on the change of water balance of the soil or formation of deposits located from the landside of the embankments.

Surface water

The structure “Chlewice-Porzecze; Backwater embankment of Odra River at Myśla River” shall not have a direct impact on the hydromorphological elements or physical and chemical elements of the Odra’s water, the worsening of the water conditions of JCWP having the code PLR W60002119199: the Odra River from the estuary of the Warta River to the Western Odra River, is not anticipated. Works will be conducted outside of the direct area of the beds of the water courses, hence no worsening of the situation of the ecosystems depending on the water.

The structure “Modernization of Marwicki polder stage I and II” shall not have a direct impact on the water condition of the Odra River and the deterioration of the JCWP water condition of the Odra River from the Western Odra River to Parnica River is not expected. Works will be conducted outside of the direct area of the beds of the water courses, hence no worsening of the condition of the ecosystems depending on the waters.

Groundwater

The impact generated by the structure “Chlewice-Porzecze. Backwater embankment of Odra River at Myśla River” is local and covers the areas directly around the Chlewice Village. The impact is insignificant for JCWPd and GZWP.

The impact generated by the structure “Modernization of Marwicki polder stage I and II” may cause local changes in the exchange of water between the river bed and the land side of the embankment (only within the area of the modernised embankment). However, the impact is insignificant for JCWPd and GZWP.

Acoustic climate

The impact is of a similar nature for the whole Task. Construction works with the use of heavy equipment and other works that may generate excessive noise in acoustically

protected areas shall be conducted between 6:00 a.m. - 10:00 p.m. The impact is of a local and short term nature – limited only to the Task implementation stage.

Nature

In accordance with the findings of the studies conducted at the stage of issue of an Environmental Decision for the Task, it does not cause severe negative impact on the Natura 2000 sites. Severe impacts on other components of the environment such as natural habitats, species of plants and animals are not anticipated. The construction works cover linear structures and do not result in any significant transformation of flora or any impact on the existing hydrographic conditions.

Cultural landscape and monuments

The conducted works within the whole scope of Contract shall not interfere directly with buildings and other structures listed in the commune register of historic monuments or/and register of historical monuments and therefore at the stage of implementation, or operation of the Task there is no severe negative impact on such structures.

Human health and safety

The Task does not generate substantial threats to human health or safety. They may occur only in the event of an emergency and other random event, such as: a fire, contamination spillage, discovery of unexploded shells, danger to unauthorised person's connected with the construction works (e.g. excavations, traffic of machines and vehicles), flood risk, hazards connected with contagious diseases, etc. EMP specifies relevant conditions in the scope of preventing such events and mitigation of their possible results.

Mitigation measures

Chapter 6 of EMP and the Appendix No 1 include a list of and describe mitigation measures aiming at limiting or elimination of negative impact on particular component of the environment. The listed mitigation measures include both the conditions specified in administrative decisions concerning environmental protection as well as the additional procedures concerning proper implementation of mitigation measures.

Environmental monitoring

Chapter 7 of the EMP and Appendix No 2 include a list of and describe monitoring measures referring to verification of proper performance of the planned mitigation measures as well as monitoring of environmental impact at the stage of Task preparation, implementation and operations. The listed monitoring measures include both the conditions specified in administrative decisions concerning environmental protection as well as the conditions specified at the stage of developing the EMP.

Public consultations

In Chapter 8, there are the results of public consultations connected with potential negative impacts on environmental and society. They refer to conducted consultations of EMF and public consultations of this EMP.

Organisational structure for implementation of the EMP

Due to the specified organisational conditions of the Task, included in the Project, the structure of supervision over the EMP implementation must be compliant with the regulations of Polish law, the World Bank requirements and the conditions of institutions responsible for the Project implementation. The implementation arrangements specified in EMP cover the operations of the following units:

- Odra-Vistula Flood Management Project Coordination Unit (PCU),
- Project Implementation Unit as a regional self-government agency (ZZMiUW in Szczecin),
- The Engineer,
- The Contractor.

A detailed list of tasks for particular units included in the above mentioned structure is provided in the Chapter 9, but in other parts of the EMP there are provisions concerning the responsibility of respective entities participating in the Task implementation.

EMP implementation schedule and reporting procedures

The Chapter 10 presents information on the EMP implementation schedule and reporting procedures.

Source materials

The basic source materials used for developing this EMP are listed in Chapter 11.

1 INTRODUCTION

1.1 ODRA-VISTULA FLOOD MANAGEMENT PROJECT

Ensuring and improving flood protection is one of the most important factors determining sustainable and stable social and economic development of regions and countries. Odra-Vistula Flood Management Project assumes the implementation of the most urgent tasks in the field of flood protection within selected parts of river basins of the two largest Polish rivers, the Vistula River and the Odra River (Fig. 1).

The Project includes 3 development components covering improvement of flood protection within: Lower and Middle Odra River (Component 1), Kłodzko Valley, mountain and highland part of the catchment area of the Nysa Kłodzka River (Component 2) and the Upper Vistula River (Component 3).

Component 1 includes various activities carried out within the vast section of the Odra River with total length of approx. 440 km (unregulated section of the Odra River).

All the work necessary for implementation was divided into three Subcomponents:

- 1A – Flood protection of areas in Zachodniopomorskie Voivodeship,
- 1B – Flood protection on the Middle and Lower Odra,
- 1C – Flood protection of Słubice city.

Component 2 will be implemented within Kłodzko Valley, which covers mountain and highland part of the catchment area of the Nysa Kłodzka River.

Two Subcomponents will be implemented within this Component:

- 2A - Active protection (covers the construction of four polders),
- 2B - Passive protection (covers flood protection of areas located along four main rivers of Kłodzko Valley).

The aim of the Component 3 – Flood Protection of the Upper Vistula is the implementation of measures aiming at limiting threats in flood risk management on selected areas, within gradual raise of flood safety in the catchment area of the Upper Vistula River.

Component 3 is divided into the following Sub-components:

- Subcomponent 3A – Flood protection of Upper Vistula towns and Kraków,
- Subcomponent 3B – Protection of Sandomierz and Tarnobrzeg,
- Subcomponent 3C – Passive and active protection in Raba Sub-basin,
- Subcomponent 3D – Passive and active protection in San basin.

Within the Project, two more Components will be implemented, which do not include construction activities:

- Component 4 – Institutional Strengthening and Enhanced Forecasting,
- Component 5 – Project Management and Studies.

Description of the Project is to be found in the Environmental and Social Management Framework published at the websites of the World Bank⁴ and the Odra-Vistula Flood Management Project Coordination Unit⁵. Detailed Project description is also presented in PAD document.⁶

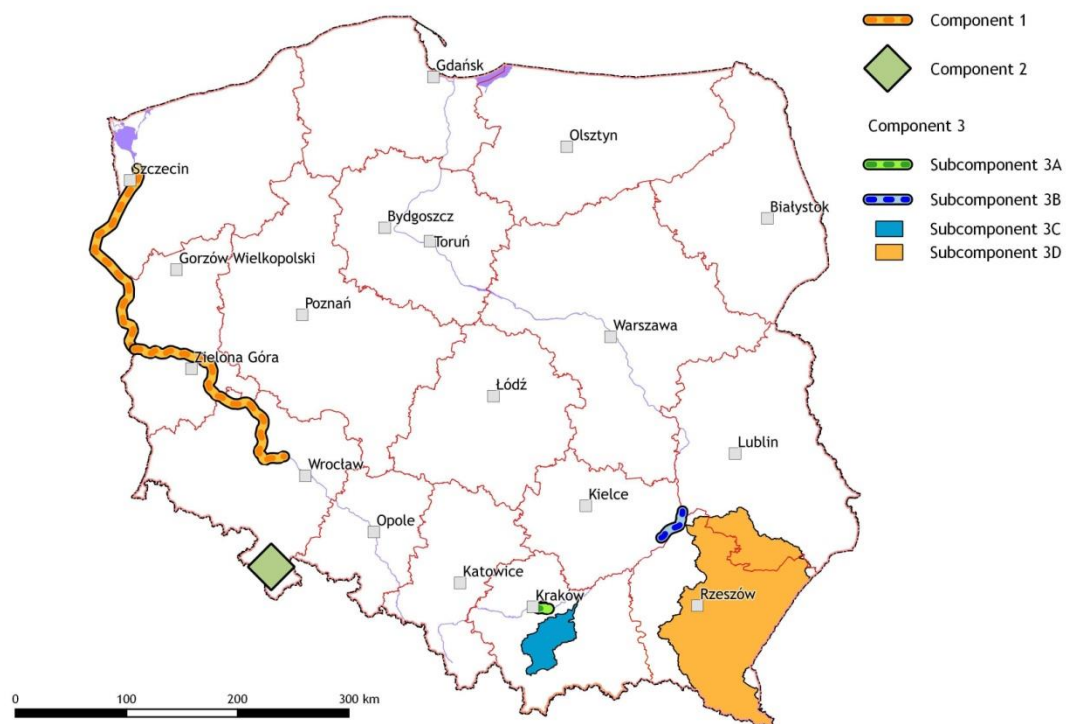


Fig.1 General location of work areas within the Project.

⁴ <http://documents.worldbank.org/curated/en/2015/04/24502899/poland-odra-vistula-flood-management-project-environmental-social-management-framework>

⁵http://www.odrapcu.pl/popdow_dokumenty.html

⁶ <http://documents.worldbank.org/curated/en/2015/07/24763021/poland-odra-vistula-flood-management-project>

2 TASK DESCRIPTION

This EMP relates to the Contract 1A.1 “Chlewice-Porzecze. Backwater embankment of Odra River at Myśla River and Modernization of Marwicki polder stage I and II”.

Zachodniopomorski Board of Amelioration and Hydraulic Structures in Szczecin, acting on behalf of Zachodniopomorskie Province, is the Project Implementation Unit (PIU) of the Task.

The Task includes construction and reconstruction of the flood embankments and involves the following structures:

Add 1). “Chlewice-Porzecze. Backwater embankment of Odra River at Myśla River” includes the implementation of the new flood embankment surrounding buildings in Chlewice Village. The structure's objective is flood protection of the Chlewice Village against high waters of the Odra River and backwaters of the Myśla River (the right-bank tributary of Odra River). The designed flood embankment comprises of two sections: with length of 1.008 km and 1.328 km.

Add 2). “Modernization of Marwicki polder stage I and II” includes the reconstruction of Marwice-Krajnik embankment at Odra Wschodnia River km 712+165-708+680 (3.485 km) and Gryfino-Mniszki embankment at Odra Wschodnia River km 720+966 - 718+850 (2.116 km). These embankments are located in the area of Gryfino and Widuchowa Communes and their purpose is protection against the flood of Marwice, Krajnik, Krzypnica, a part of Gryfino, Dolna Odra Power Plant.

2.1 LOCATION OF THE TASK

The “Chlewice-Porzecze; Backwater embankment of Odra River at Myśla River” structure shall be implemented within the meadows and farm land adjacent to Chlewice Village, within the Boleszkowice commune.

The “Modernization of Marwicki polder stage I and II” structure shall be implemented within the existing embankment of the Odra River (it included their reconstruction) as well as meadow and reed beds in the neighbourhood of the existing embankments, within the borders of Widuchowa Commune and Gryfino Municipality.

Location of the work areas is shown in the Fig. 2 and Fig. 3 below.

Environmental Management Plan for the Contract 1A.1 Chlewice-Porzece. Backwater embankment of Odra River at Myśla River and Modernization of Marwicki polder stage I and II

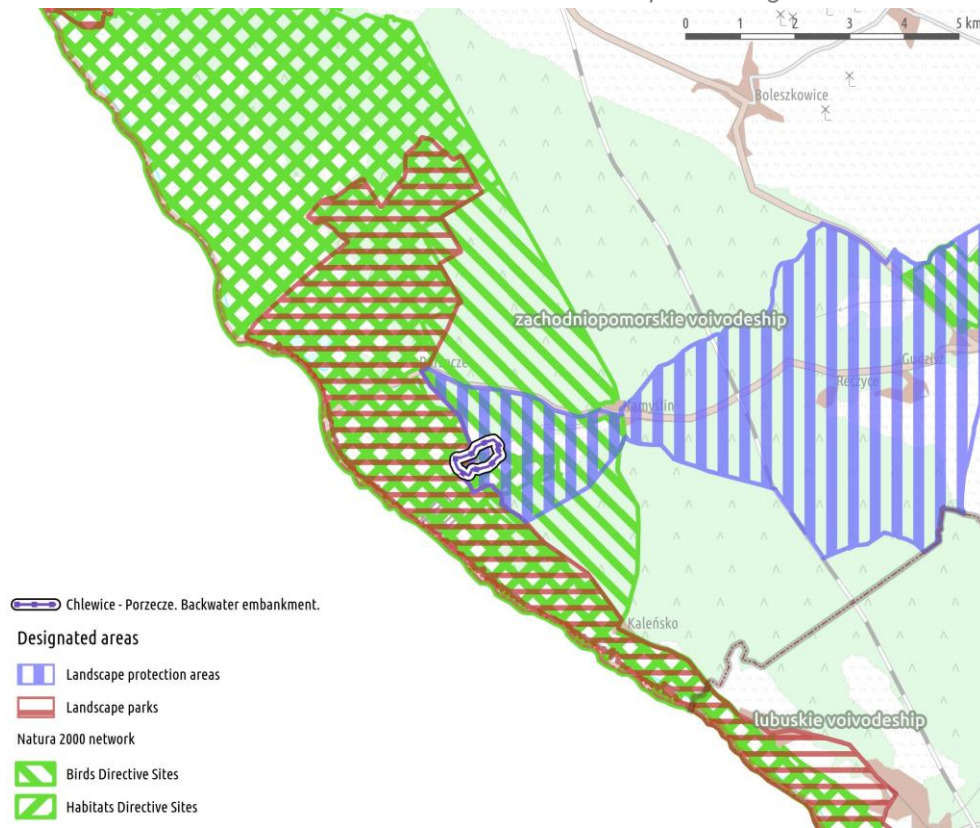


Fig. 2. General location of the construction sites within the Task

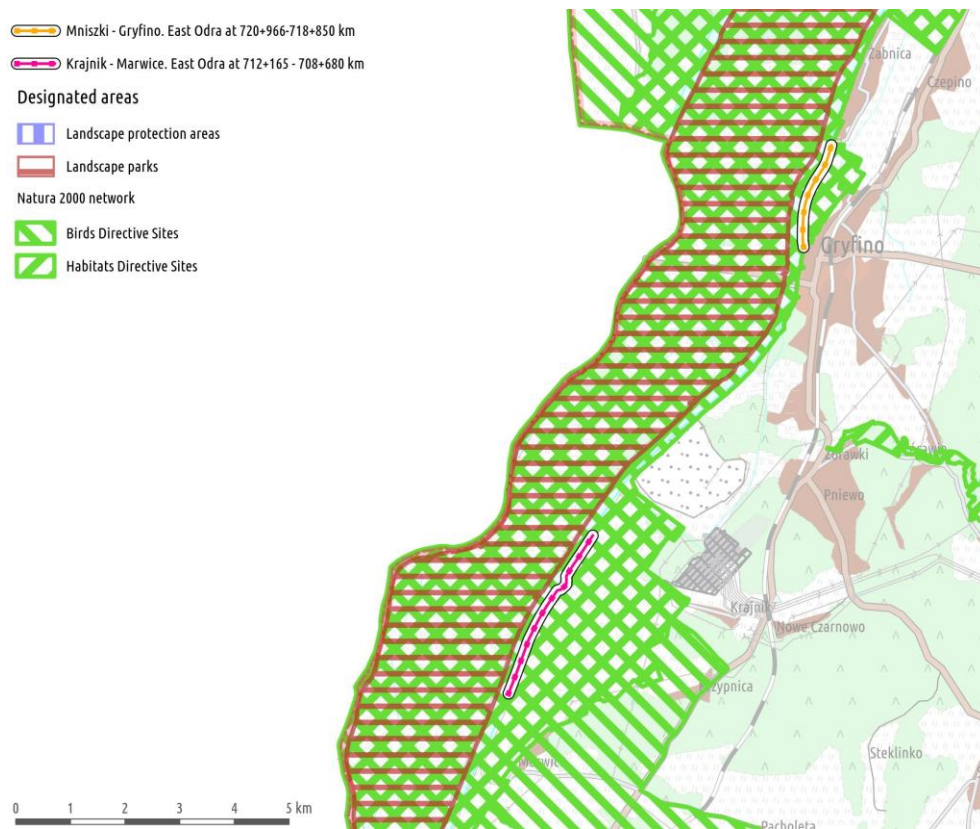


Fig. 3. General location of the construction sites within the Task

2.2 STRUCTURE “CHLEWICE-PORZECZE. BACKWATER EMBANKMENT OF ODRA RIVER AT MYŚLA RIVER”

The aim of this structure is to protect Chlewice Village against flood waters of the Odra River and backwater from the Myśla River. An embankment will be constructed around the developed area of the Chlewice Village. Currently this village has no flood-protection system and historically recorded high waters confirm real risk of flooding of buildings located in this village.

