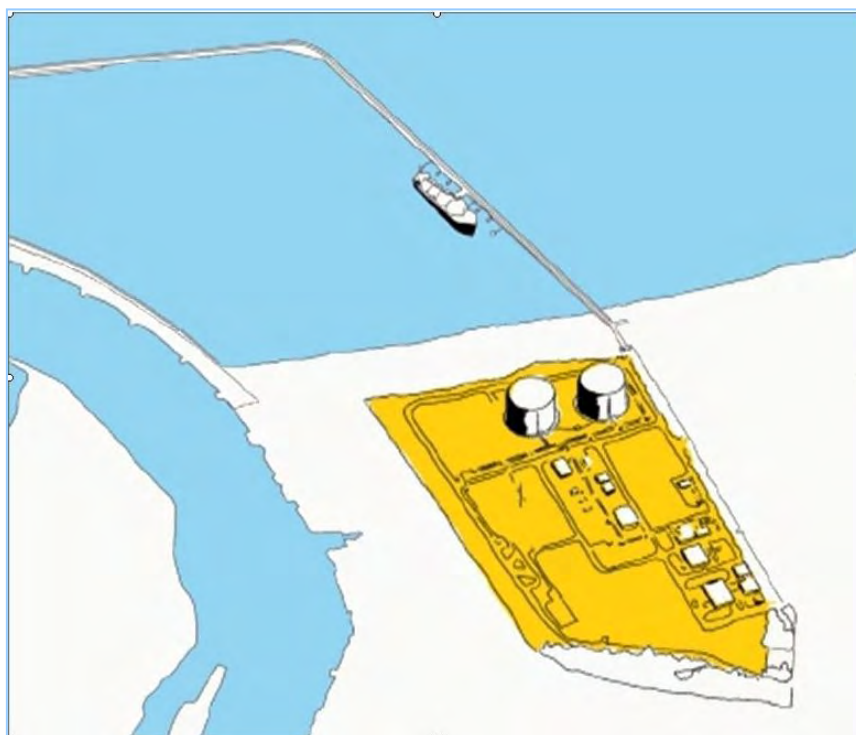


# LNG TERMINAL PROJECT

## Świnoujście, Poland



### **NON TECHNICAL SUMMARY (NTS)**

November 2010



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## 1 INTRODUCTION

This document is the Non Technical Summary (NTS) of the independent assessment of the environmental and social aspects of the LNG Terminal Project at Świnoujście, Poland. The information presented has been developed on the basis of Environmental Impact Assessment (EIA) reports, numerous supporting documents and related key permit documents. The NTS is presented published in a form and language that is understandable for the non-expert and general public. References are made to the other more detailed studies and documents that are available to the interested public.

### 1.1 PROJECT BACKGROUND

The company Polskie LNG S.A (Polskie LNG), is responsible for the construction of a Liquefied Natural Gas (LNG) Regasification Terminal in Świnoujście, Poland. After its completion, Polskie LNG will also be responsible for its operation. This terminal will be part of an overall LNG port project that is being implemented under the 2009 "LNG Terminal Act"<sup>1</sup> as part of the overall strategy for diversification of the gas supply of Poland.

The project consists of:

1. the LNG Terminal itself located onshore next to existing commercial harbour facilities,
2. a new external harbour basin that will be created by constructing a new breakwater at the mouth of the Świna River,
3. the berthing/jetty infrastructure for LNG carrier ships located inside the new basin,
4. an approx. 6-kilometre long, high-pressure gas connection pipeline (800 mm diameter) and approx. 74-kilometre long gas transmission pipeline to connect the LNG Terminal with the national gas transmission grid

(Separately these are referred to as the four "Project Components" and together as the "Project").

For each of the Project Components, the local EIA procedures were followed and the environmental approvals and permits were obtained as per the relevant Polish regulations. Construction permits were issued for the LNG terminal, the breakwater and the jetty. The pipeline route still requires formal approval by the Voivodship authority; this is anticipated by the end of 2010; subsequently, the construction permit will be issued.

Numerous related studies and investigations were undertaken as part of the EIA and permitting process over the past two years. Many meetings and discussions have been held with members of the local public in Świnoujście and other smaller towns in Poland potentially affected by the Project.

The key previous reports are publicly available as explained in the info-box below. As an addendum, supplementary documents regarding the environmental and social aspects of the project, including this NTS, are also provided on the website below.

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<sup>1</sup> Act on Re-gasification LNG Terminal in Świnoujście (April 24, 2009 "LNG Terminal Act")

**Box 1****Disclosure Documents**

The following EIA Reports were subject to formal public disclosure in the regulatory EIA process:

- EIA LNG Terminal (December 2008) prepared by Biuro Konserwacji Przyrody w Szczecinie;
- EIA Breakwater (November 2008) prepared by Biuro Konserwacji Przyrody w Szczecinie;
- EIA Jetty (December 2008) prepared by Biuro Konserwacji Przyrody w Szczecinie;
- EIA Pipeline (October 2009) prepared by Ekocentrum Sp. z.o.o.

Based on the above EIA Reports, the relevant authorities issued environmental decisions under the Polish law. These EIAs are available in Polish at this webpage:

[www.polskielng.pl/nc/terminal-a-srodowisko.html](http://www.polskielng.pl/nc/terminal-a-srodowisko.html)

Key parts of documentation, translated into English, are available at this webpage:

[www.en.polskielng.pl/nc/terminal-a-srodowisko.html](http://www.en.polskielng.pl/nc/terminal-a-srodowisko.html)

In addition, on these webpages the following documents are disclosed (Polish and English):

- Environmental Study for Dredge Spoil Disposal Breakwater
- Environmental Study for Dredge Spoil Disposal Jetty
- "Memorandum" being a summary of the local EIAs for Terminal and new external harbour and LNG berth

In order to achieve disclosure, Project Sponsors have published the Information Package in November 2010 consisting of: Stakeholder Engagement Plan (SEP),

- Non-Technical Summary (NTS),
- Environmental and Social Action Plan (ESAP) for the LNG Terminal Project
- Social Review of LNG Terminal Project,
- Biodiversity Action Plan (BAP) of LNG Terminal Project

## 1.2 NEED FOR THE PROJECT

The use of LNG as a source of gas supply is being implemented in many regions of Europe and the world, and the processes of gas liquefaction, transport, storage and regasification are well-proven (*cf.* Fact Box on LNG below). Overall, the use of gas as a fuel source is less environmentally harmful (e.g. emits fewer pollutants and less CO<sub>2</sub>) than other fossil fuels such as coal or oil. The imports of the LNG via the Project, will also allow provision of natural gas for the diversification of supply to the Polish economy.

The planning for a LNG regasification terminal along the Baltic Coast of Poland has been underway for many years by the Polish authorities and energy firms. In 2006, a decision was made to locate the LNG Terminal in Świnoujście as the most suitable location (see Alternatives Analysis, Section 2 below). On 19 August 2008, the Polish Council of Ministers adopted a resolution in which the construction of the LNG terminal was acknowledged as a strategic investment for ensuring energy security of Poland. On 24 April 2009, the Act on Investments Relating to the Liquefied Gas Regasification Terminal in Świnoujście, hereinafter referred to as the "Special Act" was enacted that *inter alia* defines the entities responsible for its execution, scope of their authorisation and the process for implementation and coordination of the Project.

The LNG terminal will allow the import of liquefied natural gas to Poland which, after regasification will be supplied to buyers in Poland, among others through the Polish transmission network. The LNG terminal will have an initial capacity to provide 5 bln Nm<sup>3</sup> per year of natural gas to the Polish grid<sup>2</sup>.

The capacity of the terminal allows for its future extension to 7.5 bln Nm<sup>3</sup> per year, which is about 50% of the present natural gas demand in Poland. Because the LNG can be imported from various suppliers around the world via seaways, Poland will become less dependent on the gas imports from the existing direct pipelines from neighbouring countries. PGNiG (*Polskie Górnictwo Naftowe i Gazownictwo*, the largest importer of natural gas to Poland) in 2009 signed long-term LNG supply contracts with *QatarGas* for a 20-year period from 2014 to 2034. Further LNG supply contracts (including LNG purchases on the spot market) are slated for signing.

## **Box 2**                    **LNG Technology Brief**

### **What is the LNG technology?**

The liquefaction of natural gas into LNG provides an alternative method for transporting gas into areas that are not served by pipelines and may be a supplemental source of gas supplies to the given state. LNG is an odourless, non-toxic, non-flammable and non-corrosive liquid that must be kept at very cold temperatures. If spilled, LNG evaporates quickly and disperses as natural gas, leaving no residue on soils or in water (because, LNG weighs about half as much as water, any LNG spilled into the sea will rise to the surface and then evaporate in the atmosphere as it warms up). Thus, no environmental contamination will occur in the event of LNG spills on water or land. The key process steps of LNG are:

- Liquefaction of natural gas from its natural form at a liquefaction plant by cooling to temperatures of about minus 160 degrees C; in the liquefaction process, the gas is compressed to about 1/600<sup>th</sup> of the original gas volume. Liquefaction plants are located in gas exporting countries (e.g. Middle East, Africa, and Australia).
- Transport of LNG via ships called LNG Tankers that have specially designed storage tanks to keep the LNG cooled and in liquid phase.
- Special jetty facilities must be built for loading and offloading of the LNG Carriers.
- LNG is regasified at a regasification terminal, where the LNG is first stored in large, cooled tanks and then, as gas is needed, it is expanded into gaseous phase and can then be fed into the existing gas network. Also, the LNG can be loaded for local transport into special LNG trucks/road-tankers or rail tankers.

There are currently about 75 regasification plants in operation globally and about 25 under construction, including the one in Świnoujście. About 24 such plants are located in Japan; in Europe there are about 19 such terminals along the coasts of Belgium, France, Greece, Italy, Portugal, Spain, Turkey and the UK.

## **1.3 PROJECT SETUP AND DEVELOPERS**

### ***Which Companies will Implement the Project?***

The LNG Project will be executed by four entities (also called Project Sponsors) as defined in the LNG Terminal Act, with respective responsibilities:

- Polskie LNG - construction and subsequent operation of the LNG terminal;

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<sup>2</sup> The capacity of 5 bln Nm<sup>3</sup> natural gas equals about 3.9 million tons or, as compressed liquid, 8.9 million m<sup>3</sup> of LNG

- Maritime Office in Szczecin (*Urząd Morski w Szczecinie*) - construction and subsequent maintenance of infrastructure to ensure access to the external port, including a new breakwater plus overall maritime traffic control;
- Szczecin & Świnoujście Seaports/Port Authority (*Zarząd Morskich Portów Szczecin i Świnoujście SA*) - construction of port infrastructure, including a special berth/jetty for the LNG Carrier ships infrastructure and subsequent handling of the LNG Carriers within the new harbour and jetty areas; and
- GAZ-SYSTEM - construction and subsequent operation of the approx. 6-km connection gas pipeline and the 74-km gas transmission pipeline connecting the terminal with the transmission grid and coordination of the LNG Project.

On 20th of August, 2009, all the Project Sponsors signed the Agreement on Cooperation regarding the construction of the Project Components (“Cooperation Agreement”) and agreed in accordance with the 2009 LNG Terminal Act that Gaz-System will assume the co-ordination of the overall Project. The Project development is supervised by a steering committee appointed at the State Treasury Ministry.

#### *What are the Project Funding Sources?*

The total costs of the LNG Terminal Project are currently estimated at PLN 3.5bn net. It is envisaged that the Project will be financed from a combination of (i) own funds of Polskie LNG contributed as a capital increase by the company owner, GAZ-SYSTEM, (ii) non-refundable grants from the European Union (EU) and (iii) a loan package provided by a group of commercial banks (led by PKO Bank Polski SA and Pekao SA, part of UniCredit Group), international financial institutions (including the European Bank for Reconstruction and Development - EBRD) and potentially other credit agencies.

The new breakwater will be financed out of the Polish state budget for maritime installations. The Szczecin & Świnoujście Seaports Authority has applied together with Polskie LNG for subsidy from EU funds; the connection and transmission gas pipelines will be financed by GAZ-SYSTEM and the European Energy Programme for Recovery.

## **1.4 DESCRIPTION OF THE PROJECT**

An overview of the Project Area is shown in Figure 1 below.

The LNG Terminal, as well as the new harbour and jetty, will be located in the town of Świnoujście, on the Baltic Sea coast in the most north-western part of the Western Pomeranian Province of Poland, and about 4.5 km from the German border. The LNG Terminal will be built on a 48-hectare plot on Wolin Island next to the existing commercial harbour facilities that extend on the right (*i.e.* eastern) bank of the Świna River, and to the north of Warszów settlement. The main terminal facilities are set back about 750 metres from the shore and are connected to the shore by a narrow corridor (ca. 10 metres wide). The site was previously owned by three public entities (Municipality of Świnoujście, the State Forest District (Nadleśnictwo Międzyzdroje) and the Szczecin & Świnoujście Seaports Authority) and had been designated for future extension of the existing port.

