

Prepared for:  
**Noble Energy**

## **TAMAR EXPANSION PROJECT**

### **DISCLOSURE SUMMARY OF ENVIRONMENTAL AND SOCIAL ASSESSMENTS AND CONCLUSIONS**

March 2015

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ENVIRONMENTAL AND SOCIAL  
ASSESSMENTS AND CONCLUSIONS**

For and on behalf of

Environmental Resources Management

Approved by: Peter Rawlings



Signed:

Position: Partner

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## Table of Acronyms

AOT	Ashdod Onshore Terminal
APC	Arab Potash Company
BAT	best available technologies
CDP	Carbon Disclosure Project
CSR	Corporate Social Responsibility
EEZ	Exclusive Economic Zone
EHS	Environmental Health & Safety
EIA	Environmental Impact Assessment
EMG	Eastern Mediterranean Gas Company, S.A.E.
ERM	Environmental Resources Management
ESMS	Environmental and Social Management System
GHG	Greenhouse Gases
GMS	Global Management System
GSPA	Gas Sales and Purchase Agreement
IFC	International Finance Corporation
IMO	International Maritime Organization
INGL	Israel Natural Gas Line
JBC	Jordan Bromine Company
MarketCo	NBL Eastern Mediterranean Marketing Company
MARPOL	International Convention for the Prevention of Pollution from Ships
MEG	MonoEthylene Glycol
NEML	Noble Energy Mediterranean Ltd
NORM	Naturally Occurring Radioactive Material
NPC	National Planning Committee
OHS	Occupational Health and Safety
OSHAS	Occupation Health and Safety Assessment Series
OSPAR	Oslo and Paris Conventions ("OS" for Oslo and "PAR" for Paris)
PRTR	Pollution Release and Transfer Register
SEMS	Safety And Environmental Management System
SEP	Stakeholder Engagement Plan
SMS	Safety Management System
SOP	Standard Operating Procedures
TAMA	<i>Tochnit Mit'ar Artzit</i>

Noble Energy Inc. conducts its business in Israel by way of investments made through its indirect wholly owned subsidiary Noble Energy International Ltd. (“Noble”). In 2009, Noble’s direct wholly owned subsidiary, Noble Energy Mediterranean Ltd. (“NEML”) and its joint venture partners (collectively with NEML – “Tamar Partners”) discovered the Tamar gas field which is located approximately 100 km offshore directly west of Israel’s northern coast. The Tamar Project achieved first gas in March 2013. Currently, Noble is seeking political risk insurance from OPIC to protect its current and prospective investments and rights in the Tamar Project in general (see Section 3 for a full project description); but also in relation to options for its future expansion activities.

Over the course of several years, including prior to discovery, NEML commissioned and conducted numerous environmental and social studies and assessments to understand, evaluate, and mitigate potential environmental and social risks pertaining to the Tamar Project. The purpose of this document is to provide a consolidated summary of these studies and assessments since 2012 (some of which were prepared by ERM and the remainder by others as noted). This document also presents the existing management programs, plans and systems NEML already has in place for the existing Tamar Project components. Important details on these management programs and commitments which apply across both the onshore and the offshore components of the Tamar Project can be found in Sections 3.1, 5.1, 6.1 and 8.

NEML’s commitments to environmental and social sustainability in its operations are reflected in the voluntary development of a variety of plans and risk analyses that are not required under Israeli regulations but yet important for the alignment of the project with good international industry practice (including International Finance Corporation’s Performance Standards) and to further reduce project-related risks. These plans and analyses which are incorporated into this summary document include: Stakeholder Engagement Plan, human rights due diligence, social and health impact assessment and an environmental risk assessment for onshore facilities.

This summary document also provides background (see Section 4) and information (Sections 5.1 and 6.1) on the compliance of the Tamar Project with the regulatory requirements in Israel, including the TAMA process which provided permitting for onshore land allocation. Israeli law comprises a strong legal framework for environmental management, and relevant components are referenced throughout this document. As a result, this legal framework ensures a robust permitting system associated with air

and water discharges and hazardous waste handling and disposal. Activities involving these functions are regulated through air, water discharge, and toxin permits that are issued for individual facilities, including for the onshore and offshore components of the Tamar Project.

The Tamar Project expands beyond Israeli territorial waters and within the Exclusive Economic Zone (EEZ). Although Israel does not have an EEZ law yet (it is currently under legislative process), NEML respects Israeli Laws (such as Labor Law or Environmental Law) across all of its facilities. The environmental requirements for the offshore facilities are prescribed in NEML's licenses and leases with the Israeli government; and international requirements for offshore waters (beyond 12 miles) i.e. IMO Convention for the Prevention of Pollution from Ships [MARPOL (73/78)] and Israeli regulations are in line with the Barcelona Convention for the Protection of Mediterranean Sea from Pollution. Additional details pertaining to compliance for specific offshore and onshore project components can be found in Sections 5 and 6, respectively.

Sections 5 and 6 provide a description of the existing environmental and social characteristics of the Tamar Project and the key onshore and offshore impacts respectively. It comprises a combination of reference to environmental and social studies and impact assessments prepared by ERM and others. This includes a risk assessment of its onshore facilities which was not required by the Israeli Authorities but commissioned by NEML as part of its project risk reduction efforts considering that the onshore component (the Ashdod Onshore Terminal) is located within an industrial zone known for pre-existing groundwater contamination.

Sections 5 and 6 also provide details pertaining to the social, health and human rights impact assessment findings for both the offshore and onshore project components respectively. As summarized in this document, there were no significant findings as it pertains to social, health and human rights aspects, and NEML has management and monitoring processes in place to manage any associated risks.

The same sections also provide important baseline information on cultural heritage, and the potential impacts of the Tamar Project on these resources. Avoidance has been a key management procedure adopted by Noble in relation to cultural heritage. Noble conducted a geophysical survey and shallow geotechnical investigation of the Tamar Development area and pipeline routes for potential cultural and heritage sites and routing of pipelines were established based on this avoidance procedure.

Section 8 provides a concise summary of the management systems and plans in place, including Noble's Global Management System (GMS), a Safety and Environmental Management System (SEMS), and other diverse

Management Plans (i.e. safety, preservation of fauna and flora, air emissions, accidental spills and emergency procedures, social mitigation plans).

Annexes in this document provide additional detailed information on the project.

## 2.0 INTRODUCTION

### 2.1 BACKGROUND

Noble Energy Inc. conducts its business in Israel, among other countries, by way of investments made through its indirect wholly owned subsidiary Noble Energy International Ltd. (“Noble”), which is registered in the Republic of Cyprus. Noble’s direct wholly owned subsidiary, Noble Energy Mediterranean Ltd. (“NEML”), incorporated in Cayman Islands and with a branch in Israel, has entered into various agreements for investing in several leases and licenses in Israel as well commercial agreements to develop, exploit and monetize Noble’s interest in its assets in Israel. NEML and its joint venture partners (collectively with NEML - “Tamar Partners”) discovered the Tamar gas field in 2009 and achieved first gas in March 2013 with >1 Bscf/d of peak deliverability at a total cost of \$3.1 billion, of which NEML contributed 36%. The Tamar Field is about 100 km offshore directly west of Israel’s northern coast line.

Noble is seeking political risk insurance from OPIC to protect its current and prospective investments and rights in the Tamar Project (see *Section 3.0* for a full project description).

### 2.2 PURPOSE OF DOCUMENT

In support of Noble’s request to OPIC, Environmental Resources Management, Inc (ERM) was engaged to prepare this *Disclosure Summary of Environmental and Social Assessments and Conclusions* document. The purpose of this document is to provide a consolidated summary of the various studies and assessments relating to the Tamar Project prepared in part by ERM and by others, as well as the existing management programs, plans and systems NEML already has in place for the existing parts of the project.

### 2.3 RELEVANT DOCUMENTS AND INFORMATION

The identification and assessment of environmental and social risks and impacts across the entire Tamar Project has been completed over the course of several years, and is documented in the relevant impact assessment and diligence documents performed by others which are referenced in this report. These include:

- Tamar Field Project Environmental Impact Assessment Final, September 2012 (2012 EIA)

- Tamar SW-1 Exploration Program - Environmental Assessment, 2013 (2013 EA)
- Tamar Lease Development Project Environmental Impact Assessment (EIA) - Matan block offshore, Israel, 2015 (2015 Tamar EIA) (presented in Parts 1 and 2)

In addition, ERM has been commissioned by NEML to perform supplementary reviews and assessments to appraise a series of topics including the Project's onshore components, social impact, human rights and the alignment of the Tamar Project against IFC Performance Standards and associated guidelines, namely the World Bank Group Environmental Health & Safety (EHS) General Guidelines (2007) and the IFC Sector Specific Guidelines: World Bank EHS Guidelines for Offshore and Onshore Oil and Gas Development. The results of these ERM studies and assessments have been integrated into the appropriate points of this document.

In conducting this assessment, other project-specific documentation and studies have also been reviewed and cross-referenced, and these have been included in the relevant parts of this report.

### 3.0 *PROJECT DESCRIPTION AND OVERVIEW*

#### 3.1 *PROJECT DESCRIPTION*

The Tamar Project, which is subject to this OPIC application, comprises three principal components, namely:

- The existing offshore components;
- The existing onshore components; and
- The options for future expansion.

##### 3.1.1 *Existing Offshore Components*

The current offshore operations comprise the following, which are also illustrated in Figure 1:

- The Tamar platforms including associated pipelines for gas injection, condensate injection and connections to the Ashdod Onshore Terminal (AOT) onshore; and
- Five subsea wells and associated umbilicals and flowlines.

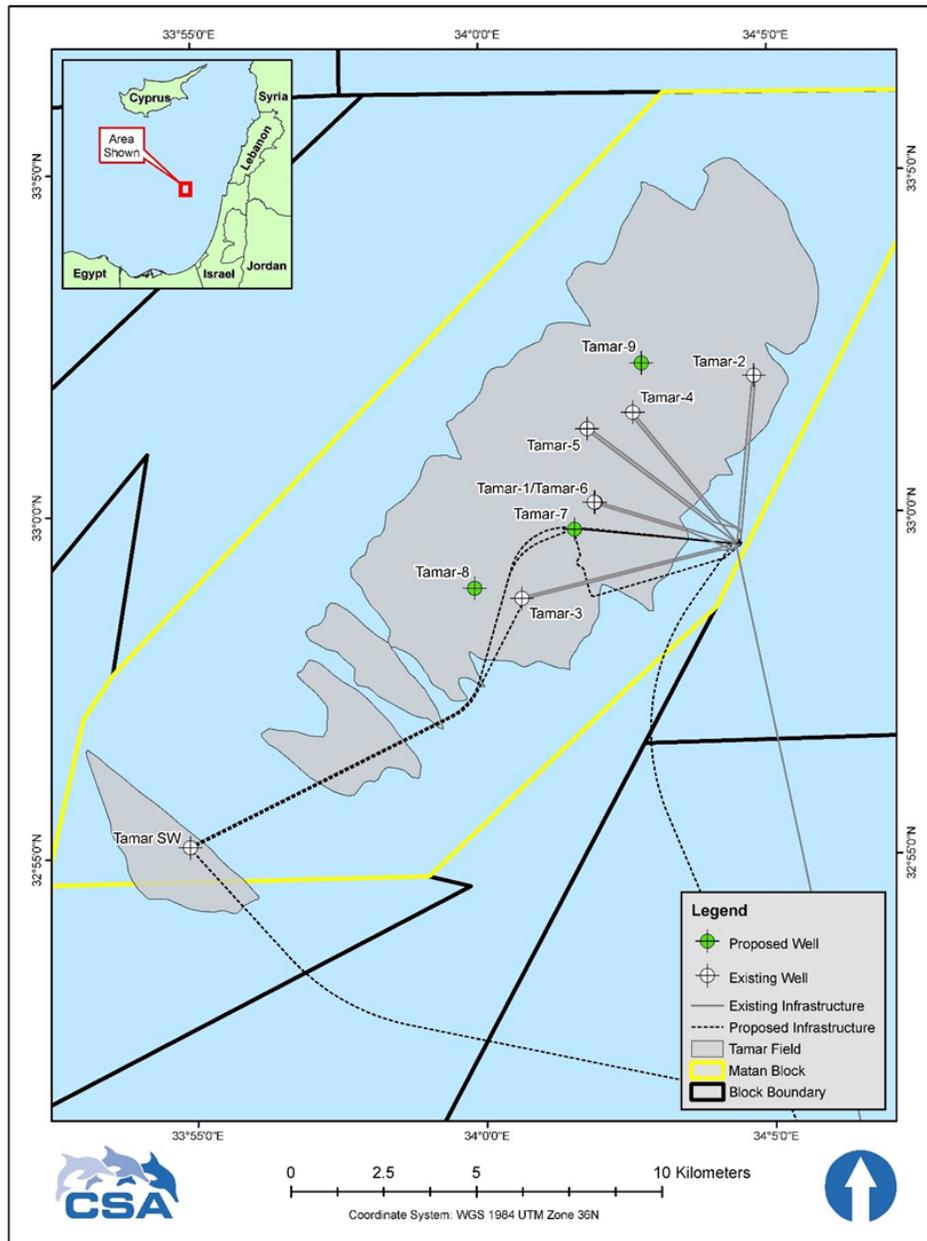
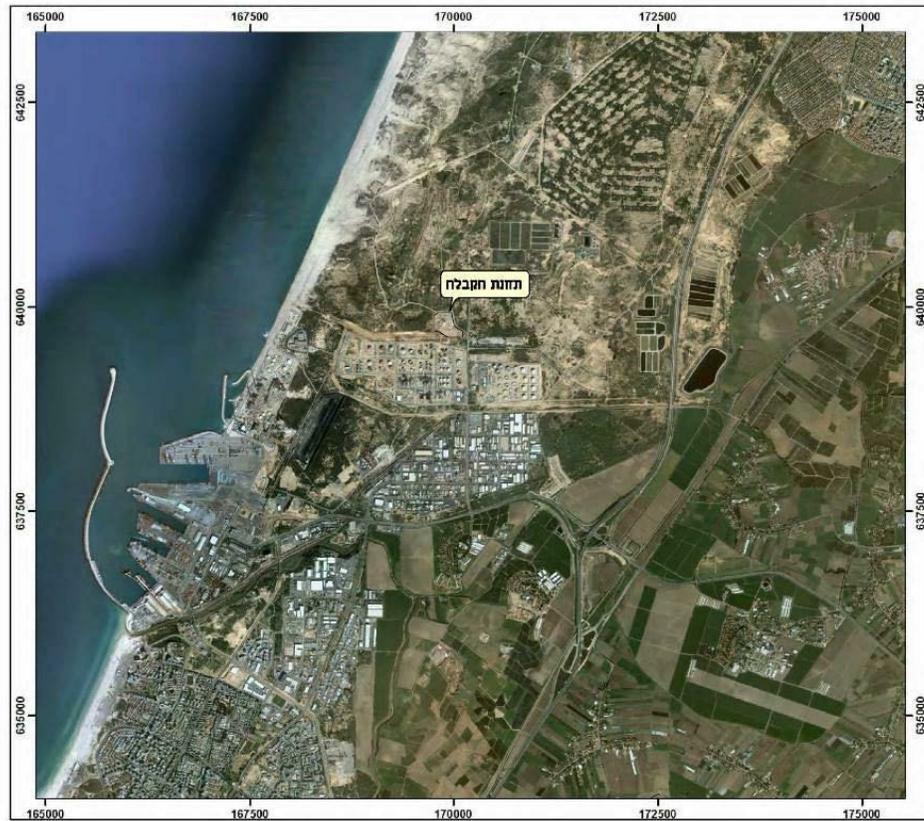


Figure 1 Tamar Offshore Gas Fields

### 3.1.2 Existing Onshore Components

The current onshore operations comprise the AOT which is located in an industrial zone designated by the local Israeli authorities primarily for use by the oil and gas and chemical industries. Within this industrial zone, the AOT facility is located north of the Paz refinery of Ashdod (which is independently owned by non-affiliates). Other industries in the immediate vicinity to the north and east of the facility are a water treatment plant, driving school and a fuel terminal. Open areas within this zone tend to be disturbed ground. Figure 2 shows the location of the AOT.



**Figure 2 Ashdod Industrial Area with indication of the AOT (Source: NEML)**

The current AOT terminal provides slug control, liquid handling, hydrocarbon dew-point control, metering, and pressure and flow control of the gas produced from the Mari-B and Tamar Platforms. Processed gas is delivered to the AOT via hot tap into the existing 30-inch pipeline for gas sales into the Israel Natural Gas Line (INGL) system.

The AOT discharges gas to the INGL Receiving Terminal located adjacent to it. The primary purpose of the AOT is to meter the gas volume and control the flow rates of the gas being sold. A Joule Thompson (JT) dew-point control system is used to reduce the hydrocarbon dew-point of the sales gas. To ensure a high level of reliability, full process redundancy and a double block and bleed philosophy is incorporated in the design where practical.

### **3.1.3 Potential Future Development Options**

The currently undeveloped Tamar Southwest Field is a separate reservoir close to the Tamar Field, but is included for the most part under the same lease for development and exploitation which governs the Tamar Field. Subject to achieving, inter alia, satisfactory commercial arrangements, necessary joint venture partners' investment approvals, and regulatory certainty over investment, the Tamar Partners are planning to undertake an expansion of the Tamar Project. The planned expansion is to meet the

growth in domestic Israeli demand, maintain operational reliability to satisfy their commercial commitments, and potentially service export markets, and also contemplates future drilling of additional wells.

The Tamar Expansion has three components:

1. installing compression, currently under construction, at the onshore gas terminal at the AOT facility (AOT Compression) which, without any additional upstream debottlenecking, will increase peak throughput capacity of Tamar infrastructure to 1.2 Bscf/d;
2. develop the adjoining Tamar Southwest field (700 Bcf) by completing the existing Tamar SW-1 discovery well, as well as the subsea tie-back of this well into existing Tamar infrastructure and installing subsea infrastructure to support a future tie-in for the Tamar-7 well; and
3. planned future drilling and completion of Tamar wells 7, 8 & 9 and connecting them with the existing Tamar subsea infrastructure by installing additional required infield flow-lines and umbilicals (see Figure 1). Tamar SW-1 will initially provide an increase in field production capacity, and well redundancy to the overall Tamar project.

Subject to receiving the necessary export permits, the Tamar Partners also have an existing contract to export gas from the Tamar Field to Arab Potash Company ("APC) and Jordan Bromine Company ("JBC") in Jordan. The gas sales are effectuated through long-term Gas Sales and Purchase Agreement(s) ("GSPA") between APC/JBC and NBL Eastern Mediterranean Marketing Company ("MarketCo" a wholly owned Noble subsidiary) on the one hand and a back-to-back GSPA between Tamar Partners and MarketCo on the other hand. In order to deliver gas to APC/JBC, a 15.5 km., 12" pipeline has to be built to connect the existing Israel Natural Gas Limited ("INGL") gas grid to the APC/JBC delivery point on the Israel/Jordan border. This 15.5 km. pipeline spur is to be built, owned and operated by INGL. An additional 35 km., 12" pipeline will be required to be built from the delivery point on the Israel/Jordan border to APC/JBC's facilities. To our knowledge, Tractebel Engineering Services ("Tractebel") have been retained by APC & JBC to build this pipeline.

Subject to, among other conditions precedent, receiving necessary regulatory authorizations (including an export permit in Israel), and signing of necessary transportation agreements, the Tamar Partners have executed a GSPA with Dolphinus Holdings Ltd. ("Dolphinus") for exporting gas to Dolphinus' customers in Egypt. The Tamar Partners have no daily firm commitment to supply gas, but have a total quantity commitment over a period of 3 years. The Tamar Partners will be responsible for transporting gas from their terminal at Ashdod, over the existing INGL grid to Ashkelon, where INGL grid interconnects with the existing EMG Pipeline (the

“Delivery Point”). The EMG Pipeline is owned by the Eastern Mediterranean Gas Company, S.A.E. (“EMG”). Dolphinus is responsible for transporting the gas on the EMG pipeline that goes from Ashkelon to El-Arish in Egypt where it interconnects into the Egyptian pipeline system.

### 3.1.4 *Associated Facilities*

The main potential Associated Facility is the Jordan pipeline described above. Further details are provided in *Annex 1*, and it is important to mention that this pipeline’s construction and permitting will be done by a third party not associated with NEML.

## 3.2 *MANAGEMENT OVERVIEW*

Recognizing the status of the Tamar project, which includes both existing and potential future expansion components; this section provides an overview of key NEML management approaches linked to the project with respect to pertinent environmental and social considerations. These represent cross-cutting commitments that apply across both the onshore and offshore components of the project.

### 3.2.1 *Policy and Management*

The Tamar Project, both existing operations and new development, are and will be undertaken, in accordance with NEML’s Environment, Health and Safety (EHS) Policy with complete expectations, commitments, roles, and accountability, as defined in NEML’s Global Management System (GMS – see *Annex 2* for an overview of the GMS). NEML’s Corporate Social Responsibility (CSR) Policy documents its commitments to protecting the health and well-being of communities, promoting respect for human rights, and abiding by the ILO’s Fundamental Principles and Rights at Work.

NEML has a risk mapping system under the GMS. A Safety and Environmental Management System (SEMS) is under development for the NEML operations to comply with best industry practice as well as to meet regulatory requirements. The SEMS will be part of an Operations Management System that will incorporate elements of Noble’s occupational safety and health systems as well as an Environmental Management System. Social and health related management and monitoring as it pertains to OHS is also covered under the aforementioned systems and plans, and NEML also operates a Safety Plan across its operations which aligns with Israeli requirements and international standards.

Further details on management and mitigation measures to be implemented are detailed in *Section 8.0*.

### 3.2.2 *Organizational Capacity*

The Project has a clear organizational capacity chart which discusses roles and responsibilities to manage environmental, safety and social aspects. NEML also has a documented management of change program.

### 3.2.3 *Stakeholder Engagement*

NEML is committed to establishing and maintaining transparent, respectful, and regular engagement practices to ensure that stakeholder concerns and interests are fully understood and managed. These practices are above and beyond the engagement activities managed by Israeli government agencies as a part of the permitting processes. NEML's Stakeholder Engagement Plan (SEP, see *Annex 3*) takes into consideration environmental and social impacts (for more detail, please also see Sections 5.5 and 6.2).

NEML has staff dedicated to community relations activities. This staff assisted with a December 2014 visit to the Tamar Platform for the Haifa district licensing authority, the Ministry of Energy and Water Resources and the Ministry of Environmental Protection in order to introduce offshore project components to national and regional government officials.

In addition, operations staff at the AOT engages with other businesses within the industrial park (the Project's area of influence) which are the primary stakeholders, including Paz Oil, INGL and the Ministry of Defense. NEML also engages with the local emergency services and conducts regular emergency drills in cooperation with local authorities and industrial park neighbors.

### 3.2.4 *Consultation and Disclosure*

Consultation and disclosure was conducted by the Government of Israel as part of the TAMA process, which is relevant for the AOT and nearshore components. Ongoing consultation occurs at the AOT by NEML with industrial park neighbors, primarily as it pertains to emergency and safety procedures and drills. Ongoing disclosure to affected sea users as it pertains to safety and buffer zones continues by the Israeli government for the offshore components of the Project.

### 3.2.5 *Grievance Mechanism*

A structured grievance mechanism (referred to as a community feedback mechanism) that provides opportunities for the receipt, investigation, and resolution of complaints is under development. For employees and contractors, NEML has a global workers' grievance mechanism (Noble Talk) for the review and resolution of concerns submitted from workers.

### *Labor and Working Conditions*

The Project implements NEML's corporate and national policies and procedures. NEML has experience with projects of this size, and these policies suit the Project's size and workforce.

The Israel Employee Policy Manual outlines employee rights under national labor and employment law, including their rights related to hours of work, wages, overtime, compensation, and benefits upon beginning the working relationship and when any material changes occur. Israeli laws regarding workforce protection (workers' rights to form and join workers' organizations of their choosing without interference), to which NEML complies, are extremely stringent.

#### **3.2.6** *Occupational Health and Safety (OHS)*

NEML has confirmed that the company is compliant with Israeli standards of the newly adopted Safety Management Plan Regulations (2013), which incorporates risk management as well as ALARP principles, OSHAS 18001, and other components of OSHA, as discussed above. The company operates under a Safety Plan (SMS), prepared as a result of the aforesaid regulations, and integrating it into the ESMS overarching program. Additionally, a Safety and Environmental Management System (SEMS) adhering to regulations established in the U.S. under 30CFR250 Subpart S is a condition of Noble's operating licenses in Israel and is being implemented to further manage operations.

NEML's four tiered approach to health and safety policies includes: a) Safe Work and Operating Practices, b) Emergency Preparedness and Community Awareness, c) Safety and Environmental Training, and d) Contractor Safety Management.

#### **3.2.7** *Workers Engaged by Third Parties*

NEML has committed to conducting environmental and social due diligence on contractors selected to support the development of the Project. NEML provides information on its environmental and social requirements to all companies invited to tender for construction and installation contracts. This includes existing contractors currently under an International Master Services Agreement with NEML.

## 4.0 LEGISLATIVE FRAMEWORK

### 4.1 TAMA

A TAMA (Hebrew acronym for "Tochnit Mit'ar Artzit") is a "National Outline Plan" created by the National Planning Committee (NPC) by virtue of the Planning and Building Law, and approved by the Government. Typically a "National Outline Plan" determines the planning of the national area under evaluation including topics such as:

- Zoning and land use.
- Selection of industrial areas.
- Sketching network of necessary main roads, lines of railroads, supply lines, power grid, etc.
- Provisions on land conservation and for maintaining the ancient holy sites, landscape, etc.

TAMAs are divided into thematic plans (dedicated to each sector like transportation, natural gas, etc.) and integrated plans which cover a number of areas (e.g. TAMA 35 which is a comprehensive plan for development and conservation). The National Planning Committee (NPC) has developed a series of TAMAs. TAMA 37 is the "National Outline Plan for the Natural Gas Transmission System in Israel". TAMA 37 was created in 2001 and is the "master plan" for promoting Israel's natural gas infrastructure, mainly the transmission system. Under TAMA 37, several additional detailed TAMAs were approved, covering separate geographic regions of the country related to different purposes. For example, TAMA 37/A/1 covers the onshore transmission pipelines in the southern part of the country; TAMA 37/B covers the onshore transmission pipelines in the northern part of the country; TAMA 37/A /2 covers the offshore transmission pipelines and reception terminals; TAMA 37/A /2(1) covers the offshore pipeline that connects the Mari-B site (from the territorial waters boundary) to the shore.

When NEML entered the country and began operations in 2004 at Mari B, the TAMA 37 process had already been initiated. The following TAMAs were approved prior to Noble beginning operations and are still relevant to the Tamar Project:

- TAMA 37/A/2 - allocated land for offshore natural gas transmission pipeline; approved May 2003.
- TAMA 37/A/2(1) - allocated land from territorial water boundary out to offshore facilities; approved June 2003.
- TAMA 37/A/2(2) - determined optimal location for onshore terminal (Ashdod) and pipeline; approved May 2004.

The Tamar project components spread across several legal jurisdictions as follows:

- Israeli law on land and in territorial waters up to 12 nautical miles offshore. This comprises a strong legal framework for environmental management, and relevant components are referenced throughout this document. As a result, it ensures a robust permitting system associated with air and water discharges and hazardous waste handling and disposal. Activities involving these functions are regulated through air, water discharge, and toxin permits that are issued for individual facilities;
- The Project falls within the typical 200 miles of an Exclusive Economic Zone (EEZ) which is defined by the United Nations Convention on the Law of the Sea as an area over which a state has special rights regarding the exploration and use of marine resources. Many of the proposed Project components are located outside Israel's territorial waters but within its EEZ. Although Israel does not have an EEZ law yet (it is currently under legislative process) NEML respects Israeli Law (such as Labor Law or Environmental Law) across all of its facilities. The environmental requirements for the offshore facilities are prescribed in NEML's licenses and leases with the Israeli government; and
- International requirements for offshore waters (beyond 12 miles) i.e. International Maritime Organization Convention for the Prevention of Pollution from Ships [MARPOL (73/78)] and Israeli regulations in line with Barcelona Convention for the Protection of Mediterranean Sea from Pollution.

Additional details pertaining to compliance for specific offshore and onshore project components can be found in Sections 5 and 6, respectively.

In addition, NEML has a broad commitment to align with international lender standards and in particular the IFC Performance Standards and associated guidelines, namely the World Bank Group Environmental Health & Safety (EHS) General Guidelines (2007) and the IFC Sector Specific Guidelines: World Bank EHS Guidelines for Offshore and Onshore Oil and Gas Development.

## 5.0 OFFSHORE ENVIRONMENTAL AND SOCIAL BASELINE AND IMPACTS

This section provides a description of the existing environmental and social characteristics of the offshore project area and the key impacts for the project's offshore components. It comprises a combination of reference to environmental studies and impact assessments prepared by others and also assessment prepared by ERM.

### 5.1 EXISTING PROJECT COMPLIANCE

For existing offshore project components, the Project applies Israeli pollution prevention regulations to components within 12 nautical miles of the coast and existing international conventions and protocols and Israeli regulations in line with Barcelona Convention for the Protection of Mediterranean Sea from Pollution for managing, minimizing and monitoring environmental risks.

An environmental monitoring plan for NEML's offshore activities is dictated from three main regulatory frameworks:

- (i) Discharge permits - The two platforms are subject to discharge permits granted by the MoEP. Among other requirements the permit list a monitoring plan. The monitoring plan lays out two levels of monitoring. First level is the ongoing monitoring of discharge streams. The monitoring results are reported to the MoEP on a monthly basis. Second level is an annual environmental monitoring survey, for chemical and biological parameters as dictated by the MoEP.
- (ii) Lease requirements - All activities are subject to compliance with the lease requirements. The Tamar lease indicates environmental-related requirements including monitoring requirements.
- (iii) Environmental Impact Assessment (EIA) - As part of the project planning phase, an EIA is prepared.

Further compliance considerations for the existing offshore operations are described below.

#### 5.1.1 Emissions and Discharges

Air Emissions: NEML reports emissions for 120 pollutants as required by Israeli regulators through the Annual Pollution Release and Transfer Register (PRTR). Links to the PRTR page are through the MoEP website

and the following link provides site specific information about the NEML offshore operations, including location of the facilities, quantities of polluting emissions (in Kg/year) and measuring methods, transfer of wastes (tons/year), transfer of hazardous substances (tons/year):

[http://www.sviva.gov.il/PRTRIsrael/Pages/ParitMifal.aspx?LPF=Search&WebId=cf6f4651-da33-45df-8e4a-fbbd2d018f7d&ListID=15493390-47dc-4181-9c9d-76c1e8a668d6&ItemID=13374&FieldID=MafteachDivuach\\_GxS\\_Text](http://www.sviva.gov.il/PRTRIsrael/Pages/ParitMifal.aspx?LPF=Search&WebId=cf6f4651-da33-45df-8e4a-fbbd2d018f7d&ListID=15493390-47dc-4181-9c9d-76c1e8a668d6&ItemID=13374&FieldID=MafteachDivuach_GxS_Text)

During equipment selection, best available technologies (BAT), reducing exhaust gas emissions, were considered as feasible for offshore construction and operation activities including exhaust gases. Additionally, low sulfur fuels will be utilized where possible, and NEML does not have H<sub>2</sub>S in its gas. Further details on air emissions are contained in *Annex 4*, which includes the Air Permit Application Summary, the AOT Toxin Permit 2014-15 and the Emissions Permit Final.

Greenhouse Gases: NEML reports its annual greenhouse gases (GHG) emissions through its Sustainability Report and also its annual Carbon Disclosure Project (CDP) submission. Mitigations to minimize GHG emissions from construction vessels, flaring and operation of the platform and AOT gas turbines include maintenance of vessels and equipment and standard operating procedures (SOP). NEML has estimated GHG emissions for all project components associated with the Tamar project. The offshore existing scope 1 GHG emissions for calendar year 2013 (2014 data is being verified and will be released shortly) are 92,995 tCO<sub>2</sub>e.

NEML currently, and will for future developments, conduct flaring and venting consistent with the Global Gas Flaring and Venting Reduction Voluntary Standard. Flaring only occurs during the period of a well test over a maximum period of two to three days during drilling. Flaring during well testing will not be continuous and will not occur in an environmentally sensitive area. If undertaken, the emissions from a well test will depend on the flow rate and gas/liquid hydrocarbon/water ratio for each well tested.

Fugitive emissions from the diesel internal combustion engines undergo routine maintenance and monitoring to maintain their efficiency. Mitigation measures are and will continue to be implemented to reduce the emissions of GHGs including maintenance of vessels and equipment and standard operating procedures.

Wastewaters: All aspects related to wastewater discharges for offshore activities (drilling and the platform) are detailed in the 2015 Tamar EIA. The Tamar Platform is equipped with all ancillary systems including produced water equipment processing. Offshore discharges are regulated under a Discharge Permit issued by the Ministry of Environmental Protection. These are based on Gulf of Mexico, OSPAR, and/or Israeli requirements.

The type and quantity of discharge of hydrotest water associated with testing flow lines of the Tamar Field are also discussed in the 2015 Tamar EIA, which delineates the estimated plume at two separate locations in the event a subsea discharge is required. Noble conducted a study of various options for the hydrotesting operation to be conducted during commissioning. The proposed alternatives all included discharging the hydrotest fluids subsea. For the 2013 Tamar Field Development Project, hydrotesting of pipelines, chemical lines, and utility lines was conducted prior to start-up. Noble Energy utilized fresh seawater for hydrotesting (i.e., with no treatment chemicals); hydrotest water was discharged back to the ocean upon completion of testing. For the proposed Tamar expansion options, hydrotesting of the proposed flow lines will be required. A CaCl<sub>2</sub> brine with a density of 1,270 kg/m<sup>3</sup> will be used, and the brine will be discharged subsea. The discharge of the hydrotest fluids will be short term but will result in high levels of salts and MonoEthylene Glycol (MEG).

Cooling water discharge effluent would result in a maximum temperature increase of 3 degrees Celsius at the end of the zone where mixing and dilution take place within 100 m of the discharge source. The use and management of cooling water is discussed in the 2015 EIA. On previously drilled wells, cooling water discharge was separate from other waste streams, but was mingled with the discharge of drilling muds and cuttings; these discharges were released 14 m below the sea surface through 14-in., 16-in., and 18-in. discharge lines. NEML do not have large amounts of cooling water. A smaller system that supports the jockey pump meets the requirement. Hypochlorite is used for preventative maintenance of cooling water systems to prevent marine fouling.

Desalination brine is produced from reverse osmosis units which produce freshwater from seawater for various domestic uses. The brine, which will have a salinity approximately twice that of seawater, will have minimal to no impacts when discharged to the environment. These discharges will meet MARPOL and Barcelona Convention requirements and are expected to dilute rapidly in the open ocean.

Other processed offshore wastewater discharges are discussed in the 2012 EIA and 2015 Tamar EIA. These discharges are managed and discharged in accordance with MARPOL and Barcelona Convention requirements, as applicable, and are in accordance with a discharge permit issued by the Ministry of Environment. Specifically, sewage water is treated in a sewage treatment plant prior to discharge. Gray water is discharged without treatment. Food wastes are macerated to pass through a 25-mm mesh. Drainage from machinery areas pass through an oil-water separator prior to discharge or retained on board to be disposed of on-shore. Measures are taken to prevent discharge of free oil in deck drainage that would cause a film on the surface water or emulsion beneath the surface of the water.

Additional miscellaneous discharges such as uncontaminated freshwater and seawater used for ballast water, and fire test water meet MARPOL and Barcelona Convention requirements.

To date, there has been no evidence of Naturally Occurring Radioactive Materials in NEML's produced waters including at the Mari B platform which started producing in 2003. NEML has procedures for checking on Naturally Occurring Radioactive Material (NORM) in equipment used on the platforms.

### 5.1.2 *Occupational Health and Safety*

Specific details as it pertains to monitoring for Occupational Health and Safety is included in the Safety Plan. Real time tracking of OHS objectives are implemented with regular reports provided to management to monitor health and safety performance and accomplishments. The Safety Plan is a requirement of the Ministry of Energy and the Ministry of Economy.

Structural safety of the drilling rig, pipeline and all associated facilities has been undertaken in their design. NEML ensures that occupational health and safety for direct hire and subcontractor personnel throughout all Project phases is managed in accordance with the appropriate US Gulf of Mexico requirements, namely OSHA Regulations pertinent to the offshore Oil and Gas industry.

Hazardous materials are handled according to their Material Safety Data Sheet (MSDS) to ensure worker health and safety.

There is a 500 meter radius buffer zone enacted where all ship traffic including fishing vessels will not be permitted near the rig. Support vessels will be deployed to ensure that no vessels enter the buffer zone. As contingency, emergency procedures have been established for the collision or interference by vessels. The actions to prevent collisions include attempts to contact vessel by audio and visual signals and warn the vessel of any infringement.

### 5.1.3 *Emergency Response*

NEML has an Emergency Management Plan (EMP, see *Annex 5*) which includes various elements to establish procedures to how the company responds to accidents and emergency situations. The EMP established the structure and the roles and responsibilities of the NEML Incident Management Team which provides the response actions to accidents and emergencies. The EMP is supplemented by annexes which include, among others, an Oil Spill Response Plan, Facility Emergency Plans, Mass Casualty Plan, Fatality Management Plan, Security Emergency Management Plan,

and a Medical Evacuation Plan. Currently, these documents are in revision to update the plans to account for the commissioning of the compression project.

The rig emergency response manual has information regarding fire and explosion actions. The Project adheres to international OHS and emergency protocols for offshore drilling. All of NEML's operating platforms air quality settings per established standards. The gas alarm and trip settings are provided in the EIA. As detailed in Section 8.2 and *Annex 5*, NEML operates a robust emergency management plan.

The EIA confirms installation of a blowout preventer (BOP) and a riser from the wellbore to the drilling rig, enabling repeated use of drilling mud. All well control equipment is tested.

#### 5.1.4 *Environmental Monitoring*

NEML will conduct environmental monitoring in accordance with discharge permits in accordance with monitoring plans established in conjunction with the Ministry of Environment. Monitoring will occur frequently (i.e. daily for fuel use, discharge etc.) and be analyzed to ensure that the practices meet operating standards and to determine corrective actions if needed.

Discharge water quality is dependent on the type of waste water (i.e. produced water, cooling water, brine etc.). Wastewater discharges will be monitored in accordance with international protocols and according to requirements in discharge permits issued by the Ministry of Environment. As stated in the 2012 EIA, the Israeli government is currently in the process of developing guidelines for baseline surveys and monitoring requirements for deep water offshore oil and gas development in Israel's EEZ and NEML is committed to comply with these requirements as soon as they are approved by the Israeli government.

## 5.2 *POTENTIAL EXPANSION PROJECT*

Section 5.1 has provided an overview of existing compliance for the offshore facilities. The following sections (5.3 to 5.6) provide a summary and discussion of the potential offshore expansion options for the Tamar project with respect to biological, physical, social and cultural resources.

The offshore components and pipeline routes were selected to avoid obstacles and significant biological communities and/or cultural resources. Protection of these resources was assured through geohazard surveys and an offshore sampling and ROV survey conducted along the pipeline routes.

Specific to emission and discharge regulations for offshore activities, NEML, through discussions with the Petroleum Commissioner of the Israel Ministry of National Infrastructure, agreed that the design of new facilities shall meet US Gulf of Mexico coastal and offshore air emissions and water discharge regulations or applicable International and Israeli regulations during the commissioning and operation of the Project.

The most comprehensive analysis of baseline conditions across the Tamar Field can be found in the 2015 Tamar EIA. This document incorporates the development area around Tamar SW-1 and the Tamar Reservoir and represents the most comprehensive review of the conditions in the Tamar Field and the potential impacts. The majority of the biological, physical and cultural heritage resource data presented in the document was collected through desktop and field surveys.

This 2015 Tamar EIA presents a summary of the regional environment, including environmental studies that have been performed for the Tamar Field, and assesses the potential impacts that could result from the proposed Tamar Field Development Project. The document represents the most complete review to date of the conditions in the field and the potential impacts. Previous activities and studies completed in the Tamar Field to date are reviewed and the results of completed monitoring throughout the field are presented. Additional, area specific information can also be found in the 2012 EIA and 2013 EA.

### 5.3 *BIOLOGICAL RESOURCES BASELINE AND IMPACT ASSESSMENT*

#### *Biological Resources Baseline*

The 2015 Tamar EIA presents the results of desktop and field surveys conducted to collect baseline data on the following biological receptors:

- Plankton;
- Benthic Communities;
- Continental Slope and Deep-sea Habitats;
- Chemosynthetic Communities;
- Fish and Other Nekton;
- Pelagic Fishes;
- Demersal Fishes;
- Marine Mammals;
- Sea Turtles; and
- Sea and Migratory Birds

Key baseline findings for biological resources are summarized below with text from the 2015 Tamar EIA in italics.

### Benthic Communities

In total, 667 individual organisms were collected during the 2013 and 2014 surveys of the Tamar Field. The taxonomic listing of infauna within the Tamar Field is provided in the 2015 Tamar EIA. The most relevant finding of the benthic community baseline were as follows:

*Species richness throughout the field was low ranging from 1 to 10 species for most samples. Given the low species richness, it is not surprising that Pielou's evenness was high and species diversity was moderate throughout the region. There is no apparent pattern to organism abundance, composition, or diversity with existing infrastructure within the field.*

### Fish and Other Nekton

The site-specific surveys in the Tamar Field indicate the presence of several demersal fish species. For example, the most common fish species observed during the July 2012 Environmental Baseline Survey at the Tamar SW-1 drillsite were tripod fish (*Bathypterois* sp.) and halosaurs (*Halosaurus* sp.).

### Marine Mammals

The 2015 Tamar EIA presents data based on regional sightings and strandings data for marine mammals in the Mediterranean Sea were reviewed and summarized in the document.

### Sea Turtles

The 2015 Tamar EIA presents the results of tracking studies that indicate three species of sea turtles could occur in the area, the green turtle (*Chelonia mydas*), leatherback turtle (*Dermochelys coriacea*), and loggerhead turtle (*Caretta caretta*). The IUCN (2014) lists loggerhead and green turtles as endangered, and the leatherback turtle as vulnerable.

### Sea and Migratory Birds

The 2015 Tamar EIA states that the avifauna within the Tamar Lease development area is likely to consist mainly of pelagic seabirds – those that spend most of their life cycle in the marine environment, often far offshore over the open ocean. The document notes that the Mediterranean is home to several hundred bird species, many of which could occur in the area, including:

- At least 38 seabird species are native to Israeli waters, including 36 seabird species listed by BirdLife International (2014a) and 2 other

species based on additional information (International Union for Conservation of Nature, 2014; Palomares and Pauly, 2014).

- Two of the seabirds in the area are vulnerable according to the IUCN (2014) Red List: the Levantine Shearwater and the Dalmatian Pelican (*Pelecanus crispus*).
- Several of the pelagic seabird species are listed in Annex II of the Protocol Concerning Specially Protected Areas and Biological Diversity of the Mediterranean (United Nations Environment Programme, 2013) as endangered or threatened avifauna of the Mediterranean region.
- BirdLife International (2014b) lists 315 migratory bird species as occurring in Israel. Of these, species listed by the IUCN (2014) as endangered, critically endangered, or vulnerable.

### 5.3.1 *Biological Resources Impact Assessment*

The 2015 Tamar EIA assesses potential impacts due to routine and non-routine events. The methodology used to assess impact magnitude and significance are presented in Chapter 4, Section 4.1.1 of the 2015 Tamar EIA. The information provided in this section presents the impact assessment for routine events and Project development. A detailed assessment of potential impacts from non-routine events can be found in Chapter 4.3 of Tamar Lease Development EIA, parts 1 and 2.

The significance of potential impacts to the biological receptors identified during the biological resources baseline surveys are summarized below with text from the 2015 Tamar EIA in italics.

#### Plankton, Fish, and Fishery Resources

The 2015 Tamar EIA identified the following potential sources of impacts to plankton, fish, and fishery resources:

- Drilling (including the release/ discharge of drill muds and cuttings);
- Physical presence of Project infrastructure;
- Routine discharges; and
- Installation activities.

Potential drilling impacts were assessed as follows:

*Given the localized nature of this impact, the rapid dispersion of the discharges, and the low toxicity of the discharges in the water column, overall impact significance of drilling from previous and planned Tamar lease area projects is anticipated to be negligible. No cumulative impacts are expected on plankton, fish, and fishery*

*resources due to drilling as the drilling periods have been spaced out over a period of months to years as well as being spaced out geographically.*

Potential impacts from the physical presence were assessed as follows:

*The presence of the drillship will attract fishes, providing shelter and food in the form of attached fouling biota (Galloway and Lewbel, 1982). Offshore structures typically attract epipelagic fishes such as tunas, dolphin, billfishes, and jacks (Holland et al., 1990; Higashi, 1994). This “artificial reef effect” generally is considered a beneficial impact. While the impact, either positive or negative, is likely to occur, overall impact significance is negligible.*

Potential impacts from the physical presence of routine discharges were assessed as follows:

*Due to rapid dilution and the location of the discharge plume, the impact of routine discharges on plankton and fish is anticipated to be negligible. Given the likely, but localized nature of this impact, overall impact significance is anticipated to be low for the proposed drilling operations as well as for the cumulative impacts of Tamar Field activities.*

Potential impacts from installation activities were assessed as follows:

*Routine and miscellaneous discharges typically occur from numerous sources on project vessels. . . These discharges must meet MARPOL [International Convention for the Prevention of Pollution from Ships] and Barcelona Convention requirements and are expected to dilute rapidly in the open ocean. Impacts on water quality likely would be undetectable beyond tens of meters from the source. The potential for impacts on plankton, fish, and fishery resources is negligible. Pipeline, MEG [monoethylene glycol] line, and utility line testing may result in the discharge of varying quantities of untreated seawater, with no impacts to near-surface water quality. The potential for impacts on plankton, fish, and fishery resources is negligible.*

*Due to the nature of routine discharges and their dilution in the receiving environment, impacts to plankton, fish, and fishery resources are expected to be minor. Given the likely nature of this impact, overall impact significance is low.*

### Benthic Communities

The 2015 Tamar EIA identified the following potential sources of impacts to benthic communities:

- Drilling (including the release/ discharge of drill muds and cuttings);
- Solid waste (drilling and infrastructure activities);
- Installation activities; and
- Infrastructure physical presence.

Potential drilling impacts were assessed as follows:

*Due to the low density of benthic infauna, the distance between wells, and the relatively small size of the impacted area relative to the Tamar lease area, the cumulative impact significance of drilling discharges on benthic communities is considered to be low.*

*Due to the low density of benthic infauna, the distance between wells, and the relatively small size of the impacted area relative to the Tamar lease area, the cumulative impact significance of drilling discharges on benthic communities is considered to be low.*

Potential impacts from solid waste were assessed as follows:

*Due to restrictions on dumping and expected adherence to applicable MARPOL provisions, this impact is anticipated to be minor. Given the nature of this impact, overall impact significance for individual wells as well as cumulatively is anticipated to be low.*

Potential impacts from installation activities were assessed as follows:

*Emplacement of the pipelines, MEG lines, control lines, and utility lines will disturb surficial sediments, causing increased localized turbidity, possible mobilization, transport of sediment-associated contaminants, and crushing and/or burial of benthic communities near the pipeline corridor. Impacts on benthic communities are expected to be minor. Given the occasional nature of this impact, overall impact significance is low. . . it is not expected that an MEG release will result in significant impacts on the biota. As a result, the overall impact significance of installation activities on benthic communities is negligible.*

Potential impacts were assessed from infrastructure physical presence were assessed as follows:

*The pipelines, umbilicals, and potentially the matting used to support them will cover benthic organisms and smother them. The presence of these hard substances (pipe) on the seafloor will serve as a substrate for additional benthic community development. Due to the limited area to be occupied by the benthic infrastructure, overall impact significance is low.*

### Marine Mammals and Sea Turtles

The 2015 Tamar EIA identified the following potential sources of impacts to marine mammals and sea turtle:

- Drillship arrival, departure, and station keeping;
- Noise (drilling and installation);
- Installation vessel arrival, operation, and departure;

- Support vessel traffic; and
- Helicopter traffic.

Potential impacts from drillship arrival, departure, and station keeping were assessed as follows:

*There is the potential for disturbance of marine mammals and sea turtles during transit of the drilling unit. The disturbance impacts would be similar to those associated with existing vessel traffic in the region. The risk of a vessel strike is considered low because of the limited amount of vessel movement and the slow speed at which the vessels will be moving, resulting in a negligible overall impact significance.*

Potential impacts from noise were assessed as follows:

*The drilling unit will only be on site for a relatively short period of time (i.e., several months), limiting the potential for noise exposure. Due to the duration of drilling operations, when coupled with the nature of the drilling program-related sound sources, the impact significance of noise on marine mammals and sea turtles is anticipated to be low.*

*Tamar drilling operations are not performed simultaneously. As a result, cumulative impacts are not considered to be different than impacts from a single drilling operation. While drilling could be occurring in neighboring lease areas, the distance between lease areas and the limited noise generated would not alter the minimal impacts on marine mammals and sea turtles from noise associated with drilling.*

Potential impacts from installation vessel arrival, operation, and departure were assessed as follows:

*There is potential for disturbance of marine mammals and sea turtles during transit of the installation vessel. The disturbance impacts would be similar to those associated with existing vessel traffic in the region. The risk of a vessel strike is considered to be low because of the limited amount of vessel movement and the slow speed at which the vessels will be moving, resulting in negligible impact significance.*

Potential impacts from support vessel traffic were assessed as follows:

*Due to the short duration of the drilling program and the frequency of the support vessel traffic, the impact significance of support vessel impacts on sea turtles is considered negligible.*

Potential impacts from helicopter traffic were assessed as negligible.

## Marine and Coastal Birds

The 2015 Tamar EIA identified the following potential sources of impacts to marine and coastal birds:

- Physical presence;
- Lights;
- Installation activities; and
- Helicopter traffic.

Potential impacts from the physical presence of Project infrastructure were assessed as follows:

*Because of the limited scope and short duration of drilling activities proposed in this program, adverse effects on marine birds from rig presence are unlikely and the overall impact significance is negligible).*

Potential impacts from lights were assessed as follows:

*Because of the limited scope and short duration of drilling activities proposed in this program, adverse effects from lighting on marine birds are considered unlikely and the overall impact significance is negligible.*

Potential impacts from installation activities were assessed as follows:

*The support vessels will be transiting to and from the shore base, using the most direct route between the shore base and the drilling unit, weather permitting. Vessel traffic could disturb individuals or groups of coastal birds. It is likely that individual birds would experience, at most, a short-term behavioral disruption, resulting in a negligible overall impact significance.*

### 5.3.2 **Ecosystems Services**

In the performance of its EIAs, NEML conducts extensive environmental baseline surveys that involve sampling and analysis of water and sediment samples and collection of video data through use of an ROV. These surveys are performed to provide statistically valid data against which future changes in the environment can be evaluated. As shown in the 2012 EIA for the Tamar Platform development, NEML evaluated vulnerable resources dependent on the sea that included mariculture, shipping, fishing and tourism industries. These EIAs also look at valuable resources such as marine birds, marine mammals, cultural resources, sensitive habitats and marine parks and reserves, among others.

Ecosystem Services will likely not be significantly impacted by project activities. However, NEML is engaging in a critical habitat assessment and

subsequent monitoring of important ecoreceptors (as needed) which will consider cumulative impacts for the Tamar Field development.

#### 5.4

#### PHYSICAL RESOURCES BASELINE AND IMPACT ASSESSMENT

##### *Physical Resources Baseline*

The 2015 Tamar EIA presents the results of desktop and field conducted to collect baseline data on the following physical resource receptors:

- Seawater Quality
  - Total suspended solids;
  - Nutrients;
  - Ions;
  - Metals;
  - Hydrocarbons;
  - Radionuclides;
- Sediment Quality
  - Particle Size;
  - Total organic carbon;
  - Metals;
  - Hydrocarbons;
  - Radionuclides;
- Air Quality
- Acoustic Environment

Key baseline findings for physical resource are summarized below with text from the 2015 Tamar EIA in italics.

##### Seawater Quality-Total Suspended Solids (TSS)

TSS levels were slightly higher at measuring stations located within the field when compared to stations located at the field perimeter. However, all values were well below the Levantine Basin mean concentrations. This indicates that TSS concentrations within the Tamar Field are uniform geographically as well as temporally.

##### Seawater Quality -Nutrients

Seawater nutrient analysis consisted of total organic carbon (TOC), total nitrogen (TN), total phosphorus (TP), nitrite, nitrate, ammonium, and phosphate. Concentrations of all nutrients were well below the Levantine

Basin mean and the proposed Mediterranean Sea water quality standards in Israel (MEQS).

### Seawater Quality-Ions

Cation and anion concentrations were. The cation/anion balance for all water samples are within the acceptable  $\pm 5\%$  analytical difference for seawater samples. All ion concentrations were similar to worldwide and Mediterranean Sea means with the exception of sulfate, which was slightly elevated over Mediterranean Sea means at a few locations.

### Seawater Quality-Metals

The key seawater quality metals findings were as follows:

*All seawater total and dissolved metals concentrations were below Israel's MEQS, EUCEQS, and CCC reference values, indicating there are no seawater metals concentrations of concern within the region. Metals concentrations were also similar to concentrations reported elsewhere within the Levantine Basin. Similarity among surveys and locations indicates that metals concentrations, when detected, are bio-available dissolved fractions and that concentrations are uniform geographically as well as temporally within the Tamar Field.*

### Seawater Quality-Hydrocarbons

The key seawater quality hydrocarbons findings were as follows:

*Mean hydrocarbon concentrations for the March 2013 Tamar Field and Pipeline Survey and February 2014 Tamar Field Background Monitoring Survey are reported. During the March 2013 Survey, water samples were collected in close proximity (within 1 km) to existing infrastructure, while water samples collected during the February 2014 Survey generally were collected more than 5 km away from the existing infrastructure and on the perimeter of the reservoir (with the exception of station E11). It must be noted that TPH [total petroleum hydrocarbons] concentrations reported for the February 2014 Survey are extremely low and do not indicate a level of environmental concern. Mean PAH [polycyclic aromatic hydrocarbons] concentrations for both surveys were low and do not indicate any source of environmental concern.*

### Seawater Quality Radionuclides

The data collected during the two field surveys indicate that radium levels in seawater throughout the Tamar Field are extremely low and well below levels of concern.

### Sediment Quality-Total Organic Carbon (TOC)

Sediment TOC concentrations throughout the survey region were low and were within the 99% confidence limit (CL) of the mean for the field. Sediment TOC concentrations within the Tamar Field were also within the 99% CL of the mean TOC concentration of the Levantine Basin.

### Sediment Quality-Metals

The 2015 Tamar EIA document presents, high-resolution sediment metals concentrations (aluminum, antimony, arsenic, barium, beryllium, cadmium, chromium, copper, iron, lead, mercury, nickel, thallium, vanadium, and zinc) within the Tamar Field. The key findings of the baseline for sediment quality-metals are as follows:

*All sediment metals concentrations (with the exception barium, as described previously) were within the 99% CL of the Levantine Basin mean. Additionally, normalization of metals concentrations with sediment grain size, achieved by performing a regression of each metal against aluminum, also showed that metals concentrations in the Tamar Field were generally within the 99% prediction interval of the Levantine Basin.*

*Concentrations of all metals within the field and reservoir were below effects range low (ERL) and effects range median (ERM) values with the exception of arsenic, copper, and nickel. However, these three metals are naturally found in high concentrations throughout the Levantine Basin. Concentrations above the ERL should be considered ambient for arsenic and copper, and concentrations above the ERM should be considered ambient for nickel.*

### Sediment Quality -Hydrocarbons

The key sediment quality hydrocarbons findings were as follows:

*TPH concentrations throughout the survey area were generally within the 99% CL of the Tamar Field mean and the Levantine Basin mean, with the exception of grid cells surrounding the Tamar-1/Tamar-6 and Tamar SW-1 wellsites. Hydrocarbons were a minor component of the mud used to drill the Tamar wellsites, and slightly elevated levels of TPH at these locations may be indicative of minor impacts due to drilling and production activities. TPH concentrations throughout the field, even in the slightly elevated grid cells, are low and are at concentrations that do not pose a threat to the environment.*

### Sediment Quality -Radionuclides

The 2015 Tamar EIA states that all radionuclide values were within the 99% CL within the Levantine Basin.

