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**PROJECT OPERATOR**

**:** **MYTILINEOS S.A.**



**ELECTRIC ENERGY BUSINESS SECTOR**

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**TYPE OF ACTIVITY**

**:**

**NEW ELECTRICITY POWER PLANT, NOMINAL POWER  
826MW, AT THE EXISTING ENERGY CENTER OF AGIOS  
NIKOLAOS VIOTIA**

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**PROJECT SITE**

**:**

**"AGIOS NIKOLAOS" POSITION - OUTSIDE URBAN PLAN OF  
DISTOMO AREA – M.U. OF DISTOMO - MUNICIPALITY OF  
DISTOMO – ARACHOVA – ANTIKYRA & OUTSIDE URBAN PLAN OF  
KYRIAKI – M.U. OF KYRIAKI - MUNICIPALITY OF LEVADEON –  
VIOTIA REGION**

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**ENVIRONMENTAL STUDY FOR THE AMENDMENT OF YPEN /DIPA /  
82557/5356 /17.09.2019 ENVIROMENTAL TERMS APPROVAL FOR THE  
INSTALLATION AND OPERATION OF CONSTRUCTION FACILITIES OF THE  
NEW ELECTRICITY POWER PLANT**

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**Environmental Study**  
**Engineer:**



**SAMARAS & ASSOCIATES S.A.**  
**CONSULTING ENGINEERS**

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**THESSALONIKI, JANUARY 2020**

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## **PROJECT OPERATOR**

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<b>MYTILINEOS S.A.</b>	
<b>PROJECT OPERATOR</b>	<b>: ELECTRIC ENERGY BUSINESS SECTOR</b>
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<b>PROJECT TYPE</b>	<b>: NEW ELECTRIC ENERGY PRODUCTION STATION, NAME POWER 826MW, IN THE APPROVED ENERGY CENTRE OF AGIOS NICOLAOS VIOTIA</b>
<hr/>	
<b>PROJECT LOCATION</b>	<b>: "AGIOS NIKOLAOS" POSITION - OUTSIDE URBAN PLAN OF DISTOMO AREA – M.U. OF DISTOMO - MUNICIPALITY OF DISTOMO – ARACHOVA – ANTIKYRA &amp; OUTSIDE URBAN PLAN OF KYRIAKI – M.U. OF KYRIAKI - MUNICIPALITY OF LEVADEON – VIOTIA REGION</b>

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## **1 INTRODUCTION**

### **1.1 PROJECT TITLE**

This Environmental Study is submitted for the amending YPEN/DIPA/82557/5356/17.09.2019 Environmental Terms Approval (ETA), as it is amended and in force by YPEN/DIPA/114847/6959/09.12.2019 decision issued by the respective Directorate of Ministry of Environment and Energy. The above mentioned environmental terms approval concern the project "Development and Operation of a new power plant with of nominal power of 826MW of Mytilineos S.A. / Electric Energy Business Sector (formerly PROTERGIA S.A.) at the Existing Energy Center of Agios Nikolaos Viotia".

This study concerns the assessment of the environmental impact of the installation and operation of construction sites that will be temporarily installed in the development area of the new power plant until the completion of the implementation phase of the project.

The details of all decisions which approved the environmental conditions of the new power station with a rated power of 826MW are presented in the following table.

**Table 1.1-1:** Environmental Permitting Framework of a new power plant with a business sector power of 826MW at the existing energy center Agios Nikolaos Viotia.

α/α	Approval title	Protocol Number	Approval Date
1.	Ministerial Decision (MD): "Approval of Environmental Terms for the development and operation of a new Power Plant with nominal power 775MW of MYTILINEOS S.A./Electric Energy Business Sector (formerly PROTERGIA S.A.) at the Existing Energy Center of Agios Nikolaos Viotia", DIPA Ministry of Environment and Energy	YPEN/DIPA/82557/5356	17.09.2019
2.	"Amendment of YPEN/DIPA/82557/5356/09.12.2019 ETA of the project "Construction and Operation of a New Power Plant of Mytilineos S.A./ Electric Energy Business Sector (formerly PROTERGIA S.A.) at the Existing Energy Centre of Agios Nikolaos Viotia" in terms of its nominal power from 775MW to 826MW, IPA MINISTRY OF ENVIRONMENT AND ENERGY	YPEN/ΔΙΠΑ/114847/6959	09.12.2019

## 1.2 KIND AND SIZE OF THE PROJECT

The main project under consideration concerns the construction and operation of a new combined cycle power plant with an installed capacity of 826 MW using Natural Gas as fuel.

The process involves **two stages of electricity generation, first from the gas turbine operation and then from the steam turbine operation**. In the **first stage** the power generation takes place in the **gas turbine**, whose rotor is rotated by hot exhaust gases, by the combustion of natural gas. The exhaust gases are then driven to the heat recovery boiler for steam production. In the **second stage** the steam from the heat **recovery boiler** is driven to the **steam turbine**, for electricity generation. After the steam has been defused in the steam turbine, the steam is liquefied in a water-cooled condenser and re-fed to the boiler. Condenser cools with seawater in closed circuit with cooling towers.

This study concerns the assessment of the potential environmental impacts, which may be caused by the installation of accompanying construction activities for the construction of the project, which relate to the:

- i. Temporary concrete production plant, which is to supply the project with ready concrete





- ii. Temporary Waste from Excavations, Construction and Demolition treatment plant, which is to manage only excavation waste resulting from the construction work of the project with a view to their optimal recovery and reuse

These activities are of a temporary nature as they are intended to serve exclusively the construction needs of the new power station. They are an integral part of the project, as they are in order to ensure the delivery of raw materials in sync with its needs and not according to the opening hours of conventional installations. The above construction facilities are to be developed within the environmentally licensed area of intervention and implementation of the project, as licensed by No. 82557/5356/17.09.2019 ETA.

As a follow-up to the above, this study is submitted, on the basis of the provisions of Article 6 of Law 4014/2011 (Government Gazette 209/21.09.2011) and Annex 5 to No. 170225/20.01.2014 (Government Gazette 135B/27.1.2014) ministerial decree, accompanied by the necessary documentation and documentation drawings. The control and approval of this file, is responsibility of the Directorate of Environmental Permitting (DIPA) of the Ministry of Environment and Energy.

**Environmental Permitted Project:**

"Development and operation of a new power plant with nominal power of 826MW of Mytilineos S.A./ Electric Energy Business Sector (formerly PROTERGIA S.A.) at the Existing Energy Center of Agios Nikolaos Viotia"

**Recommended Project:**

"Installation and operation of construction facilities for the construction of the New Power Plant with nominal power 826MW of the company Mytilineos S.A. / Electric Energy Business Sector(formerly PROTERGIA S.A.) at the Existing Energy Center of Agios Nikolaos Viotia"

The environmental identity number of the project is: PET 1902042017.

### 1.3 GEOGRAPHICAL POSITION AND ADMINISTRATIVE WORK PRODUCTION

#### 1.3.1 Place

The construction of the station under consideration is located within the expropriated area of the Royal Degree GG138D/1962, in the position of Agios Nikolaos, a valley that ends on the eastern side of the bay of Antikyra, with a front in the sea. The area of intervention and implementation of the new station is located adjacent to the Mytilineos S.A. facilities (in particular, next to the alumina-aluminum plant (formerly Aluminon of Greece), the Cogeneration High Efficiency Electricity Power Plant (SYTHYA) of Mytilineos S.A./ Metallurgy Business Sector), but also of the Independent Power Station with a rated power of 444,48MW (ASI/IRPM) of Mytilineos S.A./ Electric Energy Business Sector.



Figure 1.3.1-1: Geographical location of the project.

The construction facilities under consideration for the construction of the project are to be developed within the environmentally licensed area of intervention and implementation of the project, as licensed by No. 82557/5356/17.09.2019 (ETA) and described in detail in the following paragraphs.

### 1.3.2 Project Administrative Submission

The land of the expropriated area as well as the area of implementation of the new power station under consideration falls within the administrative boundaries of the M.U. Distomo of the Municipality of Distomo - Arachova - Antikyra, but also of the M.U. Kyriaki of the Municipality of Levadeon, both of Viotia Region.

### 1.3.3 Geographical Coordinates

The central geographical coordinates of the implementation area of the new power plant and, by extension, of the proposed construction facilities, both in the Greek Geodesic Reference System 1987 (EGSA 87) and in the World Geodesic System 1984 (WGS 84) are given in the following table:

**Table 1.3.3-1: Central Bar Coordinates of Individual Facilities Activities of ATE**

Coordinates EGSA '87		Coordinates WGS '84	
X (m)	Y (m)	Φ°	
385442	4245850	38.3560	22.6906





**Figure 1.3.3-1:** Google Earth excerpt showing the location of the new power station with a rated power of 826 MW

Below is a table of the coordinates of the peaks of the area of intervention and implementation of the station under consideration, as well as of the site of the construction sites of.

**Table 1.3.3-2:** Coordinates of The Tops of the Intervention and Implementation Area of a New Station and Proposed Construction Facilities in the Hellenic Geodesic Reference System 1987 (EGSA '87).

A/A	EGSA '87	
	X (m)	Y (m)
<b>Area 4.600m<sup>2</sup></b>		
E1	385.592,584	4.246.199,035
E2	385.550,556	4.246.162,562
E3	385.592,584	4.246.169,035
E4	385.603,042	4.246.100,929
E5	385.559,306	4.246.063,009
E6	385.554,049	4.246.068,818

A/A	EGSA '87	
	X (m)	Y (m)
<b>Area 45.000m<sup>2</sup></b>		
E7	385.637,272	4.246.076,163
E8	385.671,688	4.246.038,254
E9	385.651,730	4.246.018,876
E10	385.669,098	4.245.970,371
E11	385.599,901	4.245.903,162
E12	385.582,538	4.245.889,667
E13	385.575,465	4.245.870,284
E14	385.517,672	4.245.819,532
E15	385.508,050	4.245.800,497
E16	385.502,461	4.245.777,115
E17	385.484,616	4.245.766,943
E18	385.473,348	4.245.749,682
E19	385.443,256	4.245.723,305
E20	385.417,419	4.245.721,747
E21	385.378,592	4.245.734,232
E22	385.322,228	4.245.785,731
E23	385.390,384	4.245.852,533
E24	385.417,170	4.245.871,360
E25	385.508,352	4.245.959,391

The following orthophotograph extract shows the area of intervention and implementation of the new power plant with a rated power of 826 MW, as defined by the coordinates of the above table and licensed by No. 82557/5356/17.09.2019 ETA. The operation of the construction facilities will be implemented within the environmentally licensed area of implementation of the licensed power plant.



**Figure 1.3.2-1:** A satellite imagery extract showing with red line the expropriated area of the Royal Degree GG138D/1962, in which the activity under study is installed, while a yellow line indicates the area of intervention and implementation of the new power plant with nominal capacity of 826 MW, as well as its proposed construction facilities.



#### **1.4 CLASSIFICATION OF THE PROJECT**

According to No. DIPA/oik.37674/10.08.2016 MD on "Classification of public and private works and activities into categories and subcategories", as applicable, the environmental categorization of both the main project and its accompanying construction facilities is set out in the following table:



**Table 1.4-1:** Environmental Classification of the new plant and its proposed construction facilities in accordance with No. DIPA/oik37674/10.08.2016 MD.

Type of Activity	No	Type of project - activity based on DIPA/oik37674 /10.08.2016 MD	Subcategory A1	Subcategory A2	Category B	Comments
Main Activity						
<b>826 MW power station</b> Subcategory A1	9 <sup>th</sup> group - 209	Installations for the production of electricity with non-biogas gaseous fuels	<b>&gt;300MW</b>	300 – 20 MW or >10MW & >90 rates or ≤10MW & >150 rates	Activities not falling within category A	Capacity refers to rated thermal power. Excludes spare Electro-Derived Pairs which fall under the provisions of para. 11(b) of Article 132 of the Law 4001/2011 (A' 179) and the provisions of Law 2244/1994 (A' 158) as amended and of ministerial decree D5-EL/C/F6/oik25132/ 7-02-2009 (B'2442).
Accompanying facilities						
<b>Concrete Production Unit</b> subcategory A2	9 <sup>th</sup> group - 125	Production of ready-made concrete	-	The total	-	Facilities covered by Article 7(1)(b) shall be excluded. 2 of L. 4014/2011 (Government Gazette 209A)
<b>Construction Wastes Processing Installation</b> subcategory A2	4 <sup>th</sup> group - 16	Processing facilities (work R5, R12 and R13)	-	<b>Units <math>\mu\epsilon</math> <math>\geq</math> 200kW</b>	Units $\mu\epsilon$ $P < 200kW$	P : power In the case of a mobile unit, it shall be authorized to operate in the temporary installation position of the same unit. Mobile Construction Wastes Treatment Facilities means units whose electromechanical devices are carried on vehicles registered and do not remain in the reception area for more than one year

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In accordance with the legislation in force, and in particular No. DIPA/oik37674/10.08.2016 (Government Gazette 2471B/2016) MD, the main project, the new power plant with a nominal capacity of 826 MW, is environmentally classified in subcategory A1. Similarly, accompanying construction sites are classified individually in subcategory A2. Since, in accordance with par.5 article 1 of Law 4014/2011: "A project or activity involving individual projects or activities is classified in the sub-category of the individual project or activity with the most significant impact on the environment and therefore in the highest subcategory", this Environmental Study falls within the competence of the Directorate of Environmental Permitting of the Ministry of Environment and Energy.