The land use designation for the purpose of the LNG Terminal was formally changed by the Municipality from Forest to Industrial in a Spatial Plan Amendment procedure in 2007 (in accordance with the Plan of Conditions and Directions of Spatial Development adopted by the Municipality in 2004). The property was transferred in November 2009 to PLNG for its long-term use for the terminal. The new breakwater will extend for about three km to the north and north-west into the Baltic Sea on immediately to the east of the existing breakwater that protects the entrance to the Świna Port. This will form a new external harbour basin of about 195 ha in area to allow the LNG carriers to moor at the new jetty. An LNG pipeline bridge will connect the jetty to the terminal.

The dredging spoils excavated during construction of the new harbour basin and jetty will be deposited at two locations on the seabed northeast of Świnoujście: a 12 km<sup>2</sup> area starting about 12 km from shore and a 3 km<sup>2</sup> area about 20 km from shore.

The **connection gas pipeline** to connect the LNG Terminal with the existing gas transmission grid will be approx. 4 km in length and will go through the sandy Międzyzdrojski Las forest, along forest clearings on the Wolin island. The gas pipeline route will start in the LNG terminal in the outskirts of Świnoujście in the Warszów area, reaching the northern side of the Świnoujście-Szczecin railway line. Within the Świnoujście-Przytór Port area, the pipeline will deflect to the north-east of the railway track. Then, it will pass north of Łunowo settlement, continue north-eastward crossing the abovementioned railway line and national road no. 3 (E65). The connection gas pipeline will terminate near the existing DN300 Wolin-Kaminke gas pipeline and in the vicinity of the Łunowo settlement it will connect to the new high-pressure DN800 Świnoujście-Szczecin transmission pipeline that is to be built.

The new **transmission gas pipeline** will cross the Wolin Island and run around the Szczecin Lagoon south-eastwards over land. The 80 km route traverses the territory of Łunowo settlement. Then, it continues across the Międzyzdrojski Las forest in a clearing beside a high-voltage power line, to reach the surroundings of Lubiewo settlement. Next, it crosses two drainage/irrigation ditches and enters the Woliński National Park and its buffer zone towards the Wicko lake. In the area of the lake it crosses a local road towards Zalesie and continues along the lake shore. The gas pipeline bypasses the settlements of Wapnica and Trzciągowo villages and only near the local road to Wapnica it runs through a private plot. Having crossed the road, it returns to the woodlands of the Woliński National Park. The length of the gas pipeline section running through the Park's woodlands is approx. 4 km. In the area of the Międzyzdroje municipality, the gas pipeline crosses 2 local roads. Having left the Woliński National Park, the pipeline will enter the Wolin municipality in the vicinity of the Dargobądź settlement. After exiting the Woliński National Park in the vicinity of the Dargobądź settlement, the pipeline enters the Wolin municipality, running through the area of a stud farm, near the separated construction plots. Then, the gas pipeline passes along the high-voltage line towards the national road no. 3 (E65). Having passed that road, it passes through undulating woodland on a ca. 2 km section. Passing around a hill, it runs through farmland and crosses the Świnoujście-Szczecin railway line, and further the local Mokrzyca-Wolin road. There, it avoids stand-alone developments and an old graveyard (under archaeological and heritage conservation) and crosses the Dziwna river. After crossing the river, the pipeline crosses the local road and runs towards the railway tracks. The pipeline's route avoids the developed areas of Reclaw from the north and east, passing through farmland. Once again, it crosses railway tracks and the national road No.3 (E65). Having crossed the road, it runs alongside a high-voltage power line, and further it crosses the local road to Wiejkowo settlement and farmlands

and idle land along the local road Reclaw-Racimierz. In the vicinity of Sieniechowo village the pipeline avoids a wind farm and crosses the local road at the level of Skoszewo, further it runs along that road on a short section and enters woodlands. Then, in the vicinity of the existing Barrage and Sink Complex, it avoids stand-alone developments and enters the Stepnica municipality. Over the entire route through the Stepnica municipality, the pipeline is planned along the existing DN 150 gas pipeline. Its route continues along the northern border of the Jaroszewko settlement and then east of Żarnowo. In this area, the pipeline runs through agriculturally abandoned moorlands and wetlands. Further on, the pipeline crosses the area of Bagna Miłowskie marshes, passing by Miłowo settlement from the west, crosses two local roads running between wet meadows, and further over the meadows and idle land to the Gowienica River. Having crossed the river, it runs towards provincial road No. 112 which it crosses between developments in Stepnica. Further on the pipeline crosses a local road and the Rów Łacki ditch, passing through grazing land, meadows and woodland divided by drainage/irrigation ditches. In the vicinity of Budzień settlement, the gas pipeline enters the area of the Goleniów municipality. After entering the Goleniów municipality, the gas pipeline runs mainly through meadows and idle land. In the area of the town of Kały it turns south-eastward crossing the road no. 112, subsequently turning eastward near Krępsko. It bypasses the town of Goleniów from the north, crossing the expressway S3/6 in the vicinity of Żdżary and runs along the high-voltage power line initially eastward and then south-eastward. It crosses the Nowogardzka street, passes to the other side of the railway track, crosses the road to Marszewo and the Goleniów-Nowogard railway line. Near Budno, it crosses road 113, reaching the planned site where the gas pipeline is to be interconnected with the existing transmission system (Gas Pumping Station in Goleniów).



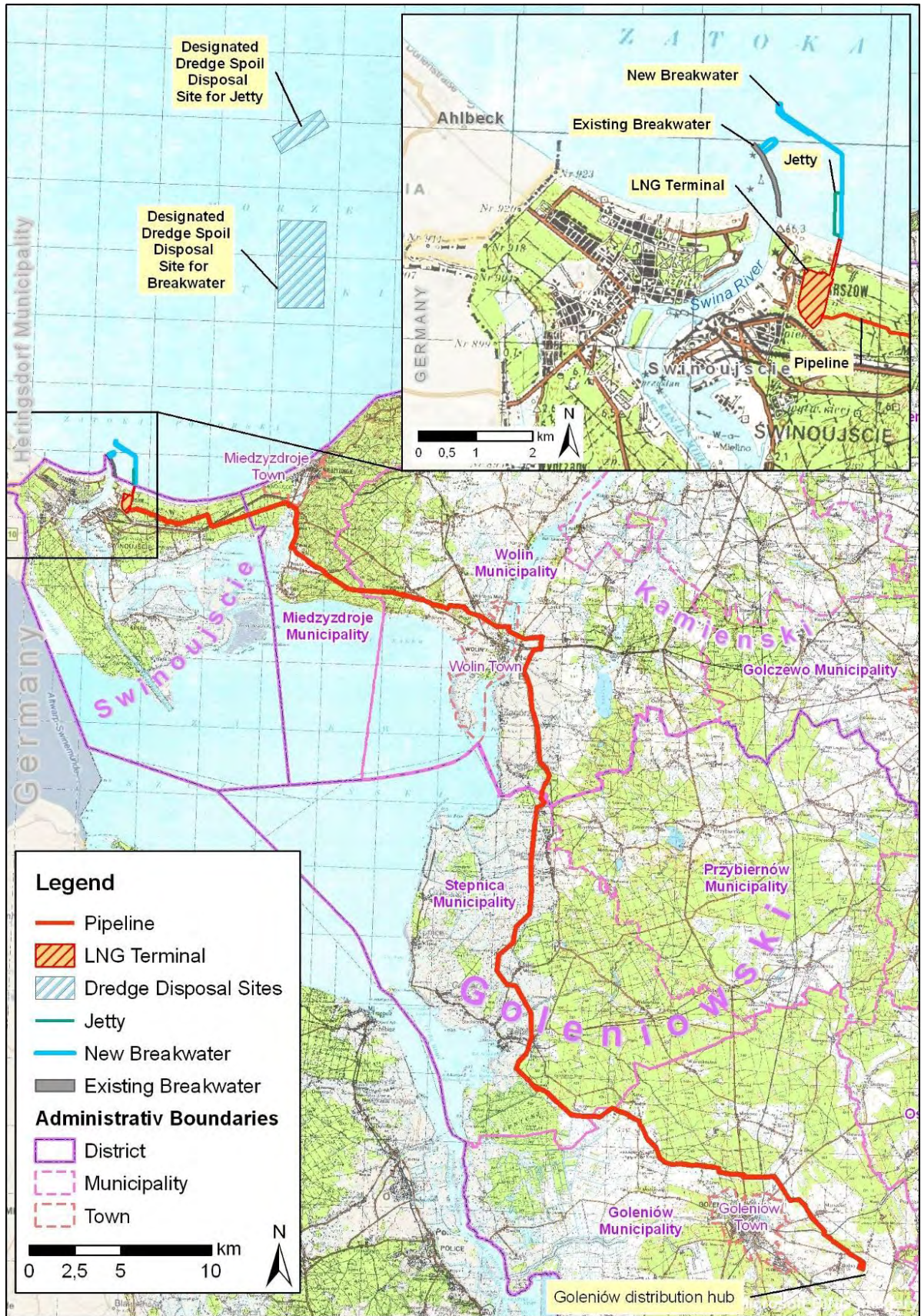
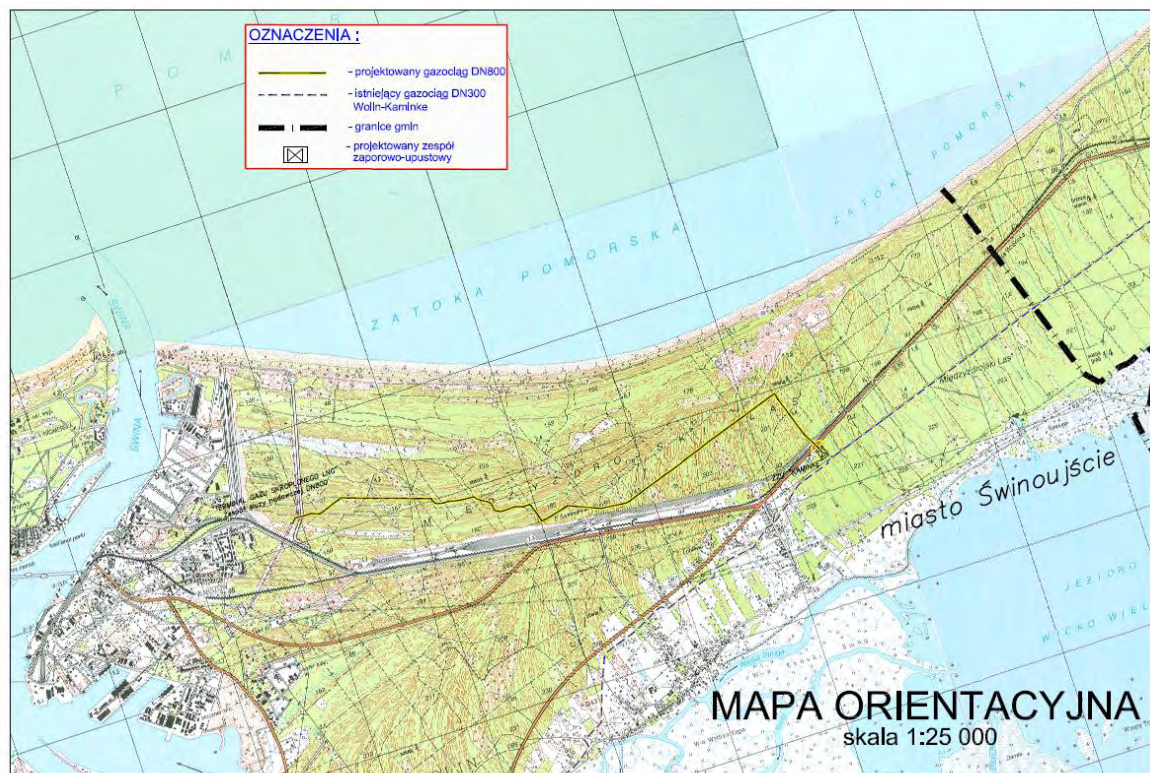


Figure 1 Overview of Project Area



Figure 2 Route of the Connection Gas Pipeline



## 1.5 KEY FEATURES OF THE FOUR PROJECT COMPONENTS

**Breakwater:** The new breakwater will extend some 3 km from the beach at a height of about 6.5 m, and will be built of steel piling, reinforced concrete, rock and reinforced concrete tetrapods. The materials will be delivered primarily by ship. The newly formed external harbour basin will be large enough for the location of the new berth/jetty for the LNG carrier ship, plus potential for five additional berths that may be developed in the future.

The fairway to and in the port basin and the location of the turning circle for ships will be dredged out to a depth of 14.5 m. This will yield about 8.2 million m<sup>3</sup> of dredging spoils, which will be deposited at the disposal site with the surface area of 12 km<sup>2</sup>, as described above. The Jetty construction will yield about 2.4 million m<sup>3</sup> of spoils to be deposited at the smaller area with the surface of 3 km<sup>2</sup>. Both these sites mainly comprise sandy seabed (i.e. do not contain sensitive flora) at depths of about 3-10 m and were selected as being most optimal amongst a number of alternatives (see discussion Chapter 3). Special ships will bring the spoils out to the disposal areas and release the spoils via bottom-doors. As shown by tests conducted on the future harbour basin floor, the dredging material is clean sea-bottom sand (please refer to the Environmental Studies of the Dredge Spoil Disposal for details). Calculations in the Environmental Studies have shown that the dredge sediments will not significantly disperse beyond the intended disposal areas and cause negative impacts (*cf.* Section 4.1.2).