The new embankment will be divided into two sections. Section of the embankment on the south side of a county road running through Chlewice Village will be marked M (from Myśla River) is 1.008 km long. The embankment on northern side of a county road, marked O (from Odra River) is 1.328 km long. Necessity to limit excessive filtration through the embankment requires a provision of a dense barrier within embankment and its base. At the crossing points of the planned sections of embankments with the existing roads, 19 embankment crossings are proposed, including 5 within the routes of the communal roads. Within the profile of the county (powiat) road where it runs with the embankments M and O it is planned to provide a mobile barrier with the opening of 5.2 m and the height of 1.55 m. Compacted and formed banks shall be strengthened by plants by sowing a grass mix and subsequently providing it with a proper maintenance.

Location of particular elements of the structure is presented in the Appendix No 5 to EMP.

2.3 STRUCTURE “MODERNIZATION OF MARWICKI POLDER STAGE I AND II”

The main aim of the structure is to protect Marwice, Krajnik, Krzypnica and a part of Gryfino against flood, including the following industrial establishments located in their vicinity: Dolna Odra Power Plant (Elektrownia Dolna Odra), Gryfino Municipal Services Company (Przedsiębiorstwo Usług Komunalnych Gryfino), District Heating Company (Przedsiębiorstwo Energetyki Ciepłej) and Sewage Treatment Plant with the total protected area of 1500 ha. The structure comprises of the reconstruction of existing two embankments of the Eastern Odra River, sections of 3.485 km and 2.116 km.

Currently the embankment sections are of unsatisfactory technical conditions. The levels of the embankment crown are 0.4-0.5 m below the required height. The embankments are subject to subsidence due to soil and water conditions, the width of the crown as well as the fall of the slopes which have been also subject to significant deformation.

*Environmental Management Plan for the Contract 1A.1 Chlewice-Porzecze. Backwater
embankment of Odra River at Myśla River
and Modernization of Marwicki polder stage I and II*

Parameters of existing embankments differ from accepted standards for this type of constructions⁷ resulting in failure to ensure proper safety levels to areas located at downstream face of an embankment during the periods of extreme floods.

Rebuilt embankment's sections will be properly formed using soil and compacted. The bodies of the embankments shall be sealed with a barrier made by deep mixing method with the use of hardening slurry. The road with a width of 3 m and surface made of crushed-stone aggregate, running along the embankment shall also be repaired.

⁷ Regulation of the Minister of Environment of 20thApril 2007 (Journal of Laws, No 86/2007, item 579) on the technical conditions to be met by the water management construction works and the location thereof.

3 INSTITUTIONAL, LEGAL AND ADMINISTRATIVE CONDITIONS

3.1 INSTITUTIONS ENGAGED INTO THE TASK IMPLEMENTATION

Investor of the Task is Zachodniopomorskie Province represented by the Zachodniopomorski Board of Amelioration and Hydraulic Structures in Szczecin. In addition, at the stage of construction and operation, its implementation may require the involvement of public administration bodies at the central, regional and local level. For the day-to-day coordination of implementation of the Project by PIU, the Odra-Vistula Flood Management Project Coordination Unit has been established.

3.2 APPLICABLE NATIONAL LEGISLATION CONCERNING THE ENVIRONMENTAL PROTECTION

Pursuant to the Polish law, an development process within the scope of the environment is governed by the a dozen or so of acts. A list of the selected and fundamental applicable legal acts concerning the environmental protection is presented in Appendix No 3 to the EMP. The number of acts and their contents, listed in Appendix No 3, may change with changes in Polish legislation for environmental protection. Apart from applying the rules specified in this EMP, the Contractor shall also apply current provisions of law within environmental protection.

3.3 EIA PROCEDURE IN POLAND

A description of the Environmental Impact Assessment in the Polish legislation is contained in the Environmental and Social Management Framework published at the websites of the World Bank⁸ and the Odra-Vistula Flood Management Project Coordination Unit⁹.

3.4 WORLD BANK REQUIREMENTS

The Task under consideration will be co-financed by the World Bank. Therefore, its implementation conditions concerning the environmental protection must be consistent with the following policies of the World Bank:

- OP 4.01 – Environmental Impact Assessment,
- OP 4.04 – Natural Habitats,

⁸ <http://documents.worldbank.org/curated/en/2015/04/24502899/poland-odra-vistula-flood-management-project-environmental-social-management-framework>

⁹ http://www.odrapcu.pl/popdow_dokumenty.html

- OP/BP 4.11 – Physical Cultural Resources.

Details of policies are included in Environmental and Social Management Framework – for the Odra-Vistula Flood Management Project published among others on the website of the World Bank¹⁰ and the Odra-Vistula Flood Management Project Coordination Unit¹¹.

3.5 CURRENT STATE OF EIA PROCEDURE FOR THE TASK

3.5.1 STRUCTURE “CHLEWICE-PORZECZE. BACKWATER EMBANKMENT OF ODRA RIVER AT MYŚLA RIVER”

The structure is classified as group II project which is most likely to significantly impact on the environment (if adequate mitigation measures are not possible to implement or are ineffective) in accordance with the classification of the Regulation of the Council of Ministers of 9th November 2010 on projects that may have significant impact on the environment. Pursuant to the decision of the RDOŚ in Szczecin of 5th August, 2011 (case number WOOS-TŚ.4233.7.2011.DK5), as part of the proceedings concerning the issue of the Environmental Decision, Environmental Impact Assessment was carried out. It was completed and the Environmental Decision was issued on 27th February 2012.

As part of the proceedings concerning the issue of a decision on environmental conditions it was stated that there was a necessity to develop Environmental Impact Assessment, but according to the Implementation Decision, there was no obligation to once more develop EIA.

Furthermore, for the purpose of the construction of the structure the following administrative decisions were obtained:

- Decision of the Regional Director for Environmental Protection in Szczecin of 30th October 2012, No. 23/2012 setting out the environmental conditions for works implementation for the structure: “Chlewice-Porzecze. Backwater embankment of Odra River at Myśla River”
- Decision of the Regional Director for Environmental Protection in Szczecin of 27th February 2012, No. 8/2012 on environmental conditions for the structure: “Chlewice-Porzecze. Backwater embankment of Odra River at Myśla River”,
- Decision of the Regional Director for Environmental Protection in Szczecin of 3th Decembre 2015 approving intentional scaring away and disturbing *Passer domesticus*, *Passer montanus*, *Certhia brahcydactula*, *Fringilla coelebs*, *Carduelis carduelis* and *Carduelis chlorus* in their breeding

<http://documents.worldbank.org/curated/en/2015/04/24502899/poland-odra-vistula-flood-management-project-environmental-social-management-framework>

¹¹ http://www.odrapcu.pl/popdow_dokumenty.html

season, in the localisation of breeding and young species raising, in connection with the implementation of the Project named: "Flood Embankment – Chlewice – Porzecze – backwater embankment of the Odra River at the Myśla River".

Copies of the above decisions are provided in the Appendix No 4 to this EMP.

3.5.2 STRUCTURE "MODERNIZATION OF MARWICKI POLDER STAGE I AND II "

The structure is classified as group II project which is most likely to significantly impact on the environment (if adequate mitigation measures are not possible to implement or are ineffective) in accordance with the classification of the Regulation of the Council of Ministers of 9th November 2010 on tasks that may have significant impact on the environment. Pursuant to the decision of RDOS in Szczecin of 27th August 2013 (case number WOOŚ-TŚ.4233.1.2013.DK.20), as part of the proceedings concerning the issue of the Environmental Decision, there was no obligation to develop Environmental Impact Assessment.

Due to insignificant interference in the environment there was no obligation to develop Environmental Impact Assessment, for the same reasons obligation to carry out EIA at the stage of issue of Implementation Decision has been lifted.

Furthermore, for the purposes of the construction of the structure the following administrative decisions were obtained:

- Decision of the Regional Director for Environmental Protection in Szczecin of 29th October 2013, No. 44/2013 establishing environmental conditions for works implementation for the structure: "Rebuilding of flood embankments along the Odra River within the area of Gryfin county (powiat)",
- Decision of the Regional Director for Environmental Protection in Szczecin of 27th August 2013, No 11/2013 on environmental conditions for the structure: "Rebuilding of flood embankments along the Odra River within the area of Gryfin county (powiat)",
- Decision of the Regional Director for Environmental Protection in Szczecin of 15th April 2016 approving departures from the prohibitions concerning the bird species under protection, i.e. purposeful destruction of two nests and natural habitats of a magpie *Pica pica*, located on the plot No 291, Gryfino I district, Gryfino Commune, in connection with the implementation of the Project named: "Reconstruction of flood embankments along the Odra River within the section from km 708+680 to km 726+231".

Copies of the above decisions are provided in the Appendix No 4 to this EMP.

4 DESCRIPTION OF THE ENVIRONMENTAL ELEMENTS

4.1 LAND AND LANDSCAPE

4.1.1 STRUCTURE “CHLEWICE-PORZECZE. BACKWATER EMBANKMENT OF ODRA RIVER AT MYŚLA RIVER”

Construction site and its direct surroundings cover estuary area of the Myśla River, which enters the Odra River near Chlewice Village (629.4 km of the Odra River course). According to physico-geographical regionalization the structure is being implemented in the area of Toruńsko-Eberswaldzka glacial stream valley (*pradolina*), of Kotlina Freienwald Brook (Kondracki 2004).

In case of a section of the Odra River Valley where new embankment will be constructed, we can identify two different site levels: fluvial flood terrace and fluvial terrace above flood level. The lower flood terrace is not very diverse. It raises approximately 2.5 m above the river level, it is inclined southwards - towards the valley of the Myśla River as well as south-west to the valley of the Odra River. Levels vary from 12 meters a.s.l. to the north of developed area of the Chlewice Village to 9 meters a.s.l. in direct vicinity of the area of the Odra River bed. Higher level of flood terrace is built of sands and fluvio-glacial gravels as well as alluvial deposits, it is diversified by aeolian sands. Dunes, which are overgrown with coniferous forest and mixed forest, are located to the north of the developed area of the Chlewice Village.

Due to the close vicinity of the Odra River bed, the landscape of estuary area of the Myśla River (backwater area) is being shaped by flow of freshet waters.

Anthropogenic modifications in this area are mainly surficial and they include developed areas, farmlands, land drainage canals, roads and mounds. Due to regulation of the river bed of the Odra River and location of weirs and hydroelectric power plants in the Myśla River (Barnowko, Dargomyśl, Chwarszczany, Gudzisz, Ręczyce and Namyślin) hydrographic conditions of these river valleys have been significantly transformed.

Moreover, the close vicinity of Chlewice aggregate mine (approx. 1 km away from southern border of built-up area) result in significant transformation of both area and landscape, and hydrographic conditions have been violated. The locations of the elements of the facilities imposed on the orthophoto map are presented in the Appendix No 5 to the EMP.

4.1.2 STRUCTURE “MODERNIZATION OF MARWICKI POLDER STAGE I AND II”

The construction site is located in the Miedzyodrze area, within the area of the East Odra River, in the Marwice - Krajnik section. It is the Lower Odra River region - a mesoregion area of Szczecin coastal region (Kondracki 2004).

Directly in this section of Odra River Valley where the works will be carried out, western part of the valley has high natural and landscape potential. Landscape is diversified by the numerous river lakes such as Szerokie Lake and Leniwe Lake. On the eastern side

of the Odra River, its oxbow lake runs parallel along the present river bed. It is cut off from the river bed of the Odra River by flood embankments. In the north it is connected to the Odra River bed by Krajnik pumping station. Riverside line is diverse, covered with rushes and with river bed overgrown with aquatic vegetation. The locations of the elements of the structure imposed on the orthophoto map are presented in the Appendix No 5 to the EMP.

4.2 CLIMATE

The area of implementation of both structures is located in the climate zone of moderate geographical latitude, of transitional climate model. It is mostly influenced by polar-sea air masses.

The region, in which the Task is located, has an average annual air temperature of approx. 8°C. Vegetation period in this area lasts for over 220 days. The most frequent wind directions of that region are western and south-western.

4.3 AIR QUALITY

The most important sources of pollution in the area of proposed Task implementation are the following:

- air quality especially in densely developed area shows high concentration of gas and dust as well as impeded ventilation which is the result of emission of gas and dust from domestic heating (emission of sulphur oxide), boiler rooms that serve as the heat source and Dolna Odra Power Plant;
- air pollution originating from Germany, especially north-east Germany due to high industrialisation of the region as well as western wind direction which is prevailing in the area under discussion;
- pollutant emissions related to road traffic and agricultural equipment.

4.4 SOIL AND LAND

4.4.1 STRUCTURE “CHLEWICE-PORZECZE. BACKWATER EMBANKMENT OF ODRA RIVER AT MYŚLA RIVER”

In the Valley of the Odra River there are alluvial soils and so called fluvial muds. They cover mainly lower flood terraces made of sands and river gravels. In the area depressions with hindered outflow peat soil, silty soil and marshy soil have developed. The area of flood basins and backwaters is dominated by heavy silty muds. These are typical alluvial soils. Medium muds, sand-clay made up of interbedded deposits of sand, peat, constitute typical habitat of riparian forests.

In overbank area there are mainly light, sandy muds, which constitute potential habitat of willow-poplar forests.

In the area of project implementation we can distinguish the following:

- anthropogenic grounds: banks, urban areas, roads;
- silty clays, sandy clays, mainly soft plastic and plastic;
- organic soil, swampy or river flood facies - these are aggregate muds and peats, with well-decomposed plant substance;
- all the layers of organic and alluvial soil, in terms of geotechnical properties, are to be classified as weak soil.

4.4.2 STRUCTURE “MODERNIZATION OF MARWICKI POLDER STAGE I AND II”

The section of valley of the Odra River within the area of works is dominated by organic and alluvial soil. These are river and swamp accumulation deposits. A short peat bog with typical organic soils forms Western fragment (beyond the actual work site). River sands occur in the substratum. Alluvial and organic soil in the eastern part have been transformed as a result of melioration.

Existing embankments are mainly made of local, sandy deposits. These are fine sands with high content of humus. Thickness of anthropogenic ground corresponds to the height of banks.

4.5 SURFACE WATER

4.5.1 STRUCTURE “CHLEWICE-PORZECZE. BACKWATER EMBANKMENT OF ODRA RIVER AT MYŚLA RIVER”

The structure is located within the area of estuary section of the Myśla River.

The Odra River in the section adjacent to the proposed area of works belongs to JCWP under the name of “The Odra River from the Warta River estuary to the Western Odra River”. It is designated as having heavily modified water body. It is included in type 21 (great lowland river). Water condition in 2010 in terms of biological elements was classified as Class II (good potential). In terms of physicochemical elements potential it still remains less than good and ecological potential was rated as Class III (moderate potential) with final assessments as bad water condition (assessment of water condition in Zachodniopomorskie Province, 2010). Catchment area of the Odra River and the Myśla River (at the estuary) amounts to 109 460 sq km.

The Myśla River belongs to JCWP and is entitled “The Myśla River from the Myśliborskie Lake to the estuary.” It is designated as having heavily modified water body. It is included in the abiotic type 20 – lowland gravel-bedded river with young- and old-glacial areas. Catchment area amounts to 1334 sq km. Water level in 2011 in terms of biological elements was classified as class II (good potential) and in 2013 it was classified as class III (moderate potential). In terms of physicochemical elements potential in 2011 the Myśla River was assessed as less than good, in 2013 it was classified as class II (good potential). In 2011 and 2013 in terms of ecological potential it was classified as class III – moderate potential, water condition is bad (assessment of water condition in Zachodniopomorskie Province, 2011, information about environmental status in Myślibórz County, VIEP 2014). The Myśla River has been designated as having

significantly modified water body, therefore while analysing hydro-morphological elements it has been assumed, in accordance with guidelines of the General Inspectorate for Environmental Protection as well as Regulation of the Minister of Environment, that in case of significantly modified water body hydro-morphological conditions will be classified as Class II. Potential of analysed JCWP has been graded as bad (VIEP 2014).