The classification of both the main activity and the construction sites in degrees of nuisance is given in the following table in accordance with 3137/191/F.15/2012 JMD (Government Gazette 1048B/04.05.2012), as amended and in force. The same table also lists their classification according to the Greek and European statistical classification of economic activities (STAKOD and NACE respectively).

As can be shown from the following table, **the main activity is classified as high nuisance, while the concrete construction plant is classified in the middle nuisance**. Similarly, the construction wastes (AEKK) processing plant, since it belongs to the 4th project group of No. DIPA/oik37674/10.08.2016 MD does not rank in degrees of nuisance.



**Table 1.4-2:** Classification in degrees of nuisance of the new station and its proposed construction facilities in accordance with No. .3137/191/F.15/ 2012 (Government Gazette 1048B/04.05.2012) JMD, as applicable.

Type of Activity	No Code ESYE – NACE	– Type of project - activity based on  3137/191/F.15/ 1048B/04.05.2012) JMD	High nuisance	Average nuisance	Low nuisance	Comments
Power Plant	35.11.	Production facilities electrical energy with gaseous fuels (without cogeneration)	<u>≥ 300MW</u>	<300 MW	-	The units refer to installed thermal power
Concrete Production Unit	23.63	Construction of ready-made concrete	-	Total	-	

Both the main activity of the new power station and the proposed construction facilities of this project are not subject to the provisions of 172058/2016 JMD (Government Gazette 354B/2016) on "Determination of measures and conditions to address risks from large-scale accidents in installations or plants; in view of the existence of dangerous substances, in compliance with the provisions of Directive 2003/105/EC 'amending Council Directive 96/82/EC on the treatment of the risks of major accidents related to dangerous substances' of the European Parliament and of the Council of 16 December 2003".

Additionally, as stated in the approved environmental impact studies, a power station (and only) falls under the provisions of JMD 36060/1155/E.103/2013 (Government Gazette 1450B/2013). In particular, the main activity is covered by subparagraph 1(1.1) of Annex I to the abovementioned Staff Regulations 'Burning of fuels in installations with a total nominal thermal output of 50MW or more».

## 1.5 PROJECT OPERATOR

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## 1.6 ENVIRONMENTAL ENGINEER

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## 2. DESCRIPTION OF ENVIROMENTALLY APPROVED PROJECT

This section provides a brief description of the environmentally approved project and a presentation of its basic characteristics, as described in the approved studies and environmental terms.

### 2.1 SUMMARY DESCRIPTION OF CURRENTS, HELPS AND SUPPORTERS – CONSOLIDATED INSTALLATIONS AND WORKS

#### 2.1.1. Power Plant Description

The nominal power of the new power station is **826 MW** under ISO new and clean conditions. The production of electricity is a "combined cycle", consisting of two stages or thermodynamic cycles, with the combination of turbine and steam turbine operation. In the first stage the power generation takes place in the gas turbine, whose rotor is rotated by the hot exhaust gas produced, by the combustion of natural gas. The exhaust gases are then driven to the heat recovery boiler to produce superheated steam. In the second stage the steam from the heat recovery boiler is driven to the steam turbine for electricity generation. After the steam has been defused in the steam turbine, the steam is liquefied in a water-cooled condenser and re-fed to the boiler. The condenser is cooled with sea water in a closed circuit with cooling towers.).

The Power Plant will include:

- GENERAL ELECTRIC 9HA.02 gas turbine, for operation with **572MW** natural gas fuel.
- Exhaust heat recovery boiler for the production of three-step pressure superheated steam.
- GENERAL ELECTRIC Steam Turbine D650, **254MW**.
- GENERAL ELECTRIC three-phase W88 generator, 990MVA, with internal hydrogen cooling circuit and external cooling circuit with water.
- Steam cycle management system.
- Chimney 50m high.

- Seawater cooling tower array: Closed wet cooling tower system with recirculation water and make up in the towers from the expelled cooling water of the sea

Accompanying facilities for the operation of the new station include:

- Systems for receiving, cleaning, measuring, regulating pressure and temperature and fuel handling (natural gas). Seawater collection infrastructure (cooling tower makeup) from the expelled cooling water of the point, with an estimated supply of 3.706m<sup>3</sup>/h.
- The returned seawater, with a temperature approximately the same as that of the input water into the cooling system, will be approximately 75% of this supply.
- Water and wastewater pumping stations.
- Closed auxiliary cooling circuit.
- Industrial and deionized water storage tanks and possibly an installation for the production of additional deionized water and EDI water (higher purity deionized water).
- Storage tanks for industrial acids, alkaline solutions, mineral oils and other additives.
- Fire- fighting installation.
- Electrical system consisting of main medium/ high voltage lifting transformers, as well as the necessary electrical equipment, which indicatively and not restrictively includes auxiliary voltage demotion transformers for the supply of the auxiliary loads of the unit, medium and low voltage panels, battery arrays, uninterrupted power supply systems, etc.
- P/G pair approx. 1.700kVA.
- Extension of the existing Agios Nikolaos high voltage center (HVC) of ADMIE S.A. (substation - GIS 400 kV).
- Storage areas for hydrogen, nitrogen and carbon dioxide bottles.
- Extra carbon dioxide tank.
- Exhaust quality monitoring/recording system.
- Central Control System of the operation of the Station.
- Personnel service facilities Warehouse building and maintenance.
- Auxiliary installations and machinery.

The development of the new station is under way within the expropriated area of N.W. GG138D/1962, MYTILINEOS S.A., in two sections of area (4.600 and 45.000sq.m.) and in proximity to the existing units: point of the Aluminum of Greece (ATE) (Mytilineos S.A./ Metallurgy Business Sector) and Mytilineos S.A./ Electric Energy Business Sector, located within the existing energy center. The proximity of the project under consideration to existing activities enables the use and exploitation of existing infrastructures, including:

- Provision of auxiliary steam during start-up and booking.
- Provision of an emergency electrical interconnection with the aluminum of Greece (ATE) plant's point unit.
- Use of existing fire safety, firefighting, as well as the means and intervention teams of the ATE plant.
- Use of health services (ambulance and first medical assistance center) of the ATE plant.
- Use of the existing certified chemical analysis laboratory of the units point and ASI.
- Road interconnection network with adjacent facilities of the plot of Mytilineos S.A.
- Water network of the ATE plant.
- Existing industrial and deionized water production facilities of the ATE plant.
- Existing installations for the treatment of industrial waste water and municipal waste water from the ATE plant.
- Telecommunications network of the ATE factory.

The average annual net electricity production of the new plant will be around **5.000GWh**, with **7.200 hours** of operation and an average annual gas consumption of **9.000GWh HHV**. Natural gas is to be distributed at the limit of the plant, to enter an adjustment station, where it will be cleaned of solid particles and liquids/concentrates. The system will also have a supply measurement station with the possibility of calculating a total quantity of fuel, as well as a chromatograph to determine the composition. The new station in its full development will consist of a thermoelectric unit of a combined single-axis cycle.

The technical operating characteristics of the new station are summarized in the table below.

**Table 2.1.1-1:** Operating characteristics of a new station with a rated power of 826 MW

load	100%	80%
Mixed station power (MW)	826	661
Net station power (MW) Net	806	641
Rate of Performance (%)	63,1	62,5

### 2.1.2. Installation Description

#### Gas turbine

The H-class gas turbine is of the latest generation and high energy efficiency. It is air-cooled, equipped with low-emission NOx (dry low-NOx) dry burners and suitable for indoor installation. In addition, it may operate continuously at the base load throughout the range of weather conditions specified for that area and shall be equipped with an absorption filter and compressor to compress the air in order to provide the correct volume of fresh air during combustion. An exhaust control will be installed at the exit of the gas turbine to reduce noise in the surrounding area. To further reduce noise in the surrounding area, the gas turbine installations are enclosed in a noise absorbing compartment. The apartment will be able to be easily removed during long scheduled maintenance.

#### Exhaust heat recovery boiler

The exhaust gases of the gas turbine will be directed to the heat recovery boiler, where their heat will be used for the production of steam. The boiler will be of natural circulation of three pressure levels, with a re-heating, consisting of:

- High Pressure Steam System (HP).
- Medium Pressure Steam System (IP) with Reheater (RH).
- Low Pressure Steam System (LP).

The exhaust gas temperature will be gradually reduced to produce steam with the desired characteristics. All steam production levels will be equipped with heat switching surfaces and water pumps to ensure stability in steam and power generation.



The construction materials of the boiler have specifications that ensure long-term smooth operation under thermal stresses conditions.

#### Steam Turbine

The three steam levels produced by the recovery boiler end up in a steam turbine. The Steam Turbine will be three-tier pressure, with a water-cooled condenser, suitable for direct connection to generator for generating electrical power at 50Hz. The steam turbine is suitable for indoor installation and complete with all auxiliary systems for reliable operation. The connection to the rest of the power train (gas turbine and generator) will be achieved by means of a drive clutch, in order to minimize the required starting time of the unit while limiting the use of auxiliary steam at start-up for warm-up. The steam turbine will have all the necessary accessories, such as safety valves, control valves, steam leak protection device and lubrication system, in accordance with international specifications

#### Generator

The three-phase generator will utilize the rotation of the steam turbine rotor and gas turbine to convert kinetic energy into electricity. The main parts of the generator are the rotor and the stator. The rotor will rotate within the stator driven by the power of the turbines (gas turbine and steam turbine). Hydrogen gas will be used as a refrigerant for cooling the generator. The generator is designed for continuous operation and will be equipped with sensors for continuous and automatic monitoring of operating parameters.

#### Steam cycle management system

The steam cycle management system includes:

- condenser, air vent and steam circuit.
- the combustion and exhaust air circuit.
- the water circuit.
- the seawater cooling circuit (closed system with cooling towers) and industrial water (auxiliary circuit).
- the chemical addition system.

**The steam of the exhaust heat recovery boiler** will supply to the steam turbine. Once defused in the steam turbine, the steam will be liquefied in a water-cooled condenser and the condensate will be collected in a condensate container. The condenser is then driven back to the heat recovery boiler and steam turbine. To protect the steam system, chemicals (ammonia solution, trinitium phosphate, carbohydrazine solution) will be added to the boiler supply line. Cooling and condensation of steam at the exit of the steam turbine, in

the condenser will be done with the help of seawater that comes **not directly from the sea, but from the discarded seawater cooling of the adjacent UNIT of the ATE plant.**

In the **combustion-exhaust air circuit**, the gases will pass through the individual parts of the gas turbine and the heat recovery boiler. The ambient air will be sucked out of the compressor and filtered as it enters. Compressed air will enter the combustion chamber where it will be mixed with natural gas and ignite producing high-temperature exhaust gases. The hot exhaust gases will be defused on the turbine fins resulting in the rotation of the axle (rotor). The exhaust gases from the turbine outlet will be pumped into the heat recovery boiler for further exploitation of their thermal energy, before eventually being poured into the atmosphere, through the chimney, at low temperature and pressure. The thermal energy directed to the heat recovery boiler will be absorbed by the water-steam circuit to produce superheated steam to be used in the steam turbine as already mentioned.

The **role of the water circuit** is to supply deionized water to the station to supplement losses in the steam circuit and various other special uses where water without hardness is required. In particular, possible losses in the cycle will be replenished by means of a deionized water supply line, which channels water into the condenser. The condenser level will be controlled through water replenishment and overflow regulatory valves.

The steam of the exhaust heat recovery boiler will be fed into the steam turbine. After the low pressure part of the steam turbine, the steam will condense into water through a heat exchanger and the help of a **closed circuit cooling system**. The condensate will be collected in the condensate container and returned to the heat recovery boiler. Steam condensation will be done with water in a closed recirculation circuit. The latent and noticeable heat of the steam will be discharged into a cooling tower array, the losses of which will be stoked by seawater. **The auxiliary cooling circuit will operate with deionized water**, after the addition of chemicals to control corrosion, to cool the auxiliary installations of the main equipment such as the oil cooling of the gas turbine generator and steam turbine, the cooling generator, the cooling of pumps, compressors, etc.



### *Chimney*

The chimney will be **50m high** and about **9,2m in diameter**. It is the last stage of the exhaust gas circuit, with the latter being pumped into the atmosphere at a temperature of <96OC and an output speed in full load conditions of 20m/sec at the chimney outlet.

### *Cooling towers*

The cooling tower array will be used to cool water through clouding and contact with cold air, so that its temperature will drop by about 80C and then return to the cooling circuit. The supply of seawater will be obtained from the waste water of the Cogeneration Power Plant of the ATE plant (Mytilineos S.A./ Metallurgy Business Sector) via an underground pipeline and supply channel after mechanical (filtering) and chemical treatments (chemical dosometry to control the development of marine life and avoid the formation of salt deposits) of the water before entering the condenser.