## Air Quality

The 2015 Tamar EIA states that there are no publicly available air quality data for the offshore areas of Israel, nor are site-specific offshore air quality measurements available for the Tamar Field area. The document notes that air quality offshore likely reflects the long-range transport of natural and anthropogenic air pollutants from across the Eastern Mediterranean. However, the offshore environment of the Tamar Field is expected to have good air quality.

The Tamar offshore expansion one-off GHG emissions are estimated at 721,027 tCO<sub>2</sub>e, which represents a conservative estimate for the drilling, installation and testing of wells SW-1, 7, 8 and 9.

## Acoustic Environment

The underwater acoustic environment was characterized by the 2015 Tamar EIA as follows:

*Although there is no specific measurement of ambient noise in the Tamar Field study area, the most likely dominant sources of ambient noise for a location in proximity to one of the busiest sea routes in the world will be industrial noise and distant shipping in the absence of wind and precipitation. In addition, the areas affected by different noise contributions likely will vary throughout the year, as acoustic propagation loss varies throughout the seasons.*

## ***Physical Resources Impact Assessment***

The Tamar Lease Development EIA, parts 1 and 2 dated February 2015 assesses potential impacts due to routine and non-routine events. The information provided in this section presents the impact assessment for routine events and Project development. A detailed assessment of potential impacts from non-routine events can be found in section 4.3 of Tamar Lease Development EIA, parts 1 and 2.

The significance of potential impacts to the biological receptors identified during the biological resources baseline surveys are summarized below with text from the 2015 Tamar EIA in italics.

## Sediments and Sediment Quality

The 2015 Tamar EIA identified the following potential sources of impacts to sediments and sediment quality:

- Drilling (including the release/ discharge of drill muds and cuttings);
- Installation activities; and
- Physical presence.

Potential impacts from drilling were assessed as follows:

*Due to the limited and minor impacts of the depositional thickness, the size of the Tamar lease area, and the limited benthic infauna, the current and cumulative impact of the discharge of WBM [water-based mud] mud and cuttings is considered to be of low to negligible impact.*

*Due to this and the small area of significant depositional thicknesses, the discharge of WBM and MOB [mineral based oil-mud]-associated cuttings will have a limited impact on the sediments and sediment quality in the vicinity of the drillsites. Recovery of the relatively small areas that are impacted could take several years. Overall impact significance is medium based on the likely occurrence of the discharge and the medium impact consequence.*

Potential impacts from installation activities were assessed as follows:

*Emplacement of the pipelines, MEG lines, control lines, and utility lines will disturb surficial sediments, causing increased localized turbidity, possible mobilization, transport of sediment-associated contaminants, and crushing and/or burial of benthic communities near the pipeline corridor. Impacts on water quality, sediment quality, and benthic communities are expected to be minor. Given the short duration of this activity, overall impact significance is low.*

Potential impacts from the physical presence were assessed as follows:

*Emplacement of the pipelines, MEG lines, control lines, and utility lines will disturb surficial sediments, causing increased localized turbidity, possible mobilization, transport of sediment-associated contaminants, and crushing and/or burial of benthic communities near the pipeline corridor. Given the short duration and limited area of this impact, overall impact significance is low.*

### Water Quality

The 2015 Tamar EIA identified the following potential sources of impacts to water quality:

- Drillship arrival, departure and station keeping;
- Drilling (including the release/ discharge of drill muds and cuttings);
- Routine (non-drilling related) discharges;
- Installation vessel arrival, operation, and departure; or
- Installation activities.

Potential impacts from drillship arrival, departure, and station keeping were assessed as follows:

*During transit to and from the project area, the drilling unit and support vessels will discharge treated sewage, domestic waste, and deck drainage. Sewage will pass*

*through a sewage treatment plant prior to discharge. Domestic wastes (gray water) will be discharged without treatment, except for food waste, which will be macerated to pass through a 25-mm mesh. Deck drainage from machinery areas will pass through an oil-water separator prior to discharge or retained on board to be disposed of onshore. These discharges would be similar to those from other ships in the region. It is expected that the discharges would dilute rapidly in the water and not be detectable beyond the immediate vicinity of the vessel(s). As a result, the overall impact significance is negligible.*

Potential impacts from drilling were assessed as follows:

*Release of drilling muds and cuttings from the wellbore during the initial stages of drilling will produce increased turbidity within the lower portions of the water column around the drillsite. This localized and short-term reduction in water quality will end shortly after completion of the upper well sections and installation of the blow out preventer and riser.*

*Turbidity effects will be localized; the total area affected by increases in water column turbidity will be limited to several hundred meters around the drillsite. The impact consequence of changes to water quality is minor. Given the localized nature of this impact and its likely occurrence, overall impact significance is anticipated to be low. Due to the time periods between drilling the wells and the transient nature of the potential impacts of drilling discharges on water quality, cumulative impacts are unlikely and not expected.*

Potential impacts from routine (non-drilling related) discharges were assessed as follows:

*Due to the nature of routine discharges and their dilution in the receiving environment, impacts to water quality are expected to be minor. Given the likely nature of this impact, overall impact significance is low.*

*As for drilling discharges, the time periods between drilling the wells and the transient nature of the potential impacts of these routine discharges on water quality, cumulative impacts are unlikely and not expected.*

Potential impacts from installation vessel arrival, operation, and departure were assessed as follows:

*The DP pipelaying vessel and its support vessels will discharge treated sewage, domestic waste, and deck drainage. Sewage will pass through a sewage treatment plant prior to discharge. Domestic wastes (gray water) will be discharged without treatment, except for food waste, which will be macerated to pass through a 25-mm mesh. Deck drainage from machinery areas will pass through an oil-water separator prior to discharge or retained on board to be disposed of onshore. These discharges would have a negligible impact and would be similar to those from other ships in the region. It is expected that the discharges would dilute rapidly in the water and not be detectable beyond the immediate vicinity of the vessel(s).*

Potential impacts from installation activities were assessed as follows:

*Emplacement of the pipelines, MEG lines, control lines, and utility lines will disturb surficial sediments, causing increased localized turbidity, possible mobilization, transport of sediment-associated contaminants, and crushing and/or burial of benthic communities near the pipeline corridor. Impacts on water quality are expected to be minor. Given the short duration of this impact, overall impact significance is low.*

### Air Quality

The 2015 Tamar EIA identified the following potential sources of impacts to air quality:

- Drilling (including release/discharge of drill muds and cuttings, flaring, and other well operations);
- Combustion emissions;
- Support vessel traffic; and
- Helicopter traffic.

Potential impacts from drilling and combustion emissions were assessed as follows:

*Air pollutant emissions from the drilling unit and support vessels are expected to rapidly dilute and disperse in the offshore atmosphere. There may be intermittent impacts on air quality within several hundred meters of the wellsite during drilling. However, no detectable impacts on air quality are expected onshore based on the relatively small quantities of pollutants emitted and the distance of the Tamar Field from shore.*

*Air pollutant emissions from a well test are expected to rapidly dilute and disperse in the offshore atmosphere. There will likely be some decrease in ambient air quality within several hundred meters of the drilling unit during the test. However, no detectable impacts on air quality onshore are expected based on the relatively small quantities of pollutants emitted and the distance of the Tamar Field from shore.*

Potential impacts from support vessel traffic were assessed as follows:

*Air pollutant emissions from support vessels are expected to rapidly dilute and disperse in the atmosphere. There may be intermittent impacts on air quality within several hundred meters around a support vessel during transit. The impacts would be similar to those from other vessel traffic in the region. Little or no detectable impact on air quality is expected onshore based on the relatively small quantities of pollutants emitted and the fact that most of the vessel transit will occur in offshore areas. The overall impact significance is expected to be negligible.*

Potential impacts from support helicopter traffic were assessed as follows:

*Air pollutant emissions from helicopters are expected to rapidly dilute and disperse in the atmosphere. There may be intermittent impacts on air quality within several hundred meters around a helicopter during transit. The impacts would be similar to those from other aircraft traffic in the region. Negligible or no detectable impact on air quality is expected onshore based on the small quantities of pollutants emitted and the fact that most of the helicopter transit will occur in offshore areas.*

### Waste

The 2015 Tamar EIA identified the following potential sources of waste management impacts:

- General waste; and
- Mineral Oil Based Mud (MOBM) cuttings.

Potential impacts from general waste were assessed as follows:

*Heavy items such as welding rods, buckets, pieces of pipe, etc. may have a minor, localized impact on sediment quality beneath the rig location by creating small areas of hard substrate on the soft bottom seafloor (Shinn et al., 1993; Gallaway et al., 2008). The size of the area affected would be negligible.*

*Lighter pieces of debris may float on the sea surface and adversely affect water quality and marine biota. The potential impacts on water quality from marine debris are expected to be similar to those from the existing shipping and fishing industries.*

*Materials accidentally lost overboard during offshore oil and gas operations could entangle marine fauna [and avifauna] or cause injury through the ingestion of the debris. Ingestion of or entanglement with accidentally discarded trash and debris can kill or injure sea turtles (Laist, 1996; Lutcaravage et al., 1997).*

Potential impacts from MOBM cuttings were assessed as follows:

*If the discharge of MOBM cuttings from the proposed wells is not approved, the cuttings from these sections will be transported to shore for disposal. As described in Section 3.7, it is estimated that approximately 27 vessel trips (between the wells and Haifa) and 80 truck trips (Haifa to the Ramat Hovav landfill) would be required for onshore cuttings disposal (CSA Ocean Sciences Inc., 2013c).*

*The individual and cumulative impacts of the disposal of MOBM-associated cuttings would decrease the ability of the Ramat Hovav landfill to accept wastes from other sources. The increased landfill requirements and negative environmental implications were noted by the USEPA (2000) in their evaluation of a “zero discharge” option in the U.S. Gulf of Mexico.*

For the use of MOB/M, the Drilling EIA states in several places that cuttings/fluids will only be discharged after treatment to <1% oil by weight which complies with Table 1 of the IFC Offshore Drilling Guidelines. Mercury and Cadmium concentrations are also specified in alignment with the requirements. Regarding discharge to the sea, it is important to note that the 2015 Tamar EIA states that MOB/M, after treatment, will be discharged at 14 m below sea surface, slightly below the 15m requirement. Noble indicated they will specify 15m on the rig if that is a feasible option.

For drilling fluids and cuttings, toxicity tests will be conducted as agreed upon with the Ministry of Environment and based upon laboratory capabilities in Israel. The other requirements relevant to mercury, cadmium and chloride have also been committed to by Noble.

## 5.5

### *SOCIAL RESOURCES BASELINE AND IMPACT ASSESSMENT*

#### *Social Resources Baseline*

The identification and assessment of social risks and impacts across the entire Tamar Project has been completed over the course of several years, and is partially documented in the EIAs as well as through additional diligence conducted by NEML. This section provides a review (prepared by ERM) of the pertinent offshore baseline data as it pertains to potential social impacts. Additional baseline information can be found in the 2012 EIA, 2015 Tamar EIA, and 2013 EA.

#### Stakeholder Overview

A stakeholder is defined in the IFC Performance Standards as “any individual or group who is affected by a project or may have an interest in or influence over it.” NEML’s construction teams, operational staff and management have frequent contact with stakeholders related to the Tamar Field offshore operations. These include national, regional and local government officials, NGOs, media, and various civil society entities.

To date, specific community level engagement has been completed by and following the Government of Israel’s TAMA and permitting processes. However, there are several groups of stakeholders specifically identified in this document (commercial fishermen, recreational fishermen, yachters and sailors) that may require engagement directly by NEML and are considered by NEML in the Stakeholder Engagement Plan (See *Annex 3*).

#### Commercial Fishing

The Israeli commercial fish industry generates approximately US\$100 million per annum in revenue and employs about 1,500 workers.

Commercial fishing is concentrated along the narrow continental shelf, which is 50 km wide along the southern portions of the country and narrows to only about 15 km in the north. Fishing takes place year-round over almost the entire continental shelf. The commercial fishing industry in Israel takes place mostly in shallow water but there are still some deep-sea fishing operations. (2012 EIA)

Although no conclusive studies have been conducted to quantify catch losses resulting from the temporary emplacement of an exploratory drilling rig, only a limited number of fishing vessels traditionally use the area where the drilling rig will be located. Also, by law, trawling operations are not allowed in the vicinity of the pipelines. (2015 Tamar EIA)

Some fishing areas are crossed by the offshore Israeli National Gas Lines (INGL) marine natural gas pipeline. A lawsuit was filed by commercial fishermen against the Israeli Government for compensation for economic losses due to the laying of the INGL pipeline in 2004-2005 (2012 EIA). According to NEML management during ERM interviews in Nov. 2014, the Supreme Court of Israel ruled in favor of the government in 2013 and compensation rights were not granted for the fishermen.

Trawling is responsible for more than half of the Israeli fishery yields in the Mediterranean. While 31 trawlers are registered and licensed in Israel, only 23 to 25 currently work regularly. Bottom trawlers fish within the territorial waters at depths ranging from 15 to 400 m, however most of the fishing effort is concentrated in waters shallower than 50 m (2012 EIA). Although trawling is practiced on a daily basis year-round, according to interviews with NEML management and environmental experts who have been hired by the Government of Israel to conduct EIAs for the Oil and Gas industry (including Lerman Architects), the practice is now illegal due to the destructive negative impacts of this activity on benthic habitats.

An estimated 700 families earn their living directly and 500 families indirectly from the inshore fishery (which is separate from the trawling industry). The distance of less than 50 m depth that trawlers operate in is similar for inshore fishermen (2012 EIA).

#### Recreational sailing, yachting, and deep sea fishing

Along with the increase in population, as well as affluence, sport fishing in Israel has risen sharply in recent years. Although sporadic in nature and predominately a hobby, many amateur non-commercial fishermen fish along the Mediterranean coast of Israel in a variety of manners. Sport fishing includes: Scuba Spear-fishing; Free Dive Spear-fishing; Rod and Line Fishing; Kayak fishing; and Yacht and Small Craft Fishing (2012 EIA).

## *Social Resources Impact Assessment*

### Methodology for Assessing Social and Health Impacts

ERM has performed a social resources impact assessment as documented below. It should be noted that the 2012 EIA, 2013 EA and 2015 EIA assessed social impacts using a different matrix and methodology which is more environmentally focused. Furthermore, the impact significance rankings for social impacts vary between the two EIAs given the inconsistent methodology and logic. Due to these factors, social impacts have been re-evaluated by ERM using the social and health specific methodology for consistency.

The significance of potential socio-economic and community impacts is generally evaluated taking into account the magnitude of the change in socio-economic and community conditions and the vulnerability of affected receptors (i.e. people and communities). The overall approach to the rating and evaluation of impacts lies in the combination of two components that, when analyzed together, result in an evaluation of the significance of social and health impacts:

- Determining the magnitude of change in social and community health assets and conditions as a result of the Project; and,
- Determining the vulnerability of people and communities, a characteristic that underpins their ability to adapt to socio-economic / cultural or bio-physical changes whilst maintaining their overall livelihood, health status and quality of life.

The evaluation matrix used in this document to assess social and health impacts and assign a significance rating based on vulnerability and magnitude is provided below in Figure 3.

			Vulnerability of Receptors		
			Low	Medium	High
			Minimal areas of vulnerabilities; consequently with a high ability to adapt to changes brought by the Project.	Few areas of vulnerability; but still retaining an ability to at least in part adapt to change brought by the Project	Profound or multiple levels of vulnerability that undermine the ability to adapt to changes brought by the Project.
	<b>Minimal</b>	Change remains within the range commonly experienced within the household or community	Negligible	Negligible	Negligible
<b>Magnitude of Impact</b>	<b>Low</b>	Perceptible difference from baseline conditions. Tendency is that impact is local, rare and affects a small proportion of receptors and is of a short duration.	Negligible	Minor	Moderate
	<b>Medium</b>	Clearly evident difference from baseline conditions. Tendency is that impact affects a substantial area or number of people and/or is of medium duration. Frequency may be occasional and impact may potentially be regional in scale.	Minor	Moderate	Major
	<b>Large</b>	Change dominates over baseline conditions. Affects the majority of the area or population in the area of influence and/or persists over many years. The impact may be experienced over a regional or national area.	Moderate	Major	Major

**Figure 3 Significance ranking matrix for social and health issues**

The definitions for the impact significance ratings are provided below:

- **Negligible:** Inconvenience caused, but with no consequences to livelihoods, culture or quality of life.
- **Minor:** Impacts are short term and temporary and do not result in long term reductions in livelihood or quality of life.
- **Moderate:** Adverse impacts that notably affect livelihood or quality of life at household and community level. Impacts can mainly be reversed but some households may suffer long-term effects.
- **Major:** Diverse primary and secondary impacts that will be impossible to reverse or compensate for, possibly leading to long-term impoverishment, or societal breakdown.
- **Scoped Out:** Potential impacts that were initially evaluated but determined by the assessment process to not be applicable. Background information and assessment details are included for these potential impacts but an impact significance rating is not provided.

### Impact on fishing livelihoods

Due to the long distance from shore (and a decrease in fish species away from shore), very few vessels are expected to be present in the project area (with the possible exception of the Tamar Platform location and the Tamar Platform-AOT corridor to shore). The use of buffer or safety zones around pipelay vessels, barges, crane vessel, and other installation and drilling-related support vessels (including a 500 m safety zone established around the ENSCO 5006 drilling rig) will effectively exclude non-project related vessels and commercial fishing operations near these activities. This exclusion has the potential to affect fishing operations in the area.

Since a majority of the Tamar Expansion will be completed in the Tamar Field, which is located 150 km from the Tamar Platform, and taking into consideration the buffer zones, the number of vessels in the Project area will be limited. However, the few commercial fishermen who historically fish in deep-sea waters near the Tamar Field have areas of vulnerability but can at least adapt in part to the changes in their fishing patterns by relocating outside of the area of influence and buffer zones, and their vulnerability is therefore medium. ERM considers that given the occasional nature of this impact, the magnitude of the impact itself will be minimal and affect only a small proportion of fishermen. Therefore, the significance of the impact of the loss of deepsea fishing areas will be negligible.

Shipping and maritime operations in the vicinity of the Tamar SW-1 drill site may be affected to a very limited degree by support vessel operations. Transiting supply vessels and other activity-specific vessels may create space-use conflicts either during transit or while on stand-by (2012 EIA). However, support vessels would normally follow the most direct route between the drill site and the onshore support base (where a short-term increase in harbor vessel activity is expected) and are not expected to interfere with fishing activities along the coast. Though these Project vessels and barges could possibly transit through potential fishing areas, due to the relatively brief mobilization period of the project, the impact significance of Project vessels in commercial fishing zones is expected to be negligible.

The extent of long-term impacts on the shallow water commercial fishery will depend on factors concerning the relief of the pipeline, its location relative to the seafloor, and the potential for snagging trawl gear. The project components that will occur near the Tamar Platform include installation of an umbilical line, utility lines, and pipelines. The new utility lines which connect to the AOT will be placed within the corridor where existing pipeline infrastructure currently exists, so there will be no additional interference with near shore fishing activities. Furthermore, a majority of the project components will occur at depths beyond 400 m where trawling does not occur. Therefore, impacts to shallow water trawling and inshore fishing

livelihoods have been scoped out and the significance of the impact has not been assessed.

#### Impact on recreational sailing, yachting, and deep sea fishing

Activities at the Tamar Field could temporarily impact recreational deepsea fishing and yachting due to the presence of the project vessels, but other recreational activities are not expected to occur in the vicinity of the potential well locations.

Although there have been no direct or conclusive studies to assess baseline conditions near the project's offshore AoI, it is expected that those who partake in recreational sailing, yachting, and fishing have a high ability to adapt to the changes in their recreational patterns by relocating outside of the AoI and buffer zones, and their vulnerability is therefore low. The magnitude of the impact itself will be low and affect only a small proportion of recreational seekers. While there may be inconvenience caused, there will be no consequences to livelihoods, culture or quality of life. Therefore, the significance of the impact will be negligible.

#### Impact on neighboring communities as a result of increased traffic

There are 10 trucks per day during construction which enter and exit the AOT facility; either full trailer or heavy-goods vehicle (HGV). After construction, the number of trucks will be reduced back down to 5 to 6 per week related to the purchase of condensate from the plant. The level of increased traffic in the construction phase of the AOT compression project is minimal compared to the number of vehicles which transit the industrial park on a daily basis. This is the same for the Ports of Haifa and Ashdod. The magnitude of the impact is minimal, since any change in traffic patterns as a result of the Project will be easily absorbed into the existing patterns of activity at the AOT and Ports. The vulnerability of the impact is low since there will be minimal areas, if any, of vulnerability. Therefore, the significance of this impact is negligible.

#### Impact of workforce on health and emergency facilities

Although the number of offshore construction workers for the offshore portion of Tamar Expansion is not known at this time, AOT site management informed ERM that it is expected to be commensurate with that of the AOT construction staffing levels (hundreds of workers). The offshore "Oil Spill Contingency Plan (November 2014)" which has been approved by the Government of Israel lists the following hospitals as the primary facilities to be contacted and/or used in the event of an emergency: Ichilov Hospital (Tel Aviv); Tel Hashomer (Ramat Gan); Herzeliya Medical Center (Herzeliya); Barzilai Medical Center (Ashdod); Rambam Medical Center (Haifa); Assaf Harofe Medical Center (Ramla); and Ziv Hospital

(Safed). These facilities are all significant in size and capable of treating mass casualties if there were a catastrophic event.

For the reasons described above, it is not likely that the offshore workforce would overload the existing health infrastructure, even if there were a catastrophic event, so the magnitude of the impact is also considered low. There would be minimal areas of vulnerability so the overall vulnerability rating would also be low. Therefore, the significance of this impact is negligible.

#### Impact of community exposure to disease as a result of workforce

At the time of the interviews in Israel, the exact number of workers needed during the construction phase of the Tamar Expansion offshore was unknown; however, AOT site management informed ERM that it is expected to be commensurate with that of the AOT construction staffing levels (hundreds of workers). It is also anticipated that due to the specialized nature of the offshore work, these workers will be from other nationalities. The workers will work and reside primarily offshore on a rotational basis. Once the offshore expansion construction phase is complete, approximately 35 permanent staff will remain working on the platform, which is consistent with current staffing levels. The number of current onshore workers at the AOT and expected offshore workers during construction is minimal in comparison to the population in Israel's major cities where workers may come onshore during rotations.

Without knowing the nationalities of the workforce, it is difficult to assess the potential for any disease exposure on the communities in which the workforce will reside and their vulnerability. However, because the change in the number of workers compared to the population is small, the magnitude of the impact is minimal. Therefore, the impact significance is negligible.

## 5.6

### *CULTURAL HERITAGE RESOURCES*

#### *Cultural Heritage Baseline*

NEML conducted a geophysical survey and shallow geotechnical investigation of the Tamar Development area and pipeline routes for potential cultural and heritage sites. A total of 95 side-scan sonar contacts were identified in the Tamar Field; two correspond to well locations and 15 indicate possible anchor locations. The rest are classified as unidentified because they have not been visually inspected.

#### **Cultural Heritage Impact Assessment**

The 2015 Tamar EIA identified the following potential sources of impacts to cultural heritage resources:

- Drilling unit arrival, departure, and stationkeeping;
- Drilling (including release/ discharge of drill muds and cuttings and other well operations); and
- Installation activities.

Potential impacts from drillship arrival, departure, and stationkeeping were assessed as follows:

*A high-resolution side-scan sonar survey or an ROV survey (depending on the type of rig utilized) will be conducted to evaluate the presence of cultural and archaeological resources when a well location or pipeline route has been selected. If any resources are detected during the survey, avoidance zones will be established to prevent any potential impacts from project activities, and the resultant impact significance is negligible.*

Potential impacts from drilling were assessed as follows:

*Cultural/archaeological resources could be impacted by the seafloor release of mud and cuttings. Surface discharges of WBM and associated drill cuttings are not expected to reach archaeological resources on the seafloor per the results of the pre-drill surveys conducted to ensure that there are no such resources at or near the well locations. The impact significance is negligible because all impacts of drilling mud and cuttings discharges on archaeological resources are expected to be avoided.*

Potential impacts from installation activities were assessed as follows:

*The installation of pipelines and other bottom structures has the potential to impact archaeological resources. Two surveys were conducted during 2010; one of nearshore areas out to 12 miles from shore (Oceana Marine Research Ltd., 2010), and one of areas from 12 miles offshore to the Tamar Field (DOF Subsea UK, 2010a, b). The surveys included the Tamar Field and potential pipeline routes to shore. One potential shipwreck was identified along one of the potential pipeline routes to shore, and a total of 95 side-scan contacts were identified in the Tamar Field. Two of these corresponded to well locations and 15 were possible anchor locations (DOF Subsea UK, 2010a). The rest were classified as unidentified because they have not been visually inspected. The results of the surveys will be used to ensure that such potential archaeological resources are not impacted. The overall impact significance is negligible.*

## 6.0

### *ONSHORE ENVIRONMENTAL AND SOCIAL BASELINE AND IMPACTS*

This section provides a description of the existing environmental and social characteristics of the onshore project area, both for existing operations and the new compressor expansion project. A current summary of both existing compliance and future compliance with the compressor expansion is provided, followed by an impact assessment for the expansion project. A social impact assessment is also presented.

The expansion project occurred within the existing AOT footprint on previously developed land.

This section comprises a combination of reference to environmental studies and impact assessments prepared by others and also assessments prepared by ERM.

## 6.1

### *PROJECT COMPLIANCE (EXISTING AND COMPRESSOR EXPANSION)*

#### *Licensing and Permitting*

When NEML began operations, it utilized the existing AOT site because the land allocation had already been approved by the TAMA 37/A/2(2) (see Section 3). The location of the original terminal was decided based on pre-existence of the industrial zone, the Ashdod Industrial Zone (as this facilitates permitting, designs, etc.); proximity to shoreline; meeting required separation distances from public receptors; accessibility in the event of supply failures; proximity to national transmission system; and proximity to customers.

Israel has a strong legal framework for environmental management, and relevant components are referenced throughout this document. As a result, it ensures a robust permitting system associated with air and water discharges and hazardous waste handling and disposal. Activities involving these functions are regulated through air, water discharge, and toxin permits that are issued for individual facilities. These permits include monthly and/or annual reporting requirements to the applicable Ministry. Applicable permits are as follows:

- Air Emission Permit; and
- AOT Hazardous Materials Toxin Permit (see *Annex 4* for both permits).

In addition, the Business License is a regulatory requirement which has its origin in protection of public health and safety of workers and ensuring

environmental quality. It is under the purview of the Ministry of Interior and is essential to being allowed to begin operations.

### *Groundwater and Soil Contamination*

As indicated in several publications of different regulatory bodies, the Ashdod area is well-known for soil and groundwater contamination since the early 2000's ("Soil contaminations in Israel - The phenomena and treatment methods", 2009 report presented to the Knesset Interior Committee, by the Knesset Center of Research & Information). This report identified the 20 most polluted soil areas in Israel. The Ashdod industrial area, and particularly in the north, is one of these most polluted areas. The report identifies the Agan Chemical plant as one of the main contributors to the contamination. This report was published after a large scale monitoring effort conducted in areas suspected as being polluted.

Of particular note, these publications have noted and recorded that the underground water in Ashdod area is contaminated with hydrocarbons and pesticides. Results from local boreholes show concentrations 10 to 1,000 times higher than the allowable thresholds for drinking water for methyl tert-butyl ether (MTBE), benzene, ethyl benzene, toluene, xylene, volatile organic compounds (VOCs), naphthalene and polyaromatic hydrocarbons. This area-wide contamination pre-dates the AOT first phase construction and existed before NEML began operations in the area.

NEML is committed to comply with local legal and regulatory requirements with respect to groundwater and soil contamination. This is being implemented and practiced through the following:

- Hazardous material storage and handling and waste management – With respect to material handling procedures to mitigate spills and leaks at the AOT, hazardous materials consumed at the AOT are stored on site along the east wall of the warehouse and with use of proper containment. See also the commentary provided in Section 3.8. Storage of hazardous materials at the AOT is subject to conditions in the Toxin Permit issued by the Ministry of Environment. Strict inventory records are maintained and hazardous material quantities are minimized to the maximum extent possible. Materials on site could include diesel and some production fluids used for machinery and in production operations. Any waste products are manifested and removed from the site as quickly as possible to comply with the Toxin Permit. Condensate at the site is stored in banded areas that contain 110% of the maximum capacity of the storage vessel. The condensate is a sales product and strict procedures are in place to control the storage and transfer of this product.

- Wastewater discharges – as described further in section 3.5, NEML do not generate any industrial effluents such that there is no discharge of waste waters to public waterways at the AOT; and
- Spill response structure that includes drills and training, through self-assessments of these procedures, and a reporting system that notifies management about any incidents and are followed by investigations to insure prevention of future occurrences. The Emergency Management Plan (EMP) and associated annexes provides further details on spill response.

During the 10 years of operations of the AOT, NEML has not had significant spills or leaks associated with the storage and handling of hazardous substances.

The expansion project will not unduly affect the current operational controls in place for the handling and management of hazardous materials and wastes, and will not result in an increase in the volumes and quantities of hazardous materials stored at the AOT.

### *Air Emissions*

NEML reports yearly emissions for a list of 120 pollutants, as detailed in its Annual Pollution Release and Transfer Register (the 2013 emissions can be found at <http://www.sviva.gov.il/PRTRIsrael/Pages/default.aspx> and the 2014 emissions will be posted in April 2015). Section 1.1 of the EHS General Guidelines requires that emissions do not result in pollutant concentrations that reach or exceed relevant ambient quality guidelines and the national legislated standards. Further details on air emissions are contained in *Annex 4*, which includes the Air Permit Application Summary, the AOT Toxin Permit 2014-15 and the Emissions Permit Final.

With respect to the expansion project, the new Booster Compressor trains will be, by far, the most significant source of energy consumption and emissions. These compressor trains will consist of gas turbines driven by single stage centrifugal booster compressors. Air emissions were analyzed based on contribution of emissions associated with the AOT expansion to the existing and future air quality utilizing the US EPA MODEL AERMOD. The model concluded that contributing emissions from the compressor trains are significantly lower than the environmental standards and targets, and their contribution to the quality of the air in the environment is expected to be negligible. The information used to derive the permit is detailed in NEML's Air Emission Permit Application that is publicly available at the

MOEP web site<sup>i</sup>, and a copy of the modelling (in Hebrew) is attached as *Annex 6*.

Specifically, an examination of the data for the gas turbines showed that their maximum hourly concentration amounted to 23.86 milligram (mg)/m<sup>3</sup>, compared to the limit of 51,000 mg/m<sup>3</sup>. Furthermore, the final Emissions Permit issued by the Ministry of Environmental Protection pursuant to the Clean Air Law of Israel presents an NO<sub>2</sub> limit of 50 mg/m<sup>3</sup> in alignment with the IFC Thermal Power Guidelines. These emissions will be continuously regulated under the abovementioned permit to ensure no exceedance of local limits.

Additionally, in alignment with government regulations pertaining to air permitting, NEML performed an analysis of Best Available Technology (BAT) on this new equipment. Mitigations to minimize emissions from the AOT gas turbines include maintenance of equipment and standard operating procedures (SOP). The compressor booster gas turbines are of Dry Low Emission (DLE) and engineering design has sought to reduce fugitive emissions. In a further commitment to continuous improvement, NEML is currently in the engineering stage to install vapor recovery units at the AOT in line with the European IPPC BREF guidelines.

NEML has estimated GHG emissions for all project components associated with the Tamar project. The AOT's existing scope 1 GHG emissions for calendar year 2013 (2014 data is being verified and will be released shortly) was as follows:

AOT	CO <sub>2</sub> e (tonnes)		
	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O
Diesel Combustion	3.27	0.02	0.01
Mobile	3.13	0.00	0.07
Fugitive	1.77	382.23	0.00
Venting	0.14	2,026.15	0.00
<b>Total</b>	<b>2,416</b>		

*Source: Noble Energy*

With respect to the Compression expansion, the main new GHG source will be the combustion of natural gas to drive the compression engines. NEML has estimated that approximately 40,000 MMbtu per year of natural gas will be consumed for the compression equipment, which converts using Israeli

<sup>i</sup> <http://www.sviva.gov.il/subjectsEnv/SvivaAir/LicensesAndPermits/PermitEmission/Pages/default.aspx>

emission factors to approximately 2,134 tCO<sub>2</sub>e. Therefore the total annual emissions when the expansion project is operational for the whole of the AOT will be of the order of 4,550 tCO<sub>2</sub>e a year.

GHG emissions will be reported annually as part of the implementation of an overall Environmental Management System currently being implemented.

### *Noise*

Recognizing the expansion components being installed at the AOT, noise levels have been examined to identify risks to sensitive receptors as defined in the Israeli regulation for "Prevention of nuisance (Noise Prevention), 1992". Utilizing a Sound PLAN model, noise contours showed that the noise level derived from the AOT operation, including the new Compression Trains, was expected to be low at 60-64 dB(A) along the AOT fence. The threshold for industrial areas according to national and international regulations is 70 dB(A). Inside the AOT, the expected noise alongside the control rooms is 61-65 dB(A). A copy of the noise modelling (in Hebrew) is attached in *Annex 6*.

The nearest sensitive receptor is located at a distance of more than 2.5km from the AOT, and is not affected by current operations and the expansion.

### *Water Discharges*

NEML do not currently discharge from the AOT and as such, do not have a discharge permit for the facility. Sanitary wastewater generated at the AOT is routed to the municipal sewer and discharged in accordance with local requirements of the Waste Water Treatment Plant (WWTP). All other process water and stormwater is collected in sumps at the facility and transported to industrial treatment facilities for disposal in accordance with local regulations. This practice will continue for the immediate future covering commissioning of the compression project. However, preliminary engineering is being developed to consider onsite treatment of the waste waters currently being collected in the sumps.

### *Waste Management*

NEML maintains various contracts for waste management services, and waste generated (including hazardous wastes) by the Project are dealt with under these existing contracts. All waste movements are manifested according to the facility's Toxin Permit which mandates proper handling and transfer. NEML is in the process of developing an engineering design for a facility at the AOT that will provide a new location for storing and managing hazardous and non-hazardous materials and wastes. This facility will be part of upgrades to the existing AOT facility.

Waste management practices are included in the BAT assessment for onshore activities (TAMA Policy on Waste) and facilities are required to follow a Waste Management Plan, identifying waste types and specific segregation, handling and shipping requirements. Currently, waste management at the AOT is done per the requirements of the Toxin Permit. Wastes are separated into hazardous and non-hazardous and are stored accordingly. Hazardous wastes are transported to a government approved hazardous waste treatment facility using licensed transporters. Manifesting is completed for all shipments according to MoEP guidelines.

In accordance with the NEML procedures, contractors will develop their own Waste Management System that recognizes the waste hierarchy and promotes sustainability through resource efficiency, waste minimization, segregation and responsible treatment and disposal of hazardous and non-hazardous waste streams. Contractors' WMP will be approved by NEML for alignment with their own Tier 3 WMP which covers all of NEML's operations in Israel.

### *Process safety*

Prior to the expansion of the AOT when the Tamar Platform was constructed, NEML assessed risks from major hazard scenarios that could have a potential loss of life to the public and employees. The physical consequences (gas dispersion, thermal radiation levels) of the major accident hazard scenarios were analyzed. Based on accident scenarios arising in the gas inlet area, process areas, condensate storage areas, and product export areas, the analysis demonstrated that the risk to the public was low. The low risk ranking was attributed to the fact that the AOT development is sited away from large concentrations of public.

Subsequently, an assessment of hazardous material risks was conducted with reference to the AOT's Hazardous Materials Toxin Permit, and the Separation distance according to the Ministry of Environmental Protection guidelines. The guidelines require that a facility will not jeopardize public receptors. Separation distances were calculated according to the above mentioned guidelines, using the US-EPA model ALOHA version 5.4.1.2 for two scenarios: rupture in the natural gas pipeline and burning condensate pool. The "worst case scenario" hazardous material incident was calculated for the burning condensate pool with an area of influence distance of 152 meters from the AOT boundary while the nearest public receptor is 2.5km from the AOT boundary.

In its current and proposed operations including the Compression Project, NEML has developed safe work practices and standard operating procedures to minimize risks of process safety incidents. Building upon Noble's Global Management System, a safety and environmental

management system is developing around 18 elements that combine the safe working principles of process safety management and internationally accepted operating practices. This system is being implemented to focus not only on employee operations but also on contractor activities within Noble's facilities. Training, employee participation, auditing, and incident investigation, among others are part of the overall system that will drive the performance of workers and management to insure process safety.

### *Emergency Response*

NEML has an Emergency Management Plan (EMP, see *Annex 5*) which includes various elements to establish procedures to how the company responds to accidents and emergency situations. The EMP established the structure and the roles and responsibilities of the NEML Incident Management Team which provides the response actions to accidents and emergencies. The EMP is supplemented by annexes which include, among others, an Oil Spill Response Plan, Facility Emergency Plans, Mass Casualty Plan, Fatality Management Plan, Security Emergency Management Plan, and a Medical Evacuation Plan. In addition, at the AOT, a Factory Plan (required by local authorities) and a Station Bill provide additional instructions in the event of incidents. Currently, these documents are in revision to update the plans to account for the commissioning of the compression project.

Note that as part of the Emergency Response Protocols, training with drills is regularly performed at the AOT. These drills are conducted on a routine basis with workers and contractors for scenarios involving military actions and events such as fires and releases of hazardous materials. Annually, the drills are performed in concert within local Fire Brigades to simulate major incidents at the facility.

### *Occupational Health & Safety*

#### Physical Hazards

The Safety Plan was developed to meet the requirements of the Israeli Labor Law and describes the process under which OHS principles and procedures are applied for the Project which includes the methodology to 1) identify hazards, 2) establish the risk potential and 3) implement policies and procedures as to how such risks will be mitigated. An assessment of physical hazards includes: natural gas fire and explosion; fall from heights (including off-shore transferring); spillage of volatile liquids; gas leaks; collapse of a structure; struck by / caught between / fell on and other similar hazards; collision with a platform; and drowning.

## Chemical and Biological Hazards

The Safety Plan includes a list of chemical / biological / physical elements for which a safety sheet or environmental monitoring is required. The plan also outlines medical procedures for those who may be exposed to these hazards. Radiological hazards are not relevant for this project.

## Personal Protective Equipment (PPE)

Appropriate PPE is required for all personnel, contractors and visitors at all NEML facilities. PPE is a control required by NEML's safety management plan to mitigate hazards and risks.

## Special Hazard Environments

The Safety Plan takes into account special hazard environments as they pertain to offshore and platform operations.

## Monitoring

The Safety Plan details the OHS Monitoring Program which is in place to verify the effectiveness of prevention and control strategies. The program includes safety inspection, testing, surveillance of work environment and workers health, and training. The GMS also outlines general monitoring requirements. Real time tracking of OHS objectives are implemented with regular reports provided to management to monitor health and safety performance and accomplishments.

## *Community Health and Safety*

### Water Quality and Availability

Drinking water sources are protected at all times so that they meet or exceed the applicable acceptability standards or the WHO Guidelines for Drinking-Water Quality. Bottled water and other types of juices and drinks are provided at all NEML facilities.

### Structural Safety of Project Infrastructure

Potential hazards to structural design were incorporated as appropriate during the planning, siting, and design phases of the original AOT build (constructed in 2008).

### Life and Fire Safety

A Life and Fire Safety Plan is in effect for the AOT operations and covers the issues of: fire prevention, means of egress, detection and alarm systems,

compartment, and fire suppression and control. Elements of this are also captured in emergency response plan and the Emergency Response Plan.

### Traffic Safety

Impacts to traffic onshore during construction and operations has been assessed as negligible. However, NEML still complies with applicable local traffic laws!

### Hazardous Materials

Employee training of transport of hazardous materials is required annually at all NEML facilities. Specific HazMat PICs have been identified and trained to oversee hazardous materials handling at each NEML facility. Training of these and other NEML workers is provided for hazardous communications, hazard identification, and risk assessment related to hazardous chemical handling.

### Disease Prevention

Impacts to community health (including disease) as a result of NEML's construction and operations staff has been assessed as negligible; however, NEML has stringent OHS training in place would could be adapted to include disease prevention if situation dictated.

## 6.2

### *SOCIAL BASELINE AND IMPACT ASSESSMENT*

In addition to the aforementioned information specific to the AOT risk assessment, this section provides a review of other pertinent onshore baseline as it pertains to potential social impacts. Additional baseline information can be found in the 2012 EIA, 2015 Tamar EIA, and 2013 EA. Section 5.5 describes the methodology ERM used to assess the social and health impacts.

#### *Social Resources Baseline*

##### Stakeholder Overview

For the onshore AOT component, the nearest community from the AOT is located approximately 2.5 km to the south - the village of Nir Galim. The village of Ben Zakai is located 4 km to the east. There are no affected communities near the AOT that will be uniquely affected by AOT existing and expansion activities. No land acquisition will occur as a direct result of the Project or operations. In addition, the scope of the Project is not expected to disrupt the economic livelihood of local communities, and there may

actually be beneficial economic impacts as a result of local employment and local supplier opportunities.

NEML's operational staff and management teams have frequent contact with their commercial neighbors inside the AOT's general area of influence (AoI) (within a 2 km radius), including Paz Oil, the Water Desalination Plant, Israel Natural Gas Line and the Ministry of Defense which has a firing range adjacent to the AOT footprint. Ongoing communication is focused around health, safety, and security coordination. There are frequent emergency response drills conducted onshore and offshore in consultation with the local emergency response authorities.

### Tourism and Recreation

Tourism and recreation are concentrated mainly along the coast. The main tourist attractions are bathing beaches, heritage sites, archaeological sites, nature reserves, and national parks. In particular to Ashdod, the coastline of Ashdod spreads over 8 km. Tourism in Ashdod has not developed and the Israel Ministry of Tourism does not consider Ashdod as a tourist destination and existing tourism is based mainly on the use of summer homes in the city (2012 EIA).

Tourists and those involved in coastal recreation experience a variety of vessel traffic, including tankers, cargo vessels, cruise ships, and a diverse assortment of smaller watercrafts. The periodic transit of supply vessels and aircrafts does not represent a unique or unexpected event.

### Onshore traffic

The project will use Israel Shipyards Ltd. at the Port of Haifa, for an onshore support base. The Port of Haifa is Israel's largest port. The port contains a broad variety of facilities that allow for the shipping and transportation of all types of cargo as well as docking facilities for large passenger liners. The project will also use the Ashdod port, which like the Port of Haifa is large and serves as a gateway into Israel.

The ERM site visit to the AOT in November 2014, confirmed that there are no local communities in the vicinity of the AOT who could be impacted by Project activities; all compression expansion work is being carried out within the existing AOT footprint, which sits on a relatively small parcel of land in the north of a large industrial park. The ERM site visit determined that there is a significant amount of vehicular traffic in the industrial park which is located several kilometers away from any major residential areas.

## Health and emergency facilities

The 2012 EIA, 2013 EA and 2015 EIA did not assess the Project for impacts of workforce on health and emergency facilities. Therefore, all baseline information provided was collected by ERM.

According to the most recent census data, Ashdod is the fifth largest city in Israel and has a population of over 200,000. Anecdotal reports show that the city prides itself on the fact that it has the largest immigrant population in the country. In terms of health care systems, Israel is also lauded by international health organizations as having one of the best healthcare systems in the world. There are three primary levels of care: a) main hospitals that are built based on population and demographics levels; b) emergency facilities, and c) regular small clinics.

According to online research, there are currently no hospital facilities in Ashdod and residents usually travel to Barzilai Medical Center in Ashkelon, approximately 20 km to the southwest, or Tel Hashomer Hospital in Ramat Gan, south of Tel Aviv. Both of these facilities are noted in the "AOT Onshore Risk Assessment and Emergency Procedures (September 2014)" which was prepared by an independent third party for NEML and approved by the relevant GoI entities as the closest facilities for use by NEML and other industrial park neighbors in the event of an emergency. The Barzilai Medical Center's website states that it has a capacity of over 600 beds. The Tel Hashomer Hospital (also known as the Sheba Medical Center) claims it is the largest hospital in the Middle East and has 1,700 bed capacity.

A new state-of-the-art public hospital is under construction in Ashdod. It is expected to open in 2016, although according to local media accounts, there is a debate at present amongst the Ministry of Health on whether the facility will allow private care which could delay the opening. According to the Ministry of Health statistics, there are several health clinics in Ashdod which could be accessed by non-local workforce in the event of a non-emergency.

According to interviews by ERM with medical professionals in Ashdod, in the event of a massive incident, the Israel Health System has immediate response teams that fly patients (via helicopters) to facilities beyond the City of Ashdod.

## Indigenous People

Stakeholder identification and mapping suggests that there are no Indigenous People within the area of influence for the Tamar project including the AOT. It is not within NEML's remit to make a determination regarding any group's indigeneity or rights over land and resources in the Project's area of influence.

### 6.2.1 *Social Resources Impact Assessment*

Impacts to onshore tourism and aesthetics as a result of the physical presence of drilling units and vessels

Offshore structures (e.g. platforms, drillships) typically are visible 5 to 16 km from shore, with small structures barely visible at 5 km. On a clear night, lights on top of offshore structures may be visible to a distance of approximately 32 km. However, any drilling unit or supporting vessel in the Tamar Field will be more than the 32 km visible distance from shore (2015 EIA). Therefore, activities will have no aesthetic impact on coastal or near shore recreation and tourism and this impact has been scoped out, and the significance of the impact has not been assessed.

Supply vessels and helicopters will periodically transit between Haifa and the Tamar Field projects. The physical presence of the support vessels which would usually avoid traveling close to the coast, except at the approach to the shore base, will be short-term although visible to coastal visitors involved in recreation and tourism. However, the frequency of Israeli Air Force helicopters patrolling coastal areas and normal vessel traffic at the ports is much higher than the number of project-related helicopters and vessels that will operate close to shore.

The AOT compression construction is occurring on an existing facility, and within an industrial zone, so will have no direct impacts to tourism or aesthetics.

The impact significance on nearshore recreational activities, aesthetics, and tourism as a result of supply vessels is negligible.

#### Impact on neighboring communities as a result of increased traffic

There are 10 trucks per day during construction which enter and exit the AOT facility; either full trailer or heavy-goods vehicle (HGV). After construction, the number of trucks will be reduced back down to 5 to 6 per week related to the purchase of condensate from the plant. The level of increased traffic in the construction phase of the AOT compression project is minimal compared to the number of vehicles which transit the industrial park on a daily basis. This is the same for the Ports of Haifa and Ashdod. The magnitude of the impact is minimal, since any change in traffic patterns as a result of the Project will be easily absorbed into the existing patterns of activity at the AOT and Ports. The vulnerability of the impact is low since there will be minimal areas, if any, of vulnerability. Therefore, the significance of this impact is negligible.

### Impact of workforce on health and emergency facilities

According to NEML management during ERM interviews, on average, around 350 staff work daily on the AOT Compression project's construction phase, with approximately 50 representing NEML, and the majority of the other workers consisting of direct labor contractors working on mechanical construction. There are 14 local contracting companies on site at any one time, and the number of contracted staff will taper off as construction ends in early 2015. During the operational phase, the number of staff on site will be 20 at any one time, which is consistent with pre-construction project staffing levels.

Interviews with AOT site management indicated that there are a wide range of nationalities present on site for the construction phase. All contracted staff that are not from the local area are provided residence in neighboring Ashdod city, as there are no worker accommodations on site.

Since the number of workers at the AOT is minimal in comparison to the population in Ashdod, the magnitude of the impact of the additional non-local workforce is minimal (approximately 0.1% of the total population during onshore construction and .01% of the total population during AOT operations) and can be easily absorbed into Ashdod's social and health infrastructure with minimal areas of vulnerability.

Even if there was a catastrophic event at the AOT facility, it is not likely to overload existing health infrastructure, as mentioned above. Therefore, the significance of this impact is negligible.

### Impact of community exposure to disease as a result of workforce

At the time of this assessment, only several months remain until completion of the onshore construction phase for the AOT. At present, according to interviews with NEML operational staff on site at the AOT, there are no concerns about the non-local workforce assimilating into the neighboring Ashdod. While the exact number of non-local construction workers was not provided, NEML's overall nation-wide local content (Israeli staff) is 70% of the entire in-country workforce. Using this as an estimate means that approximately 100 of the construction staff could be non-local which equates to .05% of the total Ashdod population, which is not a significant magnitude. Therefore, the significance of this impact is negligible..

As onshore components were not included in the scope of the Annexed EIAs, ERM has prepared the onshore risk assessment based a review of existing AOT and onshore-related documentation from NEML and other parties (summarized in the previous sections). ERM also performed a one-week visit to NEML's offices in Israel, which included a site-visit to the AOT to observe both the existing conditions and the expansion works, as well as interviews with key NEML personnel in both Israel and Houston.

### *Ground Conditions*

The existing hydrogeological conditions show that the aquifer in the area is subject to land and groundwater contamination. The soils in the east part of the AOT consist of clay and loam layers that have a low hydraulic conductivity and serve as a barrier to ground water movement. In the west part of the area, the unsaturated layers are relatively thin, and the ground composed of units having high hydraulic conductivity.

The AOT is located in the west edge of a hydrological "sink" where the underground water levels are between -2 to -4.5 meters in the centre of the "sink". The water from wells in the area is mainly for agriculture and industrial use. The production of water has created a flow direction to the centre of the "sink" and the AOT area.

### *Natural Environment*

The "Palmachim Coast Survey"<sup>ii</sup> presented an analysis of the natural resources, landscape and human heritage in the Kourkar sands of the southern coastal area of Israel, north of the AOT. The survey assessed the natural botanical values of the dune vegetation based on several parameters that included natural value and presence of ecological corridors. The survey showed high environmental sensitivity in the vicinity of the Ashdod Industrial Zone (gravel ridge area north and west of the facility), particularly to the west of the AOT. The AOT expansion project is occurring within the existing AOT footprint and does not impact upon this sensitive zone. It is also important to mention that the Survey did not take into account the legal status of these habitats which are areas legally designated for development.

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<sup>ii</sup> Palmachim Coast Survey by the Open Landscape Institute of Israel (OLI). 2008.

## *Socio-Cultural Environment*

The nearest community from the AOT is located approximately 2.5 km to the south - the village of Nir Galim. The village of Ben Zakai is located 4 km to the east. ERM has prepared a separate Social and Health Impact Discussion specific to the Tamar project (dated February 2015), which included an evaluation of social and health conditions at the AOT facility (as well as offshore). This concluded that there are no affected communities near the AOT that will be uniquely affected by AOT existing and expansion activities.

The primary stakeholders for the onshore operations are NEML's industrial neighbors, including Ashdod Paz Oil Refinery, the Ashdod Water Desalination Plant, Israel Natural Gas Lines (INGL) and the Ministry of Defense which has a firing range adjacent to the AOT footprint (i.e. in the sensitive zone referred to above). Considering these are the primary stakeholders for the Tamar Project, NEML's operations staff and management teams have frequent contact with these stakeholders related to the AOT which is focused around health, safety, and security coordination.

NEML is committed to establishing and maintaining transparent, respectful, and regular engagement practices to ensure that stakeholder concerns and interests are fully understood and managed. These practices are above and beyond the engagement activities managed by government agencies as a part of the permitting processes. NEML's Stakeholder Engagement Plan (SEP) for the Tamar project takes into consideration environmental and social impacts as described in IFC PS1 "Identification of Risks and Impacts".

A number of Statutory Declared Antiquities Sites are located within 2 km of the AOT. However, the proposed expansion of the facility will not impact any of these previously identified cultural heritage resources given that it is occurring within the existing AOT footprint. The construction of additional facilities on previously disturbed ground within the footprint of the existing facility and rights-of-way revealed the absence of cultural heritage resources.

## *Methodology*

The previous sections provide a more detailed understanding of the main compliance issues as they relate to the existing AOT operations and the proposed expansion. In addition to these compliance issues, it is also considered best practice to perform an assessment of the potential risks that may arise from the expansion project using the previous sections as a baseline. Considering the nature and function of the Ashdod Industrial Zone where the AOT facility is located, and the fact that the AOT expansion takes place in a previously developed area, it is important to define the existing

baseline and receptors to be potentially affected by the expansion. For the purpose of this Risk Assessment, “Baseline” is considered to be those physical, biological, cultural and human conditions that will prevail in the absence of the expansion, including the interactions amongst them. This risk assessment therefore addresses potential risks to this baseline from expansion activities.

For the purpose of this assessment, “Risk” is defined as the relationship between the severity and likelihood of a harmful effect or consequence to human health or the environment occurring as a consequence of AOT’s expansion (see illustrative chart below below).

Qualitative Risk Assessment						
		Likelihood				
		Rare	Unlikely	Possible	Likely	Certain
Consequence	Very High Severity	Yellow	Orange	Red	Red	Red
	High Severity	Yellow	Yellow	Orange	Orange	Red
	Medium Severity	Light Green	Yellow	Yellow	Orange	Red
	Low Severity	Green	Light Green	Yellow	Yellow	Orange
	Very Low Severity	Green	Green	Light Green	Yellow	Yellow
	Very Low Severity	Green	Green	Light Green	Yellow	Yellow

Consideration has also been given to the potential risks of the existing conditions on the expansion.

Qualitative Risk Assessment						
		Likelihood				
		Rare	Unlikely	Possible	Likely	Certain
Consequence	Very High Severity	Yellow	Orange	Red	Red	Red
	High Severity	Yellow	Yellow	Orange	Orange	Red
	Medium Severity	Light Green	Yellow	Yellow	Orange	Red
	Low Severity	Green	Light Green	Yellow	Yellow	Orange
	Very Low Severity	Green	Green	Light Green	Yellow	Yellow
	Very Low Severity	Green	Green	Light Green	Yellow	Yellow

## *Limitations*

ERM evaluated the potential risks to the Project and the environment based on the analysis of existing information based upon the scope of work described in this report. Subsequently, this is a qualitative risk assessment based primarily on professional judgment.

## *Risks Evaluated*

Although the documentation reviewed during this effort provides information on a variety of environmental and social parameters, ERM focused this risk assessment on the following risks, which are further discussed and evaluated in Section 4.4 below:

- Proximity to other industrial facilities;
- Proximity to Israel Defense Forces (IDF) firing range; and
- Existing groundwater contamination;

Risks that did not trigger further analysis included the following, and associated commentary and justification for not further analyzing these risks is provided below:

- Proximity to sensitive ecological receptors and human communities;
- Increased air emissions;
- Increased noise;
- Increased water discharges; and
- Use of hazardous materials.

### Proximity to sensitive ecological receptors and human communities

Although surveys conducted in the vicinity of the AOT indicate the presence of environmentally sensitive areas (vegetative dune communities) to the north and west, both construction and operation activities associated with the expansion will have no significant effects on these ecological receptors given that they occur within the existing footprint. There are no affected human communities near the Project that will be uniquely affected by Project activities. The nearest community from the AOT is located approximately 2.5 km to the south - the village of Nir Galim. The village of Ben Zakai is located 4 km to the east.

