

## **APPENDIX 2**

### **REVIEW OF COMPREHENSIVE, PRE-INVESTMENT MARINE ENVIRONMENTAL STUDIES**

## Review of comprehensive, pre-investment marine environmental studies

No.	Environmental component tested	Research scope	Research period	Source document
1	<b>Hydrological, meteorological and hydrochemical studies</b>	<p>The study area included MFW Bałtyk Północny (now MFW Bałtyk I) along with a 1 NM wide buffer from the development area border. Meteorological, hydrological and hydrophysical monitoring was performed in accordance with the methodology and scope of work described in Appendix 2 of this Project Information Card.</p> <p>Hydrological monitoring is carried out at two measuring stations, at the central point of the study area and at the shallowest point of the marine area. Meteorological conditions are measured at both measuring stations. Within the framework of hydrological and meteorological monitoring, the following parameters are measured: air temperature, water temperature, atmospheric pressure, flow in the water-depth, wave movement on the sea surface, water salinity, electrical conductivity of water, wind at the height of about 5 m above sea level (direction and speed) and water pressure.</p>	December 2020 – February 2021	MEWO S.A., “Quarterly survey progress report 1, Pre-investment marine environmental survey programme for environmental impact assessment of the MFW Bałtyk I project”, issued 17.05.2021 (hereinafter referred to as “Quarterly Report 1”, MEWO S.A.)
			March – May 2021	Quarterly Report 2, MEWO S.A., issued 03.08.2021
			June – August 2021	Quarterly Report 3, MEWO S.A., issued 23.11.2021
			September – November 2021	Quarterly Report 4, MEWO S.A., issued 14.01.2022
			January 2021 – February 2022 (12+1 months)	Final Report, MEWO S.A., issued 14.02.2022
	<i>Hydrological, meteorological and hydrochemical studies – <u>archival research</u></i>	<p><i>The study area included MFW Bałtyk Północny (now MFW Bałtyk I) along with a 1 NM wide buffer from the development area border and included:</i></p> <ul style="list-style-type: none"> <li><i>Studies of ocean currents and hydrometeorological conditions.</i></li> </ul>	<p><i>Year-long study (12+1 months)</i></p> <p><i>The study was completed in January 2013 (incomplete study period)</i></p>	<p><i>Maritime Institute in Gdańsk: Study of Maritime Environment for the Environmental Impact Assessment of Bałtyk Północny Offshore Wind Farm, Regular Autumn Report, Hydrological Surveys, May 2013</i></p> <p><i>Maritime Institute in Gdańsk: Study of Maritime Environment for the Environmental Impact</i></p>

No.	Environmental component tested	Research scope	Research period	Source document
		<ul style="list-style-type: none"> <li>Water quality testing: 6 times a year of the following hydrochemical parameters: aerobic conditions (dissolved oxygen, five-day oxygen demand (BOD5), total organic carbon (TOC), acidification (pH), alkalinity, biogenic substances (ammonia nitrogen, nitrate nitrogen, total nitrogen, mineral nitrogen, phosphates, total phosphorus), suspended matter in the surface and bottom layers.</li> <li>Determination on the basis of analyses of water samples taken once a year, at two points, of the content of substances particularly harmful to the environment, such as: mercury, nickel, lead, cadmium, arsenic, total chromium, chromium (VI), phenols, cyanides, mineral oils, polycyclic aromatic hydrocarbons (PAH), polychlorinated biphenyls (PCB).</li> </ul>		Assessment of Bałtyk Północny Offshore Wind Farm, Regular Winter Report, Hydrological Surveys, May 2013
	Hydrographic conditions – <u>archival research</u>	<p>The modeling area included the MFW Bałtyk Północny area. DHI created and refined a full 3D model of the internal Danish and Baltic waters to calculate the hydrodynamics around the wind farm.</p> <p>Hydrographic modeling in order to:</p> <ul style="list-style-type: none"> <li>establish initial conditions with respect to sea currents, salinity and water temperature</li> </ul>	April – June 2013	DHI: EIA offshore wind farms Poland EEZ – OWF BP Hydrographic conditions – final report v3, June 2013