Estuary sections of lowland gravel-bedded rivers, like the analysed section of the Myśla River, often show typical properties of fish territories of *Abramis brama*, so they differ significantly from conditions in most of greater rivers, where they flow into (in this case - the Odra River). Places where tributaries connect to the greater lowland river constitute particularly diverse and valuable natural habitats, because apart from typical forms for the greater river valley, like flooded area, oxbow lakes, ponds and side arms, there are also more lotic habitats with diverse bed and alternating velocity of the current.

4.5.2 STRUCTURE “MODERNIZATION OF MARWICKI POLDER STAGE I AND II”

This structure is situated within the Eastern Odra River area (km 720+935 – 708+862 of the Odra River), between Marwice and Krajnik, on its right bank, above the mouth of the Marwicki Canal.

The section of the Odra River under development is located from the Western Odra River until Parnica River, classified under the abiotic type 21 - a large lowland river. The JCWP has been indicated as strongly developed waters.

The JCWP's condition is assessed as bad.

The Odra River in that section has been indicated to include strongly modified waters, therefore the evaluation of the hydromorphological components has been performed under the assumption that in the case of strongly modified waters for the evaluation of the hydromorphological conditions class II shall be applied pursuant to the guidelines of Inspection for Environmental Protection and the Regulation of the Minister of Environment.

4.6 GROUNDWATER

4.6.1 STRUCTURE “CHLEWICE-PORZECZE. BACKWATER EMBANKMENT OF ODRA RIVER AT MYŚLA RIVER”

According to the hydrological regional division of Poland, the area under examination is located in the Wielkopolska region, in the stream valley of Toruń and Eberswald.

The groundwater level depends on the alluvial water flow within the valley and corresponds to the river water level. The groundwater deposits are located near the area surface, therefore there are many swampy and periodically wetland areas present. The groundwater outflow is compliant with the gradient, towards the riverbed. Due to the lack of insulating layer, the groundwater is exposed to pollution from point sources and surface sources. Due to the presence of organic soils (turf) within the Myśla River valleys, the groundwater may be enriched with organic material.

There are no protected resources of groundwater present within the area of the structure. The border of GZWP Dębno no. 134 is 10 km away.

4.6.2 STRUCTURE “MODERNIZATION OF MARWICKI POLDER STAGE I AND II”

According to the hydrological regional division of Poland, the area under examination is located in the Szczecin region (the Lower Odra River and the Szczeciński Lagoon Region), and the structure itself is located within a uniform groundwater no. 4 region with good quantitative and qualitative condition¹².

The groundwater deposits are located near the area surface, depend on the alluvial water flow within the valley and correspond strictly to the river water levels. The groundwater reservoirs are present 0.0 m to -0.2 m above sea level.

There are no protected resources of groundwater present within the area of the structure. The border of GZWP Szczecin Buried Valley no. 122 is approximately 10 km away.

4.7 ACOUSTIC CLIMATE

4.7.1 STRUCTURE “CHLEWICE-PORZECZE. BACKWATER EMBANKMENT OF ODRA RIVER AT MYŚLA RIVER”

There is no significant noise-generating source within the planned structure. The Chlewice Village is located rather far from the important communication roads:

- railway no. 273 – is approx. 4.9 km away from the Chlewice developed areas;
- regional road no. 127 – is approx. 2.7 km away from the Chlewice developed areas;
- national road no. 31 – is approx. 9 km away from the Chlewice developed areas.

The main noise sources in the Chlewice Village are the agricultural works and the village life itself. These sources are short-term and are not bound with any significant impact on the environment or the population.

4.7.2 STRUCTURE “MODERNIZATION OF MARWICKI POLDER STAGE I AND II”

The area to be developed with the flood protection improvement structures varies in terms of noise sources. The Krajnik – Marwice section of the embankment as well the pump station border the Dolna Odra Power Plant Complex in the Krajnik region, covering also an ash pond. The location of these power infrastructure facilities definitely affects the acoustic climate. Therefore a number of modernization works were performed in the years 2004-2010, including activities limiting the noise emission.

¹² <http://geoportal.kzgw.gov.pl/imap/>

The section of the southern Mniszki – Gryfino embankment starts at Targowa St. in Gryfino City. There are next to the river banks repair base, port wharf and warehouses. Pursuant to the commune plans, those facilities shall be maintained. The operation of port infrastructure and warehouses causes noise emissions during their business hours; however, they are located on areas separated from the existing housing infrastructure.

The remaining sections of the embankment to be modernized border green areas, partly forested. Within the Mniszki and Marwice villages there are loose smallholdings and agricultural buildings. Nevertheless, they are not important noise sources – their impact on the acoustic climate is a result of the village life and agricultural works performed there.

4.8 NATURE

4.8.1 PROTECTED NATURAL HABITATS AND PROTECTED SPECIES OF PLANTS, FUNGI AND ANIMALS

4.8.1.1 STRUCTURE “CHLEWICE-PORZECZE. BACKWATER EMBANKMENT OF ODRA RIVER AT MYŚLA RIVER”

NATURAL HABITAT

There are arable lands around Chlewice Village, where the new section of the flood embankment is to be developed, as well as various green areas forming under conditions of high groundwater levels as well as upon seasonal flood of the surface waters.

Wet meadows and rushes cover large lands between Chlewice and Porzecze, including large areas on a floodplain terrace of Odra River located north from the mouth of Myśla River and at the Myśla River below Chlewice Village.

Floodplain grassland communities grow along Myśla River (communities corresponding to lowland and mountain extensive use meadows 6510¹³).

Communities of meadow foxtail corresponding to lowland and mountain habitats of extensive use meadows 6510 (*Arrhenatherion elatioris*) are growing west of Chlewice Village as well as between Chlewice and Porzecze. However, the construction of the embankments does not collide with the occurrence of valuable natural habitats.

FLORA

Within the flooding areas of the Myśla River there also grows small fleabane *Pulicaria vulgaris* which is a rare species in the scale of the whole Poland and endangered one in

¹³ all habitats listed in Annex I of Habitats Directive have their unique codes thus habitats can not be mistaken regardless of their names in different countries (Council Directive 92/43/EEC of May 1992 on the conservation of natural habitats and of wild fauna and flora)

the Pomorze. Currently the meadow communities with mouse garlic *Allium angulosum* are also often flooded. However, the positions of these plants are located outside of the direct ground and construction works planned within the structure.

FAUNA

The direct works construction area is characterized with moderate fauna values due to the fact, that the embankment is being developed in close vicinity of a build-up area. The southern section of the embankment is located near the Myśla riverbed, and is surrounded with more valuable areas, affected by the river water.

In the area of the structure implementation and its direct surrounding, there are following protected animals:

1. bird species:

- white stork *Ciconia ciconia* – 12 nests within the area of Chlewice,
- black stork *Ciconia nigra* – feeding ground in the structure surroundings,
- western marsh harrier *Circus aeruginosus* – meadows and rushes surrounding the structure implementation site,
- white-tailed eagle *Haliaeetus albicilla* – feeding ground in the structure surroundings,
- spotted crane *Porzana porzana* – breeding sites in the structure surroundings,
- corn crane *Crex crex* – quite numerous species present on wet meadows around Chlewice,
- common tern *Sterna hirundo* – a colony of 20-25 breeding pairs within the gravel pit located south of the structure implementation area,
- little tern *Sterna albifrons* – a colony of approx. 25 breeding pairs within the gravel pit located south of the structure implementation area,
- common grasshopper warbler *Locustella naevia* – meadows surrounding the structure,
- riverbank warbler *Locustella fluviatilis* – meadows surrounding the structure,
- meadow pipit *Anthus pratensis* – meadows surrounding the structure,

And other species of animals:

- green snaketail *Ophiogomphus cecilia*,
- lilypad whiteface *Leucorrhinia caudalis*
- common frog *Rana temporaria*,

- moor frog *Rana arvalis*,
- european green toad *Pseudepidalea viridis*,
- european fire-bellied toad *Bombina bombina*,
- european beaver *Castor fiber*.

Due to the migratory nature of the animal species, they may temporarily stay in the works implementation site. However, the construction of the embankments does not result in direct collision with the nesting places of birds or key animal sanctuaries (for instance amphibians breeding places).

4.8.1.2 STRUCTURE “MODERNIZATION OF MARWICKI POLDER STAGE I AND II”

NATURAL HABITATS

The vegetation of the structure area and its surroundings is characteristic for the lower Odra River section, with dominating various rushes communities, sedges and turf. In the nearest proximity to the embankment willow communities occur. Along the embankment there are eutrophic reed rushes as well as pastures on the landside of the embankment, corresponding to lowland and mountain extensive use meadows (*Arrhenatherion elatioris*) 6510. Works implemented within the structure are limited to the area of the existing embankments and a narrow zone directly adjacent to them, and they do not cause a conflict with the patches of valuable natural habitats.

FLORA

Next to the embankment, the protected species of wild celery has its habitat. Plants are located on the edge of the construction site.

FAUNA

The structure is surrounded by highly valuable regions in terms of fauna, mostly due to the presence of large areas of wet, swampy and aquatic habitats with a diversified riverbank.

The following rare or protected animal species, among others, have been noted within the structure implementation area and around it: white-tailed eagle, eurasian sparrowhawk, grey heron. No other valuable species of birds have been noted in the direct vicinity or the structure implementation site.

4.8.2 PROTECTED AREAS

4.8.2.1 STRUCTURE “CHLEWICE-PORZECZE. BACKWATER EMBANKMENT OF ODRA RIVER AT MYŚLA RIVER”

Special Protection Area under Natura 2000 Lower Odra River Valley PLB320003

The Area covers the Odra River Valley between Kostrzyn and the Szczeciński Lagoon (length of ca 150 km) with the Lake Dąbie.

The Natura 2000 site is a bird refuge on European level. At least 43 bird species listed in Annex I to the Bird Directive and 14 species listed in the Polish Red Book are present there. It is an extremely important area, in particular for water and wetland birds during their breeding, migrating and wintering.

At least 1% of the national population of the following birds is staying within the Area during their breeding period, these are: bittern, Montagu's harrier and graylag goose; as well as relatively high populations of: black tern, red-backed shrike and vacuole. At least 1% of the population of the following bird species is present in the area during the migration period: bean and greater white-fronted geese; as well as relatively high populations of: whooper swan, great crested grebe, gadwall, northern lapwing and golden plover; the autumn common crane staging amounts to several thousand birds. During winter the great crested grebe has a high density of population.

The area has a very significant role in the system of areas for special protection of birds, ensuring proper habitats for breeding birds as well as migrating birds and birds wintering in the area of the Odra River Valley.

The structure as a whole is located within the Area (the location of the elements of the structure as compared with protected areas is presented in the Appendix No 6 to this EMP).

Site of Community Importance Lower Odra River PLH320037¹⁴

The Odra River Valley (with the two main canals of: the Eastern Odra River and the Western Odra River), spreading over 90 km, provides a mosaic covering: wetlands with peat bogs and alluvial meadows flooded during spring, alder forests and riparian forests, oxbow lakes, multiple side arms and isles. Natural alluvial territories constitute a significant share thereof. The SCI covers also a fragment of the Odra River Valley edge area with xerothermic grasslands and forests. The areas surrounding SCI are used for agricultural purposes. The meadow and pasturage management takes place over a small part of the area. On the site there are well preserved habitats, including 21 types of habitats listed in Annex I to the Council Directive 92/43/EEG. Multiple rare and endangered species of animals, including 17 species listed in Annex II to the Council Directive 92/43/EEG. The Międzyodrze area, namely a turf isle located between the Eastern Odra River and the Western Odra River constitutes the largest fluvial mud with up to 10 m deep volume crossed with a system of canals, oxbow lakes, ditches and pools with the total length of approx. 200 km. A specific flora developed in these conditions and under strictly limited management. Well preserved habitats provide shelter as well as wintering and feeding places for many rare and endangered species. Among other plants floating fern *Salvinia natans* and fringed water-lily *Nymphoides peltata* (endangered species in Poland) are found in channels of Międzyodrze.

¹⁴ Special Area of Conservation of Natural Habitat Natura 2000 - the name Community Interest Site functions in the absence of a national legislative act establishing the Natura 2000 Special Areas of Conservation

The structure is partially located within the boundaries of the Protected Area (the location of the structure implementation sites in relation to the protected areas is presented in the Appendix No 6 to this EMP).

Estuary of the Warta River Landscape Park

The area was created in 1996 covers 20 532.46 ha. The landscape of the Park is dominated by extensive meadows, pastures, while tree-covered areas occupy significantly smaller place. An extensive network of channels and drainage canals constitutes a significant element of the Landscape Park, establishing important part of its assets. The Park covers fragments of the Odra River Valley south and north of the estuary of the Warta River and a few-kilometer-long estuary section of the Warta River. The area is significant, first of all, for water and wetland birds. The vast open territory of the Odra River and Warta River Valley is also important area for breeding of avifauna, and those birds that migrate and are wintering within it.

In 2001 a part of the Landscape Park was used to create National Park of the Warta River Estuary whose area was then excluded from the Landscape Park. Therefore, currently Landscape Park has also a function of the buffer zone for the area of the National Park.

The structure is partially located within the boundaries of the Protected Area (the location of the structure area as compared to the protected areas is presented in the Appendix No 6 to this EMP).

4.8.2.2 STRUCTURE "MODERNIZATION OF MARWICKI POLDER STAGE I AND II"

Special Protection Area under Natura 2000 Lower Odra River Valley PLB320003

The assets of the Area are described in Chapter 4.8.2.1. The structure as a whole is located within the boundaries of the Area (the location of the structure area as compared to the protected areas is presented in the Appendix No 6 to this EMP).

Site of Community Importance Lower Odra River PLH320037

The assets of the Area are described in Chapter 4.8.2.1. The structure as a whole is located within the boundaries of the Area (the location of the structure area as compared to the protected areas is presented in the Appendix No 6 to this EMP).

Lower Odra River Valley Landscape Park

Landscape Park was created in 1993 within the area of 6009 ha. The Park additionally has a buffer zone covering 1140 ha. The area was established in order to protect unique nature, landscape and culture assets of the fragment of the Odra River Valley, with the assumption of implementing the rules of sustainable development there. Within the Park varied water and wet lands ecosystems dominate such as: river and channel beds, oxbow lakes, peats and wet meadows. The Park protects a unique in Europe area within the valley of a big low land river with high level of neutrality. In total there are 427 plant

species in the Park, including species that are endangered and threatened by extinction in the Pomorze Zachodnie (Żukowski and Jackowiak 1995).

The structure as a whole is located outside of the borders of the Landscape Park within about 70-100 m from its eastern border (the location of the structure area as compared to the protected areas is presented in the Appendix No 6 to this EMP).

Dębno-Gorzów Landscape Protected Area

The area was created in order to protect nature and landscape assets of the Gorzowska Plain with right tributary of the Odra River, the valleys of Kosa and Myśla Rivers. Within the Protected Area there are numerous small and bigger lakes and raised bogs. In this area there appear rare natural habitats and fauna. The whole area covers 10 088.66 ha.

4.9 CULTURAL LANDSCAPE AND MONUMENTS

4.9.1 STRUCTURE “CHLEWICE-PORZECZE. BACKWATER EMBANKMENT OF Odra RIVER AT MYŚLA RIVER”

The Chlewice Village has spatial arrangement and its streets and squares reflect the fact, that the village was founded in the Middle Ages. However, the military operations at the end of the World War II related with the attack on Berlin caused significant destruction both in buildings and the area of Chlewice Village. Despite the war destructive impact, the spatial arrangement of the village has been maintained - smallholding buildings concentrated along the roads with houses located near the roads and the utility buildings placed at the back of the plot.

