B.03.10 MONITORING

Reference Drawings and Documents
ENEM-URS-E0-00-DR-ME-00106 External tie in points
ENEM-URS-E0-00-DR-ME-00113 Discharge to Sea
IPPC Delimara Power Station: Noise Method Statement – ElectroGas Malta

GENERAL

The development includes discharges to sea and air but not groundwater or land. Information regarding the requirements of monitoring, during the operational phase, of these emissions, including noise and marine archaeology, is given below. However, the detailed Environmental Monitoring Plan (EMP) will be developed by the Operations and Maintenance teams to reflect to permit requirements.

ElectroGas Malta will implement a certifiable environmental management system (e.g. ISO 14001 certified or equivalent/similar such as the Environmental Management and Audit System (EMAS)). The process leading to the certification of all aspects of the system is expected to take between 6 to 12 months following the full commissioning of the development.

Details of monitoring to be carried out during construction are included in the Construction Management Plan (CMP) which has been submitted to MEPA as part of the development permit requirement.

MONITORING DISCHARGE TO SEA

Water quality parameters will be monitored, including, for example: pH levels, temperature and levels of oil and hydrocarbons etc., the exact requirements will be as specified in the Permit.

During operation, monitoring will be carried out for waste-streams upstream of their point of discharge into the cooling water waste-stream, or at the point of their discharge at sea (if they are not discharged into the cooling water stream). This water monitoring will entail periodic sampling and analysis of the following waste water streams presented in section 3.4 of this application.

Sampling of the CW discharge will be at the sampling point installed in the CW pipe manhole located as indicated on drawing ENEM-URS-E0-00-DR-ME-00113. In addition continuous monitoring of temperature and pH will be carried out upstream of the tie in point TP18, referenced on drawing ENEM-URS-E0-00-DR-ME-00106

Monitoring of the cooling water discharge to sea will also measure the chlorine/pH level and heat load discharge to the sea. Measurements of chlorine levels will be undertaken in accordance with ISO 7393 or equivalent; whilst ISO 6416:2004 or equivalent will be used for the continuous measurement of heat load discharge.

Monitoring will be undertaken at the location of the two discharge points to sea. These consist of the existing outlet into il-Ħofra ż-Żgħira and the proposed new rainwater outfall from the LNG regasification compound.

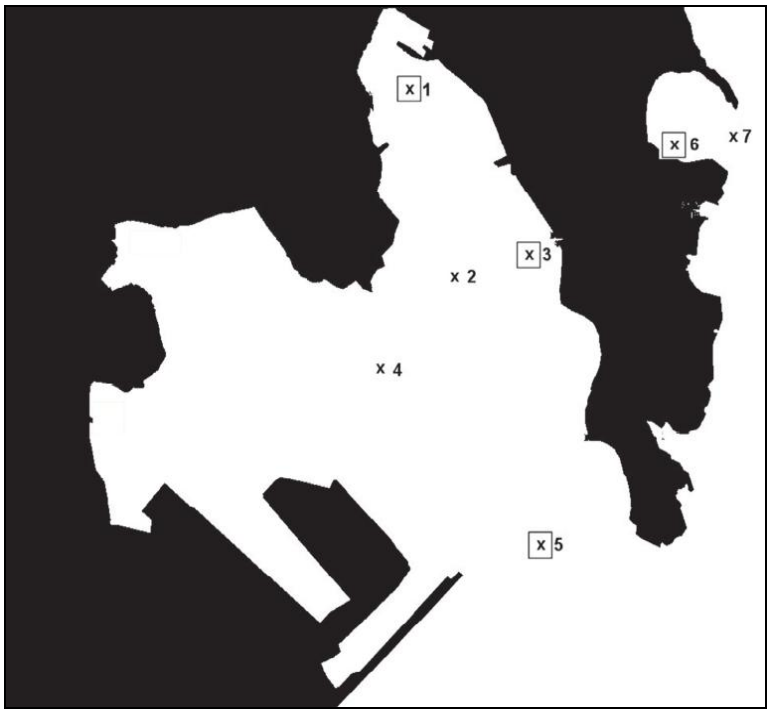
MONITORING OF THE MARINE ENVIRONMENT

During the construction phase of the development a programme of marine monitoring will have been completed at 7 fixed locations, presented on the Figure below, and this will continue seasonally during operation. The purpose of this monitoring is to detect at the earliest possible stage, any environmental damage during the operational phase of the project. The environmental standards formulated during the construction phase monitoring, for water and sediment parameters and will serve as operational monitoring thresholds.

The locations will be monitored for at least the following parameters.

Operational Monitoring	
Parameter	Depth (m)
Water	
Temperature	Profile
Salinity	Profile
Chlorophyll a	0.5, bottom
Nitrates	0.5, bottom
Phosphates	0.5, bottom
Water Turbidity	Profile
Total Suspended Solids	Profile
pH	Profile
Microbiology	0.5
Sediments	N/A
Granulometry	
Relevant organic contaminants, including butyltins	
Petroleum hydrocarbons	
Heavy metals	
Hydrodynamic survey	N/A

Marine Monitoring Locations



Crosses indicate stations used for water quality only while boxes indicate stations also sampled for sediment quality.

MONITORING OF AIR QUALITY

To monitor the air quality impacts, a monitoring program that goes beyond the basic stack/emission monitoring as foreseen in the IPPC permitting process and under LN 11/2013, will be implemented based on continuous (hourly) multi-parameter monitoring of the pollutants addressed by 2008/50/EC. This will include monitoring of ambient air quality both in terms of "industrial fence monitoring" (which also provides validation data for the emission monitoring) along with one or several monitoring location(s) located between the DPS source complex and the nearest, sensitive receptor areas and locations toward the north-west. This will ensure that monitoring is undertaken at the location of the most sensitive receptors rather than the standard methodology, which would be downwind of the source location (which in the case of DPS would be mainly in the sea).