### Increased air emissions

As previously mentioned, contributing emissions from the compressor trains are significantly lower than the environmental standards and targets, and their contribution to the quality of the air in the environment is expected to be negligible, as detailed in Noble's Air Emission Permit Application. In

addition, the emissions will be aligned with the relevant IFC EHS Guidelines.

Furthermore, mitigations to minimize emissions from AOT gas turbines include maintenance of equipment and standard operating procedures (SOP). The compressor booster gas turbines are Dry Low Emission (DLE) type, and in a further commitment to continuous improvement, NEML is currently in the engineering stage to install vapor recovery units at the AOT in line with the European IPPC BREF guidelines.

#### Increased noise

Modeled noise emissions show that emissions will not exceed national and international thresholds beyond Project boundaries. The nearest sensitive receptor is located at a distance of more than 2.5km from the AOT, and is not affected by its construction and operations.

#### Increased water discharges

NEML do not currently discharge from the AOT and as such, do not have a discharge permit for the facility. Sanitary wastewater generated at the AOT is routed to the municipal sewer and discharged in accordance with local requirements of the Waste Water Treatment Plant (WWTP). Preliminary engineering is being undertaken to consider possible onsite water treatment for liquids now captured in sumps at the facility and shipped offsite for treatment in industrial facilities.

#### Use of hazardous substances

Hazardous materials consumed at the AOT are and will be stored on site within a designated hazardous material storage area along the east wall of the warehouse. Based on potential risks for contamination identified, Noble has already considered management prevention measures for these substances.

Although all the risks previously described were not further assessed, ERM recommends that all are included in the Environmental and Social Management System (ESMS) management measures and monitoring efforts to be conducted in the future (see Section 5).

### ***Results***

#### Risks to the Project

Based on the evaluation of the significant risks of the existing conditions on Project development (see graphic below), ERM concluded that:

- Existing groundwater contamination does not represent an immediate risk to the Project. However it is important that NEML closely monitors for any changes in those conditions;
- Proximity to other facilities is considered of medium severity due to the nearby burning flares associated with the Paz refinery to the south of the AOT; and
- Although proximity to Israel Defense Forces (IDF) firing range could represent a condition of high risk to the Project, the procedures and type of military activities in that area are considered unlikely to occur.

Qualitative Risk Assessment (effects on the Project)						
		Likelihood				
		Rare	Unlikely	Possible	Likely	Certain
Consequence	Very High Severity					
	High Severity		Proximity to Israel Defense Forces (IDF) firing range			
	Medium Severity			Proximity to other industrial facilities		
	Low Severity					
	Very Low Severity		Existing groundwater contamination			

Risks to the Environment

Based on the evaluation of the significant risks of Project development on the existing conditions on (see graph below), ERM concluded that:

- Considering the extensive ESMS to be implemented, it is unlikely that the Project will contribute to existing groundwater contamination. However it is still important that NEML closely monitors for any changes in those conditions
- Proximity to other facilities is considered of medium severity due to the nearby burning flares associated with the Paz refinery to the south of the AOT.
- The Project operations (emissions) do not represent a significant risk to the Israel Defense Forces (IDF) firing range activities.

Qualitative Risk Assessment (effects on the environment)						
		Likelihood				
		Rare	Unlikely	Possible	Likely	Certain
Consequence	Very High Severity					
	High Severity					
	Medium Severity			Proximity to other industrial facilities		
	Low Severity					
	Very Low Severity	Proximity to Israel Defense Forces (IDF) firing range	Existing groundwater contamination			

According to UN Guiding Principles on Business and Human Rights, companies should respect human rights and seek to prevent or mitigate potential human rights issues that may be caused directly by a Company's projects or operations, or by project partners and suppliers. According to IFC Performance Standard 1, "each of the IFC Performance Standards has elements related to human rights dimensions that a project may face in the course of its operations. Due diligence against these Performance Standards enables companies to address many relevant human rights issues in its project." The UN Guiding Principles, the IFC Performance Standards and other ILO standards are the benchmark for guiding companies in ensuring respect for human rights.

NEML completed a Human Rights due diligence in order to:

- Identify, account for, and mitigate (where possible) actual or potential human rights impacts ;
- Ensure policies and processes to manage human rights issues are in place;
- Express commitment to respect human rights through a policy endorsed by senior leadership;
- Ensure communication takes place with stakeholders about how issues will be addressed; and
- Ensure a grievance mechanism is in place to address issues raised by the community.

Interviews were conducted with NEML's environmental, social, security, safety, and operations teams to assist in the identification of potential Project-related human rights impacts and methods for mitigating or responding to these potential impacts. The interview questions and due diligence focused on the four key areas most germane to the oil and gas industry: 1) Employee and Labor Relations; 2) Provision of Security; 3) Community Engagement; and 4) Supplier Engagement. A particular focus was paid to the supply chain, as specific supply chain documentation had not yet been received or reviewed prior to the original gap analysis or the subsequent in-country interviews.

The key Tamar Expansion activities related to each of these four areas were benchmarked using the aforementioned standardized and internationally recognized tools. The Due Diligence assessment covered any adverse human rights impacts that the Project may cause or contribute to through its own activities, or which may be directly linked to its operations, products, or

services by its business relationships (which for the Tamar Expansion, primarily refers to first-tier suppliers and security providers.)

The Due Diligence process recognizes that the human rights risks may change over time as the Project evolves and therefore it is an iterative process whereby business operations and operating context should be examined on a regular basis, especially once the Project moves into the operation phase.

As previously discussed, the Project is not considered high risk from a socio-economic standpoint, and there are no significant socio-economic triggers which would necessitate a full Human Rights Impact Assessment. However, recognizing that Israel is a country where there are risks concerning human rights commitments on the national level, it is good international industry practice to undertake a voluntary Human Rights Due Diligence.

A summary of the potential human rights impacts and recommended mitigations are provided below.

## 7.1 GENERAL POLICIES AND PROCEDURES

During the Due Diligence process, corporate and Project policies, plans and procedures were reviewed to ensure there exists a commitment from senior management to protect and manage human rights. In addition, contractual language was reviewed to ensure that business relationships, including subcontracts and supplier relationships, are bound by the same policies and procedures.

NEML abides by its Corporate Social Responsibility Policy which outlines the company's guiding principles and commits to human rights by:

*"Recognizing that governments bear primary responsibility for protecting human rights, within our sphere of influence we share the goal of promoting respect for the rights set forth in the Universal Declaration of Human Rights. We are committed to provide security in a manner that is consistent with international human rights, and are guided in this effort by the Voluntary Principles on Security and Human Rights."*

The Policy also states, *"We encourage our business partners to share our commitment to corporate social responsibility."*

These corporate commitments are also explained in similar language in the Master Services Agreement, Purchase Order documentation, and Compliance Questionnaires required for all contractors and suppliers. The requirements set forth by NEML, as part of the broader company Compliance and Ethics Program and the company's Code of Conduct,

ensure that respect for human rights is part of contractual relationships and adhered to in direct business activities. Particularly, the contractual requirements state that all third parties contracted by NEML declare whether *“its parent or any of its affiliates, or any current director, officer or key employee ever been investigated or have been the subject of any allegations of wrongdoing concerning human rights or labor conditions,”* and ask whether the third party has a *“written policy addressing working conditions and/or human rights.”*

No human rights concerns were identified with respect to policies and procedures reviewed by ERM.

## 7.2 LABOR AND WORKING CONDITIONS

Workers are an important group of stakeholders who may be subject to a range of direct impacts, potentially both beneficial and adverse, in terms of access to employment, the terms and conditions of that employment, and their health, safety and welfare while working on the Project.

Noble Energy’s Global Management System (GMS) provides a framework for establishing performance goals. The GMS incorporates Noble Energy’s Legal Requirements and Best Practices, integrating elements from both Occupational Safety and Health Management Systems (OSHMS), such as OSHA PSM, API RP 75 and 75L, OHSAS 18001, BS 8800, ILO OSH 2001, CSA Z1000-06, and ANZI Z10 with Environmental Management Systems such as EPA RMP, ISO 14001 and World Bank Group standards and guidelines. The GMS is used to ensure that the ongoing process of identification, assessment and control of safety and environmental risks will continue throughout the lifecycle of the Project.

The GMS provides for (i) identification of potential hazards to workers, particularly those that may be life-threatening; (ii) provision of preventive and protective measures, including modification, substitution, or elimination of hazardous conditions or substances; (iii) training of workers; (iv) documentation and reporting of occupational accidents, diseases, and incidents; and (v) emergency prevention, preparedness, and response arrangements. Noble Energy also has an Emergency Management Plan which provides general direction for activities associated with emergency or disaster situations and is meant to provide the appropriate guidance for strategic thinking and decision-making as it relates to “All Hazards” emergency management planning.

In Israel, Noble is partnered with Rescue One to develop and provide the country’s first oil and gas industry EHS training program (for both employees and contractors). Noble also continues to ensure that

occupational health and safety for direct hire and subcontractor personnel throughout all Project phases is managed in accordance with the appropriate industry-leading US Gulf of Mexico requirements, namely Occupational Health and Safety Administration (OSHA) Regulations pertinent to the offshore Oil and Gas industry. The onshore facilities will be regulated in accordance with Israeli regulations.

Considering the Project is abiding by the GMS, and also has Project-specific health, safety, and environment processes in place, the Due Diligence process did not identify any potential impacts in relation to Labor and Workforce Health and Safety. There are adequate processes and measures to ensure safe working conditions, which is a primary factor when ensuring compliance with human rights.

In terms of other employment practices which ensure workforce compliance with human rights (such as freedom of association and effective recognition of the right to collective bargaining), company policies adhere to international standards and are made available to all Project personnel through the Israel Employee Policy Manual, as well as the employee and contractor language in employment contracts. The Policy Manual outlines employee rights under national labor and employment law (which also addresses employment discrimination, minimum wage, etc.), including their rights related to hours of work, wages, overtime, compensation, and benefits upon beginning the working relationship and when any material changes occur. While it does not discuss specific collective agreements, it does provide reasonable working conditions and terms of employment. Israeli legislation recognizes workers' rights to form and to join workers' organizations of their choosing, without interference. NEML, in its commitment to comply with national legislations, does not seek to influence or control these mechanisms.

As part of good international industry practice, companies should provide safe and healthy working facilities for all workers on site and ensure that any residential facilities provided to workers are safe and sanitary and meet their basic needs. On average, around 350 staff is working daily on the AOT Compression Project's construction phase, with approximately 50 representing NEML, and the majority of the other workers consisting of direct labor contractors working on mechanical construction. There are 14 local contracting companies on site at any one time; the number of contracted staff will taper off as construction ends in early 2015. The Site Construction Daily Report provides a daily count of workers, a detailed synopsis of all ongoing work, and keeps a health and safety log of incidents and near misses. All workers on site are provided health and safety training and are provided adequate protective gear. During the operational phase, the number of staff on site will be 20 at any one time, which is consistent with pre-compression project staffing levels.

Interviews with AOT site management indicated that there are a wide range of nationalities present on site for the construction phase. All contracted staff that is not from the local area is provided residence in neighboring Ashdod city, as there are no worker accommodations on site. Recruitment processes are fair and transparent, and do not appear to cause conflict over vacancies. Labor and working conditions on site during construction and operation are in compliance with human rights-related components.

At the time of the due diligence assessment, the exact number of workers needed during the construction phase of the Tamar Expansion was unknown. These workers will work and reside primarily offshore on a rotational basis, and will be provided the same level of protection in terms of their employment, health, safety, and welfare as is currently in place for the Tamar and AOT operations. Once the expansion construction phase is complete, approximately 35 permanent staff will remain working on the platform, which is consistent with current staffing levels. Due to the fact that construction and operations will follow the same aforementioned stringent company labor and working conditions policies and procedures, there are no anticipated concerns from a human rights perspective.

Regarding the right to work, just and favorable conditions of work and right to privacy, companies should have a worker grievance mechanism in place to ensure compliance with human rights. Noble Energy has a global workers grievance mechanism, Noble Talk, for review and resolution of concerns submitted from workers. Noble Talk is integrated into contractor orientation/awareness training.

### 7.3 LOCAL COMMUNITIES

The site visit confirmed that there are no local communities in the vicinity of the AOT who could be impacted by Project activities; all compression expansion work is being carried out within the existing AOT footprint, which sits on a relatively small parcel of land within a large industrial park.

NEML's operational staff and management teams have frequent contact with their commercial neighbors inside the AOT's general area of influence (within a 2 km radius). These neighbors include Paz Oil, the Water Desalination Plant, INGL and the Ministry of Defense which has a firing range adjacent to the AOT footprint. Ongoing communication is focused around health, safety, and security coordination.

From a socio-economic standpoint, the only stakeholder group who could be adversely affected by the offshore work as a result of the Tamar expansion construction is deepsea fishermen (adverse effect on their livelihoods). However, the EIA process determined that there would be no significant

impact due to the buffer zones that will be in place and the low level of fishing in the areas. The EIA also determined that the impact on illegal trawling practices in the vicinity of offshore construction would be minimal. As such, there are no anticipated potential human rights impacts as they pertain to local communities and the Tamar Expansion.

The construction work at the AOT and offshore for the Tamar Expansion provide employment opportunities for locals and generally may be perceived as providing direct benefits to local communities.

Through the air permitting and TAMA process for the AOT compression expansion and the Tamar Expansion, there were opportunities for communities to express opinions and objections regarding any Project-related decision affecting their human rights (including, but not limited to, access to resources and livelihoods, perceived burden on local food or water supply, loss of land, pollution of air, or contamination of water.) During these public consultation processes, ERM was informed by NEML management that there were no significant socio-economic concerns identified. However, NEML should review any community comments from the TAMA and air permitting processes and engage with the Government of Israel (which is responsible by law for stakeholder engagement during permitting) to ensure that if any community comments pertain to human rights issues, they have been properly addressed.

NEML has committed a Grievance Mechanism to be implemented at the community level for all its projects in Israel. This grievance mechanism will enable the company to ensure a timely and appropriate response to any concerns by communities and that potential impacts are addressed appropriately. NEML should ensure that the Grievance Mechanism is also provided for use at the AOT facility.

#### 7.4

#### *SUPPLIER ENGAGEMENT (SOCIAL ISSUES ONLY)*

The Due Diligence assessment of human rights did not only include potential direct impacts caused by NEML construction and operation, but also the activities of other parties associated with the Project. This is particularly important as construction of the offshore components of the Tamar Expansion are and will continue to be undertaken primarily by contractors and subcontractors. Furthermore, equipment, parts, and manufacturing contracts have been and will continue to be let by suppliers outside of Israel, which raises the potential risk of harmful child or forced labor within the supply chain, as well as occupational health and safety risks, if not properly managed.

Good international industry practice recommends that companies advise third party suppliers and partners to comply with corporate standards on human rights practices, and reinforce the message with human rights clauses in contractual agreements, regular questionnaires, and on-site monitoring. As described above, the requirements set forth by NEML as part of the broader company Compliance and Ethics Program and the company's Code of Conduct, ensure that respect for human rights is part of contractual relationships and is adhered to in all business activities. While there are no specific processes in place to monitor supply chain to ensure there is no use of forced, compulsory or child labor (either directly or in supply or processing chains), the company does conduct a compliance check of all suppliers to ensure they have had no human rights related infringements in the past. NEML's contractors, subcontractors, and first-tier suppliers are required to adhere to all of NEML's policies as they pertain to human rights.

NEML has provided a list of its major awards for the Project, primarily for equipment, which includes the type of supplier/manufacturer/third party, value of award, and country of origin/manufacture. The primary countries of origin were the United States, Germany, UK, Malaysia, and Italy. These countries are of low risk for child and forced labor, and generally have stringent occupational health and safety laws and regulations. Therefore, the Due Diligence assessment did not find any significant potential human rights impacts related to the supply chain. However, NEML should assess its primary supply chain on an ongoing regarding human rights as major first-tier supplier contracts in foreign countries are let.

## 7.5 SECURITY PROVISION

The Due Diligence process examined several factors associated with the provision of private security, following the guidance set forth in the Voluntary Principles on Security and Human Rights.

As outlined by international guidance (Global Compact, 2010), the company is allowed to "use security guards to protect its workers and property where this is considered necessary. However, the company should ensure that its security guards, whether directly employed or contracted, behave in accordance with national law and international principles for law enforcement and the use of force. This includes preventing excessive use of force, abuse of power or other human rights abuses by security personnel towards other employees or local communities."

The AOT facility is protected by private security guards who are provided by a reputable and world-class international security firm contracted by NEML. The guards at the AOT have been trained by NEML in human rights. NEML also uses its contractual processes to ensure that provisions

are in place for conducting background checks on security staff, as well as monitoring performance. Furthermore, NEML regularly conducts security risk assessments, and ensures that company security arrangements, including the deployment of private guards, are proportionate to the security risk. Public security forces are not used to protect the AOT facility.

The previous assessment of the AOT facility also applies to the Tamar platform, as it is also guarded by the same private security contractor. However, as dictated by Israeli law, the platform perimeter and offshore construction work is protected by the Ministry of Defense. By law, NEML has no authority to dictate terms or conditions of the protection, or recommend training for public security as it pertains to the Voluntary Principles on Security and Human Rights. While NEML does engage with the relevant authorities to ensure that such security functions are coordinated, the company cannot ensure procedures are conducted in accordance with international human rights principles for law enforcement and the use of force.

The mandatory use of public security offshore does mean there is a heightened level of risk of the security infringing upon the rights of local communities and stakeholders, which is outside of NEML's control. However, the risk of a security incident involving public security forces is reduced by the fact that the buffer zones during construction will be temporary and during operations will remain 170 km offshore, although public security force retaliation to a terrorist threat against the facility could still occur.

NEML should ensure that the Grievance Mechanism is accessible to those who could be affected offshore. The Grievance Mechanism will aid the company in monitoring any actual or potential human rights violations which are either a result of operations or directly outside of company control.

## 7.6

### *CONCLUSIONS*

NEML has demonstrated its respect for human rights in a number of ways and is in alignment with internationally recognized best practices. These best practices include seeking to prevent or mitigate potential human rights issues that may be caused directly by the company's operations, or by the operations of project partners and suppliers. This has been done through ensuring that human rights related policies, procedures and plans are not only in place, but are embedded into various management systems (such as the GMS). The company has also expressed its commitment to respect human rights through a policy endorsed by senior leadership and adopted at the Project level.

## 8.0 *MITIGATION AND MANAGEMENT*

NEML has committed to a comprehensive management and mitigation framework to manage potential environmental and social risks and impacts. These include management systems, management and action plans, as well as a series of other commitments.

### 8.1 *ENVIRONMENTAL AND SOCIAL MANAGEMENT SYSTEM*

NEML intends to structure its Environmental Management Plans in alignment with its Environmental and Social Management System (ESMS), which will integrate with their Global Management System (GMS) and Quality Assurance System (QA).

Details of these plans are described below and annexed where noted.

#### *Global Management System (GMS)*

The Global Management System (GMS) provides a framework for establishing performance goals and incorporates NEML's Legal Requirements and Best Practices, integrating elements from both Occupational Safety and Health Management Systems, such as OSHA PSM, API RP 75 and 75L, OHSAS 18001, BS 8800, ILO OSH 2001, CSA Z1000-06 and ANZI Z10 with Environmental Management Systems such as EPA RMP, ISO 14001 and World Bank Group standards and guidelines. Other country and project-related processes and procedures (e.g. ERP, SEMS, Safety Plan, OSRP) are aligned with NEML's corporate commitments. NEML has a risk mapping system under the GMS which ensures alignment with PS1 management program components (see GMS Brochure in *Annex 2*).

#### *Safety and Environmental Management System (SEMS)*

A Safety and Environmental Management System (SEMS) is under development for the NEML operations to comply with best industry practice as well as to meet regulatory requirements. The SEMS will be part of an Operations Management System (OMS) that will incorporate elements of Noble's occupational safety and health systems as well as an Environmental Management System. Social and health related management and monitoring as it pertains to OHS is also covered under the aforementioned systems and plans, and NEML also operates a Safety Plan across its operations which aligns with Israeli requirements and international standards.

Under NEML's SEMS, the company will be responsible for ensuring that all contractors meet environmental and health and safety standards. This is part of NEML's ISN review of these contractors prior to awarding contracts.

***Safety Plan***

A Safety Plan was developed to meet the requirements of the Israeli Labor Law and describes the process under which OHS principles and procedures are applied for the Project which includes the methodology to 1) identify hazards, 2) establish the risk potential and 3) implement policies and procedures as to how such risks will be mitigated. It is a requirement of the Ministry of Energy and the Ministry of Economy. It includes an assessment of physical hazards includes: natural gas fire and explosion; fall from heights (including off-shore transferring); spillage of volatile liquids; gas leaks; collapse of a structure; struck by / caught between / fell on and other similar hazards; collision with a platform; and drowning.

The Safety Plan also includes a list of chemical / biological / physical elements for which a safety sheet or environmental monitoring is required. The plan also outlines medical procedures for those who may be exposed to these hazards. The Safety Plan takes into account special hazard environments as they pertain to offshore and platform operations.

A Life and Fire Safety Plan is in effect for the AOT operations and covers the issues of: fire prevention, means of egress, detection and alarm systems, compartment, and fire suppression and control. Elements of this are also captured in emergency response plan and the Emergency Response Plan.

***Emergency Management Plan***

NEML has a four tiered approach to health and safety policies which includes: a) Safe Work and Operating Practices, b) Emergency Preparedness and Community Awareness, c) Safety and Environmental Training, and d) Contractor Safety Management.

In 2014, NEML also completed, updated and published the following Plans (Components of the EMP): Business Continuity-Tier 3; MEDEVAC-Tier 3; Tamar EEP-Tier 4; Oil Spill Contingency Plan-Tier 3. NEML also conducted the following training and exercises: well containment; Equipment Deployment for an Unintentional Release of Hydrocarbons; and country evacuation. NEML also participated in a multi-national full-scale exercise testing the following functions: Terrorist Response, Search and Rescue, Medical Evacuation, and Response to Unintentional Release of Hydrocarbons. The approved Emergency Management Plan (EMP) – Tier 3 (see *Annex 5*) and approved by Israeli regulatory bodies. The EMP includes various elements to establish procedures to how the company responds to accidents and emergency situations.

The EMP established the structure and the roles and responsibilities of the NEML Incident Management Team which provides the response actions to

accidents and emergencies. The EMP is supplemented by annexes which include, among others, an Oil Spill Response Plan, Facility Emergency Plans, Mass Casualty Plan, Fatality Management Plan, Security Emergency Management Plan, and a Medical Evacuation Plan. In addition, at the AOT, a Factory Plan (required by local authorities) and a Station Bill provide additional instructions in the event of incidents. Currently, these documents are in revision to update the plans to account for the commissioning of the compression project.

The project also has a rig emergency response manual which contains information regarding fire and explosion actions. The Project adheres to international OHS and emergency protocols for offshore drilling.  
Stakeholder Engagement Plan

#### *Waste Management Plan*

NEML has developed Tier 3 and Tier 4 procedures to instruct facilities as well as contractors working at NEML facilities as to required waste management practices. These procedures cover both hazardous and non-hazardous waste disposal. An effort is currently underway to produce a life cycle chemical management program that is meant to reduce use of hazardous chemicals and reduce wastes needing hazardous waste treatment and disposal. This procedure will be initiated at the point of purchase and follow through to the disposal of the product as waste.

#### *Stakeholder Engagement Plan*

NEML is committed to establishing and maintaining transparent, respectful, and regular engagement practices to ensure that stakeholder concerns and interests are fully understood and managed. These practices are above and beyond the engagement activities managed by government agencies as a part of the permitting processes. NEML's Stakeholder Engagement Plan (SEP) (see *Annex 3*) takes into consideration identified environmental and social impacts.

#### *Environmental Monitoring Plans*

NEML will be required under the new Israeli offshore guidelines which are being applied to the Tamar Fieldwide EIA to develop a comprehensive monitoring plan and will do so once the requirements are established.

Following NEML monitoring plans and as part of the implementation of an EMS, the data from those plans are analyzed for trends and key performance indices. These plans are being developed as part of the requirements of Noble's permits and operating licenses. Recent monitoring, for example has been performed at the Tamar and Mary B fields and platforms and as part of baseline studies conducted for proposed development and drilling activities. As part of the compressor project at the AOT, Noble will be operating a

continuous emission monitoring system (CEMS) which will collect real time emissions data where it will be uploaded to regulators as well as into Noble's data management and historian system.

#### ***Other Plans***

Hazardous materials will be handled according to their Material Safety Data Sheet (MSDS) to ensure worker health and safety. NEML will develop a radioactive management program in the event that radioactive material is present in significant amounts (highly unlikely based on analysis of SW-1 well).

### 8.3 ENVIRONMENTAL MONITORING

NEML will conduct environmental monitoring in accordance with discharge permits established in conjunction with the Ministry of Environment. Monitoring will occur frequently (i.e. daily for fuel use, discharge etc.) and be analyzed to ensure that the practices meet operating standards and to determine corrective actions if needed.

### 8.4 BIOLOGICAL AND PHYSICAL MITIGATION MEASURES

As detailed in the 2015 Tamar Lease Development EIA, measures to reduce, and manage the potential impacts to the physical and biological environments include the following (additional details can be found in the EIA):

#### **Drilling and production test performance**

- Drilling and completion operations will be conducted using industry best practice. The installation, maintenance, and testing of the BOP will follow prescribed safety protocols.
- Drilling operations will comply with applicable well control standards, including adherence to safe drilling practices. All drill string sections will be properly set in concrete to assure well integrity. Upon the completion of drilling, the well will be properly closed and abandoned per current industry best practice.
- All drilling operations will be conducted in compliance with a series of operational procedures and instructions, including prescribed drilling procedures, well control procedures, and work instructions. Primary responsibilities and relevant reference documents, which cover operational procedures, including drilling, will be clearly identified.

#### **Handling of Hazardous Materials**

- Hazardous chemicals will be handled in accordance with their SDS-specified guidelines, as integrated into the operator's guidelines for handling hazardous materials. All hazardous materials will be properly identified, stored, and handled, per SDS requirements and in such a manner that secures no spill/discharge to sea. In addition, hazardous materials will be handled with SDS-based exposure limits.
- Hazardous wastes will be handled in compliance with applicable regulations and permit requirements, and guidelines and will be detailed in the environmental management procedures.
- Hazardous materials that should be kept away from each other (e.g., oxidizers and flammables) will be separated.
- SDS information will be on hand for each hazardous material in store.
- Firefighting equipment will be available on board.
- Hazardous materials will be stored in a proper container.

#### **Reduction and Prevention of Harm – Land, Seawater, and Coastline, Including Marine Ecology**

- All seafloor activities will be conducted considering the location of communication cables.
- All discharges to the sea will be according to the discharge permit provisos.
- Oil spill response, both aboard the project vessels and overboard, will adhere to the vessel's Shipboard Oil Pollution Emergency Plan and NEML's Oil Spill Response Plan for Offshore Operations and its Emergency Preparedness and Community Preparedness protocols.
- All solid waste processing, storage, and transport will comply with waste management priorities and procedures (e.g., Israel Regulation, MARPOL Annex V). No solid waste discharge will be allowed.
- The operator will maintain the solids control equipment in optimal operating condition.
- The operator will maintain its Marine Sanitary Devices in operating conditions.
- Conduct a detailed survey along the alignment of the planned utility lines to determine the possible existence and extent any archaeological sites.

#### **Preservation of Fauna and Flora**

- Use shallow geohazards data to verify the absence of hard bottom or chemosynthetic communities within the pipeline and control line corridor;

- Ensure support vessels follow the most direct route possible (weather conditions permitting) between the project location and the marine transportation hub (Haifa);
- Plan flight paths to avoid populated areas, wildlife areas, and bird colonies, and set minimum cruise altitudes when crossing the coast or offshore islands to minimize physical presence and noise-related effects; and
- Conduct routine flights during daylight hours

only. **Monitoring Procedures**

- Monitoring program will be conducted following completion of drilling. The post-drilling survey will be conducted, including sampling of seawater, sediments, and infauna. Reporting of results will include comparison of pre-drill and post-drill survey results.
- The specific seawater and sediment chemistry analytes are outlined in Tables 4-21 and 4-22.
- Mud samples will be taken for every drilling section, including those drilled using MOB/M.
- Testing of drilling muds and associated chemicals will be conducted in compliance with discharge permit requirements, including the periodic toxicity testing of drilling muds during drilling.
- Monitoring is performed at all levels and phases of the work, including during drilling and installation activities, and for ongoing operations. Area-well-specific environmental monitoring is performed, as are periodic area-wide monitoring surveys.
- Monitoring procedures have been and will be instituted to comply with all applicable permits and regulations, NEML policy, and best industry practice.

**Preventing/Reducing Light Hazards**

Lights should be shielded (i.e., oriented downwards) to maximize work areas and minimize lighting of the sea surface, when feasible and when vessel navigational safety is not compromised. This minimizes the potential for light to be visible to marine organisms.

**Measures for Reducing Air Emissions**

- Conduct routine maintenance procedures.
- When practical, utilize low-sulfur fuels to limit SO<sub>x</sub> production.
- During the drilling of the well, every attempt will be made to ensure that no H<sub>2</sub>S gas is released into the atmosphere. This will be done by

keeping the wellbore full of drilling mud that is of sufficient density to exert a hydrostatic pressure greater than formation pressure, which will ensure that no influx into the wellbore will occur.

- Mud logging personnel will install and maintain H2S detection equipment at strategic locations on the rig. The Control Room Operator and supervisory personnel will be alerted should H2S be detected.
- An H2S detection system will be installed to warn of the presence of H2S. The sensors will be located at the possum belly, moon pool area, pit room, and rig floor. Audible alarms will sound if H2S is detected.

### **Accidental Spills and Emergency Procedures**

- Develop and implement an Oil Spill Contingency Plan/Emergency Response Plan, which outlines
- Tier II and III equipment and resource requirements;
- Routinely check equipment stockpiles onshore and aboard supply vessels;
- Conduct spill drills to familiarize personnel with emergency response procedures;
- Comply with NEML's EHS GMS, including its Environmental Policy and Health and Safety Policies;
- Conduct oil spill dispersion modeling to determine likely trajectories and resources at risk;
- Accidental spills will be reported to the relevant authorities; and
- NEML will maintain appropriate oil spill response and cleanup equipment and supplies to efficiently address spill incidents.

### **Measures for Reducing the Impacts of Discharges and Wastes**

- Conduct routine maintenance procedures and verify that all equipment associated with discharge sources (e.g., oil-water separators, solids control equipment, sanitary wastes, gray water, food wastes) is working within stated discharge specifications, in compliance with permitted discharge limitations or acceptable standards;
- Comply with NEML's Waste Management Plan and adhere to MARPOL restrictions on overboard dumping of waste; and
- Conduct a site clearance survey at the Tamar Field and along the pipeline corridor to verify the absence of marine debris.

### **Measures to Manage the Safety of Vessels and Infrastructure**

- Enforce a buffer zone around the DP pipelay vessel;
- Ensure that NEML consults with Haifa port authorities and provides notices to mariners that a DP pipelay vessel and other support vessels will be operating offshore;
- Position the DP pipelay vessel away from major shipping lanes to the maximum extent feasible;
- Mark the DP pipelay vessel with appropriate navigational markers;
- Ensure support vessels follow the most direct route possible (weather conditions permitting);
- Avoid traveling close to the coast, except for when approaching the shore base;
- Ensure support vessels do not transverse coastal waters at night; and
- Vessel operators are to follow applicable maritime navigation rules.

### **Wellsite Abandonment and Rehabilitation**

At the time of abandonment, NEML will comply with applicable regulations and best industry practice, which are designed to achieve the following:

- Isolate and protect all freshwater zones.
- Isolate all potential future commercial zones.
- Prevent in perpetuity leaks from or into the well.
- Cut pipe to an agreed level below the seafloor and remove all surface equipment, if required

## 8.5

### *SOCIAL MITIGATION MEASURES*

This section focuses on management and mitigation measures pertaining to the social impacts detailed in Sections 5.5 and 6.2.

#### *Mitigations and management of specific impacts*

##### *Impact on fishing livelihoods*

Ongoing disclosure to affected sea users as it pertains to safety and buffer zones continues by the Israeli government for the offshore components of the Project. Israel has a unique situation in that NEML's gas producing facilities are considered as strategic assets that require strict security measures for protection. In this light, the Ministry of Defense establishes safety zones around the Noble platforms that prevent fishing and other

vessels from approaching within five miles of the facilities. From this sense, NEML has little to no influence on most maritime activities surrounding NEML's platforms.

However, since no fishing is expected in the vicinity of the well due to water depth [approximately 1,700 m]; no mitigation measures are suggested beyond the 500 meter radius buffer zone enacted where all ship traffic will not be permitted near the rig. Support vessels, including military, will be deployed to ensure that no vessels enter the buffer zone.

While NEML is protected against legal ramifications from grievance seekers by the TAMA process, the fishermen who sought compensation for previous related Project impacts could seek further action against NEML directly (namely social pressure to achieve compensation and worst case protests or legal action) (see Section 5.5). While not likely (considering they have sought legal recourse to the full extent of Israeli law), any direct action against NEML could have reputational impacts. Commercial fishermen have been included as a stakeholder group with the Stakeholder Engagement Plan (see Annex C) and seasonal considerations for fishermen are understood and respected by NEML as part of the engagement process.

NEML does have provisions in place as part of its emergency response procedures to notify mariculture and fishing communities in the event of an incident. These actions would include establishing mitigation actions to protect and limit damage to these resources.

#### *Impact on recreational sailing, yachting, and deep sea fishing*

Recreational sailors, yachters and fishermen have been included as a stakeholder group with the Stakeholder Engagement Plan (see Annex 3). Ongoing disclosure to affected sea users as it pertains to safety and buffer zones continues by the Israeli government for the offshore components of the Project, which may include notifications of buffer zones which could affect recreation.

#### *Impact on onshore neighboring communities as a result of increased traffic*

As documented in NEML's Stakeholder Engagement Plan (see Annex 3), NEML's operational staff and management teams have frequent contact with their commercial neighbors inside the AOT's general AoI (within a 2 km radius). These neighbors include Paz Oil, the Water Desalination Plant, INGL and the Ministry of Defense which has a firing range adjacent to the AOT footprint. Ongoing communication is focused around health, safety, and security coordination, including potential traffic impacts

### *Impact of community exposure to disease as a result of workforce*

NEML has attempted to minimize the number of expatriate workers at its sites and focuses on hiring a national workforce. As part of its activities at its facilities, NEML has an operational incident reporting system that notifies management and health and safety professionals of any injuries or illnesses among its workforce. This incident tracking system follows any illnesses or injuries through an initial report to its conclusion as to any required medical treatment and results.

NEML has stringent occupational health and safety programs and training programs which could be mandated to educate the workforce on risks associated with communicable diseases and conduct of the workforce in communities, if necessary.

### ***Stakeholder Engagement***

NEML has staff dedicated to community relations activities. This staff assisted with a Dec. 2014 visit to the Tamar Platform for the Haifa district licensing authority, the Ministry of Energy and Water Resources and the Ministry of Environmental Protection in order to introduce offshore project components to national and regional government officials.

In addition, operations staff at the AOT engages with other businesses within the industrial park (the Project's area of influence) which are the primary stakeholders, including Paz Oil, INGL and the Ministry of Defense. NEML also engages with the local emergency services and conducts regular emergency drills in cooperation with local authorities and industrial park neighbors.

A structured grievance mechanism (referred to as a community feedback mechanism) that provides opportunities for the receipt, investigation, and resolution of complaints is under development. The mechanism will consider stakeholder accessibility (e.g., consider approaches other than phone and email), where applicable. A person to manage the process has been committed.

There is also a public comment process in place which is related to the EIA and EA processes undertaken by the Government of Israel. NEML are greatly affected by public comments in that the Government of Israel puts a lot of focus into anticipation of being asked questions.

The Air Quality and Toxin Permits, which are publically accessible documents and required by the Government of Israel also include contact details for the relevant NEML person responsible.

## *Human Rights*

In an effort to enhance its human rights performance on the Project (including both the AOT and the Tamar Expansion), NEML should continue to embed human rights related mitigations in the form of stakeholder engagement planning and a grievance mechanism into its operations. An additional benefit of these mitigations will be the establishment of processes to proactively manage any actual or potential human rights issues in the future. Specific recommendations are:

- NEML should review any community comments from the air permitting processes and engage with the Government of Israel (which is responsible by law for stakeholder engagement during permitting) to ensure that if any community comments pertain to human rights issues have been properly addressed.
- NEML should ensure that the Grievance Mechanism is also provided for use at the AOT facility.
- NEML should assess its primary supply chain on an ongoing basis regarding human rights as major first-tier supplier contracts in foreign countries are let.
- NEML should ensure that the Grievance Mechanism is accessible to those who could be affected offshore. The Grievance Mechanism will aid the company in monitoring any actual or potential human rights violations which are either a result of operations or directly outside of company control.

## **Annex 1 – Overview of the Jordan pipeline**

## JORDAN PIPELINE – SCOPE

Two pipeline projects from the Israeli Gas Grid to Jordan are being conducted by Israel Natural Gas Lines (“INGL”).

### 1. 30" PIPELINE FROM 'DOVRAT' VS TO 'EMEK HAYARDEN' MS

#### a. General

Constructing a 30" pipeline that will connect existing INGL infrastructure in Israel to the Arab Gas Pipeline in Jordan as needed to facilitate the supply of NG to the Jordanian National Electric Power Company (“NEPCO”).

Israel Natural Gas Lines (“INGL”) does planning & engineering and will own and operate a 30" pipeline from the existing Dovrat station to the Jordan border . A Map describing the route is attached.

Tractable has been retained to perform FEED for the pipeline extending from the Delivery point at the Israel/Jordan border till the connection to the Arab Gas Pipeline.

#### b. Statutory Planning Status (Table 1)

- a. The section from 'Dovrat' VS to 'Emek-Hayarden' MS is established and was approved within TAMA 37B (2006).
- b. The section from 'Emek-Hayarden' to the Jordan border is being planned by Natural Gas Authority (NGA) under new statutory plan (TABA – Local outline plan).
- c. The 'Dovrat' VS expansion is required to include branching to the 30" pipeline and a pig receiver/launcher. This expansion will require a revised statutory plan (TABA).
- d. For the 'Emek Hayarden' MS, 3,000 m<sup>2</sup> is required but the current area is only 700 m<sup>2</sup>. NGA has initiated a revised statutory plan (TABA) plan for this additional area. The Planning company is AVIV.
- e. For the 'Gazit' Valve Station (VS) between 'Dovrat' and 'Emek-Hayarden', INGL is preparing a new statutory plan (TABA – Local outline plan) for a ~700 m<sup>2</sup> site.

#### c. Engineering

Detail design includes the following SOW:

- a. Expansion of 'Dovrat' Valve Station (VS).
- b. 30" pipeline from 'Dovrat' VS to 'Emek Hayarden' MS
- c. 'Gazit' VS
- d. 'Emek-Hayarden' MS
- e. 30" pipeline from 'Emek-Hayarden' MS to Jordan Border (pending statutory plan approval)
- f. Isolating valve (Next to the border)

**Figure 1: 30" route from Dovrat to Jordan Border (NEPCO PIPELINE)**



**Table 1. Summary table for system planning and engineering status**

System elements Description		size	Planning TAMA/TABA	Design
Pipeline	Dovrat - Gazit	22 km / 30"	Approved	Ongoing*
	Gazit - Emek-Hayarden			
	Emek-Hayarden - Jordan	3 km / 30"	Ongoing*	Not started
Stations	'Dovrat' VS [Expansion]	TBD	Ongoing*	Not started
	Gazit VS [new]	700 m <sup>2</sup>	Ongoing*	Not started
	'Emek-Hayarden MS [new]	~ 3,000 m <sup>2</sup>	Ongoing*	Not started

(\* Subject to the planning and engineering budget limit)

## **2. 12" PIPELINE TO JORDAN APC/JBC**

### **2.1 General**

Constructing a part of a pipeline that will extend existing INGL infrastructure in order to supply NG to APC/JBC at their facilities in Jordan by a 12" pipeline connection, (length 15.5 Km)

The new pipeline will be constructed from the existing Sdom station till the delivery point at the Israel/Jordan border

An additional 12" line will be constructed from the Delivery point at the border till APC/JBC's facilities on the Jordanian side of the Dead Sea (by Tractable on behalf of APC/JBC) to complete the connection

## 2.2 **Regulatory**

The pipeline route in Israel was approved by the National Planning Committee on January 6, 2015. Two routing options were presented, while the preferred route by INGL was approved. This pipeline route is along Highway 90 and south of the salt ponds (Figure 2).

The statutory planning documents (TAMA 37/A/8/1) are being prepared by INGL, in accordance with the approved route. The statutory plan documents will include special instructions for environmental, existing infrastructure considerations, and drainage issues. The planning documents will be reviewed by the 'Editors Committee' to be finalized and issued for final depositing and public objections by April 1, 2015.

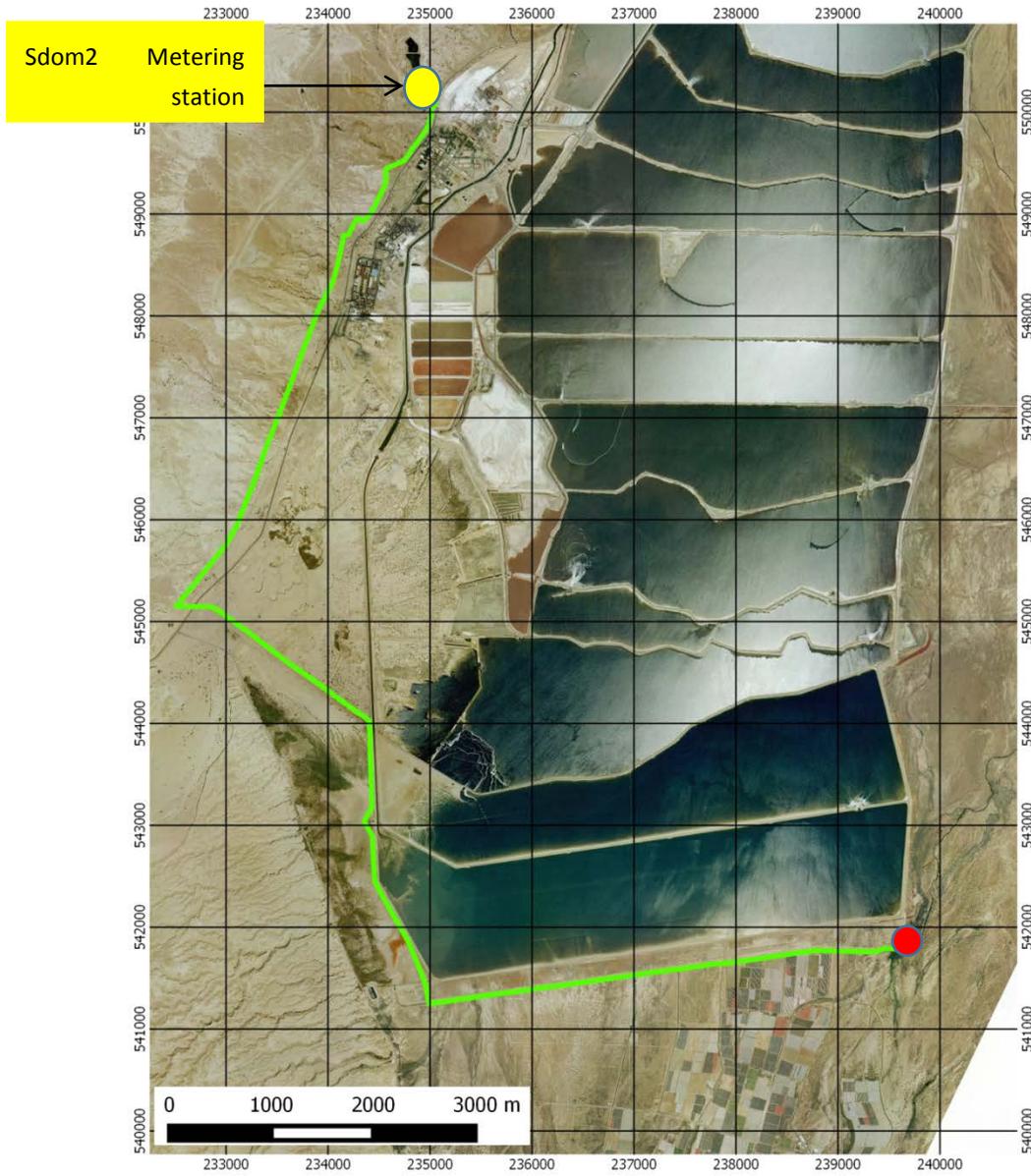
## 2.3 **Engineering**

- a. The 'Sdom 2' Metering Station is under construction. A dedicated space in the station perimeter and structure is reserved for the APC/JBC metering skid and pipe work.
- b. Engineering SOW will include the following:
  - Pipeline, 12" Dia'/15.5Km, from 'Sdom 2' MS to Jordan border (Tie-In point).
  - Border crossing of a 3 m depth of cover, in accordance with Ministry of Defense requirements.
  - Buried Isolation valve about 100-200 meters west of the border.
- c. Technical coordination with APC/JBC at the connection point is being discussed, including final location for pipeline connections.

## 2.4 **APC/JBC**

APC/JBC hired Tractebel Engineering services to provide the FEED including routing for the pipeline on the Jordanian side of the border..

**Fig 2: 12" pipeline route from 'Sdom' to Jordan border**



## Annex 2 – GMS Brochure



ADVANCING EHS  
LEADERSHIP  
*through*  
GLOBAL  
TEAMWORK

## POLICY

Noble Energy is committed to conducting its business in a manner that protects the environment, health and safety of all employees and the public. Noble Energy's commitment is to maintain a culture that fosters the development of a safe, efficient and environmentally sound workplace. We will comply with all applicable laws and regulations and apply reasonable standards where laws and regulations do not exist. Through continuous EHS stewardship, we strive to minimize injuries and incidents while protecting the environment.

## PRINCIPLES

### *Leadership*

demonstrated through high expectations and personal ownership, responsibility and accountability for EHS performance

### *Performance*

promoted through positive interaction with people and our environment on a daily basis to achieve excellence

### *Excellence*

advanced through genuine care and compassion for your fellow man and the environment leading to a strong EHS culture

### *Culture*

fostered through interpersonal relationships, teamwork and common beliefs; communicated repeatedly, consistently and accurately

## VISION

Demonstrate leadership in Safety and Environmental Management, continuously decreasing the risk of injury, illness and environmental impact.

## VALUES

### INTEGRITY

We are committed to conducting our business with integrity, respect and ethical standards.

### TEAMWORK

We are committed to supporting and implementing a team-oriented work environment, ensuring cooperation, communication and professionalism.

### PROCESS

We will continuously challenge existing ideas and best management practices to provide high EHS standards in all of our operations.

### ACCOUNTABILITY

We will provide a fair appraisal of our safety and environmental activities and foster a culture that encourages individual responsibility for safety and environmental leadership in each organizational unit.



## 14 KEY ELEMENTS

In order to achieve excellence in our operations, Noble Energy and its operated affiliates must consistently and equitably implement the effective application of quality, commercially viable and corporately sustainable operations. Noble believes that the protection of our personnel, our neighbors and our surrounding environment are vital to the future integrity of both the corporation and the industry that supports it. To this end, Noble has established a Global Environmental Health and Safety Management System (GMS). This GMS incorporates Noble's legal requirements and best practices into an umbrella framework within a model that integrates elements from both Occupational Safety and Health Management Systems (OSHMS) such as: OSHA PSM, API RP 75 & 75L, OHSAS 18001, ILO OSH 2001, CSA Z1000-06 and ANZI Z10; with Environmental Management Systems (EMS) such as: EPA RMP, ISO 14001 and World Bank.





P R E P A R E  
\* \* \* \* \*

PREPARE

## I. MANAGEMENT COMMITMENT AND EMPLOYEE PARTICIPATION

Noble Energy's management is committed to, and provides leadership and resources for, protecting the health, safety, environment and social aspects of our business. We maintain high ethical standards as a responsible corporate citizen. Noble's management is committed to the implementation of our GMS and to the establishment of clear and consistent expectations of how we will conduct our business responsibility worldwide. In addition to Noble's Safety, Health, and Environmental Protection Policy, the company's Code of Business Conduct includes the following related policies:

- The Workplace Safety Policy, which reflects the company's commitment to maintain a safe workplace that is free from recognized hazards
- The Violence in the Workplace Policy, which reflects the company's commitment to prohibit verbal or written threats of violent behavior, as well as acts of violent behavior, in the workplace
- The Firearms and Weapons Policy, which reflects the company's commitment to prohibit employees, other than authorized security personnel, from carrying firearms or other weapons on the company's premises
- The Prohibited Substances Policy, which reflects the company's commitment to prohibit employees from the unlawful manufacture, distribution, dispensation, possession, or use of a controlled substance, or being under the influence of a prohibited substance without medical authorization while on the company's premises or while performing services for the company.

Noble Energy will assign and notify each employee of the GMS responsibilities inherent to their job position, periodically measure performance and recognize the worker's achievement of goals, objectives and targets. To assist employees in realizing their EHS responsibilities and provide opportunities for continual improvement, the following programs and initiatives have been established:

- **Stop Work Authority:** Any person engaged in operations on a Noble Energy facility, whether an employee or a contractor, has the authority and responsibility to “stop work” to preserve the safety of personnel, protection of the environment and compliance of government regulations.
- **EHS Champions:** Area specific operations personnel dedicated to improving EHS initiatives and compliance with EHS policies on a daily basis
- **(NSC) Noble Safety Council:** Dedicated representatives from various areas of operations who meet quarterly to share safety related experiences, issues and concerns and serve as advisory to management in the fostering of a safe and healthful workplace
- **(NEC) Noble Environmental Council:** Dedicated representatives from varies areas of operations who meet quarterly to share environmental related experiences, issues and concerns and serve as advisors to management in the fostering of an environmentally responsible workplace
- **Area Safety Committees:** Dedicated employees committed to working together towards the improvement of EHS performance within a specific area or region. Representatives from each local committee serve on the Noble Safety Council and Noble Environmental Council
- **GMS Rewards Program\*:** The company depends heavily on the elements of our GMS in the fostering of a safe and healthful workplace. Management of change (MOC), pre-start-up review, risk analysis, Standard Operating Procedures (SOP), Job Risk Analysis (JRAs), near-miss reporting and training are all examples of initiatives that require active participation. In support of these initiatives, the company maintains a participation program. Earned points are accumulated on a quarterly basis to an online company store and may be redeemed for merchandise bearing the company logo and your recognition as a “Leader in Safety.”

- **Kid's Poster Contest:** At Noble we value our employees as our most important asset. In order to promote safety and health, both on the job and off, we created a kid's safety poster contest for the children, grandchildren, nieces and nephews of our employees to encourage safety in our homes. The top three entries are published in the quarterly EHS Newsletter.
- **Why I Work Safe Program:** Each quarter, employees have the opportunity to submit a photograph along with a brief description that best represents why they work safely. The top three entries are published in the Quarterly EHS Newsletter.
- **Quarterly EHS Newsletter:** Quarterly newsletter generated within Noble that highlights EHS news, activities, new initiatives, employee involvement and seasonal considerations

## II. LEGAL ASPECTS AND DOCUMENT CONTROL

Noble Energy identifies and complies with all regulations in each country where it conducts business. In the absence of host country regulations, Noble Energy applies best industry practices.

Retention of records, reports, and documentation is specified by this GMS, maintained in compliance with Noble Energy's Records Retention Policy and may be maintained in one or more of the following formats: electronic, imaged, paper, or radiographic.

## III. SAFE WORK AND OPERATION PRACTICES

Noble Energy has developed Safe Work and Operating Practices for its personnel. Third-party contractors will follow their own Safe Work and Operating Practices, which must meet the general requirements of Noble's Safe Work and Operating Practices. These Practices include company plans, procedures and strategies implemented for the protection of personnel and the environment. They are periodically reviewed to support continual improvement and include applications such as:

- **Standard Operating Procedures (SOP)-** A written set of instructions that provide direction, improve communication, reduce training time and improve operational efficiency
- **Job Risk Analysis (JRA) -** A method that can be used to identify, analyze and record the steps involved in performing a specific job, the existing or potential safety and health hazards associated with each step, and the recommended action(s)/procedure(s) that will eliminate or reduce these hazards and the risk of a workplace injury or illness

- Safe Work and Operating Practices;
- Hazardous Communication Program  
(online Noble MSDS database @ [www.eservice.msds.com](http://www.eservice.msds.com))
- Lockout / Tagout Program
- Respiratory Protection Plan
- H2S Management Plan
- Fleet Safety Management Plan
- Dive Safety Plan

#### **IV. PROCESS SAFETY AND ENVIRONMENTAL INFORMATION**

Risks inherent to an operation are evaluated using industry best practice assessment methods. Risks identified are reduced to the most feasible level at the design stage and managed in accordance with risk severity in the operation stage.

- Facilities or appropriate field offices will maintain information on the significant environmental aspects and related actual or potential impacts associated with their work and the environmental benefits of improved performance.

#### **V. EMERGENCY PREPAREDNESS AND COMMUNITY AWARENESS**

Noble Energy develops and implements incident management plans at each of its operations and also at the corporate level in order to coordinate each of its facilities. The plans contain provisions for dealing with anticipated emergencies and clearly assign authority and duties to ensure that responses to emergencies are timely and effective. Plans include:

- Business Continuity Plan
- Incident Management Plans
- Oil Spill Contingency Plans
- Spill Prevention, Control and Countermeasure Plans
- H2S Contingency Plans
- Hurricane Evacuation Plans
- Coast Guard Emergency Evacuation Plans



E X E C U T E  
.....

EXECUTE

## VI. SAFETY AND ENVIRONMENTAL TRAINING

All personnel at Noble Energy operated facilities are trained to perform their functions in a manner to protect personnel, the environment, and equipment. Contractors are responsible for providing training for their employees prior to beginning work at Noble Energy facilities and for providing adequate training documentation or verification. A variety of training methods are applied including:

- (CBT) Computer Based Training: A collection of general safety awareness programs chosen to educate employees in the general risks associated within the oil & gas industry and to meet specific regulatory training requirements.
- (SST) Site Specific Training: Site Specific Training is identified for each district through an assessment survey, area risk analysis, job safety analysis, near-miss reports, incident reports, employee input, or regulatory requirements.
- Safety Alerts / Did You Knows: Documents occasionally distributed to communicate safety and environmental information
- Field Safety Orientation: Safety orientation provided once each calendar year prior to personnel gaining access to a Noble Energy field location

## VII. CONTRACTOR SAFETY MANAGEMENT

Noble Energy is committed to a safe, healthful and environmentally responsible work environment and recognizes the impact that our contractors can have toward achieving EHS excellence. It is intended that contractors work under conditions and pursuant to rules that are at least as protective as those governing Noble Energy's employees. It is not intended that Noble Energy take control of a contractor's safety program or relieve any contractor of their safety responsibility. Noble Energy has developed a separate Contractor Safety Management Plan to achieve compliance with this element of the GMS that includes the evaluation of contractor safety performance prior to contract award through the ISNworld Contractor Database.

“Contractor Safety Program Assessment” maintained through ISN Software Corporation @ <http://www.isnworld.com>.