These disposal areas will be restricted for fishing activity for about 3 years. Two additional years will be needed for the sea bottom to recover. The evaluation of potential impacts to local fishermen is currently being conducted (refer to Social Review).

**LNG Berthing/Jetty<sup>3</sup> facility:** The berthing station will be located within the new external harbour and will serve for mooring and offloading of the LNG carrier ships. The related dredging works were described above. The LNG carriers are specially designed *Q-Flex* type vessels with an LNG capacity of 216,000 m<sup>3</sup>, 315 m long and 50 m wide with a draught of 12.5 m (see

Figure 3). These ships are larger than other ships presently served by the Świnoujście port<sup>4</sup>. It is anticipated that 38 LNG Carriers per year will berth at the LNG Jetty equipped with all necessary devices such as navigation equipment, mooring equipment, etc. The jetty will serve exclusively for unloading of vessels with LNG; there will be no facilities present for fuelling of ships or handling of ballast water<sup>5</sup>. The gas pipeline connecting the jetty to the LNG Terminal will carry liquefied LNG only.

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<sup>3</sup> In the English version of this document the terms "berth", "berthing facility" and "jetty" are used interchangeably

<sup>4</sup> The length limit for Świnoujście port is 270m (larger ships only as exception with special permit). The length of freight ships presently entering 225 m, and a few with 240 m; the largest ferries that presently use Świnoujście Terminal are about 190 metres long e.g. *MF Wolin* ferry Świnoujście – Trelleborg.

<sup>5</sup> Due to the LNG unloading process, the ships will take on ballast water but do not need to discharge ballast water at the port.



**Figure 3** Example of a Q-Flex Type LNG Carrier

The construction of the berth is under the responsibility of Szczecin and Świnoujście Seaports Authority, while the specific equipment for the LNG Carrier unloading facilities will be installed and operated by Polskie LNG.

**LNG Terminal:** The liquefied natural gas re-gasification terminal will contain facilities for:

- Receipt of LNG from the Jetty via the LNG pipeline bridge;
- Storage of LNG in two onshore cryogenic tanks with capacity of 160,000 m<sup>3</sup> each; the height of the tanks will be approx. 50 metres; and the flare will be approx. 65 metres;
- Re-gasification of stored LNG using the Submerged Combustion Vaporizer (SCV) regasification technology<sup>6</sup> and transfer of the gas into the pipeline connecting the terminal with the national gas network. The initial gasification capacity will be 5.0 billion Nm<sup>3</sup> gas per year, with the possibility to increase to 7.5 billion Nm<sup>3</sup> per year by adding a third land cryogenic storage tank without the need to expand the terminal site;
- Loading of a small portion of the LNG into road-tanker trucks (up to 21 trucks per day) for local distribution by interested third parties. Polskie LNG will not have its own truck fleet.

Figure 4 presents an aerial visualisation of the LNG Terminal, the new breakwater that encloses the new external harbour basin and the jetty.

<sup>6</sup> The SCV technology is explained in Chapter 3 – Project Alternatives



**Figure 4** Visualization of future LNG Terminal and new harbour including the jetty

**Gas Pipeline:** The high-pressure connection gas pipeline approximately 4 km in length (pressure of 8.4 MPa; nominal diameter of 800 mm) will be built by GAZ-SYSTEM. The gas pipeline will be connected to the newly-built Świnoujście-Szczecin gas pipeline near Łunowo in the Świnoujście Municipality. GAZ-SYSTEM will also build a new transmission gas pipeline approximately 80 km in length (see the route shown in Figure 2), which will be fed into the network in Budna near Goleniów, where a gas pumping station is currently in construction.

The pipelines (connection and transmission) will be constructed in accordance with the existing standards and similar to other such gas pipelines in Poland. The pipelines will be completely underground, buried at a minimum depth of 1.1 meters. The pipelines will be built using the moving construction site method, where construction sections will continuously move forward along the pipeline route. Approximately 5700 pipeline sections (14 metres length each) will be needed. The pipes will be transported by trucks to the work crews as they move sequentially along the route. The construction sequence is to remove the top soil, lay out the pipes, weld the pipes together to strings, dig a trench, lower the pipe string into the trench, connect the strings, backfill the trench and reinstate the top soil. The width of the regular construction strip will be 26 metres, in forest areas it is reduced to 18 metres. Part of the cleared strip will be replanted but a 4 metre-wide zone free of trees and bushes must be maintained. Restrictions for future build-up will apply for a safety strip of 12 metres.

In accordance with design safety requirements, aboveground block valve stations will be installed every 10 – 20 km along the route; these require an area of about 10 m by 14 m. An instrumentation and automated control room will be built at the Goleniów grid hub (on a fenced plot about 40 m by 60 m in area); all the technological processes relating to the gas flow will be regulated and controlled automatically. The new buildings will be light-weight steel

structures. During operations, the pipelines will be inspected and cleaned by so-called PIGs (pipeline integrity gauge). A PIG is inserted at the start of the pipeline at the LNG Terminal and cleans and inspects the pipeline on its way to Goleniów, where a 5 m<sup>3</sup> tank will be used to collect any impurities in the pipeline. Such pigging/cleaning will be performed on an as needed basis, however no more frequently than once per year.

The connection pipeline route follows existing forest paths (minimizing the need for felling trees) for the first four kilometres from the LNG Terminal. The Świnoujście-Szczecin gas pipeline will run for approx. 95% of its length in parallel with existing smaller gas pipelines using the existing right of way corridors to the extent possible; in this way the impacts on land use and the requirement for vegetation clearance for the new pipeline were minimized.

## 1.6 PROJECT IMPLEMENTATION SCHEDULE

The implementation time schedules of the various Project Components are coordinated to enable commencement of the LNG Terminal operations by the target date of 30 June 2014.

For all Project Components, the necessary Environmental Decisions were issued by the respective responsible authorities as were the construction permits (except for the pipeline, discussed below).

The basic design for the LNG Terminal (FEED<sup>7</sup>) has been prepared and the EPC Contractor<sup>8</sup> was selected in June 2010. Preparatory site clearance was completed in 2009 and works for road access and other infrastructure started in spring 2010. Commencement of the construction works for the terminal started in June 2010 with general site grading and will be continued by the selected EPC contractor; construction started in September 2010. Start-up and trial run of the terminal is planned for February 2014. Commercial operation will commence in July 2014.

Construction works for the breakwater for the new external port basin began in August 2010 and are scheduled to be completed in June 2013. The Maritime Office in Szczecin, as the investor / Project Sponsor responsible for that part of the investment project, concluded a contract in May 2010 with a general EPC contractor for these works. Construction of the LNG ship berth<sub>2</sub> under the responsibility of the Szczecin and Świnoujście Seaports Authority, is to commence in October 2010 after the first sections of the new breakwater from the shore have been completed. Starting with piling works, the erection of support structures of the berth platform and the bridge on which the connection pipeline is to be led will be completed in June 2012. The outfitting of the berth with LNG jetty unloading facilities is planned to be completed by November 2012, in parallel to completion of the new breakwater structure.

Subsequently, the fairway to and inside the new harbour basin, the turning circle and the berthing area will be dredged out to the required depths. The dredging and disposal of excavated material associated with the construction of the breakwater will be conducted within 24 months. Start and end dates have not yet been identified by the Project Sponsor. The dredging for the jetty will be carried out in two stages over a 4 month and 6 month period

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<sup>7</sup> FEED = Front End Engineering Design (*i.e.* basic design)

<sup>8</sup> EPC = Engineering, Procurement and Construction; refers to the main contractor who will prepare the detailed design, obtain the construction materials and then build the facilities (using additional subcontractors where needed) on behalf of the Project Sponsors.

before and after pile driving and waterfront construction, respectively. According to the current schedule, dredging would start in autumn of 2010. Dredging will take place outside of the herring spawning season (which is normally in April – May).

For the gas pipeline, change procedures in Local Area Planning (MPZP) started in 2008 in the five municipalities traversed by the pipeline. The changes to Local Area Plans must be preceded by changes in the Local Development Planning Studies (SUiKZP) in the Municipalities. The SUiKZP and MPZP documents include the statutory preparation of a strategic assessment of environmental impact and consultations with the public. In accordance with the Polish law, the public consultations have been conducted along the entire route of the gas pipeline.

In the Świnoujście municipality, where the connection pipeline is located, the SUiKZP change procedure has been completed, which the Local Area Plan (MPZP) is awaiting its adoption by the Municipal Council. Local Area Planning documents including the environmental impact forecast have been displayed for public scrutiny for a period of 21 days. During that period, the municipality has organized a public discussion on the changes made in the draft plan, as an element in the legally required process. The availability of all the documents and the meetings were announced in the local press and announcement boards. In the four remaining municipalities along the transmission pipeline route, the process for the Local Area Plan (MPZP) change procedure has commenced.

So far, the meetings held have not recorded any negative comments or objections.

Construction activities (including tree-felling, trenching and laying of the pipes) will be undertaken in autumn and winter months (September 2011 – February 2012 and September 2012 – February 2013) in accordance with the measures stipulated by the Environmental Decision to minimize environmental disturbances (bird breeding, vegetation period) and tourism.

## 2 PROJECT ALTERNATIVES

The Project is part of the national strategy to diversify Poland's gas supply and to improve continuous natural gas supply throughout the country. This section discusses the alternatives that were considered for key physical and technical aspects of the Project.

### Location Alternatives – why was Świnoujście selected for the LNG Terminal?

The general location of an LNG port at the Polish coast was the subject of a feasibility study initiated by Polish Oil and Gas Company (PGNiG) in 2006, which compared as location alternatives the western coast at Świnoujście and the eastern coast near Gdansk. Świnoujście was finally selected, *inter alia*, because it is the seaport closest to the Danish Straits, which shortens the journey of the LNG Carriers passing through those waters, and also the approach to Świnoujście will avoid the already congested navigation route north of Bornholm Island (thus reducing the risk of collision at sea). Furthermore, the Świnoujście site is less populated than the other alternative port locations and thus has a greater advantage from the viewpoint of industrial risk and public safety.

The specific LNG Terminal location at Świnoujście was initially considered adjacent to the sea shore and closer to the breakwater/jetty, but this was moved about 750 metres further inland to preserve the ecosystem of the sand dunes and dune vegetation, as well as the historic

fortifications and bunkers. The LNG terminal will now be built next to the existing industrial area of the Świnoujście Port complex, in the area designated for port development and will be connected to the berth/jetty by a narrow technical corridor across the dunes and the beach.

For this technical corridor, various underground, on-ground, or overhead pipeline design alternatives were considered. The selected overhead LNG pipeline bridge option was found to be most advantageous, in terms of the smallest occupied area and thus the least impact on Natura 2000 habitats (dunes, vegetation and soil); and unhindered access by the public to the beach and the historical buildings located between the terminal and the beach.

#### What options were considered for design of the external harbour facilities?

The existing fairway and harbour facilities in Świnoujście are not large enough to handle the LNG carriers, and therefore a new external harbour basin must be built with special LNG berthing facilities. Seven different configurations for the external harbour were considered and compared (including impacts on operational safety and local hydrodynamics and coastal impact). The selected option has a key advantage that it uses the already existing breakwater at the mouth of the Świna River as the future western harbour wall of the new outer harbour basin and leaves the Świna outflow untouched.

#### Where will the Dredging Spoils from maritime construction be disposed?

A total of about 10.6 million m<sup>3</sup> of dredge spoils (from clean sandy sea bottom sediment) will be generated as part of the new harbour construction. The two fundamental options are Onshore or Offshore disposal: Onshore disposal would pose significant logistical challenges with respect to dewatering and transporting such large volumes, and landfill capacity is limited. On the other hand, the offshore disposal of clean dredging spoils onto the seabed is a common international practice and is the selected option for this Project. Sometimes such spoils can also be used as fill-material for maritime construction; however, there is no such need in Świnoujście at this time.

A number of seabed disposal areas were considered for both the harbour and jetty spoils (please refer to the respective Environmental Studies for details). The chosen disposal locations were selected because they are mainly sandy and without sensitive seabed flora, have the least overlap/impact with herring spawning grounds, no obstacles on the seabed or conflict with existing or planned maritime uses such as shipping lanes, recreational boating, naval-military exercises, planned offshore wind farms, oil & gas concession areas or other projects.

#### What are the Technology Alternatives for Re-Gasification?

There are three basic available technological alternatives for re-gasification of the cooled LNG:<sup>9</sup>

- (i) Submerged Combustion Vaporizers (SCV), which uses natural gas (i.e. the LNG itself) as a fuel source for the heating process,
- (ii) Open-Rack Vaporizers (ORV), which uses sea water as a heat source (and thus saves consumption of fuel gas), and

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<sup>9</sup> Refer to the IFC EHS Guidelines for LNG Facilities at [http://www.ifc.org/ifcext/sustainability.nsf/AttachmentsByTitle/gui\\_EHSGuidelines2007\\_LNG/\\$FILE/Final+-+LNG.pdf](http://www.ifc.org/ifcext/sustainability.nsf/AttachmentsByTitle/gui_EHSGuidelines2007_LNG/$FILE/Final+-+LNG.pdf) (<http://www.ifc.org/ifcext/sustainability.nsf/Content/EHSGuidelines>)



(iii) Shell-and-Tube Vaporizers (STV), which use external heat sources. Each technology has its own advantages and disadvantages.

Polskie LNG selected the SCV technique as being the best option for this Project.