In addition to the air quality monitoring program, and to obtain complete spatial coverage, air quality modelling will be undertaken. Air quality modelling in support of traditional (point) monitoring can also identify the contributions of various emission sources (primarily the individual contributions of the energy sector versus the transportation sector) but also natural sources and long-range transportation, in particular for PM2.5 and PM10 at any receptor location. The use of (real-time) simulation modelling is also foreseen in EU Directive 2008/50/EC.

Air quality simulation, starting with dynamic emission modelling (PEMS), in combination with numerical weather data will also provide forecasts of air quality under extreme weather situations (inversion) and thus will provide both operational guidance as well as public information.

An operational real-time monitoring, data management and simulation system provides a reliable, accessible and open information source to monitor compliance as a follow-up to the EIA studies for ambient concentrations as defined in EU Directive 2008/50/EC, including regular reporting, alerts and warning (ozone) and general public information to demonstrate the expected environmental improvements by the proposed project over time.

Emission of methane from the LNG and natural gas (NG) facilities will not occur during normal operating conditions. In the unlike event the pressure in the FSU moss tanks rises above certain pre-set value, the on-board auxiliary boilers during phase 2 or the main boiler during phase 1 will start firing BOG to control the pressure in the tanks. Only if this safety measure fails, the BOG will be vented to the atmosphere via the Moss tank release valves. Likewise in the onshore facilities, if the NG pipeline pressure starts to rise, the NVCC will start firing natural gas in order to control the pressure, and only if this safety measure fails, the natural gas will be vented through the release valves. The number of flange connections in the LNG and NG pipelines are limited and welded connections have predominately been used in order to prevent small leaks. LNG leak and gas detection system will be included. Further information is available in BAT comparison emissions from storage section 2.2.4 and the risk assessment section 2.8.

To monitor flue gas emissions, a Continuous Emission Monitoring System (CEMS) will be used. This system will monitor and log the emissions released from each HRSG exhaust stack. The CEMS will consist of sample probes, filter, sample line (umbilical), a calibration gas system, and a series of gas analysers which reflect the parameters being monitored and stored. The gas analysis system consists of an extractive system where representative samples are taken from the stack with a sampling probe and conveyed to the analyser through a sample line and a gas conditioning system. The CEMS system will comply with EN ISO 14956 and EN 14181.

During initial operations the plant will operate in open cycle, during which time the flue gas emissions will discharge via the by-pass stacks. This will not in general be the normal operational mode of the plant however will initially be the operational mode to support the early commissioning activities of the development. It is proposed that the gas turbines will be fully operating in open cycle mode for around six months during the combined cycle commissioning period and then rarely after commencement of commercial operations. As stated earlier the plant is design for and predicted to run at base load in continuous combine cycle mode. Emission concentrations when operating in open cycle mode will not vary from those expected in combined cycle mode, which the exception that the temperature will be elevated and thus the discharge will be more buoyant.

However there are a few dispatch ranges at which Open Cycle of one or more of the GTs wil be required, as discussed earlier in this submission, thus monitoring of emissions during open cycle mode whilst the by-pass stacks are in operation will be through installing monitoring probes into the relevant receptors in the by-pass stack which will be connected to the main CEMS monitoring equipment. There will be one common CEMS which may be manually switched between the two stacks as dictated by the operational mode of the plant.

The exact locations of the air monitoring stations are shown on drawing ENEM-URS-E0-DR-ME-00106. A schematic diagram of the CEMS will be provided together with the calibration certificate once the monitoring probes are fully installed and commissioned.

NOISE MONITORING

Noise generation monitoring will be carried out in the locations identified on the Figure below. The 'blue' stations identified 'It' would be used for long term monitoring, whilst the other monitoring locations would be on a short-term basis. Monitoring would be pre and post installation. The short term measurements will be assisted to acknowledge the main sources of noise emission during measurement and at minimum be three hours long, with an interval of five minutes maximum. The assessment will be done in the free-field or corrected to reflect free field conditions. Each location will be measured during the day and at night (between 23:00 and 07:00 hours). There will be 20 short term results; 10 pre-installation and 10 post-installation. The measurement microphone height will be two meters, dependant on the topography of each monitoring point.

Combined noise monitoring will be carried out in conjunction with the other operators on the Delimara site. Enemalta will take the lead in this and have engaged with Acousti-CAL Consultancy to produce the noise monitoring method statement which has been discussed and coordinated by all parties.

Combined and coordinated noise monitoring will be carried out by all three parties (Enemalta, EGM and DPS3) for all the three installations on the Delimara site. To this end Acousti-CAL Consultancy have been engaged to produce noise monitoring method statements for all of the three parties. These have been discussed and coordinated between the teams.

Refer to ElectroGas Malta Method Statement in Appendix A of this section.

MARINE ARCHAEOLOGY

The Construction Management Plan (CMP) regulates marine archaeology during the construction phase of the proposed development. Onshore pile arising have been monitored by the projects independent environmental monitors during piling operations. No objects of interest have been found to date. Off shore piles are hollow steel driven piles and as such no airings were produced during these piling works and thus no monitoring of arising was required. Post construction, the seabed around the newly constructed jetty may, if required, be inspected so as to study any possible effects of new current patterns and scouring processes on potential archaeological deposits.

Appendix A - IPPC Delimara Power Station: Noise Method Statement – ElectroGas Malta

IPPC Delimara Power Station - EGM Noise M