## VIII. PRE-START-UP REVIEW

Noble Energy conducts pre-start-up reviews before the start-up of new facilities or new equipment that have undergone major modifications or prior to major projects (e.g. shutdown/turnarounds) through the use of Noble's Energy's checklist and electronic-based management system. The goal of pre-start-up reviews is to verify EHS design application of equipment prior to commissioning and to ensure full communication of schedule, tasks and potential associated risks to all personnel involved in the start-up of a project/task/operation. Pre-start-up reviews are specific to each case, but confirm the following:

- Construction and/or equipment are in accordance with the design specifications
- EH&S operating and emergency response procedures are in place
- Training for emergency response procedures has been completed
- Applicable permit requirements are completed and received
- A hazard review has been performed and the recommendations have been resolved
- A pre-start-up safety review has been performed by employees with familiar with the operation
- EH&S information is current
- Documentation is in place (P&ID's, Management of Change Program and Standard Operating Procedures)

## IX. MANAGEMENT OF CHANGE

Noble Energy maintains procedures to identify and control risk associated with change and to maintain the accuracy of safety and environmental information. Changes are managed using an electronic MOC system to review risk associated with change actions including:

- The organization
- Personnel
- Systems
- Permitting
- Procedures
- Equipment
- Products
- Materials
- Chemicals

## X. RISK ASSESSMENT AND MANAGEMENT

A risk assessment program has been developed with the goal of reducing injuries and minimizing the consequences of uncontrolled releases and other environmental / safety incidents. With regard to existing Noble Energy operated facilities, risk analysis requirements are met by ensuring that facilities meet or exceed applicable standards of country, federal, state and local regulatory agencies including Noble's Safe Work Practices Manual. Where regulatory requirements do not exist or apply, requirements are applied using reasonable standards based on specific risk assessment. Risk management controls are identified during risk assessments and integrated into Safe Work and Operating Procedures. Periodic EHS compliance audits will be conducted in order to ensure compliance with identified applicable regulatory requirements and implemented management and control measures. Audit action items are maintained and tracked to completion through the Risk Analysis Manager (RAM) electronic database. Specific audits include:

- EHS Regulatory Compliance
- Risk Analysis Audits
- PSM Audits
- Rig/Workover Audits
- Environmental Audits



V E R I F Y  
\* \* \*

## XI. PERFORMANCE MONITORING AND MEASURING

Noble Energy establishes performance monitoring and measurement requirements for each aspect of its operations that have a potential to impact the health, safety, environment or sustainability of its business. Noble informs employees of their responsibilities with regard to managing risks and supporting Noble Energy in meeting its goals, objectives, targets and compliance requirements. Requirements include:

- Safety performance
- Worker health risk exposure
- Air/water releases (e.g. in accordance with permit requirements); and
- Compliance audits.

## XII. INCIDENT REPORTING ANALYSIS AND CORRECTIVE ACTION

All EHS incidents occurring at a Noble Energy facility (e.g. injuries, illnesses, asset damage, environmental damage, spills, near misses and community complaints) are reported to the Operations Management, regardless of the event's seriousness. Incidents are properly analyzed for cause and evaluated for corrective action in order to minimize recurrence and provide for the consistent protection of personnel health and safety, the environment and sustainability. All corrective actions identified during investigations, inspections, reviews, surveys and/or audits are documented within the Risk Analysis Manager (RAM) electronic database and tracked through completion in order to support continual improvement.

## XIII. MANAGEMENT SYSTEM COMPLIANCE AUDITS

Noble Energy conducts periodic self-audits of its GMS. The findings of any such audits are used to adjust and improve the GMS as necessary. Self-Assessments conform to the following:

- That all GMS program elements are in place
- That the GMS program includes necessary elements to meet the safety and environmental objectives of Noble Energy
- That each GMS program element is being effectively implemented



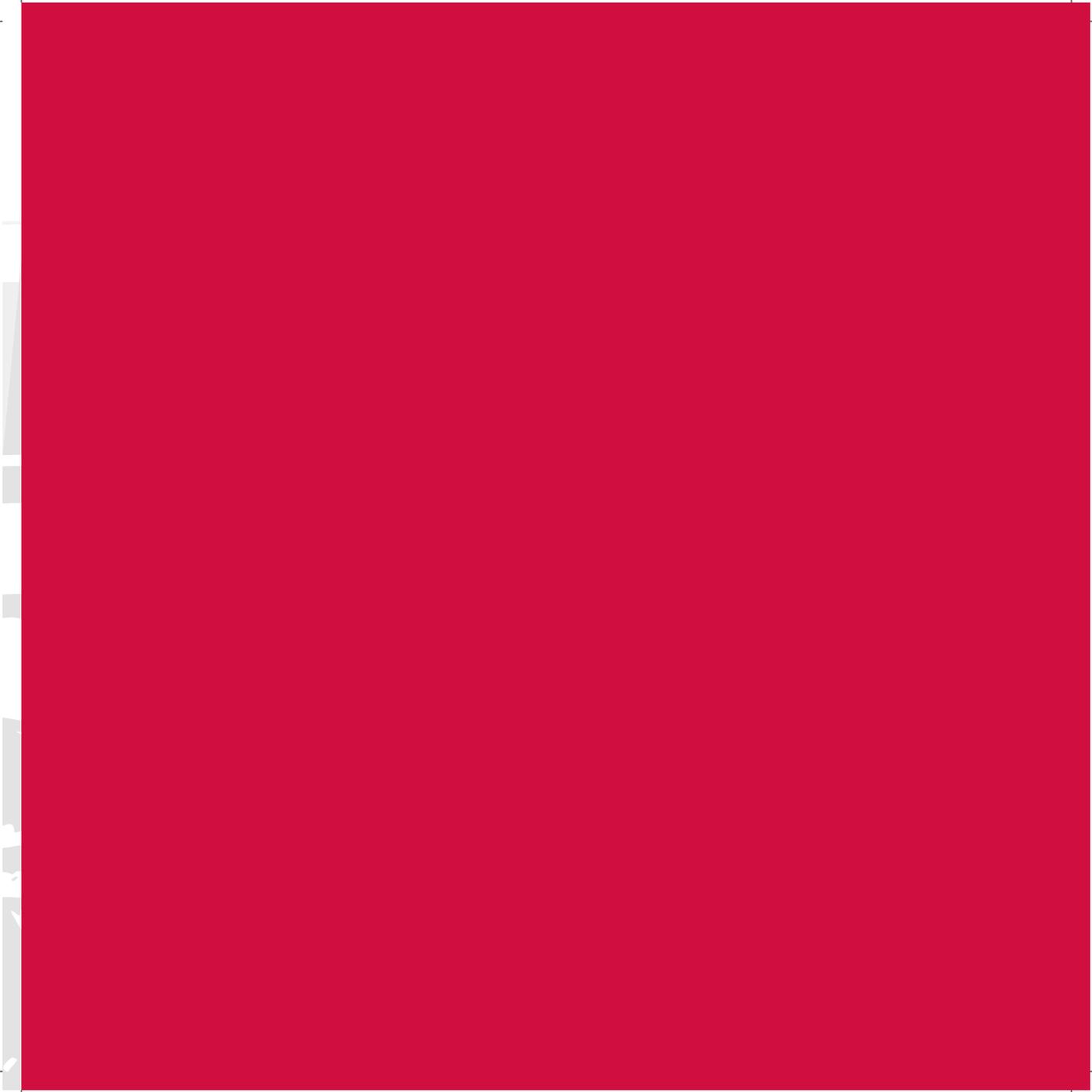
P E R F O R M

#### XIV. OPERATIONAL INTEGRITY AND CONTINUAL IMPROVEMENT

Noble Energy or its contractors design, procure, construct and install all critical equipment in accordance with Noble Energy's standard specifications or other specifications that are acceptable to Operations Management. Noble Energy's program for assurance of quality, mechanical and operational integrity of critical equipment may cover the following areas: design, procurement, fabrication, installation, maintenance, and inspection testing.

PERFORM







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## Annex 3 – Stakeholder Engagement Plan (SEP)



Noble Energy – Tamar Project  
Stakeholder Engagement Plan  
March 2015  
Operations Phase

(For External Disclosure)

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## **ABBREVIATIONS**

<b>Abbreviation</b>	<b>Description</b>
SEP	Stakeholder Engagement Plan
ERM	Environmental Resources Management
IFC	International Finance Corporation
IFC PS	International Finance Corporation Performance Standard
TAMA	Government of Israel “National Outline Plan”
NPC	National Planning Committee
EIA	Environmental Impact Assessment
GoI	Government of Israel
MoEP	Ministry of Environmental Protection
EP	Equator Principles
AOI	Area of Influence
INGL	Israel National Gas Lines
KPI	Key Performance Indicator
ESMS	Environmental and Social Management System

## **GLOSSARY**

<b>Terms</b>	<b>Description</b>
Stakeholder	Any individual or group who is affected by a project or may have an interest in, or influence over it.
Consultation	The process of sharing information, ideas and concerns in a two-way dialogue between project proponents and stakeholders, allowing stakeholders to express their views and for these to be considered in the decisions about project planning and implementation.
Disclosure	The process of publishing and making available information in various ways (such as on the internet, in paper form or in press announcements).
Engagement	General term for activity including both disclosure and consultation.
Environmental and Social Management System	A system to manage the environmental and social risks and impacts of a project's activities.
Grievance	Formal notified complaint by people who feel they have been adversely affected by project-related activities.
Grievance Procedure	Process of recording and addressing grievances so that they can be tracked through to a resolution.

## 1.0

## INTRODUCTION

### 1.1 OVERVIEW

This document is the Stakeholder Engagement Plan (SEP) for the Noble Energy Tamar Project in Israel (“the Project”). The SEP is designed to ensure that the Project’s plans for engagement with stakeholders during the operations phase of the Project are communicated and understood by all those concerned.

The SEP sets out the approach that the Project will follow to implement an engagement program with stakeholders over the life of the Project’s operations. A stakeholder is defined by the International Finance Corporation (IFC) as “*any individual or group who is affected by a project or may have an interest in, or influence over it. This may include individuals, businesses, communities, local government authorities, local nongovernmental and other institutions, and other interested or affected parties.*” The SEP focuses on engagement with external stakeholders.

The SEP is a ‘living’ document and is being developed progressively, and updates issued, as the Project’s operations evolve. This update corresponds to the Project’s operations at the Ashdod Onshore Terminal (AOT) taking into consideration the compression expansion and operation of five producing offshore wells, as described in Section 1.2.1.

The SEP is organized as follows:

- Section 1 provides background information about the Project and outlines the objectives of stakeholder engagement;
- Section 2 outlines the national and international requirements for stakeholder engagement;
- Section 3 provides an overview of the local context, and describes how stakeholders are identified and the methods and tools used to support engagement;
- Section 4 summarizes stakeholder engagement undertaken to date in the operations phase;
- Section 5 provides the program for ongoing and future engagement;
- Section 6 describes roles, responsibilities and resources for stakeholder engagement;
- Section 7 explains the ways in which stakeholders can contact Noble Energy, including the grievance mechanism for the Project; and
- Section 8 describes the monitoring and reporting of stakeholder engagement activities.

It should be noted that Noble Energy has been active in Israel for over 10 years and stakeholder engagement related to other projects and in the normal course of doing business has been ongoing. This SEP does not attempt to capture and

document such engagement, but is instead focused on recent past, present and future engagement related specifically to the Project and its operations. As this is a 'living' document, it may be updated when operational conditions change, or before the commencement of any new offshore construction activities.

## **1.2 BACKGROUND AND OBJECTIVE OF STAKEHOLDER ENGAGEMENT**

### ***Background***

The Tamar Field was discovered in January 2009 and was the largest natural gas discovery in the world at that time. It is located in 1,679 m water depth, 90 km offshore of Haifa. Noble Energy Mediterranean, Ltd and its Co-Venturers began developing the field in September 2010 and the facility start-up was accomplished in March 2013. It currently consists of five wells which are tied back to a single subsea manifold. To date, six wells have been drilled in the Tamar field (Tamar-1 through Tamar-6) and one additional well (Tamar SW-1) in the Tamar SW operating area. Of these, Tamar-2 through Tamar-6 are currently producing. The plans for completion of the Tamar SW-1 well; installing subsea infrastructure to support a future tie-in for Tamar-7; drilling and completing Tamar-7 through Tamar-9 wells; and the installation of the infrastructure to tie those wells into the existing Tamar subsea equipment is under development (see Figure 1).

A gas production and transportation system composed of subsea trees, infield flowlines and umbilicals, and a pipeline, currently links the field to the Tamar Offshore Receiving and Processing Platform (Tamar Platform), which is located approximately 149 km south-southeast of the field in 234 m water depth. The Tamar Platform is connected to Mari-B platform for potential future gas injection. Gas is sent to the AOT via an existing 30-inch export line for final treatment prior to delivery to INGL for domestic gas supply. A compression project at the AOT facility (referred to herein as the AOT compression expansion) will be completed in the next few months and will increase peak throughput to 1.2 bcf/d.

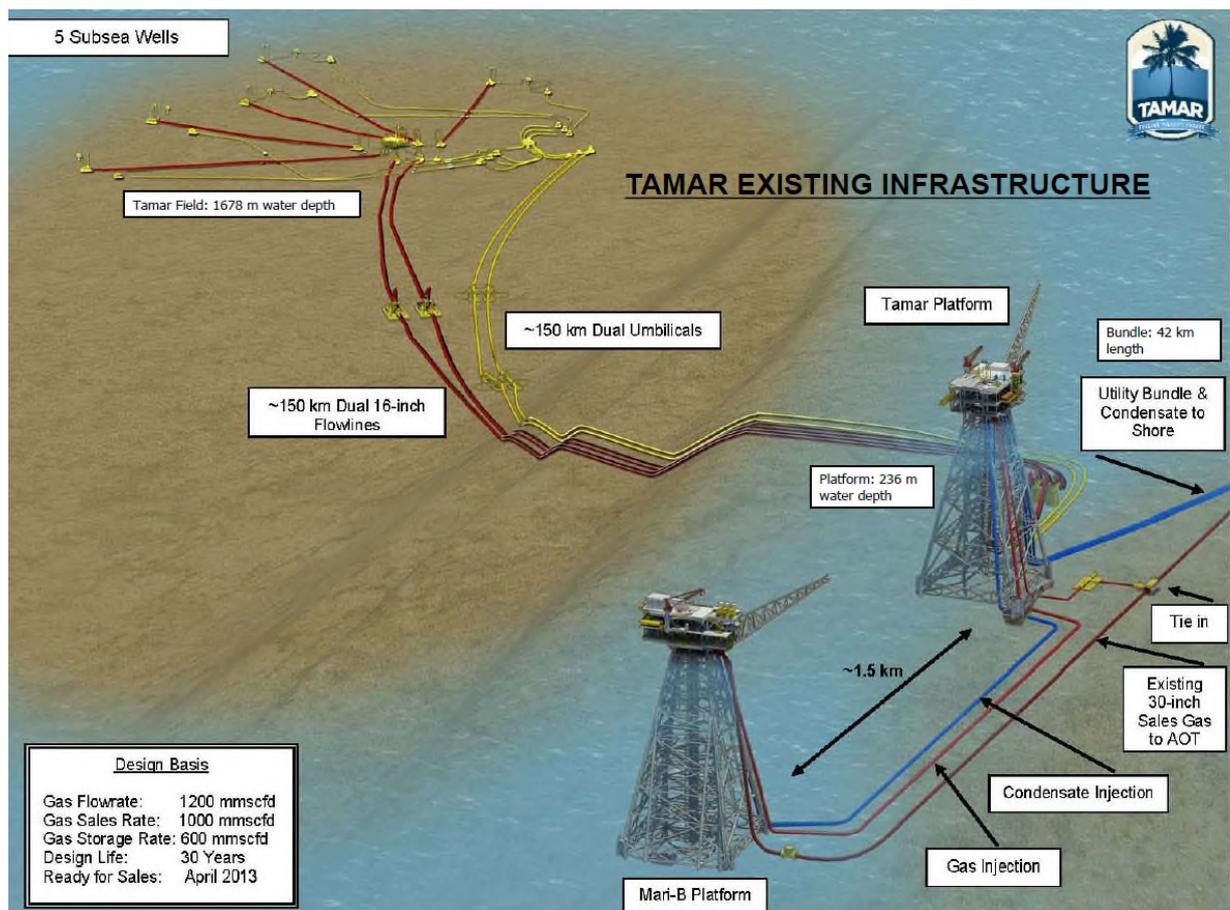


Figure 1 – Tamar Existing Infrastructure (Source: Noble Energy)

## Objectives

Noble Energy is committed to a transparent and respectful dialogue with stakeholders throughout the life of the Project. The activities of engagement are guided by good international industry practice, as well as all applicable laws and regulations in Israel.

In Noble Energy's commitment to comply with good international industry practice, and more specifically, the International Finance Corporation's Performance Standards (IFC PS), the Project has developed a Stakeholder Engagement Plan. This is aligned with IFC PS1 which states that:

*“The client[company] will develop and implement a Stakeholder Engagement Plan that is scaled to the project risks and impacts and development stage, and be tailored to the characteristics and interests of the Affected Communities. Where applicable, the Stakeholder Engagement Plan will include differentiated measures to allow the effective participation of those identified as disadvantaged or vulnerable. When the stakeholder engagement process depends substantially on community representatives, the client will make every reasonable effort to verify that such persons do in fact represent the views of Affected Communities and that they can be relied upon to faithfully communicate the results of consultations to their constituents.”*

The objectives of stakeholder engagement, outlined in this SEP, are to:

- Promote the development of respectful and open relationships between stakeholders and Noble Energy in the current operations phase;
- Identify Project stakeholders and understand their interests, concerns and influence in relation to Project activities, as it pertains to the operations phase;
- Provide stakeholders with timely information about the operation, in ways that are appropriate to their interests and needs, and also appropriate to the level of expected risk and potential adverse impacts;
- Support alignment with financing standards and guidelines for stakeholder engagement, as necessary in the operations phase; and
- Record and resolve any grievances that may arise from Project-related activities through a formal Grievance Procedure.

Although the SEP is specific to Noble Energy's activities in the operations phase of the Project, in order to provide context, a detailed description of the Israeli regulatory requirements are provided below.

A TAMA (Hebrew acronym for "Tochnit Mit'ar Artzit") is a "National Outline Plan" created by the National Planning Committee (NPC) by virtue of the Planning and Building Law, and approved by the Government. These National Outline Plans are important because they provide instructions for planning, allocate land for relevant usages, and in some particular cases even grant building permits. The Israeli Law and its subordinate regulations provide a legal foundation for conducting environmental impact assessments and other requirements for environmental analysis.

When Noble Energy entered the country and began operations in 2004 at Mari B, the TAMA 37 process had already been initiated and Noble Energy was required to liaise with stakeholders at the national and regional level to obtain necessary permits and approvals to operate. This was done in compliance with national legislation and regulatory requirements at the time. Community-level stakeholder engagement had been performed per the TAMA process. It should be noted that all of the components of the Tamar project (i.e. those located in Israel's Exclusive Economic Zone - EEZ) are located outside the jurisdiction of the Planning and Building Law (see Figure 2 below) except for the AOT. The environmental requirements for the offshore facilities are prescribed in Noble Energy's licenses and leases with the Israeli government.

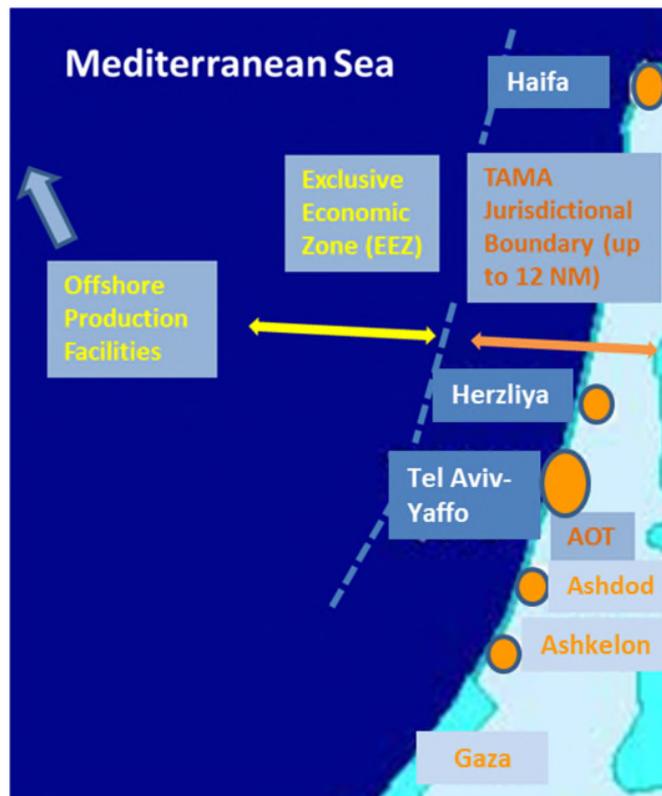


Figure 2 – The Planning and Building Law Jurisdictional Boundaries (Source for project related information: ERM)

The following TAMAs were approved prior to Noble Energy beginning operations and are still relevant to the Tamar Project:

- TAMA 37/A/2 - allocated land for offshore natural gas transmission pipeline; approved May 2003.
- TAMA 37/A/2(1) - allocated land from territorial water boundary out to offshore facilities; approved June 2003.
- TAMA 37/A/2(2) - determined optimal location for onshore terminal (Ashdod) and pipeline; approved May 2004.

The TAMA 37/A processes had stakeholder consultation phases and were approved after consideration of public comments as per the legal provisions. However, all engagement was completed in advance and independent of Noble Energy.

When Noble Energy began operations, it utilized the existing AOT site where the land allocation had already been approved by the TAMA 37/A/2(2).

**3.1 LOCAL CONTEXT OVERVIEW**

Noble Energy's operations staff and management have frequent contact with stakeholders related to all offshore operations occurring in Israel, including for the Tamar Project. These include national, regional and local government officials, media, and various civil society entities. Noble Energy's operations teams continue to abide by stringent national laws related to stakeholder engagement for offshore work (detailed in later sections).

The Project has undergone a series of environmental and social impact assessments for various phases and components of the overall project, some mandated by national legislation and regulation and some undertaken voluntarily by Noble Energy. There were no onshore or offshore social and health operational impacts identified which were determined to be significant during the operations phase.

Onshore operations consist of the AOT facility and logistics operations performed from the Israeli Ship Yard in Haifa (storing, handling and supplying materials, chemicals and equipment, primarily needed for drilling operations), as well as other offshore logistics at the Port of Ashdod. The impact assessments<sup>i</sup> conducted for the Project state that the Haifa Port is one of Israel's busiest ports. The periodic transit of supply vessels and aircraft related to the Project's operations does not represent a unique or unexpected event. The same set of circumstances applies for the Port of Ashdod. Therefore, there are no Affected Communities near the Project's port operations that will be uniquely affected by Project activities.

The same applies for the AOT operations. The nearest community from the AOT, Nir Galim, is located approximately 2.5 km to the south. Ben Zakai is located 4 km to the east. The environmental and social risk assessment<sup>ii</sup> and subsequent social and health impact review<sup>iii</sup> conducted for the AOT did not find any environmental, social or health impacts to communities outside of the immediate Industrial Area (which is an approximate 2 km radius from the AOT and considered the Project's Area of Influence (AOI) for assessment purposes.)

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<sup>i</sup> Tamar Lease Development Project Environmental Impact Assessment (EIA)- Matan block offshore, Israel. 2014 (2014 EIA) and Tamar SW-1 Exploration Program - Environmental Assessment. 2013 (2013 EA)

<sup>ii</sup> Ashdod Environmental and Social Risk Assessment, 2015

<sup>iii</sup> ERM, Social and Health Impact Discussion, Tamar Expansion in Israel, February 2015

Therefore, the primary stakeholders for the onshore operations are Noble Energy's industrial neighbors inside the AOT's general AOI, including Paz Ashdod Oil Refinery, Ashdod Water Desalination Plant, Israel Natural Gas Lines (INGL) transmission station and the Ministry of Defense which has a firing range adjacent to the AOT footprint (see Figure 3). Considering these are the primary stakeholders for the Tamar Project, Noble Energy's operations staff and management teams have frequent contact with these stakeholders related to the AOT which is focused around health, safety, and security coordination. Coordination with Haifa and Ashdod Ports stakeholders (operational workers within the ports) occurs but to a lesser extent considering the small scale of Noble Energy's activities and footprint at these large ports.

There are frequent emergency response drills conducted onshore and offshore by Noble Energy in consultation with the local emergency response authorities. Engagement at the regional level also continues as it pertains to the necessary permits and reporting requirements for construction (such as the December 2014 AOT Air Quality permit) and operations (such as the Pollution Release and Transfer Register reporting system). Some permits, like the Air Quality permit, also require a public consultation and disclosure period which is managed by the authorities as dictated by national and regional regulations.

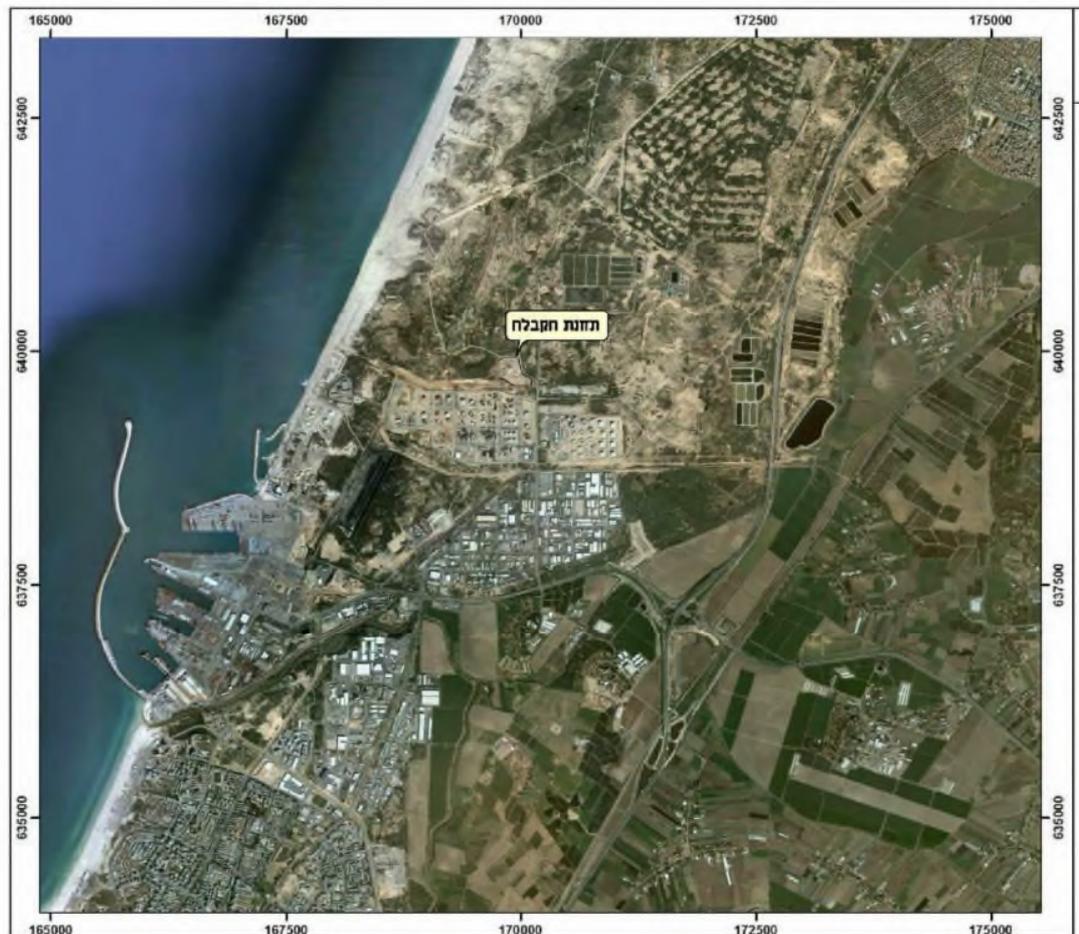


Figure 3 – Ashdod Industrial Area with indication of the AOT (Source: Noble Energy)

### **3.2 STAKEHOLDER IDENTIFICATION AND MAPPING**

Stakeholders for the Project have been identified by Noble Energy by drawing on the local knowledge of Noble Energy staff, particularly those with operational and stakeholder engagement responsibilities, and as documented in the various environmental and social impact assessment reports.

The table below lists the stakeholders at the time of writing. The mapping process allows Noble Energy to better understand the type of engagement which is best suited for each stakeholder depending on their level of interest in and influence on the Project (dynamic communication, constant engagement, information purposes only, etc) during the operations phase. These methods of engagement are discussed further in Section 3.3.

It is helpful to group stakeholders based on common interests and characteristics. Noble Energy uses a number of ‘stakeholder categories’ to help structure activities for stakeholders of the Project, including a summary of the anticipated interest of these groups with respect to the Project (e.g. potential impacts, benefits, concerns) and how they have been engaged to date. This information is provided in Table 1 as well as in subsequent sections.

***TABLE 1: STAKEHOLDER CATEGORIES AND IDENTIFICATION***

<b>Stakeholder Category</b>	<b>Interest in Project</b>	<b>Stakeholders Identified to Date</b>
National Government	National authorities have an interest in the operating procedures, particularly in terms of ensuring compliance with Israeli regulations, emergency and safety. Leads participatory exercises in emergency response. In addition to their regulatory role, government departments have specific interests in topic areas such as cultural heritage, transport and fisheries.	Ministry of Environmental Protection (MoEP); Ministry of Energy, National Infrastructures, and Water Resources (MNIWR); National Park Authority; Israel Antiquity Authority (IAA); Ministry of Defense
Regional Government	Local and regional authorities have a general interest in the potential impacts and benefits for their respective communities.	Ashdod Municipality; Haifa Municipality; Ashdod Fire & Rescue

	Provides permits for Project activities, and business licenses for operations of onshore facilities.	Services
Regional Associations	Regional associations may be interested in data from the Project's numerous marine surveys, as well as the potential effects on the marine environment or ecology.	Regional Environmental Association
Local Industrial Facility Neighbors	Local industrial facilities surrounding the AOT facility have an interest in the AOT in terms of safety and emergency response considering the proximity to their facilities. They also have an opportunity to purchase condensed gas from Noble Energy's AOT facility.	Paz Ashdod Oil Refinery; Ministry of Defense; Ashdod Water Desalinization Plant; INGL
Community Services and Infrastructure	Community service and infrastructure providers are interested in how the Project might impact community services and emergency response in the event of an unplanned event.	Local Hospitals (such as Ichilov Hospital in Tel Aviv and Rambam Medical Center in Haifa); Ashdod Emergency Response Services
Marine area users	Fishermen and fisheries organizations (including fishing businesses) may be interested in potential project impacts on fishing activities, including access to deepsea fishing areas. They will most likely, however, be concerned about unplanned events (e.g. fuel spills) and safety no-go zones.	Fishing and environmental organizations such as EcoOcean Marine Research and Education; the IsraFish Association; the Israel Fishing Forum; Israel Sport Fishing; Israeli Project for Maintenance Management of Fishing in the Mediterranean Sea
Local and International NGOs	NGOs (including local, national and international NGOs, as well as other community based organizations) may be interested in a diverse set of issues, ranging from protection of environment, to archaeological assets, to potential impacts on tourism and other industries related to offshore activities.	Zalul; Kachol Veyarok

Media	Journalists and other representatives of the media are often interested in ensuring that clear and transparent information about the Project is communicated to the national population.	Channel 1; Channel 2; Channel 10; Channel 33 (Arab-speaking viewers); various radio and website outlets
Academic or Research Organizations	Academic and research organizations may be interested in data from the Project's numerous marine surveys, as well as the potential effects on the marine environment or ecology, marine cultural heritage and environmental protection. These organizations may also be interested in local content and training programs.	Israel Limnological and Oceanographic Institute; Marine Pollution Services

### **3.3 DISCLOSURE AND ENGAGEMENT METHODS AND MATERIALS**

The engagement process encourages meaningful participation by stakeholders. Noble Energy will employ a range of methods and channels for disclosing information in order to tailor disclosure to the interests and needs of the various stakeholder groups and will also produce materials appropriate for specific stakeholders and types of engagement. This may include typical disclosure and engagement methods, such as:

- Local Newspaper Articles, Radio, Television Pieces, or Digital Media – Used to convey information to local audiences about proposed Project activities and progress (particularly relevant for any future offshore construction work).
- Internet/Website - Used to promote information or invite stakeholder queries and comments via email.
- Community Feedback Dedicated Line - Used by the public to obtain information, ask questions or report grievances.
- Public Education, Outreach - use the general public and media outreach efforts as described in Section 4 to raise awareness on key issues of the Project specifically.

The stakeholder engagement process includes two-way targeted engagement related to specific Project impacts during operations, for example potential impacts related to unplanned events (e.g. accidental spills) and impacts to deepsea fishing and recreational activities (as a result of safety no-go zones around offshore platforms which are controlled by the Ministry of Defense and overseen by the Navy). The environment and social impact assessment reports prepared have assessed the majority of the residual environmental and social operational impacts of the Project to be of low or of no significance; however,

any specific engagement activities by Noble Energy will continue to be organized around specific topics of interest and known concerns of stakeholders (such as notification of offshore safety zones for fishermen and emergency response procedures for AOT industrial zone neighbors).

Feedback mechanisms are adapted to suit the needs and preferences of different stakeholders and their physical locations. Noble Energy has a Community Feedback Mechanism which is located on their in-country website in Hebrew and provides a dedicated email and phone number for Project-related feedback (discussed in Section 7).

**COMPLETED STAKEHOLDER ENGAGEMENT**

Noble Energy operations staff and management continually engage with external stakeholders as it pertains to operations activities. This primarily includes engagement with local authorities and AOT neighbors regarding safety and emergency response.

It should be noted, and as previously discussed, Noble Energy engages with a myriad of stakeholders in the course of daily operations for all in-country projects and operations as a part of doing business in Israel. These daily interactions are not included in this SEP unless they pertain directly to the Tamar Project in the operations phase.

**Engagement Related to Offshore Operations**

Below are Noble Energy's engagement efforts for offshore related activities:

- Consultation with Ministry of Transport - Administration of Shipping and Ports and the various Ministry of Defense interlocutors responsible for sea safety and security, as it pertains to buffer and safety zones, Notice to Mariners, and emergency response exercises.
- A full scale emergency response exercise was held in 4Q2014 which included 30 Noble Energy employees from Israel and Houston, and 17 contractors from Marine Pollutions Services (MPS), Marine Ties, and OSRL, to test the Israel Incident Management Team's (IMT) ability to deploy shoreline protection resources in case of an unintentional release of hydrocarbons. Additional exercises will be conducted as per Noble Energy's procedures.
- During 2014, Noble Energy arranged visits to the Tamar Platform for several governmental offices to introduce the offshore project components.

**Engagement Related to Onshore Operations**

In 4Q2014, the regional government under Israeli law managed a public disclosure and comment period for the AOT's Air Quality Permit which is a requirement for Noble Energy's operations and included new data as it pertains to the AOT compression expansion. The public disclosure period for the permit allowed the public an opportunity to comment on the AOT compression expansion as it pertains to the potential onshore environmental and social impacts. There were no objections to the permit and it was issued in December 2014.

## **Engagement related to Noble Energy Operations in Israel**

Noble Energy engages with the media on a regular basis in an effort to educate the public on the offshore oil and gas industry, as well as the positive benefits of natural gas to both the economy and the population. Noble Energy also partakes in regular engagement with local businesses, suppliers and government organizations as part of its commitment to help build the capacity of Israeli's oil and gas sector, in general. This includes, but is not limited to, the following activities:

- Partnerships with local colleges, including Ruppin Academic Center College, focused on capacity building in the oil and gas sector. Includes the development of technical training programs with international organizations to build capacity of national staff in over 40 disciplines, including production and operations; supply chain management; material coordination, etc.
- Cooperating with the Israeli Export Institute and the Ministry of Economy to establish a local content index to help supply chain, operations and drilling departments seek business opportunities with local companies.
- Sponsoring a Contractor Safety Seminar to impart knowledge about working with Noble Energy in a way that ensures safe work environments.
- Partnering with the Chief Scientist office of the Ministry of Economy and two other companies, to host a capacity-building conference on "Challenges & Opportunities for the Israeli Technological Industry" with more than 350 Israeli industry and government representatives participating.
- Partnering with MadaTech, Israel's National Museum of Science, Technology, and Space, for continued support of the Noble Energy Science Park which brings science to life and draws visitors from a cross-section of Israeli society.
- Hosting 18 Israeli companies to visit Noble Energy offices in Houston for workshops and introductions to other US based companies - in collaboration with the Israeli Export Institute, Ministry of Economy, and US Chamber of Commerce.

## **5.0**

### **OVERVIEW OF PLANNED ACTIVITIES**

Noble Energy plans to continue engaging with stakeholders on issues related to the Project. Engagement with the public in the operations phase for onshore is focused on continuous adherence to health, safety and environmental procedures. The type of offshore engagement as described in Section 4.0 will continue throughout the operations of the Tamar Project.

Engagement with government and other external stakeholders for both onshore and offshore will continue to be focused on health and safety, as well as include coordination for additional environmental surveys. Continued engagement is anticipated as, but not limited to, the following:

#### **National and Regional Levels**

- Ministry of Environmental Protection – Noble Energy engages as it pertains to permits during the operations phase (such as discharge, air emission and toxin permits).
- Ministry of National Infrastructures, Energy and Water Resources – Noble Energy engages as it pertains to the preliminary permits, licenses, leases, development plans, Safety Management Plan, all related to offshore exploration, development and production of natural gas.
- Ministry of Defense and Ministry of Transport-Administration of Shipping and Ports – Noble Energy provides information on offshore activities as necessary for the government to further coordinate and disclose to marine sea users.
- Regional Councils – Noble Energy engages as it pertains to permits for some Project-related activities.
- Media – Noble Energy continually engages as it pertains to educating the public on the Project and the oil and gas industry in general.

#### **Regional Associations**

- Regional Environmental Association – Noble Energy informs and coordinates on environmental issues.

#### **Local Level**

- Ashdod Industrial Zone business neighbors – Noble Energy informs, discloses, and coordinates with business neighbors regarding health, safety, and emergency response, as well as for other business purposes.
- Community Service Providers– Noble Energy engages with and coordinates regarding health, safety, and emergency response, as well as for compliance with local regulations.

- **Marine Area Users** – Through regional officials as mentioned above, Noble Energy provides notification of changes to offshore safety and buffer zones, permits, and emergency response exercises.

**ROLES AND RESPONSIBILITIES**

Noble Energy has staff and resources devoted to managing and implementing the company's Stakeholder Engagement Program. The program is managed by Israeli community affairs and stakeholder engagement management teams in consultation with Noble Energy Social Performance and Communication and Government Relations staff at headquarters. The primary local Israeli staff members responsible for stakeholder engagement at all levels as it pertains to the environmental and social components of the Project include:

- EHS Manager
- Operations Manager
- Health and Safety Manager
- Environmental Manager
- Security Advisor
- Director of Corporate Affairs
- Regulatory Affairs Director
- Government and Regulatory Affairs Manager
- Regulatory Analyst
- Construction and Engineering Manager
- Human Resources Manager
- Media Relations Advisor
- Corporate Social Responsibility Coordinator

## **7.0 CONTACT WITH NOBLE ENERGY FOR THE TAMAR PROJECT**

### **7.1 FEEDBACK PROCESS**

Stakeholders can contact Noble Energy at any time by letter, phone, fax, or email. Contact information is available on the company's website, and is included in all external publications and communications (including reports, leaflets, letters, emails, etc.). Communications with Noble Energy can be conducted in Hebrew, English, or Arabic as necessary.

Stakeholders are invited to provide feedback about the Project. This will allow Noble Energy to monitor how the Project is doing and will help it identify areas of improvement. Noble Energy will treat all types of feedback with professional consideration and respect and base its responses on open and honest communication.

### **7.2 GRIEVANCE PROCEDURE**

Noble Energy understands that it must have in place its own communications and grievance redress procedure directly related to the Project's operations and any future offshore construction phases (and not linked to the development of the oil and gas sector, and not in reference to broader policy decisions or other matters external to the Project.) Noble Energy is establishing a Community Feedback Mechanism (CFM), which is a Grievance Procedure aiming to ensure that any grievances associated with Project activities are addressed in good faith through a transparent and impartial process.

Specific objectives of the Grievance Procedure are:

- to help Noble Energy identify issues and concerns early, so that they can be addressed quickly and proactively;
- to continuously improve Project performance in all areas; and
- to demonstrate Noble Energy's commitment to meaningful stakeholder engagement, and respect for local opinions and concerns.

Noble Energy will use the CFM as a critical component of the broader stakeholder engagement activities, including monitoring and reporting.

### **7.3 COMMUNITY FEEDBACK MECHANISM**

Noble Energy is developing a structured CFM that provides opportunities for the receipt, investigation, and resolution of complaints at the Project level during the operations and any future offshore construction phases. The

grievance procedure will be published on Noble Energy's website and stakeholders will be notified about the grievance procedure in an appropriate manner. Noble Energy will ensure that contact details associated with the grievance procedure will also be placed at the entrance to the AOT.

A member of the media relations team has been assigned as the person in charge of managing the CFM, including the internal processes for ensuring grievance resolution.

**MONITORING AND REPORTING****81 MONITORING**

It is important to monitor stakeholder engagement to ensure that consultation and disclosure efforts are effective, in particular that stakeholders have been meaningfully consulted throughout the process

Monitoring will include:

- monitoring consultation activities conducted with government authorities and non-governmental stakeholders (such as the recent construction-phase Air Quality Permitting process for the AOT);
- monitoring the effectiveness of the engagement processes by tracking feedback received from engagement activities; and
- monitoring any grievances received.

**82 TRACKING STAKEHOLDER ENGAGEMENT ACTIVITIES**

Future tracking of stakeholder engagement will be used to assess the effectiveness of the Project's stakeholder engagement activities. Indicators for tracking will include, among others:

- place and time of formal engagement events and level of participation including by specific stakeholder categories and groups (e.g. women);
- number of comments by topic and type of stakeholder, and details of feedback provided through the CFM or other means (office visits, emails, phone calls);
- numbers and types of grievances and the nature and timing of their resolution;
- recording and tracking commitments made to stakeholders; and
- community attitudes and perceptions on Noble Energy's activities pertaining to the Project based on media reports and stakeholder feedback.

**83 PROJECT REPORTING*****Internal Reporting***

Reports on stakeholder engagement efforts will summarize all activity for the period, and provide a summary of issues raised and how they have been addressed. Potential issues include timeliness of responses and corrective and

mitigation measures taken to address grievances, and analysis of trends in key performance indicators (KPIs). These may include:

- total numbers of stakeholders engaged according to stakeholder category;
- numbers of comments and queries received according to topic and responses;
- issues raised and levels of support for and opposition to the Project; and
- numbers of grievances lodged.

### ***External Reporting***

The SEP will be reviewed on a regular basis and revised as needed to reflect completed engagement activities and future engagement plans.

During the operations phase, Noble Energy will continue to provide updates as necessary, although it is difficult to predict what events will occur over the operational lifecycle. Noble Energy anticipates providing information to stakeholders which will focus on non-routine activities, after an unplanned event or incident (if one occurs), or if there is any change to company structure or practice.

# **Annex 4 - Air Permit Application Summary, AOT Toxin Permit 2014-15 and Emissions Permit Final.**

## **Air Emission Permit Application Summary**

### **1 General**

This document is a summary of the Air emissions permit application, submitted by Noble Energy to the Israeli Ministry for Environmental Protection for the Ashdod Onshore Terminal (AOT).

In 2013, operations were commenced for the construction of the compression trains at the AOT. The purpose of the compression system is to enable the flow of larger volumes of gas to the transmission system (INGL). The AOT currently treats approximately 1.2 MMSCFD. The compression system will enable sales of approximately 1.6 MMSCFD. The pressure of the natural gas that is delivered to INGL is dictated by the requirements of INGL, and amounts to approximately 80 bars. Prior to setting up the compression trains, the work pressure at the AOT was approximately 80 bars from the platform, and the onshore landing point at the coastal valve station (CVS) until sales to INGL. Construction of the compression trains enables Noble to work under variable pressures throughout the process and to adjust the pressure of the gas sold to INGL in accordance with its requirements. In this way, the pressure of the gas arriving to shore can be reduced, the pressure fall between the platform and the coastal station can be increased, thereby increasing the volume of gas treated, without constructing additional infrastructure outside of the premises of the terminal, and increasing the environmental footprint of Noble Energy's operations.

With the decision to construct the compression system came the need to submit an application for an Air emissions permit. According to the requirements of the Clean Air act, 2011, an energy facility with a thermal input of more than 50 MW requires an emission permit. The compression trains contain three gas turbines (each train one turbine), each of which has a thermal input of approximately 50 MW. The turbines operate the compressors.

A description of the process at the AOT is set out in Chapter 2 below. Chapter 3 sets out the emissions into the atmosphere from such process and Chapter 4 sets out the results of running the AERMOD model and calculation of the concentrations of pollutants stemming from the operations of the reception terminal and contribution to the air quality of the region.

### **2 Review of AOT Location & Process**

The compression trains are being constructed within the premises of the Ashdod Onshore Terminal, hereinafter the AOT.

The gas treatment process involves drying by reducing the dew point, at the end of which the gas is exported into the National Transmission System that is operated by INGL.

In addition to the gas treatment system, the AOT also treats condensate that is produced from the Tamar reservoir. The treatment of condensate includes stabilization and storage. Storage is done in three containers on the premises of the AOT, and is usually transferred to costumers a few times a week via designated pipeline.

## 2.1 Location of the Ashdod Onshore Terminal

The AOT was constructed at Ashdod after the approval of the National Outline Plan 37A2-2 and is located within the Ashdod industrial area. The following is a table setting out the public receptors within a radius of 10 km from the facility:

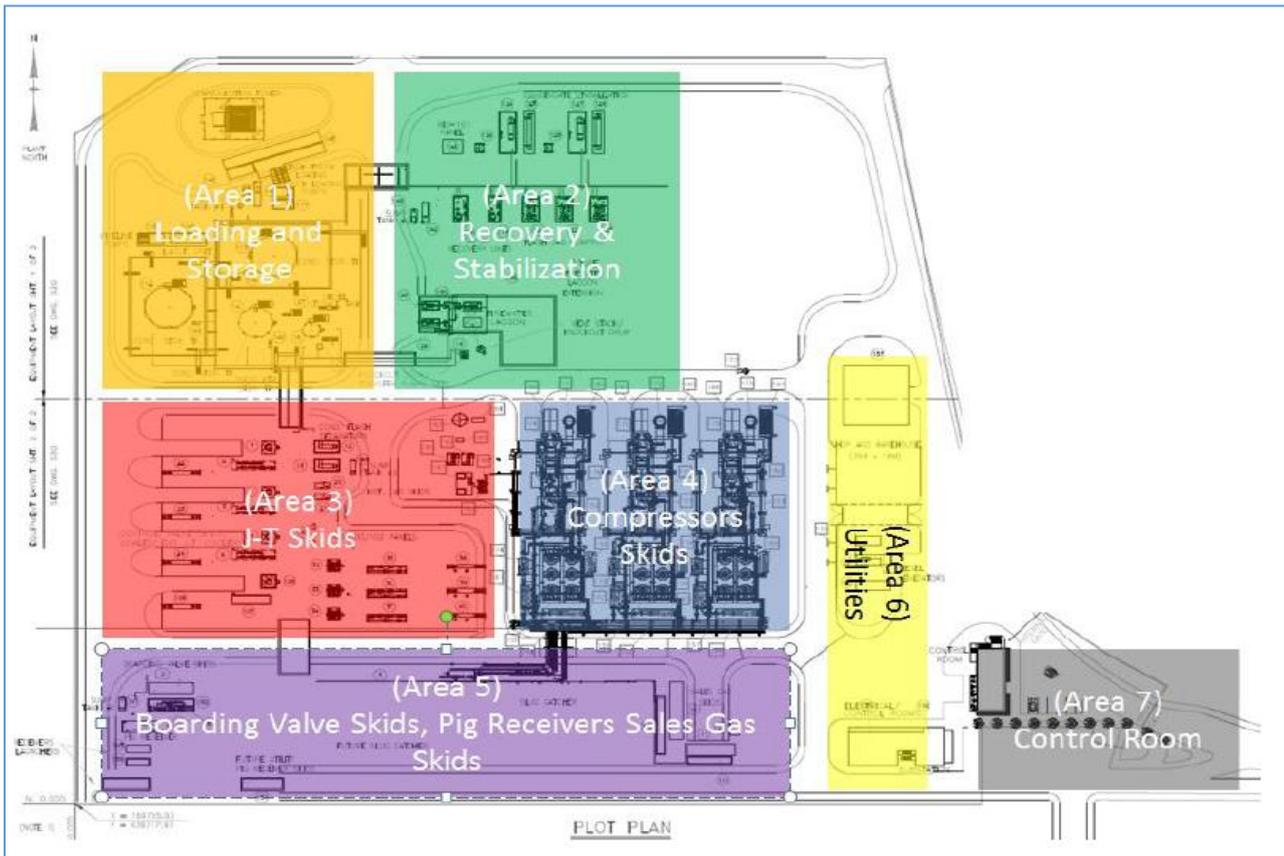
**Table 1: Sensitive Receptors within a Radius of 10 km from the AOT**

#	Receptor	X	Y
1	Ashdod	635689	167610
2	Yad Shabtai School, Ashdod	633571	167462
3	Shazar School, Ashdod	634226	166808
4	Renanim School	633816	166635
5	17th Quarter School, Ashdod	630892	164349
6	Shetulim	631333	170094
7	Hatzor – Ashdod	631211	173910
8	Gan Yanve	633819	173176
9	Gan Hadarom	634754	171833
10	Benei Darom	636506	171041
11	Nir Galim	637100	170130
12	Bizaron	633819	174550
13	Neve Mivtah	634824	175530
14	Kanot Agricultural School	634551	176734
15	Kibbutz Yavne	635880	173806
16	Beit Rabban	636109	174775
17	Kerem Yavne	636499	173767
18	Misgav Dov	636499	175313
19	Meishar	636305	176914
21	Netivei Noam Religious School, Gedera	636124	179052
22	MM Pines School, Gedera	635506	178566
23	Vered Kindergarten, Gedera	635661	178592
24	Aseret	636882	176377
25	Kfar Mordechai	637676	176758
26	Shidma	637928	175794
27	Kfar Aviv	637671	173613
28	Banaya	639336	176616
29	Ben Zakai	640587	174270
30	Yanve	643106	175069
31	Guma Kindergarten, Yavne	642630	174425
32	Ramot Weizmann School, Yavne	642870	174738
33	Hanegev Kindergarten, Yavne	643088	175050
34	Galia	643614	177986
35	Kfar Hanagid	643868	176336

36	Palmachim	649129	172115
37	Beit Gamliel	640467	177478
38	Gedera	636444	178822
39	Moriah Special School, Gedera	635830	178946

The following figure sets out the layout of the site, classified into areas.

**Figure 1 – Layout of the Site and Boundaries**



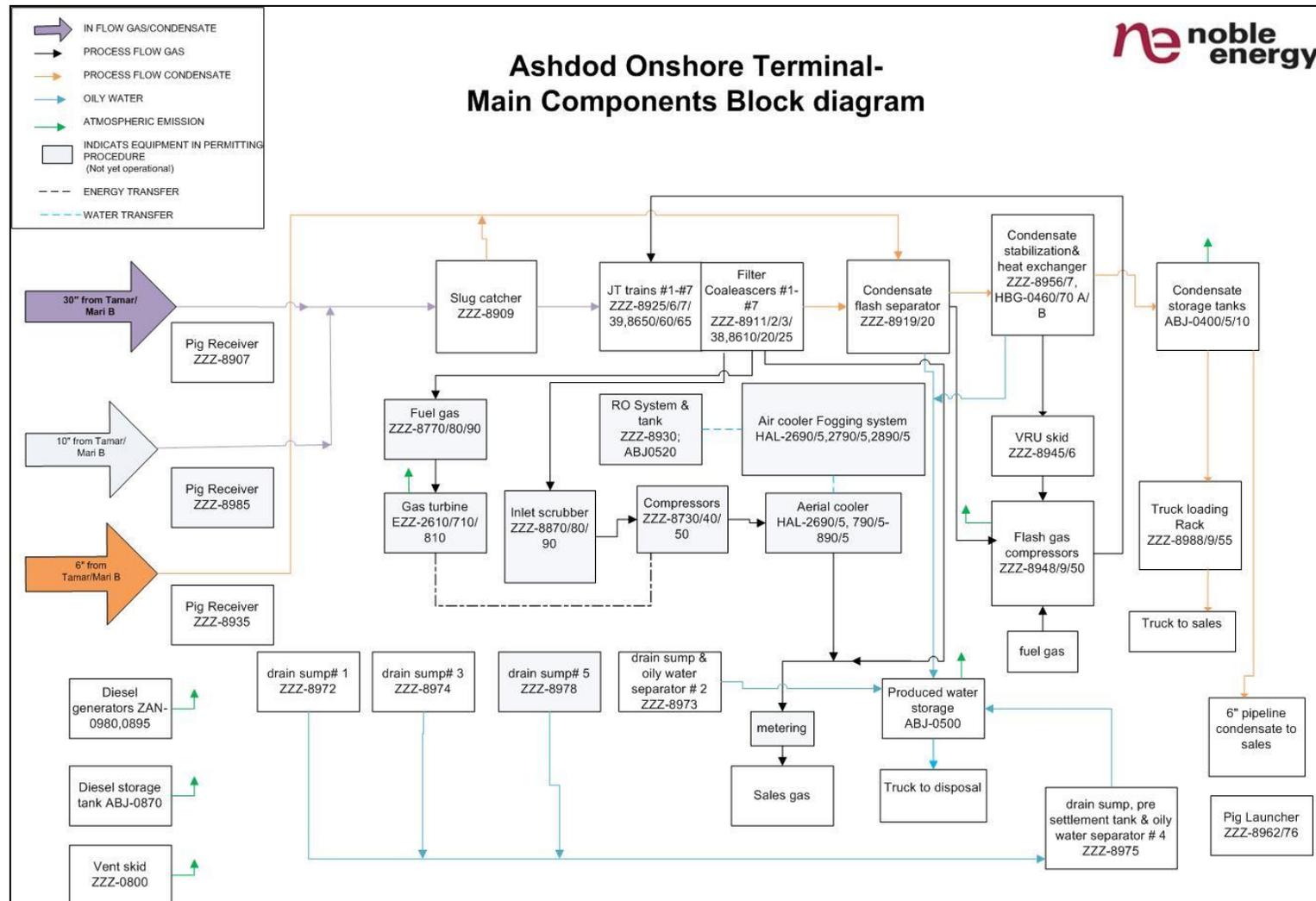
## **2.2 Description of Process**

The main function of the AOT is to complete treatment of the gas and to tailor it to the requirements of INGL. The process is continuous, in closed systems, without venting (except in emergencies or for rare operational requirements). The AOT has three main products:

1. Natural gas – which is exported directly, without storage or collection, into the National Transmission System.
2. Liquid hydrocarbons– condensate- undergoes a process of stabilization, which includes the extraction of highly volatile components from the liquid. The stabilized condensate passes through storage containers prior to sale. The condensate is pumped usually through a pipeline a number of times a week to the adjacent refinery.
3. Produced water – seawater that is extracted during the process. After the separation of it, produced water is transferred into a special storage container, and from it, is sent for disposal at an authorized site. No produced water is currently obtained in the process.

The following diagram (figure 2) describes the main components that operate at the Ashdod Onshore Terminal, including the new compression system.

Figure 2 Ashdod Onshore Terminal- Block Diagram



The AOT treatment process consists of two systems:

- The gas Treatment System
- The Condensate Treatment System

Following is a description of the main elements of each system.