Several types of protected structures or requiring particular attention for their historical and cultural value may be listed in that area, i.e.:

- fire-fighter's house made of a crush stone, covered with a gable roof from the 2nd half of the 19th century (entered into the historical monuments' register of the commune);
- the area of the former Evangelic cemetery (entered into the historical monuments' register of the commune);
- the ruins of the church destroyed in 1945 in form of the foundations;
- the ruins of the old smallholding buildings;
- the ruins of traditional houses.

The structures left without any legal form of protection of historical monuments are often subject to uncontrollable transformations destroying their original form or devastating their cultural value.

In addition, multiple archaeological sites are located within the village (zone W.III):

- Chlewice, site no. 1 (AZP: 46-05/1);

- Chlewice, site no. 2 (AZP: 46-05/2);
- Chlewice, site no. 3 (AZP: 46-05/3);
- Chlewice, site no. 4 (AZP: 46-05/4);
- Chlewice, site no. 5 (AZP: 46-05/5).

None of the sites mentioned above interferes with the planned structure.

However, it may happen that during the excavation some artefacts or historic structures, as well as archaeological sites will be discovered.

4.9.2 STRUCTURE “MODERNIZATION OF MARWICKI POLDER STAGE I AND II”

Within the area closely surrounding the planned structure no objects are subject to preservation. Also with respect to the existing tangible assets there is no need to expropriate current owners and perpetual users or to disassemble the existing structures. The landscape is dominated with green areas – meadows and pastures with small concentrations of trees and bushes. Such cultural landscape is typical for the German culture – the human settlements are in form of a compact and high-density housing (also in the village). In addition, the polder system of the so-called Przełom Odra River (German: Oderbruch) has been operating since the 2nd half of the 19th century and has become a part of the spatial development in the region. There is one historic structure (not listed in local registry of monuments) near the Site, at Targowa Street in Gryfin, by the embankment access road. the structure is an old de-commissioned building of the Waste Water Treatment Plant.

The planned structure does not interfere with the evidenced archaeological sites. However, it may happen that during the excavation some artefacts or historic structures, as well as archaeological sites will be discovered.

4.10 POPULATION

4.10.1 STRUCTURE “CHLEWICE-PORZECZE. BACKWATER EMBANKMENT OF ODRA RIVER AT MYŚLA RIVER”

The structure within the flood protection of the Chlewice Village from the Odra River waters and from the backwater of the Myśla River is located within the territory of Boleszkowice commune, Myślaborz local administration unit (powiat). The structure is located approx. 20-160 m from Chlewice Village. The planned backwater embankment is supposed to protect Chlewice Village, with 77 residents, from flooding (Central Statistical Office of Poland 2015).

4.10.2 STRUCTURE “MODERNIZATION OF MARWICKI POLDER STAGE I AND II”

The main objective of the modernization of the Marwicki polder is flood protection of the towns and villages: Marwice, Krajnik, Krzypnica and part of the town of Gryfino along with the industrial plants, including: Dolna Odra Power Plant, Municipal Service Office in Gryfino (Przedsiębiorstwo Usług Komunalnych Gryfino), County Heating Company (Przedsiębiorstwo Energetyki Ciepłej) and a Sewage Treatment Plant with a total area

*Environmental Management Plan for the Contract 1A.1 Chlewice-Porzecze. Backwater
embankment of Odra River at Myśla River
and Modernization of Marwicki polder stage I and II*

surface of 1,500 ha. These places have the following number of residents: Marwice (Widuchowa commune) – approx. 200 residents, Krajnik (Gryfino Commune) – approx. 170 residents, Krzypnica (Gryfino Commune) – approx. 200 residents. Approx. 21 600 residents live in the town of Gryfino (Central Statistical Office of Poland 2015).

5 ENVIRONMENTAL IMPACT ASSESSMENT – SUMMARY

5.1 LAND AND LANDSCAPE

5.1.1 STRUCTURE “CHLEWICE-PORZECZE. BACKWATER EMBANKMENT OF ODRA RIVER AT MYŚLA RIVER”

The construction of the new embankment in the open landscape of the Myśla River Valley will cause a change of this landscape. However, the modifications will be of a local nature and will only affect the area near the village. The proposed embankment is an artificial bank, providing therefore a linear landscape element enclosing the village buildings in the south, west, north and east. Due to the height and the “sealed” nature of the bank, it will be deemed a specific landscape dominant, contrasting with the plain and open territory of the floodplain. The landscape is dominated by grasslands, wet meadows and fields as well as depressions in form of a marsh with small rush vegetation. The embankment location will definitely have impact on the landscape and aesthetics of the landscape viewed from the river as well as from the village. Since the future developments will not be located outside the protection area, surrounding the village with the embankment will be of a spatial nature thus avoiding the problem of dispersion of buildings within the valley. In such a case the negative interference in the Myśla River Valley landscape is limited.

Since the embankment is relatively short and closed, the valley morphology modifications will be local, linear and limited to the area of the earth works. The structure will not affect significantly the flow of the flood waters through the floodplain or the sedimentation of the residues within the river estuary.

The intensification of the lateral erosion in the vicinity of the embankment itself throughout the section in question is not assumed. Only the sections immediately surrounding the Myśla riverbed may be exposed to the force of flood water. The planned embankment borders topographic lows and shallow groundwaters near the bridge. These zones are at risk of water stagnation concerning both flood water and groundwater, and this shall be taken into account during the embankment sealing process.

Since the valley is not diversified, the structure will dominate the landscape – it will be a convex artificial form of the countryside. It will be surrounded by new, artificial habitat conditions.

Table No. 1. Potential impact caused by the structure with respect to: the landscape and ground surface

Impact	Construction stage / operation stage	Duration, scope
Ground surface and landscape degradation	Destruction of the ground surface within the scope of earth works and temporary roads	Permanent, local
Landscape structure and habitat fragmentation	Introduction of an artificial form into the landscape of a large river valley, river habitat degradation	Permanent, local
Change of landscape nature	Isolation of the countryside landscape from its surroundings, cutting down trees interfering with the embankment site	Permanent, local

5.1.2 STRUCTURE “MODERNIZATION OF MARWICKI POLDER STAGE I AND II”

The implemented works relate to reconstruction of existing embankments. No new impact with respect to the ground surface and landscape occurs.

Only a short-term impact may occur related to the landscape modification during the construction period, which is due to the earth works.

The construction works will not modify the site functions and will not affect the manner of the land use. The impact refers only to the zone, where the surface of ground is disturbed. Upon the completion of works, the site will be restored.

Table No. 2. Potential impact caused by the facility with respect to the: landscape and ground surface

Impact	Construction stage	Duration, scope
Ground surface degradation	Ground surface destruction within the scope of earth works and temporary roads	Temporary, local
Landscape modification	Earth works – turf removal, embankment, construction of the screen	Temporary, local
	Embankment top elevation	Permanent, local

5.2 CLIMATE

The Task will not affect the climate conditions on a larger scale (town/region/country). However, micro-scale changes related to cutting out trees and bushes as well as the construction of the flood embankment will be noticeable. The surface texture modification may result in slight changes of wind direction and speed. Such changes will be negligible, and the Task implementation will not be related to any practical risks to the climate of the surroundings.

Therefore no mitigation or monitoring measures are recommended with respect to the climate.

5.3 AIR QUALITY

During the Task implementation a dust and gas pollution will be emitted to the environment. During the operation stage no significant air pollution emission is expected.

The fuel combustion by the equipment used on site for the Task implementation (construction, transport of materials) will constitute the main source of emitted pollution (nitric oxides, carbon oxides, hydrocarbons and dust particles). The site deprived of vegetation (cutting down trees and bushes), the surface of the embankment without the soil layer and the embankment works (embankment construction) will contribute to the level of suspended solids. Increased dusting will be noticeable both during the performance of the works mentioned above (the highest concentrations) and later on, until soil is covered with grass (the particulates are moved from the surface with the wind). The highest temporary concentrations of pollution will be noticeable within several dozen of meters from their sources and may exceed the limit values (short-term situations, limited in territory to the embankment body and the zone of adjacent land). Along with the distance, the pollution will be dispersed in the atmosphere. The process

will differ, depending on the meteorological conditions (season and weather conditions, in particular wind speed and level of the mixing layer).

The emission of air pollutants during the construction stage will be short-term and reversible. It will not cause any significant and permanent environmental impact.

During the Task operation period a local temporary pollution may occur, related to the fuel combustion by the mowing equipment (farm equipment). The emission amount and its impact on the air quality in a given region is negligible.

5.4 SOIL AND LAND

Since the Task includes the reconstruction and construction of an artificial earth bank, it will affect the soil structure within the scope of earth works conducted. The scope of modification is limited to the area of the embankment. The embankment sealing (filtration screen/sheet pile walls) will cause interference deep inside the mineral/organic soil. Water absorption drainage downstream in the embankment will locally impact the water and adsorption properties of the soil surrounding the embankment, in particular of the organic soil.

The Task will have a local impact on the land structure and moisture of the soil.

5.5 SURFACE WATER

5.5.1 STRUCTURE “CHLEWICE-PORZECZE. BACKWATER EMBANKMENT OF ODRA RIVER AT MYŚLA RIVER”

The structure will not impact on the hydromorphological as well as physical and chemical properties of Odra River waters, on JCWP section of Odra River from the estuary of Warta River to the Western Odra River.

The embankment construction will locally affect the water relations in the valley within the area immediately surrounding the Chlewice Village. The flood water and alluvial flow modification within the mouth of Myśla River will be limited and will not impact the sedimentation within that section. Due to the closed nature of the embankment, the construction shall not limit the scope of flood water it shall only modify the flow direction thereof.

Since there is no direct interference into the Myśla riverbed, no deterioration of the water condition throughout the JCWP river section: the Myśla River from the Myśliborskie Lake to its mouth is anticipated.

The temporary risk of deterioration of hydromorphological as well as physical and chemical conditions in the vicinity of the embankment along the Myśla riverbed is possible during the implementation.

The construction of the embankment will permanently eliminate surface flood water from the village during operation stage. In addition it will limit the surface flow from the

developed areas, minimizing the direct inflow if contaminated or polluted water into the river water during the flood.

Table No. 3. Potential impact on surface water subject to construction of the facility

Hydromorphological indicators of water quality	Impact	Duration, scope
HYDROLOGICAL REGIME water flow amount and dynamics	Modification of the flood water flow direction and dynamics	Permanent, local
WATERWAY, STREAM, BROOK OR RIVER CONTINUITY number and type of barriers provided gateways for water organisms	No impact	
MORPHOLOGICAL CONDITIONS Waterway, stream, brook or river depth and width variability	Intensification of river bed and lateral erosion processes in the Myśla riverbed	Temporary, local
bed structure and surface	No impact	
riverbank structure	Alluvial sediment erosion, development of erosion forms: depressions, flood intakes, undercuts, slopes	Temporary, local
stream speed	Change of flood water flow dynamics	Temporary, local

The structure implementation will not affect the ecological potential of the selected section of JCWP: Myśla River from the Myśliborskie Lake to its mouth. Due to its local nature, the structure generates no negative impact on the whole JCWP. It does not affect the waterway flow. The modification of the riverbed morphological conditions will be local.

5.5.2 STRUCTURE “MODERNIZATION OF MARWICKI POLDER STAGE I AND II”

The structure will not directly impact the condition of the Odra River water. No quality deterioration of the JCWP water from the Western Odra River to Parnica River is expected as a result of the structure implementation.

Since no interference in both riverbed and bank vegetation is assumed and no works are to be conducted in inter-embankment zone, neither the change in the water flow conditions nor in conditions of natural habitats are expected. The construction materials will be transported by road transport, along the existing roads and embankment top.

Due to the reconstruction of the existing embankment system, no distortion of the existing surface water flow is assumed.

Table No. 4. Potential impact on surface water subject to construction of the facility

Hydromorphological indicators of water quality	Impact	Duration, scope
HYDROLOGICAL REGIME water flow amount and dynamics	No impact	N/A
WATERWAY, STREAM, BROOK OR RIVER CONTINUITY number and type of barriers providing gates for water creatures	No impact	N/A
MORPHOLOGICAL CONDITIONS Waterway, stream, brook or river depth and width variability bed structure and surface riverbank structure stream speed	No impact	N/A

The structure implementation will not affect the ecological potential of the whole section of JCWP: Odra River from the Western Odra River to Parnica River. Due to its local nature, the structure generates no negative impact on the whole JCWP. It does not affect the waterway continuity.

During the operation, the structure shall not contribute to any deterioration of the biotic elements, since it consists of reinforcement of the existing embankment and no new buildings are provided which could alter the spatial development and water relations within the river valley. It should also be indicated that the most valuable territories and habitats are located in the Odra River section in question on its left bank (within Miedzodrze) and the modernization of the embankment on the right bank will not affect them significantly.

5.6 GROUNDWATER

5.6.1 STRUCTURE “CHLEWICE-PORZECZE. BACKWATER EMBANKMENT OF ODRA RIVER AT MYŚLA RIVER”

The construction of embankment around Chlewice Village will only locally modify the direction and dynamics of the alluvial water flow within the protected zone, namely within

the housing development protected by the embankment. This impact results from the construction of the filtration screen, structure of which is to limit the ground flow through the embankment body. The screen is made in the process of deep soil mixing and sheet piling within the peat interbeddings. The screen depth does not reach the impermeable layer hence it will not eliminate the ground flow through the embankment foundation. The modification relates to the groundwater flow intensity through the protection zone, resulting in slower increase and decrease of the groundwater level compared to the river water level. Due to the morphological conditions there is the minor risk of flooding within the protection zone during floods. Moreover a capillary rise of groundwater occur during floods within the lowlands. Such water will be pumped out with a portable pump.

Due to the large distance from the Main Groundwater Reservoir, the structure will not affect the groundwater condition.

Table No. 5. Potential impact on groundwater subject to construction of the facility

Impact	Construction stage/ Operation stage	Duration, scope
Connection to groundwater parts	Modification of the alluvial water flow direction within the filtration screen Modification of the flow intensity through the embankment and its foundation	Permanent, local
Impact on the Main Groundwater Reservoir	No impact	N/A

The structure implementation will not affect the groundwater condition and status of this section of the Myśla River. Due to its local nature, the structure will not affect the GZWP Dębno no. 134.

5.6.2 STRUCTURE “MODERNIZATION OF MARWICKI POLDER STAGE I AND II”

The embankment modernization proposed in scope of works on the structure will not affect the groundwater relations significantly. The local impact is related to the construction of the filtration screen within the axis of the existing embankment. The 6.0 m high and 0.30 – 0.35 m wide filtration screen is designed to be constructed in form of a narrow trench, using a milling and excavating equipment. The top level of the screen will be located 0.8 m below the embankment top.

Due to the large distance from the Main Groundwater Reservoir, the structure will not affect the groundwater condition.

Table No. 6. Potential impact on groundwater subject to construction of the facility

Impact	Construction stage/ Operation stage	Duration, scope
Connection to groundwater parts	Modification of the flow intensity through the embankment and its foundation	Permanent, local
Impact on the Main Groundwater Reservoir	No impact	-

The structure implementation will not affect the groundwater condition and status of this section of the Odra River Valley. Due to its local nature, the structure will not affect the GZWP Buried Valley Szczecin no. 122.

5.7 ACOUSTIC CLIMATE

5.7.1 STRUCTURE “CHLEWICE-PORZECZE. BACKWATER EMBANKMENT OF ODRA RIVER AT MYŚLA RIVER”

The impact of the planned structure on the acoustic climate shall be considered separately for the construction works stage and for the operation stage. During the implementation of the construction works related to the embankment and reconstruction of the colliding infrastructure the noise levels may be temporarily exceeded. Such a situation is related to the earth works performed with heavy construction equipment such as: bulldozer dump truck on a truck chassis, self-propelled trencher, excavators, etc. It shall be noted that along the most of its length, the embankment is away from the acoustic protected development. In addition, to minimize negative acoustic impact, the construction works requiring heavy equipment will be performed between 6:00 am and 10:00 pm while the equipment itself must be characterized with low noise emission levels and high technical condition.

During the structure operation no negative impact on the acoustic climate will be present – upon the completion of construction works the condition preceding the structure implementation shall be restored. In addition, the embankment construction will improve the acoustic condition of the environmentally valuable areas as it will divide the village buildings that constitute the source of noise related to everyday human activities, from wild animals and other creatures.