The ORV technology was considered as a supplemental methodology (i.e. both SCV and ORV would have been used, depending on the season), but the Project Sponsors decided to abandon the ORV option, due to its lower economic efficiency of the system (usage of ORV is limited to several months per year due to sea water temperature) and lack of environmental permit at the moment (environmental analysis will need to evaluate potential environmental impacts of the temperature of water discharged into the Świna River, e.g. cooling impact, use of biocide chemicals etc). The STV option is only feasible at LNG terminals where waste heat from a third party is available (such as a nearby heat and power plant). However, there is no such external waste heat source at the Świnoujście LNG Terminal location, and thus this option was not considered at all.

#### What alternatives for the Gas Pipeline Route were considered?

Four optional pipeline routes were considered from the LNG Terminal to the existing grid connection. Three of the optional routes passed through the Szczecin Lagoon, which is a designated Natura2000 site and part of which extends into German territory. Dredging for the pipeline trench at the bottom of the shallow lagoon would result in widespread sediment dispersion and adverse affects on biodiversity (including protected Natura2000 features) and would also have a transboundary effect to the German part of the lagoon. Therefore, the fourth route option over land was chosen. The 74-km overland route is longer than the optional routes through the Lagoon, and also crosses or passes by a number of Natura2000 sites and Wolin National Park (*cf.* Figure 4 below). However, for 95% of its length, the new pipeline runs parallel/adjacent to existing smaller gas transmission lines making use of existing corridors and thus keeps vegetation losses to a minimum; also, disturbance of fauna is minimized because construction will only be permitted during Autumn and Winter months (refer also to the Pipeline EIA and the BAP).

### **3 SOCIO-ECONOMIC AND ENVIRONMENTAL SETTING**

#### **3.1 SOCIO-CULTURAL AND ECONOMIC CONDITIONS**

Świnoujście, founded in the 18<sup>th</sup> century, is a seaside health-spa resort and harbour town with a population of approx. 44,000. Key economic activities include tourism and the harbour and related infrastructure: dock, repair shipyards, a naval base, package cargo transshipping terminal and a busy ferry terminal (serving connections to Denmark, Germany, and Sweden). Altogether, there are about 10000 ship movements annually in and out of the Świnoujście fairway. The town's main attractions include 19<sup>th</sup> Century fortifications (Fort Gerhard), WWII bunkers located in the dune forests and a 19<sup>th</sup> Century lighthouse (68-meter high, the highest in the Baltic) and a scenic sandy beach.

The sea area near Świnoujście is fished by a fleet of small fishing boats (28) and a few larger cutters(4) based at the Świnoujście Port on the right bank of the Świna. The catch is dominated by herring and to a lesser extent, sprat, cod and flatfish. Freshwater fish such as perch, pike,

roach, bream and eel constitute a minor portion of the catch. The fishery business in the Pomeranian Bay is under pressure from fisheries restriction and dwindling resources. Therefore, it should be emphasized that no set herring nets are used in the actual area of the new external harbour. Moreover, fishery activities are prohibited in the vicinity of the existing breakwater and the fairway.

Besides the above-mentioned military fortifications in the dunes, there are no registered archaeological sites known in the Project Area at Świnoujście. A sonar survey of the seabed area for the new outer harbour was undertaken by the Maritime Office in Szczecin and no suspicious objects that could be ship wrecks, e.g., or potential heritage features were detected. Also, during clearance of the terminal site no historical objects were found).

The pipeline route mainly traverses rural areas with a number of small villages; Wolin, where the pipeline crosses under the Dziwna River, is the largest town on the route. Economic activities are mainly agriculture, and tourism around Szczecin lagoon and on Wolin Island. 50% of the route is passing through private land.<sup>10</sup>

On the 74 kilometres route, the pipeline crossing through farmland on total 39.4km (49.2%), 17.2 km (21.5 %) woodland and forests, and the total length of the sections crossing through other types of land is 23.4 km (29.3 %). The crossing length of agricultural soil with high productivity (Class I to III) is less than 1 kilometre<sup>11</sup>.

At Wapnica the route passes near a hotel ship and an exhibition with a German WWII V3 missile with visitor facilities and a small caravan park around it. There are marked bicycle and hiking routes on Wolin Island and along the lagoon; to the south and east of Wolin there are wind farms in operation.

Along the pipeline route there are a number of locations of cultural heritage, including sites of archaeological interest that are either passed by or directly crossed by the route. A concentration of archaeological heritage is found in the area around Wolin where also an open air Viking Museum is established. More details on the social conditions in the project area are included in the Project Social Review prepared by PLNG<sup>12</sup>.

### 3.2 *PHYSICAL ENVIRONMENTAL CONDITIONS*

Świnoujście has a flat topography and wide, sandy beaches with sand dunes reaching heights of 15 m. Further inland at Wolin Island, the landscape consists of moraine hills (up to 150 metres in height). The regional climate is mild, tempered by the Baltic Sea influence. The depth to groundwater table varies depending on the topography. It may range from about 8 m below ground level; this shallow groundwater is not used for public drinking water supply.

The marine coast area is characterised by a sandy seabed, with a series of shallow sand bars parallel to the beach that buffer the effect of occasional winter storms. The maximum water

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<sup>10</sup> The total number of owners/co-owners of land is 454 (at the current stage, the number of tenants is unknown), the number of private owners, including co-owners is 398 and the number of institutional owners is 56.

<sup>11</sup> Approx. 16 kilometres belong to soil class IV and 23 kilometres to class V-VI.

<sup>12</sup> The PLNG Project Social Review can be found at [www.polskielng.pl/nc/terminal-a-srodowisko.html](http://www.polskielng.pl/nc/terminal-a-srodowisko.html)

depth in the area where the new harbour basin will be located is 9.7 metres. The seabed sediment here consists of fine and medium sized sand overlain by a thin veneer of organic matter, typical of the Pomeranian Bay. Surveys and tests carried out as part of the EIA studies indicate that this sediment is well aerated and shows little sign of pollution, and both sea water and sediment meet general quality criteria. The water quality in the near shore area is affected by the occasional outflow from the Szczecin Lagoon through the Świna River and vice versa. The turbidity is generally low and salinity highly variable.

The physical properties of the dredge spoil disposal sites about 12 and 20 kilometres off the coast are characterized by fine-grained sand of the sea bottom.

The transmission gas pipeline route traverses low hills on Wolin Island (up to about 50 m height) and is then mostly flat for most of its length further south along the Szczecin Lagoon and eastward towards Goleniów. The area along the planned pipeline route is characterized by woodlands, farmland and moor- and wetlands with locally high groundwater tables.

### 3.3 BIOLOGICAL ENVIRONMENT AND BIODIVERSITY CONDITIONS

#### Overview

The coastal area around Świnoujście, Wolin Island and Szczecin Lagoon comprise a variety of habitats with high conservation value. The Project Components are located within or close to areas covered by the European Nature 2000 Network – that are identified as Special Areas of Conservation (SACs) or Sites of Community Importance (SCIs) under the EU Habitats Directive 92/43/EEC or classified as Special Protection Areas (SPAs) under the Birds Directive 79/409/EEC. These areas are commonly referred to as “Natura 2000” sites. Also relevant for the Project Area is a National Park (Wolin), a Wildlife Reserve (Olszanka) and other conservation areas. The mentioned areas are shown in Figure 5.

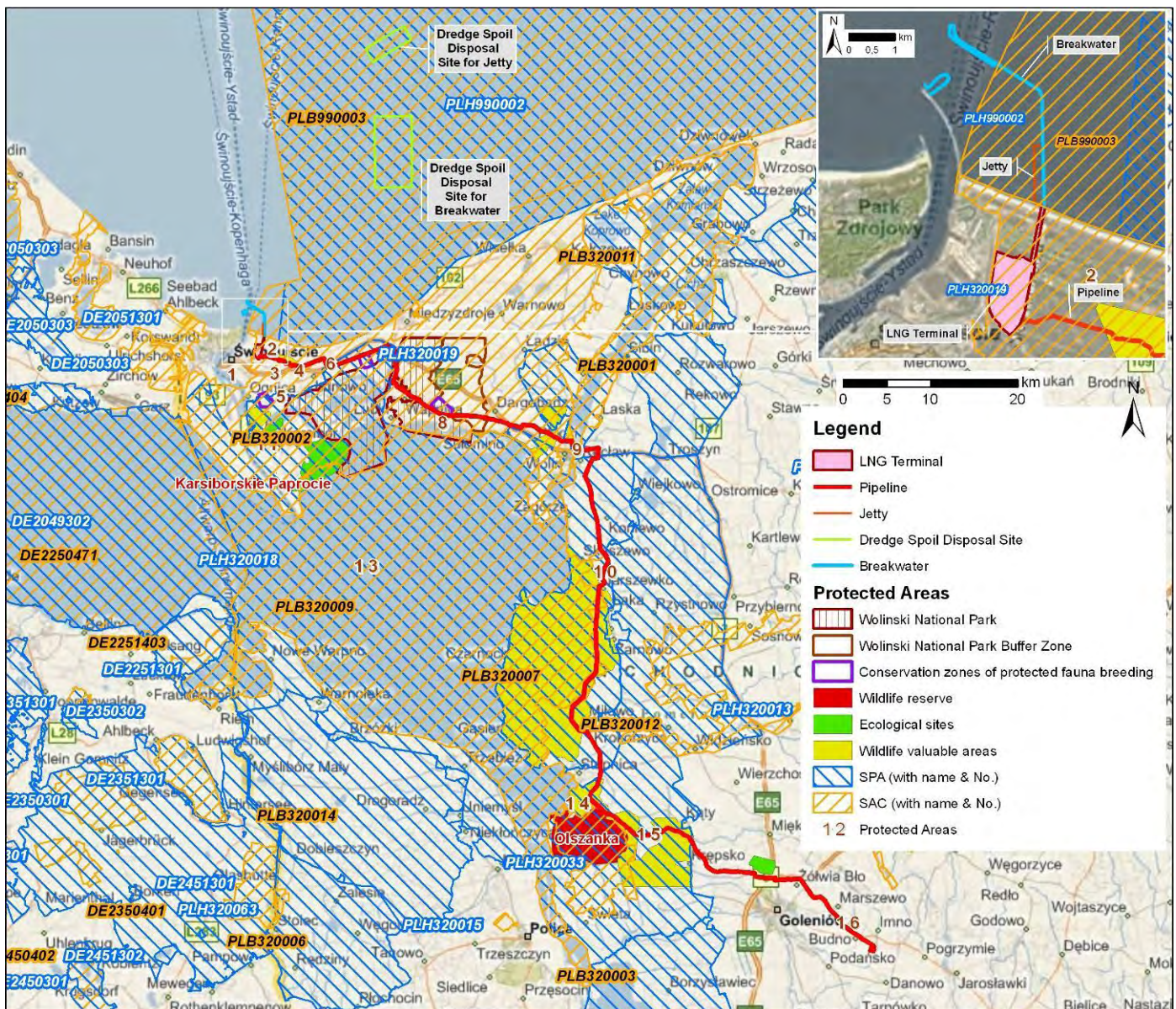
#### Landside Environment

The LNG Terminal site is located within a designated Natura 2000 site (PLH 320019 Wolin i Uznam SCI). Different habitats are situated parallel to the sea shore. Moreover, the investment project site contains six protected types of natural habitats (according to Annex I Habitats Directive) (one of them priority: 2130 grey dunes) and 30 protected plant species (vascular plants, fungi species).

The wildlife survey conducted within the EIA studies revealed a large number of species that require strict conservation. These include, among others: pool frog (*Pelophylax lessonae*) and moor frog (*Rana aroalis*), sand lizard (*Lacerta agilis*) are included in the Habitat Directive as species requiring strict conservation. Additionally, there are three bird species listed in Appendix I of the Birds Directive (species requiring special conservation measures) were observed during the field investigations (woodlark *Lullula arborea*, red-backed shrike *Lanius collurio* and black woodpecker *Dryocopus martius*). The most valuable breeding species on the site are *Lullula arborea* and *Lanius collurio*. The section of beach located between land part and sea part of the LNG terminal, besides breeding, is very important place of preying and rest for many gulls and shore birds, *Charadriiformes*. Fortifications and shelters located near the proposed LNG site, especially Fort Gerhard, are inhabited by bats. (five bat species identified in the area during the field investigations are protected on EU level – listed in Annex II or IV).

The pipeline route passes through several Natura 2000 sites. This includes the habitat

protection areas of Natura Sites PLH320019 Wolin i Uznam, PLH320018 Ujście Odry i Zalew Szczeciński and PLH320033 Uroczyska w Lasach Stepnickich, and the bird protection areas PLB320002 Delta Świny, PLB320009 Zalew Szczeciński, PLB320007 Laki Skoszewskie, PLB320011 Zalew Kamiński i Dziwna, PLB320012 Puszcza Goleniowska. Further the pipeline passes through parts of Wolin National Park and several areas valuable for wildlife and passes near Olszanka Wildlife reserve (between Stepnica and Goleniów). The environs of Szczecin lagoon are habitat to various protected flora and fauna species. Notably, Wolin National Park, Międzyzdroje Forest and Olszanka Reserve have small populations of White-tailed Eagles (*Haliaeetus albicilla*). As mentioned in Section 1.4 above, the pipeline route follows the corridor of existing pipelines that pass through these areas, and thus the impact of the new pipeline is minimized.