### **The gas Treatment System:**

- Mechanical Liquid Separation System – Slug Catcher

With Entering the AOT the gas passes through a mechanical separation facility known as the slug catcher. The gas flows in a pipeline which splits into four smaller diameter pipelines. The split into four streams reduces the pressure, and therefore the temperature and speed of the gas flow as well. When the speed of the gas flow is reduced, liquids that flowed in with the gas from the platform sink to the bottom of the facility and are collected and removed from the gas stream, to the condensate treatment system.

- Joule-Thompson Gas Coolers – JT Trains

These facilities are designed to reduce the dew point of the gas and to extract liquids from the gas stream by expansion and cooling of the gas. Four of these kinds of facilities are currently in operation.

The Method of Operation of the Gas Coolers:

The new compressor system requires three more JT coolers in addition to the existing four, each of which shall have a work capacity of 300 MMSCFD.

- Filter coalescers (four existing and three new)

After cooling in the JT system, the gas flows through coalescers, in which liquid droplets are collected and combined into larger drops, passing through several layers of filters within the coalescer. Finally, large drops are released in the bottom portion of the coalescer and are pumped out for treatment and stabilization.

The gas that leaves the cooling system and the filters is currently pumped directly into the gas metering and sales skid. After installation and operation of the compressors, the gas will be sent for compression and thereafter, for metering and sales.

Separate gas streams for internal use consist of instrument gas and fuel gas for the Flash Gas Compressors compressors (FGC- see chart 2), as part of the stabilization package. After construction of the compressors trains, it will also be used for combustion in the gas turbines. Instrument gas is used also as blanket gas in the condensate containers.

- The Compression Trains:

The gas turbines constitute the source of the energy generation to operate the new compressors located inside the AOT. The process of the energy production in the gas turbines is described below:

Natural gas (fuel gas) at a pressure of approximately 47 atmospheres, is supplied to the combustion chamber of the gas turbine. At the same time, filtered and compressed air is supplied to the combustion chamber. Heated gases generated by combustion of the fuel disperse through the turbine. The blades of the turbine turn the expansion energy into mechanical energy. This mechanical energy is used to operate a compressor that is connected to the turbine axle. The compression force is operated on the natural gas (the sales gas) that reaches the compressor (after drying processes in the AOT facility). The compressed natural gas (the sales gas) is cooled and transferred to the transmission system operated by INGL.

### **The Condensate Treatment System:**

- Condensate flash separators:

The condensate that is separated from the gas stream undergoes a flash process in which gas residue exits the liquid. The pressure in the facility is lower than the pressure of the incoming liquid. Reduction of the pressure causes the gases dissolved in the liquid to be released. The separated gas passes into special compressors which are operated using gas engines, and from there, the gas goes back into the process (to the JT coolers). The liquid is transmitted into the stabilization system.

- Stabilization of Condensate:

The purpose of the stabilizers is to stabilize the condensate and to reduce the vapor pressure of the condensate by heating and evaporating off the light components of it. Thereafter, the gas returned to the process (following compression). The stabilization system includes is a system of pumps, heaters and coolers which have the purpose of separating/ evaporating the more volatile components from the Condensate. The stabilizer receives partially stabilized condensate which comes in from the condensate flash separators and liquids returning from the vapor recovery unit (VRU).

These liquids are heated by a heat exchanger, and thereafter by electric heaters in a number of stages. The hydrocarbons that are in gaseous state are removed from the process and transferred to the VRU, via a heat exchanger. The hot water in the process is collected in the cell at the bottom of the stabilizer, and from there is pumped into the water container.

The hot condensate is pumped from the stabilizer by two pumps. Part of the condensate is pumped back to the stabilizer in order to maintain a quantity of liquid of 60% in the facility. The rest of the condensate is transferred via heat exchangers in to the storage tanks.

There are two alternatives for delivering the condensate to the costumers:

*Batch delivery of condensate via pipeline.* The condensate pipeline exits from the south-western corner of AOT in a westerly direction.

*Delivery via trailers:* North-west of the storage tanks, there is a loading for container trucks. The loading terminal is activated in case of emergencies or in situations in which condensate is required to be transferred or removed other than to the Ashdod refinery, and irregularly.

### **3 Air Emission sources Review**

#### **3.1 Gas Turbines**

Out of three turbines, two will be operated continuously throughout the year, in order to ensure the supply of gas to all consumers in the country. One turbine shall be a back-up turbine, and shall only be operated when necessary. The turbines will be operated at maximum load, depending on the Israeli market needs.

The emissions data for NO<sub>x</sub> and CO have been taken from the manufacturer's data (General Electric). The maximum emission of these pollutants takes place when the environmental temperature is around 5 degrees Celsius, and the turbines are operated at a load of less than 70% of the maximum load (according to a meteorological analysis, this situation is expected to occur in less than 10% of the hours in a year). The rate of emission of SO<sub>2</sub> has been calculated on the basis of the maximum sulfur content in the gas, in accordance with the requirements of INGL, which amounts to 0.01%. The emission of PM has been calculated in accordance with the maximum output of the turbine. The maximum emission rates used to examine environmental impacts are derived from these maximum calculations and are:

- The maximum emission rate of NO<sub>2</sub> is 12 kg per hour.
- The maximum emission rate of PM is 1.6 kg per hour.
- The maximum emission rate of SO<sub>2</sub> oxides is 0.704 kg per hour.
- The maximum emission rate of CO is 11 kg per hour.

**Table 2: Turbine Data**

<b>Measurement</b>	<b>Value</b>
Turbine rotation speed (RPM)	6,484
Fuel capacity (kg/s)	0.975
Mass of combustion gases (kg/s)	56.7
Capacity of emissions gases in stack conditions (cubic meters/hour)	462,623
Percentage of oxygen in emission gases	14%
Percentage of water in emission gases	3.91%

#### **3.2 Gas Engines – Flash Gas Compressors**

The gas engines were constructed at the start of 2013 and no samples have yet been taken from them. The gas engines are used for the compression of the gas obtained after the condensate stabilization process. The compressed gas is diverted back into the process. The emission calculation is based on the EPA's emissions coefficients for gas engines. The rate of emission of SO<sub>2</sub> has been calculated on the basis of the maximum sulfur content in the gas, in accordance with the requirements of INGL, which amounts to 0.01%. The maximum emission rates used to examine environmental impacts are derived from these maximum calculations and are:

- The maximum emission rate of NO<sub>2</sub> is 1.17 kg per hour.
- The maximum emission rate of PM is 0.014 kg per hour.
- The maximum emission rate of SO<sub>2</sub> is 0.05 kg per hour.
- The maximum emission rate of CO is 0.33 kg per hour.

**Table 3: Emission Coefficients for Gas Engines**

Pollutant	Emission Factor (lb/MMBtu) <sup>b</sup> (fuel input)	Emission Factor Rating
<b>Criteria Pollutants and Greenhouse Gases</b>		
NO <sub>x</sub> <sup>c</sup> 90 - 105% Load	3.17 E+00	A
NO <sub>x</sub> <sup>c</sup> <90% Load	1.94 E+00	A
CO <sup>c</sup> 90 - 105% Load	3.86 E-01	A
CO <sup>c</sup> <90% Load	3.53 E-01	A
CO <sub>2</sub> <sup>d</sup>	1.10 E+02	A
SO <sub>2</sub> <sup>e</sup>	5.88 E-04	A
TOC <sup>f</sup>	1.64 E+00	A
Methane <sup>g</sup>	1.45 E+00	C
VOC <sup>h</sup>	1.20 E-01	C
PM10 (filterable) <sup>i</sup>	3.84 E-02	C
PM2.5 (filterable) <sup>i</sup>	3.84 E-02	C
PM Condensable <sup>j</sup>	9.91 E-03	E

**Table 4: Calculation of Emission of Particles and Nitrous Oxides from Gas Engines:**

NOx (kg\hr)	PM10 (kg\hr)	factor Nox (lb/Mmbtu)	factor PM10 (lb/Mmbtu)	bhp	
1.173	0.014	3.170	0.038	325.000	gas gen 1
1.173	0.014	3.170	0.038	325.000	gas gen 2
1.173	0.014	3.170	0.038	325.000	gas gen 3

### 3.3 Fugitive Emissions

#### 3.3.1 Storage Tanks

The storage system includes two condensate tanks of approximately 556 cubic meters in volume each, one condensate container of 318 cubic meters in volume and one container for produced water of approximately 80 cubic meters in volume. The condensate reaches

the AOT in a 6" pipeline, from the Tamar production platform. In addition, condensate is obtained in the process of reduction of the dew point of the gas in the JT coolers. The vapor pressure of the condensate obtained from reduction of the dew point in the JT is higher (6.8 Kpa) than that of the condensate that comes from the platform (2.51 Kpa)<sup>1</sup>. The two kinds of condensate sometimes mix with each other and are sometimes kept separate. In order to estimate emissions, a scenario has been presumed in which the condensate coming from Tamar is stored partly in a large container (556.5 cubic meters) and partly in a small container (318 cubic meters), whilst the condensate obtained from the JT coolers is kept in the large container (556.5 cubic meters). The scenario for estimating the emissions is based on the following maximum values: During one week, approximately 2100 barrels (approximately 333 cubic meters) of JT condensate and approximately 8000 barrels (approximately 1270 cubic meters) of condensate are received. The entire quantity is stored on site. The actual quantities are lower, at around 6000 barrels of condensate a week.

### 3.3.2 Emissions from the Truck Loading

There are three stations for filling tankers condensate at AOT. These stations enable the transfer of condensate in container trucks where pumping through the pipeline is not possible. **This terminal is not in regular use.**

The potential emission from the truck loading has been calculated in accordance with the PRTR emissions calculator.

**Table 5: Calculation of Hourly Emissions from the Terminal using the PRTR Calculator**

Data Input			Air Emission Quantity Results			
Type	Parameter	Units	Value	Container Filling Method	Units	Total Emission
JT Condensate	Volume of Material for Filling of Container	m <sup>3</sup> / h	52.0	Filling of container from bottom opening, without steam balance system.	kg / h	3.04
	Material steam pressure (for temperature at filling time) <sup>2</sup>	Pa	6,800.0			
	Efficacy of means for reduction of emissions (if any) <sup>3</sup>	%	0.0			
“Normal” condensate	Volume of Material for Filling of Container	m <sup>3</sup> / y	52.0	Filling of container from bottom opening, without steam balance system.	kg / h	1.12
	Material steam pressure (for temperature at filling time) <sup>2</sup>	Pa	2,510.0			
	Efficacy of means for reduction of emissions (if any) <sup>3</sup>	%	0.0			

<sup>1</sup> Vapor pressures are calculated on the basis of condensate components.

### 3.3.3 Estimation of Emissions due to Leaks from Equipment Components

Emissions from equipment component leaks were estimated in accordance with the guidelines set out in the EPA Protocol for Equipment Leak Emission Estimates (EPA-453/R-95-017) using the average emission factor method (Chapter 2.3.1).

In order to estimate emissions, all pipeline components of the condensate system were mapped. Note that prior to operation of the condensate pipeline system, all of the connections are tightened in order to reduce any possibilities of vapor leaks as far as possible.

The following are details of emissions coefficients used for the purpose of calculating equipment component emissions and a summary of the emissions estimated.

**Table 6: Emissions Coefficients for the Estimation of Equipment Component Emissions**

TABLE 2-3. MARKETING TERMINAL AVERAGE EMISSION FACTORS		
Equipment type	Service	Emission factor (kg/hr/source) <sup>a</sup>
Valves	Gas	1.3E-05
	Light Liquid	4.3E-05
Pump seals	Gas	6.5E-05
	Light Liquid	5.4E-04
Others (compressors and others) <sup>b</sup>	Gas	1.2E-04
	Light Liquid	1.3E-04
Fittings (connectors and flanges) <sup>c</sup>	Gas	4.2E-05
	Light Liquid	8.0E-06

<sup>a</sup>These factors are for total organic compound emission rates (including non-VOC's such as methane and ethane).

<sup>b</sup>The "other" equipment type should be applied for any equipment type other than fittings, pumps, or valves.

<sup>c</sup>"Fittings" were not identified as flanges or non-flanged connectors; therefore, the fitting emissions were estimated by averaging the estimates from the connector and the flange correlation equations.

**Table 7: Estimate of Emissions from Equipment Components – Condensate**

Type of Accessories	Number of Components in Contact with Condensate	Emission Factor (kg/hour/source)	Hours per Year	Service	Hourly TOC Emission (kg/hour)	Annual TOC Emission (kg/hour)
Valves		0.000043	8,760	light liquid	0	<b>0</b>
Pumps	16	0.00054	8,760	light liquid	0.00864	<b>76</b>
Sampling points and other equipment	2	0.000008	8760	light liquid	0.000016	0.14
Connectors and flanges	732	0.00013	8,760	light liquid	<b>0.095</b>	<b>834</b>
<b>Total</b>	<b>750</b>				<b>0.104</b>	<b>910</b>

#### **4 Environmental Survey – Pollutant Dispersal Model**

This Chapter sets out the impact of the operations of the Ashdod Onshore Terminal on the air quality at the Ashdod Industrial Zone, within a radius of 10 km around the site. An AERMOD pollutant dispersion model was used, which is the model that is approved for use by the Ministry for Environmental Protection for the purpose of calculating the dispersal of air pollution from a wide variety of sources of emissions (field sources, stacks, roads, quarries, sources of odors, etc.), taking into account local topographical and meteorological conditions. The AERMOD model used for the running of this emissions permit is AERMOD version 12060 of the EPA.

##### **4.1 Sources of Emissions**

According to the guidelines of the Ministry for Environmental Protection, the pollutants in respect of which the air pollution dispersion model was run are: Total suspended particles, PM-10, NO<sub>x</sub>, CO and SO<sub>2</sub>. The following tables set out the physical characteristics of the gas turbines and their expected emissions.

**Table 8: Physical Characteristics of the Stack**

Identification	Source	Coordinate (X)	Coordinate (Y)	Height (m)	Diameter (m)	Temperature (degrees)	Speed (m/s)
1	EZZ 2610	169888.21	639830.12	14	2.38	540.00	28.10
2	EZZ 2710	169912.2	639830.23	14	2.38	540.00	28.10
3	EZZ 2810	169936.18	639830.12	14	2.38	540.00	28.10

**Table 9: Expected Rate of Emission (kg/hour) from Gas Turbines for Pollutants with Environmental and Target Values**

Identification	Source	Nitrous oxides (kg/h)	Particles (kg/h)	Sulfur dioxide (kg/h)
1	EZZ 2610	12.00	1.58	0.704
2	EZZ 2710	12.00	1.58	0.704
3	EZZ 2810	12.00	1.58	0.704

#### 4.2 **Scenarios for Running the Model**

In accordance with the guidelines set out by the Ministry for Environmental Protection, the following scenarios were examined:

- 1. Background Scenario in Existing Condition:** Examination of the quality of air in the environment due to background sources only, in a radius of ten kilometers around the emission sources that is the subject of the permit. Background facilities including the emission sources inside the AOT prior to the Compression project)
- 2. Future Scenario for Background Sources or Gas Turbines:** Examination of the quality of the air in the environment due to background sources and the gas turbines.
- 3. Future Scenario for Gas Turbines:** Examination of the quality of the air from gas turbines only.

#### 4.3 **Area of Examination**

In order to examine the quality of the air in the region, a circular grid was defined in a radius of 10 kilometers, with the center of the circle being fixed on the planned location of the gas turbines at coordinates 169912.20, 639830.23, on the New Israel Grid.

#### 4.4 **Receptor Network**

In order to run the model, a network of discrete receptors was defined at a resolution of 100 meter intervals from the fence of the existing site and up to a distance of 500 meters from the fence. After this distance, receptors were set at intervals of 500 meters for the entire circular grid. In total, 1,872 discrete receptors were tested over the entire area of the circular grid. In order to examine concentrations at sensitive receptors in the region, another 38 receptors were defined at sensitive points on the grid.

#### 4.5 **Impact of Buildings**

In order to calculate the impact of the phenomenon of descent of the pollution plume downwards as a result of the presence of buildings, the main existing and planned buildings were included in the running of the model. There are no buildings for the turbines themselves, however, for the purpose of calculation in the model, the physical characteristics of the turbines were taken into account as buildings.

#### 4.6 **Summary of the Model Results**

##### 4.6.1 **Total Suspended particles (TSP)**

TSP is emitted from the background sources and is expected to be emitted from the planned gas turbines. The results of calculation of the air quality in the existing situation, with respect to inhalable particles, show deviations from the environmental values from the background sources. The maximum concentration obtained from the background sources amounted to 1317.62 micrograms/cubic meter, the second highest concentration from background sources amounted to 1211.85 microgram/m<sup>3</sup>, which constitutes a deviation of 4 times greater than the environmental standard and the target. The concentrations obtained for the gas turbines in the future showed that the expected impact of them on particle concentrations in the environment is negligible. The maximum concentration obtained in future conditions amounted to 5.61 microgram/m<sup>3</sup>, the second highest concentration amounted to 5.04 microgram/ m<sup>3</sup>, constituting approximately 1.68% of the environmental standard and the three-hour target. In daily and annual averages, there are no deviations from the environmental values set out in the law in any of the scenarios examined. The second maximum daily concentration obtained from the background sources amounted to 152.28 microgram/ m<sup>3</sup>, which constitutes 76.14% of the environmental value and target, the second maximum concentration obtained from the background sources amounted to 10.33 microgram/ m<sup>3</sup>, constituting approximately 13.77% of the environmental value and the target. For the gas turbines, the concentrations obtained in daily and annual average times were significantly lower than the environmental values and the target. The second

maximum daily concentration obtained from the gas turbines amounted to 1.63 microgram/ m<sup>3</sup>, and constitutes 0.81% of the environmental value, the second concentration measured under future conditions amounted to 0.1 microgram/ m<sup>3</sup>, constituting 0.14% of the environmental value and the target. An examination of the maximum concentrations obtained for all averaging times at points of sensitivity and in all scenarios tested shows that the contribution of the gas turbines at such points is negligible.

In conclusion, the expected impact of the gas turbines at the AOT on the concentration of TSP in the air compared with the background sources and compared with the environmental standards and the target is minimal.

#### 4.6.2 Delicate Inhalable Particles (PM-10)

This pollutant is emitted from the background sources and is expected to be emitted from the planned gas turbines. The results of calculation of the quality of the air with respect to delicate inhalable particles (PM-10) show that there are deviations from the environmental values and the target from background sources only. The maximum daily concentration obtained from the background sources amounted to 152.28 microgram/ m<sup>3</sup>, which concentration constitutes a deviation of 1.52% from the environmental value and 204% of the target value, the second maximum concentration obtained from the background sources amounted to 10.33 microgram/ m<sup>3</sup>, constituting approximately 17.21% of the environmental value and 51.63% of the target value. For the gas turbines, the daily and annual concentrations obtained were significantly lower than the environmental values and the target. The second maximum daily concentration obtained amounted to 1.63 microgram/ m<sup>3</sup>, constituting 1.09% of the environmental value and 3.26% of the target value, the second concentration amounted to 0.1 microgram/ m<sup>3</sup>, which concentration constitutes 0.17% of the annual environmental value and 0.51% of the annual target value. An examination of the maximum concentrations obtained for all averaging times at points of sensitivity and in all scenarios tested shows that the contribution of the gas turbines to air pollution at such points is negligible.

In conclusion, we can say that the expected impact of the gas turbines at the AOT on the concentration of delicate inhalable particles in the air compared with the background sources and compared with the environmental standards and the target is minimal.

#### 4.6.3 NO<sub>x</sub>

This pollutant is emitted from the background sources and is expected to be emitted from the planned gas turbines. The results of calculation of the air quality with respect to nitrous

oxides shows that there are no deviations from environmental standards or targets either from background sources or from the gas turbines. An examination of the maximum half-hourly concentrations obtained shows that the maximum half-hourly concentration obtained from background sources amounted to 272.91 microgram/m<sup>3</sup>, the second maximum concentration from background sources amounted to 236.05 microgram/ m<sup>3</sup> and constitutes approximately 25.11% of the environmental standard. The concentrations obtained for the gas turbines in the AOT showed that the expected impact of them on nitrous oxide concentrations is low, the maximum half-hourly concentration amounted to 57.94 microgram/ m<sup>3</sup>, the second half-hourly concentration obtained amounted to 52.23 microgram/ m<sup>3</sup>, and constitutes approximately 5.56% of the environmental value. In daily and annual averages, there are no deviations from the environmental values or the target set out in the law. The maximum daily concentration obtained from background sources amounted to 93.04 microgram/ m<sup>3</sup>, the second highest daily concentration amounted to 79.20 microgram/ m<sup>3</sup>, constituting 14.41% of the daily environmental value. The maximum annual concentration obtained from background sources amounted to 19.82 microgram/ m<sup>3</sup>, constituting 66.06% of the annual target value. For the gas turbines, the maximum daily concentration obtained amounted to 21.39 microgram/ m<sup>3</sup>, the second maximum concentration amounted to 12.34 microgram/ m<sup>3</sup>, and constitute 2.20% of the environmental value. The maximum annual concentration obtained from the gas turbines amounted to 0.77 microgram/ m<sup>3</sup>, constituting 2.56% of the annual target value. An examination of the maximum concentrations obtained for all averaging times at points of sensitivity and in all scenarios tested shows that the contribution of the gas turbines to air pollution at such points is negligible.

In conclusion, we can say that the expected impact of the gas turbines on the concentration of NO<sub>x</sub> in the air compared with the background sources and compared with the environmental standards is minimal.

#### 4.6.4 NO<sub>2</sub>

This pollutant is emitted from the background sources and is expected to be emitted from the planned gas turbines. The results of calculation of the air quality with respect to nitrogen dioxide shows that there were no deviations from environmental standards or targets either from background sources or from the gas turbines at the AOT. An examination of the maximum hourly concentrations obtained shows that the maximum hourly concentration obtained from background sources amounted to 146.96 microgram/ m<sup>3</sup>, the second maximum concentration amounted to 113.47 microgram/ m<sup>3</sup> and the maximum

concentration in the 99.9th percentile amounted to 84.10 microgram/ m<sup>3</sup> and constitutes approximately 42.05% of the environmental values and the standard. An examination of the maximum hourly concentrations obtained from the gas turbines shows that the maximum hourly concentration obtained from the gas turbines amounted to 23.86 microgram/ m<sup>3</sup>, the second maximum concentration amounted to 20.62 microgram/ m<sup>3</sup> and the maximum concentration in the 99.9th percentile amounted to 12.04 microgram/ m<sup>3</sup> and constitutes approximately 6.02% of the environmental value and the standard. During annual averaging times, there are no deviations from the environmental and target values set out in the law, the annual maximum concentration obtained from the background sources amounted to 6.32 microgram/ m<sup>3</sup>, constituting approximately 15.79% of the target value. The maximum annual concentration obtained from the gas turbines amounted to 0.68 microgram/ m<sup>3</sup>, constituting 1.71% of the target value. An examination of the maximum concentrations obtained for all averaging times at points of sensitivity and in all scenarios tested shows that the contribution of the gas turbines to air pollution at such points is low.

In conclusion, we can say that the expected impact of the gas turbines at the AOT on the concentration of NO<sub>2</sub> in the air compared with the background sources and compared with the environmental standards and the target is low.

#### 4.6.5 SO<sub>2</sub>

This pollutant is emitted from the background sources and is expected to be emitted from the planned gas turbines. The results of the air quality calculation with respect to sulfur dioxide show that in the current situation, there are deviations from the environmental and target values from the background sources, and not from the gas turbines. An examination of the maximum hourly concentrations obtained from the background sources shows that the maximum concentration obtained amounted to 440.68 microgram/ m<sup>3</sup>, the second highest concentration amounted to 440.63 microgram/ m<sup>3</sup>, and the concentration obtained in the 99.9th percentile amounted to 394.86 microgram/m<sup>3</sup>, constituting a deviation of approximately 25.89% from the hourly environmental value. For the ten-minute target value, the concentration that was obtained constitutes a deviation of approximately 25.16% of the target value. The concentrations obtained for the planned gas turbines showed that there are no deviations from the environmental and target values during the short-term averaging times, the maximum concentration obtained amounted to 3.02 microgram/ m<sup>3</sup>, the second maximum concentration obtained amounted to 2.74 microgram/ m<sup>3</sup>, and the concentration obtained in the 99.9th percentile amounted to 1.54 microgram/ m<sup>3</sup>, which constitutes approximately 0.78% of the environmental value. For

the ten-minute target value, the concentration that was obtained constitutes approximately 0.49% of the target value. In daily and annual averages, there were deviations from the environmental and target values from the background sources only. The maximum daily value obtained from the background sources amounted to 219.51 microgram/ m<sup>3</sup>. The second daily concentration amounted to 186.92 and constituted a deviation of approximately 49.54% from the environmental value and approximately 864.62% from the target value. The annual concentration obtained from the background sources amounted to 43.77 microgram/ m<sup>3</sup> and constitutes approximately 72.94% of the environmental value and a deviation of approximately 118.83% of the target value. For the gas turbines, the maximum daily concentration amounted to 1.28 microgram/ m<sup>3</sup>, the second highest concentration amounted to 0.74 microgram/ m<sup>3</sup>, and constitutes 0.59% of the environmental value and 3.70% of the target value. The annual concentration obtained for the gas turbines amounted to 0.05 microgram/ m<sup>3</sup> and constitutes approximately 0.08% of the environmental value and approximately 0.23% of the target value. An examination of the maximum concentrations obtained for all averaging times at points of sensitivity and in all scenarios tested shows that the contribution of the gas turbines to air pollution at such points is negligible.

In conclusion, we can say that the expected impact of the gas turbines at the AOT on the concentration of SO<sub>2</sub> in the air compared with the background sources and compared with the environmental standards and the target is low.

#### **4.7 Summary of Environmental Survey**

The purpose of the environmental survey is to assess the contribution and impact of the gas turbines planned to be constructed at the AOT in the Northern Industrial Zone at Ashdod on air quality.

Three gas turbines are planned to be constructed, two of which shall operate constantly and one of which shall be for back-up purposes. Pursuant to the instructions of the Ministry for Environmental Protection, a pollutant dispersion model was run for the pollutants for which there are environmental and target values. The pollutants for which there are environmental values and which were included in the running of the model are: Total suspended particles (TSP), delicate inhalable particles (PM-10), NO<sub>x</sub>, NO<sub>2</sub>, and SO<sub>2</sub>.

A simulation of dispersal of the pollutants under current conditions shows that the maximum calculated concentrations obtained in the model for the gas turbines are

significantly lower than the environmental standards and targets, and their contribution to the quality of the air in the environment is expected to be negligible.

The results of the model on maps appear in the enclosed appendix (An English title was added in a text box for each map. GT means Gas turbine and background refers to background concentrations including the existing facilities at AOT prior to the GT installation, for further regarding the model scenarios information please refer to chapter 4.2).



ב' בחשון תשע"ה  
26 באוקטובר 2014  
סימוכין: 111/0500/14

לכבוד  
מר פטריק קוק  
ים תטיס בע"מ  
ת"ד 12890  
הרצלייה 4672500

אדון נכבד,

הנדון: היתר רעלים – ים תטיס בע"מ

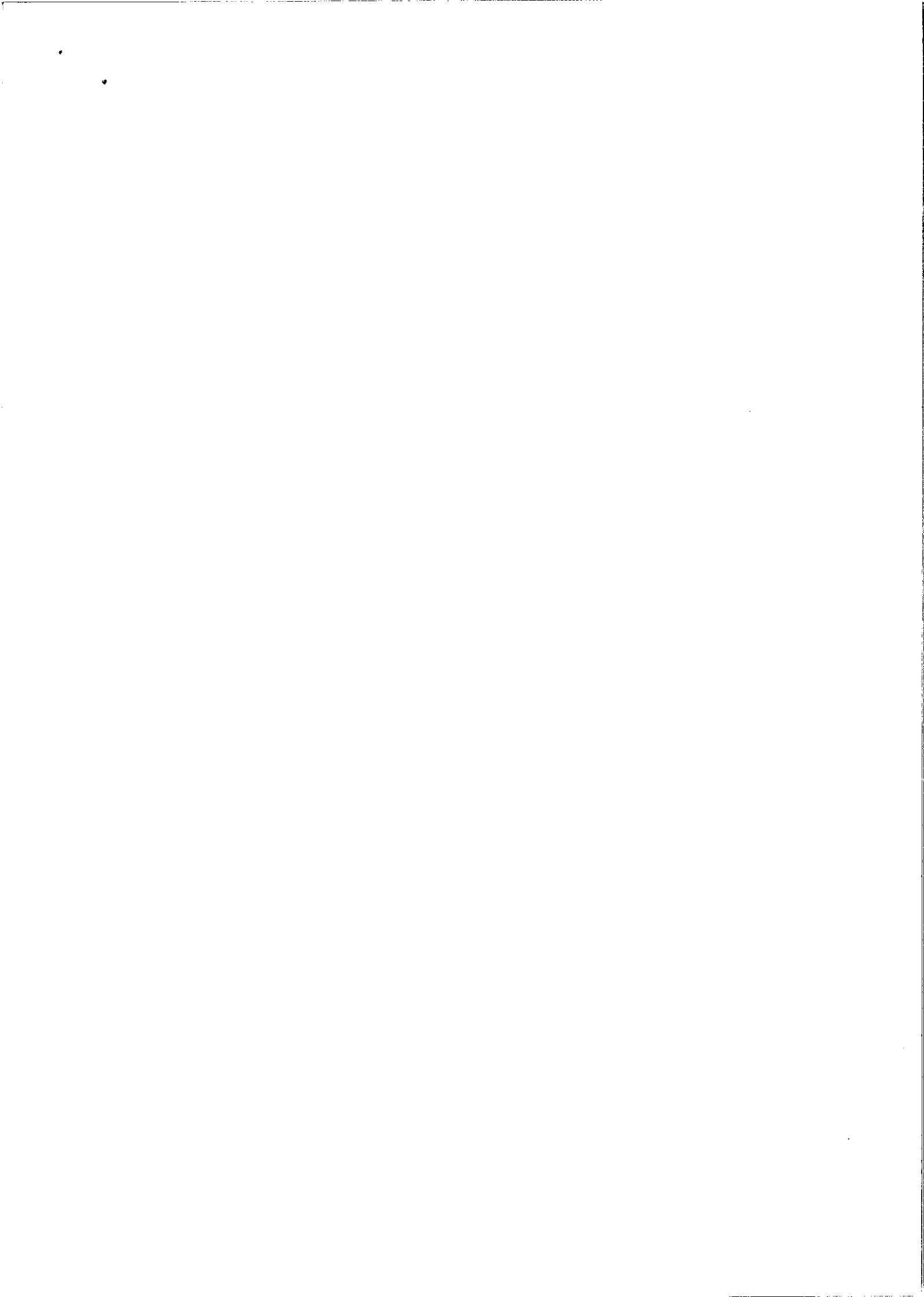
אנו מתכבדים בזה לשלוח אליך היתר רעלים מסי' 623186 לשנים 2014-2015.  
הננו מבקשים להסב את תשומת לבך לכך שע"פ חוק החומרים המסוכנים התשנ"ג - 1993,  
1. אסור לך למכור רעלים לאדם שאין לו היתר רעלים כחוק.  
2. עליך לנהל פנקסי מכירות וקניות רעלים כחוק.

בברכה,

לילך פדלון  
ממונה חומרים וטב"ק

**העתיקים:** מר גיא סמט - מנהל המחוז, כאן.  
מר דרור גולדשטיין – אחראי רעלים  
גבי אורנה פרימור – אחראי רעלים  
גבי חנה וכסמן – א"ע לאיכות הסביבה אשדו  
מרכז מידע לאיכות הסביבה, רמלה.  
תיק היתר רעלים, ש-111





מס' היתר: 623186

מס' מפעל: 159104

היתר רעלים-ים תטיס בע"מ

בתוקף סמכותי לפי סעיף 3 לחוק החומרים המסוכנים, התשנ"ג 1993 - (להלן החוק),  
ניתן בזה היתר רעלים לתקופה מיום 19/10/2014 עד יום 22/10/2015 כלהלן:

למבקש

תאגיד או עסק: ים תטיס בע"מ- מתקן קליטת גז חופי, מס' 159104

בעל היתר רעלים: פטריק קוק

דרכון אמריקאי: 488990878

טלפון: 099572761

טלפון נייד: 0505215680

מען התאגיד או העסק: הנפט 1, אשדוד, מיקוד 7752169

מען למכתבים: שד אבא אבן 12, הרצלייה, ת.ד. 12890, מיקוד 4672500

טלפון התאגיד/עסק: 0732424200 פקס התאגיד/עסק: 09-9553410

מהות העסק: אספקת חשמל, גז, קיטור ומיזוג אוויר (קירור)

עיסוק: 1. מסחר ברעלים 2. עיסוק בגז טבעי 3. העברת רעלים 4. אחזקה  
(צנרת עילית או תת  
קרעית)

5. אחסנת רעלים  
שימוש

אחראי רעלים בתאגיד או בעסק

שם: אורנה פרימור ת.ז. 031849094

כתובת: הזז 16, הרצליה

טלפון (פרטי): 0732424235

טלפון (נייד): 0526567443

תפקיד בתאגיד/בעסק: אחראי רעלים

שם: גולדנשטיין דרור ת.ז. 35678184

כתובת: באר יעקב

טלפון (פרטי): 0747193365

טלפון (נייד): 0547854398

תפקיד בתאגיד/בעסק: אחראי רעלים

לעיסוק ברעלים כמפורט בתוספת הראשונה לבקשה להיתר רעלים מיום 05/08/2014

המאושרת והחתומה בידי הממונה, המצורפת להיתר זה והמהווה חלק בלתי נפרד ממנו (להלן - הבקשה).

עסקד מסווג לסיווג A.

בתנאים מיוחדים כמפורט בתוספת השניה המצורפת להיתר זה והמהווה חלק בלתי-נפרד ממנו.

מודגש בזה כי :

1. היתר זה ניתן אך ורק לסוגי העיסוק, זהות העוסק, מיקום העיסוק, שם הבעלים/מנהל, שם אחראי הרעלים וסוגי וכמויות הרעלים שפורטו בו. יש להודיע מיד לממונה על כל שינוי בנתונים האמורים, לשם בדיקת הצורך לשנות את ההיתר, לבטלו או להחליפו.

2. עיסוק ברעלים ללא היתר רעלים ובכלל זה עיסוק שלא לפי הנתונים להם ניתן ההיתר או בניגוד לתנאיו מהווה עבירה פלילית שהעונש המרבי עליה הוא מאסר עד שלוש שנים או קנס מ- 404,000 ש"ח עד 808,000 ש"ח למנהל ועד 1,616,000 ש"ח לתאגיד או עסק, כמפורט בחוק.

ליילך פדלון  
ע"הממונה"  
לפי ר"ס (החומרים המסוכנים)  
חתימת הממונה המחוזית 19

כ"ה תשרי תשע"ה  
19 אוקטובר 2014

תאריך

כל האמור בלשון זכר אמור גם בלשון נקבה.

מדינת ישראל  
המשרד לאיכות הסביבה

הענף לחומרים מסוכנים

טל: 08-6264000, פקס: 08-6264111

מחוז דרום

רחוב התקווה 4, ת.ד. 230, 84102, באר שבע

תאריך: 19 אוקטובר

2014

כ"ה תשרי

תשע"ה

מס' מפעל: 159104 מס' היתר: 623186

עבור:

פטריק קוק

ים תטיס בע"מ- מתקן קליטת גז חופי  
שד אבא אבן 12, הרצלייה, מיקוד 4672500

שלום רב,

חנדון: היתר רעלים

מצ"ב היתר רעלים שמספרו 623186.

לאחר סיווג עסקך בקטגוריה A תוקף ההיתר הוא ל 1 שנים.

מיום 19/10/2014 עד ליום 22/10/2015.

הנך מתבקש להתחיל בהליך חידוש ההיתר הבא 3 חודשים לפני מועד פקיעת היתר זה.

בכבוד רב

הממונה

**טופס פרטים על אחסון וציריכת חמ"ים (טופס 2 בתוך הגי'א) ובקשה להיתר רעלים (התוספת הראשונה להיתר רעלים)**

שם מתחיק / מבקש ההיתר (תואגיד): \_\_\_\_\_ יום תטיס בעי"מ \_\_\_\_\_ מסי מתחיק במיקוד העורף: \_\_\_\_\_ מסי היתר רעלים: \_\_\_\_\_ דף 1 מתוך 3

מס' מזהה	שם החומר (שם מסחרי ושם כימי), ריכוז	קבוצת סיכון	קודי חירום	סוג אריזה (a) מעב צפירה (b)	משקל נמי אריזה	שיטת אחסון (2)	כמות מרבית מאושרת להחזקה (מ"ק)	כמות מרבית מבוקשת להחזקה (מ"ק)	כמות שנתית משוערת להחזקה (מ"ק)	מס' מזהה
1	Bactron B1150 (1,5-pentanedial, 1:1-30:8-50-60%) CAS 111-30-8 מכ"ס (3)	6.1, 8	2X	מזכ/נזל	30 ק"ג	סטנדרטיים	2 טון	2 טון	2 טון	2922 אר"מ: 2810 אר"מ: CAS מכ"ס (3)
2	Bactron B2100 (tetraakis(hydroxymethyl) phosphonium sulphate(2:1) 30-60%) CAS מכ"ס (3)	6.1	2X	מזכ/נזל	30 ק"ג	בתנאים סטנדרטיים	2 טון	2 טון	2 טון	מכ"ס (3)
3	Cat ELC (Diethylene glycol 1:1-46-6-1-5%, Ethylene glycol, 1:07-21-1, 30-50%) CAS מכ"ס (3)	-	-	קוביות/נזל	1.2 טון	תנאים סטנדרטיים	2.5 טון	2.5 טון	2.5 טון	1993 אר"מ: 2924 אר"מ: CAS מכ"ס (3)
4	Condensate CAS מכ"ס (3)	3	3YE	אחר/נזל	-	תנאים סטנדרטיים	1,500 טון	32 טון	90,000 טון	1202 אר"מ: CAS מכ"ס (3)
5	Diesel Fuel CAS 68476-34-6 מכ"ס (3)	3	3YE	צובר	-	תנאים סטנדרטיים	32 טון	32 טון	32 טון	מכ"ס (3)
6	Emulsicon XF-421 (Benzenesulfonic acid, C10-16-alkyl derivate, 68584-22-5, 30-60%) CAS מכ"ס (3)	8, 3	3W	קוביות/נזל	1.3 טון	תנאים סטנדרטיים	4 טון	4 טון	4 טון	מכ"ס (3)

טופס זה לאחד ההתמנות ע"י הממונה מהווה נספח להיתר הרעלים, אין לגרוע או להוסיף פרטים בטופס זה לאחר החתמתו.

**לשימוש המשד להגנת הסביבה**

הנג נאשר החזקת הרעלים המפורטים ברשימה לעלי על-ידי העוסק \_\_\_\_\_ (ח/מ/ת) \_\_\_\_\_

חתימת ממונה \_\_\_\_\_ חתימת ממונה \_\_\_\_\_

עד תאריך \_\_\_\_\_ עד תאריך \_\_\_\_\_

- מכירת, פת, מיכל וכד' (אם מופיע במסי שוני אריזה יש לציין בשורה נפרדת).
- בהתנסות, בקידוד, דחיס, בתנאים סטנדרטיים וכו'.
- רק יבואים יכלאו שדה זה.
- שדה זה יכולה ע"י המשד להגייס.
- נזל, גז, בלתי, גז מנוזל, גז, מוצק
- במסגרת סגורת כון מעדלות קורר באמצעות אמונה, כמות חרעלים המבוקשת להחזקה ותכמות חשנית המוערת לחחיקה
- תחשע בכמות הרעלות המדרשת להוספה למערכת ועל פי השיעור המינימלי כמפורט בתנאים להיתר.

**הצהרה: אני מצהיר שכל הפרטים בטופס זה מלאים, נכונים ומדויקים.**

שם פרטי ומשפחה \_\_\_\_\_ תאריך \_\_\_\_\_

שם פרטי ומשפחה \_\_\_\_\_ תאריך \_\_\_\_\_

מטריד קוד \_\_\_\_\_

מס' ת"י \_\_\_\_\_

488990878 (דרכון אמריקני) \_\_\_\_\_



טופס פרטים על אחסון וצילינג חמ"ס (טופס 2 בתוך חמ"ס), ובקשה להיתר רעלים (התוספת הראשונה להיתר רעלים)  
 שם מחזורי / מבקש ההיתר (תאגיד): \_\_\_\_\_ עם תנאים בע"מ \_\_\_\_\_ מסי מחזורי בפקוד העורף: \_\_\_\_\_ מסי היצר רעלים: \_\_\_\_\_ מתוך 3 דף 2

מס.	מסי מזהה	שם החומר (שם מסחרי ושם כנייה/ריכוז)	קבוצת סיכון	קודי חירום	סוג אריזה (5)	משקל נקי, אריזה	הזרמת גז טבעי בצנרת (2)	כמות מרבית נבזקת לשהייה (ק"ג)	כמות מרבית מאושרת להחזקה (4) (ק"ג)	כמות שנתית מוערכת להחזקה (6) (ק"ג)	מס.
7	אריזת CAS 74-82-8	Natural Gas (Methane)	2.1	2SE	אחר/גז	-	הזרמת גז טבעי בצנרת	2 MMIN <sup>3</sup> /h	2000 טון	10 BCM	7
	מכס (3)							מכס (3)			
8	אריזת CAS 00772-37-9	Nitrogen	2.2	2RE	מיכל נוזל	20 טון	תנאים סטנדרטיים	20 טון	20 טון	8.5 MINton	8
	מכס (3)							מכס (3)			
9	אריזת CAS	Regal Premium EP 32, 46, 68 (mineral oil (C15-C50) 95-99.99%; Petroleum distillates <2.5%; Alkyl phenol <0.5%; Aryl amine <0.2%)	2.2	2RE	תבית נוזל	210 ק"ג	תנאים סטנדרטיים	70 טון	70 טון	70 טון	9
	מכס (3)							מכס (3)			
10	אריזת CAS	Regal SGT 22 (Alkylphosphate, 273-066-3, 1-3%; Triphenyl phosphate, 204-112-2, <1%)	8	2R	תבית נוזל	210 ק"ג	תנאים סטנדרטיים	3.5 טון	3.5 טון	3.5 טון	10
	מכס (3)							מכס (3)			
11	אריזת CAS 1310-73-2	Sodium Hydroxide Solid	8	2R	שק/מזקק	25 ק"ג	תנאים סטנדרטיים	4.5 טון	4.5 טון	10 טון	11
	מכס (3)							מכס (3)			
12	אריזת CAS 75-45-6	Freon	2.2	2TE	מיכל/גז	13 ק"ג	תנאים סטנדרטיים	200 ק"ג	200 ק"ג	200 ק"ג	12
	מכס (3)							מכס (3)			

טופס זה לאתר החתמת ע"י הממונה מהווה נספח להיתר הרעלים, אך לנרוע או להוסיף פרטים נוספים זה לאתר החתמתו.

לשימוש המשרד להגנת הסביבה

הנני מאשר החזקת הרעלים המפורטים ברישימה לעיל על-ידי העניסק \_\_\_\_\_ (ח/מ/ת/ג) 673126  
 חתימת נמנית \_\_\_\_\_  
 עד תאריך \_\_\_\_\_  
 מותאם \_\_\_\_\_

(1) הובר. פת. מיכל וכד' (אם מופיע במסי) סוג אריזה יש לציין בשורה נפרדת.  
 (2) בתמיסה, בקירור, דחוס, בתנאים סטנדרטיים וכד'.  
 (3) רק יבואנים יכולים שדה זה.  
 (4) שדה זה יצולא ע"י המשרד לחמ"ס. לפיקוד העורף יועבר הטופס כששדה זה מלא ומאושר.  
 (5) נוזל, גז, מוצק, נוזל מוצק.  
 (6) במערכות סגורות כגון מערכות קירור באמצעות אמוניה, כמות הרעלים המבוקשת להחזקה והכמות השנתית המוערכת להחזקה יתחשבו בכמות הרעלים הנדרשת להוספה למערכת ועל פי השיעור המורבי כמפורט בתנאים לחיתור.  
 הצהרה: אני מצהיר של הפרטים בטופס זה קלאיים, נכונים ומדויקים  
 פטריק קונג  
 שם פרטי ומשפחה  
 תאריך

Koble Energy Mediterranean Ltd.  
 Corp. No. 560017162

488990878 (דרכון אמריקני)  
 מסי ת"י



קוד	שם החומר (שם מסחרי ושם כימי), ריכוז	קבוצת סיכון	קודי חירום	סוג אריזה (5) מצב צבירה	משקל יח' אריזה	שיטת אחסון (6)	כמות מרבית מבוטאת להחזקה (ק"ג)	כמות מרבית מאושרת להחזקה (ק"ג)	כמות שנתית משוערת להחזקה (ק"ג)	גוסי	מס' מזהה
13	TM-03-059 Copper Sulfate Solution			חבילנות נוזל	30 ק"ג	סטנדרטיים	30 ק"ג	30 ק"ג	60 ק"ג	13	אריזת מביים
14	TM-05-E03 Dead Zone (Diquat Di bromide 85-007 4.35%)			חבילת נוזל	220 ק"ג	תנאים סטנדרטיים	220 ק"ג	220 ק"ג	440 ק"ג	14	אריזת: מביים
15	CAS									15	אריזת מביים
16	CAS									16	אריזת מביים
17	CAS									17	אריזת מביים
18	CAS 1888									18	אריזת מביים
19	CAS									19	אריזת מביים

טופס זה לאתר החתמתו ע"י הממונה מהווה נספח להיתר הרעלים, אין לנרוע או לחסוף פרטים בטופס זה לאחר החתמתו.

לשירות המשרד להגנת הסביבה  
 חתום מאשר החזקת הרעלים המפורטים ברשימה לעיל על-ידי החוקק: 62188 (ח/ג/ת) \_\_\_\_\_  
 תחילת מסמך זה: 22/10/15 מתאריך: 22/10/15  
 יתקיימת: 22/10/15 עד תאריך: 22/10/15

- חתימת פת, מיכל וכד' (אם מופיע במסי סוג אריזה יש לציין בשורה נפרדת).
- בתמיסה, בקיור, דחס, בתנאים סטנדרטיים וכד'.
- רק יצרנים וסלחן שדה זה.
- שדה זה ימלא ע"י המשרד להגנים. לביקור העורף יועבר הטיפול כששדה זה מלא ומאושר.
- חלף גו, בלתי גו מנוזל, גו מוצק.
- במערכות סגורות מנוזליות קיורד באמצעות אמוניה, כמות הרעלים המבוטאת להחזקה והכמות השנתית המסוימת להחזקה תתחשב בכמות הרעלים הנדרשת להיספח למערכת ולע פל השעור המוריי כמפורט בתנאים להיתר.

הצהרה: אני מצהיר שכל הפרטים בטופס זה מלאים, נכונים ומדויקים.

שם פרטי ומשפחה: דוד גולד שם פרטי ומשפחה: דוד גולד  
 כתובת: דוד גולד כתובת: דוד גולד  
 חתום: דוד גולד חתום: דוד גולד

Koble Energy Mediterranean Ltd.  
 Corp. No. 560017162



טופס 2

**פנקס רעלים (קניות)**

לענין טופס זה "קניה" לרבות יבוא או מסחר.

מספר סידורי	תאריך קניה	שם הרעל	כמות הרעל ק"ג/ליטר*	שם הספק ומענו

\* מחק את המיותר.

ג. על-פי חוק החומרים המסוכנים, חלה האחריות לקיים את כל התנאים המיוחדים בהיתר זה הן על בעל ההיתר וכן על בעלים או מנהל או שותף או פקיד האחראי מטעם התאגיד או העסק על התחום הנוגע לעניין.

ד. בעל היתר הרעלים ימנה אחראי רעלים שיפעל מכוח כתב מינוי מטעם התאגיד או העסק, באופן שיהיו לו כל הסמכויות הדרושות לכך שיתקיים בתאגיד או בעסק טיפול מקצועי-בטיחותי בחומרים מסוכנים לפי מיטב הידע והטכנולוגיות המקובלות, ולכך שיקוימו התנאים המיוחדים המפורטים בתוספת זו.

**חלק ב' : תנאים מיוחדים לענין אחראי רעלים**

א. אחראי הרעלים, שמונה כאמור בפסקה ד' לעיל, יכיר היטב את תכונותיהם המסוכנות של הרעלים המפורטים בתוספת הראשונה ואת אופן הטיפול בהם, הן בשימוש שוטף והן באירוע חריג.

ב. הפסקת עבודתו של אחראי רעלים מהווה הפרת תנאי מיוחד בהיתר. יש להודיע לממונה על החלפת אחראי רעלים מבעוד מועד כדי לאפשר הוצאת היתר רעלים חדש או תיקון ההיתר הקיים, לפי הענין.

שם מפעל : ים תטיס בע"מ- מתקן קליטת גז חופי , מס' 159104

חלק ג' : תנאים מיוחדים לענין הטיפול ברעלים

## תנאים כללים

### א. מבוא

- א.1. חוק החומרים המסוכנים, התשנ"ג - 1993 (להלן – החוק) קובע כי כל עיסוק ברעלים לרבות יצור, יבוא, אריזה, מסחר, ניפוק, העברה, אחסנה, החזקה ושימוש חייב בהיתר רעלים.
- א.2. התנאים דלהלן הם תנאים כלליים ויישומם יתבצע ע"פ לוח זמנים כפי שיאשר הממונה. ניתן להוסיף עליהם בכל עת על פי הצורך.
- א.3. תנאים אלה אינם באים במקום כל דרישה אחרת של גופים הממונים על כך מתוקף חוק. בכל מקרה של סתירה בין התנאים התנאי המחמיר קובע.

### ב. תנאים כלליים להיתרי רעלים

- ב.1. אין למכור רעלים למי שאינו בעל היתר רעלים כמפורט בסעיף 8 לחוק. בעל היתר הרעלים אחראי לנהל ולעדכן את פנקסי הרעלים שלו כמפורט בסעיף 5 לחוק.
- ב.2. היתר הרעלים ניתן לעיסוק בחומרים ובכמויות כמפורט בתוספת הראשונה המצ"ב בלבד. ההיתר אינו מאפשר קליטת, קניית או מכירת פסולות של הרעלים הנ"ל או פסולות מסוכנות אחרות ממקורות חוץ, אלא אם ניתן לכך אישור מראש ובכתב במפורש.
- ב.3. בעל היתר הרעלים יחזיק גיליון בטיחות (MSDS) כמפורט בתקנות הבטיחות בעבודה (גיליון בטיחות) התשנ"ח - 1998.
- ב.4. בעל היתר הרעלים ינקוט בכל האמצעים הדרושים לטיפול ברעלים שבעסקו, לפי מיטב הידע והטכנולוגיות המקובלות והשימות כלכלית ( best available technology economically achievable) ובכפוף להוראות היצרן ולגיליונות הבטיחות (MSDS), לרבות אמצעים למניעת תקריות ולטיפול בהן.
- ב.5. בעל היתר הרעלים חייב לתפעל או להחזיק את העסק שברשותו כך שתצומצם פליטת רעלים לסביבה: לאוויר, למקורות מים, לקרקע או לשפכים בהתאם לדרישות החוקים והתקנות הרלוונטים.  
בעל ההיתר יכין נוהלי תיפעול ותחזוקה שיבטיחו את תקינות הציוד ובכלל זה צנרת, מאצרות, משאבות, שסתומים, גלאים, ציוד לטיפול בתקלות, אמצעי בטיחות וציוד מגן.

**ב. בעל היתר הרעלים יעמוד בדרישות שירותי הכבאות וההצלה ויפעל על פי הנחיותיהם בכל הקשור למניעת דלקות וטיפול בהן.**

**ב. במפעל יוכן מיפוי למקורות ותרחישים אפשריים להיווצרות חשמל סטטי. על פי ממצאי מיפוי זה יותקנו התקני הארקה. ההתקנים יתוחזקו לאבטחת יעילותם מעת לעת.**

**ג. מבנה לאחסון רעלים:**

- ג.1 המבנה בו מאוחסנים רעלים (להלן: המבנה) יהיה מחומר קשיח ולא בעיר.
- ג.2 רצפת המבנה תהיה מחומר קשיח מונע חלחול. הרצפה תהיה בעלת שפה מוגבהת או שתנוקז לבור איסוף במטרה למנוע את פיזור הרעלים מחוץ למבנה בעת שפך.
- ג.3 המבנה יהיה מאוורר באופן טבעי או מאולץ.
- ג.4 דלת המבנה תפתח החוצה.
- ג.5 במבנה המיועד לאחסון של רעלים דליקים או רעלים ששרפתם תפלוט חומרים רעילים לסביבה יהיו קירות המבנה, המחיצות או הקירות הפנימיים מחומר עמיד לאש.
- ג.6 במבנה תותקן תאורה להתמצאות בחשכה.
- ג.7 במבנה המיועד לאחסון חומרים דליקים ובסביבה בה משוגעים חומרים כאלה יהיו אביזרי החשמל מסוג המוגן מהתפוצצות.

**ד. אחסון (בכל שטח המפעל לרבות במחסנים, אולמות ייצור, מערכות טיפול בשפכים):**

- ד.1 בעל ההיתר יודא כי לתחום אחסון הרעלים יכנסו רק עובדים שהוסמכו לכך.
- ד.2 יופרדו רעלים העלולים להגיב ביניהם.
- ד.3 יופרדו רעלים שההנחיות לטיפול בהם בעת חירום סותרות זו את זו.
- ד.4 ליד כל אזור אחסון יוחזקו חומרים סופגים ובמידת הצורך אמצעי שאיבה. עמדות כיבוי אש תמוקמה בהתאם להנחיות שירותי הכבאות וההצלה.
- ד.5 רעלים יאוחסנו באריזות סגורות ותקינות וככל האפשר באריזות המקוריות.
- ד.6 לא יאוחסנו נוזלים מעל מוצקים או אבקות.
- ד.7 אבקות יאוחסנו באופן שימנע הרטבתן ופיזורן.
- ד.8 מכלי אחסון נוזלים או גזים מונזלים למעט גזים מונזלים דליקים, ייבנו בתוך מאצרות או במחסנים הבנויים כמאצרה או על משטחי אחסון ואיסוף המנוקזים למכל איסוף למעט במקרים שיאשר הממונה. המאצרות, משטחי האחסון והאיסוף ומכלי האיסוף ייבנו על פי התנאים למאצרות (ד.16).

**ד.9** מכלי גזים מונזלים דליקים חדשים ייטמנו. בעל ההיתר יוודא כי מתחת למכלים קיימים לא תתאפשר הצטברות גז דליק.

**ד.10** בעל ההיתר יוודא כי מכלים ריקים ובהם שאריות הרעלים יועברו לרמת תובב, או יוחזרו לספק ממנו נתקבלו חומרי הגלם, או ישטפו כך שלא יכילו את הרעל שאוחסן בהם ומי השטיפה יטופלו במתקן קדם טיפול. התויות המקוריות יוסרו ממכלים שנשטפו ואינם מכילים שאריות הרעלים שאוחסנו בהם. מכלים מרוקנים מרעלים יאוחסנו בנפרד.

**ד.11** אחסון של מכלים ניידיים (דוגמת: תביות וקוביות) יעשה רק על גבי משטחים מתאימים ותקינים.

**ד.12** מכלים ניידיים יאוחסנו כך שתובטח גישה נוחה של כלי השינוע לכל אחד מהם.

**ד.13** ניתן לאחסן רעלים במשטחים המונחים זה על גבי זה בשתי קומות. בכל מקרה בו מעוניינים ביותר משתי קומות יש לקבל אישור בכתב מאת הממונה.