5.7.2 STRUCTURE “MODERNIZATION OF MARWICKI POLDER STAGE I AND II”

During the embankment elevation works and filtration screen assembly, the noise levels may be temporarily exceeded. The nature of the earth works will entail the use of heavy construction equipment such as: bulldozer dump truck on a truck chassis, self-propelled trencher, excavators, etc. Burdensome construction works requiring heavy equipment will be performed between 6:00 am and 10:00 pm while the equipment itself will be characterized with low noise emission levels and high technical condition. It shall also be

noted that only the Gryfino – Mniszki section of the embankment is located adjacent to the area of acoustic protection.

No negative impact on the acoustic climate is assumed to happen during the operation period, and seasonal maintenance works will not emit excessive noise.

5.8 NATURE

5.8.1 PROTECTED NATURAL HABITATS AND PROTECTED SPECIES OF PLANTS, FUNGI AND ANIMALS

5.8.1.1 STRUCTURE “CHLEWICE-PORZECZE. BACKWATER EMBANKMENT OF ODRA RIVER AT MYŚLA RIVER”

NATURAL HABITAT

No protected habitats or protected flora species are present within the construction site and in its immediate surroundings. Due to the vicinity of buildings, gardens and small fields, the weed flora and intensively used grasslands dominate in the area. Within this area there are no wet lands, wet meadows or similar areas of the type on which the construction of the embankments could have a negative impact. The area is occasionally flooded during catastrophic water levels.

FLORA

No protected habitats or protected flora species are present within the construction site and in its immediate surroundings. The closest areas valuable due to the presence of rare flora species are located several dozen meters away from the planned embankment location. This relates to the habitats of small fleabane *Pulicaria vulgaris* and marsh pea *Lathyrus palustris*. These areas may be destroyed in case of improper localization of the construction site facilities and truck roadways. Therefore, the Contractor will be obliged to implement works in accordance with the conditions specified in the administrative decisions issued for the structure, among other decisions on environmental conditions of the structure implementation, which provide for rules for location of the site facilities in a manner securing natural assets on the external side of the newly built embankments.

FAUNA

The embankment is planned to be developed mostly in the near vicinity of the existing buildings. Only the southern section, along the Myśla River, borders the areas of relatively high environmental value. The construction of the embankment will prevent the existing floodplains from being sporadically flooded (catastrophic water level), within the area of about 6 ha (areas located between the Chlewice Village and the river bed of the Myśla River. However, in this area, neither a presence of natural habitats nor animal species directly dependent on flooding by river waters have been found. The areas south of Chlewice Village mainly consist of intensively used grasslands.

The projected structure around the Chlewice Village shall form tight embankment so that the areas flooded by river waters could stay, as far as possible, on a similar to the current level.

However, the construction of the embankment will be associated with creation of site facilities, presence of construction equipment, permanent lighting, vehicle traffic and similar elements related to construction works. The said actions shall not directly cause destruction of significant positions and habitats of animal species. However, they shall cause disturbance and scaring of animals, first of all birds.

5.8.1.2 STRUCTURE “MODERNIZATION OF MARWICKI POLDER STAGE I AND II”

NATURAL HABITAT

The Project shall not cause reduction of the area of previously existing wet lands and flooded areas where there may occur natural habitats which are directly dependent on the surface flooding by the waters of the Odra River.

FLORA

Within the route and within the zone of embankment modernization works, several dozen of the protected wild celery *Angelica archangelica* plants will be destroyed. The species is common in the Odra River banks zone and the destroyed local population is assumed to reinstate in a short time following the completion of works. No other significant impact on the flora due to the structure implementation is assumed, under conditions specified in the administrative decisions issued for the structure.

FAUNA

No danger of direct destruction of habitats, breeding sites, nesting sites or other crucial sites for a given individual development of animal species has been found. However, the presence of the equipment, illuminated construction site facilities and performance of the construction works will frighten animals living in the waters and open areas adjacent to the Site. This will impact the avifauna in particular.

The Project includes modernization of existing embankments sections and therefore, its implementation shall not cause diminishment of the area of previously existing wet lands, flood areas where there may occur natural habitats directly dependent on the surface flooding by the waters of the Odra River.

5.8.2 PROTECTED AREAS

5.8.2.1 STRUCTURE “CHLEWICE-PORZECZE. BACKWATER EMBANKMENT OF Odra RIVER AT MYŚLA RIVER”

The implementation of the structure shall not cause direct destruction of natural habitats or habitats of species considered as protected within Natura 2000 sites: Lower Odra River Valley PLB320003, Lower Odra River PLH320037. Although construction of the embankment will cause local destruction of flora along the line of the new embankment,

in those areas natural habitats treated as protected within Nature 2000 site, were not found. Intensively used grasslands that surround Chlewice Village are not appropriate habitats for birds which are protected within Natura 2000 site.

The structure shall be also partially implemented within the Estuary of the Warta River Landscape Park.

The embankment covers mainly the developments of the Chlewice Village, together with a few hectares of intensively used grasslands. Construction of the embankment in the planned location shall not cause negative impact on the protected areas. There will be no direct impact related to occupation, damage to natural habitat of species, or indirect impact related to possible violating the function of the area and significant ecological connections within its scope.

5.8.2.2 STRUCTURE “MODERNIZATION OF MARWICKI POLDER STAGE I AND II”

The structure shall be partially constructed within the boundaries of Natura 2000: Lower Odra River Valley PLB320003, Lower Odra River PLH320037, as well as within the Lower Odra River Valley Landscape Park.

A part of the structure implementation assumes modernization of the existing embankments is proposed so it shall not result in direct destruction and reduction of the area which is subject to regular flooding in the Odra River Valley. Therefore, the development shall not cause direct destruction of natural habitats and animal habitats considered as protected within the Natura 2000 sites, in particular water and marsh birds. It is also planned to seal the body of the embankment however it shall not have significant negative impact on natural habitats and habitats of species on the land side of the embankment in relation to the assumed stagnation of waters on the land side of the embankment.

Theoretically, some species of animals may be frightened (mainly birds). Thus negative impact shall be reduced by implementation of mitigation measures.

5.9 CULTURAL LANDSCAPE AND MONUMENTS

5.9.1 STRUCTURE “CHLEWICE-PORZECZE. BACKWATER EMBANKMENT OF ODRA RIVER AT MYŚLA RIVER”

Since the structure is not located in the immediate vicinity of any historical monuments or other objects of historical or cultural importance, no negative impact on objects of historical or cultural importance will take place both during the development's implementation and operation stages. At the same time it should be noted that the embankment's construction will improve the protection of the Chlewice Village as well as any historical monuments and/or valuable items of the heritage, in particular the building of the fire-fighter's house from the 2nd half of the 19th century and the ruins of the

Evangelical cemetery (entered into the register of historical monuments of the commune).

5.9.2 STRUCTURE “MODERNIZATION OF MARWICKI POLDER STAGE I AND II”

The structure implementation will not affect the historical monuments and other objects of historical or cultural importance. Since the scope of works comprises of raising level of and modernization of the existing hydraulic facilities, the structure implementation will not affect the cultural landscape of the area.

At the same time it should be underlined, as a result of the works to be performed the flood protection of the historical monuments in the Marwice village (post-Evangelical church with the adjacent cemetery) will be increased.

However, it may happen that during the earth works some artefacts or historic structures, as well as archaeological sites will be discovered. The Contractor is obliged to its proper protection.

5.10 TANGIBLE ASSETS

5.10.1 STRUCTURE “CHLEWICE-PORZECZE. BACKWATER EMBANKMENT OF ODRA RIVER AT MYŚLA RIVER”

The basic objective of the embankment construction is the protection of the tangible assets in Chlewice Village against flood water. The structure implementation requires some expropriation, however the scope and scale thereof are relatively small compared to the increased flood safety of all the facilities in the village. No demolition of existing building is envisaged, since there is no collision with the works. In short sections the existing roads will be rebuild due to clash with the emabnkment. In addition, 19 embankment crossings have been provided to grant the access to farm land from the smallholdings. In the neighborhood of the construction sites and transport roads it is also possible that there will be impact on the buildings located in the vicinity.

5.10.2 STRUCTURE “MODERNIZATION OF MARWICKI POLDER STAGE I AND II”

The structure will contribute to the flood safety within the region. Due to the fact, that the structure will be implemented on the properties owned by the Investor, no expropriation administrative procedure is necessary against the current owners and perpetual users for the benefit of the public sector. In the neighborhood of the construction sites and transport roads it is possible that there will be impact on the buildings located in the vicinity.

5.11 HUMAN HEALTH AND SAFETY

The impact on the human health and safety during the structure implementation may be connected with the following factors:

- Increase in the pollution emission to the atmosphere – anticipated emission level on the basis of anticipated intensity of works and possibility of conducting the

works simultaneously on larger areas will not cause exceeding the norms for permissible concentration of air pollution. Periodically, there may be an increased concentration of dusts in the air; nevertheless, without any impact on the residential building development surrounding the area of works;

- Increased noise emission – during the performance of construction works connected with the modernization of the existing embankment, erecting a new embankment and rebuilding of the colliding infrastructure, it is possible that there will be short-term exceeding of noise level norms. During the works, it is likely that noise level limits will be exceeded which will be connected with the operation of heavy equipment and tools such as mechanical saws;
- Contamination with petroleum derivatives – incorrect organisation of works and failure to follow applicable norms within the scope of use and type of machines could lead to contamination of the terrains in the vicinity of built-up areas with this type of substances.

Therefore, the relevant mitigation measures are presented in Appendix No 1 to EMP.

5.12 EXTRAORDINARY HAZARDS

A counterpart of an industrial accident as regards to this Task is a flood in the period of conducting the works of the modernization of the existing embankment. During the period of the flood wave, in the inter-embankment zone, there may be construction machines, construction materials and other elements of infrastructure or the equipment of the construction sites. Surge waters of this type are extreme phenomena. Forthcoming flood wave may be predicted well in advance, and preventive measures may be applied – both people and equipment can be evacuated outside of the danger zone.

Another type of an extraordinary threat is the leakage of oil derivatives to water and soil. Nevertheless, for this purpose appropriate preventive measures are applied, which refer to the adequate organisation of building sites and site facilities as well as continuous inspection of the construction equipment.

A possibility of discovering unexploded shells is yet another extraordinary hazard for the environment as well as human health and safety. In the event of discovering unexploded shells, the Contractor shall immediately interrupt works and evacuate workers as well as notify the police and a licensed sapper unit. The Contractor shall ensure sapper supervision throughout the performance of earthworks, which will consist in on-going inspection and clearance of the terrain, from hazardous objects of a military origin and their disposal.

5.13 CUMMULATIVE IMPACTS

In the Task implementation period there will be no other works of similar nature or/and located within the areas of the Task implementation. Therefore, there shall not be cumulative environmental impacts.

6 DESCRIPTION OF MITIGATION MEASURES

6.1 LAND AND LANDSCAPE

In order to limit the negative impact of the Task on the land and landscape, mitigation measures have been planned which will be introduced at the time of construction works. The Contractor must undertake and perform a range of required activities, including:

- The construction stage must be preceded with works connected with preparing the Site for the development covering, i.a. preparing the places for storing construction materials, building site facilities, etc. and allocating and preparing (and obtaining approval of the road administrators) traffic routes for machines and vehicles.
- It is necessary to limit as much as possible the area of temporary occupation (temporary routes, sites, building site facilities, storage yards for construction materials, parking lots and other) which must be located in the area:
 - with the least nuisance to the environment,
 - outside areas of a natural environmental value, indicated by the Contractor's environmental team (in particular, outside natural habitat boundaries, habitats of species of plants and animals under protection in Natura 2000 sites, as well as stands of plants, animals and fungi under legal protection),
 - beyond the Odra River inter-embankment zone (for the following Structure: "Modernization of Marwicki polder stage I and II"),
 - and on the internal side of the embankment surrounding Chlewice (for structure "Chlewice-Porzecze. Backwater embankment of Odra River at Myśla River").
- The areas of temporary occupation (temporary routes, sites, building site facilities, storage sites for construction materials, parking lots and other) must be located and prepared in accordance with the recommendations of the Contractor's environmental team, approved by the Engineer.
- It is necessary to conduct works by methods limiting land occupation and preventing land transformation alteration.
- The area directly adjacent to flood embankments must be reinstated upon completing the works.
- Upon completing construction works, it is necessary to reinstate temporarily occupied sites to their previous condition (land reclamation). In the places where humus was removed, it is necessary to level it. After preparing for sowing, the reinstated site must be sown with grass mix (the composition of a grass mix will be agreed with the Contractor's fitosociologist) and cared for appropriately

through mowing (at least twice a year in June and September) also in the Defect Notification Period. The dates of mowing must be specified by the Contractor's environmental team and approved of by the Engineer, and for the following Structure: "Modernization of Marwicki polder stage I and II" they will be determined beyond the bird breeding season.

- Transport and machine and vehicle traffic must take place, mostly, along the existing road system and on the embankment's crown, not interfering with the habitats and areas adjacent to the Task area. The implementation of the following Structure: "Modernization of Marwicki polder stage I and II" – transport and machine and vehicle traffic must take place, mostly, along the existing road system and along the embankment routes and on the embankment's crown.
- It is not allowed to perform earthworks which permanently deform the relief, with the exception of works involving the construction and modernisation of flood embankments.
- It is necessary to apply utmost care at the time of earthworks in the vicinity of oxbow lakes in order to avoid destructing or changing their structure.

A complete set of mitigation measures refereeing to the protection of land surface and landscape is presented in the Appendix No 1 to this EMP.

6.2 CLIMATE

There is no need for the mitigation measures with respect to the protection of the local climatic conditions for this Task.

6.3 AIR QUALITY

The following mitigation measures aimed at the reduction/elimination of the Task's negative impact on the air quality are recommended:

- Equipment, machines and vehicles used for construction works must be in working order and meet standards and legal requirements arising from the conditions of authorisation for putting into service (and public road traffic, if applicable), hold approvals and have low emission rates.
- It is necessary to limit the operating time of combustion engines, construction machines and cars equipped with compression-ignition diesel engines.
- Traffic of vehicles and machines as well as earthworks must be minimised to cover only those necessary for the Task implementation.
- In the period of standstill and breaks in work, combustion engines of the equipment, machines and vehicles must be switched off.
- It is required to lower the speed limit near the building site.
- Loose materials and aggregate intended for being used at the construction stage must be protected against being blown away and against excessive dusting

during transport and storage as well as during their use for the construction of the embankment.

- It is necessary to apply required technical and organisational measures in order to maintain clean access routes and to introduce measures limiting dust emission at the time of transporting construction materials, conducting construction works, from the areas of their storage to the building site and from building sites.

In order to protect air quality, including assurance that no additional unidentified currently impacts appear, it is necessary to implement the above mitigation measures. The mitigation measures in the scope of air protection are presented in the Appendix No 1 to EMP.

6.4 SOIL AND LAND

Mitigation measures for soil impact will include activities connected mostly with the prevention of contamination of soil-water environment with oil derivative substances, other pollutants and with securing the said environment against the consequences of the construction works carried out.

Thus, it is required to prepare and to fulfil the Task in the manner preventing any pollutant from entering the soil and ground.

It is necessary to keep order on the building site and ensure correct work organisation.

It is necessary to use only pro-environmental materials in the Task fulfilment (natural or neutral) period. Materials, raw materials, fuels, fertilisers, cement and concrete mixtures used must have relevant approvals for use. Earth embankments must be performed from natural materials without the use of hazardous materials or materials harmful to human health.

In order to prevent soil contamination, it is necessary to use equipment, machines and vehicles in working order. The Contractor must perform ongoing inspections of the condition of equipment, vehicles and machines as well as eliminate, by means of available organisational measures, a possibility of entering of any contamination to the soil and water environment, including the spillage of fuels, hydraulic oils and oil derivative substances, both during servicing, re-fuelling, transporting as well as the operation of machines, equipment and vehicles.

It is necessary to store lubricating substances and fuels on dedicated sites, with correct sealing degree and equipped with sorbents for neutralising oil derivative substances.

It is necessary to include activities such as obligatory vehicle and machines traffic along temporary routes and manoeuvre sites and, if possible, machine movement along the same routes.

Equipment, machines and vehicles used for construction works must be located in dedicated parking places with protecting measures against the spillage of oil derivative substances to the soil and water environment. If such equipment, machines and vehicles are not used, they must be parked in dedicated places.