### *Auxiliary Systems*

The auxiliary systems for the safe and smooth operation of the station concern:

- **Deionized water distribution system.** The deionized water will be supplied at a designated terminal point from the adjacent facilities of the cogeneration plant. The water supplied will be distributed through pumps and ducts. Deionized water is required to make up for losses of the water/steam cycle and closed-circuit cooling water as well as to wash the gas turbine compressor.
- **Compressed air system.** Air compressors and related equipment (dehumidifiers, filters, pressure vessels for compressed air storage, etc.) will produce the compressed air provided as air for use in automatic regulators as well as as air for use in the station.
- **Chemical dosing and sampling systems** for the determination of chemical parameters will regulate water chemistry and serve the continuous monitoring of water chemistry parameters in the water/steam cycle, such as dissolved oxygen, pH, conductivity, sodium content, etc.
- **The station's storm drain system** and wastewater drainage and discharge networks. The waste water of the plant (oily, non-oily, chemical, etc.) will be collected and collected in different waste water networks, depending on the composition. The oily run-off will be processed in lamella oil separator for the removal of the oily phase.
- **Fire and fire detection system.** Firefighting water will be provided from appropriate terminals of existing power stations in the area. Fire protection measures as well as technical prevention characteristics will be provided for the adequate protection of the station, in accordance with the requirements of the Greek Legislation.
- **Water for use** will be available from appropriate terminals of existing power plants in the area or from the alumina-aluminum plant.

- **Drinking water** will be available from suitable terminals of existing power plants in the area or from the alumina-aluminum plant

### **2.1.3. Technical Description of Building Projects**

The coverage and construction elements of the building infrastructure, which will house the new power station, are estimated at a total **coverage area of approximately 15.0 acres and a total building area of approximately 17,4 acres**. In any case, at the stage of the final design of the project, there may be slight deviations in the layout and building elements of the project under consideration, but in no case alter the character of the environmentally licensed project.

## **2.2 INPUTS OF MATERIALS, ENERGY AND WATER DURING THE PROJECT OPERATION**

### **2.2.1 Material Inputs - Consumption of raw/auxiliary materials**

For the day-to-day operation and maintenance of the new station, provision is made for the use of raw materials and materials as shown in the following table, including their annual consumption.

**Table 2.2.1-1: Raw materials for the operation of the new power station**

Raw materials	Consumption	Use
Diesel Oil	2,3 t	Power generators
Trinatrium phosphate	2,4 t / year	Treatment of boiler water, for pH control and surface protection
Phosphonic acid solution	60 t / year	Cooling Tower Anti-Cathodic
Sodium xylosulphate solution	20 t / year	Biodepartant Cooling Towers
Carbohydraride solution	4 t / year	Boiler Water Treatment for Oxygen Capture
Ammonia or amine solution	9 t / year	Adjusting the pH of the Boiler's steam
H <sub>2</sub> (under pressure, in cylindrical bottles)	2 t / year	Replenishment of losses of H <sub>2</sub> cooling generator
N <sub>2</sub> (under pressure, in cylindrical bottles)	6 t / year	Washing of natural gas pipelines Rinse of gas turbine burners when they need maintenance. Maintain Boiler during reservations
CO <sub>2</sub> (under pressure, in Cylindrical bottles and tank)	15 t / year	Means of network inactivation and firefighting indoors
Sodium hypochlorite solution (NaOCl)	210 t / year	Preventing the development of microorganisms in the cooling circuit (conductors, cooling towers)
Mineral oils /Lubricants	5 t / year	Various lubricants for its operation mechanical equipment
Corrosion inhibitor	3 t / year	Protection of the Closed Cooling Circuit against corrosion
Alkaline metal solution (<0,5 ppm)	1 t / year	Gas turbine washing detergent
Anti-cathodic	1 t / year	Anti-cathodic in the Boiler Barracking Vessel (BlowDownTank)
He (under pressure, in cylindrical bottles)	0,05 t / year	Chromatograph Consumable
Inergen (under pressure, in cylindrical bottles)	1 t / year	Indoor firefighting equipment

The above quantities are indicative and depend on the annual opening hours, the number of starts and the charging of the Station.

## 2.2.2 Water usage

Mytilineos S.A. maintains seventeen (17) licensed water collection facilities (drillings), which are located in the privately owned expropriated area of the company. The above drilling network serves, in accordance

with No.1544/170742/05.09.2012 water license from the Water Directorate of Central Greece, the operation of all the activities of the ATE (business sector Metallurgy) plant, the existing Independent Power Station (ASI) with a rated capacity of 444,48 MW of the Electricity business sector, as well as the water supply of settlements and auxiliary installations outside the ATE plant. No. 1544/170742/05.09.2012 water license is in force in accordance with para. 4b of Article 6 of Regulation (EC) No 1782/2003. 146896/2014 JMD, as its validity has been automatically extended until 2022.

According to No.82557/5356/17.09.2019 (ETA) as amended by ministry of environment and energy/DIPA/114847/6959/09.12.2019 ETA and relating to the construction and operation of the project under consideration (new Power Station (SI) of MYTILINEOS S.A. / business sector Electric Energy (formerly PROTERGIA S.A.)), it is foreseen that the coverage of the needs of the new power station in water will be covered by the existing service network of ATE. Therefore, the water supply of the activity under study will be made by the existing drilling network of Mytilineos S.A.

The use of water for the operation of the new power station concerns:

- **Industrial water:** The coverage of the requirements of the new Station in both industrial and deionized water is planned to be carried out by the existing drilling network and in particular the corresponding service network of the adjacent units of the business sector Metallurgy and ASI of the business sector Electric Energy. The supply of industrial and deionized water is estimated at 12,3<sup>m³</sup>/h or **295<sup>m³</sup>/d**. Industrial water for general use primarily covers the washing needs of the main and auxiliary equipment of the station, the (possible) cooling requirements of the heat recovery boiler during starts, as well as the requirements of the firefighting network. During the operational phase of the new station there are inevitably some minimal losses in the closed water-steam circuit, which are replenished with deionized water coming from the deionization plant of the ATE plant and then from the EDI (Electrode ionization) treatment plant of the existing ASI.
- **Water for water use** which will also come from its respective existing network with an indicative average hourly consumption of **0,4t/h**.

In addition, according to No. 82557/5356/17.09.2019 (ETA) of the project under consideration as amended by ministry of environment and energy/DIPA/114847/6959/09.12.2019 ETA, the operation of the new power station requires **replenishment water in the cooling towers of the plant**, due to exhaust losses and continuous removal, which will come from the **discarded seawater cooling of the adjacent point plant** of the ATE plant. The capture of seawater will be done through pumps installed near the cooling towers. In the event that the point unit is switched off (e.g. for damage reasons), provision will be made for maintaining

the operation of the seawater replenishment circuit of the station's cooling towers by means of a valve

bypassing the auxiliary cooling circuit of the Cogeneration Power Plant. The new power plant under consideration will use a maximum of 3,706m<sup>3</sup>/h of discarded seawater and will return due to exhaust losses and the continuous removal of 2.850,3m<sup>3</sup>/h of seawater.

The intake of seawater for the cooling needs of the Cogeneration Power Plant of the ATE aluminum plant, which also serves the needs of the existing Independent Power Station (ASI) with a nominal capacity of 444,48 MW of the Electricity Business Sector and is intended to serve the new power station under consideration, as defined in the Water License Agreement 1544/170742/05.09.2012, concerns a supply of up to 22.000m<sup>3</sup>/h maximum. The collection of seawater is done through a pumping station established in the zone of Aigialos and amounts to a maximum licensed at 192.720.000m<sup>3</sup>/year.

### 2.2.3 Energy usage

Natural gas will be used for the operation of the new power station in quantities of approximately **9.000GWh HHV** gas per year. It is noted that the planned modern installations and the high degree of efficiency reduce the overall fuel consumption by further limiting air pollution.

In addition, part of the electricity generated by the project under consideration will cover its energy requirements. The Station will be connected to the existing energy transmission system via the Agios Nikolaos (HVC) (closed-type substation 400 kV). Finally, diesel consumption will be done in very special cases by the power generators of the station(H/G).

## 2.3 EXPENDITURE OF DISPOSALS AND EXPENDITURE OF RIGHTS, THORY AND ELECTROMAGNETIC ACTINOVOLIA FROM THE OPERATION OF THE WORK.

### 2.3.1 Liquid Waste Outflows from project operation

The operation of the activity under study is expected to produce industrial waste water and urban waste water.

● **Liquid industrial waste from the plant under study includes:**

i. Water with small impurities of mineral oils including:

- any leaks from transformer, engine room, boiler room, fuel and oil filters, gas turbine and steam turbine lubricant tanks,
- waste from condenser losses.
- waste from the closed auxiliary cooling circuit and the sampling building.
- liquid waste resulting from the maintenance/washing of equipment (water from starts, reservations, maintenance of the plant).
- potentially burdened rainwater, fire-fighting water or washing discharges of sites potentially bearing traces of oil.

The above currents will be driven for initial treatment to an oil-separater with a capacity of at least 3<sup>m3</sup> in order to then be driven to the existing industrial waste water treatment system of the Mytilineos S.A. /business sector Metallurgy plant for further treatment and final disposal. The oil phase will be collected in barrels and made available to an authorized hazardous waste management body.

- ii. the removal (stratonization) of the heat recovery boiler will be led directly to the wastewater treatment system of the Mytilineos S.A. /business sector Metallurgy plant for further treatment and final disposal.
- iii. Liquid waste produced during the cleaning and maintenance periods of the steam turbine, as well as liquids produced during plant, heat recovery boiler and heat exchangers. This current will be made available directly to the existing industrial waste water treatment plant of the ATE plant (Mytilineos S.A./ Metallurgy Business Sector).



- iv. Unenceded rainwater and fire-fighting water through a sampling well may be expelled directly to the final marine recipient through the rainwater network of Mytilineos S.A. / business sector Metallurgy facilities.

The average hourly supply of the new plant's industrial waste water to the existing waste treatment plant, under normal operating conditions, is estimated to be in the order of 8m<sup>3</sup>/h, while respectively the maximum daily wastewater supply of the plant may be 430m<sup>3</sup>/d (includes start up as a 2-hour transit) or 1.000m<sup>3</sup>/d in the case of start-up after long maintenance. The liquid industrial waste from the new power plant (SI) will be channeled through a closed pipeline to the existing industrial waste liquid treatment plant of the Metallurgy Business Sector ATE plant. In order to ensure the safe and uninterrupted management of liquid industrial waste in cases of start up as a 2-hour transit and start after long maintenance of the new power station, provision was made in the design of the new plant for the construction of a tank for the collection and regulation of the supply (at start-up) with storage capacity of 300m<sup>3</sup> and then a pumping complex with adjustable supply. This supply regulation tank ensures compliance with the maximum supply of 30m<sup>3</sup>/h to the existing industrial waste water treatment system of the ATE plant.

The treated liquid industrial waste of the new power plant is to end up from the existing infrastructure of the ATE plant (along with the treated liquid industrial waste of the ATE plant and the existing Independent Power Plant (ASI) with a rated capacity of 444.48 MW of the Electricity business sector) at sea via a pipeline with a diameter of 0,35 m. The estuary point of the above pipeline is located in the port of Agios Nikolaos, in front of the premises of the ATE plant at a depth of 1,5 m, within the mixing zone with a face on the sea 400 m and a length of 200 m from the coast, as described in the initial permit for the disposal of wastewater of the Viotia Prefecture (F42/11/3246/08.07.1983).

- The **urban sewage** of the station under study includes sewage from the sanitary areas. The employees of the new power plant (SI), whose sewage will be driven to the existing urban wastewater treatment plant of the Ate plant of Mytilineos S.A./ Metallurgy Business Sector, will amount to 23 people, while the maximum number of people present will be about 12 people.

The treated urban waste water of the new power plant is to end up from the existing infrastructure of the ATE plant (along with the treated urban waste water of the ATE plant and the existing Independent Power Station (ASI) with a rated capacity of 444,48 MW of the Electricity business sector) to an adjacent suitable well from which they are transported by pumps and metal pipeline to the marine area via an undersea

pipeline. The estuary point of this pipeline is the Corinthian Gulf (outside the gulf of Antikyra), at a distance of about 2.800m from the coast and at a depth of 135m (ETA 160170/07.10.2008, §4.9.7. b).

As regards the documentation that the capacity of the existing industrial waste water and urban waste water treatment infrastructures of the ATE plant, Mytilineos S.A./ Metallurgy Business Sector, also covers the operating requirements of the new power plant with a rated capacity of 826 MW, No. 8191/434/24.01.2020 relevant Technical Report pursuant to term 4.12.8 of No. YPEN/DIPA/114847/6959/09.12.2019 decision amending the approval of environmental terms of the new power plant at the existing energy center of Agios Nikolaos Viotia.

Finally, as mentioned in previous paragraphs, part of the discarded seawater cooling of the ATE plant will be used by the cooling towers of the new power plant under construction of Mytilineos S.A. / Electric Energy Business Sector. The project under consideration will use a maximum of 3.706m<sup>3</sup>/h of discarded seawater and will return due to exhaust losses and the continuous removal (**blowdown**) of the cooling towers of 2.850,3m<sup>3</sup>/h of seawater, without increasing its temperature. With the above evaporation of seawater, in the cooling towers of the station the thermal load to the Corinthian Gulf is reduced. The above current is to be eliminated at sea from the existing closed pipeline of the ATE plant (together with the expelled seawater of the ATE plant and the existing Independent Power Station (ASI) with a rated capacity of 444,48 MW of the Electricity Business Sector).