**ד.14** במקרים בהם יאשר הממונה אחסון חומרים דליקים שלא בתוך מבנה יש לאחסנם בצל ולהפרידם מחומרים בעירים לרבות צמחיה.

**ד.15** בעל ההיתר ידווח לממונה על כל המכלים התת קרקעיים המכילים רעלים ומצויים בשטח המפעל.

#### **ד.16 מאצרות (הנחיות מפורטות בנושא יצורפו במידת הצורך):**

**ד.16.1** קיבולת המאצרה תהיה לפחות 110% מנפח המכל המאוחסן בה.

כאשר מאוחסנים במאצרה מספר מכלים יהיה נפח המאצרה לפחות: 110% מנפח המכל הגדול ביותר. לא יאוחסנו מכלים במאצרה בקומות אלא באישור מיוחד בכתב מאת הממונה.

**ד.16.2** קירות המאצרה יהיו בעלי חוזק מכני מספק בכדי להכיל את תכולתה המקסימלית.

**ד.16.3** המאצרה תהיה אטומה עמידה או מצופה בציפוי עמיד לכל החומרים המאוחסנים בתוכה באופן שתמנע לחלוטין דליפה לסביבה.

#### **ה. שילוט:**

##### **ה.1 שילוט מתקני איחסון רעלים -**

**ה.1.1** כל המתקנים בהם מאוחסנים רעלים וכל העמדות לאחסון רעלים ישולטו באופן ברור והשילוט יוצב במקום בולט. הכיתוב יהיה קריא וברור ויעשה על חומר עמיד מכנית וכימית. שילוט מתקן יציין גם את שם המתקן.

**ה.1.2** שילוט הרעלים יכיל את הפרטים הבאים: השם הכימי של החומר המאוחסן באותיות עבריות או לועזיות, מס' או"ם, קבוצת סיכון, ציון הסיכון וקוד חירום. במידה ומאוחסנים בעמדה

מס' רעלים ניתן לשלטם בשלט משותף. במקרה זה יצוין על השלט שם הקבוצה, ציון הסיכון וקוד החירום המחמיר.

**ה.2. שילוט צנרת** - יש לסמן סוגי צנרת (נוזלים, גזים) עם שם החומר המועבר בצנרת וכיוון הזרימה. ניתן לחלופין לסמן צנרת באמצעות צבעים שונים ובתנאי שמקרא הסימון יוצג במקום בולט בכניסה למפעל.

**ו. הערכות לאירוע חירום וטיפול בו:**

"אירוע חומרים מסוכנים" כהגדרתו בחוק החומרים המסוכנים, התשנ"ג-1993: "התרחשות בלתי מבוקרת או תאונה, שמעורב בה חומר מסוכן, הגורמת או העלולה לגרום סיכון לאדם ולסביבה, לרבות שפך, דליפה, פיזור, פיצוץ, התאיידות, דליקה."

ו.1 בעל ההיתר יכין ויפעיל נוהל חירום אשר מטרתו להגדיר את האחריות, הסמכויות והפעולות לביצוע בעת אירוע חומרים מסוכנים. נוהל החירום יוגש לאישור הממונה. הנוהל יכיל את הפרטים המפורטים להלן:

ו.1.1 מיפוי הרעלים במפעל, ובכלל זה אזור אחסון הרעלים, אופן אחזקתו ודרכי גישה אליו.

פרוט תנאי אחסון החומרים, סוגי האריוזות ואמצעי ההפרדה בין סוגי הרעלים השונים.

ו.1.2 תרחישים אפשריים של אירועים ואופן הטיפול המתאים לכל אחד מהם.

ו.1.3 מיפוי ופרוט האמצעים הקיימים במערכת היצור למיגון מפני תקלות ותקריות כתוצאה מהתפוצצות, התלקחות או פיזור בסביבה של רעלים.

ו.1.4 מיפוי ופרוט האמצעים הטכניים והציוד לטיפול באירוע ומיקומם, לרבות אמצעי התראה, אמצעי ניטרול ומערך גילוי וכיבוי אש.

ו.1.5 רשימת אנשי צוותי החירום לטיפול באירוע ותפקידיהם כולל אופן ההתקשרות עימם בשעות העבודה ולאחריהן.

ו.1.6 רשימת גופי החירום וגופי ההצלה ומספרי הטלפון שלהם.

ו.1.7 פרוט ציוד המיגון האישי ומיקומו.

ו.1.8 נוהל זה יעודכן עם כל שינוי באחד מסעיפיו ולפחות פעם בשנה. פרטי העידכון יישלחו לממונה עם תאריך עדכון.

ו.1.9 הנוהל יוחזק בשער המפעל ובידי בעל ההיתר, אחראי הרעלים ומנהל המפעל.

ו.1.10 בעל ההיתר ידאג לתרגול נוהל החירום לפחות פעם בשנה. הודעה על מועד התרגיל תשלח לממונה.

**2. ציוד מיגון, ציוד ואמצעים טכניים:** במפעל יוחזק ציוד מיגון המתאים לחומרים המסוכנים הקיימים בו. הציוד ישמר במצב תקין וימצא במקום נגיש ומשולט.

**3. נוהלי דיווח:** על כל אירוע יש לדווח בהקדם האפשרי ולא יאוחר מ 15 דקות מגילוי האירוע, למטרה ולמוקד המשרד לאיכות הסביבה - 6911\* (במכשירים ללא כוכבית פעילה: -1222 6911).

3.1 לאחר כל אירוע חומרים מסוכנים יערוך בעל ההיתר תחקיר. התחקיר, מסקנותיו והלקחים ממנו יעמדו לרשות הממונה על פי דרישתו.

**ז. שינוע:** שינוע רעלים יעשה רק ע"י משנעים בעלי היתר ממשרד התחבורה ובעלי היתר רעלים להעברת חמ"ס.

**ז. 1. אזור פריקה וטעינה בעסק:** האזור ינוקז למערכת אגירת שפך מקומית או למערכת ניקוז מפעלית ובכל מקרה לא למערכת ניקוז נגר עילי.

**ז. 2. נוהל פריקה וטעינה:** במפעל יוכן נוהל לפיו יהיה אחראי מטעמו במהלך עבודות הפריקה והטעינה. האחראי יבדוק חיבורים לצנרת, הזנה למכלים המתאימים וכו'.

**ז. 3. שילוט בשינוע:** כלי הרכב או כל אמצעי שינוע אחר ישולט לפי תקנות שירותי הובלה התשס"א - 2001 .

**ז. 4. טעינת החומרים ע"ג כלי הרכב תעשה על פי התקנות הנ"ל.**

#### **ח. טיפול בפסולת חומרים מסוכנים:**

**ח. 1. תקומנה הוראות תקנות רישוי עסקים (סילוק פסולת חומרים מסוכנים) התשנ"א - 1990.**

**ח. 2. כל פסולת חומרים מסוכנים שמקורה במפעל, תסולק בהקדם האפשרי ולא יאוחר מתום שישה חודשים ממועד היווצרותה למפעל לנטרול וטיפול בפסולת חומרים מסוכנים שברמת חובב (להלן: אתר הפסולת הרעילה), כשהיא ארוזה ומשונעת בהתאם להוראות כל דין. סילוק למקום אחר לצורך מחזור או שימוש חוזר בפסולת או מטעם אחר יוכל להיעשות רק לאחר קבלת אישור מראש מאת מנכ"ל המשרד לאיה"ס. שמן משומש יסולק ע"פ תקנות מניעת מפגעים (שמן משומש), התשנ"ג 1993 לבעל היתר רעלים לאיסוף ו/או אחסון ו/או מחזור שמנים משומשים.**

**ח. 3. בעל מפעל יחזיק וישמור במשרדיו במשך חמש שנים לפחות את החשבונות של אתר הפסולת הרעילה או של מקום המחזור או השימוש החוזר לפי הענין ויצגן בפני הממונה על פי דרישתו להוכחת סילוק הפסולת כנדרש.**

**ח. 4. כל משלוח של פסולת חומרים מסוכנים ילווה ב"טופס מלווה לפסולת מסוכנת" (בנוסח הטופס שצורף לטפסי בקשה להיתר ונמצא באתר האינטרנט של המשרד). על בעל היתר הרעלים**

למלא את כל הפרטים הנדרשים בטופס האמור, בהתאם לעיסוקו כ-יצרן הפסולת/ המוביל/ תחנת המעבר/ היעד הסופי לפי העניין, ולאשר את אמיתות המידע בחתימתו.

ח.5 לאחר מילוי החלק הרלוונטי לו בטופס, על בעל ההיתר לשמור העתק מטופס זה במשרדו למעקב. הטופס המקורי יועבר עם הפסולת המסוכנת ליעדה הבא.

ח.6 הטופס המלא לאחר שנחתם על ידי כל הגורמים הרלוונטיים, יוחזר ליצרן הפסולת על ידי היעד הסופי (כדוגמת מפעל מחזור או מפעל טיפול). יצרן הפסולת ישמור במשרדיו את הטופס המלא במשך חמש שנים לפחות ויציגו בפני הממונה על פי דרישתו.

ח.7 פסולת חומרים מסוכנים ואריזות ריקות של חומרים מסוכנים יאוחסנו בעמדה ייעודית ומשולטת בשלט ברור. העמדה תהיה סגורה למניעת כניסה בלתי מבוקרת.

ח.8 פסולת חומרים מסוכנים העלולות להגיב ביניהן, יופרדו באופן שתמנע כל אפשרות תגובה ביניהן.

ח.9 כל קבוצה תשולט בשלט שיפרט את מהות הסיכון ואת קוד החירום המחמיר המתאים.

ח.10 כל אריזה ובה פסולת חומרים מסוכנים תסומן בתווית ובה יפורטו: שם המפעל וכתובתו, סוג הפסולת וסיכונה, תאריך תחילת מילוי האריזה.

ח.11 פסולת דליקה או ראקטיבית במיוחד תאוחסן במבנה מקורה ומאוורר.

ח.12 עמדות הפסולת הנוזלית יהיו בנויות כמאצרה או כמשטח איחסון ואיסוף המתנקז ישירות או ע"י תעלות למיכל איסוף. כאשר מאוחסנים בעמדה מכלים בנפח הגדול מ- 1 מ"ק יהיה נפח המאצרה 110% מנפח המיכל הגדול. כאשר מאוחסנים מכלים של 1 מ"ק או קטנים מהם יהיה נפח המאצרה 110% מסך כל הפסולת המאוחסנת או לחלופין ניתן לאחסן פסולת זו על משטח אחסון המנוקז לבור איסוף בנפח 4 מ"ק. איטום המאצרות, משטחי איסוף ובורות האיסוף יעשה כמפורט בסעיף מאצרות כך שימנע זיהום הסביבה.

ח.13 אריזות הפסולת יסודרו באופן שתתאפשר גישה נוחה לכל חבית/ מיכל וקריאת מדבקת הסימון.

ח.14 פסולת חומרים מסוכנים תארז באריזות תקינות המתאימות לסוג החומר ועל פי דרישת המפעל המיועד לקליטת הפסולת.

ח.15 חביות יאוחסנו ע"ג משטחים תקינים ושלמים.

ח.16 פסולת תאוחסן בגובה שתי קומות לכל היותר.

ח.17 פסולת מוצקה תיארוז באופן שימנע פיזור החומר.

- ח.18 לפני משלוח ראשון של כל סוג פסולת חומרים מסוכנים יש להעביר למפעל הטיפול את כל המידע הקיים לגבי הפסולת ובכלל זה דפי מידע MSDS, אנליזות ודוגמאות מייצגות. כמו כן יועבר מידע נוסף או דוגמאות בכל שלב שהוא ע"פ דרישת המפעל הקולט.
- ח.19 כל משלוח של פסולת חומרים מסוכנים יתבצע רק לאחר תאום עם המפעל הקולט והרשאה בכתב להעברת הפסולת.
- ח.20 לפני סגירה או העתקת מפעל יש לערוך סקר עפ"י הנחיות המשרד לאיכות הסביבה לבדיקת זיהום הקרקע, המבנים והציוד מהחומרים המסוכנים להם ניתן ההיתר או תוצרי פירוקם. עפ"י המלצות הסקר יש לבצע טיהור וניקוי השטח כולל המבנים הקבועים והציוד.

#### תנאים נוספים:

1. צנרת הולכת הגז לרבות אביזרים, מכשור ויחידות ציוד יעמדו בכל האמור בתקן NEN 3650, בתקן 5664 הישראלי ובהוראות תמ"א 37 ו-37 א' 2, לרבות עמידות בפני רעידת אדמה (לפי תקן ישראלי לעמידות בפני רעידות אדמה).
2. העסק יחזיק גלאים ניידים וקבועים לגילוי נוכחות גז טבעי. הגלאים יתוחזקו ויכולו לפי הוראות יצרן מוסמך וימצאו שמישים ובהישג יד בכל עת.
3. תוואי צנרת הולכת הגז הטבעי יסומן בכוון זרימה ושם הזורם וכן יעמוד במפרט רשות הגז הטבעי.
4. צנרת הולכת הגז ויחידות הציוד יוגנו מפני פגיעות פיזיות.
5. צנרת הולכת הגז הטיבעי תוגן מפני קורוזיה בהגנה קטודית ואנודית.
6. העסק יחזיק בנוהל לבקרה על תקינות ההגנה קטודית ואנודית מפני קורוזיה על צנרת הולכת הגז הטבעי.
7. מתקנים עיליים ימוגנו מפני ברקים לפי תקן ישראלי להגנה מברקים.
8. אין לאחסן או להציב חומרים בעירים\דליקים בסביבה הקרובה למערכת הגז.
9. אזורי מערכות הגז השונים, ודרכי הגישה אל אזורים אלה ישולטו בשלטי אזהרה על איסור עישון.
10. לא תתבצע כל עבודה באש גלויה בצנרת הולכת הגז, באביזריה או במכשור כאשר קיים גז טבעי במערכת.
11. כל שינוי במערכת הולכת הגז, על כל מרכיביה, יבוצע רק לאחר שנבדק ואושר ע"י גורם מקצועי מוסמך לעניין.
12. בקרבת מערכות גז תפעוליות אין להשתמש במכשור העלול לגרום לחיווצרות ניצוצות, לרבות אמצעי תאורה בגדי עבודה וכלי עבודה. אלא אם כן ימוגנו לפי אזור הסיכון (לפי המוגדר בתקן האירופי en 60079).
13. בעסק יעשה שימוש במתקנים מוגני פיצוץ, כמו כן אין למקם מקורות הצתה קבועים, מסביב לאזורים בעסק בהם יש שימוש בגז טבעי.

14. אמצעי הקשר של צוותי החרום יהיו מסוג המוגן התפוצצות.
15. העסק יערך לטיפול בתקלות אקראיות ומכוונות באופן שימנע נזק לסביבה. בידי הצוות יהיו אמצעים לטיפול בתקלות כולל האמצעים לאיטום דליפות ואפשרות לסגירות ידניות של מגופים במידה ולא ניתן יהיה לסגור את מגופי זרימת גז מרחוק.
16. העסק יחזיק ויפעל עפ"י נוהל חירום, המאושר ע"י רשות הגז, העוסק בהיבטים של טיפול שוטף במערכת.
17. העסק יכתוב ויישם נוהל עבודות חמות HOT WORK.
18. פחממנים המנוקזים ממערכת ניקוי הגז הטבעי יטופלו עפ"י תקנות רישוי עסקים לסילוק פסולת מסוכנת.

ליילך מילר  
"הממונה"  
חוק החומרים המסוכנים  
4566  
חתימת הממונה וחתימת

כ"ה תשרי תשע"ה  
19 אוקטובר 2014

תאריך

כל האמור בלשון זכר אמור גם בלשון נקבה .  
כל האמור בלשון יחיד אמור גם בלשון רבים .

מדינת ישראל  
המשרד לאיכות הסביבה

הענף לחומרים מסוכנים  
טל: 08-6264000, פקס: 08-6264111

מחוז דרום  
רחוב התקווה 4, ת.ד. 230, 84102, באר שבע

תאריך: 19 אוקטובר 2014  
כ"ה תשרי תשע"ה  
מס' מפעל: 159104, היתר מספר: 623186

עבור יחידת סביבתית / איגוד ערים: אשדוד חבל יבנה

שלום רב,

הנדון: היתר רעלים

תדמור גדעון בעל היתר הרעלים במפעל ים תטיס בע"מ- מתקן קליטת גז חופי שברשותו היתר רעלים מתאריך 19/10/2014 עד תאריך 22/10/2015 נתן את הסכמתו המפורשת להעברת פרטי הבקשה אליכם, בהתאם לסעיף ו' 1 בבקשה להיתר רעלים. אין לראות בכך את הסכמתו להעברת המידע הכלול בבקשתו לכל גורם אחר.

למותר לציין, החלטתכם בדבר העברת המידע לגורמים נוספים כפופה להוראות כל דין ובמיוחד לחוק חופש המידע התשנ"ח - 1998 ולחוק להגנת הפרטיות, תשמ"א - 1981.

בכבוד רב

הממונה

**Emissions Permit under the Clean Air Law, 5768-2008**  
**Natural Gas Terminal belonging to Yam Tethys Ltd.**

Permit No.: 1348

By virtue of my power under sections 20 and 22 of the Clean Air Law, 5768-2008 (hereinafter: the Law), I hereby grant a permit for operation of a source of emissions, the details of which are set out below, and I make it conditional upon the following conditions:

**Details of Source of Emission:**

Source of Emission: The Natural Gas Reception Station of Yam Tethys Ltd., in accordance with the details set out in the Application for Grant of an Emissions Permit which was submitted to the Ministry on December 2, 2013, and the supplements to such Application of March 6, 2014 and May 7, 2014 (hereinafter: the “Application Documents”).

Owner of Source of Emission: Yam Tethys Ltd. (Private Company No. 513226100), the Manager of the Factory and any other person included under the definition of the “Owner of the Source of Emission” in the Law, as the case may be.

Address of Source of Emission: 1 Haneft St., Ashdod

**Conditions of Emissions Permit:**

- Definitions 1. “Owner of the Source of Emission”, “Sampling”, “Fuel”, “Emissions Permit”, “Best Available Technology”, the “Commissioner”, “Air Pollution”, “Excessive Air Pollution”, “Pollutant”, “Source of Emission”, “Source of Emission Requiring a Permit”, “Environment Values” – as defined in the Clean Air Law, 5768-2008;
- “Means of Treatment” or “Means for Treatment of Emission Gases” – means for reducing the concentration or quantity of air pollutants out of the emission gas by collection, absorption, filtration, occlusion, combustion etc., or technology or techniques for the prevention of generation of pollutants;
- “Emission Gas” – gas released into the air, including solids, liquids and gases borne in such or compounds thereof;



“Emission Gas under Standard Conditions” – one cubic meter of emission gas calculated under the following conditions: Dry gas; temperature of 273.15K; pressure of 15%, 101.3 KPa oxygen for natural gas turbine and 5% for diesel generator, all expressed in milligrams per standard cubic meter (hereinafter mg/scm);

“Emergency Diesel Generator” – a diesel generator intended for emergency purposes only in which the electricity supply from the national grid is stopped and which is operated for no more than 300 hours per year;

“Shut down” – a process or situation of cessation of the operation of energy production units;

“Thermal Output” – a value measured in megawatts calculated in accordance with the type of fuel, consumption per unit of time and its lower calorific value;

“Gas turbine” – an energy production unit that operates via a turbine that is powered by fuel combustion gases;

“Production Unit” – a facility designed for the production of energy via the combustion of fuel;

“Environmental Unit” – The Ashdod and Yavne Cities Union for Environmental Protection;

“Point Source of Emission” – as defined in the Clean Air (Emissions Permits) Regulations, 5770-2010 (hereinafter: the Emissions Permits Regulations);

“Non-Point Source of Emission” – as defined in section 11(2) of the Emissions Permits Regulations;

“Procedures for Testing Air Pollutants in Stacks” – The Procedures for Testing Air Pollutants in Stacks, 2002, as updated from time to time, and as published on the website of the Ministry for Environmental Protection;

“Procedures for Continuous Monitoring of Stacks” – The Procedures for Continuous Monitoring of Stacks, as updated from time to time, and as published on the website of the Ministry for Environmental Protection;



- “Continuous Monitoring” – automatic measurement and recording via a device for the continuous measurement of the values being measured;
- “Process Survey” – the process survey contained in the Application Documents;
- “Lower Calorific Value” – the latent energy content per unit of weight or volume of fuel less the energy required to vaporize the water emitted in gas emissions originating in fuel;
- “Emission Values” – the maximum emissions concentrations of air pollutants set out in Table A;
- “Unusual Emissions” – as defined in section 11(4) of the Emissions Permits Regulations;
- “Reliance Interval” – a statistical value that represents the uncertainty of measurement and defines an interval around the result obtained;
- “Air Quality Coordinator” – the Southern District Air Quality Coordinator of the Ministry for Environmental Protection, who has been authorized as Commissioner for the provisions of the Law, in whole or in part.

**General**

2. (a) The Application Documents constitute an integral part of this Emissions Permit. In the event of any contradiction between these conditions and the Application Documents, these conditions shall prevail.
- (b) The conditions in this Permit apply to the facilities, processes, means of production and scope of operations, noted in the Application Documents.
- (c) The owner of a source of emission shall not operate facilities or activities that are not included in the process survey. In the event that a facility or activity included in the process survey were not in use or were not in existence on the date of issue of the Permit, the owner of the source of the emission shall give notice in writing to the Air Quality Coordinator, at least two weeks in advance prior to the planned date of operation.

(d) The owner of the source of the emission shall take the steps and measures required for the purpose of optimal management of the consumption and/or exploitation of energy at the source of the emission, including the identification of methods for reducing consumption and/or for optimal exploitation of the energy, via correct planning and operation, proper maintenance and appropriate treatment of malfunctions, and all in accordance with Energy Efficiency BREF.

(e) The owner of the source of emission will mark all of the containers, production facilities and stacks in the source of emission, for the purpose of identification thereof, in accordance with the tags that appear in the process survey. New facilities will be marked when installed. The owner of the source of the emission shall ensure the due maintenance of marking so that the marking of such shall be clear and visible at all times.

(f) In the event of any malfunction causing or likely to cause a deviation from the emission values, the owner of the source of the emission shall act to correct the malfunction immediately upon detection of it and shall take all of the steps and measures necessary to stop such deviations from emission values, including reduction of production outputs, termination of processes, shut-down of facilities, etc.

**Emissions  
into the Air**

3. (a) No emission gases shall be emitted from fuel combustion processes from point sources other than via the stacks set out in Table A and in accordance with the limitations and emission values noted alongside them.

(b) The owner of the emission source will take operational and technological measures which constitute the best available technique, for the purpose of preventing and reducing air contamination from the source of the emission, whether the source of the emission is point or non-point, in accordance with the provisions of these Conditions.

(c) The owner of the emission source shall operate the energy production system in an optimal manner which shall reduce the quantity of air contaminants that are emitted per kilowatt-hour of compression energy produced.

(d) Notwithstanding the provisions of sub-section (a), the results of monitoring and sampling in the following cases shall not be deemed to be in deviation from emission values –



- (1) During a malfunction in a means of treatment of emission gases or in a production unit which caused a deviation, as set out in section 8;
- (2) During start-up or shut-down, over the period of time approved by the Air Quality Coordinator, and provided that the owner of the source of the emission submits to the Air Quality Coordinator and to the Environmental Unit, in advance and in writing, a list of start-up and shut-down durations for the production units, in accordance with the manufacturer's instructions. The owner of the emission source shall submit data characteristic of the start-up and shut-down process depending on time with respect to the production units at the source of the emission to the Air Quality Coordinator and to the Environmental Unit three months after the first activation of such. The Air Quality Coordinator shall be entitled to alter the approved time for start-up and shut-down, in accordance with the manufacturer's instructions, taking into account the data submitted to him as aforesaid.
- (3) At the time of effecting acceptance tests for new production units, measures or facilities for the reduction of air pollutant emissions, new equipment in production units, calibration checks, fitness checks which might affect the emission of pollutants in accordance with a plan approved in advance by the Air Quality Coordinator.

**Prevention of 4.  
Unusual  
Emissions**

- (a) The owner of a source of emission shall keep and activate procedures for the prevention of malfunctions and incidents which might cause deviations from the maximum emissions values and/or which might cause strong or unreasonable air pollution.
- (b) The owner of the emission source shall conduct an investigation and refreshing of the procedures set out above, at least once every three years and every time there is a malfunction or incident.

**Prevention of 5.  
Strong or  
Unreasonable  
Odors**

- (a) The owner of the emission source shall take all measures required in order to reduce and prevent the emission of air pollutants which might cause strong or unreasonable odors outside of the boundaries of the source of the emission, such as by diverting emission gases that might cause odor hazards to appropriate treatment facilities, or the storing of odorous materials in closed and sealed facilities.



(b) In accordance with the demand of the Air Quality Coordinator, and in accordance with his instructions, the owner of the emission source shall conduct an odor survey for air pollutants which might cause strong or unreasonable odors. The survey shall be performed in accordance with a plan that shall be prepared by the owner of the source of the emission and which shall be submitted for the evaluation of the Air Quality Coordinator. If necessary, the plan submitted shall be amended in accordance with the comments and instructions of the Air Quality Coordinator and shall be submitted again for his approval.

(c) The owner of the emission source shall submit the survey, as set out in section 5(b) above, on the date prescribed by the Air Quality Coordinator, and if he does not so prescribe, then within three months of the date of receipt of the demand to conduct the survey. If necessary, the survey submitted shall be amended in accordance with the comments and instructions of the Air Quality Coordinator and shall be submitted again on the date that he prescribes.

**Use of Fuels** 6.

(a) The owner of the the emission source shall be entitled to heat the gas turbine burners and the gas engines using natural gas only.

(b) The heating of the emergency diesel generator shall be effected using diesel only.

**Means for  
Treatment of  
Emission  
Gases** 7.

(a) The owner of the emission source shall implement measures for the treatment of the emission gases at the source of the emission including the measures set out in Table A, in accordance with the manufacturer's instructions, at any time during which the production unit is in operation.

(b) In the event that it is not possible to implement measures for the treatment of emission gases due to the shutting down of such for service and maintenance, the owner of the emission source shall shut down the production unit containing the treatment measures and shall not permit the emission of pollutants from it.

(c) The owner of the emission source shall maintain the means for treatment of emission gases in accordance with the manufacturer's instructions, and in the absence of manufacturer's instructions, shall effect appropriate maintenance for the purpose of best operating the means, and all in accordance with the operation, maintenance and control procedures.



(d) The owner of the the emission sources shall prepare an operation, maintenance and control procedure for the good working order of the means of treatment of emission gases, two weeks after obtaining this permit, and shall act in accordance with such. Such procedures shall be submitted to the Air Quality Coordinator, and to the Environmental Unit, in accordance with any demand.

**Malfunctions 8.  
that may  
Cause  
Deviation  
from  
Emission  
Values**

(a) Notwithstanding the provisions of sections 2(f), 3(a), 7(a) and 7(b), in the event of a malfunction in a means of treatment or in a production unit, which causes or which might cause a deviation from emission values, the owner of the source of the emission may activate the production unit for 24 during such malfunction.

(b) During the course of a malfunction as set out in sub-section (a), the owner of the source of the emission shall take the following actions:

- (1) Shall report the malfunction to the Air Quality Coordinator and to the Environmental Unit, immediately, and shall immediately institute all of the measures required to remedy the malfunction.
- (2) Shall take all of the measures required in order to reduce air pollution and to prevent deviation from emission values.
- (3) If, at such time, deviations from the environmental values prescribed in the Air Quality Values Regulations are measured in the environment of the production facility which might stem from the malfunction, the Commissioner may instruct the owner of the source of the emission to reduce energy production or to stop the operation of the production unit even before the 24 hour period has ended.

(c) Operation of the production unit during the course of the malfunction as set out in this section, and which causes a deviation from emission values, shall not be for longer than 120 hours cumulatively during any period of twelve consecutive months.



(d) The owner of the emission source may operate a production unit during a malfunction in a treatment measure or in a production unit for longer periods of time than that set out in sub-sections (a) and (c) in the event that shutting down of the unit might cause a decrease in the supply of gas, provided that the Commissioner has given his consent to such operation in writing.

**Warning System**

9. (a) The owner of the emission source shall install and operate, in the control room, a computer system for warning of each of the following events (hereinafter: the "Warning System"):

- (1) A reading of higher emission values than those set out in Table A on the continuous monitoring devices;
- (2) A malfunction or improper function of the production unit which causes or which might cause a deviation from emission values;
- (3) A malfunction or improper function of the means of treatment of emission gases which causes or which might cause a deviation from emission values;
- (4) A malfunction or improper function of the continuous monitoring devices;
- (5) A malfunction or improper function in the transferring of continuous monitoring data in real time to the Environmental Unit, as set out in section 15;
- (6) A malfunction or improper function of the Warning System;

**Storage Containers**

10. (a) The storage of materials in containers shall be effected as set out in the process survey or in alternative containers with identical qualities, including with respect to the type of the material, the nature of storage and the marking of the container.

(b) The owner of the the emission source may store materials in containers other than in accordance with the provisions of the process survey, subject to any law and after obtaining the written consent of the Air Quality Coordinator.

(c) Fuel Containers:



- (1) Construction and installation of overhead vertical containers shall be effected in accordance with Standard No. API 650, and horizontal containers in accordance with Standard No. DIN 6616, as the case may be.
  - (2) The owner of the the emission sources shall examine and repair overhead vertical containers containing fuels constructed in accordance with Standard No. API 650 via an authorized inspector in accordance with the provisions of Standard No. API 653.
  - (3) The owner of the the emission sources shall install warning measures for the prevention of overfilling of vertical aboveground containers in accordance with the provisions of Standard No. API 2610, as updated from time to time.
- (d) There shall be no unpoint emissions from the condensate containers ABJ-0400, ABJ-0405, ABJ-0410 after the installation of measures for the treatment of the emission gases from them at an efficiency of not less than 98%, as set out in Table B.

## Stacks

11. (a) The stacks set out in Table A which are required to be sampled shall be equipped with test ports on balconies and with fixed sampling surfaces and with convenient and safe means of accessing them, in accordance with the procedures for testing air pollutants in stacks. Access to the test ports shall be preserved at all times.
- (b) The height of stacks EZZ-2610, EZZ-2710 and EZZ-2810 shall not be less than 14 meters. In the event of any change in the height of the roofs adjacent to the source of the emission, the owner of the source of the emission shall submit calculations for adjustment between the specifications of the stacks and the emissions data under section 5.5.3 of TA LUFT 2002, and a plan, containing timetables for the performance of the requisite changes, to Air Quality Coordinator and the Environmental Unit, within three months of the date of the change, and shall implement the plan subject to the instructions of the Air Quality Coordinator.



**Periodic Stack 12.  
Inspections**

- (a) Sampling from stacks shall be effected in accordance with the Procedures for Testing Air Pollutants in Stacks and by laboratories which have been authorized by the National Laboratory Certification Authority under the National Laboratory Certification Authority Law, 5757-1997, for the effecting of sampling from the stacks.
- (b) The owner of the emission source shall effect periodic sampling in the stacks of the emission source, in the frequency set out in Table A, for the purpose of testing the emission of the pollutants set out alongside such stacks in such table, or at such other frequency in accordance with the demand of the Air Quality Coordinator.
- (c) Sampling the Diesel generators stacks will be done according to the demand of the Air Quality Coordinator, if there is a fear of malfunction operation and black smoke was observed during operation, beyond start up and shutdown periods. As far as possible the sampling shall be done while operating for maintenance tests of the generators.
- (d) The owner of the emission source shall submit an annual sampling plan for the approval of the Air Quality Coordinator not later than one month prior to the planned date of sampling, shall coordinate the date of each planned sampling with the Air Quality Coordinator and the Environmental Unit and shall enable the Air Quality Coordinator and the Environmental Unit to be present during the sampling.
- (e) The owner of the emission source will approach the Air Quality Coordinator to be exempt from one or more sampling of the pollutants laid out in table A, based on the sampling results. The exempt will be given by the Air Quality Coordinator after being convinced that the concentrations are negligible and that they don't change.



- (f) The owner of the emission source will approach the Air Quality Coordinator in order to change the sampling period for each of the pollutants stated in table A, from every half year to every year, based on the sampling results. The provision will be given after the Air Quality Coordinator is convinced that there is no change in the operation regime or in the gas analysis since the last sampling.
- (g) The owner of the emission source shall preform the stack sampling in typical (routine) work conditions of the facility being tested, and shall provide the sampling laboratory with a printed output of the production process data, including workload, during the conducting of the sampling and three days preceding the date of conduct of the test, which shall be attached to the test report.
- (h) The owner of the emission source shall submit to The Air Quality Coordinator the gas analysis that was done in approximate time to the stack sampling including content total Sulfur and total Nitrogen.
- (i) The owner of the emission source shall submit a stack sampling report to the Air Quality Coordinator and to the Environmental Unit on an electronic medium, within 30 days of the date of performance of the sampling and in accordance with the provisions of the Procedures for Testing Air Pollutants in Stacks.
- (j) In calculating the concentration of air pollutants in the stack, the air fed into the stack for the purpose of diluting or cooling the emission gases will not be taken into account.
- (k) At the time of sampling the stack of the emergency diesel generator, the owner of the emission source shall sample the fuel that is being used for the purpose of testing for ash, sulfur and asphalt contents.

**Continuous  
Monitoring**

13. (a) The owner of the emission source shall activate a continuous monitoring system for the measurement of nitrous oxides on the stacks of gas turbines EZZ-2610, EZZ-2710 and EZZ-2810.



- (b) The owner of the emission source shall submit to the Air Quality Coordinator information in order to determine the method of continuous monitoring of nitrous oxides, which sets out the  $\text{NO}_2/\text{NO}$  ratio in the waste gases from the source of the emission. In the event that the  $\text{NO}$  concentration in the waste gases is more than 90% of the total content of nitrous oxides, the Air Quality Coordinator shall be entitled to exempt the owner of the source of the emission from continuous monitoring of  $\text{NO}_2$ .
- (c) The owner of the emission source shall install and operate continuous monitoring devices in the stacks set out in sub-section (a) in order to determine the following parameters: Oxygen percentage, temperature and pressure.
- (d) The owner of the source of the emission shall install and operate, in every unit in the source of the emission:
- (1) A device for the continuous measurement of the flow of fuel fed into the unit.
  - (2) A device for the continuous measurement of compression energy. Compression energy shall be calculated as the quantity of gas compressed within a unit of time, compared with the quantity of fuel consumed during such unit of time.
- (e) The owner of the emission source shall calculate the flow rate of the waste gas based on the quantity of fuel fed into the gas turbine at any time.
- (f) The owner of the emission shall ensure that operation of the continuous monitoring systems, including calibration and the reliability test of the calibration shall be in accordance with the updated version of the Procedures for Continuous Monitoring in the Stack, published on the website of the Ministry for Environmental Protection.
- (g) The owner of the source of the emission shall provide the continuous monitoring device data set out in sub-sections (a), (c), (d) and (e) to the Air Quality Coordinator in a monthly report, in accordance with the provisions of section 18(e).
- (h) The owner of the source of the emission shall keep the monitoring system in good condition at all times, and shall take all of the means necessary for the immediate repair thereof.



- (i) The owner of the source of the emission shall give notice in writing to the Air Quality Coordinator, at least 24 hours prior to the start of performance of planned maintenance works on the facilities of the source of the emissions, which might affect the data obtained from the monitoring system. The notice shall include a brief explanation of the substance of the planned works, the time of commencement and termination.
- (j) If, during the course of one day, more than three average hour values are found that are erroneous or that were not recorded at all, as a result of impairment or faulty maintenance of the continuous monitoring system, all of the data measured in such system during such day shall be marked and disqualified. If, during the period of one year, 10 such days are found, the Company shall immediately take action to improve the reliability of the continuous monitoring system, including replacement of it in accordance with the instructions of the Air Quality Coordinator.

**Calculation of 14.  
Results of  
Ongoing  
Monitoring**

- (a) Calculation of the continuous monitoring and the stack sampling results and their comparison to the threshold values shall be made in accordance with the up-to-date version of the Procedures for Continuous Monitoring of Stacks, published on the website of the Ministry for Environmental Protection, including as set out below:
  - (1) Calculation of the average measurements of one hour shall be calculated for periods of time commencing at the top of the hour and calculation of the average measurements of one day shall be calculated for periods of 24 hours commencing at midnight.
  - (2) For the purposes of this section, a valid average is an arithmetic hourly or daily average of the concentration of the pollutant in units of mg/scm less a reliance interval of 20% of the concentration measured for a nitrous oxide pollutant. A valid daily average will be calculated on all valid hourly values.
- (b) Notwithstanding the provisions of section 3(a), the results of the continuous monitoring effected during hours of operation of the energy production unit will not be deemed to be in deviation from the emission values under the following conditions:



- (1) The valid daily average is not greater than the emission value.
- (2) The valid hourly average is not greater than twice the emission value.
- (c) Results measured in conditions set out in section 3(d) will not be included in the continuous monitoring calculation.
- (d) Notwithstanding the provisions of sub-section (b), if a deviation from emission values is found in any sampling despite the fact that the result of the continuous monitoring conducted at the time of the sampling was not indicative of such deviation or if there is some other reason to presume that the results of the continuous monitoring are not reliable, the calculation of the results of the continuous monitoring under this section shall not be deemed to be a defense with respect to deviation from emission values.

**Real Time  
Provision of  
Data**

15. The owner of the emission source shall provide the Environmental Unit, in a computerized form and in real time, with the following information and data:

- (a) Data from the continuous monitoring devices as set out in sections 13(a), 13(c) and 13(d) and a calculation of the waste gas flow rate as set out in section 13(e);
- (b) The date and duration of start-up and shut-down processes of the units from start to finish;
- (c) The duration of malfunctions in the means of emission reduction (e.g. **DLN burner**) from start to finish, or the marking of an orderly operation of means of treatment;
- (d) Data regarding the flow of fuel fed into the production unit (e.g. **gas turbine**);

**Environmental  
Management  
System**

16. The owner of the source of the emission shall submit a plan for an environmental management system to the Air Quality Coordinator and to the Environmental Unit within one year of the entry of this Permit into force, including timetables and milestones for implementation, in accordance with the instructions set out below. The owner of the source of the emission shall operate the environmental management system in accordance with the approval of the Air Quality Coordinator.



- (1) The owner of the source of the emission shall publish a declaration on the Company's website regarding the environmental policy at the source of the emission.
- (2) The owner of the source of the emission shall appoint a commissioner to act on its behalf with respect to the construction, implementation and management of an environmental system at the source of the emission (hereinafter: the "Environmental Commissioner"). The Environmental Commissioner shall be responsible for all of the following:
  - (a) The construction, implementation and update of the environmental management system, in accordance with the environmental policy;
  - (b) A report and update to senior management regarding the performances of the system, including recommendations for improvements.
- (3) The owner of the emission source shall publish the details of the factory Environmental Commissioner on the website of the source of the emissions, as a contact person for public complaints on issues of environmental hazards relating to the source of the emissions. Any complaint submitted shall be examined and treated, and orderly records of each complaint received, the details thereof, the date of submission thereof and the method of treatment thereof shall be kept.
- (4) The owner of the source of the emission shall implement and update work, operations and maintenance procedures that are relevant for preservation of the environment. Such procedures shall be kept in a procedures file, as well as:
  - (a) Any resolution of management of the source of the mission relating to the environment;
  - (b) A copy of any document published to all of the employees relating to environmental protection.
- (5) The owner of the source of the emission shall determine and act to implement a plan for improvement of environmental protection issues at the source of the emission.



- (6) The owner of the source of the emission shall provide continuous and documented training to its employees or other actions that are relevant to environmental activities that is related to its EMS, in order to promote awareness among the workers of the emission source..
- (7) The owner of the source of the emission shall provide ongoing and documented training for employees or shall take such other actions relating to the environmental actions regarding the environmental management system with the aim of increasing awareness of the issue among employees of the source of the emission.

## Records

17. The owner of the source of the emission shall keep full records, for every energy production unit separately, of each of the items set out below, shall keep such records for 3 years and shall present them to the Air Quality Coordinator and to the Environmental Unit, upon their demand:
  - (1) The results of the continuous monitoring (e.g. for NOx) in six-minute, two-hour and daily averages, including emission rates and maximum concentrations;
  - (2) Times of automatic and external calibration of the continuous monitoring system, results of calibration, results of tests required under the Continuous Monitoring Procedure and calibration documents;
  - (3) Dates of stack sampling, results of stack sampling, including full sampling reports;
  - (4) Dates of maintenance of continuous monitoring devices;
  - (5) Exceedances from emission values including dates of Exceedance, duration, the reason for each Exceedance and the method of treatment thereof;
  - (6) Dates of malfunctions in measures for treatment of waste gases (e.g. DLN burner) and the continuous monitoring system, duration, reasons for the malfunctions and method of treatment thereof;
  - (7) Timing of shut-downs for the purpose of maintenance of the production units (e.g. gas turbine) and measures for treatment of waste gases (e.g. DLN burner);
  - (8) Timing of start-ups, shut-downs and operation of the production units (e.g. gas turbine) in unusual conditions;



- (9) Specifications of the composition of the gas and consignment notes of diesel, including analysis of the composition of it as provided by the diesel supplier, if effected;
- (10) Data of the quantity of gas combusted in the gas turbine burners during a period of one month, and the lower calorific value thereof.
- (11) Hours of operation of the energy production system and emergency diesel generators.

**Reporting**

18. (a) The owner of the emission source shall report immediately, and not later than 24 hours after the time of detection, to the Air Quality Coordinator and to the Environmental Unit, of any deviation from the emissions values, the circumstances thereof and the actions that it took for the purpose of stopping it, and any malfunction in the production units or in the means of treatment of emission gases which caused the deviation from the emissions values.
- (b) The owner of the emission source shall submit a detailed report to the Air Quality Coordinator and to the Environmental Unit, in accordance with their demands, about malfunctions as set out in sub-section (a), setting out, inter alia, the date of the malfunction, the reason for it, the duration of it, and the actions taken for the purpose of remedying it and preventing a repeat of it. Such report shall be provided no later than two weeks after detection of the malfunction, or on such other date as the Air Quality Coordinator may instruct.
- (c) The owner of the emission source shall provide the Air Quality Coordinator and the Environmental Unit with the results of the data from the natural gas analysis effected soon after the date of sampling of the stack, including the total sulfur and total nitrogen content thereof.
- (d) The owner of the emission source shall give notice in advance to the Air Quality Coordinator and to the Environmental Unit of a planned change in the method of operation of the production system, which might cause an increase in the emission of air pollutants from it, and shall effect such change only subject to this Permit.



(e) The owner of the emission source shall submit a monthly report to the Air Quality Coordinator regarding the previous month, not later than the 10th of the subsequent month. The monthly report shall include precise, full and up-to-date details of the summary of the continuous monitoring results, including:

- (1) The availability of the continuous monitoring system during the course of the month, as a percentage;
- (2) The valid maximum daily concentration obtained during the month;
- (3) The three highest valid hourly concentrations obtained during the month;

(f) The owner of the source of the emission shall submit an annual report on the previous year to the Air Quality Coordinator and to the Environmental Unit, at the end of each year and not later than April 1 of the subsequent year. The report shall contain precise, full and up-to-date details of the following matters:

- (1) The annual emission of each of the air pollutants emitted from the source of the emission, in units of tons per year, calculated on the basis of continuous monitoring data or periodic sampling, except for air pollutants in respect of which a report of annual emission was submitted under the Environmental Protection (Emissions and Transfers into the Environment – Reporting and Register Duties) Law, 5772-2012;
  - (1) The capacity factor of the production system;
  - (2) The type and quantity of fuel in the units, in tons per year;
  - (3) The hours of operation of the system during the year;
  - (4) Unusual emissions which occurred at the source of the emission;
  - (5) Results of periodic calibration and test of reliability of calibration in accordance with the most up-to-date version of the Procedures for Continuous Monitoring of the Stack, published on the website of the Ministry for Environmental Protection;



- (6) A summary of malfunctions;
- (7) An annual summary of the results of continuous monitoring;
- (g) The owner of the emission source must provide all of the reports required under this Permit in writing and digitally. Immediate reports, as are required under the conditions of this Permit, shall also be delivered by telephone to the Air Quality Coordinator and to the Environmental Unit.
- (h) The owner of the emission source shall give notice to the Air Quality Coordinator in writing and in advance of actions done for the purpose of testing the good working order of the energy production system which might cause an increase in the emission of pollutants into the air.

- Timetables** 19. (a) Two weeks after receipt of the permit, the owner of the emission source shall submit a timetable, in a Gantt chart, to the Air Quality Coordinator and to the Environmental Unit, which shall include details of milestones for the performance of all of the requirements set out in the Permit, in accordance with the timetables set out in Table B.
- (b) Should the owner of the emission source discover that it will not be able to comply with the timetables in this Permit despite having implemented all of the measures required for the purpose of compliance with such, it may submit a reasoned request, in writing, to the Air Quality Coordinator, for the provision of an extension of the fixed timetables, provided that such request is submitted at least one month prior to the date for performance of the provisions of this Permit. The request shall contain an alternative proposed plan, including an alternative timetable with milestones for performing what needs to be supplemented.

- Other Laws and Regulations** 20. These Conditions shall not release the owner of the emission source from the performance of the provisions of any law that applies to the business, including the Clean Air Law, 5768-2008, the Business Licensing Law, 5728-1968, the Hazardous Materials Law, 5753-1993, and the regulations made thereunder.



- Contact Persons** 21. Upon entry of this Permit into force, the owner of the emission source shall give notice to the Air Quality Coordinator of the name of the contact person between it and the Air Quality Coordinator and the methods of contacting such person. The contact person shall be well-versed in the operations of the emission source and shall be available at all times.
- Commencement** 22. This Permit shall commence on **17.12.2014.**



**Table A – Emission and Sampling Values from Point Sources of Emission**

No.	Means for Initial Treatment of Emission Gases	Facilities Connected to Treatment Facility / Stack	Type of Pollutant	Emission Values (mg/scm) Unless recorded otherwise	Frequency of Sampling (from the date of entry into force of the Permit)
1	DLN (Dry Low NO <sub>x</sub> Gas Burner)	Gas Turbine EZZ-2610	Nitrous Oxides (expressed as nitrogen dioxide)	*50	Continuous Monitoring Periodic sampling once every 12 months
			Particles	5	
			Sulfur dioxide	10	Periodic sampling once every 6 months
			Carbon monoxide	*75	
2	DLN (Dry Low NO <sub>x</sub> Gas Burner)	Gas Turbine EZZ-2710	Nitrous Oxides (expressed as nitrogen dioxide)	*50	Continuous Monitoring Periodic sampling once every 12 months
			Particles	5	
			Sulfur dioxide	10	Periodic sampling once every 6 months
			Carbon monoxide	*75	
3	DLN (Dry Low NO <sub>x</sub> Gas Burner)	Gas Turbine EZZ-2810	Nitrous Oxides (expressed as nitrogen dioxide):	*50	Continuous Monitoring Periodic sampling once every 12 months
			Particles	5	
			Sulfur dioxide	10	Periodic sampling once every 6 months
			Carbon monoxide	*75	
4	-	Emergency diesel generator ZAN-0890	Sulfurous Oxides	170	Upon the request of the Air Quality Coordinator
			Particles	80	
5	-	Emergency diesel generator ZAN-0891	Sulfurous Oxides	170	Upon the request of the Air Quality Coordinator
			Particles	80	
6	To be set in accordance with the implementation program.	Condensate			
7		Containers: ABJ-0400			
8		ABJ-0405 ABJ-0410			
9	-	FGC Gas Engines	Particles	-	Upon the request of the



**Table A – Emission and Sampling Values from Point Sources of Emission**

No.	Means for Initial Treatment of Emission Gases	Facilities Connected to Treatment Facility / Stack	Type of Pollutant	Emission Values (mg/scm) Unless recorded otherwise	Frequency of Sampling (from the date of entry into force of the Permit)
10	-		Nitrous Oxides (expressed as NO <sub>2</sub> )	-	Air Quality Coordinator
11	-		Sulfurous Oxides (expressed as SO <sub>2</sub> )	-	

\* Emission values apply above 70% load in the production unit.

**Table B – Measures for Implementation of Best Available Technique**

No.	Facility/ Operations	Demand	Means of Implementation	Timetables
1	Condensate Containers: ABJ-0400 ABJ-0405 ABJ-0410	Prevention of unpoint emissions and compliance with the emissions data set out in Table A.	Submission of a program for the installation of measures for the treatment of emissions gases for the approval of the Air Quality Coordinator. The program shall include a timetable and milestones for implementation.	Two weeks after entry of this Permit into force
			Implementation of the program approved by the Air Quality Coordinator.	To be set in accordance with the dates defined in the program.



# Annex 5 – Israel Emergency Management Plan (EMP) Tier 2 Rev 2



Global EHSR	Plan - Tier 3	No. 138-13-EHSR-EMP-PA-T3	2
Department	Document Type and Tier	Number	Rev

Document Title:

**Noble Energy Mediterranean Ltd (NEML)  
Emergency Management Plan (EMP) - Tier 3**

Rev Comments	Date	Rev
Version 2.0	3/20/2014	2

Approval	Date	Signature
Global Emergency Response Manager ██████████		
Director of Operations ██████████		

# Noble Energy Mediterranean Ltd. EMP – Tier 3

No. 138-13-EHSR-EMP-PA-T3

## DISTRIBUTION LIST

COPY NUMBER	NAME	TITLE	LOCATION
1	██████████	VP, Commercial	Herzliya, Israel
2	██████████	Operations Director	Herzliya, Israel
3	██████████	Operations Manager	Herzliya, Israel
4	██████████	Production Superintendent	Herzliya, Israel
5	██████████		Herzliya, Israel
6	██████████		Herzliya, Israel
7	██████████	EHSR Manager	Herzliya, Israel
8	██████████	Security Manager	Herzliya, Israel
9	AOT	Production Foreman	Ashdod, Israel
10	Tamar	Production Foreman	Offshore, Israel
11	OSC	Watch Officer	Herzliya, Israel
12	██████████	Country Manager	Houston, Texas
13	██████████	Global ER Manager	Houston, Texas
14	██████████	EMBU Security Manager	Houston, Texas
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## 1. PURPOSE

The Emergency Management Plan (EMP) provides general direction for activities associated with emergency or disaster situations and should not be considered a detailed checklist or "quick action" guide for incident response. It is a planning document meant to provide the appropriate guidance for strategic thinking and decision-making as it relates to "All Hazards" emergency management planning.

Noble Energy Mediterranean Ltd. (NEML) has developed this EMP to provide the conceptual framework to prepare for, respond to, and recover from a major emergency or disaster that could impact operations in Israel. Where possible, the EMP will define appropriate Prevention and Mitigation measures to eliminate or reduce vulnerability and minimize the potential impact of any remaining hazards. To facilitate this, a Hazard and Vulnerability Risk Analysis (HVRA) using the using the formula and methodology defined in Appendix 2 of this EMP.

## 2. SCOPE

The NEML EMP and supporting annexes applies to all personnel, contractors, facilities, pipelines, and other assets directly or indirectly supporting activities in the Israel Operational Area (OA). The EMP establishes criteria that will be undertaken when reacting to an incident or disaster that has the potential to disrupt activity in the OA.

## 3. GLOBAL EHS MANAGEMENT SYSTEM APPLICABILITY

The implementation of this Plan conforms to the following Global Management System (GMS) elements:

- Element 3 – Safe Work and Operating Practices
- Element 5 – Emergency Preparedness & Community Awareness

## 4. ADMINISTRATION

### 4.1 Plan Development

The EMP is a Tier 3 document developed by the Noble Energy Inc. (NEI) Emergency Response Coordinator for Eastern Mediterranean with input from the leadership of the OA and stakeholders.

#### 4.1.1 Hazard, Vulnerability and Risk Analysis

An HVRA was conducted for the Operational Area sites and activities. The method and formulas associated with conducting the analysis are incorporated in Appendix 2 of this plan.



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### 4.1.2 Priorities

All incidents share a general list of priorities to be taken into account for response actions. General emergency management practices and the Incident Command System (ICS) establish a list that can be harmonized with NEI established corporate priorities. A comparison of those prioritizations is shown in the table below:

PRIORITIES		
Order	Emergency Management Priorities	Corporate Ideals
1	Life Safety	Human Life
2	Incident Stabilization	Environment
3	Property and Environmental Preservation	Assets
4	Societal Restoration	Reputation

### 4.1.3 Classification of Incidents

The classification of the incident shall be determined by the specific resource needs of the incident, as determined by OA management or the Incident Commander (IC) upon consultation with the Command and General staff of the Incident Management Team (IMT). These decisions will be based on the *actual* situation, taking into account the *potential* for escalation. See Appendix 3 for descriptions of the classifications.

### 4.1.4 Review

During the development process review of the plan should be conducted by corporate, leadership of the OA, and relevant stakeholders. During the review process, versioning is tracked by letter as reflected on the document cover page.

### 4.1.5 Approval

Upon determination that the plan accurately reflects the OA's strategic expectations for emergency management, the plan will be approved by signature as reflected on the document cover page. Once approved, versioning and revision will be reflected by number.

### 4.1.6 Implementation

Upon approval the leadership of the OA will be responsible for implementing the plan, in whole or in part, based on the emergency situation and available resources. The Emergency Response Coordinator for Eastern Mediterranean will provide direct support to the OA and will facilitate reviews, approval, and exercising of the plan.



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## 4.2 Annexes to the EMP

The EMP serves as a strategic document for the OA. As such, there is a need to create function specific Annexes that provide operational level detail. The table below defines the Annex development timeframe. Prior to initiating the identified phase of the exploration & production activity and relevancy to the location, the plans identified should be completed.

Emergency Planning	Seismic	Drilling	Appraisal	Development / Production	Situational
<b>All Locations</b>					
Emergency Management Plan		X			
Annex A - Oil Spill Response Plan		X			
Annex B - Well Containment Plan			X		
Annex C - Severe Weather Plan	X				
Annex D - Business Continuity Plan				X	
Annex E - Office Emergency Plan		X			
Annex F - Facility Emergency Plan		X			
Annex G - Mass Casualty Plan		I	D		
Annex H - Fatality Management Plan		I	D		
Annex I - Security Emergency Management Plan	X				
Annex J - Medical Evacuation Plan (MEDEVAC)	X				
Annex K - Reserved					X
Annex L - Reserved					X
Annex M - Reserved					
Annex N - Reserved					
<b>Offshore Locations</b>					
Annex O - Emergency Evacuation Plan		X			
Annex P - Offshore Installation Security Plan				X	
Annex Q - Reserved					
<b>International Locations</b>					
Annex R - Country Evacuation Plan		I			
Annex S - Reserved					
Annex T - Outreach, Training & Exercise Plan		X			
Reserved - Operational Area					
Reserved - Operational Area					

I = International Locations

D = Domestic Location

X = Domestic and International



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### 4.3 Distribution of Planning Documents

The Director of Operations shall determine how and to whom the EMP and annexes are distributed. In general, copies of the plan and annexes should be distributed to the Incident Management Team (IMT), the Corporate Support Team (CST), and the Crisis Management Team (CMT) and relevant stakeholders. The preferred method for distribution will be electronically using the Portable Document Format (PDF).