Only vehicles, machines and equipment connected with the performance of works as part of the Task are allowed to be present on the building site and its facilities.

Works organisation shall exclude any pollution, such as oil derivatives, entering soil.

Building site facilities must be equipped with oil derivative substances sorbents throughout the Task implementation period. The Contractor must also provide training to employees within the scope of their correct usage.

Fuelling up should take place by means of mobile and stationary fuel distribution points with appropriate security measures such as a station with a sorbent for liquidating any leakages and outflows of oil derivative substances to the ground.

In the event of any spillage of oil derivatives any leakage is immediately removed and contaminated soil layers are managed in compliance with the applicable legal regulations.

The protection measures on the work areas have also been specified. Prior to the commencement of earthworks, it is necessary to remove 30 cm thick layer of humus which will be re-used for subsequent land reclamation. The Contractor should choose a place for storing humus and securing it against damage, being driven through and compacted, and which will ensure its re-use.

If technically feasible and reasonable, soil material gathered from earthworks must be, in the first place, managed in the building site through using it for building and shaping embankments. For the remaining soil material not appropriate for being re-used (e.g. chemically contaminated), the Contractor must manage in compliance with applicable waste regulations.

The implementation of the following structure: Chlewice-Porzecze. Backwater embankment of Odra River at Myśla River, peat excavated during earthworks must be managed by means of mixing it with humus and using in shaping a covering layer of the embankment.

In order to protect soils including assurance that no additional unidentified currently impacts appear, it is necessary to implement described mitigation measures. The mitigation measures connected with soil protection are presented in the Appendix No 1 to EMP. Mitigation measures aimed at the protection of surface waters (presented in Chapter 6.5 and Appendix No 1 to EMP) result also in the protection of soil and lands.

6.5 SURFACE WATER

In order to protect the condition of surface water and prevent their contamination, it is necessary to implement a range of mitigation activities.

It is necessary to secure the building site and implement the Task in the manner excluding spillage of any pollutants to the surface and ground waters, including but not limited to contamination with oil derivative substances.

In the event of oil derivative substance spillage to surface waters, the Contractor is obliged to prompt ensuring of mechanical collection of oil derivative substance from the water surface.

It is forbidden to collect waste and locate the building site facility in the places of shallow ground waters in forms with good permeability, peaty depressions or near proximity of the Myśla and Odra river waters.

It is necessary to use an appropriate drainage system, ensuring the maintenance of excavations without stagnant waters.

Water and mud collected in excavations must not be discharged directly to oxbow lakes.

Within floodplains (inter-embankment zones) of the Odra River and the Myśla River, and flood direct risk areas, it is forbidden to fix equipment and machines, including replacement of oils and fuel. Machines may be parked only in dedicated zones.

Construction works must be led in the manner avoiding their interference with natural overgrowth on the Odra and the Myśla rivers banks or with their beds.

The earth material to be re-used must be stored as far as possible from the river bed avoiding any damage to the bed and banks.

With reference to the "Modernization of Marwicki polder stage I and II" works must be carried out only on the landside of the embankments.

As part of "Chlewice-Porzecze. Backwater embankment of Odra River at Myśla River", it is necessary to situate the building site facility in the inter-embankment zone (between buildings of Chlewice Village and planned embankment), ensuring efficient usage of the land, and upon completing the works, the land must be reinstated.

Mitigation measures in the area of surface waters protection are listed in the Appendix No 1 to this EMP.

6.6 GROUNDWATER

No significant threats to the condition and resources of ground water, connected with the Task implementation, have been determined. At the time of sectional installation of sheetpile walls, within flood embankments, drainage of wetlands and swampy lands must be minimised.

Mitigation measures in the scope of waters protection are listed in the Appendix No 1 to this EMP.

6.7 ACOUSTIC CLIMATE

The acoustic impacts shall be periodic and limited directly to the surroundings of the works implementation site. Particular attention as part of the acoustic impact in the Task implementation stage must be paid to the residential development areas, including Chlewice and Gryfino.

It is assumed to implement mitigation measures in order to limit intensity of impact at the stage of works implementation:

- a) construction works in the areas and immediate vicinity of areas under acoustic protection must be carried out only during the day, i.e. between 6:00 a.m. and 10:00 p.m.;
- b) it is necessary to use modern and quiet construction equipment, machines and vehicles in working order, with i.a. low noise emission and equipped with silencers;
- c) it is necessary to use the technologies of construction works which are least burdensome in terms of acoustics, maintain good work organisation, correct equipment operation and ensuring correct technical order,
- d) it is necessary to avoid the operation of more equipment units in the same place at the same time;
- e) it is necessary to localise standstill sites for machines as far as possible from the areas under noise protection and at the same time as close as possible to the area of works;
- f) In the areas under acoustic protection and the working sites adjacent to these areas, in order to mitigate the nuisance for inhabitants and environment, it is allowed to use only pumping engines equipped with soundproof housing;
- g) during the implementation of the structure: Chlewice-Porzecze. Backwater embankment of Odra River at Myśla River, while performing embankments near buildings (embankment M to hectometre 0+50) in order to limit the level of emitted vibrations, it is forbidden to use dynamic devices (vibrating rollers) for soil compaction.

A set of actions related with limitation of noise emission is presented in the Appendix No 1 to the EMP.

6.8 NATURE

6.8.1 NATURAL HABITATS, FLORA AND FAUNA

In order to prevent the occurrence of negative impacts and for their reduction, a range of mitigation measures has been proposed to be introduced at the stage of work performance.

Prior to the commencement of works, the Contractor is obliged to perform single site survey of the areas of temporary and permanent occupation, aimed at: (1) determining the current layout of stands with protected plants and (2) those present in the national and regional red lists of endangered species of plants and determining the sites of possible occurrence of such species,

If during site survey or construction works, there are discovered species of plants, animals or fungi under strict or partial species protection, before taking any action, the Contractor must obtain relevant permission required by law (Article 56 of the Natural Environment Protection Act or similar legal provisions applicable at the time of preparing and conducting works).

If it is necessary to relocate such species, the Contractor is obliged to plan such action, obtain required permission, to conduct effectively such actions and implement other activities required (e.g. drawing-up and submitting reports to the body issuing relevant permission).

During construction works it is forbidden to destroy plants outside the development terrain.

Works must be conducted under permanent supervision of the Contractor's environmental team. The Contractor's environmental team includes the following experts in the field of natural environment protection: botanist, herpetologist, ornithologist, chiropterologist, entomologist and water protection expert. The Contractor's environmental team will be responsible for, i.a., ongoing inspection of the localisation and method of conducting construction works for the purpose of reducing their impact on the natural environment.

The Contractor ought to ensure the schedule for performing works so that the dates and location of respective stages of construction works are suitable for the requirements of environmental decisions and the EMP and so that they do not affect species under protection which are found in the area of works and in their vicinity.

It is forbidden to kill animals during earthworks and it is necessary to help animals to leave excavations in the case they accidentally entered them.

It is forbidden to make use of substances which could be lethal to animals.

In the event of discovering the breeding stands of protected fauna species within the areas of construction works, it is obligatory to suspend works until such stands are left by these species.

The implementation of the following Structure: Chlewice-Porzecze. Backwater embankment of Odra River at Myśla River:

- before commencing the implementation of the structure, the Contractor must obtain permission, referred to in Article 56 of the Natural Environment Protection Act (or similar provision applicable at the time of preparing and conducting works) issued by a competent Regional Directorate for Environmental Protection and General Directorate of Environmental Protection for purposeful scaring away and disturbing avifauna, under partial and strict protection within the Task impact area;
- Construction works may be conducted outside the bird breeding season, i.e. from 1 October to the end of February;

- in the event of possible reasonable necessity of commencing works before the animal breeding season and plant vegetation season, they can be done between 1 of March and 30 September, only in the case of obtaining permission under Article 56.1 of the Natural Environment Protection Act (or similar provision applicable at the time of preparing and conducting works);
- if it is necessary to destroy the habitat of a Roman snail, it is required to obtain permission, referred to in Article 56 of the Natural Environment Protection Act (or similar provision applicable at the time of preparing and conducting works);
- prior to the commencement of earthworks, plants from the entire surface near the base of the embankment with widening by 1.0 m on both sides must be mowed and removed;
- before removing a humus layer from the surface where embankment will be built, turfs must be routed and soil removed with such turfs outside the works zone.

The implementation of the following Structure: Modernization of Marwicki polder stage I and II:

- construction works may be conducted outside the bird breeding season, i.e. from 1 September to the end of February;
- in the event of possible justified necessity of commencing works before the bird breeding season, the Contractor must obtain permission, referred to in Article 56 of the Natural Environment Protection Act (or similar provision applicable at the time of preparing and conducting works) issued by a competent Regional Directorate for Environmental Protection and General Directorate of Environmental Protection for purposeful scaring away and disturbing avifauna, under partial and strict protection within the structure impact area;
- it is necessary to scare the animals away before starting works;
- the Contractor is obliged to ensure work organisation which maximally shortens the time of works, aimed at reducing adverse impacts on the animals living within the Task area and within its impact.

Temporarily occupied sites must be organised only beyond the areas of a natural environmental value, upon agreement of the Engineer's environmental team, and, if possible, in hardened and sealed places, equipped with sorbents enabling instantaneous liquidation of the effects of any fuel or oil derivative substances leakage.

Construction works must be carried out, avoiding damage to trees and shrubs not intended for felling and ensuring protection of their crowns, trunks, root systems and against mechanical damage and drying out.

Trees and shrubs not intended for felling, which grow on the construction site and which are prone to damage due to traffic, equipment transfer, etc. must be protected against

damage, for instance, through placing trunk shields made of wooden boards around the entire trunks up to the height of at least 1.5 m.

If a tree gets damaged, it is necessary to undertake required measures immediately under supervision of the Contractor's environmental team, which will limit damage impact.

In the immediate vicinity of trees (within their crown projection to the ground plane) it is advised not to store any construction materials or park any equipment or machines.

Felling of trees and shrubs should be minimised.

Felling of trees and shrubs as part of the structure "Chlewice-Porzecze. Backwater embankment of Odra River at Myśla River", must be conducted with the following rules:

- felling of trees and shrubs, within the scope necessary for the Task implementation, must be carried out outside a vegetative period and bird breeding period (from 1 November to the end of February),
- it is necessary to ensure particular protection and care towards two oaks, one in the embankment slope foot and the other growing near the embankment under construction, i.e. in the distance exceeding 3 m from the embankment,
- it is necessary to ensure compensation for plant loss as a result of clearance through the re-vitalisation of plants in Chlewice by means of planting trees and landscaping the area,
- works must be carried out under strict Contractor's environmental team supervision.

The clearance of trees and shrubs as part of the structure "Modernization of Marwicki polder stage I and II" must be conducted taking into account the following rules:

- clearance of trees and shrubs, within the scope indispensable for the Task implementation, must be carried out outside the bird breeding season (outside the period between 1 March and the end of August),
- felling must be performed manually.

In order to reduce possible negative impacts on the species of animals settled in trees, there are procedures established and a need for conducting a supervision by the Contractor's environmental team in order to limit possible negative impacts on the populations of protected species (inspection of trees intended for felling by adequate experts, flushing out and catching fish, obtaining separate, legally required, permissions for departing from prohibitions related to the species under protection).

Prior to beginning of the construction works there should be conducted site inspection of places of construction works with participation of botanist or phytosociologist in order to locate the presence and estimate the population of invasive plants (except for small balsam *Impatiens parviflora*). After locating and visibly marking places where invasive

plants grow, preventive actions should be taken during the implementation of the Task, which will limit spreading of these plants, including, among others, removing humus layer along with invasive plants and transporting them from area of works to the composting plant or neutralizing in any other effective manner. It is unacceptable to mix this humus with humus overgrown with local native vegetation.

The Contractor is responsible for conducting training (completed with a test verifying the knowledge of participants) on the EMP rules and conditions and mitigation measures at the time of construction for its managing personnel and engineering-technical personnel supervising the construction works. Such training must be prepared with the help of its environmental team. The Contractor's employees which will handle fuels and other oil derivative substances should receive prompt training within the protection of soil and water environment and applicable protective measures, including the use of sorbents.

Contractor's environmental team prepares necessary materials and requests for obtaining permits for deviation from prohibitions of protection of species of plants, fungi or animals on the terms and in the mode specified by the Act of 16 April 2004 on environmental protection. The above-mentioned decisions issued by RDOŚ/GDOŚ are to be requested for by the Contractor.

The complete set of mitigation measures for protection of natural habitats and plants and animal species is listed in the Appendix No 1 to this EMP.

6.8.2 PROTECTED AREAS

Activities aimed at reducing negative impacts on the protected areas are coherent with the activities anticipated for natural habitats and species of flora and fauna described in Chapter 6.8.1.

During the construction stage, the Contractor shall comply with standards, prohibitions and recommendations as well as it shall respect limitations arising from the existence of areas and facilities formed under the Environmental Protection Act.

In the places where construction works will be carried out within the Natura 2000 sites within protected areas should be separated from the construction areas. Fence should secure protected terrains against unauthorized access of persons involved in construction works and entering of construction vehicles and machines. The purpose of the activity is protecting the territories within the boundaries of the protected areas against accidental destruction.

A complete set of mitigation measures referring to the protected areas is listed in the Appendix No 1 to EMP.

6.9 CULTURAL LANDSCAPE AND HISTORIC MONUMENTS

Gathered knowledge and materials concerning the planned Task indicate lack of significant risks related to its implementation on historical monuments and cultural landscape. However, the Contractor will be obliged to implement preventive actions in case of adverse impacts.

As per the Act of 23 July 2003 on historic monuments law (Journal of Laws of 2014, item 1446, as amended) if a person discovers an object during construction or earth works, which may be a historical monument, such a person shall suspend all the works likely to destroy or damage the objects discovered, it shall secure them with the use of available measures and it shall notify the Provincial Conservator of Historical Monuments immediately, and, if impossible, a village head and mayor. The Contractor shall also notify the Engineer in this respect.

In the locations where works will be conducted within archaeological sites, prior to the commencement of works, the Contractor shall ensure archaeological rescue excavations performed by a qualified person. The above will ensure the removal of valuable objects and other elements of a historic value from the Site and will enable the performance of specific works. During the works, continuous archaeological supervision will be ensured.

For the purpose of implementing the above EMP conditions related to protection of cultural landscape and monuments, the Contractor will also obtain the permit issued by the Provincial Conservator of Historical Monuments for the performance of archaeological rescue survey.

A complete set of mitigation measures referring to the culture landscape and historical monuments is listed in the Appendix No 1 to EMP.

6.10 TANGIBLE ASSETS

Precautionary measures have been introduced to protect existing condition and to ensure the necessity to reinstate the conditions of various structures (buildings, structures, infrastructure, etc.) at the time prior to the execution of the works, should they be damaged or their condition deteriorate as a result of the work's implementation.

6.11 HUMAN HEALTH AND SAFETY

The guidelines binding for the whole Contract 1A.1 are presented below.

Ensuring health and safety in terms of organisation:

- 1) Preparing a Safety and Health Protection Plan by the Contractor which will be binding until the construction is complete.
- 2) The Contractor shall ensure and maintain the safety of the works conducted.
- 3) An obligation to set out the construction area, if feasible, as far as possible from the residential development areas in order to eliminate excessive noise and vibration emission at the time of the Task implementation.
- 4) An obligation to secure and attach permanent marking of the building site.
- 5) An obligation to conduct works in accordance with applicable legal provisions and OHS rules.
- 6) Storing materials in the manner that secures them against damage or in the manner that poses no risk to the human and property safety, such as falling over, sliding down or falling down of products and devices.

- 7) Defining dangerous zones which pose a risk to human health and life, and marking them with the use of warning boards. Additionally securing these zones against unauthorised access.
- 8) If hazardous substances and materials are stored on the building site, they must be protected appropriately, preventing the access of unauthorised persons, and information on a hazard must be provided on warning boards.
- 9) In a flood water (surge waters) periods, it is necessary to conduct ongoing monitoring of water levels and a forecast for surge period.
- 10) All the works must be carried out according to the design, OHS regulations and recommendations of the Building Manager and Investor's Supervision.