### 2.3.2 Solid Waste Outflows from project operation

Solid waste from the operation of the new power plant includes:

- The oily layer from the oil separator of the complex for the collection and treatment of other liquid industrial waste.
- Sludge from fuel and lubricants.
- Urban waste.
- Packaging materials, batteries and accumulators, waste electrical and electronic equipment, and lubricating oil waste.

The types and expected approximate quantities of estimated solid waste are given in the tables below.

**Table 2.3.2-1: Non-hazardous solid waste**

α/α	ECA Code	description	Estimated quantity (t/year)
1	05 07	Sludge from the fuel purification complex (natural gas)	0,5
2	05 07 99	Waste not otherwise specified (waste from cleaning and transport of natural gas)	0,5
3	15 01 01	Packaging of paper & cardboard	8
4	15 01 02	Plastic packaging	2
5	15 01 03	Wooden packaging	10
6	15 01 04	Metal packaging	8
7	16 01 03	End-of-life tyres	0,4
8	16 06 04	Alkaline batteries (except 16 06 03)	0,2
9	16 06 05	Other batteries & accumulators	0,2
10	19 09 01	Solids from primary refining & indentations	0,5
11	19 09 02	Muds from the clarity of water	0,5
12	19 09 03	Muds from carbonate removal	1
13	19 09 05	Saturated or depleted ion exchange resins	0,5
14	19 09 06	Solutions & muds from the regeneration of ion exchangers	0,2
15	20 01	Urban waste similar to urban type and packaging materials	1
16	20 01 36	Discarded electrical and electronic equipment other than that referred to in paragraph 20 01 21, 20 01 23 and 20 01 35	2
17	20 03 01	Mixed municipal waste	2
18	15 02 03	Absorbent materials, filter materials, vacuum fabrics and protective clothing other than that referred to in 15 02 02*	25
19	16 01 17	ferrous metal	10
20	17 04 07	Mixed Metals	2
21	17 02 03	plastic	10
22	17 04 05	Iron and steel	10

The separation and sorting of solid non-hazardous waste will take place within the site of the project under consideration, and will then be stored according to their material in a properly designed area in order to be disposed of in licensed recycling plants.

**Table 2.3.2-2: Hazardous solid waste**

$\alpha/\alpha$	ECA Code	description	Estimated quantity (t/year)
1	13 01 11*	Synthetic hydraulic oils	2
2	13 02 05*	Non-chlorinated engine, gearbox and mineral-based lubrication oils	100
3	13 03*	Waste insulation and heat transfer oils	0,5
4	13 05*	Oil/water separator waste	20
5	16 07 08*	Waste containing oil	1
6	05 01 11*	Sludge from the fuel purification complex	1
7	05 01 03*	Sludge from the periodic cleaning of the diesel tank	0,5
8	16 06 01*	Lead batteries and accumulators	70
9	16 02 15*	Hazardous components removed from discarded equipment	0,1
10	20 01 21*	Waste electrical and electronic equipment	0,02
11	15 02 02*	Cloths, towers, etc. contaminated with oils / petroleum / chemicals	4
12	15 01 10*	Packaging containing residues of dangerous substances	4
13	16 05 06*	Chemical Laboratory Waste	1
14	12 03 01*	Turbine washing liquids	30
15	16 05 07*	Discarded inorganic chemical materials consisting of or containing hazardous substances	2
16	16 05 08*	Discarded organic chemical materials consisting of or containing hazardous substances,	20
17	20 01 33*	Mixed batteries and accumulators	1
18	11 01 05*	Cleaning acids	1
19	20 01 35*	Electrical and Electronic Equipment	0,5
20	15 01 10*	Packaging containing or contaminated residues of dangerous substances	4

Hazardous solid waste will be temporarily collected by category in special barrels in a suitable place and will be delivered to specialized licensed management bodies.

### 2.3.3 Emissions of pollutants into the air and greenhouse gases from the operation of the project.

As has already been mentioned, the fuel of the plant under study will be natural gas (N.G.), so no SO<sub>2</sub> and particulate emission limit values are set. The relevant European Reference Manual, which refers to the type of (N.G.) combustion activity and technology of the "*Reference Document on Best Available Techniques for Large Combustion Plants, December 2017*", **clearly states that gas combustion is not practically linked to particulate emissions or SO<sub>2</sub> emissions**, and that CO<sub>2</sub> emissions from gas combustion are also significantly lower than What from other fossil fuels ("The emissions from the commission of natural gas are principally NOX and CO, with most negligible SO<sub>x</sub> and dust emission. CO<sub>2</sub> emissions from natural gas nutrition are also inherently lower than from other fosil fuels", Section 7.1.1.2).

The station's gas turbine will have low-emission NO<sub>x</sub> dry-type (DLN) burners for gas combustion. Given the technology of the burners but also the chemical composition and specifications of the fuel supplied to the plant, the pollutants contained in these exhaust gases are nitrogen oxides (NO<sub>x</sub>) and in practically negligible quantities Sulphur dioxide (SO<sub>2</sub>) and carbon monoxide (CO). It is noted that the safety systems and equipment specifications are such that there are no fuel leaks and therefore no gaseous exhaust emissions occur.

The exhaust gases of the station shall be channeled into the atmosphere by means of a **chimney approximately 9,2m in diameter and 50m in height.:**

- CO<sub>2</sub>: 255.795 kg/h  
310 kg/MWhgross
- NO<sub>x</sub>: 30mg/Nm<sup>3</sup>, dry, Ref 15% O<sub>2</sub>
- NO<sub>x</sub> σαν NO<sub>2</sub>: 116,98 kg/h
- CO: 30mg/Nm<sup>3</sup>, dry, Ref 15% O<sub>2</sub>
- CO: 116,98kg/h
- Exhaust output temperature <96 °C
- Exhaust output temperature in normal 100% load mode <80°C
- Exhaust gas supply:1026kg/s
- Chimney height: 50 m (initial estimate)
- Chimney diameter: 9,2 m (initial estimate)

With regard to greenhouse gas emissions (but not gaseous pollutants) the project operator participates in the Emissions Trading System according to No. 181478/965 JMD (Government Gazette 3763/B/2017) concerning the "Amendment and codification of No.54409/2632/2004 Joint Ministerial Decision "Greenhouse gas emission allowance trading scheme in compliance with the provisions of Directive 2003/87/EC "on the establishment of a trading system greenhouse gas emission allowances within the Community and the amendment of Council Directive 96/61/EC of 13 October 2003 and other provisions" (B' 1931) as amended and in force.».

#### **2.3.4 Noise and vibration emissions from the operation of the project**

According to the design data, the noise levels (dBA) during the operation of the station under study will comply with the provisions of Presidential Decree 1180/81 for acceptable noise levels in areas dominated by the industrial element. In particular, according to the abovementioned P.D., the noise ceiling is 65dBA,

measured on the limit of the property on which the installation is on. During the operation of the station and in places where there may potentially be increased noise levels, all necessary measures will be taken to protect (appropriate insulation, use of earplugs, etc.) the health and safety of staff.

Due to the nature of the activity, it is not expected that any vibrations will be felt by the operation of the station. The design of the station buildings will take into account any vibrations from the operation of the machines so that they are absorbed.

### **2.3.5 Electromagnetic radiation emissions from the operation of the project**

The operation of the station under study is not related to electromagnetic radiation emissions.

## **2.4 DEVELOPMENT OF THE ENVIRONMENTALLY APPROVED WORK**

The project "Development and Operation of a New Power Plant with a rated power of 826MW of MYTILINEOS S.A. / Electric Energy Business Sector (formerly PROTERGIA S.A.) at the Existing Energy Centre of Agios Nikolaos Viotia" is environmentally licensed under No. YPEN/DIPA/82557/5356/17.09.2019 (ETA), as amended and in force by No YPEN/DIPA/114847/6959/09.12.2019 decision adopted by DIPA of the Ministry of Environment and Energy.

In addition, for the project under consideration, No. 904/2019 RAE Decision as well as YPEN/DIE/3550/54/14.01.2020 authorization to install the project under consideration by the ministry of environment and energy Electricity Directorate.

### **3. DESCRIPTION OF PROPOSED AMENDMENT**

#### **3.1 TECHNICAL DESCRIPTION OF AMENDMENT OF THE WORK**

The proposed amendment concerns the installation and operation of construction sites that will be temporarily installed at the development site of the new power station until the completion of its implementation phase. In particular, for the smooth implementation of the new power station it was considered necessary, the location and operation of the following construction support activities:

- i. a construction waste treatment plant, which is to manage only the excavation waste resulting from the construction work of the project with a view to their optimal recovery and reuse.
- ii. concrete production plant, which is to supply the project with concrete.

This amendment shall not affect to a minimum the operation of the new power plant with a rated capacity of 826 MW, as environmentally approved. The location and operation of the proposed construction facilities is limited to the construction phase of the project and is purely temporary in nature. The purpose of the operation of the support activities is to ensure the delivery of raw materials in synchronization with the construction needs of the project and not according to the opening hours of the conventional installations.

The above construction facilities are to be developed within the environmentally approved area of intervention and implementation of the new plant, as licensed by No. 82557/5356/17.09.2019 ETA and will remain in it throughout the construction of the project, until its final delivery.





**Figure 3.1-1:** A satellite imagery extract showing the expropriated area of the GG138D/1962, in which the activity under study is installed, while a yellow line indicates the area of intervention and implementation of the new power plant with a rated capacity of 826 MW, as well as its proposed construction facilities.

The following paragraphs detail the operating status of the individual accompanying construction service activities of the new power station with a rated capacity of 826 MW.

### 3.2 ANALYTICAL TECHNICAL DESCRIPTION OF WORKING INSTALLATIONS FOR THE CONSTRUCTION OF THE NEW ELECTRIC ENERGY PRODUCTION STATION

#### 3.2.1 Excavation, Construction and Demolition Waste Treatment Plant

According to the approved environmental impact study of the project it is foreseen that the construction phase includes excavations and earthworks related to the foundation of buildings and equipment, as well as the safe configuration of the installation site of the main project (support work/configuration of roads, etc.). From the excavation and configuration of the area of intervention and implementation of the project it is estimated that about 200.00 m<sup>3</sup> of excavation materials will emerge. In addition to the temporary deposit in the adjacent limestone quarry of the ATE (business sector Metallurgy) plant provided for in the approved environmental impact study, this material is planned to be used by the project operator to the best extent possible by proceeding with its processing and reuse work on the project in every possible way.

In this context, the installation of a **construction plant for the processing of excavation materials** resulting from the construction of the new 826 MW power station is under way. Initially, mechanical pre-selection of excavation materials will take place, separating soil materials (17 05 04 Soils and stones other than those referred to in point 17 05 03) from excavation materials which will be compressed by grabbing and crushed to reduce their size. The current of the excavation materials, which will remain after the initial stage of pre-selection, will be introduced into the **waste treatment system**, which will consist of a breaker and sieve. The excavation materials will initially be driven to the breaker in order to reduce their size and prepare for the next stage of sorting. The next stage of sorting involves the passage of excavation materials from sieves of various sizes, to classify the materials according to their granulometry. At this stage, vibrating sieves, which are constructed so that vibrations are evenly distributed on their surfaces, will be used to achieve uniform stratification of the material.

After the completion of the process of processing the excavation materials, the treated materials will be taken either to the adjacent quarry of the ATE plant or to the intervention site of the project under consideration, in order to be promoted to appropriate use according to their granulometry and composition (e.g. as a raw material in the production of concrete, foundation-sanitization work, etc.).

### **3.2.2 Construction Concrete Production Unit**

The production process of concrete is based on the ratio of mixing of broken aggregates, with cement and water, tested through weighing funnels and conveyor belt. In the construction plant concerned, the majority of the aggregates will come from the construction waste (AEKK) processing plant, either in the absence of suitable material, from licensed companies in the area. Inert materials will be supplied either directly to cars or to a loader from outdoor warehouses. From the funnels the inert materials feed the film and through the conveyor belt the inerts go to the pre-storage of the mixer and from there to the mixer where they are mixed with cement, water and a small amount of improvers. Cement from the storage silo is driven to the weighing funnel where it is weighed accurately. When the weighing is complete, it is driven to the mixer. The same is true of water and improvers which have independent weighing funnels. After the weighing has been completed, the raw materials are taken to the mixer, where the mixing takes about 30 seconds and after the product is ready for loading and final transport. Depending on the needs of the project, the ready-made concrete production plant has the ability to produce various categories of concrete.

Finally, in addition to the construction facilities examined in this environmental study, the project operator may install office or material storage spaces either within the environmentally licensed intervention and implementation area of the new plant, or even in the installation site of the ATE (business sector Metallurgy) plant or the existing Independent Power Plant (ASI) with a rated capacity of 444,48 MW (business sector Electricity), ensuring the agreement of the body.

### **3.2.3 Building installations**

The operation of the (WECD) processing plant requires only mechanical equipment which can be either fixed or self-propelled.