No.	Environmental component tested	Research scope	Research period	Source document
		<ul style="list-style-type: none"> <li>• <i>assess long term impacts on hydrodynamic conditions due to operations and short term impacts due to dredging</i></li> <li>• <i>assist in the identification of the distribution of suitable habitat for marine mammals and waterbirds (temporal and spatial distribution of e.g. salinity, currents, depths, etc.).</i></li> </ul>		
2	<b>Seabed survey</b>	The study area included MFW Bałtyk Północny (now MFW Bałtyk I) along with a 1 NM wide buffer from the development area border. Bathymetric, sonar, and seismic measurements (shallow seismic and seismoacoustic profiling) were taken from a SITULA unit. Research: geophysical surveys, bathymetry, side scan sonar, shallow seismic and seismoacoustic surveys, magnetometry and shallow core sampling.	December 2020 – February 2021	Quarterly Report 1, MEWO S.A., issued 17.05.2021
			March – May 2021	Quarterly Report 2, MEWO S.A., issued 03.08.2021
			June – August 2021	Quarterly Report 3, MEWO S.A., issued 23.11.2021
			September – November 2021	Quarterly Report 4, MEWO S.A., issued 14.01.2022
3	<b>Studies on physicochemical properties of sediments</b>	The study area included MFW Bałtyk Północny (now MFW Bałtyk I) along with a 1 NM wide buffer from the development area border. The surveys followed the methodology described in <i>Appendix 2</i> . Sediment sampling was initiated as part of the study of sediment physicochemical properties. This was conducted from the MINTIS unit on February 23 and 24, 2021. Sampling was conducted at 20 test stations out of 188 planned.	December 2020 – February 2021	Quarterly Report 1, MEWO S.A., issued 17.05.2021

No.	Environmental component tested	Research scope	Research period	Source document
		Sediment sampling for the first campaign was completed. Testing included granulometric and physicochemical analysis of the sediments.	March – May 2021	Quarterly Report 2, MEWO S.A., issued 03.08.2021
		Sediment sampling was conducted as part of the second campaign to investigate the physicochemical properties of sediments. As part of the second campaign, the study covered the summer period and consisted of physicochemical analysis of the collected sediments and macroscopic description.	June – August 2021	Quarterly Report 3, MEWO S.A., issued 23.11.2021
		Continued and completed laboratory analyses of sediment samples collected in the area as part of the second campaign for testing physical and chemical properties of sediment samples.	September – November 2021	Quarterly Report 4, MEWO S.A., issued 14.01.2022
4	<b>Marine aggregate research</b>	The study area included MFW Bałtyk Północny (now MFW Bałtyk I) along with a 1 NM wide buffer from the development area border. The surveys followed the methodology described in <i>Appendix 2</i> . Analysis of data collected during seabed and sediment physicochemical properties surveys has begun.	December 2020 – February 2021	Quarterly Report 1, MEWO S.A., issued 17.05.2021
		Analysis of data collected during seabed and sediment physicochemical properties surveys was performed.	March – May 2021	Quarterly Report 2, MEWO S.A., issued 03.08.2021
		Bathymetric and sonar data, including data from follow-up surveys conducted during the reporting period, were analyzed to identify potential areas	June – August 2021	Quarterly Report 3, MEWO S.A., issued 23.11.2021

No.	Environmental component tested	Research scope	Research period	Source document
		of exploitable resources. Core sampling began in late August.		
5	<b>Acoustic background research</b>	The study area included MFW Bałtyk Północny (now MFW Bałtyk I) along with a 2 NM wide buffer from the development area border. The surveys followed the methodology described in <i>Appendix 2</i> . Background sound monitoring was conducted using stand-alone SM4M Submersible Wildlife Acoustics sound recorders equipped with an HTI-96 omnidirectional ultrasonic hydrophone recording ambient noise in the frequency range of 2 Hz to 192 kHz. Monitoring was conducted in accordance with international standards and methodology described in <i>Appendix 2</i> .	December 2020 – February 2021	Quarterly Report 1, MEWO S.A., issued 17.05.2021
			March – May 2021	Quarterly Report 2, MEWO S.A., issued 03.08.2021
			June – August 2021	Quarterly Report 3, MEWO S.A., issued 23.11.2021
			September – November 2021	Quarterly Report 4, MEWO S.A., issued 14.01.2022
			November 2021 – February 2022	Final report, MEWO S.A., issued 28.02.2022
	<i>Acoustic background – archival research</i>	<i>The research concerned the area of the MFW Bałtyk Północny near the Southern Bank and included 2 measuring stations. The purpose of this study was to monitor external noise along with porpoise monitoring using C-POD.</i>	<i>Acoustic background was monitored for October 2012 through January 2013, and then from January 2013 using a different receiver through April 2013.</i>	<i>DHI: EIA offshore wind farms Poland EEZ – OWF BP  EIA assessment on marine mammals – final report concerning research on ambient noise, v3, July 2013</i>
6	<b>Benthos research</b>	The study area included MFW Bałtyk Północny (now MFW Bałtyk I) along with a 1 NM wide buffer measured from the development area border. The surveys followed the methodology described in <i>Appendix 2</i> . Macrozoobenthos surveys were initiated in the MFW Bałtyk I area during this reporting period.	March – May 2021	Quarterly Report 2, MEWO S.A., issued 03.08.2021