**Figure 5 Biodiversity sites in the Project area**

### Marine and Shore Environment

The seabed in the nearshore belt is inhabited by common benthic species typical of the Pomeranian Bay. Notably, the soft-shell clam *Mya arenaria*, Baltic clam *Macoma baltica*, various species of amphipods, ragworms, nematodes and mussel. Common macro-algae and benthic diatoms dominate. Algae are also found on and in the crevices of the existing breakwater, while the rock armour also provides a habitat to mussels or barnacles. The water column hosts a suite of phytoplankton and zooplankton species, representative of a freshwater and brackish water environment. There are large seasonal differences in the number of species observed.

The sandy beach is home to species protected under Polish law, such as the amphipod *Talitrus saltator* which thrives on accumulated beach wrack in the drift line. The species is also found on beaches to the east of the project area.

The fish fauna comprises typical marine species (e.g. eelpout, cod, herring, flatfish) and freshwater fish species, notably pike and perch. A few protected species that are listed on Annex II of the Habitat Directive are occasionally observed in the area, including the twaite shad *Alosa fallax*, allis shad *Alosa alosa*, salmon, ziege, the sea and river lamprey, eel, and two species of sturgeon. The latter are stocked in Polish rivers.

Marine mammals that occasionally frequent the Pomeranian Bay include: the harbour porpoise *Phocaena phocaena*, the white-beaked dolphin, the gray seal and common seal. There are no known seal haul out sites near the Project Area. These species are listed in Annex II or Annex IV of the Habitat Directive.

The existing breakwater is an important resting place for many bird species, mostly waders, gulls and terns including the dunlin, the Bar-tailed godwit and the purple sandpiper in notable numbers. Among the more than 100 species of birds, some 26 are listed on Annex I of the Bird Directive, and 22 are listed in the Polish Red Book of Animals. The Pomeranian Bay and Odra Delta (which includes Szczecin lagoon) are an important stop over for migratory birds. Large numbers of birds flock to the area in spring and autumn.

Behind the beach lies an area of sand dunes with successive zones of strandline vegetation including grassleaf orach *Atriplex littoralis* seaward of the dunes, pioneer vegetation (including sand couch grass *Elymus farctu*) on shifting dunes. White dunes and more mature grey dunes are covered with grassland. The pioneer vegetation adapts to a continually changing landscape. The sand dune areas are listed on Annex I of the Habitat Directive.

The proposed new external harbour lies just within a Special Area of Conservation, the Natura 2000 PLH 990002 'Ostoja na Zatoce Pomorskiej'. The Annex I habitat under protection is the shallow Odra Sand Bank located some 23 km north of the Project Area.

Other protected areas in the immediate vicinity of the LNG terminal and harbour area are:

- Special Protection Area; Natura 2000 – *Zatoka Pomorska PLB 990003* - about 1 km to the east of the Project Area;
- proposed Ecological Site to be protected – '*Wydmy na Warszawie i Przytorskis Wydmy*', focusing on protection of valuable beach and dune habitats including specific plants and landscape features.

For more details regarding the biodiversity aspects of the Project area, please refer also to the Biodiversity Action Plan (BAP), disclosed separately at the Project Website.<sup>13</sup>

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<sup>13</sup> [www.polskieng.pl/nc/terminal-a-srodowisko.html](http://www.polskieng.pl/nc/terminal-a-srodowisko.html)

## 4 *PROJECT'S POTENTIAL ENVIRONMENTAL IMPACTS AND ANTICIPATED MITIGATION MEASURES*

This Chapter describes the key potential environmental impacts of the Project identified in the environmental impact assessment reports – EIAs (and other studies), along with the prevention/mitigation measures.

Overall, the Project Sponsors and their consultants have undertaken a number of comprehensive studies to evaluate the ecological aspects of the Project Area, and the Project design (including siting of the Project Components, pipeline routing etc) includes many measures to prevent or minimize potential impacts. In addition, the Competent Authorities have stipulated in the Environmental Decisions that the Project Sponsors must implement numerous and detailed mitigation measures, and further measures have been developed to be in compliance with international requirements and are listed in the Environmental and Social Action Plan - ESAP (the ESAP will also be publicly disclosed for information and comment as required for international finance).

The impacts and mitigation measures are presented below for environmental and social issues for the Project Components during the main Project stages of construction, operation and decommissioning<sup>14</sup>.

### 4.1 *IMPACTS-MITIGATION DURING THE CONSTRUCTION PHASE*

#### 4.1.1 *General Construction Topics*

##### Management Plans

General prevention/mitigation measures during construction include preparation and implementation of the following matters in the form of plans / procedures / programs by LNG Project Contractors (under the supervision of the Project Sponsors) / Investors, e.g.:

- solid waste management
- spill prevention and response
- traffic management
- Noise monitoring
- Environmental management system
- occupational health and safety assurance
- Impacts on local community from presence of large construction workforce

The contractors must provide staff duly trained in implementation of all such Plans and other mitigation measures and observe environmental requirements during the construction of the Investment project.

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<sup>14</sup> The potential impacts and mitigation measures described in this chapter are examples of key items only; there are many more issues described in more detail in the EIAs, Environmental Studies, Environmental Decision documents and the ESAP. Also please refer to specific topics described further in the Social Review and the BAP.

The contractors will be required to prepare the occupational health and safety program during the construction period and implementation of the Investment project will be supervised by the environmental supervisors as well as supervisors representing the investor or contract engineer assigned to each of the components of the Project.

Besides Health and Safety for construction, contractors will also be required by the Project Sponsors to comply with applicable social norms and labour requirements of Poland that are in line with the EU and relevant international standards with regard *inter alia* to fair contract and payment conditions, working times, non-discrimination and social conditions of accommodation. This will also apply to subcontractors involved and apply for Polish and any workers from other countries.

Detailed construction logistics plans will be prepared by the main contractors responsible for the different Project Components, including details on safety arrangements, which will be agreed with the responsible government health and safety authorities.

#### Workforce during Project Construction periods

The overall Project will require a large workforce during construction periods. The largest part will be required for the LNG Terminal, where at peak times about 1500 -1700 people will be working (which is almost equal to the population of the whole Warszów district of Świnoujście). On July 15, 2010, Polskie LNG concluded an EPC contract with a construction consortium for the Terminal that is lead by an Italian firm. The EPC contractor may bring in significant numbers of workers from their own and other countries. Significantly fewer workers will be required for building the new breakwater (up to 250), berthing facilities (about 60) and the pipeline (approx. 250 workers); these works will be carried out by a consortium of international and Polish companies using probably Polish workers.

Workers accommodation will be provided by the EPC Contractors. A housing camp for construction workers at the terminal will probably be established on plot No. 11-23 on the area of Commercial Port Świnoujście (approx. 200 m to the east from the terminal site and east of the existing railway line). At present, this area is used for storage. The use of the southern part of the terminal site is also considered as an option. Working and accommodation conditions will be in compliance with Polish regulations which are in line with EU law. An environmental, social, health and safety management plan for the camp will be developed, including a *Code of Conduct* for its inhabitants. Project Sponsors will work with local authorities to identify ways the local community can benefit from the influx of workers (e.g. opportunity to supply foodstuffs, etc.).

A grievance procedure has been set up to deal with any complaints in an efficient manner. If the construction workforce is from another country, there will be adequate information (e.g., on safety) for workers in their primary language and a Community Liaison Officer to assist with communication (CLO will also provide answers on faxes, mails and written forms in German).

#### Socio-Economic benefits

The 4-year construction period also will provide opportunity for developing the local infrastructure. It can be anticipated that local shops and restaurants will profit from the presence of a large workforce (also outside of the main tourist season). Significant tax proceeds will be contributed to the municipality budget at the operating stage of the Installation.



## Monitoring

Any potential disruptions or disturbance caused by the construction activities of the Project Components will be of relatively short duration. Pre- and post construction monitoring will be carried out to verify whether any significant impacts have occurred, and a requirement of compensatory actions may be imposed by the Competent Authority in case of any unacceptable impact. Monitoring will be performed by the Project Sponsors (and their environmental supervisors and consultants including special environmental supervisors), the competent authorities/agencies to ensure compliance with the Environmental Decisions, and consultants on behalf of the lending institutions to ensure conformance with the ESAP obligations.

More specific impact-mitigation topics are presented below.

### **4.1.2 Construction of Maritime Facilities**

The key potential environmental and social impacts expected during the construction of the breakwater and LNG berthing infrastructure.

They include:

- noise (mainly underwater noise),
- seabed disturbance/dredging and spoils disposal,
- negative impact on fish and aquatic mammals,
- disturbance of public access to local tourist sites.

Public road safety and safety of navigation will be considered in the setting up of the construction logistics plans, and details on safety arrangements will be agreed with the responsible authorities and notified to the local public in advance of works.

The risk of accidents and spillages in the harbour/port areas is considered to be of lower priority; this will be minimized by having proper storage of chemicals and waste at designated laydown areas.

The vessel management system operated by the Maritime Office Szczecin will reduce the risk of vessel collisions, plus emergency response equipment is available in case needed.

#### - Noise / underwater vibration

The nearly three-year long planned construction period of the new external harbour facilities including the jetty with the use of heavy equipment (pile drivers, floating cranes) and related noise and vibrations could cause disturbance in the life of marine mammals and fish (*e.g.* the herring during spawning). Several key mitigation measures are planned, *e.g.*:

- The contractors will perform works in accordance with the restrictions included to the Environmental Decisions, especially that no dredging and sediment disposal works will be conducted during the herring spawning season (April-May, when larval and juvenile stages of herring can be present);
- To reduce the overall period of high turbidity from dredging-related activities, Trailer Suction Hopper Dredgers will be used and equipment of the dredger and methods will be

adapted to conditions to minimise suspension of sediments. Monitoring of sediment dispersion will be applied to adjust dredging and disposal operations.

- Vibration piling will be the primary method of piling. Exceptionally, if due to technical reasons the vibration piling will not be possible to conduct, a hydraulic hammer will be used. Soft start procedures will be applied to piling operations. If piling has to be executed during herring spawning, then piling will be reduced to technologically possible minimum.

The disturbance of the local fish habitats and resources during maritime construction activities near the mouth of the Świna may temporarily reduce the normal fish migration in the Świna River between the Baltic Sea and the Szczecin Lagoon. To offset this potential impact, the Environmental Decision prescribes that the Project Sponsor for the breakwater participates financially for at least 3 years in increasing the volume of the fish stocking programme performed by the Fish Stocking Committee of the Ministry of Agriculture.

#### - Dredging and dredge disposal

Dredging and dredge disposal will inevitably lead to a loss or disturbance of seabed habitat. Benthic species such as clams living in or on the seabed may perish. The benthic communities are likely to recover, although owing to changed hydrodynamic conditions, species abundance and distribution may change. The impact of a temporary loss of benthic production is not considered significant in terms of the fisheries productivity, marine mammals or birds. As discussed previously, specific Environmental Studies were done to assess potential impacts of the spoils disposal areas (see also social topics below regarding potential impact to fishermen at these sites). According to calculations, the plume dispersion from dredge disposal will extend to roughly 600 metres downdrift in winter.

#### - Habitat Loss / Destruction and Re-creation

The construction of the new breakwater will add hard substrate in a predominantly sandy environment. The structure will quickly become colonised by a possibly diverse community of mussels, barnacles, macro-algae and other organisms that are currently also found on the existing breakwater. The new breakwater – with its 3km length - will likely provide an important resting ground for waders and gulls in the area.

The impact from earthworks on the beach and dunes will be reduced by minimising the necessary footprint of infrastructure, laydown areas or equipment used, and by the subsequent reinstatement of habitat, particularly for the protected amphipod *Talitrus salator*. The impact of construction works on coastal dunes with herbaceous vegetation (priority habitat type 2130 *grey dunes*) will not be significant because the impact will be limited to an area of 0.3 ha and an efficient regeneration of the vegetation can be expected. A similar prognosis was given for humid dune slacks (habitat type 2190), where about 0.43 ha will be directly impacted. Technical installations will cross the grey dunes near Ku Morzu St, an area which already is degraded. After the construction phase, an efficient regeneration of these dune habitats is expected.

#### - Access to Tourist Areas

A portion of the beach near the Warszów district (about 0.5 km in length) at the new harbour basin will be temporarily closed for safety reasons to tourists during the construction period of the new breakwater and pipe bridge. Access to the beach to the west of the construction area is still possible by walking around the fence; this poses a minor inconvenience to beach-goers. Once construction is completed, only a smaller section of beach (about 100 m wide) directly

adjacent to the new breakwater will remain off limits to the public for safety reasons (access to beach and other tourist areas further onshore is addressed in the Section below re LNG Terminal Construction).

- Noise Impacts at Residential Areas.

Owing to the relatively large distance between the Warszów district from the construction works, noise disturbance from the marine construction is unlikely to be troublesome. Activities that produce high levels of noise will only be allowed during day time, and calculations show that relevant noise limits will not be exceeded. Noise monitoring will be undertaken, and appropriate noise reduction measures will be implemented if needed.

- Impact on Fishing from New External Harbour and Spoils Disposal Areas

During dredge spoil disposal, the sea area will be temporarily restricted from fishing.