Accordingly, the ready-made concrete production plant under consideration is to include:

■ Reception and storage area for raw materials.

The cement is stored in ground-based watertight silos, which will have saccofilters, while the inert materials are stored in outdoor areas with a maximum height of 3 meters.

■ Feeding systems of the first materials to the concrete mixer.

The cement is powered by screws, and the inert materials from funnels – storage silos, conveyor belt, sloping conveyor belt, and intermediate metal warehouse just before the final supply to the concrete production mixer. Water and improvers are supplied with pumps from ground tanks to the scales and from there directly to the mixer.

■ Weighing systems which, for cement, water and improvers, consist of high-precision weighing funnels for inert weighing conveyor belt.

■ Mixer with horizontal axis driven by electro reducers for mixing raw materials and production of concrete.

■ Barrel loading system consisting of a properly configured hopper.

■ Respirator for the dusting of the concrete production mixer during the filling phase.

In addition, as described in the following paragraphs, the installation of liquid waste sedimentation tanks is being launched for the service of the concrete production plant. The installation of the concrete production plant requires the construction of a concrete slab and concrete bases on the ground for the installation of silo cement after their bases.

An indicative provision of the construction sites under consideration is attached to the Annex to this environmental study, which may change to a small extent depending on the development of the construction phase and the service of the project. In any case, the construction facilities under consideration are not permanent but temporary and are to be developed within the environmentally licensed area of intervention and implementation of the new plant, as authorized by No. 82557/5356/17.09.2019 (ETA) and will remain in this area, estimated, less than 2 years, which will last the construction phase of this project.

### 3.2.4 Mechanical installations

The total power of the mechanical equipment of the temporary construction facilities concerned is expected to be 500,00 kW.

## 3.3 INPUTS OF MATERIALS, ENERGY AND WATER IN THE OPERATION OF THE PROJECT

### 3.3.1 Material Inputs - Consumption of raw/auxiliary materials

Since, in the case of the construction waste processing plan under consideration will serve only the construction work of the plan under consideration, the solid waste to be treated in the plant concerned will be mainly excavation materials (i.e. 17 05 06 Excavation rubble other than those referred to in point 17 05 05) and not demolition materials which will, as a matter of priority, be taken to plants contracted with an approved alternative management system and in rare cases where they are not necessary will be processed in the construction plant under consideration. Soil materials (i.e. 17 05 04 Soils and stones other than those referred to in point 17 05 03) resulting from construction work will be used in earthworks, landscaping and other similar work.

In the case of the ready-made concrete production plan, the quantities of raw materials necessary for the production of 1 m<sup>3</sup> of concrete are:

- cement (II/32,5 & I/42,5)	: 280 - 400 kg
- Inert (sand - gravel)	: 1900 kg
- water	: 200 kg
- Improvement products	: 0,5 – 6,0 kg

The production capacity of the concrete plant under consideration is estimated to be approximately 85 m<sup>3</sup>/day of vibrating concrete of various qualities depending on the needs of the project. The opening hours of the plant concerned depend solely on the development of the construction phase of the new plant. According to the initial measurements, for the implementation of the new production plant, the total quantity of concrete produced is 35.000 m<sup>3</sup> (various qualities C30/37, C25/30, C16/20).

### **3.3.2 Water usage**

Of the planned support activities, the concrete construction plant is essentially a hydro-intensive activity, since the operation of the excavation material processing plant does not require water consumption beyond the systematic wetting of excavation materials to limit dust.

The consumption of water during the operation of the concrete production plant is shared, on the one hand at the stage of mixing the raw materials (cement – inert materials and water), on the other hand in the context of the maintenance of the equipment, through the cleaning of the machinery of the complex and the vehicles transporting the product and finally in the wetting of the aggregates in their storage area.

The total volume of water expected to be consumed in this plant depends directly on the required amount of concrete production. However, given the reuse of leaching water in the concrete production process - after subsidence - as analyzed in subsequent paragraphs, it is estimated that the water consumption for the operation of the concrete construction plant will not exceed 15 m<sup>3</sup>/d and will be ensured by the existing drilling network.

### **3.3.3 Energy usage**

The coverage of the operational needs of the construction units mainly concerns electricity (pump movement, lighting, air conditioning, mechanical equipment in general) and consumption of motor oil in the event that self-propelled equipment is ultimately selected for the construction waste processing plan.

## **3.4 WASTE EXPOSURES AND EMISSIONS OF POLLUTIONS, NOISE AND ELECTROMAGNETIC RADIATION FROM THE PROJECT OPERATION**

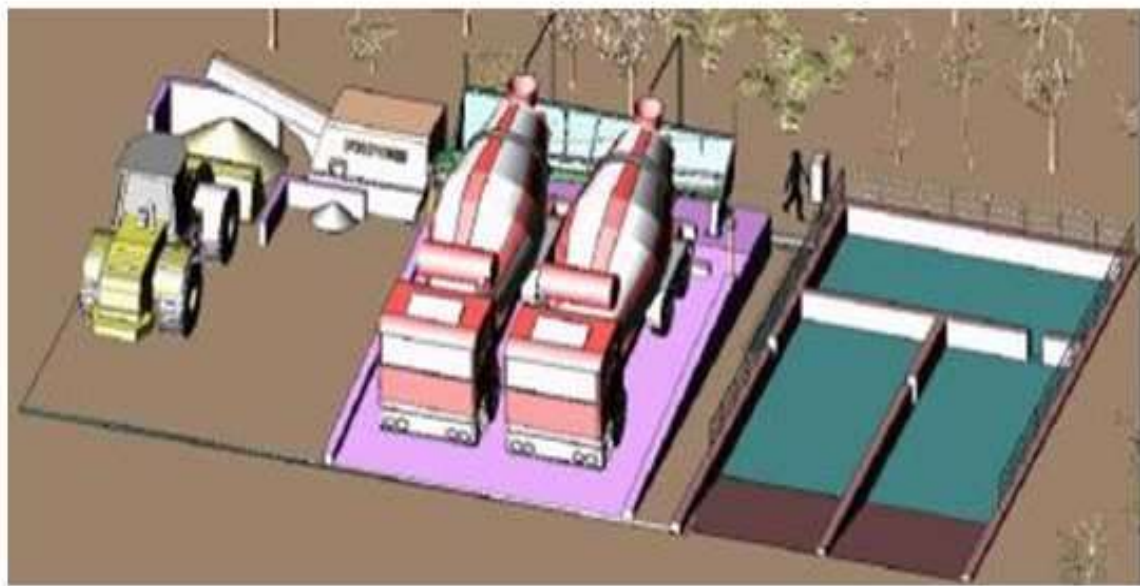
### **3.4.1 Liquid Waste outflows from the operation of the construction facilities of the new plan**

During the operation of the accompanying construction facilities of the new power plan, liquid waste is expected to arise only from the operation of the ready-made concrete production plan.



The liquid waste generated by the production of concrete comes mainly from washings carried out in the context of the maintenance of equipment and in particular: (a) the mixer - stirrers, (c) the concrete pumps and (d) the vehicles transporting the product. In more detail, the car bins and the equipment of the ready-made concrete production plant need to be rinsed in order to remove any solid residues of concrete components that are likely to have been affixed to their inner surface.

Liquid waste (washing water) resulting from the washing of the equipment shall be driven through a properly formed trench into an array of watertight rectangular cross-section sedimentation tanks, in order to stay there in order to achieve precipitation of the solids. These tanks will have a configured ramp for loader access that will remove the solids that sit. The water, which has been largely exempted from solid impurities, is then reused in the production process. The sedation sludge in the sedimentation tank is either reused for the production of lower concrete quality if necessary, or is driven to a specially licensed management company.



**Figure 3.4.1-1:** Indicative schematic display of a waste water sedimentation tank device of a construction concrete plant

The operation of the sedimentation tanks is detailed in Chapter 8 of this Regulation. Bearing in mind that the treated liquid waste of the plants is reused in the production process, it appears that the disposal of treated waste water concerns its reuse as a raw material and does not constitute a substantial outflow of liquid waste.

### **3.4.2 Solid waste outflows from the operation of the construction sites of the new plant**

Since the processing plant concerned is to manage only excavation materials from its operation, solid waste is not expected to occur.

Similarly, the solid waste expected to result from the operation of the concrete plant includes quantities of fresh concrete that will not be used in the project (which are estimated to be very small as the concrete production is in sync with the development of the main project). In addition, the sludge resulting from the sedimentation tanks shall either be reused for the production of lower concrete quality where such a need exists, or shall be driven to a specially licensed management company. The estimated amount of sludge produced is 0,8 m<sup>3</sup> per day. Both the returns of concrete and sludge from the sedimentation tanks are classified under the code EKA 10 13 14 waste of concrete and concrete sludge.

Finally, urban waste from the operation of the project's construction facilities will be removed from the municipality concerned.

### **3.4.3 Emissions of pollutants into the air and greenhouse gases from the operation of the construction facilities of the new plant**

The operation of the excavation material processing plant is expected to produce suspended dust particles from their processing and storage. In particular, the production of dust is to be detected mainly during the supply of waste to the device of the breaker but also of the coscans.



With regard to the operation of the concrete plant, the presence of gaseous waste is found in the production of suspended dust particles, mainly at the following points of activity:

- during loading - transport - unloading of inerts in piles, but also from the storage site of inerts in the inert silo.
- when weighing inerts and especially fine-grained aggregates on weighing tape.
- in cement storage silos.
- in the mixer.
- during the transport and movement of vehicles and machinery for works.

Finally, the production of greenhouse gases from the operation of the construction sites concerned is limited to combustion processes by the movement of self-propelled machinery, but these are negligible.

#### **3.4.4 Noise and vibration emissions**

Noise emissions are expected to come mainly from the operation of site equipment (mechanical processing and sorting of excavation materials, pumps and mixers for concrete production). However, by taking the necessary measures and placing the various machines on anti-vibration bases, any form of disturbance in the wider area will be addressed and minimized.

#### **3.4.5 Electromagnetic radiation emissions**

The operation of the construction sites under consideration is not related to electromagnetic radiation emissions.

### **3.5 ALTERNATIVE SOLUTIONS**

The environmental study under consideration concerns the location and operation of construction sites that will be temporarily installed on the development site of the new power plant until the completion of the implementation phase of the project.

This chapter examines **the do nothing plan solution**, namely the non-location of construction facilities within the environmentally approved site of the new power plant and the servicing of the construction needs of the project by contractually licensed installations located at least 50 km from the activity in question.

The support of the project from conventional installations results in:

- i. moving heavy vehicles over longer distances (either for the transport of excavation materials or for the transport of raw materials) resulting in a further environmental burden on the atmospheric and acoustic environment and an increase in traffic congestion.
- ii. limiting the autonomy of the operator and significant time delay in the implementation of the project, since the delivery of raw materials is not guaranteed in sync with the construction needs and not according to the opening hours of the conventional installations.

The on-site management of excavation materials, synergistically, with the temporary operation of a concrete construction plant achieves to the maximum extent possible the utilization of excavation materials with the least possible nuisance. Finally, the environmentally approved site of the new plant will be de facto of a construction nature during the construction phase of the project and is therefore the optimal alternative to the location of the project's construction facilities, confirming the fact that the proposed amendment is the environmentally more rational alternative.

#### **4. COMPATIBILITY OF PROPOSED AMENDMENT WITH INSTITUTIONAL COMMISSIONS**

As regards the compatibility of the proposed amendment with statutory commitments and taking into account that:

- i. the proposed construction facilities for the new 826 MW power station:
  - ▶ are to be developed within the environmentally licensed area of intervention and implementation of the new plant, as authorized by No. 82557/5356/17.09.2019 ETA
  - ▶ are of a purely temporary nature as they will remain at the site of the project during the construction of the project only (2 years) and then they are to be removed
  - ▶ compatible with the existing institutional commitments in the project area
- ii. from the time of issue of The No. Ministry of environment and energy/DIPA/82557/5356/17.09.2019 (ETA), as amended and in force by No. YPEN/DIPA/114847/6959/09.12.2019 decision to amend the project "Construction and Operation of a new Power Plant with a rated power of 826MW of MYTILINEOS S.A./ Electric Energy Business Sector (formerly PROTERGIA S.A.) at the Existing Energy Centre of Agios Nikolaos Viotia" only 2 months have passed and therefore no changes have been made to the framework text of the statutory commitments (land uses, building conditions, statutory boundaries of settlements, provisions of areas of the national system of protected areas, forests and woodlands, social infrastructure facilities) related to the compatibility of the main project and much more of the construction facilities.

That there are no restrictions and prohibitions on the authorization and implementation of the proposed amendment.

## 5. APPROVED STATEMENT OF THE ENVIRONMENT

According to the forecasts of the 170225/2014 MD (Government Gazette 135B/27.01.2014), this chapter records, analyses and evaluates the parameters of the natural and man-made environment in the study area that may be affected by the requested modification of the activity.

The proposed construction facilities for the new 826 MW power plant are to be developed within the environmentally approved intervention and implementation area of the new power station, as authorized by No. 82557/5356/17.09.2019 ETA and therefore the study area of the requested amendment remains the same as that studied at the issue stage of the project's area.