No.	Environmental component tested	Research scope	Research period	Source document
		Phytobenthos surveys were conducted. Surveys were conducted in June and July 2021. The surveys followed the methodology described in <i>Appendix 2</i> .	June – August 2021	Quarterly Report 3, MEWO S.A., issued 23.11.2021
		Phytobenthos and macrozoobenthos surveys in accordance with the quarterly reports described above.	As above.	Final Report, MEWO S.A., issued 19.01.2022
7	<b>Ichthyofauna research</b>	The study area included MFW Bałtyk Północny (now MFW Bałtyk I) along with a 1 NM wide buffer measured from the development area border. The surveys followed the methodology described in <i>Appendix 2</i> .  Winter campaign research began. Conducted surveys: (1) fishing for ichthyoplankton at 7 stations from the vessel r/v BALTICA, (2) hydroacoustic surveys from the ship (analysis of the density and characteristics of the pelagic fish assemblage in the study area was realized using complementary methods of hydroacoustic sounding and pelagic control hauls), (3) fishing for demersal fish using gillnets.	December 2020 – February 2021	Quarterly Report 1, MEWO S.A., issued 17.05.2021
		The spring campaign included ichthyoplankton sampling, pelagic hauls, and fishing with gillnets.	March – May 2021	Quarterly Report 2, MEWO S.A., issued 03.08.2021
		The summer campaign included ichthyoplankton sampling, pelagic hauls, and fishing with gillnets.	June – August 2021	Quarterly Report 3, MEWO S.A., issued 23.11.2021

No.	Environmental component tested	Research scope	Research period	Source document
		The autumn campaign included ichthyoplankton sampling, pelagic hauls, and fishing with gillnets.	September – November 2021	Quarterly Report 4, MEWO S.A., issued 14.01.2022 Final Report, MEWO S.A., issued 13.01.2022
	<i>Ichthyofauna – archival research</i>	<p><i>The study area included MFW Bałtyk Północny (now MFW Bałtyk I) together with the buffer of 1 Mm offshore measured from the development area border and covered:</i></p> <ul style="list-style-type: none"> <li><i>Pelagic fish assemblage surveys including: hydroacoustic surveys, pelagic control hauls, ichthyoplankton surveys, and hydrometeorological measurements, as well as</i></li> <li><i>Studies of demersal fish communities</i></li> </ul>	<p><i>04-08 October 2012</i></p> <p><i>13-14 November 2012</i></p>	<p><i>Maritime Institute in Gdańsk: Ichthyofauna study in the area of the Northern Baltic Marine Wind Farm (MFW BP)</i></p> <p><i>Fall report for reporting period I (September – November 2012 r.)</i></p>
8	<b>Seabirds and migratory birds</b>	<p>The study area included MFW Bałtyk Północny (now MFW Bałtyk I) along with a 8 NM wide buffer measured from the development area border. The surveys followed the methodology described in <i>Appendix 2</i>.</p> <p>First reporting period. Adjustments were made to transects for seabirds. Applied methodology was in accordance with <i>Appendix 2</i>.</p> <p>Surveys of spring migration of birds were carried out. Monitoring of migratory birds was performed in accordance with the methodology and the scope of work, as well as in accordance with applicable recommendations and regulations.</p>	March – May 2021	Quarterly Report 2, MEWO S.A., issued 03.08.2021