The near shore coastal area is traditionally used by local fishermen with small fishing boats; this includes the area of the new external harbour. Even though the port boundaries were extended in 2008 to include the planned new external harbour basin, there was occasional illegal fishing in the area of the new external harbour until the middle of 2010. Therefore as part of the further stakeholder engagement activities, a focus group meeting with the fishermen will be held to discuss if any mitigation measures are warranted.

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#### **4.1.3 Construction of LNG Terminal**

The key potential environmental and social impacts expected during the construction of the LNG Terminal include site clearance/habitat destruction, noise, traffic impacts to local tourist facilities.

- Site Clearance/Habitat destruction

Some permanent impacts to the future site of the LNG terminal are inevitable. The preparatory works for the terminal construction have already been completed with the site clearance in 2009 and some levelling activities, including clear-cutting of about 33 ha of forests (21 hectares comprising a mono-culture of 40 – 60 year old pine trees of relatively low ecological value and 12 hectares of woodland). These actions were all completed in accordance with permits and approvals from the competent authorities, and Polskie LNG is making the obligatory compensation payments<sup>15</sup> to the State Forest Directorate (SFD) and (one-time charge distributed over four instalments) to Municipality of Świnoujście for activities related to environmental protection compensating the losses from removal of trees, in accordance with the procedures of the Environmental Protection Law and Forest Law.

Groundwater lowering is needed during the construction phase and small ponds in the direct vicinity may temporarily dry out. After completion of construction works the initial conditions will usually return. However, adverse impacts on one or several generations of amphibian reproduction in this affected area cannot be excluded, but will be spatially limited. Specifically, two areas with concentrated records of amphibians, e.g. *Rana arvalis*, will be damaged at the

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<sup>15</sup> In any case, freshwater fisheries in Szczecin Lagoon will likely benefit from the Project, as participation of the Project in the lagoon fish restocking programme was required by the Competent Authority.

<sup>16</sup> One time for cutting of premature trees and annually for next 10 years for deforestation

northern margin of the LNG Terminal site; no mitigation is possible here, as this will be the location of the large LNG storage tanks.

On the other hand, the small peat bog and an adjoining pond in the southern part of the LNG terminal site are required to be protected. The earthworks will be conducted after transferring the protected species in accordance with obtained permission of the responsible authority. This area will be conserved as a natural “greenbelt” along the southern perimeter of the site to minimize visual and noise impacts to the residential areas of Warszów further to the south.

#### - Construction Noise and Air Emissions

The calculated environmental noise impact during construction could exceed night time limits in the residential area in the southwest. These activities will only be temporary. Impacts on ambient air quality are also temporary. With a proper work schedule and operation of modern equipment, it is expected that the impacts will not be significant. This will be verified through monitoring; if needed to maintain the noise limits, appropriate noise reduction measures will be undertaken, and certain noisy activities may be stopped at night. The Environmental Decisions provide for stringent noise limits and monitoring requirements in view of the residential areas of the Warszów district and the sensitive spa resort conditions in Świnoujście on the western side of the Świna.

#### - Traffic Impacts to Tourist Areas

The construction works at the terminal site will affect the access roads (particular the Ku Morzu Street) to several nearby touristic sites such as Fort Gerhard, the historic Lighthouse, and bunkers in the dune areas. A Transport Management Plan will be developed by the EPC Contractor for the Project and information made available to the public by Polskie LNG. It is planned to conduct certain construction works during the off-peak tourist season (i.e. not in mid-summer) to minimize the traffic impacts on Ku Morzu Street. Traffic conditions for beach visitors in the Site vicinity will have to be re-organized moderately, although overall the access to the beach will remain unrestricted.

Polskie LNG will, in cooperation with the municipality, provide for new arrangements of beach access to the East of the new breakwater such as construction of new approach path to the beach, parking lot, signage of tourist trails. An agreement between Świnoujście Municipality and Polskie LNG was signed on 15 July 2009, under which Polskie LNG commits to modernize existing *Ku. Morzu Street*, to construct a new parking lot with 100 vehicle places and to arrange some access paths to the beach. In the mentioned agreement, Świnoujście Municipality has committed to amend the existing Spatial Plan for this area until the end of 2011 to enable conducting the construction works. The Maritime Office Szczecin has already established a provisional new passage.

#### **4.1.4 Construction of the Pipeline**

The key potential environmental and social impacts expected during the construction of the connection and transmission pipelines include temporary disruption of current land uses, site clearance/habitat transformation, noise and traffic impacts.

#### - Current Land Uses

The pipeline route does not conflict with existing residential houses and will not cause physical displacement of people. The width of the regular construction strip will be 26 metres, in forest

areas it will be reduced to 18 metres or even 6 metres in environmentally valuable areas. Because the pipeline will be buried at least 1.1 metres below the surface, normal agricultural activities including ploughing can continue after reinstatement. Restrictions for future build-up will apply for a safety strip of 12 metres. The safety strip is incorporated in the Local Area Plans of the settlements in the course of the ongoing Spatial Plan Amendment procedures.

As per LNG Act, the Voivode, after the Decision on the Location, will retain independent property assessors to determine value of assets and level of compensation. The land for the pipeline will be secured by an easement; the ownership will remain the same. Compensation will be paid to owners and users for the temporary construction damage, loss of crops etc. Only for the aboveground installations land will be purchased by GAZ-SYSTEM to be used for installation of 4 – 8 block valve stations (10m x 14m each)<sup>17</sup>. The land for the Goleniów Distribution Hub (40 m x 60 m) where construction works will be completed in 2010, is in the ownership of GAZ-SYSTEM.

#### - Site Clearance/Habitat Destruction

The potential impacts on land use and the need for vegetation clearance along the 80 km transmission pipeline route were greatly minimized by aligning about 95% of the routing distance in parallel or adjacent to existing pipelines. Mitigation measures to protect flora and fauna along the pipeline route are presented in the BAP.

## **4.2 IMPACTS DURING THE OPERATION PHASE**

### **4.2.1 Employment and Socioeconomic Benefits**

#### Workforce During Operations

For operation of the new LNG Terminal, the preliminary staffing plan foresees a total of 81 people, including: management staff (5), operation staff (42), maintenance staff (29), safety staff (5)<sup>18</sup>.

High qualifications are required from the employees-to-be. Special post-graduate studies focused on LNG operations will be launched at the Maritime Academy in Szczecin.

During operation local businesses potentially will to some extent benefit from maintenance and repair related services but it cannot be assumed that this would lead to significant addition employment for companies providing services to the LNG terminal.

It is not anticipated that significant new employment will directly stem from the operation and maintenance of the new breakwater and jetty infrastructure. These activities will primarily be performed by the respective departments of the existing Maritime Agency and Port authorities. Likewise, the connection gas pipeline will be operated by the existing units of GAZ-SYSTEM.

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<sup>17</sup> Block valve stations will be installed about every 20 km, the exact number of BVS will be known after the detailed design (May 2011), the number may be between 4 and 8 BVS required.

<sup>18</sup> The LNG terminal will be operated around the clock in 3 shifts with 48 staff being present during regular work hours between 8 – 17 hrs.

#### - Socio-Economic benefits

The Świnoujście municipality will benefit significantly from the tax revenues generated by the LNG terminal operation. The additional taxes paid by Polskie LNG to the municipality will make up roughly one-fourth of the current annual town budget; it is estimated that the facility operator will pay annual taxes to the local municipality budget in amount of ca. 50-60 million PLN (equivalent to approx. 25-30% of the 2010 budget).

#### **4.2.2 Operation of the water-side facilities**

Once in operation, the potential impacts of the jetty and breakwater are essentially limited to shoreline impacts and impacts to water quality from a change in hydrodynamic conditions, effects from light emission, and the impacts from significant spillages, explosions or releases in the event of an accident.

#### - Shoreline impacts

The physical presence of the breakwater has the potential to affect shoreline, but owing to the natural tendency of the coast to accrete, it is unlikely that coastal erosion will occur. The loss of shallow sand bars formerly present within the external harbour will be compensated by the creation of similar habitat through a foreshore nourishment measures directly to the east of the breakwater. Beach replenishment is foreseen if post-construction monitoring demonstrates that the beach to the east is adversely affected by the structure.

The effect of the breakwaters, a narrow opening for ships to enter and the increased depth, implies a reduction of the wave energy and the exchange of water. Over time, the water quality and sediment quality may deteriorate within the external harbour basin, which leads to an impoverishment of the benthic fauna and proliferation of algae. As this effect would be within the harbour itself, the consequences are not significant.

A further consequence is that the beach and dune area directly bordering the external harbour will undergo a gradual shift to a more mature dune system at the expense of the pioneer vegetation. Such species will, however, still be present to the east of the newly erected breakwater.

The Project's impact on the beach sediments will only affect a narrow section of shore (approx. 0.4 ha) where the pipeline and transport infrastructure for connection of the unloading pier will be located. This area is only a small percentage of the total area of the present coastal ecosystem. Technical installations will be crossing the habitat of grey dunes at a location adjoining *Ku Morzu St*, an area which already is degraded. The planned pipeline bridge connecting the jetty with the Terminal will be routed overhead on columns, with spacing designed to minimize interference with local habitat.

#### - Lighting

The use of directional lights for illumination the marine facilities will reduce unnecessary light pollution during night time, whilst still reducing the risk of collision with low-flying birds during night and fog conditions.

#### - Public Beach Access

The existing breakwater will remain accessible to the public after the Project becomes operational, whereas access to the new breakwater with the berth infrastructure will be limited.

Swimming will no longer be permitted in the new harbour basin, but this is a relatively small part of the overall beach area; undisturbed beaches exist directly to the east for about 10 kilometres towards Miedzyzdroje. The LNG pipeline bridge that connects the berth with the terminal will not create a barrier, as beach-goers will be able to walk beneath it.

#### -Maritime Safety

A navigation risk assessment was undertaken by the Maritime Academy in Szczecin for the LNG port facilities and the navigation access and the required measures for safe navigation and emergency response were identified. As a result of the quantitative risk assessment (QRA), an improved Vessel Tracking System (VTE) will be installed by the Maritime Office Szczecin, and a fire fighting ship, tug boats and support vessels will be purchased by the relevant port authorities and their staff will be trained. Further, for the new external harbour a Port Regulation will be established by the Maritime Office Szczecin. Accordingly, the relevant port authorities will update the present Emergency and Oil Spill Response of the port to cover the new external harbour and LNG vessel traffic, and additional equipment and services will be purchased as needed and staff will be trained by the relevant port authorities in advance of the start of LNG ship operations, *i.e.* by mid 2014. The preparation of the new response plan will be consulted with the competent authority and responsible response organisations (Maritime Office Szczecin, Search-and-Rescue SAR/Border Patrol, Fire Brigades, Provincial Crisis Containment Centres).

The nearest human settlements are located at safe distance in case an explosion of LNG were to happen in association with a collision at the harbour entrance or during mooring / unloading operations at the jetty. The unloading facilities are designed in line with industry best practice to reduce the risk of significant releases of gas or materials including fire extinguishers, safety valves and strict HSE procedures.

The *Q-Flex* LNG Carrier ships are specifically designed for the safe transport of the low temperature LNG. The double hull provides better protection for the LNG tanks in the event of a collision, grounding, and against radiant heat. The ships are equipped with gas detectors and safety alarm systems and the tanks are continuously monitored for leaks.

It should be emphasised that the global past experience of LNG transport and re-gasification over the past several decades has shown that the risks of a significant accident are very low.

#### **4.2.3 Operation of the Terminal**

The key potential impacts of LNG terminal operations are related to air and noise emissions, visual impacts and positive socio-economic benefits (*cf.* Section 4.2.1)

The LNG terminal will be serviced by the local utilities with respect to water supply, wastewater and solid waste management; there are no significant quantities of hazardous wastes or wastewater generated during regasification operations.

#### - Noise Emissions

The LNG terminal operations will have some sources of noise emissions. The predicted noise

levels indicate that applicable Polish values will be met.<sup>19</sup> However, at the residential area located southwest of the terminal, the predicted night time levels come close to the limit value. Therefore, acoustic shielding of relevant noisy installations (e.g. pumps, vaporizers) will be applied if the obligatory monitoring confirms any limit exceedances.

#### - Air Emissions

The main air emission sources will be the combustion of LNG in the SCV vaporizers' burners. The annual CO<sub>2</sub> emissions from the vaporizers, predicted at about 150,000 tons per year. This is low compared with the overall 208 million tons of annual CO<sub>2</sub> emissions allocated for Poland in the years 2008-2012 according to European Greenhouse Gas Trading Scheme. In accordance with international good practice and IFC guidelines for facilities with emissions > 100,000 tons per year, PLNG will be required to quantify and report these emissions. The plant design already includes measures to minimize emissions, e.g. all LNG evaporated in the storage tanks, pipelines, or other equipment will be collected and either used for combustion or returned into the process. The installation of a flare stack (65m) is required for safety reasons for combustion of gas overload in case of an emergency, and such a flare requires a small but constant gas flow to keep the flare burning at all times on low flame. Other sources of air emissions are the gas fuelled boiler. The calculated plant emissions show that the stringent air quality requirements in Poland for health resort zones as here in Świnoujście will be met.