Ensuring health and safety in terms of the technical measures used:

- 1) The use of machines and tools in a perfect technical order, subject to periodical technical inspections according to the manufacturer's requirements combined with monitoring of any spillages of petroleum derivative substances.
- 2) The use of machines and tools according to their intended use.
- 3) It is necessary that during vehicle and machine public road traffic, traffic rules are adhered to, including speed limit.

Ensuring human health and safety in terms of fire protection:

Ensuring human health and safety on the building site

- 1) It is necessary to provide a building site facility for the time of works which ought to be equipped with sorbents for removing possible spills of petroleum derivatives.
- 2) Activities connected with machine maintenance and filling up the fuel must be carried out in designated sites, hardened, and if there are no such sites – it is necessary to use ecological mats enabling collection of any fuel spills.
- 3) It is necessary to minimise the restraint of the terrain during Task implementation.
- 4) Exclude a possibility of locating a material and machine base and waste storage sites in environmentally valuable areas, in water environments and wetlands as well as on land not prepared for the aforementioned functions, posing a risk of entering of pollution into surface and groundwater.
- 5) Materials must be stored in the manner that secures them against damage or in the manner that does not pose a risk to the human and property safety, such as falling over, sliding down or falling down of products and devices.
- 6) If hazardous substances and materials are stored on the building site, they must be appropriately protected, preventing the access of unauthorised persons. In addition the information on a hazard must be provided on warning boards.

Ensuring human health and safety in the surroundings of the Task implementation:

- 1) It is necessary to ensure constant control of a technical condition of machines, correct performance of works and strict observance of OHS regulations in order to eliminate an increased noise level in the works area and in its vicinity.

In the operation stage, the structures will not pose a hazard for the environment and health of users.

Contractor's OHS supervision shall be responsible for adequate marking of building site according to applicable laws. This marking shall be regularly controlled, in the case of destruction or theft of marking the Contractor shall promptly replace it or supplement it. The Contractor is responsible for training Contractor's management and engineering-technical personnel regarding the rules and conditions of the EMP. The Contractor's employees must undergo OHS training.

Mitigation measures in the scope of human health and safety protection are listed in the Appendix No 1 to the EMP.

6.12 EXTRAORDINARY HAZARDS

Crisis situation

In the event of emergency the following services must be notified:

Services	Telephone number
Emergency number from a mobile	112
Police	997
Fire Brigade	998
Emergency Medical Service	999
Municipal Police	986

Flood

The occurrence of flood in the period of construction works related to modernization of the existing embankments may be considered similar to industrial breakdown. Approach of a flood wave may be foreseen and appropriate preventive measures may be introduced which will be specified in the construction site's flood management plan for the time of the works, devised by the Contractor and approved by the Engineer.

Leakage of oil derivatives

Another type of an extraordinary hazard is the leakage of oil derivatives to water and soil. Nevertheless, for this purpose appropriate preventive measures are applied, which refer

to the adequate organisation of building sites and back-up facilities as well as continuous inspection of the construction equipment used. In the event of any spillage of oil derivatives, leakage is immediately removed and contaminated soil layers are managed in compliance with the applicable legal regulations.

Discovery of unexploded shells

The works will be conducted partially in the Odra River Valley close to the river bed. On account of the fact that during the WWII there were military actions carried out, it is possible to discover unexploded shells during construction works, which may include the following: detonators, missiles, aerial bombs, artillery and rifle bullets, armoured missiles, grenades, mines, explosive materials, scrap containing the residues of explosive materials, etc. In the event of discovering unexploded shells, the Contractor shall immediately stop the works and evacuate workers and notify the police, a licensed sapper unit as well as the Engineer and the PIU.

In the event of discovering unexploded shells, it is necessary to notify the police immediately – they will undertake further actions, such as securing the site and notifying the sapper unit.

It is strictly forbidden to dig out unexploded shells, out raise them, bury them, transfer them or throw them to the fire, river, channel, oxbow lakes, canal etc. The Investor has not tested the works site for the presence of unexploded shells.

The Contractor shall ensure sapper supervision throughout the performance of earthworks, which will consist in on-going inspection and clearance of the terrain, including the terrains of former military ranges, from hazardous objects of a military origin and their disposal.

Fire

Fire safety in the area of the Task rests with the Contactor. Detailed procedure in the event of fire will be provided in SHP Plan prepared by the Building Site Manager.

6.13 WASTE AND SEWAGE

The Task implementation will involve generation of waste; therefore in the course of works it is necessary to reduce their amount as well as adverse environmental impact.

The waste generated must be managed by the Contractor in compliance with applicable law. The Contractor should ensure the organisation of works guaranteeing waste segregation and their successive collection by authorised entities. It should also protect the building site against formation of "illegal landfills" and prior to commencement of works conduct inspection of the building site in order to identify any "illegal landfills".

The waste generated should be regularly selectively collected in appropriate containers located in dedicated areas, preventing dusting and disseminating of light fractions and then systematically discharged to the landfill.

It is prohibited to incinerate waste (e.g. in bonfires) on the building site.

It is forbidden to store any waste in the building site connected with repairs and maintenance of equipment, machines and devices used for construction works. Any repairs of machines and servicing must be carried out by specialised companies or persons authorised for such works by the manufacturer (authorised service). Waste generated during such works (i.a. damaged parts, seals, filters, containers after lubricants and fluids, used oils, fluids, etc.) must be collected by contractors of repairs and services and they cannot be stored in the building site. They must be managed in compliance with applicable law.

Hazardous waste must be handled in the following manner: by the time it is handed over to entities holding permit for waste utilisation, it is necessary to store waste preventing hazardous substances from entering the environment, i.e. in tightly closed containers, in roofed sites, on hardened and impermeable ground, protected against unauthorised access. Hazardous waste storage sites must be allocated beyond flood waters area.

Waste water discharged from improved surface and temporary site facilities (e.g. sites for storing fuels and oils, parking lots, barracks, etc.) must not transfer pollutions to surface or ground water.

Places designated for vehicles and construction machines service should be, for the time of the works, paved and equipped with appropriate sorbents. There should also be ensured drainage of rain water from paved yards ensuring removal of petrol derivatives.

Building site facilities must be equipped with required number of toilets (e.g. portable toilets) and the Contractor's employees ought to take care of their physiological needs in dedicated places.

Domestic sewage generated in the building site facility must be discharged to a sealed tanks and then regularly handed over to the sewage treatment plant. If technically feasible, it is allowed to discharge sewage to the sewage mains discharging waste to the sewage treatment plant.

It is important to ensure regular disposal of domestic sewage previously gathered in sealed and closed tanks.

The guidelines for sewage handling are provided in Appendix No 1 to EMP.

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

The Contractor on the basis of specified mitigation measures described in this EMP (Chapter 6, Appendix No 1 and decisions on environmental conditions in Appendix No 4) shall perform works as part of Contract 1A.1.

The Contractor shall prepare its own procedure of introducing mitigation measures which will be included in the Quality Assurance Plan and shall obtain the Engineer's approval prior to the commencement of works.

At the same time, the Contractor shall provide the following documents, which are necessary for the performance of construction works and shall submit them to the Engineer:

- Building site organisation design, which should include, among others, the following elements:
 - Location of the construction site facility,
 - Managing the construction site facility,
 - Securing the construction site facility,
 - Service roads,
 - Environmental protection within the construction site facility.
- Waste Management Plan, which should include, among others, the following elements:
 - Encountered and estimated types and volumes of waste,
 - Manners of preventing negative impact of the waste on environment,
 - Manners of waste management with taking into account collection, transportation, 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 construction site jointly with marking of the works,
 - OHS and environmental 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 swollen flows in the period of works performance,
 - The rules of work for the Contractor's team in the period of flood risk,
 - Basic duties of the members of the Flood Protection Team,
 - List of people with assigned duties in the period of flood risk,
 - List of equipment and transportation means needed to conduct rescue actions.

- SHP Plan, which should include, among others, the following elements:
 - Indication of site or area development elements which may pose a threat to the human safety and health,
 - Information on anticipated threats occurring during construction works, specifying the extent and type of threats as well as location and time of their occurrence,
 - Information on allocating and marking the construction site appropriately for the threat type,
 - Information on the manner of instructing workers prior to the commencement of particularly hazardous works,
 - Specification of the manner of storing and transporting materials, products, substances and hazardous substances in the building site,
 - Indication of technical and organisational measures preventing hazards resulting from the performance of construction works in the zones of particular health danger or close to them, including those ensuring fast and efficient communication, enabling immediate evacuation in the case of fire, accident or other threats,
 - Indication of a storage place for building site documentation and documents required for correct machine operation and other technical equipment.

The aforementioned documents will be approved and supervised by the Engineer.

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 Engineer shall review and approve the above-mentioned documents.

6.15 MITIGATION MEASURES DURING OPERATION PERIOD

The operation of embankments is associated with maintaining their proper technical conditions, among others, through periodical mowing of embankment plants by means of agricultural equipment or grazing.

In the Defect Notification Period, the Contractor holds responsibility for mowing embankments and reinstated areas under temporary occupation during construction period. Mowing must take place at least twice a year. The dates for mowing must be specified by the Contractor's environmental team and approved of by the Engineer, and for the following Structure: Modernization of Marwicki polder stage I and II they will be determined beyond the bird breeding season.

The Investor is responsible for subsequent years of operation of the embankments.

*Environmental Management Plan for the Contract 1A.1 Chlewice-Porzecze. Backwater
embankment of Odra River at Myśla River
and Modernization of Marwicki polder stage I and II*

It is not allowed to plant trees and shrubs on the embankments in the distance of 3 m from the embankment foot.

7 DESCRIPTION OF ENVIRONMENTAL MONITORING MEASURES

According to the decisions issued by RDOŚ in Szczecin, the Investor is obliged to notify the authorities on the commencement and completion date for works connected with the structure implementation: Chlewice-Porzecze. Backwater embankment of Odra River at Myśla River and the structure: Modernization of Marwicki polder stage I and II. The Consultant, on behalf of the Investor, is responsible for this notification.

7.1 ENVIRONMENTAL MONITORING DURING WORKS

7.1.1 LAND AND LANDSCAPE

In the case of this Task, monitoring shall comprise of the following: location of temporarily occupied sites outside the areas of environmental value, indicated by the Contractor's environmental team, location of roads, sites and building site facilities, including mitigation of impacts on the plants and land. The adherence to the rules of vehicle traffic along dedicated temporary roads and appropriate reclamation of temporarily occupied sites shall be monitored. The control of the occupation of the sites in the areas adjacent to the Task implementation site and located outside it shall also be monitored. The guidelines for this environmental element are presented in Appendix No 2 to EMP.

7.1.2 CLIMATE

In the case of the Task in question, monitoring with regard to the protection of local climate conditions has not been found necessary.

7.1.3 AIR QUALITY

In the case of the Task in question, it is not necessary to perform any monitoring with regard to the protection of local climate conditions. However, it is necessary to conduct monitoring concerning implementation of mitigation measures. Detailed guidelines concerning monitoring are specified in the Appendix No 2 to this EMP.

7.1.4 SOIL AND LAND

It is assumed to conduct monitoring of the correct implementation of mitigation measures. Detailed guidelines in the scope of monitoring are specified in the Appendix No 2 to this EMP.

7.1.5 SURFACE WATER

Due to the limited scope of the impact of the development on surface water, it has not been found necessary to monitor biological elements during the construction of the embankments and afterwards.

Monitoring of surface water in the Task area is not required – according to the issued environmental decision, there will be no work on the side of the riverbed and no disturbance of the natural undergrowth of the banks of the river and its ecosystem.

It is assumed to conduct monitoring of the correct implementation of mitigation measures. Detailed guidelines in the scope of monitoring are specified in the Appendix No 2 to this EMP.

7.1.6 GROUNDWATER

Continuous monitoring of the quality of groundwater is not necessary because there is no potential risk of polluting. It is assumed to conduct monitoring of the correct implementation of mitigation measures, Detailed guidelines in the scope of monitoring are specified in the Appendix No 2 to this EMP.

7.1.7 ACOUSTIC CLIMATE

It is assumed to conduct monitoring of the correct implementation of mitigation measures. Detailed guidelines in the scope of monitoring are specified in the Appendix No 2 to this EMP.

7.1.8 NATURE

A fundamental condition outlined in the aforementioned decision is to appoint the Contractor of the environmental team for the duration of the entire period of works. The Contractor's environmental team monitor adverse impacts on natural habitats and habitats of species under the Community interest, as well as flora and fauna species under legal protection, which are impossible to be predicted and/or were impossible to reveal at the stage of establishing the conditions for the Task implementation.

Such a team, consisting of specialists in natural habitats and flora, invertebrate species, ichthiofauna, ornithology, chiropterology and water, ought to be responsible for the correct implementation of the Contract within the context of implementing mitigation activities, including areas under protection and should respond on a current basis to any threats which must be handled through the adequate organisation and technology of works.

Effectiveness of the activities conducted according to the needs in order to remove external, invasive plant species, should be monitored.

It is also assumed to conduct monitoring of the correct implementation of mitigation measures. Detailed guidelines in the scope of monitoring are specified in the Appendix No 2 to this EMP.

7.1.9 CULTURAL LANDSCAPE AND MONUMENTS

Monitoring measures in respect of cultural landscape and historic monuments are of preventive nature – due to the potential presence of archaeological sites near the development site, supervision by a specialist (archaeologist) is advisable; if necessary emergency research should be done in consultation with the Provincial Monument Conservator. The monitoring also covers implementation of correct procedure in case of

finding valuable items or other historical substance and implementation of works covered by possible permit of the Provincial Conservator of Historic Monuments (archaeological rescue survey).

Detailed guidelines in the scope of monitoring are specified in the Appendix No 2 to this EMP.

7.1.10 TANGIBLE ASSETS

Monitoring of protection of material goods will include checking the correct reinstatement of the previous condition (condition preceding the commencement of construction works) in the area of temporary occupation, as well as monitoring of the structures and buildings which deteriorated as a result of the works. Monitoring will also include condition of buildings and roads at risk.

7.1.11 HUMAN HEALTH AND SAFETY

Threats to the human health and safety must be monitored on a current basis by the Contractor's personnel and Engineer at the works construction stage. The guidelines for this environmental element are presented in Appendix No 2 to EMP.

7.2 ENVIRONMENTAL MONITORING DURING OPERATIONAL PERIOD

Environmental monitoring of the development at the operation stage includes checking proper maintenance of the embankments.

8 PUBLIC CONSULTATIONS

8.1 PUBLIC CONSULTATIONS OF ENVIRONMENTAL IMPACT REPORT (2012)

In accordance with Polish EA procedure the Task was subject to mandatory public consultations performed within the environmental impact assessment at the stage of issue of the decision of environmental conditions of the Task.

Detailed information on the commencement of EIA for the structure "Chlewice-Porzecze. Backwater embankment of Odra River at Myśla River" and the possibility of becoming familiar with the content of the EIA report was publically announced in the notice of 2nd December 2011 on the information board of the Boleszkowice Commune Office between 2nd December 2011 and 10th January 2012 and on the information board of the Regional Environmental Protection Authority in Szczecin between 5th December 2011 and 27th December 2011 (ref: WOOŚ-TŚ.4233.7.2011.DK.14). The relevant announcement was also published on the BIP¹⁵ website. Within the specified time limit, no observations or proposals concerning the EA report were submitted.

For "Modernization of Marwicki polder stage I and II", in accordance with the decision issued by the Regional Director of Environmental Protection in Szczecin of 27 August 2013 on environmental conditions for the development project named: "Rebuilding of flood embankments along the Odra River in Gryfin Powiat" there was no need of preparing an environmental impact report due to the minor range of interference and modification of the existing environmental conditions.

8.2 PUBLIC CONSULTATIONS OF THE ENVIRONMENTAL MANAGEMENT FRAMEWORK (2015)

The draft of EMF was subject to the public consultation procedure carried out in compliance with the World Bank Operational Policy OP 4.12 in order to enable the public to read the document and ensure a possibility of submitting comments and questions to its content.

Documentation of the public consultation process of EMF is available on the website of the Odra-Vistula Flood Management Project Coordination Unit¹⁶.