No.	Environmental component tested	Research scope	Research period	Source document
		During the reporting period, seabird observations were conducted and autumn bird migration surveys were initiated.	June – August 2021	Quarterly Report 3, MEWO S.A., issued 23.11.2021
		During the autumn season, covering the months of September through November, six seabird survey campaigns consisting of a single cruise were conducted, covering all transects each time. Surveys of autumn bird migration continued.	September – November 2021	Quarterly Report 4, MEWO S.A., issued 14.01.2022
			Spring (March – May) and autumn (August – November) 2021	Final Report, MEWO S.A., issued 28.02.2022
	<i>Seabirds and migratory birds – archival research</i>	<i>Study area MFW Bałtyk Północny (now: MFW Bałtyk I) and Bałtyk Środkowy III. Studies included:</i> <ul style="list-style-type: none"> <li><i>Daytime surveys: observing (counting birds took place not only in the area allocated to the project but also in the adjacent water body</i></li> <li><i>Night-time surveys: acoustic and radar measurements</i></li> </ul>	<i>June – September 2012</i>	<i>Pomarinus Ornithological monitoring of the area under construction of marine wind farm “Bałtyk Północny” Interim Report No. 1</i>
			<i>October – December 2012</i>	<i>Pomarinus Ornithological monitoring of the area under construction of marine wind farm “Bałtyk Północny” Interim Report No. 2</i>
			<i>January – February 2013</i>	<i>Pomarinus Ornithological monitoring of the area under construction of marine wind farm “Bałtyk Północny” Interim Report No. 3</i>

No.	Environmental component tested	Research scope	Research period	Source document
		<p><i>Study area MFW Bałtyk Północny (now MFW Bałtyk I)</i></p> <p><i>Analysis of historical bird distribution surveys (2004/2005 and 2007) for the Bałtyk Środkowy II and Bałtyk Środkowy III areas.</i></p> <p><i>Analysis of quarterly reports prepared by Prof. W. Meissner (Pomarinus Ornithological monitoring of the area under construction of marine wind farm "Bałtyk Północny" Interim Report No. 1 and Pomarinus Ornithological monitoring of the area under construction of marine wind farm "Bałtyk Północny" Interim Report No. 2).</i></p>	<p><i>April – May 2013</i></p> <p><i>August – October 2013</i></p>	<p><i>DHI: "EIA offshore wind farms Poland EEZ – OWF BP. EIA assessment on birds – final report" v2, June 2013</i></p> <p><i>Including Annex 3 prepared by DHI: R. Żydelis "Evaluation of Interim Reports No. 2: "Ornithological Monitoring of the MFW Bałtyk Północny" and "Bałtyk Środkowy" and the reference area "Ślupsk Bank".</i></p>
		<p><i>Surveys in the Southern Middle Bank area were also conducted by Baltic Power Sp. z o.o. as this area is important for birds during wintering or can be a stopover during migration. Birds were observed from the boat in the whole area, on water and in migration. Surveys were divided into 4 migration periods: spring, summer, fall and winter. A total of 13 survey campaigns were conducted.</i></p>	<p><i>October 2018 – November 2019</i></p>	<p><i>Environmental Impact Assessment of Baltic Power offshore wind farm, MEWO S.A. and Maritime Institute of Gdynia Maritime University, July 2020</i></p>
9	<b>Marine mammals</b>	<p>The study area included MFW Bałtyk Północny (now MFW Bałtyk I) along with a 2 NM wide buffer measured from the development area border. The surveys followed the methodology described in <i>Appendix 2</i>.</p>	December 2020 – February 2021	Quarterly Report 1, MEWO S.A., issued 17.05.2021
			March – May 2021	Quarterly Report 2, MEWO S.A., issued 03.08.2021
			June – August 2021	Quarterly Report 3, MEWO S.A., issued 23.11.2021

No.	Environmental component tested	Research scope	Research period	Source document
		Passive acoustic monitoring using C-POD equipment was conducted to confirm the presence of porpoises. In addition, aerial observations were made in the area and adjacent waters to confirm the presence of harbour porpoises and other marine mammal species. Furthermore, observations of marine mammals were conducted during cruises performed as part of seabird surveys.	September – November 2021	Quarterly Report 4, MEWO S.A., issued 14.01.2022
			December 2021 – March 2022	Final Report, MEWO S.A., to be issued in March 2022
	<i>Marine mammals – archival research</i>	<i>The research concerned the area of the MFW Bałtyk Północny near the Southern Bank and included 3 measuring stations. Passive acoustic monitoring along with porpoise monitoring using C-POD. Visual monitoring from the plane (approx. 6000km<sup>2</sup>)</i>	<i>Acoustic monitoring was carried out in: October 2012, January and April 2013</i>  <i>Visual monitoring was carried out on: 12 October and 19 November, 2012</i>	<i>DHI: EIA offshore wind farms Poland EEZ – OWF BP, EIA assessment on marine mammals – final report, v3, July 2013</i>
10	<b>Chiropteroфаuna</b>	The study area included MFW Bałtyk Północny (now MFW Bałtyk I) along with a 2 NM wide buffer measured from the development area border. Monitoring surveys and bat population analyses were performed according to the methodology described in Appendix 2.	March – May 2021	Quarterly Report 2, MEWO S.A., issued 03.08.2021
		Surveys during the fall migration were initiated. During the indicated period, 2 survey campaigns were conducted from the survey unit to record bat activity along the transect route. In addition, continuous surveys from a monitoring station	June – August 2021	Quarterly Report 3, MEWO S.A., issued 23.11.2021