#### - Impacts from the presence of the physical Structures

The tall parts of the LNG terminal – being mainly the LNG storage tanks with a height of 50 m and the 65 m tall flare – may pose a hindrance for bird migration at the terminal location, which is near one of the main European flyways for migrating birds.

Field studies being performed to date in the terminal area have shown that the migration route is apparently not directly at the Project site, but nevertheless Polskie LNG is obliged to undertake various preventive measures, including placing appropriate lighting on the tank shells as well as continued monitoring of the area.

Due to the large distance of the LNG Terminal to the Wolinski National Park, its operation will have no adverse effects on the Park's environment. It will also have no negative impact on the conservation conditions of the "*Warszów and Przytorsk Dunes*" ecological sites.

#### - Impacts on Landscape and Scenery / Visual amenity

The tall structures of the LNG terminal will impact the overall landscape views of Świnoujście and will be visible well beyond the local area (including from the nearby German coastal resorts; cf. Section 6) from where it will be visible in the background of the historic lighthouse and the harbour cranes. Impacts on local views from the nearby Warszów settlement are mitigated by a greenbelt on an earth scarp at the southern perimeter of the LNG terminal premises.

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<sup>19</sup> The Polish values are similar to those in Germany and are also at least as stringent as international guidelines (e.g. of IFC)



## - Public Safety

The LNG Terminal is designed to international best practice industry standards and applicable Polish and EU regulations and norms<sup>20</sup>. It will include all *state-of-the-art* safety features.

The tanks have been placed at the north of the site at maximum distance from the closest settlement in Warszów (the nearest residential house is at a distance of approx. 300 m to the fence, approx 750 m to the nearest gas tank). The terminal will be constructed by an experienced international EPC contractor who is specialised on LNG installations. Operational procedures will be prepared and the terminal will be operated by trained staff. For the Terminal, risk assessments were undertaken to assess the likelihood of fire, leaks and explosion<sup>21</sup>.

The terminal will be an installation that falls under the so-called "Seveso II Directive" of the European Union and thus requires a comprehensive emergency response plan that is coordinated and agreed with the fire brigades and other public disaster response entities. The Seveso II documentation will be prepared by Polskie LNG and is legally required to be submitted for approval to the authorities at latest 30 days prior to operation of installations. The operation stage is scheduled for July 2014 (December 2013: completion of the construction works for the whole Terminal).

Polskie LNG will develop a "Security Organizational Plan" for the construction stage of the LNG terminal in Świnoujście. This Plan will be prepared in four stages between July and October 2010 and will include generally accepted standards to ensure the security of similar investments, and the scope will cover key topics such as:

- incidents management rules for EPC Contractor that required to be notified or registered by local medical and emergency services;
- relationships between EPC Contractor staff and representatives of local district and municipal authorities;
- guidelines for prevention of occupational hazards; maintenance of public order and public security, fire protection and flood prevention.

The Plan will also cover the recommendations for business continuity in terms of critical assets that can disrupt the functioning of sensitive systems during construction, along with applicable mitigation/prevention measures, their costs and timetable for implementation the security measures. In parallel to this, the expert team will address risks arising from terrorist threats including threats identification, the consequences (effects) of hypothetical terrorist acts, specification of acceptable risk level, and proposals for security measures. The EPC Contractor will be obliged to incorporate the Plan in the course of the construction works.

It is considered that a small portion of the liquefied gas might be sold locally. Polskie LNG will not have its own road-tanker fleet, but will ensure that any third parties purchasing LNG at the terminal are licensed for this kind of transportation and comply with Polish and EU safety standards for transportation of hazardous materials such as for truck and equipment safety, driver qualification etc.

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<sup>20</sup> In particular the LNG terminal specific EN1473

<sup>21</sup> As per international best practice and in line with Polish Standard: QRA, HAZIP, HAZOP studies

#### 4.2.4 Operation of the Pipeline

Regular pipeline operation will not be associated with significant adverse impacts to the environment, especially because about 95% of the route will follow existing pipeline routes. As such, future maintenance of the corridor will continue essentially as in the past.

Inspections via helicopter flyovers are only allowed outside the breeding season of specified bird species and only with approval of the Ministry of Environment.

##### - Public Safety

The gas pipeline will be designed and then constructed to established Polish and international norms and standards applied by GAZ-SYSTEM S.A. (same as for other such gas pipelines in Poland). The pertinent regulations foresee a safety strip of 12 metres to both sides that cannot be used for building. In a few locations the new pipeline will run close to residential houses, however, keeping the required safety distance.

The pipeline will be buried underground and protected from corrosion by polyethylene coating and cathodic protection. Welds will be X-rayed successively after finishing of welding works and the pipeline will be hydro-pressure-tested before commissioning. Above ground markers show the location of the pipeline and the safety strip that excludes erection of structures is included in the Local Area Plans of the communities. The pipeline system will have a leak detection system and automatic shut off valves at intervals between 10 – 20 kilometres along the route. Pipeline and associated facility integrity will be monitored by periodic PIG inspection runs inside the pipeline (as described in Chapter 2.2) and monthly patrol of the route by car and foot and helicopter flyovers<sup>22</sup>.

Emergency procedures will be coordinated between GAZ-SYSTEM and the competent public response organisations. Plans will be established before operation commences and will be communicated to the municipalities and local agencies like fire brigade etc.

### 4.3 IMPACTS DURING THE DECOMMISSIONING PHASE

For all components of the Project, the types of ecological impacts that may result from decommissioning activities at some future time will be comparable to those associated with the construction phase.

There are no current plans to decommission the LNG Terminal. It is currently not envisaged that the breakwater or the pipeline will be removed at the end of the Project lifetime; with appropriate maintenance such structures can last for many years longer. If and when decommissioning of Project structures and equipment is required, the demolition and dismantling activities will occur in accordance with the environmental and safety regulations in force at that time, including appropriate recycling, re-use and disposal of materials and restoration of landscapes. Presumably the respective technologies for decommissioning activities will have improved and the regulations will be likely more stringent than at present. Given the relatively environmentally benign operations of the LNG terminal (e.g. no significant

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<sup>22</sup> For protected areas these flyovers are carried outside sensitive times (bird breeding) and have to be agreed by the General Director for Environmental Protection in Warsaw

quantities of polluting substances generated, stored or handled), the risk of any widespread contamination of soil or groundwater at time of decommissioning would appear to be minimal.

Decommissioning of the LNG Terminal operations at some future time will of course result in the permanent loss of jobs for those persons employed at the Terminal and the related service-providers (catering, maintenance, etc). On the other hand, the demolition and dismantling activities will provide short-term work for the construction, waste management and other contractors involved with such services. It can be assumed that, given the broad commercial-economic base of the Świnoujście region, the loss of the jobs due to closure of the Terminal will not have a significant overall impact on the local economy, and that alternative local employment opportunities may be feasible for the former Terminal staff.

The wider socio-economic ramifications of the closure of the LNG Terminal and cessation of LNG imports via this facility cannot be predicted at this time.

A decommissioning plan for the Project Components will be developed prior the commencement of decommissioning as required for obtaining the decommissioning permit in accordance with the Building Law and other pertinent requirements in place at the time of decommissioning. This will also include developing social plans to mitigate the consequences of employee's retrenchment.

## 5 CUMULATIVE IMPACTS

This section discusses the potential for significant cumulative impacts that may be caused

- by the LNG Terminal Project in combination with other new projects that might be ongoing in the region and
- from the LNG Terminal Project itself (*i.e.* between its various Components).

The following other construction/development projects are planned for the Świnoujście area during the period of the LNG Terminal Project construction between the present up to about 2014:

- Construction of a road tunnel under the Świna River to connect Wolin and Uznam Islands as part of National Road No.3 (E75)
- Construction of a parking lot with 75 spots for trucks at the Euro-Terminal site (approx. 2 km from the LNG Terminal site)
- Modernization and construction of new buildings and a new dock at the Marine Renovation Shipyard (approx 2 km from LNG Terminal site), and several smaller road projects<sup>23</sup> in the vicinity of the gas pipeline route.

Of the above, the Świna River tunnel planned by the General Directorate for National Road and Highways (GDNRH) is the largest other project in the area. According to public information

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<sup>23</sup> This inter alia includes a ring road around Troszyn, Parłówek and Ostromice towns along with the S-3 Wolin-Troszyn road, a ring road around Brzozowo, Brzozowo-Miękowo road section, a ring road around Miękowo, Goleniów-Rzęsnica interchange (A6) road section (S6 road, Goleniów interchange, end of the Miękowo ring road.

from the GDNRH<sup>24</sup>, the approximately 1.6 km long tunnel will begin on Uznam Island (Świna Left bank) with a passage in the area of the wastewater treatment plant. The tunnel outlet on Wolin Island (Świna Right Bank) will be behind the sea ferries jetty. About 2.5 km of access roadway will be built. In the first construction stage one tube will be built for two lanes of traffic, but ultimately, the tunnel will have two tubes for total of four lanes. The Decision on Environmental Conditions for the tunnel project was issued by Regional Directorate for Environmental Protection on 1 June, 2010. <sup>25</sup>

None of the above projects are in the immediate vicinity of the proposed LNG Terminal Project construction sites and thus there are no expected cumulative impacts to local residents due to construction area noise, emissions, or other effects. Furthermore, there are no additional significant cumulative impacts on the local environment or ecology as a result of these various projects.

The specific impacts caused by the construction and operation of the four Project Components and the corresponding measures to prevent and minimize such impacts are separately addressed in the respective EIAs, EIA Decision Documents from the Competent Authorities. Additionally, the impacts from construction and operation of the LNG terminal, the jetty and breakwater have been considered collectively and were summarised in the “*Memorandum LNG Terminal on the Polish Coast in Świnoujście*” (May 2010). Impacts on ambient air quality and regarding noise were modelled for the operation phase considering the three components and the results show that limit values for the residential areas are kept.

The construction of the two onshore Components - the LNG Terminal at Świnoujście and the 80-km buried Pipeline - is spatially distant from each other and partly of different nature; the respective impacts will have no significant effects on each other.

The two maritime Components – Breakwater and Jetty – on the other hand are closely interrelated. and in terms of impacts on environment and in the public view can essentially be seen as one combined project. The Breakwater construction, together with the dredging for the new harbour basin, will be a substantially larger and longer project than the Jetty construction - which will take place within the same space as the Breakwater/basin and sequentially during the Breakwater construction. The studies indicate that the impacts of these Components additive but not expected to be synergetic, i.e. the combination of various separate impacts will not combine to create some greater additional effects.

Impacts on Biodiversity / Natura 2000 are minimized and mitigated by the measures set out in the decisions for the individual Components of the Project and in the BAP.

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<sup>24</sup> See website of GDNRH at

[http://www.gddkia.gov.pl/article/oddzialy/gddkia\\_szczecin/informacje/aktualnosci/article.php/id\\_item\\_tree/678805b3bc0c4846da72fb4870b3d12f/id\\_art/4112b7de5870c45fd6b58ee4c595f4fc](http://www.gddkia.gov.pl/article/oddzialy/gddkia_szczecin/informacje/aktualnosci/article.php/id_item_tree/678805b3bc0c4846da72fb4870b3d12f/id_art/4112b7de5870c45fd6b58ee4c595f4fc)

<sup>25</sup> [http://szczecin.rdos.gov.pl/index.php?option=com\\_content&view=article&id=981bwieszczenie-z-dn01062010-r-w-sprawie-przedsiwzicia-polegajcego-na-budowie-staego-poczenia-pomidzy-wyspami-uznam-i-wolin-w-winoujciu&catid=39bwieszczenia&Itemid=81](http://szczecin.rdos.gov.pl/index.php?option=com_content&view=article&id=981bwieszczenie-z-dn01062010-r-w-sprawie-przedsiwzicia-polegajcego-na-budowie-staego-poczenia-pomidzy-wyspami-uznam-i-wolin-w-winoujciu&catid=39bwieszczenia&Itemid=81)

## 6 *TRANSBOUNDARY IMPACTS*

The LNG Terminal will be located at a distance of 4.5 kilometres from the border to Germany, the next settlement across the border being Ahlbeck (Heringsdorf Municipality) at about 5 km from the Terminal.

Despite the distance and the forests on the left bank of the Świna that provide for visual shielding, the historic Świnoujście lighthouse with its 68 metres height and the harbour cranes on the Świna left bank are presently well visible from Ahlbeck. Consequently it is expected that the LNG terminal installations (notably the two 50 metre high tanks and the 65 metre high flare tower) will likewise be visible from the German side. Also the large LNG Carriers on journey or in the external port will be visible from the beaches in German and will likely add to the attraction of the seascape.

Due to the distance, potential impacts from significant event such as gas explosion are unlikely to have any impact for the German side. However, LNG tanker accidents may have a potential for transboundary impacts if spills from a tanker collision or grounding results in a loss of fuel oil that could reach German waters and beaches

The present Świnoujście harbour is equipped with emergency, including spill, response equipment adequate for the existing vessel traffic and additional provisions will be made by the Maritime Office in Szczecin for the LNG ships. For the operation stage a plan will be elaborated for combating pollution, which will identify possible additional needs or equipment going beyond what is available at present by the Maritime Search and Rescue Service (SAR) in Świnoujście. (*cf.* Section 4.2.2). The Oil Spill Prevention and Response Plan (OSPRP) will reflect any existing local and regional plans and agreements, include priorities for protection of sensitive environments and populations and be shared with relevant Polish and German authorities. As per ESAP, the OSPRP will be completed prior to operation of the new external harbour and LNG berth.