**Figure 5-1:** An extract of satellite imagery (google earth), showing in yellow the outline of the environmentally licensed installation site of the new power station with a rated power of 826 MW as well as of the construction sites under consideration, in white the expropriated area of Mytilineos S.A. and in red the outline of the study area is shown.

As noted in the previous chapter, only 2 months have passed since the recent environmental authorization of the main project under consideration and therefore no changes in the existing environmental situation have occurred in the study area in relation to the reported approved environmental studies of the project. Furthermore, taking into account that the operation of the construction sites concerned will be temporary and transient, any effect on the environmental means of the natural and man-made environment is not expected and therefore this chapter is not the subject of an examination of this study.

## 6. RESULTS OF MONITORING AND CONTROLS

### 6.1 Findings of an Initially Imposed Monitoring Program

For the new power station, the cycle of issuing all the necessary permits and approvals is currently being completed in order to start its construction work immediately. Therefore, monitoring and control results are not available at this stage. In any case, after the completion of the proposed work, an environmental monitoring programme will be implemented on the basis of the approved environmental conditions of the project.

### 6.2 Findings of Regular and Extraordinary Environmental Inspections

Since the construction phase of the new power station has not even begun, **no regular or even exceptional environmental inspections have been carried out** by the competent ministry of environment and energy services.

## **7. ASSESSMENT AND EVALUATION OF THE ENVIRONMENTAL IMPACT OF THE ACTIVITY**

In general, the decision to approve environmental conditions imposes specific measures, conditions and restrictions on the implementation and operation of a project and these refer mainly to the type, size, basic technical characteristics of the project, emission limit values, monitoring compliance with environmental conditions by the project operator.

With regard to the new power station with a rated capacity of 826 MW, a specific framework for the construction and operation of the project, providing for the prevention of pollution and environmental degradation, has already been established through the approved environmental impact studies and the accompanying decisions.

The size and nature of the construction sites of the main project ensures that the nuisance that will be caused to the environment is short-term, weak and reversible. In addition, the environmental impact of their location and operation is significantly weaker than those of the main project and it is therefore expected that the measures and restrictions provided for the construction of the main project will also cover the measures necessary for the construction and operation of the support activities for the new production plant.

However, the completeness of this study in this chapter describes the assessment and evaluation of the direct and indirect environmental impacts that may result from the operation of construction facilities launched as part of the construction of the new 826 MW power plant.

### **7.1 IMPACTS ON CLIMATE AND BIOCLIMATIC FEATURES**

The operation of the construction sites of the new plant does not expect any effects related to climatic and bioclimatic characteristics, as there is no: (a) production of greenhouse gas emissions (in addition to the negligible amounts of CO<sub>2</sub> resulting from the operation of self-propelled machinery) and (b) production of significant energy emissions, mainly in the form of heat (hot gases). Therefore, it is not necessary to develop the corresponding module.

## **7.2 IMPACT ON MORPHOLOGICAL AND TOPOLOGICAL CHARACTERISTICS**

Since the excavation material processing plant and the ready-made concrete production plant will operate only in the construction phase of the project where the environmentally approved site of the new plant will have a de facto construction character, it appears that the potential impact on the morphological and local characteristics of the area from the requested modification is considered neutral in relation to the already licensed project.

## **7.3 IMPACT ON GEOLOGICAL, TEKTONIC AND SOIL CHARACTERISTICS**

Taking into account the temporary nature and nature of the construction sites of the main project, any impact on the geological and tectonic characteristics of the study area does not arise.

Furthermore, bearing in mind that both during the construction phase and during the operational phase of both the construction sites and the main project, all appropriate measures will be taken for the rational management of the solid and liquid waste generated, in order to ensure the protection of the soil quality characteristics, it appears that no additional effects on the soil characteristics of the study area are expected in relation to the already authorized project.

## **7.4 IMPACTS ON THE PHYSICAL ENVIRONMENT**

As mentioned above, the environmental impact on the natural environment from the construction of the main project is more significant than the impact expected from the location and operation of the construction facilities during the construction phase of the new plant.

The rational management of solid and liquid waste and compliance with the proper operating practice of the construction sites ensure the protection of the flora and fauna of the study area.

In addition, the location of the construction sites of the new plant is developed within the environmentally approved site of the new station, i.e. purely in the land part adjacent to the protected area with code GR 2530007 and the name "KORINTHIAKOS GULF». The operation of the above facilities does not result in any outflow to the protected area and therefore there are no effects related to the integrity and ecological functioning of the protected area concerned. In addition, according to No. 10502/14.06.18 circular of the General Directorate for Environmental Policy of the Environment and Energy Ministry of and in particular in accordance with paragraph 2a provides that: *'if the environmental impact assessment on the basis of which the environmental conditions were adopted and an amended ETA was adopted, account had been taken of the location of the project or activity (partially or totally) within a Natura 2000 area, and provided that the Amendment Dossier substantiated that there were no substantial variations in the environmental impact from the requested change (modernization, improvement, extension or modification) compared to those considered and evaluated for the data (a) of the natural environment in the protected area, then the submission of an special ecological assessment is not required.'*

Therefore, the potential effects on the natural environment of the study area from the requested modification are classified as **neutral**.

## 7.5 IMPACTS ON THE HUMAN ENVIRONMENT

### 7.5.1 Spatial Planning - Land Uses

The location and operation of the construction facilities during the construction phase of the new station is of a temporary nature and does not run counter to the spatial, urban institutional commitments of the study area.



### **7.5.2 Structure and functions of the anthropogenic environment**

The operation of the construction sites concerned is not expected to affect in any way the structure and main characteristics of the environment of the nearest settlements.

### **7.5.3 Cultural heritage**

The operation of the construction sites under consideration is not expected to affect in any way the cultural heritage of the study area.

### **7.5.4 SOCIAL - ECONOMIC IMPACTS**

The proposed amendment will have a positive impact to a small extent on the socio-economic environment of the region, as it will contribute to the temporary increase in jobs.

## **7.6 IMPACTS ON TECHNICAL SUBSIDIES**

The location of the construction sites of the new station which is being launched within the environmentally approved installation site of the new station will have a positive impact on the technical infrastructure of the study area, as it will minimize nuisance to the road network of the study area during the construction phase of the project.

## **7.7 RELATIONSHIP WITH HUMANITARIAN PRESSURES IN THE ENVIRONMENT**

The proposed amendment is not expected to affect existing anthropogenic pressures on the environment in the region or create new pressures on the environment.

## **7.8 IMPACTS ON AIR QUALITY**

As mentioned above, gaseous pollutants from the operation of construction installations are limited to suspended dust particles and exhaust gases from self-propelled equipment and are not differentiated from those described in the approved environmental studies.

For the indicative quantification of the dust produced by the operation of the construction facilities (and in particular the breaker) emission factors are used, as they have been obtained from corresponding measurements in various human activities. The emission factor is a representative value for linking the amount of a pollutant emitted into the atmosphere to the activity causing the emission of the pollutant.

The AP-42 coefficients of the US Environmental Protection Agency (USEPA, January 1995) were used for the purposes of this study.)(<https://www.epa.gov/air-emissions-factors-and-quantification/ap-42-compilation-air-emissions-factors#5thed>).

For the calculation of total emissions of suspended particles E in kg/year, the operation of the breaker shall take into account the:

- the production capacity of the processing site, A, (expressed in t/year) will be in the worst case, 50.000 tonnes per year (taking into account that the construction phase of the project will take 2 years and from the excavation and configuration projects of the intervention and implementation area of the project it is estimated that approximately 200.000 m<sup>3</sup> of excavation materials will occur)
- the dust emission factor, EF breaker, expressed in kg/t, expressing the amount of dust released per tonne of material processed, depending on the machine used as mentioned above. In the literature (National Pollutant Inventory, November 1999) where AP-42 (USEPA) coefficients are collected specifically for crusher processes of various materials, a standard particle emission factor appears equal to 0.004kg/tn.
- the coefficient C approaching the average percentage of dust remaining, following the preventive and containment measures normally applied, where in this case it is sprayed with water. It is estimated that approximately 80% mean hover removal will be achieved, so they will remain 20% therefore C=0.2.

According to the following formula:  $E = A \times EF_{\text{breaker}} \times C$ , the maximum estimated contribution to the production of particulate matter from the operation of the breaker is:  $E = 50.000 \text{ tn/y} \times 0,004 \text{ kg/tn} \times 0.2 = 40 \text{ kg/y}$

As can be seen from the above, the quantitative assessment of the dust produced by the operation of the construction sites is not expected to affect the air quality of the study area and under no circumstances is it estimated that the limit of 50µg/m<sup>3</sup> set by the United States will not be exceeded. 14122/549/E.103/2011 (Government Gazette 488/B'/30-03-2011) JMD "Measures to improve air quality, in compliance with the provisions of Directive 2008/50EC "On air quality and cleaner air for Europe" of the European Parliament and of the Council of the European Union of 21 May 2008".

Therefore, the requested amendment does not expect any additional effects on the air quality of the study area in relation to the environmentally approved project. In any case, the project operator is to apply the approved environmental conditions and good practice techniques during construction work, significantly suppressing the presence of dust and exhaust gas.

## 7.9 EFFECTS OF NOISE AND VIBRATION

During the operation of the construction sites, sources of noise are electromechanical equipment and the procedures for loading and unloading raw materials and produced products. However, the effects on the acoustic environment from the requested modification are limited and are not expected to affect the noise levels prevailing in the study area.

Similarly, as foreseen by the approved project, vibrations during construction mainly concern oscillations caused by the movement of vehicles transporting construction materials, vibrations due to excavations and construction work. In order to deal more effectively with the vibrations caused, all appropriate measures will be taken in accordance with the applicable legislation. Moreover, due to the location of the plant, which is at a significant distance from settlements, but also the industrial character of the installation site the impact will be limited and do not cause nuisance to the wider area. The operation of the construction sites under consideration does not differentiate the effects already assessed during the initial environmental authorization of the project.

In any case, the proposed amendment will not in any way affect the potential impacts associated with noise and vibration generated in relation to the environmentally approved project.

## 7.10 IMPACTS ON ELECTROMAGNETIC PENSIONS

The requested modification is not related to the presence of electromagnetic fields in the study area.

## 7.11 IMPACTS ON WATER

From the operation of the construction sites concerned only the concrete construction plant could potentially affect the aquatic environment of the area. However, the fact that proper management of the plant's wastewater is foreseen during its operation, which will in no case result either in the adjacent surface water flow or in the groundwater of the area, as detailed in Section 8, renders the effects of the requested modification on the waters neutral.




## 7.12 SUMMARY OF IMPACTS

The installation and operation of the construction facilities for the construction of the new power station with a rated capacity of 826 MW do not make any substantial differences in the impact on the environment of the area, compared to those already assessed for the originally environmentally licensed project and dealt with by appropriate measures by the approved environmental conditions of the project.

As can be shown from the table below, the environmental impact of the natural and anthropogenic environment of the study area is neutral.

**Table 7.12:** Summary environmental impact table of the project.

Impact Category	Impact rating in relation to the licensed project
Climate and Bioclimatic Characteristics	No Impact
Morphological - Toxicological Characteristics	No Impact
Geological, Masonic and Soil Characteristics	No Impact
Natural Environment	No Impact

Anthropogenic Environment		
	Land Uses	No impact
	Structure and Functions of the Anthropogenic Environment	No impact
	cultural heritage	No impact
Socio-economic Impact		Positive Impact
Impact on Technical Infrastructure		Positive Impact
Association with anthropogenic pressures in the environment		No impact
Effects on Air quality		No impact
Effects of noise or vibration		No impact
Effects related to electromagnetic fields		No impact
Effects on water		No impact

## **8. TREATMENT OF ENVIRONMENTAL IMPACT**

This chapter describes in detail any additional measures proposed to address the environmental impact of the location and operation of the proposed construction sites for the construction of the new 826 MW power plant.

The description of the measures is directly related to the impact assessment as presented in Chapter 7 hereof and therefore follows the corresponding thematic structure. The description of the measures is directly related to the impact assessment as presented in Chapter 7 hereof and therefore follows the corresponding thematic structure.

### **8.1 MEASURES TO TREAT THE IMPACT ON CLIMATE AND BIOCLIMATIC CHARACTERISTICS**

The description of the measures is directly related to the impact assessment as presented in Chapter 7 hereof and therefore follows the corresponding thematic structure.

### **8.2 MEASURES TO TREAT THE IMPACT ON THE MORPHOLOGICAL AND TOPOLOGICAL CHARACTERISTICS**

No negative effects on the morphological and landscape characteristics of the area are expected from the requested modification and therefore no response measures are required.

### **8.3 MEASURES FOR THE IMPACT ON GEOLOGICAL, TEXTONIC AND SOIL CHARACTERISTICS**

The site in question is not expected to cause any impact on the geological and tectonic characteristics of the area and therefore no further measures are foreseen. Accordingly, in order to prevent the burden on the soil of the area, it is not necessary to take additional anti-pollution measures beyond those already provided for by the environmentally licensed project and concern mainly the rational management of liquid and solid waste.