## 5 CONCEPT OF OPERATIONS

### 5.1 Situation

- The IMT is based on best management practices and utilizes the Incident Command System (ICS). The IMT will direct and coordinate all response and recovery operations.
- The Incident Command Post (ICP) is the designated location for the IMT to manage emergency response and recovery activities.
- During an emergency, the IMT will have operational control of all Noble resources in the OA.
- If resources obtained pursuant to agreements and/or contracts are insufficient and additional support is required, the IMT will request assistance from the CST

### 5.2 Assumptions

- The IMT function will be activated and staffed on a graduated basis, as needed, to address specific emergency needs.
- Training and Exercises will be conducted to ensure a rapid and effective response to any emergency situation can be implemented with little or no warning.
- It is possible for an emergency / major disaster to occur at any time and place. In many cases, dissemination of warnings allowing for implementation of increased readiness measures may be possible. However, some occur with little or no warning.
- If early warning of an impending emergency is received, the IMT will implement appropriate prevention and/or mitigation measures to protect life, the environment, preserve assets and reputation.
- Personnel will be familiar with executing expected actions relevant to their work site or role.
- The IMT will maintain an appropriate level of depth to ensure the critical positions can be filled by individuals with the appropriate knowledge, skills, and abilities to execute the positions function.
- The IMT will be prepared to function without external material support for the initial 48 hours.



### 5.3 IMT Activation

A roster will be developed and maintained to ensure continuity and coverage 24/7 for the IMT. All emergency situations or predefined incidents will be reported to the Operations Support Center (OSC) as soon as is practical. Upon identifying an emergency situation exists requiring additional resources, the IMT will be activated in accordance with the procedures defined in Appendix 4 of this plan.

## 6 ROLES AND RESPONSIBILITIES

### 6.1 Qualified Individual (QI)

- Direct activation of IMT, as appropriate.
- Ensure that strategic issues such as Business Continuity, Legal Liabilities and Company Reputation are considered.
- Issue Strategic Objectives to Incident Commander (IC).
- Communicate incident details to operational leadership.
- Manage Media Relations.
- Authorize expenditure of funds for incident response.
- Serve as focal point between IMT and CST/CMT.
- Maintain personal Activity Log (ICS-214) .
- Manage Host Nation Government Relations.

### 6.2 Incident Commander (IC)

- Set Incident Objectives and operational period.
- Establish response organization.
- Activate required Command & General Staff positions.
- Implement resource ordering process.
- Implement cost sharing / cost accounting procedures.
- Communicate incident details to QI.
- Approve and authorize implementation of the Incident Action Plan (IAP).
- Maintain personal Activity Log (ICS-214).

### 6.3 Public Information Officer (PIO)

- Develop incident information with IC for release to public and media.
- Obtain QI review and approval of all information releases.
- Coordinate/Conduct Media Briefings.
- Manage Joint Information Center (JIC), if activated.
- Brief IC on PIO issues and concerns.
- Participate in the Command & General Staff, Planning Meeting and Operation Period Briefing.
- Maintain personal Activity Log (ICS-214).

### 6.4 Legal Officer

- Advise IMT on Legal Issues related to incident.
- Review all Public and Media Releases.
- Participate in the Command & General Staff and Planning Meeting .



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- Maintain personal Activity Log (ICS-214).

## **6.5 Liaison Officer**

- Serve as communications conduit between IMT and stakeholders impacted by the incident.
- Monitor operations for potential interagency problems.
- Participate in Command & General Staff and Planning Meeting.
- Coordinate activities of visiting dignitaries.
- Maintain personal Activity Log (ICS-214).

## **6.6 Safety Officer**

- Develop and publish Site Safety Plan (ICS-208).
- Develop the Hazard Risk Analysis worksheet (ICS-215A).
- Review and Approve Medical Plan (ICS-206) .
- Participate in Command & General Staff, Tactics Meeting, Planning Meeting and Operations Period Briefing.
- Monitor Incident Operations for Safety Issues .
- Maintain personal Activity Log (ICS-214).

## **6.7 Security Officer**

- Develop Site Security Plans, as appropriate.
- Assist Safety Officer with Development of Hazard Risk Analysis worksheet (ICS-215A).
- Participate in Command & General Staff, Tactics Meeting, Planning Meeting and Operations Period Briefing.
- Monitor Incident Operations for Security Issues .
- Maintain personal Activity Log (ICS-214).

## **6.8 Human Resources (HR) Officer**

- Coordinate Critical Stress Management (CSM).
- Coordinate between IMT and injured employee(s).
- Coordinate with PIO concerning employee information.
- Provide IMT employee administrative oversight.
- Maintain personal Activity Log (ICS-214).

## **6.9 Operations Section Chief**

- Evaluate and request sufficient staffing and supervision.
- Participate in Command & General Staff, Tactics Meeting, Planning Meeting and Operations Period Briefing.
- Identify / utilize Staging Areas.
- Supervise Operations Section personnel.
- Subdivide work areas into manageable components.
- Develop work assignments and allocate tactical resources based on strategic requirements (ICS-215).
- Participate in the planning process and the development of the tactical portions (ICS-204 and ICS-220) of the IAP.



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- Assist with development of long-range strategic, contingency, and demobilization plans.
- Maintain personal Activity Log (ICS-214).

### **6.10 Source Control Section Chief**

- Participate in Command & General Staff, Tactics Meeting, Planning Meeting and Operations Period Briefing.
- Evaluate and request sufficient staffing and supervision.
- Identify / utilize Staging Areas.
- Supervise Source Control Section personnel.
- Subdivide work areas into manageable groups.
- Develop work assignments and allocate tactical resources based on strategic requirements (ICS-215).
- Participate in the planning process and the development of the tactical portions (ICS-204) of the IAP.
- Assist with development of long-range strategic, contingency, and demobilization plans.
- Maintain personal Activity Log (ICS-214).

### **6.11 Planning Section Chief**

- Facilitate Command & General Staff, Tactics Meeting, Planning Meeting and Operations Period Briefing.
- Collect, process and display situational information.
- Assist the OSC and SCSC in development of response strategies.
- Supervise the preparation of the IAP.
- Supervise tracking of personnel and resources assigned to the incident.
- Establish reporting requirements and schedule.
- Determine the need for specialized resources to support the incident.
- Establish special information collection activities, as necessary (e.g. weather, environmental, toxics, etc.).
- Direct development of supporting plans, as required (e.g. Traffic, Medical, Communications, demobilization, transition, security, etc.).
- Maintain personal Activity Log (ICS-214).

### **6.12 Logistics Section Chief**

- Participate in Command & General Staff, Tactics Meeting, Planning Meeting and Operations Period Briefing.
- Determine and supply immediate incident resource and facility needs.
- Manage resource request process.
- Track resource effectiveness and make necessary adjustments.
- Provide resource and logistical support for upcoming operational period per ICS 215.
- Develop Communications (ICS 205 & 205A), Traffic and Medical (ICS 206) Plans for IAP.
- Identify long term service and support requirements .
- Maintain personal Activity Log (ICS-214).



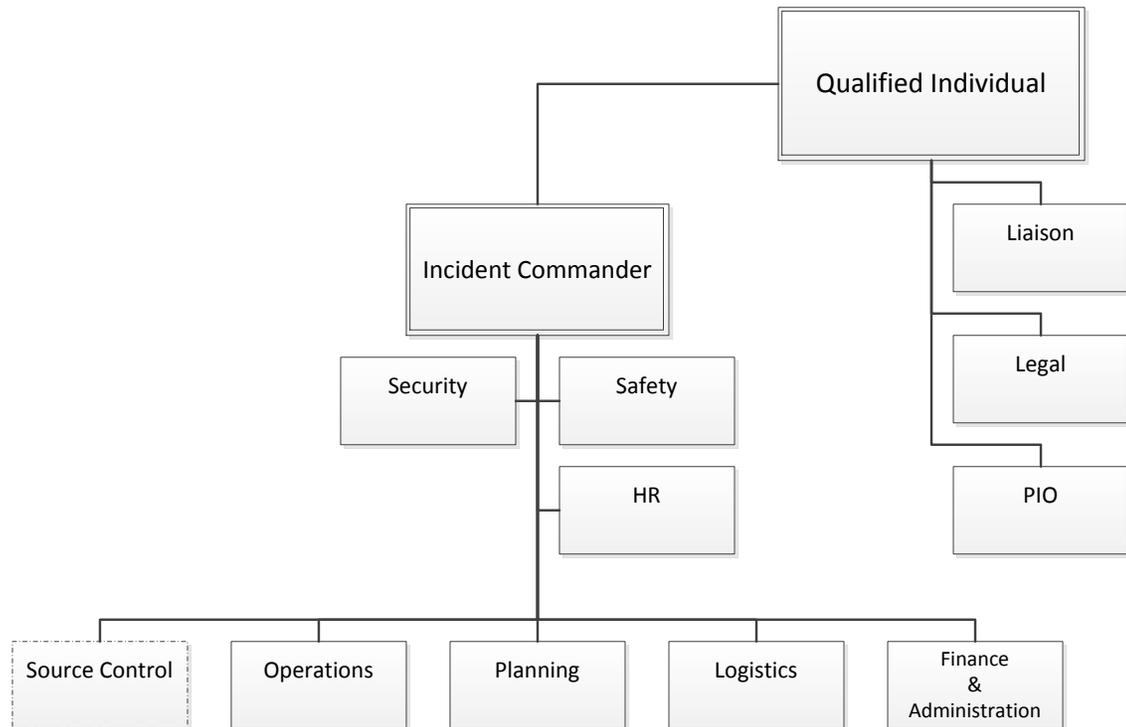
### 6.13 Finance & Administration Section Chief

- Participate in Command & General Staff, Planning Meeting and Operations Period Briefing.
- Review operational plans and provide alternatives where financially appropriate.
- Manage all financial aspects of the incident.
- Provide cost analysis, as requested.
- Establish third party claims process, if required.
- Track personnel and equipment time.
- Ensure all obligation documents are properly prepared and completed.
- Establish and manage compensation & claims issues .
- Maintain personal Activity Log (ICS-214).

## 7 ORGANIZATION

### 7.1 INCIDENT MANAGEMENT TEAM (IMT)

The following organization charts may depict how the IMT will establish command and management position(s). Additionally, the IMT will request appropriate resources and funding authority, as required, to successfully respond to and recover from the incident. The IMT will provide situational awareness updates to the QI for dissemination to the Noble Corporate Support Team (CST) and/or the Noble Crisis Management Team (CMT).



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## 8 SERVICE & SUPPORT ACTIVITIES

### 8.1 Agreements & Contracts

Should internal resources prove to be inadequate during an emergency; requests will be made to local agencies, contractors, mutual aid agreements and contracts, and CST for assistance. Such assistance may include equipment, supplies, or personnel. All agreements will be entered into by authorized officials and should be in writing. Agreements and/or contracts should identify the personnel authorized to request assistance.

Inter-company Agreements with other oil and gas companies are encouraged. The IMT will activate these agreements, if deemed necessary.

### 8.2 Reports

All Incidents involving contractor or employee injury/illness, equipment damage, vehicle damage, fires, security or unintentional discharges are to be reported, as soon as practical, to the OSC. Once the OSC receives an incident report, they will disseminate the incident information in accordance with the Noble Energy Mediterranean Ltd. Incident Reporting Tier 4 procedures.

In the event of an unintentional discharge of materials of a type or quantity that must be reported to a regulatory agency or agencies, corporate EHSR will make the required reports in accordance with all applicable regulatory requirements and industry best practices.

### 8.3 Records

All incident records and documentation will be maintained in accordance with any pertinent regulatory requirements and NEI Policies. Examples of information to be documented include but are not limited to:

- Documentation of notifications made internally and by EHSR to other stakeholders, including local, state, and federal agencies
- Potential deviations from prescribed strategies and/or plan tactics
- Issuance of protective action recommendations
- Protective actions ordered by governmental agencies
- Casualties, both to the public and responders
- AAR and CA/IP



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## 9 CORPORATE SERVICE AND SUPPORT

### 9.1 CORPORATE SUPPORT TEAM

When activated, the CST will support and assist the IMT through coordination with the QI. Examples of CST support include but are not limited to; assessing cascading impacts, deploying additional personnel, reviewing contractual obligations, coordinating contingency planning, and managing crisis communications.

### 9.2 CRISIS MANAGEMENT TEAM

The primary focus of the CMT is to maintain the integrity of the company as a whole and to preserve the company's reputation. The CMT will monitor the situation and provide support to the incident response, as needed.

### 9.3 COORDINATION

A critical element of any coordination activity is maintaining a Common-Operating-Picture (COP). This allows on-scene and off-scene personnel to have the information about the incident. This is accomplished through the timely exchange of information between the CMT, CST and the IMT. This coordination allows the OA to manage the incident and to the extent possible sustain normal business operations. The image below illustrates how the various teams are utilized in relation to an incident's complexity.

## Building Block Approach



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## 10 PLAN MAINTENANCE

### 10.1 Exercising the EMP

All exercises will be based on the OA's needs and will be developed, facilitated, and evaluated with direct support from the EHS Operations - Emergency Management and/or NEI Global Security. Upon completion of each exercise, the Lead Planner for the exercise will develop an After Action Report (AAR) using feedback from exercise participants and evaluators. The AAR will be used to develop a Corrective Action/Improvement Plan (CA/IP).

### 10.2 EMP Review and Update

At a minimum, the EMP and Annexes shall be reviewed annually or updated when any conceptual (i.e. threats, hazards, resources, capabilities) or contractual changes are made by the OA. Additionally, the EMP will be updated based on lessons learned during exercises and reflected on the CA/IP.



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## APPENDIX 1 – ACRONYMS AND DEFINITIONS

ACRONYMS	
AAR	After Action Report
CA/IP	Corrective Action / Improvement Plan
CMP	Crisis Management Plan
CMT	Crisis Management Team
COP	Common Operating Picture
CST	Corporate Support Team
EHS/R	Environmental, Health, Safety, / Regulatory
EMP	Emergency Management Plan
GMS	Global Management System
HR	Human Resources
HVRA	Hazard Vulnerability and Risk Assessment
IC	Incident Commander
ICP	Incident Command Post
ICS	Incident Command System
IMT	Incident Management Team
JIC	Joint Information Center
MEDEVAC	Medical Evacuation
NEI	Noble Energy, Inc.
OA	Operational Area
OSC	Operations Support Center
PDF	Portable Document Format
PIO	Public Information Officer



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DEFINITIONS	
Crisis Management Team (CMT)	An executive leadership group focused on corporate and reputational impacts created by an incident
Corporate Support Team (CST)	A specialized group assembled from NEI personnel to provide support to Incident Management Teams (IMT) in the event of an incident that has grown in complexity beyond the capabilities of the IMT.
Global Management System	The umbrella framework under which NEI's legal requirements and best practices are incorporated within a model that integrates elements from both Occupational Health & Safety Administration and the Safety Environmental Management System.
Hazard Vulnerability and Risk Assessment	A document, incorporated by appendix to this plan, that identifies the local hazards that have caused or possess the potential to adversely affect public health and safety, public or private property, the environment, or the business unit.
Incident	An undesired event which results, or has the potential to result, in harm to people, damage to property, loss of process and/or harm to the environment.
Incident Commander (IC)	The designated NEI representative responsible for the management of all incident activities on site. The Incident Commander leads the Incident Management Team (IMT).
Incident Command Post (ICP)	The field location at which the primary tactical-level, on-scene incident command functions is performed.
Incident Command System (ICS)	A standardized on-scene emergency management concept specifically designed to allow its user(s) to adopt an integrated, modular organizational structure scalable to the complexity and demands of an incident.
Incident Management Team (IMT)	A team comprised of personnel from a respective OA organized into an Incident Command System (ICS) structure in the event of an incident that has grown beyond the capabilities of on-site personnel.
Operational Area	The area of responsibility identified for core business functions (i.e. Wattenberg, Rockies, Appalachia, Deep-water, Israel, Cyprus, EG, Cameroon, Nicaragua and Falklands).
Public Information	Information that is disseminated to the public via the news media before, during, and/or after an emergency or disaster
Qualified Individual	A designated NEI representative authorized to expend funds during emergency operations and serves as the link between the IMT and CST.
Stakeholder	External entities within the Operational Area that may be impacted by NEI emergency operations.



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## APPENDIX 2 – HAZARD VULNERABILITY RISK ANALYSIS

The tables in this section illustrate the potential hazards that may be faced by the OA. By assessing a potential hazard's impact in relation to the probability of its occurrence, the OA can determine their vulnerability to that hazard and the risk faced as a result. This allows for the prioritization of preparedness actions that should be taken by the OA.

The initial step in the process is to rate each hazard by assigning it an impact rating for a variety of categories (Area Impacted, Health and Safety, Property, Environment, Economic). The categories and the system for rating the impact an incident would have are described below:

IMPACT RATINGS		
Category	Description	Rating
Area Impacted (AI)	No offsite impact	0
	Impact confined on land	1
	Impact to water	2
	Impact to community	3
Health & Safety Consequences (HS)	No Health & Safety Impact	0
	Less than 5 injuries or illness	1
	5 or greater injuries or single fatality	2
	Greater than 10 injuries or more than one fatality	3
Property Damage (PD)	No property damage	0
	Few properties destroyed or damaged	1
	Few destroyed but many damaged	2
	Few damaged and many destroyed	2
	Many properties destroyed and damaged	3
Environmental Damage (EN)	Little or no environmental damage	0
	Resources damaged with short term recovery	1
	Resources damaged with long term recovery	2
	Resources destroyed beyond recovery	3
Economic Disruption (EC)	No economic impact	0
	Low direct and/or indirect costs	1
	High direct and low indirect costs	2
	Low direct and high indirect costs	2
	High direct and high indirect costs	3

Similarly to how impact ratings are determined, the probability of occurrence is determined utilizing the following table:

PROBABILITY OF OCCURENCE		
Category	Description	Rating
Probability of Occurrence (PO)	Occurs every 1,000 - 10,000 Years	1
	Occurs every 100 - 1,000 Years	2
	Occurs every 10 - 100 Years	3
	Occurs every 1 - 10 Years	4
	Once a year or more occurrence	5

For each hazard, the sum of the impact ratings is multiplied by the probability of occurrence. The product of this calculation is the Hazard Vulnerability Risk Index (HVRI). It is summarized by the equation below:

## (AI + HS + PD + EN + EC) x PO = HVRI

The impact ratings, probability of occurrence, and Hazard Vulnerability Risk Index scores for the OA are detailed in the following table(s):

HAZARD IDENTIFICATION AND RISK INDEX							
Hazard	Area Impacted	Health & Safety	Property	Environment	Economic	Probability of Occurrence	Total
Naturally occurring hazards that can occur without human influence and have potential direct or indirect impact on the entity (people, property, environment), such as the following:							
Flooding	0	2	2	0	2	4	24
Hurricane	0	0	0	0	0	0	0
Coastal Storm	3	2	2	2	1	3	30
Tornado	1	2	2	1	2	2	16
High Winds	1	1	1	1	1	1	5
Extreme temperatures (heat, cold)	0	3	0	0	1	3	12
Drought	1	0	0	0	2	4	12
Hail	1	2	2	0	2	3	21
Lightning	1	2	2	0	1	3	18
Earthquake	1	2	3	1	2	2	18
Tsunami	2	1	1	0	2	1	6
Volcano	0	0	0	0	0	1	1
Landslide, mudslide, subsidence	1	1	2	1	2	3	21
Glacier - Iceberg	0	0	0	0	0	0	0
Fire (forest, range, urban, wildland, urban interface)	1	1	1	2	1	2	12
Snow, ice, sleet, avalanche	1	1	1	1	1	2	10
Famine	0	1	0	0	2	1	3
Geomagnetic storm	0	0	0	0	2	1	2
Emerging diseases that impact humans or animals	0	2	0	0	2	2	8
Animal or insect infestation or damage	0	1	1	0	1	2	3
Technologically caused events that can be unrelated to natural or human-caused events, such as the following:							
Central computer, mainframe, server, software, or application (internal/external) hazards	0	0	1	0	1	4	8
Ancillary support equipment hazards	0	1	1	1	3	3	18
Telecommunications hazards	0	0	0	0	1	4	4
Energy/power/utility hazards	0	2	1	0	1	3	9
Human-caused events, Accidental hazards, such as the following:							
Unintentional Release	3	1	2	2	3	4	40
Source Control Incident	3	3	2	2	3	2	26
Hazardous material (explosive, flammable liquid, flammable gas, flammable solid, oxidizer, poison, radiological, corrosive) spill or release	3	1	2	2	3	4	40



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**HAZARD IDENTIFICATION AND RISK INDEX (Continued)**

Hazard	Area Impacted	Health & Safety	Property	Environment	Economic	Probability of Occurrence	Total
Human-caused events, Accidental hazards, such as the following (continued):							
Explosion/fire	3	2	2	3	2	2	24
Transportation accident	0	1	1	1	1	2	8
Building/structure collapse	1	3	2	0	2	1	8
Energy/power/utility failure	1	0	0	0	2	3	6
Fuel/resource shortage	0	0	0	0	0	0	0
Air/water pollution, contamination	3	1	1	2	2	2	18
Water control structure/dam/levee failure	0	0	0	0	0	0	0
Financial issues, economic depression, inflation, financial system collapse	1	0	0	0	2	1	3
Communications systems interruptions	1	0	0	0	0	1	1
Misinformation - media	3	0	0	0	3	3	18
Terrorism (CBRNE)	3	3	3	2	3	1	14
Terrorism (Eco)	3	3	3	2	3	2	28
High Profile Special Events	0	0	0	0	0	0	0
Sabotage	3	3	3	3	3	1	15
Civil disturbance, public unrest, mass hysteria, riot	1	3	3	1	3	3	33
Enemy attack, war	3	3	3	3	3	3	45
Insurrection	1	3	2	1	3	3	30
Strike or labor dispute	0	0	0	0	2	3	6
Disinformation	0	0	0	0	0	1	1
Criminal activity (vandalism, arson, theft, fraud, etc.)	1	1	2	1	2	3	21
Electromagnetic pulse	3	1	2	2	3	1	11
Physical or information security breach	1	1	2	2	2	3	24
Workplace violence	1	2	2	0	2	2	14
Product defect or contamination	3	2	2	2	3	1	12
Harassment	0	1	0	0	2	2	6
Discrimination	0	1	0	0	2	2	6



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## APPENDIX 3 – INCIDENT CLASSIFICATION

All incidents share a general list of priorities to be taken into account for response actions. General emergency management practices and the Incident Command System (ICS) establish a list that can be harmonized with Noble’s established corporate priorities. A comparison of those prioritizations is shown in the table below:

PRIORITIES		
Order	Emergency Management Priorities	Corporate Ideals
1	Life Safety	Human Life
2	Incident Stabilization	Environment
3	Property and Environmental Preservation	Assets
4	Societal Restoration	Reputation

The classification of the incident shall be determined by the specific resource needs of the incident, as determined by OA management or the Incident Commander upon consultation with the Command and General staff of the IMT. These decisions will be based on the **actual** situation, taking into account the **potential** for escalation. Descriptions of the classifications can be found in the table below:

INCIDENT CLASSIFICATIONS	
Level	Description
Minor Incident Level 1	A Minor (Level 1) Incident is one which can be dealt with either totally by the facility, vessel, or facility, or that requires response from a limited number of personnel at the office to provide technical advice and support. Notifications shall be made to all relevant agencies and designated internal contacts. Mobilization of the IMT is not required at this incident level. In a situation where the initial incident could be classified as a Minor Incident but where there is the potential to escalate to a Serious (Level 2) Incident, a Serious Incident shall be declared at the outset.
Serious Incident Level 2	A Serious (Level 2) Incident is one which affects the safety of the installation, vessel, or facility and its associated equipment, personnel, and/or the environment. This incident type requires mobilization of the IMT and may require integration of external agencies into the response organization. Contractors may also mobilize their internal response teams and liaise with the IMT via a contractor representative.
Major Incident Level 3	A Major (Level 3) Incident is one which affects the safety of the facility, its associated equipment, personnel, and/or the environment, which, in addition to the IMT, requires mobilization of additional contracted response resources and the CST, as well as integration with external agencies. The Crisis Management Team (CMT) will be notified of all Level 3 Incidents.
Crisis Incident Level 4	A Crisis (Level 4) Incident is a situation in which cascading impacts, contractual implications, corporate viability, shareholder interests, or other implications may cause a negative impact on the corporation or its reputation. A Crisis can only be declared by the Crisis Management Team (CMT) and is exclusively handled by that group. The procedures for the CMT are detailed in the Corporate Support and Crisis Management Plan (CMP), which is a separate document from this EMP.



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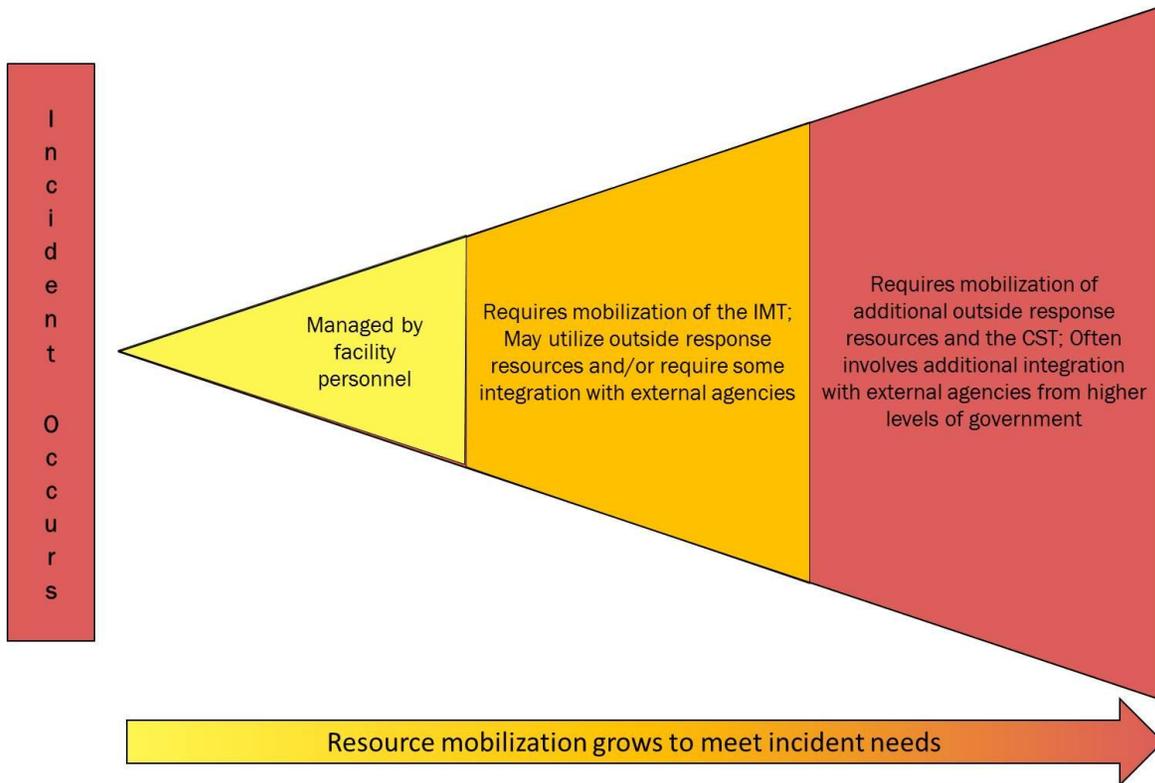
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As demonstrated by the figure below, the personnel mobilized in response to an incident should increase in number and capability proportional to an escalation in the complexity or severity of an incident. Resources should only be mobilized based on incident needs.



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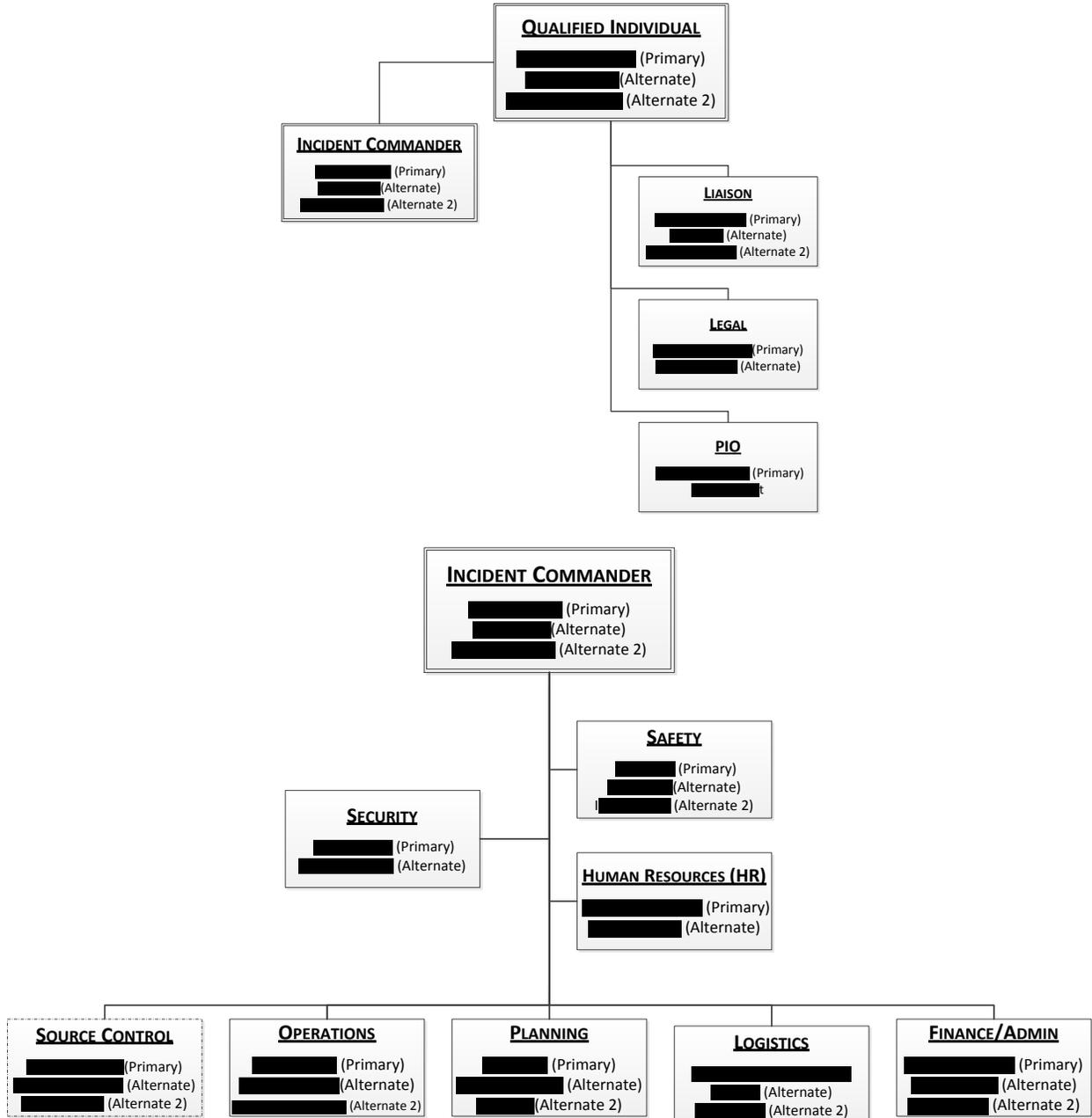
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# APPENDIX 4 – ISRAEL IMT ACTIVATION PROCEDURES

## TAB A – ISRAEL IMT ORGANIZATION



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## TAB B – IMT ACTIVATION PROCEDURES

A determination for the need to activate the Israel IMT resides under the authority of the Operations Director or his designated representatives. Upon notification that an incident or event is occurring that meets the criteria set forth of a Level 2 incident or higher or a Level 1 incident that warrants the need for additional resources beyond what is readily available.

The Israel OA maintains an IMT Roster with designated individuals to serve in the various Command and General Staff positions. Each position listed has a “Primary” and “Alternate” identified by name, and where possible an “Alternate 2.” If partial or full activation of the IMT is directed, the OSC will initiate notification procedures to the specific individuals being requested or to the full IMT using the following communication systems:

- Grid Me Now
- Everbridge (cell phone, email, SMS text)
- VHF Radio (if issued)
- Satellite Phone (if issued)

IMT members are obligated to respond to an activation notification from the OSC within 15 minutes to ensure all required positions are staffed. In the event the designated “Primary” IMT member cannot be reached or is unavailable, the OSC will then activate the first “Alternate” individual listed for that position. If the “Primary” or first “Alternate” cannot be reached or are unavailable, the OSC will then activate “Alternate 2” if listed. If contact with all listed individuals for an activated position are attempted and none respond in the allotted time, the OSC will immediately notify the IC.

Based on the situation, the IC will designate a specific time for IMT members to report to the Incident Command Post (ICP). If an IMT member is unable to report to the ICP at the designated time for any reason, they will communicate that to the OSC and will provide an estimated time of arrival. If this occurs, the OSC will immediately relay that information to the IC.

The OSC will maintain the IMT Roster and update it as required. The IMT Notification procedure will be tested quarterly to ensure a timely response during an emergency situation. Any issues identified during the quarterly test will be communicated to the Operations Director and will be accompanied by potential solutions to resolve the issue within 24 hours of the test.



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**INTERNAL NOTIFICATIONS - INCIDENT MANAGEMENT TEAM**

IMT POSITION	NAME	IMT POSITION SUCCESSION LEVEL	OFFICE	OFFICE-Internal	OTHER
	Noble Energy Mediterranean Ltd. Operations Support Center				
Qualified Individual		Primary			
		Alternate			
		Alternate 2			
Legal		Primary			
		Alternate			
Public Information Officer (PIO)		Primary			
		Alternate			
Liason Officer		Primary			
		Alternate			
		Alternate			
Incident Commander		Primary			5
		Deputy			
		Alternate			
Operations Section Chief					
		Alternate		0	
		Alternate 2			
Planning Section Chief					



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Logistics Section Chief	[REDACTED]	Primary	[REDACTED]	[REDACTED]	[REDACTED]
	[REDACTED]	Alternate	[REDACTED]	[REDACTED]	[REDACTED] 6
	[REDACTED]	Alternate 2	[REDACTED]	[REDACTED]	[REDACTED]
HR Officer	[REDACTED]	Primary	[REDACTED]	[REDACTED]	[REDACTED]
	[REDACTED]	Alternate	[REDACTED]	[REDACTED]	[REDACTED]
Safety Officer	[REDACTED]	Primary	[REDACTED]	[REDACTED]	[REDACTED]
	[REDACTED]	Alternate	[REDACTED]	[REDACTED]	[REDACTED]
	[REDACTED]	Alternate 2	[REDACTED]	[REDACTED]	[REDACTED]
Security/Intelligence Officer	[REDACTED]	Primary	[REDACTED]	[REDACTED]	[REDACTED]
	[REDACTED]	Alternate	[REDACTED]	[REDACTED]	[REDACTED]



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## TAB C – ICP ACTIVATION PROCEDURES

### 1. GENERAL

This procedure is intended to provide guidance for the activation and operation of the Israel IMT's Incident Command Post (ICP). The ICP supports field operations by maintaining a common operating picture, procuring resources, coordinating activities, and communicating information internally and externally. The ICP also provides various electronic media allowing the IC to interface with field assets and the QI to interface with the CST/CMT. These activities help facilitate decision making processes by providing a central location where decision makers can effectively plan and coordinate the response to an incident affecting operations.

The ICP is a collection of conference rooms located floors [REDACTED]. The following is a breakdown of where the various IMT functions are located within building [REDACTED]:

- [REDACTED] Floor Small Conference Room – Qualified Individual and Support Staff
- [REDACTED] Floor Large Conference Room – Incident Commander and Command Staff
- [REDACTED] Floor Large Conference Room – Logistics and Finance Sections
- [REDACTED] Floor Large Conference Room – Operations and Planning Sections

In the event Building [REDACTED] is unavailable or incapable of supporting ICP operations, the [REDACTED] floor conference center in Building [REDACTED] is the designated ICP Alternate location.

### 2. ACTIVATION

The designated ICP space supports NEML daily operations to host meetings and conduct training. When activated, the ICP will take precedence over all other scheduled activities for that space unless otherwise directed by the IC. The ICP will be activated and staffed to the extent and duration necessary to resolve the incident or as determined by the IC.

Upon activation, the OSC Staff will coordinate and manage the deployment of equipment and resources to support the IMT, too include the following:

- IMT Telephones (land line)
- Command and General Staff Cell Phones
- Radios
- IMT Position Job Books
- IMT Position Vests
- Visual Aids (maps, ICS wall displays, etc.)

#### 2.1 LEVELS OF ACTIVATION

There are three levels of ICP activation that may occur in response to an incident;

**STANDBY** - This is the lowest level of activation. IMT Staff are notified of a situation that could potentially require a partial or full activation of the ICP. The staff will monitor the situation and will be ready to report to the ICP, if needed. Examples of situations that may trigger an ICP Standby are: pending severe weather; an unusual incident at AOT or offshore that could escalate to an emergency; escalation of hostilities toward Israel by a group or nation.

**PARTIAL ACTIVATION** - Partial activation occurs when an incident requires the response of multiple elements of a Business Unit, and is or has the potential to impact Production or



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Drilling Operations. Some examples of emergencies that may trigger a partial activation are: closure of critical transportation routes, minor HAZMAT Incidents with no casualties, and the temporary evacuation of a facility for safety reasons (Health, Safety, Security).

**FULL ACTIVATION** - Full activation occurs when the incident requires participation of multiple response elements external resources, performing the full range of emergency service or response functions. Full activations are typically triggered by an incident that requires an immediate and significant response to prevent or mitigate loss of life, impact to the environment, and property damage. The triggers are closely associated with activation of an emergency plan listed as an annex to the EMP.

*NOTE: The CST should be advised of any partial or full activation of the Israel IMT to ensure the ability to quickly respond should the situation escalate.*

### **3. DEACTIVATION**

When the incident has been resolved, the QI or the IC determines advanced incident support and coordination are no longer needed; they will deactivate the ICC and transition to normal operations.

The process of demobilizing includes demobilizing all Sections and Units with an ICC function and documenting activities and functions during the incident in preparation for an After Action Review and a Root Cause Analysis.

To accomplish this:

- The IC will notify specific Section and / or Units when their position is no longer required to be staffed
- IMT staffed positions will ensure that any open actions that have not yet completed will be promptly addressed after the deactivation
- IMT staffed positions must ensure that all required ICS forms, logs, messages and other documents related to the incident are copied with the originals and left in ICC Position Folders
- The IMT staff will return supplies and equipment to the storage location and secure their personal items.
- An official notification will be sent by the IC to all involved internal and external participants, that the MBU ICC has been deactivated.

The ISC Staff will then rehabilitate and reconstitute the ICP and return it to return a normal state of readiness.



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Global EHSR	Plan - Tier 4	042-14-EHSR-FEP-PA-T4	A
Department	Document Type and Tier	Number	Version/Revision

**Document Title:**  
**Noble Energy Mediterranean Ltd (NEML)**  
**EMP Annex F, AOT Facility Emergency Plan (FEP) – Tier 4**

Approval	Date	Signature
Emergency Response Manager [Redacted]		
Production Manager [Redacted]		

# NEML AOT Facility Emergency Plan – Tier 4

No. 042-14-EHSR-FEP-PA-T4

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# NEML AOT Facility Emergency Plan – Tier 4

No. 042-14-EHSR-FEP-PA-T4

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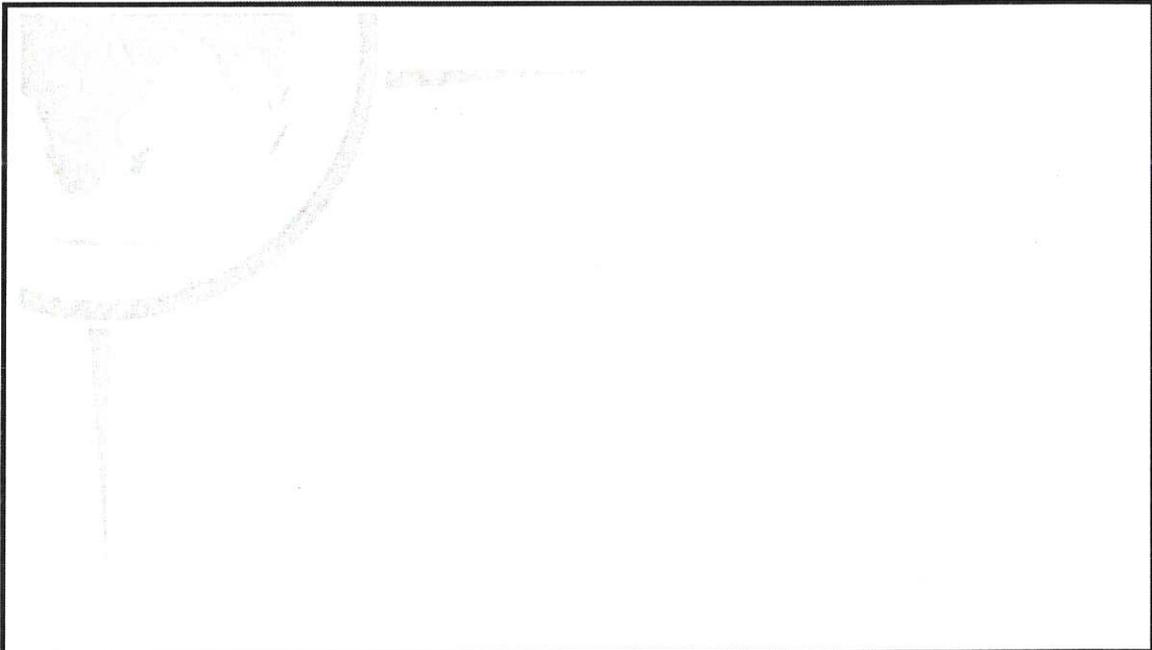
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**Noble Energy Mediterranean Ltd (NEML)  
Oil Spill Contingency Plan (OSCP) - Tier 3**

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Approval	Date	Signature
Global Emergency Response Manager [Redacted]	4 Nov 2014	[Redacted Signature]
Operations Director [Redacted]	4 Nov 14	[Redacted Signature]

# Noble Energy Mediterranean Ltd OSCP – Tier 3

No. 145-13-EHSR-EFP-PA-T3

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## 1 PURPOSE

The purpose of this plan is to build an overall system of preparedness and operational response capabilities for a release of hydrocarbons in the Mediterranean Sea.

## 2 SCOPE

Noble Energy Mediterranean Limited (NEML) has been operating offshore Israel since 1998 and continues to engage in exploration and production activities for gas reserves in the Exclusive Economic Zone (EEZ) of the State of Israel. These activities include production operations from the Mari-B & Tamar platforms, the planned Leviathan Floating Production, Storage, and Offloading (FPSO) Vessel, and Pressure Reduction Metering Platform (PRMP), as well as drilling operations intended to secure additional natural gas reserves. See Figure 1 for Operational Area Map.

This plan is intended to identify the levels of risk, operational capabilities and objectives, resource requirements, roles and responsibilities, and reporting procedures for a release as a result of Exploration, Drilling, or Production Operations.

The Oil Spill Contingency Plan (OSCP) defines NEML's actions for responding to a release of liquid hydrocarbons from an offshore source to ensure compliance with Israel's National Preparedness and Response Plan for Incidents of Sea Pollution by Oil. This plan encompasses all NEML activities in the areas offshore of Israel, which includes exploration, production, and pipeline operations and has been developed using the following guidance documents, plans, and protocols:

- Guidance for the Preparation of an Emergency Factory Plan for the Treatment of Incidents of Sea Pollution by Oil for Entities Exploring for and Producing Gas and Oil at Sea.
- National Preparedness and Response Plan for Incidents of Sea Pollution by Oil (National Plan).
- The Protocol of the Barcelona Convention Concerning the Protection of the Mediterranean Sea Against Pollution Resulting from Exploration and Exploitation of the Continental Shelf and the Seabed and its Subsoil, 1994 (Barcelona Convention).
- The Protocol Concerning Cooperation in Combating Pollution of the Mediterranean Sea by Oil and other Harmful Substances in Case of Emergency, 1976 (Superseded by the Emergency Protocol).
- The Protocol Concerning Cooperation in Preventing Pollution from Ships, and in Cases of Emergency, Combating Pollution of the Mediterranean Sea, 2002 (Prevention and Emergency Protocol).



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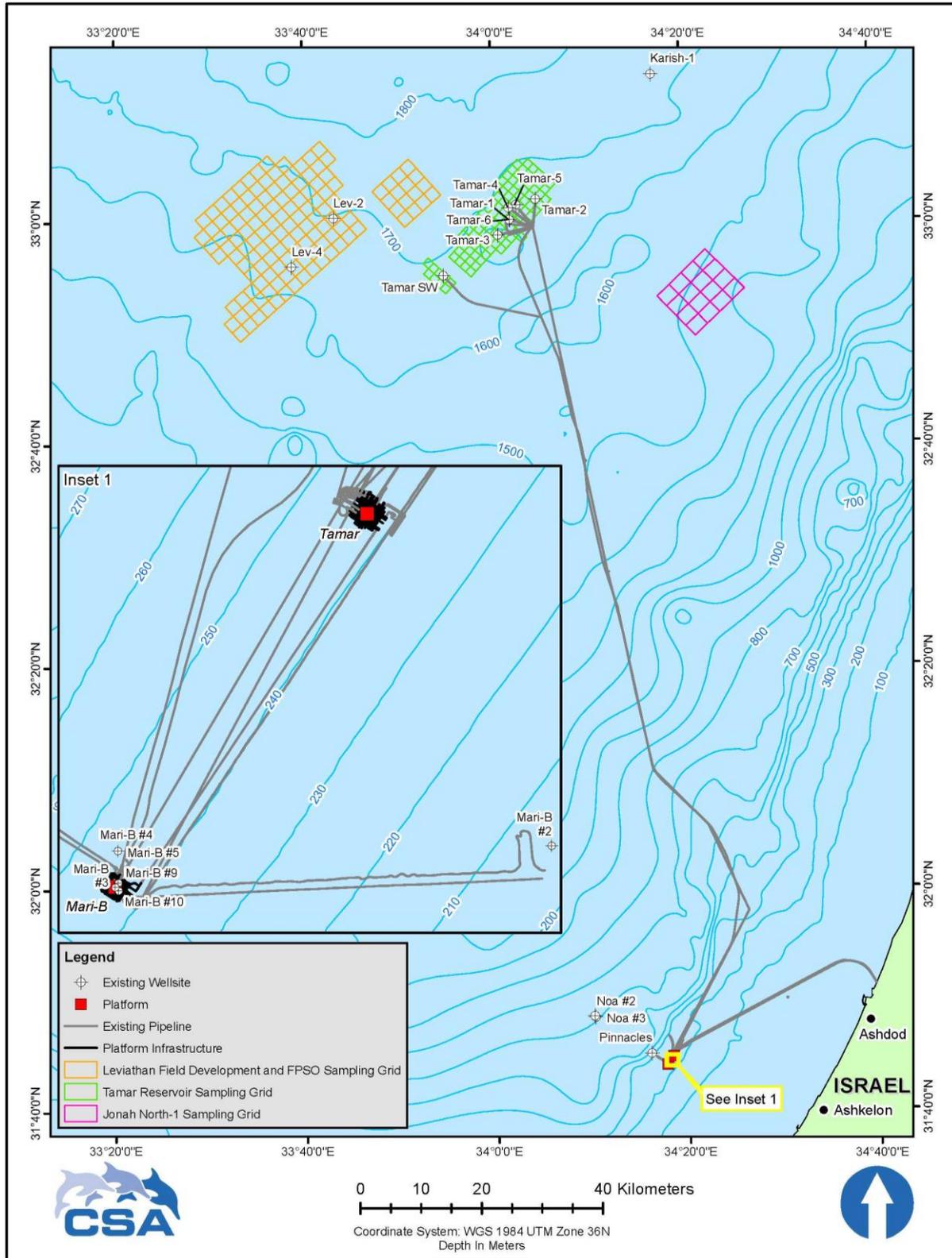
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## 3 EHS MANAGEMENT SYSTEM APPLICABILITY

The implementation of this Plan conforms to the following Noble Energy Inc.'s (NEI) Global Environmental, Health, and Safety (EHS) Management System (GMS) elements:

- Element 3 – Safe Work and Operating Practices; and
- Element 5 – Emergency Preparedness & Community Awareness.

## 4 ADMINISTRATION

### 4.1 PLAN DEVELOPMENT

This plan was developed by a team of environmental, health and safety specialists and emergency response personnel from NEI with assistance from external subject matter experts in oil spill response operations.

### 4.2 RISK MANAGEMENT

Potential release scenarios have been identified from information in the operational overview and historical data. Understanding the overall risk requires these scenarios to be defined in terms of the likelihood of occurrence and potential consequences. The likelihood of each scenario has been qualitatively estimated based on industry data and experience and is listed in Appendix 2 - Risk Considerations. The potential consequence has been predicted based on the sensitivities at risk as described below. Those scenarios deemed to be “worst case” have been modeled to gain an understanding of trajectory.

### 4.3 CLASSIFICATION OF INCIDENTS

All incidents share a general list of priorities to be taken into account for response actions. General emergency management practices and the Incident Command System (ICS) establish a list that can be harmonized with NEI established corporate priorities. A comparison of those prioritizations is shown in the table below:

#### 4.3.1 TIER 1 – MINOR INCIDENT

A minor incident is one which may be managed by the facility or vessel, or requires response from a limited number of personnel to provide technical advice and support. Notifications shall be made to all relevant agencies and designated internal contacts in accordance with the NEML Incident Reporting Procedures. Mobilization of the Incident Management Team (IMT) may not be required at this level.

#### 4.3.2 TIER 2 – SERIOUS INCIDENT

A serious incident is one which affects the safety of the installation, vessel, or facility and its associated equipment, personnel, and/or the environment. This incident type requires mobilization of the IMT and may require integration of external agencies into the response organization. Contractors may also mobilize their internal response teams and liaise with the IMT via a contractor liaison.

#### 4.3.3 TIER 3 – MAJOR INCIDENT

A major incident is one which affects the safety of the facility, its associated equipment, personnel, and/or the environment, which, in addition to the IMT, requires mobilization of additional contracted response resources and the Corporate Support Team (CST), as well as integration with external agencies.



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## 4.4 REVIEW

This plan shall be, at a minimum, reviewed annually and updated in accordance with all policy, procedural, and resource changes associated with oil spill response. The review process will be managed by the Emergency Response Coordinator for Eastern Mediterranean and will include leadership of the Israel Operational Area (OA) and relevant stakeholders.

## 4.5 APPROVAL

Upon determination that the plan accurately reflects the OA's operational expectations for oil spill response, the plan will be approved by the Eastern Mediterranean Business Unit (EMBU) Operations Director and the NEI Emergency Response Manager.

## 4.6 IMPLEMENTATION

Upon approval of the plan, the leadership of the OA will be responsible for implementing the plan, in whole or in part, based on the emergency situation and available resources. The Emergency Management Coordinator for Eastern Mediterranean will provide direct support to the OA and will facilitate reviews, approval, and exercising of the plan.



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## 5 CONCEPT OF OPERATIONS

### 5.1 SITUATION

- Worst Case Discharge (WCD) for exploratory and development drilling operations is the daily rate of an uncontrolled flow of natural gas and oil from all producible reservoirs into the open wellbore.
- The package of reservoirs exposed to an open borehole with the greatest discharge potential is considered the worst case discharge scenario.
- During an incident, modeling of these scenarios is conducted by Witt O'Brien's and is based on accepted industry standards.

### 5.2 ASSUMPTIONS

- The general characteristics of the product associated with NEML operations favors dispersant over recovery. NEML's strategy can be viewed as:
  - Dispersant Application
  - Mechanical Recovery
  - Shoreline Protection
  - Shoreline Cleanup/Recover
  - Rehabilitation
- Should multiple strategies be implemented, they may occur simultaneously. Thus, Simultaneous Operations (SIMOPS) becomes a critical factor in responding to a release.

### 5.3 RELEASE SCENARIOS

Statistically, the most common releases are small incidents associated with day to day operations, such as those occurring during routine maintenance and fuel transfers. However, in terms of assessing risks to the environment, it is important to consider potential releases that have a low probability of occurring, but a high potential impact, such as a well blowout.

The potential release scenarios for exploratory drilling and production operations are summarized in the tables located in Appendix 3 Risk Considerations. These scenarios and release volumes represent a broad cross section of possible release scenarios.

As a result of prevention and preparedness activities such as training, establishment of standard operating procedures and engineering solutions, potential releases are likely to be small, with larger releases being extremely unlikely.

The following are potential scenarios for a release of produced hydrocarbons from NEML offshore activities:

#### 5.3.1 OPERATIONAL FAILURE

Operational failure includes occurrences such as the discharge of drilling or completion fluid or tank/container overflows. The most likely operational failure associated with NEML operations is a small release during bunkering or transfer operations. The volume of such a release is dependent on the specifics of the failure, but is typically a small, fixed amount with an instantaneous release.



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## 5.3.2 EQUIPMENT FAILURE

This includes instances such as the rupture of process piping, process equipment, or sea craft. The volume of this type of release will not exceed the volume of the vessel or line that has failed and is released nearly instantaneously.

## 5.3.3 RUPTURED PIPELINE

This type of release may occur at any point in a pipeline system. It may be the result of a faulty pipeline or from an accidental impact with the pipeline. Pipelines are monitored by means of a Supervisory Control and Data Acquisition (SCADA) system, which would allow for remote shutdown of the line in the event of a rupture. The volume of such a release will depend on the size and flow rate of the line and the speed with which the line is shut down.

## 5.3.4 LOSS OF SOURCE CONTROL

Such an incident constitutes the extreme scenario as the likelihood is small and the systems in place to prevent them have multiple engineered redundancies. The volume of such a release is dependent on the rate of release from the well and amount of time that is required to regain source control.

## 5.4 RELEASE SCENARIO PREPAREDNESS

NEML has taken the following preparedness measures for response to the potential release scenarios listed above:

### 5.4.1 OPERATIONAL FAILURE

These failures result in small releases of condensate or diesel which require only monitoring and reporting. Preparations are included in this plan for reporting and in training of personnel.

### 5.4.2 EQUIPMENT FAILURE

These failures result in small releases of condensate or diesel which require only monitoring and reporting. Preparations are included in this plan for reporting and in training of personnel.

### 5.4.3 RUPTURED PIPELINE

These failures may result in releases which require Tier 1 response. A Tier 1 response package has been placed in-country for initial response to pollution events originating from a NEML facility. This package includes offshore boom, skimming assets, personal protective equipment (PPE), and dispersant delivery systems to be used in response to a release. The Tier 1 package is on-hire from [REDACTED], who also performs quarterly maintenance on the equipment to ensure its operational readiness. Personnel support will be provided by local contractors, namely [REDACTED] Group. NEML has a Master Service Contract in place with these service providers, both of which owns or has access to a number of response resources and personnel trained on the use of those resources.

**NOTE:** All NEML Production operations, too include pipelines, are natural gas. If a rupture were to occur, a limited amount of condensate would be the physical hydrocarbon that would result from such an incident. The decision to use dispersant on condensate would be made by the NEML IMT.



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## 5.4.4 LOSS OF SOURCE CONTROL

These failures may result in releases which require Tier 2 or Tier 3 response. For response to incidents requiring resources above and [REDACTED] Oil Spill Response Ltd. (OSRL) and [REDACTED] for Tier 2 and 3 resources. These resources are globally positioned in a state of readiness for deployment in order to facilitate a rapid response to a release anywhere in the world. NEML also has contracts in place with [REDACTED] to perform as a contract Spill Management Team (SMT).

## 5.5 RESPONSE PROCEDURES

The handling of incidents resulting from a release include defining roles and responsibilities, operative work procedures, and methods of treatment for both onshore and offshore, and methods of waste management.