No.	Environmental component tested	Research scope	Research period	Source document
		(measurement buoy) were initiated during the autumn migration period.		
		Three survey campaigns were conducted from the survey unit during the indicated period to record bat activity along the transect route. Due to adverse weather conditions, the last survey campaign scheduled to take place in October had to be postponed until November 2021.	September – November 2021	Quarterly Report 4, MEWO S.A., issued 14.01.2022
				Final Report, MEWO S.A., issued 7.02.2022
	<i>Chiropterofauna – archival research</i>	<i>The study area included MFW Bałtyk Północny (now MFW Bałtyk I) along with a 2 NM wide buffer measured from the development area border. Study covered observations of bats in the OWF area.</i>	<i>10 October – 30 November, 2012</i>	<i>Maritime Institute in Gdańsk: Study of Maritime Environment for the Environmental Impact Assessment of Bałtyk Północny Offshore Wind Farm, Regular Autumn Report, Bat Research, May 2015</i>
11	<b>Cultural heritage and archaeological research</b>	The study area included MFW Bałtyk Północny (now MFW Bałtyk I) along with a 1 NM wide buffer measured from the development area border. The surveys followed the methodology described in <i>Appendix 2</i> . A search of archival and literature data was conducted in order to characterize the cultural changes that took place in the South Baltic area during the Stone Age and to locate shipwrecks lost in the area of the planned MFW Bałtyk I project.	March – May 2021	Quarterly Report 2, MEWO S.A., issued 03.08.2021
		Further search of archival and literature data was conducted to characterize selected Paleolithic, Mesolithic and Neolithic sites located	June – August 2021	Quarterly Report 3, MEWO S.A., issued 23.11.2021
			September – November 2021	Quarterly Report 4, MEWO S.A., issued 14.01.2022

No.	Environmental component tested	Research scope	Research period	Source document
		in the southern Baltic coastal zone as part of the study of prehistoric remains.		
	<i>Archaeology – <u>archival research</u></i>	<p><i>The area of the MFW Bałtyk Północny (now MFW Bałtyk I) together with the buffer of 1 Mm offshore measured from the development area border.</i></p> <p><i>Analysis of archival material on potential archaeological sites.</i></p>	<i>Archival data analysis</i>	<p><i>Maritime Institute in Gdańsk: Study of Maritime Environment for the Environmental Impact Assessment of Bałtyk Północny Offshore Wind Farm, Regular Autumn Report, Archaeological Research, June 2013</i></p> <p><i>Maritime Institute in Gdańsk: Study of Maritime Environment for the Environmental Impact Assessment of Bałtyk Północny Offshore Wind Farm, Regular Winter Report, Archaeological Research, May 2013</i></p>
12	<b>Fishery analysis</b>	<p>The study area included MFW Bałtyk Północny (now MFW Bałtyk I) along with a 1 NM wide buffer measured from the development area border. The surveys followed the methodology described in <i>Appendix 2</i>.</p> <p>Analysis of VMS data was performed using the R program and following the WGSFD - ICES methodology. Source data were extracted from the Fisheries Monitoring Centre (FMC) database for all countries/vessels that reported any activity in the analysis area.</p>	December 2020 – February 2021	Quarterly Report 1, MEWO S.A., issued 17.05.2021
			March – May 2021	Quarterly Report 2, MEWO S.A., issued 03.08.2021
			June – August 2021	Quarterly Report 3, MEWO S.A., issued 23.11.2021
			September – November 2021	Quarterly Report 4, MEWO S.A., issued 14.01.2022