#### **8.4 MEASURES TO DEAL WITH THE IMPACT ON THE NATURAL ENVIRONMENT**

The approved environmental conditions of the new power station, as they have been formulated in no. YPEN/DIPA/82557/5356/17.09.2019 ETA, as amended and in force by no. YPEN/DIPA/114847/6959/09.12.2019 decision, have defined a specific framework for its operation, providing conditions that ensure the protection of the natural environment. As mentioned in chapter 7, the operation of the construction sites does not appear to affect the functioning of the natural environment (i.e. flora, fauna, ecosystems, wooded areas and other important natural areas) of the study area and even more so the ecological function of the marine protected area of the Corinthian Gulf and therefore no further measures are foreseen.

#### **8.5 MEASURES TO DEAL WITH THE IMPACT ON THE HUMAN ENVIRONMENT**

The siting and operation of the construction site service facilities during the construction phase of the new station is of a temporary nature and is not expected to affect the man-made environment of the study area.

#### **8.6 MEASURES TO DEAL WITH THE IMPACT ON THE SOCIO-ECONOMIC ENVIRONMENT**

As positive effects of the proposed amendment are expected, no response measures are required.

#### **8.7 MEASURES TO DEAL THE IMPACT ON TECHNICAL INFRASTRUCTURE**

As positive effects of the proposed amendment are expected, no response measures are required.

#### **8.8 MEASURES TO DEAL WITH THE IMPACT OF HUMAN PRESSURES ON THE ENVIRONMENT**

Existing sources of pollution and existing anthropogenic pressures on the environment will not be intensified by the siting and operation of the site facilities under consideration and therefore no anti-pollution measures are required.

#### **8.9 MEASURES TO DEAL WITH THE IMPACT ON AIR QUALITY**

From the requested modification is expected the production of particulate matter dust for the limitation of which the project operator is going to apply the approved environmental conditions and techniques of good practice during the construction works significantly suppressing the presence of dust and exhaust gases. However, the paragraph under consideration highlights distinct measures for the reduction of suspended

particulate matter relating to the operation of the construction site treatment plant, excavation, construction and demolition waste and the concrete construction site.

The dust created during the movement of vehicles, from the transport of the products produced by the facility as well as from the transport of the raw materials used during the production process, is treated by wetting both the traffic routes and the loading and unloading points, as well as the storage and drop points of the raw materials throughout the implementation phase of the project, especially during the dry seasons. The wetting works will be carried out through an aquifer that will have the facility, in which a water spraying system has been installed in order to effectively wet.

In addition to wetting, the following measures are taken to deal with the creation of particulate matter during the operation of construction sites.:

- Trucks transporting aggregates will be closed
- The mixer and weighing mill in the concrete construction site will be of the closed type and will have ventilation through ventilators
- In the construction site production unit of concrete will be placed covering the conveyor belts along their entire length with sheet metal as well as industrial curtains at the points of fall from tape to tape as well as the engine.
- A sazzofilter will be placed on the cement storage silo

As is therefore apparent from the foregoing at the stage of storage of aggregates in heaps, the measures to limit the production of particulate matter include the storage of aggregates by type of material in piles of not more than three meters high and systematic maceration. For the management of cement, which concerns the raw material with the smallest granulometry, storage is foreseen in silos, which have dust filters, so there is no question of dispersing dust and fine-grained materials, while the vibrational sieve for the separation of the treated excavating materials will be of a closed type limiting dust emissions in the project area.

Compliance with the above-mentioned anti-pollution measures enhance the protection of the quality of the atmospheric environment of the study area under consideration.

## **8.10 MEASURES TO TREAT THE EFFECTS OF NOISE AND VIBRATION**

The measures taken to reduce noise and vibration from the operation of the requested modification are not



differentiated from the environmentally licensed project and concern the adoption of appropriate sound and anti-vibration measures in order to comply with the permitted noise limit.

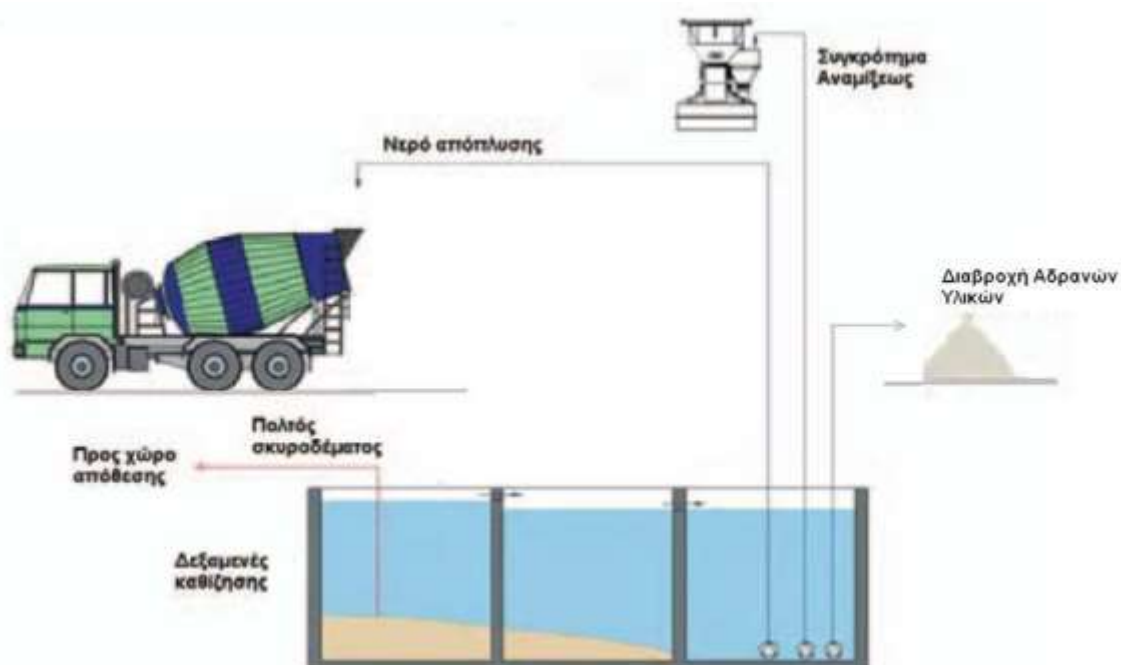
### 8.11 MEASURES TO DEAL WITH THE IMPACT ON ELECTROMAGNETIC FIELDS

The requested modification is not related to the presence of electromagnetic fields in the study area.

### 8.12 MEASURES TO DEAL WITH THE IMPACT ON WATER

From the operation of the construction site in question, only the construction site plant producing concrete could potentially affect the water environment of the area, given that in the context of maintenance and proper operation of the equipment, washings of the machinery are to take place, in particular: a) the mixer, b) the stirrers and c) the concrete pumps.

The liquid waste (leaching water) that results from the washing of the equipment, is led through a suitably shaped trench to an array of watertight tanks precipitation of rectangular cross-section, in order to stay there, in order to achieve subsidence of the solids. These tanks will have a configured ramp for loader access that will remove solids that settle. Then the water, which has been largely rid of the impurities of solids, is reused in the production process.



**Figure 8.12-1:** Schematic display of disposal – recirculation of treated wastewater



The leaching water subsidence system consists of three tanks of 12,51 m<sup>3</sup>, 25,2 m<sup>3</sup> and 25,2 m<sup>3</sup> respectively. The total useful volume of the system for the removal of solid waste from the leaching water is 62,91 m<sup>3</sup> and taking into account that the daily amount of leaching water will not exceed 12 m<sup>3</sup>, it follows that the residence time of the liquid waste amounts to at least 5 days ensuring the adequacy of the natural process of sedimentation of solid particles and resolution of liquid waste.

Subsequently, the treated liquid waste may be used as a raw material in the plant, either as mixing water (which, since it is used as an auxiliary – complementary, it is not even required to adjust this PV) or as a washing water for equipment. The above described way of wastewater from the concrete production unit ensures the recycling and reuse of the plant's liquid waste, preventing any burden on the water potential of the study area.

Similarly, the settling sludge in the settling tank is either reused for the production of lower grades of concrete if there is a similar need, or is temporarily stored in watertight containers until its final delivery to a specially licensed management company.

### 8.13 IMPACT SUMMARY

During the construction and operation stage of both the main project and the construction site facilities, the project operator will adopt procedures for control, monitoring and compliance with the approved environmental conditions. In any case, the measures to prevent and avoid the potential environmental impacts described in the approved environmental studies and in the terms of the environmental terms approval (ETA) are considered sufficient, given that the proposed amendment, as already mentioned, concerns only the construction phase and does not result in substantial differences in the potential environmental impact of the area from the already licensed project.

**THESSALONIKI, JANUARY 2020**

**PROJECT OPERATOR**

**ENVIRONMENTAL STUDY ENGINEER**

## 9. CODING OF RESULTS AND PROPOSALS FOR AMENDMENT OF THE ENVIRONMENTAL TERMS APROVAL

This chapter presents an Environmental Terms Approval plan for the project, the implementation and observance of which will be a prerequisite for the implementation and operation of the construction site facilities serving the construction phase of the station.

*The proposal of the draft Decision amending the Approval of Environmental Terms follows the provisions of the J.M.D. econ. 48963/2012 (Government Gazette 2703B/05.10.2012) "Environmental terms approval (ETA) content specifications for projects and activities of category A' of no. 1958/13-1-2012 decision of the Minister of Environment, Energy and Climate Change (B' 21), as in force, according to article 2 par. 7 of Law 4014/2011 (A' 209) ».*

### ETA PLAN

**SUBJECT:** 'Amendment of No. Ministry of Environment and Energy/DIPA/82557/5356/17.09.2019 Decision approving environmental terms, as amended and in force, of the project "Construction and Operation of a New Power Station of MYTILINEOS S.A. / business sector Electricity (formerly PROTERGIA S.A.) of nominal power of 826 MW at the Existing Energy Center of Agios Nikolaos in Viotia".

### PREFACE

Having regard to:

1. The Law 998/1979 (Government Gazette 289/A/1979) "On the protection of forests and forest areas in general of the country", as amended by law. 2040/92 (Government Gazette 70/A/ 23.4.1992), Law 3208/03 (Government Gazette 303/A/24.12.2003) and Law 4280/2014 (Government Gazette 159/A/8.8.2014)).
2. The Law 1650/86 (Government Gazette 160/A/86) "For the protection of the environment", as amended and in force.
3. The Law 2244/1994 (Government Gazette 168/A/07-10-1994) "Regulation of issues of power generation from renewable energy sources and from conventional fuels and other provisions».

4. The Law 2939/2001 (Government Gazette 179/A/2001) "Packaging and alternative management of packaging and other products - Establishment of a National Organization for the Alternative Management of Packaging and Other Products (EOEDSAP) and other provisions", as amended and in force.
5. The Law 3010/02 (Government Gazette 91/A/02) "Harmonization of Law 1650/86 with Directives 97/11/EU and 96/61/EU, delimitation procedure and regulation of issues for water streams and other provisions».
6. To N. 3028/2002 (government gazette 153/A/2002) "For the protection of antiquities and Cultural Heritage in general".
7. The Law 3199/2003 (Government Gazette 280/A/2003) "Protection and management of water – Harmonization with Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000", as amended and in force.
8. The Law 3325/05 (Government Gazette 68/A/2005) "Establishment and operation of industrial - craft facilities in the context of sustainable development and other provisions", as supplemented by Law 4072/12 (Government Gazette 86A) "Improvement of business environment-New corporate form-Trademarks-Real Estate Brokers-Regulation of shipping, ports and fisheries issues and other provisions and other provisions».
9. The Law 3378/2005 (Government Gazette 203/A/2005) "Ratification of the European Convention for the Protection of the Archaeological Heritage (revised)».
10. The Law 3852/10 (Government Gazette 87/A/2010) "New Architecture of Local Government Administration and Decentralized Administration - Kallikratis Programme».
11. The Law 3937/2011 (Government Gazette 60/A/2011) "Conservation of biodiversity and other provisions».
12. The Law 3982/11 (Government Gazette 143/A/17-6-2011) "Simplification of the licensing of technical professional and manufacturing activities and business parks and other provisions", as amended by Law 4072/12 (Government Gazette 86A) "Improvement of the business environment-New corporate form-Trademarks-Real Estate Brokers-Regulation of shipping, ports and fisheries issues and other provisions" and Law 4155/13 (Government Gazette 120A) "National System of Electronic Public Procurement and other provisions".
13. The Law 4014/11 (Government Gazette 209/A/2011) "Environmental licensing of projects and activities, regulation of arbitrary in relation to the creation of an environmental balance and other provisions of the Ministry of Environment", as in force.
14. The Law 4042/12 (Government Gazette 24/A/2012) "Criminal protection of the environment - Harmonization with Directive 2008/99/EC - Framework for the production and management of waste -



Harmonization with Directive 2008/98/EC - Regulation of issues of the Ministry of Environment, Energy and Climate Change".