As described in Section 3 above, the pipeline route alternatives through Szczecin lagoon, that would likely cause transboundary impacts from sediment plumes, were discarded in favour of the land-routing.

## 7 *STAKEHOLDER ENGAGEMENT*

### 7.1 *PREVIOUS CONSULTATION*

Each stage of the Project was accompanied by information disclosure and public consultations with institutional stakeholders and local communities. The disclosure campaign covered the scope of the permitting and environmental assessment procedures for the different project components according to the Polish regulatory requirements. The following were disclosed:

- The Land Zoning Procedures for the LNG Terminal Site in Świnoujście Municipality (2004 and amendments in 2007)
- The Land Zoning Procedures for the Pipeline Route in the five municipalities traversed by the pipeline (2009 – ongoing)
- The separate EIA processes for the four project components (LNG Terminal, new breakwater (external harbour), and the jetty (LNG tanker berth) that took place in 2009.

The Sponsors have undertaken the required EIA documents disclosure for the different components of the LNG Project. In line with Polish legislation the EIA procedures were performed without a public scoping. Public participation took place through the disclosure of the draft EIA for 21 days as stipulated in the Polish law.

In the case of the LNG terminal, comments were only received during that period from one party (NGO *Zachodniopomorskie Towarzystwo Ekologii Praktycznej*, West-Pomeranian Society of Practical Ecology in Szczecin) and these related inter alia to alternatives and ecological baseline studies. The following Table 1 summarizes the previous disclosure of the single EIAs.

**Table 1** *Previous EIA Disclosure*

LNG Terminal	Breakwater (New Outer Harbour)	Jetty	Pipeline
<p><b>Land Part:</b> Full EIAs were disclosed as paper copy from 12 Feb 2009 to 28 Feb 2009 at the Mun. of Sw office in Sw.</p> <p><b>Marine Part:</b> Full EIA was disclosed as paper copy from 2 Jan 2009 to 23 Jan 2009 at RDOS office in Szczecin.</p>	<p><b>Land Part:</b> Full EIA was disclosed as paper copy from 6 Feb 2009 to 27 Feb 2009 at the Municipality. of Świnoujście office.</p> <p><b>Marine Part:</b> Full EIA was disclosed as paper copy from 10 Feb 2009 to 3 March 2009 at RDOS office in Szczecin.</p>	<p>Full EIA was disclosed as paper copy from 24 Feb 2009 to 17 March 2009 at RDOS office in Szczecin.</p>	<p>Full EIA was disclosed as paper copy from 16 Nov 2009 to 30 Nov 2009 at RDOS office in Szczecin.</p>

Besides the regulatory public disclosure of details on the LNG Project, the Project Sponsors also organized additional information disclosure (within the framework of open Project communication process).

Supplementary to the statutory disclosure and consultation described above, the Project Sponsors engaged into voluntary public meetings and consultations for the LNG Terminal and new harbour with jetty<sup>26</sup>. These activities have taken place in Świnoujście since September 2007 till now. Their purpose is to inform the public about the project details and to provide the possibility to ask questions and raise concerns on the Project.

Between September 2007 and April 2009, Open Door events were held once a month in so-called "Information Points" located in Warszów and in the town centre of Świnoujście. Project representatives were present and answered questions of local residents. Overall there were only few visitors to these information events.

Subsequently however, the Project received wider public attention at following public meetings where the Project Sponsors presented the project and responded to queries:

- October 9, 2009: Public Meeting at Warszów Culture Hall, organised by Warszów District Authority, with attendance about 120 residents.

<sup>26</sup> For the pipeline no meetings additional to the statutory ones for the spatial plan amendments were conducted.

- January 15, 2010: Public Meeting at Warszów Culture Hall, organised by the local citizens group *Right Bank of Świna River Development Association* (Stowarzyszenie na Rzecz Rozwoju Prawobrzeża Świnoujścia) , with the attendance about 200 residents.
- March 10, 2010: “Seminar” at Świnoujście Culture Hall, initiated by PLNG and organised by the City Council of Świnoujście, with attendance of about 80 residents.

All the above meetings were announced locally by invitation postings and were covered by press.

The last meeting on March 10, 2010 took about 6 hours and about 100 questions were discussed. Key issues raised by local population and discussed were inter alia LNG plant safety, creation of jobs and business opportunities including lodging for workforce, public health and safety concerns in Warszów due the large number of workers, construction nuisances, future use of the beaches and local fishery, and the Project Sponsors provided information and the envisaged solutions. A summary of key issues is provided in Box 3 below.

In March 2010, Polskie LNG produced a pamphlet that describes the key aspects of the Project.

Further, the Project sponsors (Polskie LNG, UMS, ZMPSiŚ) provided information on their websites about Project background and the present stage of development. In addition, Polskie LNG and the Szczecin & Świnoujście Seaports Authority provided a log of Frequently Asked Questions (FAQs).

***Box 3 Summary of key issues discussed during the Public Meeting on March 10, 2010***

Regarding the issues of plant safety most questions were about risks of explosion and fire danger. During the public meetings the representatives of Polskie LNG explained the fire prevention methods that will be applied in the installations and also the inspection procedures, which need to be conducted prior the LNG terminal will be put in operation and further that periodical inspections will be undertaken by the competent Fire Brigade units. Additionally it was stated that the LNG terminal will be equipped with a special rescue vehicle, as a part of an emergency response plan.

Several questions were related to the impact of the planned investment on the tourist attractiveness of Świnoujście. An external expert for PolskieLNG pointed out that the new external harbour with the large berthing LNG tankers might become an attraction point for tourist on the right bank of Świna River. PolskieLNG informed that In accordance an agreement signed with Świnoujście Municipality, recreational beach access infrastructure will be re-established (access paths to the beach, parking lot, bike path along the Ku Morzu St.) in vicinity of LNG terminal.

With respect to creating the potential work places for local people PolskieLNG informed that the entire service field for the LNG terminal will amount to 124 new jobs. The Terminal itself will be a work placement for relatively few very skilled employees. Taking into account the fact that qualified personnel will be needed to operate the terminal, LNG started the close cooperation with the Maritime Academy in Szczecin and postgraduate studies will be established.

Some question asked by Świnoujście residents reflected to the compensations and benefits for local community. The residents may benefit from working in the terminal service zone, the LNG facility operator will pay annual taxes to the local municipality budget in amount of ca. 50-60 million PLN.

There was a set questions addressed to PLNG during the meeting concerned the biodiversity and environment protection. PLNG representatives and present at the meeting external experts reported on the wide spectrum of conducted analysis regarded the environment protection. It was

also underlined that as an output of conducted researches the minimizing and mitigation measures were imposed by issued environmental decision on PLNG will fully participate in implementing these activities.

There was one question raised regarding the fishing and herring spawning grounds during the meeting. The Maritime Office Szczecin representative explained to the audience that in the area of planned external port there already a ban on fishing in accordance with the port regulations in place. On the base of conducted research there was no indication of herring spawning ground in this area. Moreover, because of new breakwater construction it will be possible to create a suitable habitat for spawning fish, as was the case observed in Klaipeda/Lithuania.

## 7.2 ONGOING AND FUTURE STAKEHOLDER ENGAGEMENT

### - Stakeholder Engagement Plan

A Stakeholder Engagement Plan (SEP) was developed by Project Sponsors, including GAZ-SYSTEM as the project coordinator. The SEP identifies the key stakeholders and describes the communication plan for the LNG Terminal Project. The SEP takes into account best international practice in relation to information disclosure. The document will be reviewed and updated on a regular basis if activities change or new activities relating to stakeholder engagement commence.

### - Disclosure Package

The Disclosure Package will be available from November 2010 on the Project website and documents will be locally available as hardcopy for review by the interested public. Additionally, twice monthly an information desk will be open at the Culture Hall in Warszów (one of the locations where the Disclosure Package will be available)

The Disclosure package will consist of the SEP, the NTS, the ESAP and further supporting documents (Social Review, Biodiversity Action Plan) that describe the environmental and social aspects of the overall LNG Project and the mitigation measures that the project Sponsors are implementing.

### - 60-Day Feedback Period

The Disclosure Package will be available on the website and as hard copy in Świnoujście, Warszów and in Ahlbeck on the German side.

Comment collection boxes will be installed at all locations where the documents are available.

Stakeholders, including the public, will have 60 days from the release of information to submit their comments on special comments forms via drop boxes at the location of disclosure, by e-mail, letter or fax or by phone (contact details see at the end of this NTS). All comments and queries received during the disclosure period will be recorded and processed by the grievance mechanism. At any time after this period, comments can also be forwarded to the CLO.

Information material on the project will be available in local and regional newspapers and in the Package disclosure locations in line with the activities included in the SEP. Statutory stakeholders including NGOs identified in the SEP receive a separate notice by e-mail or letter.

Detailed information on actions taken to ensure public disclosure of information on investment and on the complaint, inquiry and feedback mechanisms is provided in the "Stakeholder Engagement Plan" (SEP).



### 7.3 TRANSBOUNDARY CONSULTATIONS

Representatives of Voivodeship of West-Pomerania held a number of informative meetings with the administration in Germany about the LNG Terminal Project. The Polish EIA process, conducted for all the project components, did not include formal transboundary consultation under the ESPOO Convention<sup>27</sup> with German authorities or the German public, since no significant transboundary impacts were identified in the course of the environmental impact assessment procedure. Nevertheless, Polskie LNG and GAZ-SYSTEM S.A., on behalf of the LNG Project Sponsors, are involved in an ongoing consultation process with regional authorities in Germany (State Agency for Agriculture and Environment “StALU” in Stralsund – formerly called StAUN). Further consultations will include disclosure to the German authorities of key documents including Risk Assessment Studies (for the LNG terminal, Maritime Risk Assessment) and Emergency and Spill Response Plans. Moreover, the LNG Project Sponsors hosted a visit of StALU representatives at the project site in August 2010. The parties agreed on an action plan and communication approach to disclosures and responses to inquiries from the German side.

Subsequently, the German authority sent an official stance that after their appraisal they “do not see any grounds indicating that a significant adverse impact could be anticipated on the German territory as a result of the largest possible industrial accident during transport, unloading or loading LNG in Świnoujście, leaving aside the issue of the probability of such an accident”.

Local disclosure of the NTS and the SEP documents in the German language in Ahlbeck (Heringsdorf Municipality) during the 60-day period and arrangements for a comment and feedback mechanism have been included in the Stakeholder Engagement Plan (SEP).

### 7.4 COMMUNITY LIAISON AND GRIEVANCE MECHANISM

Project sponsors will designate a Community Liaison Officer (CLO) and a support team who will be in charge to update local communities on Project progress and topics of interest such as job opportunities, according to the Communication Plan included in the Stakeholder Engagement Plan (SEP). The CLO will be the key point for further interfacing with local communities and the local authorities. This will also include handling of potential local issues such as complaints from population. The CLO will coordinate above on behalf of all involved Project Sponsors, *i.e.* Polskie LNG, GAZ-SYSTEM, Szczecin & Świnoujście Seaports Authority and Maritime Office in Szczecin.

## 8 ENVIRONMENTAL AND SOCIAL ACTION PLAN

The Project Sponsors have agreed an Environmental and Social Action Plan (ESAP) with the Lenders that summarises the key action items from the Environmental Decisions that were issued by the competent authorities (as per applicable Polish/EU regulations), plus includes numerous additional measures to safeguard environmental and social aspects of Project implementation as per international good practice and the Lender requirements (e.g. IFC Performance Standards, Equator Principles and EBRD Performance Requirements).

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<sup>27</sup> Convention on Environmental Impact Assessment in a Transboundary Context - <http://www.unece.org/env/eia/>

The ESAP addresses the following main topics during the Project phases of Construction, Operations and Decommissioning, as applicable:

- Implementation of all environmental protection and mitigation measures stipulated in the Environmental Permits and Decisions
- Implementation of the Biodiversity Action Plan
- Process Safety and Emergency Response
- Contractor management
- Overall EHS management capacity of Project Sponsors
- Public/Stakeholder Engagement - Grievance mechanism
- Social Review
- Underwater noise management - construction
- Transboundary consultations
- Environmental supervision and monitoring
- Facility security
- Training needs
- Change management during project implementation

The ESAP is in the public domain at [www.polskieng.pl/nc/terminal-a-srodowisko.html](http://www.polskieng.pl/nc/terminal-a-srodowisko.html) and in the locations stated in the Stakeholder Engagement Plan (SEP) where Project documents are located.

The ESAP specifies that monitoring of action plan implementation will be undertaken by an Independent Environmental and Social Monitoring Consultant on behalf of the Lenders.

Annual monitoring reports will be compiled by the Project Sponsors and made available to the relevant authorities and the lenders, as requested and appropriate<sup>28</sup>. The reports shall cover the status of EHS related matters like permits, status of compliance with obligations arising from such licenses or permits, exceeding of regulatory environmental standards with root cause analysis, corrective measures.

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<sup>28</sup> As per the Decisions, the monitoring for the LNG Terminal, breakwater and Jetty and the pipeline shall be carried out for five years after its completion.

## 9 CONTACT DETAILS

Inquiries regarding the Project can be made with following point of contact:

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