¹⁵ http://archiwumbip.szczecin.rdos.gov.pl/index.php?option=com_content&view=article&id=1884:obwieszczenie-z-dn-02122011-r-w-sprawie-przedsiwzicia-pod-nazw-wa-przeciwpowodziowy-chlewice--porzecz--wa-cofkowy-rzeki-odry-przy-rzece-myli&catid=39:obwieszczenia&Itemid=81

¹⁶

http://www.odrapcu.pl/doc/OVFMP/RPZSiS_Zalacznik_08_Raporty_z_procedury_upublicznienia_projektu_EMAF.pdf;

http://www.odrapcu.pl/doc/OVFMP/RPZSiS_Zalacznik_09_Raporty_z_konsultacji_spolecznych_RAF.pdf

8.3 PUBLIC CONSULTATIONS OF THE ENVIRONMENTAL MANAGEMENT PLAN (2016)

Draft of EMP for the Contract 1A.1 Chlewice and Porzecze. Backwater embankment of Odra River at Myśla River. Modernization of Marwicki polder stage I and II was subject to the public consultations carried out in compliance with the requirements of the World Bank operational policies (OP 4.12.) Public consultations were to enable the natural persons, institutions and all interested parties to familiarise with the document and ensure a possibility of submitting comments, questions and motions to its reading.

After developing the draft EMP, on 24.04.2016, an electronic version of the document was placed on the website of the West Pomerania Board of Amelioration and Hydraulic Structures in Szczecin (<http://melioracja.zzmiuw.pl>) Boleszkowice Commune (www.boleszkowice.pl), Gryfino Town Hall and Commune Office (www.gryfino.pl), Widuchowa Commune (www.widuchowa.pl) and PCU (www.odrapcu.pl).

Detailed information on a possibility of reading draft EMP and a possibility of filing motions and comments, including contact details (e-mail, address of a place where it was possible to read such a draft document, office hours, telephone number) were published in the local press. The announcement was published on 24.05.2016 in Gazeta Gryfińska and in the local supplement to Gazeta Wyborcza. Additionally, the Announcement including the above information was also published on the above mentioned websites of ZZMiUW in Szczecin and on the website of PCU. The published Announcement also included information on the planned consultation meetings within the EMP public disclosure (with providing the date, time, place and purpose of the meetings).

A hard copy of the documentation was provided and available for all the interested parties in the period between 24.05.2016 and 08.06.2016 inclusively (i.e. for 10 working days), at the seat of ZZMiUW in Szczecin (ul. Wyzwolenia 105, Szczecin), at the seat of the Commune Office in Boleszkowice (ul. Świerczewskiego 24, Boleszkowice), at the seat of Gryfino Town Hall and Commune Office (ul. 1 Maja 16, Gryfino) and Widuchowa Commune Office (ul. Grunwaldzka 8, Widuchowa). During the public disclosure no people who wanted to get familiarised with the hard copy of the document in the indicated locations were noticed. However, downloading of the files from the indicated websites was observed.

During the public disclosure, questions and remarks concerning the content of draft EMP was sent by electronic mail and it was properly analysed. The Consultant provided answers and explanations to questions and remarks, which were then sent to persons and entities who submitted them.

After the end of the 10- working-days period of the draft EMP public disclosure, there were two meetings open to all the interested parties. The first meeting was organised on 09.06.2016 in the Village Club in Namyślin (Namyślin 70, Namyślin), at 4:30 p.m. 15 people participated in the meeting. The Meeting was opened by the Consultant, who presented information on the rules of developing and functioning of Environmental Management Plans during the implementation of the investments co-financed by the World Bank, as well as detailed information on the draft EMP for the Contract 1A.1 Chlewice-Porzecze. Backwater embankment of Odra River at Myśla River. Modernization of Marwicki polder stage I and II

Environmental Management Plan for the Contract 1A.1 Chlewice-Porzecze. Backwater embankment of Odra River at Myśla River and Modernization of Marwicki polder stage I and II

(with particular attention paid to the structure: Chlewice and Porzecze. Backwater embankment of Odra River at Myśla River).

Upon completing all presentations, the Consultant encourages the public to ask questions and report any remarks and doubts concerning the presented document. In the course of this debate in the rural common-room the participants asked a number of questions which were answered by the Consultant in the course of the meeting. After it was confirmed that the meeting participants received answers to all the questions, those present were thanked for attending the meeting and for their active participation. And here the meeting ended.

The second meeting was held on 10.06.2016 at 4:30 in a conference room, at the seat of Gryfino Town Hall and Commune Office (ul. 1 Maja 16, Gryfino). 10 people participated in the meeting. The Meeting was opened by the Consultant, who presented information on the rules of developing and functioning of Environmental Management Plans during the implementation of the investments co-financed by the World Bank as well as detailed information on the draft EMP for the Contract 1A.1 Chlewice-Porzecze. Backwater embankment of Odra River at Myśla River. Modernization of Marwicki polder stage I and II (with particular attention paid to the structure: Modernization of Marwicki polder stage I and II).

Upon completing all presentations, the Consultant encourages the public to ask questions and report any remarks and doubts concerning the presented document.

The Consultant gave the audience the answers and explanations to all the issues raised. After it was confirmed that the meeting participants received answers to all the questions, those present were thanked for attending the meeting and for their active participation. And here the meeting ended.

By the letter of 13th June 2016, the Head of Boleszkowice Commune, in reference to the consultation meeting of 9th June 2016, handed over his remarks to the draft EMP and further implementation of the Task. The Consultant provided answers and explanations to submitted comments, which were then sent to the Head of Boleszkowice Commune.

Remarks and motions handed over during the draft EMP consultation process and both debates were also analysed 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.

9 EMP IMPLEMENTATION ORGANIZATIONAL STRUCTURE

The said Task constitutes a part of the Odra-Vistula River Flood Management Project, co-financed from the World Bank's funds (1A Subcomponent structures). 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

PCU is responsible for the entire coordination of the Project implementation. PCU belongs to budget units supervised by the President of the KZGW.

The PCU tasks in respect to implementation of this EMP are, as follows:

- cooperation with the Ministry of Finance, the Ministry of Interior Affairs and Administration, Ministry of the Environment, the KZGW and other bodies of government and self-government administration connected with the Project implementation;
- coordination of activities of PIU and supporting such units within EMP implementation;
- monitoring and assessment of the EMP implementation progress;
- ongoing cooperation with the World Bank, including the preparation of quarterly progress reports on the Project implementation.

9.2 PROJECT IMPLEMENTATION UNIT (PIU)

An entity which is directly responsible for implementing EMP for the Task and monitoring the progress in its implementation is PIU as a regional self-government agency (ZZMiUW in Szczecin).

PIO is a separate organisational cell subordinate supervised by the ZZMiUW Director. This structure is transparent and has a high decisive level which increases the effectiveness of the Task implementation.

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

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

The scope of PIO 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 supervising over the correct Task implementation;
- cooperation with PCU;
- conducting an administration and legal supervision over EMP implementation;
- verifying the Reports and accounts of EMP implementation prepared by the Consultant and Contractor;
- conducting a financial supervision over EMP implementation;
- supervising the proper application of formal procedures during the implementation of EMP, as required by the Construction Law, Contracts, the Environmental Protection Law and other documents.

9.3 ENGINEER

The role of the Engineer is to support PIU in the effective performance of the entire Task process (from the preparation of the Task to its settlement) carried out as part of the ZZMiUW tasks. An Engineer is appointed by means of QCBS (Quality and Cost Based Selection) method, according to the *Guidelines for the Appointment and Employment of Consultants by the World Bank Loaners*. In accordance with the scope specified in the Engineer Contract, Engineer will be obliged to perform the supervision over EMP implementation, comprising, i.a. the following:

- monitoring of EMP implementation;
- monitoring the Contractor' activities;
- verifying the quality of construction works performed by the Contractor and the construction materials, including but not limited to preventing the use of defective and not approved construction products;
- representing ZZMIUW in Szczecin 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 the mitigation measures the negative impact on the environment;
- conducting additional studies, if it is necessary to verify Contractor's reports;
- identifying problems resulting from a harmful environmental impact of the implementation of construction works on environment and presenting a proposal for solving such problems;
- checking and accepting construction works to be covered up and concealed, participating in technical tests and site acceptances of technical plants and devices 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:

- conducting construction works according to the rules specified in EMP, Contract conditions and design documentation pursuant to applicable legal provisions and requirements of administrative decisions issued for the Task;
- carrying out the Engineer's recommendations (including the recommendations of experts from Engineer's environmental team and the Investor's supervision) concerning the implementation of EMP;
- ensuring the preparation of a Safety and Health Protection Plan, Waste management plan, Quality assurance plan, The construction site's flood management plan for the time of the works and Building site organisation design;
- keeping the construction site documentation;
- drafting monthly reports and technical inspection reports;
- the preparing reports concerning environmental protection;
- application for the changes in the project solutions to ZZMiUW in Szczecin if it is justified by the necessity of increasing the safety of the construction works performance or improving the construction process within the scope concerning EMP implementation.

10 EMP IMPLEMENTATION SCHEDULE AND REPORTING PROCEDURE

The implementation of EMP will allow the parties involved in the preparation, performance and supervision of Task to:

- identify different environmental aspects which have a considerable impact on the state of the environment and therefore to control, correct, and reduce them but which, consequently, generate economic effects;
- rectifying adverse consequences of the works conducted during the implementation to the benefit of the environment and financial results;
- determine the aims and tasks performed within the adopted environmental policy, covered by 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:

- a risk to ignore the environmental protection issues during the process of implementation of the Task by Contractors of the work;
- 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 the selection of the Contractor, the Contracting Authority will submit a draft of this EMP to the World Bank in order to obtain its opinion;
- EMP will be then subject to public consultations;
- after the public consultations (and supplementing the document with the consultations results), EMP will be supplemented and submitted in its final version for the approval by the World Bank;
- upon the approval of EMP by the World Bank, a final document will be attached to the Bidding Documents for selection of the Contractor;
- all activities of the Contractor will be systematically reported (once a month), both in Polish and in English, in paper and electronic versions, with reference to the obligations required by EMP and other contractual documents. These documents will be subject to the approval of the Engineer and the Contracting Authority.

Furthermore, an environmental decision imposes an obligation of monitoring the Task's environmental impact within the scope of natural environmental monitoring, which consists of:

- Prior to the commencement of the next stage of works implementation the nature survey within the Task impact shall be performed.
- During the implementation of the Task constant supervision of environmental team shall be ensured.
- Constant monitoring and maintenance in good working order of all devices during operations shall be ensured.
- RDOŚ in Szczecin shall be informed about the dates of works commencement and completion.
- Information on the decisions concerning the method and scope of the performance of mitigation measures, and also documents confirming the participation of specialists (e.g. memorandum of understanding and/or a declaration of a specialist confirming the proper performance of activities) should be submitted to the Regional Director for Environmental Protection in Szczecin together with the reports mentioned above.

Monitoring at the civil works execution stage involves the preparation of 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 team and approved and submitted to RDOŚ by PIU. 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.

The Project reporting system will also be based on monthly reports submitted by the Contractors to 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. On this basis there will be consolidated and quarterly reports drawn-up.

PIU shall supply 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 PCU. Furthermore, especially in the case of problems with the Task implementation, the PCU shall expect 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) Report review by the Engineer,
- c) Submission of a report to the Employer (for information),
- d) Submission of a report to RDOŚ in Szczecin (only within the scope required by the environmental decision),
- e) Submission of a PIU's quarterly report to PCU.

2) Archiving:

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

3) Evaluation – on-going assessment of the outcomes of the planned activities implementation which arise from EMP. Ongoing analysis of documentation (the Reports of the Contractor of the works) by the Engineer. Providing the Employer with reliable information on the course of the construction process, including the fulfilment of activities limiting the adverse impact on the environment and recommendations arising from environmental decisions.

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 (EMP final reports drawn up by the Contractor and the Engineer),
 - ✓ EMP Report upon expiry of the Defects Notification Period drawn up by the Engineer.

SOURCE MATERIALS

- Decision issued by the Regional Director of Environmental Protection in Szczecin of 30 October 2012 on environmental conditions for the project implementation: Flood Embankment Chlewice-Porzecze - backwater embankment of Odra River at Myśla River;
- Decision issued by the Regional Director of Environmental Protection in Szczecin of 27 February 2012 on environmental conditions for the project implementation: Flood Embankment Chlewice-Porzecze - backwater embankment of Odra River at Myśla River;
- Decision issued by the Regional Director of Environmental Protection in Szczecin of 29 October 2013 on environmental conditions for the project implementation: Rebuilding of flood embankments along the Odra River in Gryfin District;
- Decision issued by the Regional Director of Environmental Protection in Szczecin of 27 August 2013 on environmental conditions for the project implementation: Rebuilding of flood embankments along the Odra River in Gryfin District;
- Gonczarewicz A., Nowicki J., Wira J. 2012. Construction design: "Rebuilding of flood embankments along the Odra River in Gryfin District ", Gryfino, Widuchowa, Gryfino District, Zachodniopomorskie Province. Employer ZZMiUW in Szczecin;
- Environmental and Social Management Framework for Odra-Vistula Flood Management Project;
- Demographical Year 2015. Central Statistical Office, Warsaw;
- Siemiński W., Kowalczyk W. 2011. Construction Design: Flood Embankment Chlewice-Porzecze - backwater embankment of Odra River at the Myśla River, Commune Boleszkowice, Chlewice District, Namyślin District, Employer ZZMiUW in Szczecin;
- Resolution No XXVIII/128/05 of Boleszkowice Commune Council of 31st March 2005 on: passing a study of conditions and spatial land development of Boleszkowice Commune;
- Resolution No XLVIII/293/2010 of Boleszkowice Commune Council of 29th October 2010 on: passing the amendment to the study of conditions and spatial land development of Boleszkowice Commune;

APPENDICES

APPENDIX NO 1 – PLAN OF MITIGATION MEASURES

APPENDIX NO 2 – PLAN OF MONITORING MEASURES

APPENDIX NO 3 – LIST OF NATIONAL LEGAL ACTS CONNECTED WITH THE ENVIRONMENTAL PROTECTION

APPENDIX NO 4 - COPIES OF THE FINAL ADMINISTRATIVE DECISIONS ISSUED FOR THE TASK (WITHIN THE CONTRACT 1 A.1)

- Decision of the Regional Director for Environmental Protection in Szczecin of 30th October 2012, No. 23/2012 setting out the environmental conditions for works implementation for the structure: “Chlewice-Porzecze. Backwater embankment of Odra River at Myśla River”
- Decision of the Regional Director for Environmental Protection in Szczecin of 27th February 2012, No. 8/2012 on environmental conditions for the structure: “Chlewice-Porzecze. Backwater embankment of Odra River at Myśla River”,
- Decision of the Regional Director for Environmental Protection in Szczecin of 3th Decembre 2015 approving intentional scaring away and disturbing *Passer domesticus*, *Passer montanus*, *Certhia brahcydactula*, *Fringilla coelebs*, *Carduelis carduelis* and *Carduelis chlorus* in their breeding season, in the localisation of breeding and young species raising, in connection with the implementation of the Project named: “Flood Embankment – Chlewice – Porzecze – backwater embankment of the Odra River at the Myśla River”.
- Decision of the Regional Director for Environmental Protection in Szczecin of 29th October 2013, No. 44/2013 establishing environmental conditions for works implementation for the structure: “Rebuilding of flood embankments along the Odra River within the area of Gryfin county (powiat)”,
- Decision of the Regional Director for Environmental Protection in Szczecin of 27th August 2013, No 11/2013 on environmental conditions for the structure: “Rebuilding of flood embankments along the Odra River within the area of Gryfin county (powiat)”,
- Decision of the Regional Director for Environmental Protection in Szczecin of 15th April 2016 approving departures from the prohibitions concerning the bird species under protection, i.e. purposeful destruction of two nests and natural habitats of a magpie *Pica pica*, located on the plot No 291, Gryfino I district, Gryfino Commune, in connection with the implementation of the Project named: “Reconstruction of flood embankments along the Odra River within the section from km 708+680 to km 726+231”.

APPENDIX NO 5 – LOCATION MAP OF THE TASK

APPENDIX NO 6 – LOCATION MAP OF THE TASK ON THE BACKGROUND OF DESIGNATED AREAS AND NATURA 2000 NETWORK

APPENDIX NO 7 – POTENTIAL FLOOD RISK AREA

APPENDIX NO 8 – AREAS EXCLUDED FROM A POTENTIAL FLOOD RISK ZONES