15. P.D. 51/2007 (Government Gazette 54/A/2007) "Definition of measures and procedures for the integrated protection and management of water in compliance with the provisions of Directive 2000/60/EC».
16. P.D. 132/2017 (Government Gazette 160/A/ 30-10-17) "Organization of the Ministry of Environment, and Energy».
17. P.D. 81/2019 (Government Gazette 119A/08.07.2019) "Establishment, merger, renaming and abolition of Ministries and determination of their responsibilities Transfer of services and responsibilities between Ministries.».
18. P.D. 83/2019 (Government Gazette 121A/2019) "Appointment of Deputy Prime Minister, Ministers, Deputy Ministers and Deputy Ministers»
19. P.D. 84/2019 (Government Gazette 84/A/17-7-19) "Establishment and abolition of General Secretariats and Special Secretariats / Unified Administrative Sectors of Ministries».
20. The no. Ministry of environment and energy/YPRG/67409/8288/2-8-19 (Government Gazette 3107 B) Decision of the Prime Minister and the Minister of Environment and Energy "Assignment of responsibilities to the Deputy Minister of Environment and Energy, Gerasimos Thomas».
21. M.D. D6/F1/OIK. 8295/19.04.1995 (Government Gazette 385/B/10.05.1995) "A. Procedures and supporting documents required for the issuance of licenses for the installation and operation of power plants, the fees payable as well as any other necessary details. B. Determination of general technical and economic terms of contracts between producers and PPC, details of the formation of tariffs as well as terms of interconnection».
22. Kya 11294/93 (Government Gazette 264B) "Operating conditions and permissible limits on the emission of gaseous waste from industrial boilers, steam generators, olive and air heaters fueled by fuel oil, diesel or gas».
23. The J.M.D. 37111/2021/03 (Government Gazette 1391/B/03) "Determination of the way of informing the participation of the public during the process of approval of environmental terms of projects and activities in accordance with paragraph 2 of article 5 of Law 1650/86 as replaced by paragraphs 2, 3 of article 3 of the Law 3010/02" as amended by the J.M.D. econ 1649/45/2014 (Government Gazette 45/B/14).
24. The Ministerial Decision 50910/2727/2003 (Government Gazette 1909/B/22-12-2003): "Measures and conditions for solid waste management».
25. J.M.D. 13588/725/06 (Government Gazette 383B) "Measures, conditions and restrictions for the management of hazardous waste in compliance with the provisions of Council Directive 91/689/EEC "on hazardous waste" of 12 December 1991. Replacement of no19396/1546/1997 joint ministerial decision "Measures and conditions for the management of hazardous waste", as amended by Law 4042/12



(Government Gazette 24A).

26. The J.M.D. 24944/1159/06 (Government Gazette 791B) "Approval of General Technical Specifications for the management of hazardous waste in accordance with article 5 (par. B) no. 13588/725 joint ministerial decision "Measures, conditions and restrictions for the management of hazardous waste, etc." (B' 383) and in compliance with the provisions of article 7 (par. 1) of Council Directive 91/156/EC of 18 March 1991", as amended by Law 4042/12 (Government Gazette 24A) and in force.
27. The J.M.D. econ. 3137/191/Φ.15/12 (Government Gazette 1048B) "Matching of the categories of industrial and craft activities and activities of electricity production with the degrees of nuisance mentioned in the planning decrees", as supplemented and amended by the J.M.D. 13234/800/Φ.15/12 (Government Gazette 3251B), Φ15/48/5/14 (Government Gazette 27B), econ. 10432/1115/Φ.15/14 (Government Gazette 2604B) and 132894/1751/ Φ15/2017 (Government Gazette 4421B).
28. The J.M.D. 21398/2012 (Government Gazette 1470/B/2012) "Establishment and operation of a special website for the posting of decisions approving environmental terms (ETA), decisions on renewal or amendment of ETA, in accordance with article 19a of Law 4014/2011 (Government Gazette A/209/2011) ».
29. The J.M.D. 48963/12 (Government Gazette 2703/B/2012) "Specifications of content of Decisions approving environmental terms for projects and activities of category A' of no. 1958/13-1-12 decision of the Minister of Environment, Energy and Climate Change (B' 21) as in force, according to article 2 par. 7 of Law 4014/2011 (A' 209)" as amended and in force.
30. The J.M.D.167563/EYPE/13 (Government Gazette 964/B/2013) "Specification of the procedures and the specific criteria for the environmental permitting of projects and activities of articles 3, 4, 5, 6 and 7 of Law 4014/2011, in accordance with the provisions of article 2, paragraph 13 thereof, of the special forms of the above procedures, as well as any other issue related to these procedures».
31. J.M.D. 36060/1155/E.103/13 (Government Gazette 1450B) "Definition of a framework of rules, measures and procedures for the integrated prevention and control of environmental pollution by industrial activities, in compliance with the provisions of Directive 2010/75/EU "on industrial emissions (integrated pollution prevention and control)" of the European Parliament and of the Council of 24 November 2010" as amended and in force.
32. M.D. 1649/45/14 (Government Gazette 45B) "Specification of the procedures for the opinions and the way of informing the public and the participation of the interested public in the public consultation during the environmental licensing of projects and activities of Category A of the decision of the Minister of Environment, Energy and Climate Change with no. 1958/2012 (Government Gazette A 21) according to article 19 paragraph 9 of Law 4014/11 (A 209), as well as any relevant detail».
33. The J.M.D. 51373/4684/15 (Government Gazette 2706/B/2015) "Ratification of the National Waste



Management Plan and the National Strategic Plan for the Prevention of Waste Generation».

34. The JMD econ. 51575/26.10.2016 "Approval of the Strategic Environmental Impact Study of the National Hazardous Waste Management Plan".
35. JMD 1915/2018 (Government Gazette/ 304/B/2018) "Amendment of no. 48963/2012 (B' 2703) joint ministerial decision, no. 167563/2013 (B' 964) of a joint ministerial decision and no. 170225/2014 (B' 135) ministerial decision, issued under the authority of Law 4014/2011 (A' 209), in compliance with Directive 2014/52/EU "amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment" of the European Parliament and of the Council of 16 April 2014».
36. M.D. 170225/14 (Government Gazette 135B) "Specification of the contents of the environmental permitting files of projects and activities of Category A of the decision of the Minister of Environment, Energy and Climate Change with no. 1958/2012 (21 B) as in force, according to article 11 of Law 4014/11 (A 209), as well as any relevant detail".
37. MD no. DIPA/OLK.37674/2016 (Government Gazette 2471/B/2016) which amended and codified the M.D. 1958/2012 (Government Gazette 21/B/13.1.2012) "Classification of public and private projects and activities into categories and subcategories according to Article 1 paragraph 4 of Law 4014/21.9.11 (Government Gazette 209/A/2011)" as amended by no. Eco. 2307/18 (Government Gazette 439/B/2018) and is in Force.
38. M.D. econ 62952/5384/2016 (Government Gazette 4326/B/30.12.2016) "Approval of the National Hazardous Waste Management Plan (NEEAEA), in accordance with article 31 of Law 4342/2015».
39. Act of the council of ministers 49 of 15-12-2015 (Government Gazette 174/A/2015) "Amendment and approval of the National Waste Management Plan (E.S.D.A.) and the National Strategic Plan for the Prevention of Waste Generation ratified by the 51373/4684/25-11-2015 joint decision of the Ministers of Interior and Administrative Reconstruction and environment and energy, in accordance with article 31 of Law 4342/2015».
40. No. econ. 153914/2.12.15 Circular of the Minister of Environment and Energy on the application of article 18 of the J.M.D. 36060/1155/E.103/13 (Government Gazette 1450B) on the obligation to submit a basic report (ΑΔΑ: 7ΔΡΣ14653Π8-8Ο2).
41. The Best Available Techniques mentioned in Guides and Reference Texts and in particular the Implementing Decision (EU) 2017/1442, of 31 July 2017 setting out the conclusions on Best Available Techniques (BAT) under Directive 2010/75/EU of the European Parliament and of the Council, as regards large combustion plants, the Reference Manuals (BREFs) for the determination of best available techniques for refrigeration systems (Reference Document on the application of Best Available Techniques to Industrial Cooling Systems, December 2001), the Reference Report on Monitoring of





Emissions to Air and Water from IED installations, July 2018).

42. Regulation 166/2006 (L 033/04.02.2006) of the European Parliament and of the Council of 18 January 2006, E-PRTR Regulation, "establishing a European pollutant release and transfer register and amending Council Directives 91/689/EEC and 96/61/EC».
43. No. 2012/249/EU Commission Implementing Decision of 7 May 2012 on the determination of start-up and downtime periods for the purposes of Directive 2010/75/EU of the European Parliament and of the Council on industrial emissions.
44. The fact that the unit under consideration falls under the provisions of JMD 54409/2632/04 (Government Gazette 1931B as amended by JMD 181478/965/2017 (Government Gazette 3763B) "Amendment and codification of no. H.P. 54409/2632/2004 joint ministerial decision "Scheme for greenhouse gas emission allowance trading in compliance with the provisions of Directive 2003/87/EC "establishing a scheme for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC" of 13 October 2003 and other provisions", (B' 1931) as amended" and in force, on a scheme for greenhouse gas emission allowance trading pursuant to Article 21 of which no carbon dioxide emission limits are imposed on the plant in question, nor are the energy efficiency requirements of combustion plants emitting carbon dioxide emissions imposed on the plant in question.
45. The Decree of 24.10.1962 (Government Gazette 138 D'/ 1.11.1962 which expropriated the wider area to which the disputed area belongs, for and at the expense of the company then "Aluminum S.A. of Greece" for public benefit and specifically for industrial use with the establishment of an Aluminum Industry in it.
46. The no. EGY econ, 902/21.12.2017 (Government Gazette 4673/B/29.12.17) Decision of the National Water Committee on "Approval of the 1st Revision of the River Basin Management Plan of the Water District of Eastern Sterea Ellada and the corresponding Strategic Environmental Impact Study».
47. The no. Ministry of Environment and Energy /41375/328/6.7.2018 (B' 2682) Decision of the National Water Commission on the subject: "Approval of the River Basin Flood Risk Management Plan of the Water District of Eastern Sterea Ellada (EL07) and the corresponding Strategic Environmental Impact Study».
48. No. Ministry of Environment and Energy /DIPA/82557/5356/17.09.2019 Decision approving environmental terms, concerning the relevant station.
49. No. Cfi. Ministry of environment and energy/DIPA/114847/6959/09.01.2019 Decision amending the station in question as to its nominal validity





## DECIDE

The amendment of no. YPEN/DIPA/82557/5356/17.09.2019 Environmental Terms Approval of the project "Construction and operation of a New Power Station of Mytilineos S.A. in the Existing Energy Center of Agios Nikolaos, Viotia", as amended and in force, for the siting and operation of construction sites for the construction needs of the specific project in accordance with the following:

### **I. In section 4.2 Construction Phase, the following paragraph is added:**

#### 4.2.7 Time-setting and operation of construction site facilities

In the context of the construction of the project, it is provided within the environmentally licensed area of intervention and its implementation, as defined by data E1, E2, E3, ..... E25, E25, E1, which are reflected in the Plan "topographical plan – 111915-UDK-CDA-MET-007" that accompanies the present, the siting and operation of construction site facilities serving its construction which concern:

- i. facility for the treatment of excavations of structures & demolitions (and mainly excavation materials of the project)
- ii. concrete production unit with an average concrete production capacity of 85m<sup>3</sup>/day

During the installation and operation of construction sites, the following should be observed:

- 4.2.7.1 The construction site facilities will be used exclusively to meet the needs of the new power plant with a nominal capacity of 826MW.
- 4.2.7.2 During the implementation and operation of the construction site facilities, the environmental conditions of the EPO of the main project in force, 48 and 49 in this regard, should be observed.
- 4.2.7.3 During the operation of the construction site facilities, the measures described in the amendment file concerning the restriction of release and concentration of suspended particles - dust in the area of the construction site should be observed.
- 4.2.7.4 During the operation of the construction site plant for the production of concrete, the measures described in the amendment file for the proper management of the produced liquid and solid waste should be observed.
- 4.2.7.5 The modification of the construction site facilities for the construction of the project in question or the environmental permitting of installations resulting from the technical planning of projects at a stage following the ETA, it is possible to submit and approve TEPEM, in accordance with the provisions of paragraph 2 of article 7 of Law 4014/2011.



For the rest, the with no. YPEN/DIPA/82557/5356/17.09.2019 Decision approving the Environmental Terms of the project of the subject, as amended and in force.

The publication of this decision required by law is made by posting it on the special website, at the website ETA ypeka.gr (in accordance with the provisions of article 19a of Law 4014/2011), as well as on the Joint Ministerial Decision no. 21398/12 (Government Gazette 1470/B/2012).

**THE DIRECTOR GENERAL OF ENVIRONMENTAL POLICY OF  
THE MINISTRY OF ENVIRONMENT & ENERGY**

**Attachment:**

Amendment dossier

## 10. PHOTOGRAPHIC DOCUMENTATION



**Photo. 1:** Panoramic view of the wider development area of the new power station and construction sites



**Photo. 2:** Panoramic view of the wider development area of the new power station and construction sites





**Photo. 3:** Display of photographic documentation locations of the indicatively proposed installation location of the construction site of the new power station





**Photo . 4:** View of the indicatively proposed location of the installation site of the construction site plant for the production of concrete.



**Photo. 5:** View of the indicatively proposed location of the construction site plant for the treatment of excavating materials.