### 5.5.1 IMMEDIATE RESPONSE (Identification of Incident + 4 hours)

- Any person observing or becoming aware of a release of any size must immediately report the incident to the person in charge of the facility. The person in charge of the facility will **immediately** report all releases (known or unknown source) to the Operations Support Center (OSC). Do not delay reporting pending additional information.
- Field personnel will take immediate actions that may include the following:
  - Stop the discharge, if capable and safe to do so.
  - Assess the possible hazards:
    - Fire and explosion potential of vapors at or near the source.
    - Potential toxic effects of the discharge.
    - Damage to facility affecting safety.
  - Protect personnel by:
    - Sounding alarm.
    - Shutting off ignition sources.
    - Restricting access.
    - Evacuate as necessary.
    - Initiate rescue and response actions.
  - Report all discharges to Ministry of Environmental Protection (MoEP) Emergency Environmental Center.
  - Obtain surveillance using aircraft or vessel to determine:
    - Size of slick.
    - Description of slick.
    - Location of leading and trailing edge of slick.
    - Direction of movement.
    - Threat to personnel, sensitive areas, and/or coastline.
    - Wildlife spotted in the area.
- The Incident Commander (IC) will obtain information regarding the incident from field personnel and assemble certain members of the IMT. The Section Chiefs will notify and brief personnel in their Section to initiate immediate response actions.

### 5.5.2 SUPPLEMENTARY RESPONSE (Incident Identification + 12 hours)

Based on the assessment of the Incident Management Team additional resources may be activated to support response actions.

The IMT is a team comprised of personnel from NEML Operations and Support activities organized into an Incident Command System (ICS) structure. The IMT is activated in the



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event an incident expands beyond the capabilities of on-site personnel. When activated, the IMT assumes responsibility for the following actions:

- Sizing up the incident to identify the problems that need to be addressed by response personnel.
- Ensuring that response operations are carried out in a safe, well-organized, and effective fashion.
- Developing solutions to the problems and organizing the work to be done into manageable tasks to achieve site control, ensure site safety, control the source of the incident, and protect people, the environment, and property.
- Securing and assigning necessary response resources.
- Supporting response operations.
- Continuously assessing the incident to determine the adequacy of available response resources and the potential need for elevation to a Tier 2 or Tier 3 response.
- Interacting, as appropriate, with IMT personnel, government agency officials, and other involved or interested parties.

On-site personnel and the IMT are capable of handling most incidents that may occur at NEML facilities. However, the potential exists for incidents that require a response capability beyond that provided by the Tier 1 resources. If and when such incidents occur, the IMT would activate the NEI Corporate Support Team (CST) as described in the OA Emergency Management Plan (EMP).

## 5.6 DISPERSANT APPLICATION

During response to a release, it is essential to establish clear objectives and focus response actions accordingly. This section describes the benefits of using dispersants and provides objectives that are applicable to most scenarios. Dispersants may be applied utilizing sub-surface, surface, and/or aerial application methods.

The main objective in responding to an offshore release is to minimize impact by removing as much product from the surface of the water as quickly as possible. This will result in:

- Reducing public contact with product in the near-shore and onshore areas,
- Reducing the inhalation by responders of VOCs,
- Reducing shoreline and near-shore environmental and economic impacts, and
- Reducing wildlife loss.

Application of dispersants provides the following benefits in meeting the below objectives:

- Apply dispersants to large slicks.
- Treat thousands of barrels of product per day.
- Reduce shoreline and wildlife impacts by transferring the product from surface waters into the water column more quickly and be biodegraded by naturally occurring micro-organisms.
- Operate effectively over a much wider range of wind and wave conditions than mechanical recovery.
- Responds as a self-contained, all inclusive, dedicated operational unit of equipment and personnel that have been trained and exercised together.
- Can be easily monitored for effectiveness.

The application of chemical dispersants is part of an overall comprehensive strategy to a major oil spill. All of these response techniques will be considered for use in compliance with Israeli Government and MoEP Standards.



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Special Monitoring of Applied Response Technologies (SMART) protocol for monitoring alternative operational strategies or tactics, including the application of dispersants, will be conducted to measure efficacy and/or to monitor any potential health and safety impacts to the public or environment.

The IMT may set the following response objectives for surface dispersant operations:

- Activate sufficient dispersant assets.
- Thoroughly document response activities.
- Assess dispersant effectiveness and environmental impacts.
- Effectively communicate dispersant risks and information.



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### 5.6.1 DISPERSANT CAPABILITIES

The dispersant capabilities listed in the table below reflect the Tier 1 capabilities maintained by NEML in country as well as the Tier 2/3 capabilities NEML maintains via membership in OSRL:

Aircraft/Vessel Staging Base	Payload (gallons / liters)	Estimated Dispersant Capability* (gallons/liters)				Estimated Amount of Oil Treated (barrels/mt)			
		DY1	DY2	DY3	Total	DY1	DY2	DY3	Total
<b>OSRL</b>									
C-130 with ADDS (East Midlands Airport, UK)	5,000 / 18,927	---	10000 / 37850	10000 / 37850	20,000/ 75700	---	4763 / 757 m <sup>3</sup>	4763 / 757m <sup>3</sup>	9526 / 1,514m <sup>3</sup>
B-727 NIMBUS (East Midlands Airport, UK)	TBD								
<b>Noble Energy Mediterranean, Ltd.</b>									
Production Support Vessel #1 (Ashdod Port)	5,000 / 18,927 L	60000 / 227100 L	60000 / 227100 L	60000 / 227100	180000/ 681300 L	28571/ 4543 m <sup>3</sup>	28571/ 4543 m <sup>3</sup>	28571/ 4543 m <sup>3</sup>	85713/ 13029 m <sup>3</sup>
Production Support Vessel #2 (Ashdod Port)	5,000 / 18,927 L	-----	60000 / 227100 L	60000 / 227100	120000/ 454200 L	-----	28571/ 4543 m <sup>3</sup>	28571/ 4543 m <sup>3</sup>	57142/ 9082 m <sup>3</sup>
Contracted Vessel (Ashdod Port)	1,057 / 4,000 L	---	77 / 291 L	77 / 291 L	154 / 582 L	---	37 / 5 m <sup>3</sup>	37 / 5 m <sup>3</sup>	74 / 10 m <sup>3</sup>
<b>Total</b>	-----	60000 / 227100 L	130000/ 492050 L	130000/ 492050 L	320000/ 1211200L	28571/ 4543 m <sup>3</sup>	61942/ 9848 m <sup>3</sup>	61942/ 9848 m <sup>3</sup>	152445 / 24239 m <sup>3</sup>



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## 5.6.2 DISPERSANT APPROVAL PROCESS

The MoEP's approval is required before applying dispersants within Israeli waters. No spray operations either by aircraft or vessel will be conducted without written approval from MoEP.

To expedite the commencement of dispersant operations to respond to a spill, the IMT will commence the dispersant approval process simultaneously with activating dispersant resources. To obtain Israeli government approval the IMT will first complete and submit the Initial Response Information Form to the appropriate Israeli authorities. This form will provide initial information on the spill, location of the spill showing it is in an approved dispersant application area, and the dispersant will be effective on the oil spilled, and second prepare the daily Aerial/Vessel Dispersant Application which provides the operational details for approval by the MoEP before commencing dispersant operations.

## 5.6.3 DISPERSANT OFFSHORE APPLICATION AREAS

To commence the approval process, the IMT should first determine the location of the spill and whether the location is in an area where dispersants can be applied. The following section describes the Israel offshore waters where dispersant may be applied and the dispersant prohibited areas.

Dispersant is the primary response tool for oil spills that occur in offshore areas that have water depths greater than 20 meters and are greater than 1 nautical mile (nm) from national parks, marine reserves or other specially protected areas.

The Israel offshore waters where dispersant application may be permitted are shown in Figure 2. This diagram shows the 20 m depth contour line in black along the coast of Israel and shows the national park areas in red. The red areas are sized to show the 1 nm setback for conducting dispersant spraying. This diagram is not drawn to exact measures and should not be used for applying dispersants in the field.



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Figure 2



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## 5.7 MECHANICAL RECOVERY

NEML's current operations do not involve significant amounts of recoverable product, thus making mechanical recovery an inappropriate strategy.

If a release scenario lends itself to mechanical recovery due to unforeseen product characteristics or volume, use of skimming assets would be utilized primarily around the source of the release. Concentration of skimming assets around the source would allow for more efficient recovery operations by maximizing the encounter rate of the skimmers. Skimmers will be deployed in conjunction with inflatable offshore boom, such as the Hi-Sprint located in NEML's Tier 1 package. The booming operation is a two vessel operation, with one vessel serving as a "deployment craft" and one as a "daughter craft". The deployment craft holds the boom deployment/recovery reel and the bulk of personnel assets assigned to the operation. The daughter craft contains an inflator and a limited number of deckhands. The two craft must work in close concert to establish a "J" or "U" formation, in which the skimmer is placed at the apex. This allows for a deep collection point at which product gathers, thereby creating the maximum encounter rate possible.

Additionally, should recoverable product be encountered, smaller skimming units and shore protection boom would be positioned near to the shoreline to protect critical assets. Aerial observation should be used to determine if recoverable product is approaching shorelines, and, in the event that it is discovered, the spotter aircraft can notify the near-shore skimming assets where to position themselves to be most effective.

From a strategic standpoint, near-shore and offshore skimming resources will be deployed in much the same fashion. The only significant difference is the actual skimmers used, which can vary based on capacity. Should additional skimming resources be required to accomplish strategic or tactical objectives, they will be brought in through agreements with NRC and OSRL.

## 5.8 SHORELINE PROTECTION

Booming strategy may include placement of deflection boom in front of the inlet, and angling of the boom inside of the inlets to collect any product that may pass the deflection boom. Shallow water skimmers may be placed at the end of deflection booms or especially sensitive and/or natural collecting points. In open shallow water areas, skimmers may be used in a dynamic mode.

Appendix 4 identifies areas that could potentially be impacted by an unintentional release and may require shoreline protection resources to be deployed.

## 5.9 WASTE MANAGEMENT

NEML procedures for waste management of materials recovered from a release are as follows:

### 5.9.1 WASTE COLLECTION & STORAGE LOCATIONS

Waste collection receptacles shall be clearly labeled and provided in strategic locations. Employees, contractors, and visitors shall be advised of what waste should or should not be discarded in them. Food and drink is prohibited in any waste storage area.

Waste collection receptacles shall be labeled appropriately and provided in locations determined by coordinated efforts of the Waste Group Supervisor and appropriate ministry officials. The Waste Group Supervisor will establish the locations of the receptacles and the central processing location based on response activities and the location of the release. Waste collection receptacles will be lined, covered, and readily available.

When waste satellite collection points (on vessels) are full they will be shipped to the central processing location for transportation to the disposal facility. Any liquid waste



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recovered from skimming activities will be transferred for temporary storage at Dor and/or Gadot based on availability and existing master service agreements. The NEML EHS Manager maintains a copy of this agreement.

The central processing area should be kept orderly and be designated specifically for hazardous waste. Product should not be stored in this area. Waste should also be stored using safe practices.

## 5.9.2 WASTE TRANSPORTATION & DISPOSAL

All waste shipped to shore for disposal will be collected at either the central processing area or temporary liquid storage area locations and disposed as specified in this Plan.

The generator is ultimately responsible for the proper disposal of its wastes. The Waste Group Supervisor shall ensure legal requirements are complied with at all times. The Waste Group Supervisor is responsible for ensuring the hazardous Waste Disposal Log is up to date and a copy of all shipping documentation is maintained in a centralized location onsite.

## 5.10 REHABILITATION

To support a sustained response effort, additional resources have been identified. These resources will be engaged at the direction of the IMT to support rehabilitation efforts within the affected area.

A list of resources NEML has immediate access to can be found in Appendix 6 of this plan.

## 5.11 REPORTING REQUIREMENTS

It is NEML's policy to report all releases immediately as required by regulations. Upon discovery of a release, the Incident Commander (IC) or his designee will notify the Environmental Emergency Center, the MoEP Marine Coastal and Environmental Department (MCED), Ministry of Energy and Water Resources (MEWR) and other appropriate local officials. The IC, or his designee, will also notify the responsible party (if known).

Designated personnel will immediately report the incident to the Ministry of the Environment having jurisdiction over the location where the incident has occurred. As additional information becomes available, the ministry will be notified through normal reporting channels.

If necessary, requests will be made to the On-Scene Inspector with MCED, for the following:

- 2 km Safety Zone in Water - MCED
- 10 km Safety Zone in Air - MCED
- Notice to Mariners – MCED



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Note: When calling from outside of Israel, dial country exit code, +972, and drop the leading "0" in the area code. The leading "0" in area codes (02, 03, 04, etc.) is only dialed when calling within Israel.

REQUIRED NOTIFICATIONS	
Ministry of Environmental Protection – Emergency Environmental Center	
	[REDACTED]
<b>REPORTING REQUIREMENTS</b>	
TYPE:	Threat / Knowledge of a liquid hydrocarbon discharge greater than 1 bbl into water.
VERBAL:	Immediate verbal/oral notification (by telephone).
WRITTEN:	Ensure a log of notification is maintained.
Ministry of Natural Infrastructure, Energy and Water Resources – Senior Coordinator for Oil & Gas	
[REDACTED]	[REDACTED] [REDACTED]
<b>REPORTING REQUIREMENTS</b>	
TYPE:	Threat / Knowledge of a liquid hydrocarbon discharge greater than 1 bbl into water.
VERBAL:	Immediate oral notification.
WRITTEN:	Ensure a log of notification is maintained.
Ministry of Environmental Protection – Marine & Coastal Division	
[REDACTED]	[REDACTED] [REDACTED]
<b>REPORTING REQUIREMENTS</b>	
TYPE:	Threat / Knowledge of a liquid hydrocarbon discharge greater than 1 bbl into water.
VERBAL:	Immediate oral notification.
WRITTEN:	Ensure a log of notification is maintained.
Natural Gas Authority	
[REDACTED]	[REDACTED] [REDACTED]
<b>REPORTING REQUIREMENTS</b>	
TYPE:	Threat / Knowledge of a liquid hydrocarbon discharge greater than 1 bbl into water.
VERBAL:	Immediate oral notification.
WRITTEN:	Ensure a log of notification is maintained.
Petroleum Commissioner (Per Leviathan Leases)	
[REDACTED]	[REDACTED]
<b>REPORTING REQUIREMENTS PER LEVIATHAN LEASES</b>	
TYPE:	Threat / Knowledge of a liquid hydrocarbon discharge 1 bbl or greater into water.
VERBAL:	Immediate oral notification.
WRITTEN:	Written report due no later than 24 hours after awareness of event. Report must include the cause, location, volume, and remedial action taken. Spills of more than 50 barrels must include information on the sea state, meteorological conditions, and the size and appearance of the slick.
Ashdod Port Marine Coastal Inspector	
	[REDACTED]
<b>REPORTING REQUIREMENTS</b>	
TYPE:	The master or any other representative of the vessel, whether at sea or in port should notify Israeli authorities on any pollution that may impact Port Operations.
NOTE:	The report should be made through the respective Port Control.



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## REQUIRED NOTIFICATIONS

Haifa Port Marine Coastal Inspector

## REPORTING REQUIREMENTS

**TYPE:** The master or any other representative of the vessel, whether at sea or in port should notify Israeli authorities on any pollution that may impact Port Operations.

**NOTE:** The report should be made through the respective Port Control.



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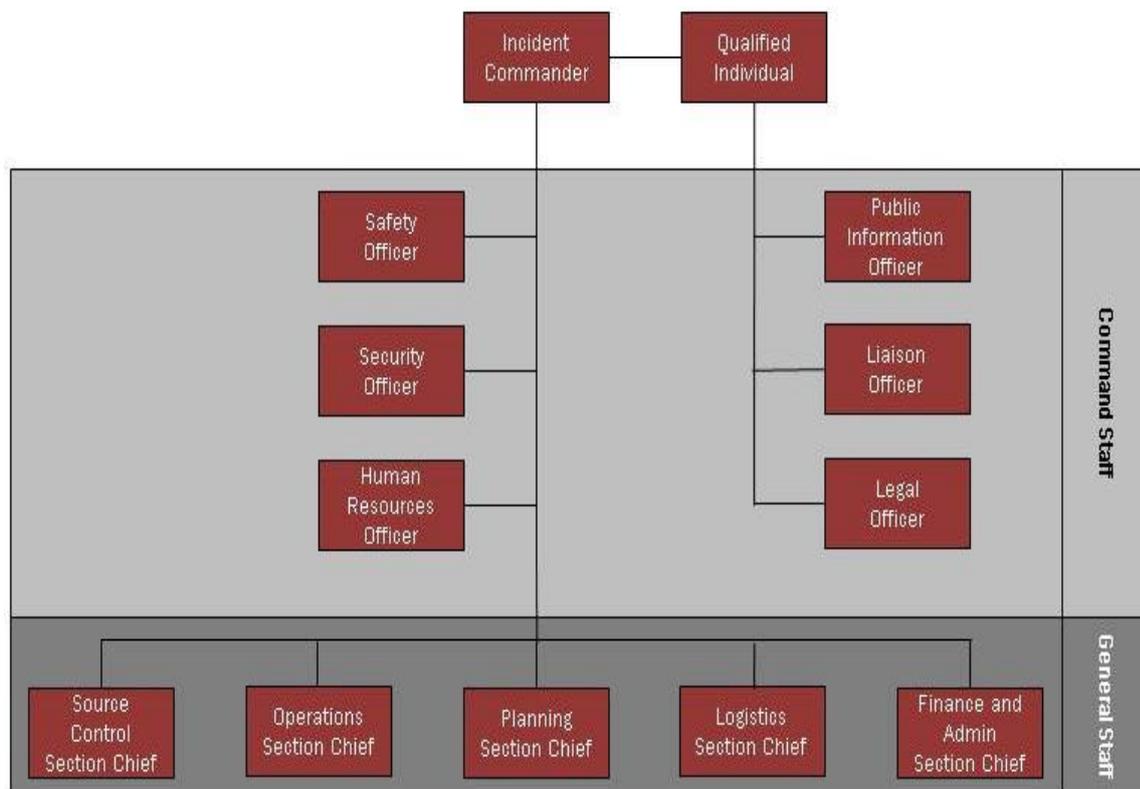
## 6 IMT ROLES AND RESPONSIBILITIES

The IMT is a team comprised of personnel from NEML Operations and Support activities organized into an ICS structure (Figure 3). The IMT is activated in the event an incident expands beyond the capabilities of on-site personnel. When activated, the IMT assumes responsibility for the following actions:

- Sizing up the incident to identify the problems that need to be addressed by response personnel.
- Ensuring that response operations are carried out in a safe, well-organized, and effective fashion.
- Developing solutions to the problems and organizing the work to be done into manageable tasks to achieve site control, ensure site safety, control the source of the incident, and protect people, the environment, and property.
- Securing and assigning necessary response resources.
- Supporting response operations.
- Continuously assessing the incident to determine the adequacy of available response resources and the potential need for elevation to a Tier 2 or Tier 3 response.
- Interacting, as appropriate, with IMT personnel, government agency officials, and other involved or interested parties.

On-site personnel and the IMT are capable of handling most incidents that may occur at NEML facilities. However, the potential exists for incidents that require a response capability beyond that provided by the Tier 1 resources. If and when such incidents occur, the IMT would activate the NEI Corporate Support Team as described in the Business Unit's Emergency Management Plan (EMP).

Figure 3: Incident Management Team Organization



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## 6.1 QUALIFIED INDIVIDUAL (QI)

- Direct activation of IMT, as appropriate.
- Ensure that strategic issues such as business continuity, legal liabilities, and company reputation are considered.
- Issue strategic objectives to Incident Commander (IC).
- Communicate incident details to OA leadership.
- Manage media relations.
- Authorize expenditure of funds for incident response.
- Serve as focal point between IMT and CST/CMT.
- Manage government relations.
- Maintain an activity log (ICS-214).

## 6.2 INCIDENT COMMANDER (IC)

- Set Incident Objectives and operational period.
- Establish incident response organization.
- Activate required Command & General Staff positions.
- Implement resource ordering process.
- Implement cost sharing/cost accounting procedures.
- Communicate incident details to QI.
- Approve and authorize implementation of the Incident Action Plan (IAP).
- Participate in the Command & General Staff Meeting.
- Maintain an activity log (ICS-214).

## 6.3 PUBLIC INFORMATION OFFICER (PIO)

- Develop incident information with IC for release to public and media.
- Obtain QI review and approval of all information releases.
- Coordinate/Conduct media briefings.
- Manage Joint Information Center (JIC), if activated.
- Brief IC on public information issues and concerns.
- Participate in the Command & General Staff Meeting, Planning Meeting, and Operation Period Briefing.
- Maintain an activity log (ICS-214).

## 6.4 LEGAL OFFICER

- Advise IMT on legal issues related to the incident and response operations.
- Review all media releases prior to release.
- Participate in the Command & General Staff Meeting and Planning Meeting.
- Maintain an activity log (ICS-214).

## 6.5 LIAISON OFFICER

- Serve as communications conduit between IMT and stakeholders impacted by the incident.
- Monitor operations for potential government interagency problems.
- Participate in Command & General Staff Meeting and Planning Meeting.
- Coordinate activities of visiting dignitaries.
- Maintain an activity log (ICS-214).



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## 6.6 SAFETY OFFICER

- Develop and publish Site Safety Plan (ICS-208).
- Develop the Incident Action Plan Safety Analysis worksheet (ICS-215A).
- Review and Approve Medical Plan (ICS-206).
- Participate in Command & General Staff Meeting, Tactics Meeting, Planning Meeting, and Operations Period Briefing.
- Monitor incident operations for safety issues.
- Maintain an activity log (ICS-214).

## 6.7 SECURITY OFFICER

- Develop Site Security Plan, as appropriate.
- Assist Safety Officer with development of Incident Action Plan Safety Analysis worksheet (ICS-215A).
- Participate in Command & General Staff Meeting, Tactics Meeting, Planning Meeting, and Operations Period Briefing.
- Monitor incident operations for security Issues.
- Maintain an activity log (ICS-214).

## 6.8 HUMAN RESOURCES (HR) OFFICER

- Coordinate Critical Stress Management (CSM) issues.
- Coordinate between IMT and injured employee(s).
- Coordinate with PIO concerning employee information.
- Provide IMT employee administrative oversight.
- Maintain an activity log (ICS-214).

## 6.9 OPERATIONS SECTION CHIEF

- Evaluate and request sufficient staffing and supervision.
- Participate in Command & General Staff Meeting, Tactics Meeting, Planning Meeting, and Operations Period Briefing.
- Identify/Utilize Staging Areas.
- Supervise Operations Section personnel.
- Subdivide the section's work areas into manageable components.
- Develop work assignments of the section's personnel and allocate tactical resources based on strategic requirements Operational Planning Worksheet (ICS-215).
- Participate in the planning process and the development of the tactical portions on the Organization Assignment List and Air Operations Summary Worksheet (ICS-204 and ICS-220, respectively) of the IAP.
- Assist with development of long-range strategic, contingency, and demobilization plans.
- Maintain an activity log (ICS-214).

## 6.10 SOURCE CONTROL SECTION CHIEF

- Participate in Command & General Staff Meeting, Tactics Meeting, Planning Meeting, and Operations Period Briefing.
- Evaluate and request sufficient staffing and supervision.
- Identify/Utilize Staging Areas.
- Supervise Source Control Section personnel.



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- Subdivide the section's work areas into manageable groups.
- Develop work assignments for the section's personnel and allocate tactical resources based on strategic requirements Operational Planning Worksheet (ICS-215).
- Participate in the planning process and the development of the tactical portions of the Organization Assignment List (ICS-204) of the IAP.
- Assist with development of long-range strategic, contingency, and demobilization plans.
- Maintain an activity log (ICS-214).

## 6.11 PLANNING SECTION CHIEF

- Facilitate Command & General Staff Meeting, Tactics Meeting, Planning Meeting, and Operations Period Briefing.
- Collect, process, and display situational information to the IMT.
- Assist Operations and/or Source Control Section Chiefs in development of response strategies.
- Supervise the preparation of the IAP.
- Supervise tracking of all personnel and resources assigned to the incident.
- Establish IMT reporting requirements and schedule.
- Determine the need for specialized resources to support the incident.
- Establish special information collection activities, as necessary (e.g., weather, environmental, etc.).
- Direct development of IMT supporting plans, as required (e.g., traffic, medical, communications, demobilization, transition, security, etc.).
- Maintain an activity log (ICS-214).

## 6.12 LOGISTICS SECTION CHIEF

- Participate in Command & General Staff Meeting, Tactics Meeting, Planning Meeting, and Operations Period Briefing.
- Determine and supply immediate incident resource and facility needs.
- Manage resource request process.
- Track resource effectiveness and make necessary adjustments.
- Provide resource and logistical support for upcoming operational period per information within Operational Planning Worksheet (ICS-215).
- Develop Communications Plan (ICS 205 & 205A) and Medical Plan (ICS 206) for IAP.
- Identify long term service and support requirements.
- Maintain an activity log (ICS-214).

## 6.13 FINANCE & ADMINISTRATION SECTION CHIEF

- Participate in Command & General Staff Meeting, Planning Meeting, and Operations Period Briefing.
- Review operational plans and provide alternatives where financially appropriate.
- Manage all financial aspects of the incident.
- Provide cost analysis, as requested.
- Establish third party claims process, if required.
- Track personnel and equipment time.
- Ensure all obligation documents are properly prepared and completed.
- Establish and manage compensation & claims issues.
- Maintain an activity log (ICS-214).



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## 7 COORDINATION WITH OTHER ENTITIES

### 7.1 NEIGHBORING FACILITIES AND AUTHORITIES

NEML will work to develop and implement cooperative plans and procedures with neighboring facilities and authorities. The list of contacts in Appendix 4 - Neighboring Facilities and Authorities, references the facilities and coastal authorities which may be affected by pollution from NEML operations.

### 7.2 COORDINATION WITH NEIGHBORING LOCAL AUTHORITIES

NEML will work with neighboring local authorities and their relevant emergency plans to facilitate response measures. This includes contacting those entities in the event of an incident and offering any necessary assistance to prevent or mitigate potential impacts to those local authorities. NEML's response resources will be deployed in a manner to prevent impacts to sensitive areas and support the needs of all neighboring local authorities will be considered in those efforts.

### 7.3 CONTRACTED EQUIPMENT AND SERVICES

NEML has entered into contracts with a number of contractors for the purpose of responding to releases. Those contractors are:

- [REDACTED] (Tier 1 Equipment, Manpower, and Waste Handling)
- [REDACTED] (Tier 1 Equipment, Manpower)
- [REDACTED] (Tier 1 Equipment Package, Tier 2/3 Equipment and Manpower Support)
- [REDACTED] (Tier 2/3 Equipment and Manpower Support)
- [REDACTED] (Compensation and Claims)
- [REDACTED] (Spill Management Team)
- [REDACTED] (Contingency Support for Waste Handling)
- [REDACTED] (Contingency Support for Waste Handling)

#### 7.3.1 EQUIPMENT SPECIFICATIONS

Item descriptions, quantity, function, location, general response times and specifications of mechanical equipment and special products for the treatment of sea pollution, are located in Appendix 6 – Technical Means for Treatment of Incident. The timeframes for all assets listed as being in country include the timelines for being operationally deployed. Those assets listed as cascading from out of country show a timeline for arriving at a point of entry into Israel. In order for those resources to be operationally deployed, several factors should be considered:

- NEML is assuming approximately a four (4) hour time frame to clear customs for all out of country resources.
- It should take approximately two (2) hours to transit from the point of entry to a shore-base deployment point.
- Approximately one (1) hour should be allowed for load-out of equipment onto the appropriate deployment platform.
- Assuming a speed of ten (10) knots, it should take a vessel:
  - Approximately 1 hour, 30 minutes to travel the 13.5 nm to the Mari-B or Tamar platforms. Travel times for the Leviathan FPSO and PRMP will be determined based on the final location of each.

Dispersant application equipment should be assembled to deployment readiness during this transit time, thus not increasing the response time of those resources.



## 8 PLAN MAINTENANCE

### 8.1 TRAINING AND EXERCISE

NEML requires all response personnel to have appropriate training to serve in their assigned position during a response.

#### 8.1.1 OPERATIONAL TRAINING

Training will be conducted at least annually in operational response actions, including dispersant application, aerial observation, and mechanical recovery. This training may be held in conjunction with annual drills.

#### 8.1.2 SIMULATION DRILL

A simulation drill for the IMT will be held annually, including an activation of the Incident Command Post (ICP), for the purpose of evaluating procedures and locating gaps.

#### 8.1.3 FULL SCALE EXERCISE

A full scale exercise will be conducted once every three (3) years combining the efforts of the IMT and actual equipment deployment.

### 8.2 RECORDS

A log will be maintained which documents the history of the events and communications that occur during the response. When recording this information, the log may become instrumental in legal proceedings.

#### 8.2.1 INCIDENT ACTION PLAN

During significant response activities, development of an Incident Action Plan (IAP) is critical for identifying objectives and strategies and implementing tactics for each operational period. The number, type and frequency of the IAP forms used is dependent on the complexity of the incident and determined by the Incident Commander in conjunction with the Unified Command (if activated). The incident management software CommandPro® will be utilized in the development of the IAP.

The Documentation Unit Leader within the ICS organization is responsible for the control of records during an incident. They will determine the process for keeping records and how to keep them. Ultimately, records kept from a NEML incident will be kept at the NEML offices for a period of no less than three years.



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## APPENDIX 1: ACRONYMS AND DEFINITIONS

ACRONYMS	
bbbl	barrel
bbls	barrels
CMP	Crisis Management Plan
CMT	Crisis Management Team
COP	Common-Operating-Picture
CST	Corporate Support Team
EHS	Environmental, Health, and Safety
EHSR	Environmental, Health, Safety, Regulatory
EMBU	Eastern Mediterranean Business Unit
EMP	Emergency Management Plan
EEZ	Exclusive Economic Zone
FPSO	Floating Production, Storage, Offloading
GMS	Global Environmental, Health and Safety Management System
HR	Human Resources
IAP	Incident Action Plan
IC	Incident Commander
ICP	Incident Command Post
ICS	Incident Command System
IDF	Israeli Defense Forces
IEC	Israel Electric Corporation
IMT	Incident Management Team
JIC	Joint Information Center
MCED	Marine Coastal and Environmental Department
MEWR	Ministry of Energy and Water Resources
MPS	Marine Pollution Service
MOD	Ministry of Defense
MoEP	Ministry of Environmental Protection
MOT	Ministry of Transportation
NEI	Noble Energy, Inc.
NEML	Noble Energy Mediterranean Ltd
NM	Nautical Mile
NRC	National Response Corporation
OA	Operational Area
OSC	Operations Support Center
OSCP	Oil Spill Contingency Plan
OSRL	Oil Spill Response Ltd
OSRO	Oil Spill Response Organization
PIO	Public Information Officer



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PPE	Personal Protective Equipment
PRMP	Pressure Reduction Metering Platform
QI	Qualified Individual
SCADA	Supervisory Control and Data Acquisition
SIMOPS	Simultaneous Operations
SMART	Special Monitoring of Applied Response Technologies
SMT	Spill Management Team
VOC	Volatile Organic Compounds
WCD	Worst Case Discharge



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DEFINITIONS	
Crisis Management Team (CMT)	An NEI executive leadership group focused on corporate and reputational impacts created by an incident
Corporate Support Team (CST)	A specialized group assembled from NEI personnel to provide support to IMT in the event of an incident that has grown in complexity beyond the capabilities of the IMT.
Global Environmental, Health and Safety (EHS) Management System (GMS)	The umbrella framework under which NEI's legal requirements and best practices are incorporated within a model that integrates elements from both the US Occupational Health & Safety Administration and the US Bureau of Safety and Environmental Enforcement (BSEE) Safety Environmental Management System.
Hazard Vulnerability and Risk Analysis (HVRA)	A document, template incorporated by appendix to this plan, that identifies the local hazards that have caused or possess the potential to adversely affect public health and safety, public or private property, the environment, or the OA's organization.
Incident	An undesired event which results, or has the potential to result, in harm to people, damage to property, loss of process, and/or harm to the environment.
Incident Commander (IC)	The designated NEML representative responsible for the management of all incident activities on site. The IC leads the IMT.
Incident Command Post (ICP)	The field location at which the primary tactical-level, on-scene incident command functions is performed.
Incident Command System (ICS)	A standardized on-scene emergency management concept specifically designed to allow its user(s), an incident response organization, to adopt an integrated, modular organizational structure scalable to the complexity and demands of an incident.
Incident Management Team (IMT)	A team comprised of personnel from the OA organized into an ICS structure in the event of an incident that has grown beyond the capabilities of on-site personnel.
Operational Area (OA)	The area of responsibility identified for core business within Israel.
Public Information	Information that is disseminated to the public via the news media before, during, and/or after an emergency or disaster
Qualified Individual (QI)	A designated NEML representative authorized to expend funds during emergency operations and serves as the link between the IMT and CST.
Stakeholder	External entities within the OA that may be impacted by NEML emergency operations.



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## APPENDIX 2: EXTERNAL PERSONNEL AND EMERGENCY RESCUE AND COMMAND SERVICES

**Note:** When calling from overseas, dial country exit code, +972, and drop the leading "0" in the area code. The leading "0" in area codes (02, 03, 04, etc.) is only dialed when calling within Israel.

<b>AIR FORCE</b>		
[REDACTED]		
[REDACTED]		
[REDACTED]		
[REDACTED]		
[REDACTED]		
[REDACTED]		







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## APPENDIX 3: RISK CONSIDERATIONS

### Near Shore Release Scenarios

Ref.	Scenario	Product	Volume	Likelihood	Consequence	Comments
1	Minor fuel releases from support / supply vessel.	Diesel	<1m <sup>3</sup> (6.3bbbls)	C	0	Likely to naturally dissipate quickly.
2	Crew transfer / supply vessel incident resulting in loss of fuel.	Diesel	10 - 1000m <sup>3</sup> (63- 6300 bbl)	B	3	Diesel release likely to naturally dissipate. Due to large volume likely to spread over a large area. Exact volume depends on vessel.

### Offshore Release Scenarios

Ref.	Scenario	Product	Volume	Likelihood	Consequence	Comments
1	Minor operational or maintenance releases.	Utility, diesel, crude	<1m <sup>3</sup> (6.3 bbl)	C	0	Release unlikely to have a significant impact due to size, and it would be easily mitigated. Release may not reach with the marine environment if contained on deck.
2	Minor diesel releases during fuel transfer operations.	Diesel	<1m <sup>3</sup> (6.3 bbl)	C	1	Likely to naturally dissipate quickly.
3	Major releases during fuel transfer operations - full flow release due to rupture of transfer hose.	Diesel	<10 m <sup>3</sup> (63 bbl)	C	2	Diesel release likely to naturally dissipate, but due to large volume likely to spread over a large area. Exact volume depends on shut down time.
4	Blowout, maximum anticipated uncontrolled flow rate.	TBD	TBD	B	5	Information regarding maximum flow rate for a well blowout will be provided during the drilling permitting process for each well.
5	Blowout, medium anticipated uncontrolled flow rate.	TBD	TBD	B	4	Information regarding medium flow rate for a well blowout will be provided during the drilling permitting process for each well.
6	Blowout, minimum anticipated uncontrolled flow rate.	TBD	TBD	B	3	Information regarding minimum flow rate for a well blowout will be provided during the drilling permitting process for each well.
7	Drilling Rig diesel tank rupture.	Diesel	273.5m <sup>3</sup> (1,720 bbl)	B	3	Diesel release likely to naturally dissipate. The largest potential release is loss of the entire inventory which is unlikely.
8	Loss of lube oils from Drilling Rig.	Lube Oil	6m <sup>3</sup> (38 bbl)	B	2	Unlikely entire inventory will be lost to sea.



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Ref.	Scenario	Product	Volume	Likelihood	Consequence	Comments
9	Supply vessel incident resulting in loss of fuel oil.	Diesel	1000m3 (6,300 bbl)	B	3	Diesel release likely to naturally dissipate quickly, but due to large volume likely to spread over a large area. Exact volume depends on vessel.
10	Crew transfer vessel incident resulting in loss of fuel oil.	Diesel	10m3 (63 bbl)	B	2	Diesel release likely to naturally dissipate quickly.

### Risk Assessment Matrix and Summary

The risk assessment matrix shows the overall risk profile for Noble Energy drilling and production operations. The matrix indicates there are no high risk operations as a result of NEML's implementation of various prevention and mitigation strategies to ensure the risk is as low as reasonably practicable. Such measures include the closed drain system on the rig and oil-water separator system. The only spill scenarios that present a moderate risk are well blowouts. This moderate risk rating results from the potential large scale impact and potential shoreline impact, despite the low probability of such events actually occurring.

CONSEQUENCE					INCREASING LIKELIHOOD				
Severity	People	Assets	Environment	Reputation	A	B	C	D	E
					Never heard of in the industry	Heard of in the industry	Happened in organization /more than once per year in industry	Happened at the location/ more than once per year in organization	Happened more than once a year at the location
0	No injury or health effect	No damage	No effect	No impact			1		
1	Slight injury or health effect	Slight damage	Slight effect	Slight impact			2		
2	Minor injury or health effect	Minor damage	Minor effect	Minor impact			8		
3	Major injury or health effect	Moderate damage	Moderate effect	Moderate impact		3, 6			
4	Permanent total disability / up to 3 fatalities	Major damage	Major effect	Major impact		5			
5	More than 3 fatalities	Massive damage	Massive effect	Massive impact		4, 7, 9			



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## APPENDIX 4: NEIGHBORING FACILITIES AUTHORITIES

No	Plant	Location	Contact Person	Title	Phone 1	Phone 2
█	██████████	████	██████████	████ ██████████	██████████	██████████
█	██████████	████	██████████	██████████ ████	██████████	██████████
█	██████████	████	██████████	██████████ ████	██████████	██████████
█	██████████████████		██████████	██████████ ████	██████████	██████████
█	██████████ ████ ██████████	████ ████	██████████	████ ██████████	██████████	██████████
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## APPENDIX 5: FACILITIES AND VESSELS - WCD

### Production Facilities and Satellite Structures

FAC. NAME	WATER DEPTH	LATITUDE/ LONGITUDE	DIST. SHORE	API GRAV.	WCD	ALL STORAGE
Mari-B	235 m 771 ft	██████████ ██████████	25 km 15.5 mi	30	24 m <sup>3</sup> 150 bbl	102 m <sup>3</sup> 640 bbl
Tamar	235 m 771 ft	██████████ ██████████	25 km 15.5 mi	30	16 m <sup>3</sup> 100 bbl	79.5 m <sup>3</sup> 500 bbl
Leviathan FPSO	TBD	TBD	TBD	TBD	TBD	TBD
Leviathan PRMP	TBD	TBD	TBD	TBD	TBD	

### Pipelines

FROM	LATITUDE/ LONGITUDE	TO	LATITUDE/ LONGITUDE	LENGTH	SIZE	API GRAV.	WCD	THRU VOLUME	DIST. SHORE
Mari-B Platform	██████████ ██████████	Coastal Valve	██████████ ██████████	41 km 25.5 mi	76.2 cm 30 in	Dry Gas		28.3 MMm <sup>3</sup> /d 1.0 Bcf/d	25 km – 0 km 15.5 mi – 0 mi
Tamar Platform	██████████ ██████████	Coastal Valve	██████████ ██████████	41 km 25.5 mi	15.24 cm 6 in	30	22.6 m <sup>3</sup> 142.3 bbl	248 m <sup>3</sup> /d 1,560 bbl/d	25 km – 0 km 15.5 mi – 0 mi
Tamar Platform	██████████ ██████████	Coastal Valve	██████████ ██████████	41 km 25.5 mi	25.4 cm 10 in	Dry Gas		1.8 MMm <sup>3</sup> /d 63 MMcf/d	25 km – 0 km 15.5 mi – 0 mi
Tamar Platform	██████████ ██████████	Mari-B Platform	██████████ ██████████	1.6 km 1 mi	20.32 cm 8 in	30	22.25 m <sup>3</sup> 139.4 bbl	248 m <sup>3</sup> /d 1,560 bbl/d	25 km – 25 km 15.5 mi – 15.5 mi
Tamar Platform	██████████ ██████████	Mari-B Platform	██████████ ██████████	1.6 km 1 mi	40.64 cm 16 in	Dry Gas		17 MMm <sup>3</sup> /d 600 MMcf/d	25 km – 25 km 15.5 mi – 15.5 mi
Tamar Wells	██████████ ██████████	Tamar Platform	██████████ ██████████	156 km 97 mi	40.64 cm 16 in	30	48.2 m <sup>3</sup> 303 bbl	17 MMm <sup>3</sup> /d 600 MMcf/d	80 km – 25 km 49.7 mi – 15.5 mi
Tamar Wells	██████████ ██████████	Tamar Platform	██████████ ██████████	156 km 97 mi	40.64 cm 16 in	30	48.2 m <sup>3</sup> 303 bbl	17 MMm <sup>3</sup> /d 600 MMcf/d	80 km – 25 km 49.7 mi – 15.5 mi
Leviathan Wells	TBD	FPSO	TBD	TBD	TBD	TBD	TBD	TBD	TBD
FPSO	TBD	PRMP	TBD	TBD	TBD	TBD	TBD	TBD	TBD
PRMP	TBD	Coastal Valve	TBD	TBD	TBD	TBD	TBD	TBD	TBD

### Exploratory / Development Drilling

FAC. NAME	WATER DEPTH	LATITUDE/ LONGITUDE	DIST. SHORE	API GRAV.	WCD	ALL STORAGE
TBD	TBD	TBD	TBD	TBD	TBD	TBD

### Support Vessels

Vessel Name	Operation	Tank Product	API Gravity	Tank Volume
EDT Kennedy	Production/Supply	Diesel	35-38	606 m <sup>3</sup> 3,810 bbl
EDT Leon	Production/Supply	Diesel	35-38	982 m <sup>3</sup> 6,176 bbl
Rig Support Vessel #1	Drilling	TBD	TBD	TBD
Rig Support Vessel #2	Drilling	TBD	TBD	TBD



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## APPENDIX 6: TECHNICAL MEANS FOR TREATMENT OF INCIDENT

RESPONSE RESOURCES					
DESCRIPTION OF EQUIPMENT			ORGANIZATION		
NAME	QTY	FUNCTION	NAME	LOCATION	RESPONSE TIME (Hours)
Ayles Fernie AFEDO Disp. Sprayer	3	Chemical Dispersant	NRC	Aboard On - Hire Vessels	2 Hours
Sweep Boom, Offshore, Foam, AirFlo	30 m	Boom	NRC	Israel - Haifa Port	12 Hours
10 m - Side Sweep Arm, w/ rig gear	1	Skimmer	NRC	Israel - Haifa Port	12 Hours
Containerized Inflatable Boom	400 m	Boom	NRC	Israel - Haifa Port	12 Hours
Weir Skimmer (Foilex 250)	1 (25 m3)	Storage	NRC	Israel - Haifa Port	12 Hours
Diesel Transfer Pump 2"x2"	1	Product Transfer	NRC	Israel - Haifa Port	12 Hours
Sorbent Boom 8"x10' /bale	25 Bales	Sorbent	NRC	Israel - Haifa Port	12 Hours
Sorbent Pads 17'x19', 100/bale	15 Bales	Sorbent	NRC	Israel - Haifa Port	12 Hours
Heavy Oil Type Snares	20 Boxes	Skimming Equipment	NRC	Israel - Haifa Port	12 Hours
Dasic Slickgone NS	23,923 L	Chemical Dispersants	NRC	Israel - Haifa Port	2 Hours
Face Shields	4	PPE	NRC	Israel - Haifa Port	12 Hours
Safety Glasses	100	PPE	NRC	Israel - Haifa Port	12 Hours
Rubber Gloves	200	PPE	NRC	Israel - Haifa Port	12 Hours
Tyvek Suits	15 Boxes	PPE	NRC	Israel - Haifa Port	12 Hours
Half-face respirators	1	PPE	NRC	Israel - Haifa	12 Hours
Weatherproof Storage PPE/Bags	2	Storage	NRC	Israel - Haifa Port	12 Hours
Handheld Gas Meter	2	PPE - Gas Monitoring	NRC	Israel - Haifa Port	12 Hours
Sea-Brat 4 (Dispersant)	15,000 L	Dispersant	MPS	Ashdod	12 Hours
Dispersant Sprayer	1	Dispersant	MPS	Ashdod	12 Hours
Lamor Weir Skimmer	1	Skimming	MPS	Ashdod	12 Hours
Lamor Multimax 50	1	Skimming	MPS	Ashdod	12 Hours
DIP-400 Skimmer	1	Skimming	MPS	Ashdod	12 Hours
DESMI Terminator	1	Skimming	MPS	Ashdod	12 Hours



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RESPONSE RESOURCES					
DESCRIPTION OF EQUIPMENT			ORGANIZATION		
NAME	QTY	FUNCTION	NAME	LOCATION	RESPONSE TIME (Hours)
Manta Ray Skimmer	1	Skimming	MPS	Ashdod	12 Hours
Skimmer with Changeable Heads	1	Skimming	MPS	Ashdod	12 Hours
Sorbent Boom, Pads, Pom Pom	1	Absorbent	MPS	Ashdod	12 Hours
C75 Spate Pump, 3"	1	Pump	MPS	Ashdod	12 Hours
Extra Pipes and Hoses for Pump	1 Set	Pump	MPS	Ashdod	12 Hours
Collapsible Liquid Container	1	Temporary Storage	MPS	Ashdod	12 Hours
Stakes	20	Tools	MPS	Ashdod	12 Hours
Stakes	20	Tools	MPS	Ashdod	12 Hours
Hammer	1	Hand Tools	MPS	Ashdod	12 Hours
Plastic Container	1	Temporary Storage	MPS	Ashdod	12 Hours
Assorted Tools	1	Hand Tools	MPS	Ashdod	12 Hours
Caution Tape	2	Hand Tools	MPS	Ashdod	12 Hours
Rope, 20 m	5	Hand Tools	MPS	Ashdod	12 Hours
Disposal Bags	5 Package	Disposal	MPS	Ashdod	12 Hours
Disposable Coveralls	400	PPE	MPS	Ashdod	12 Hours
Gloves	400	PPE	MPS	Ashdod	12 Hours
Goggles	400	PPE	MPS	Ashdod	12 Hours
Plastic Boots	400	PPE	MPS	Ashdod	12 Hours
Safety Helmet	400	PPE	MPS	Ashdod	12 Hours
Shovel	200	Hand Tools	MPS	Ashdod	12 Hours
Rakes	200	Hand Tools	MPS	Ashdod	12 Hours
Working Tools	1	Hand Tools	MPS	Ashdod	12 Hours
Anchors	10	Anchor	MPS	Ashdod	12 Hours
Detergent	4 bbl	Detergent	MPS	Ashdod	12 Hours
Zodiac (RIB)	2	Boat	MPS	Ashdod	12 Hours
Light Tower	2	Lighting	MPS	Ashdod	12 Hours
60 KVA Generator	1	Generator	MPS	Ashdod	12 Hours
85 KVA Generator	1	Generator	MPS	Ashdod	12 Hours
100 KVA Generator	1	Generator	MPS	Ashdod	12 Hours
Trailer	2	Trailer	MPS	Ashdod	12 Hours
200 l Barrels	10	Temporary Storage	MPS	Ashdod	12 Hours
Ro Boom	1,450 m	Containment/ Recovery	MPS	Ashdod	12 Hours
Life Buoy	6	PPE	MPS	Ashdod	12 Hours



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RESPONSE RESOURCES					
DESCRIPTION OF EQUIPMENT			ORGANIZATION		
NAME	QTY	FUNCTION	NAME	LOCATION	RESPONSE TIME (Hours)
MOYNO Submersible Pump	8	Pump	MPS	Ashdod	12 Hours
Life Vest	30	PPE	MPS	Ashdod	12 Hours
First Aid Bag	1	PPE	MPS	Ashdod	12 Hours
Lifting Gear	N/A	Lifting	MPS	Ashdod	12 Hours
1,000 l Plastic Container	20	Storage	MPS	Ashdod	12 Hours
Buoy	5	Buoy	MPS	Ashdod	12 Hours
Tidal Guard Boom	100 m	Protection	MPS	Ashdod	12 Hours
Harbor Boom	600 m	Protection	MPS	Ashdod	12 Hours
Pumping Truck	1	Pump	MPS	Ashdod	12 Hours
Barge	1	Temporary Storage	MPS	Ashdod	12 Hours
EMCO 3 Tag Boat	1	Boat	MPS	Ashdod	12 Hours
EMCO 2 Crane Boat	1	Boat	MPS	Ashdod	12 Hours
Oil Spill Tracking Buoy - I-Sp	1	1 Offshore Oil Tracking System	Oil Spill Response Ltd	Manama, Kingdom of Bahrain	24-36 Hours
Oil Spill Tracking Buoy - ISMD	1	1 Offshore Oil Slick Tracking System	Oil Spill Response Ltd	Manama, Kingdom of Bahrain	24-36 Hours
Roboom 200 m BayBoom	800 m (2,660ft)	Offshore Oil Containment Boom	Oil Spill Response Ltd	Manama, Kingdom of Bahrain	24-36 Hours
Diesel Driven Rope Mop System	1	2 Recovery of Oil from Near-Shore	Oil Spill Response Ltd	Manama, Kingdom of Bahrain	24-36 Hours
Komara 20k Disc Skimmer with Power Pack	2	Recovery of Oil from Near-Shore	Oil Spill Response Ltd	Manama, Kingdom of Bahrain	24-36 Hours
Komara 12k Disc Skimmer with Power Pack	2	Recovery of Oil from Near-Shore	Oil Spill Response Ltd	Manama, Kingdom of Bahrain	24-36 Hours
Komara 7k Disc Skimmer with Power Pack	5	Recovery of Oil from Near-Shore	Oil Spill Response Ltd	Manama, Kingdom of Bahrain	24-36 Hours
Vikoma Minivac Vacuum System	5	Recovery of Oil from Near-Shore	Oil Spill Response Ltd	Manama, Kingdom of Bahrain	24-36 Hours
Komara 40k Skimmer with Power Pack	2	Offshore Oil Recovery System	Oil Spill Response Ltd	Manama, Kingdom of Bahrain	24-36 Hours
Termite Weir Skimmer with Power Pack	2	Offshore Oil Recovery System	Oil Spill Response Ltd	Manama, Kingdom of Bahrain	24-36 Hours



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RESPONSE RESOURCES					
DESCRIPTION OF EQUIPMENT			ORGANIZATION		
NAME	QTY	FUNCTION	NAME	LOCATION	RESPONSE TIME, (Hours)
Terminator Weir Skimmer	1	Offshore Oil Recovery System	Oil Spill Response Ltd	Manama, Kingdom of Bahrain	24-36 Hours
Helix Skimmer	1	Offshore Heavy Oil Recovery System	Oil Spill Response Ltd	Manama, Kingdom of Bahrain	24-36 Hours
Fastank – Small	10	Storage of Recovered Oil	Oil Spill Response Ltd	Manama, Kingdom of Bahrain	24-36 Hours
Storage Barge	2	Storage of Recovered Oil	Oil Spill Response Ltd	Manama, Kingdom of Bahrain	24-36 Hours
Unitor Oil Bag - Large	1	Storage of Recovered Oil	Oil Spill Response Ltd	Manama, Kingdom of Bahrain	24-36 Hours
Unitor Oil Bag	1	Storage of Recovered Oil	Oil Spill Response Ltd	Manama, Kingdom of Bahrain	24-36 Hours
Sea Sentinel Boom 10 m	370 m (1,230ft)	Inshore Oil Containment Boom	Oil Spill Response Ltd	Manama, Kingdom of Bahrain	24-36 Hours
Sea Sentinel Boom 20 m	1000 m (3,330ft)	Inshore Oil Containment Boom	Oil Spill Response Ltd	Manama, Kingdom of Bahrain	24-36 Hours
Shore Guardian Boom 10 m	540 m (1,780ft)	Inshore Oil Containment Boom	Oil Spill Response Ltd	Manama, Kingdom of Bahrain	24-36 Hours
Shore Guardian Boom 20 m	440 m (1,465ft)	Inshore Oil Containment Boom	Oil Spill Response Ltd	Manama, Kingdom of Bahrain	24-36 Hours
Troil Boom GP 750 (20m)	80 m (265ft)	Inshore Oil Containment Boom	Oil Spill Response Ltd	Manama, Kingdom of Bahrain	24-36 Hours
Sea Sentinel Boom 10 m	900 m (3,000ft)	Inshore Oil Containment Boom	Oil Spill Response Ltd	Southampton, United Kingdom	36-48 Hours
Sea Sentinel Boom 10 m	570 m (1,900ft)	Inshore Oil Containment Boom	Oil Spill Response Ltd	Singapore	36-48 Hours
Sea Sentinel Boom 20 m	4,320 m 14,380ft	Inshore Oil Containment Boom	Oil Spill Response Ltd	Southampton, United Kingdom	36-48 Hours
Sea Sentinel Boom	1,720 m 5,643ft	Inshore Oil Containment Boom	Oil Spill Response Ltd	Singapore	36-48 Hours



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RESPONSE RESOURCES					
DESCRIPTION OF EQUIPMENT			ORGANIZATION		
NAME	QTY	FUNCTION	NAME	LOCATION	RESPONSE TIME (Hours)
Sea Sentinel Boom Air/Skirt	800 m (2,625ft)	Inshore Oil Containment Boom	Oil Spill Response Ltd	Singapore	36-48 Hours
Shore Guardian Boom 10 Sec	440 m (1,444ft)	Inshore Oil Containment Boom	Oil Spill Response Ltd	Southampton, United Kingdom	36-48 Hours
Shore Guardian Boom 10 Sec	550 m (1,804ft)	Inshore Oil Containment Boom	Oil Spill Response Ltd	Singapore	36-48 Hours
Shore Guardian Boom 20 Sec	1,820 m 5,971ft	Inshore Oil Containment	Oil Spill Response Ltd	Southampton, United Kingdom	36-48 Hours
Shore Guardian Boom 20 M	660 m (2,200ft)	Inshore Oil Containment	Oil Spill Response Ltd	Singapore	36-48 Hours
Troil Boom Gp1100	550 m (1,830ft)	Inshore Oil Containment Boom	Oil Spill Response Ltd	Singapore	36-48 Hours
Supermax - Rigid Boom	650 m (2,160ft)	Inshore Oil Containment Boom	Oil Spill Response Ltd	Singapore	36-48 Hours
Sea Curtain - Foam Filled In 5	700 m (2,330ft)	Inshore Oil Containment Boom	Oil Spill Response Ltd	Singapore	36-48 Hours
Roboom 200 M Bay Boom	2,600 m 8,650ft	Offshore Oil Containment Boom	Oil Spill Response Ltd	Southampton, United Kingdom	36-48 Hours
Roboom 200 Meters Bay Boom	1,600 m 5,320ft	Offshore Oil Containment Boom	Oil Spill Response Ltd	Singapore	36-48 Hours
Hi Sprint Rapid Boom With Reel	300 m (1,000ft)	Offshore Oil Containment Boom	Oil Spill Response Ltd	Southampton, United Kingdom	36-48 Hours
Hi Sprint Rapid Boom With Reel	600 m (2,000ft)	Offshore Oil Containment Boom	Oil Spill Response Ltd	Singapore	36-48 Hours
Diesel Driven Rope Mop System	2	Recovery of Oil from Near-Shore	Oil Spill Response Ltd	Southampton, United Kingdom	36-48 Hours
Diesel Driven Rope Mop System	2	Recovery of Oil from Near-Shore	Oil Spill Response Ltd	Southampton, United Kingdom	36-48 Hours
Diesel Driven Rope Mop System	2	Recovery of Oil from Near-Shore	Oil Spill Response Ltd	Southampton, United Kingdom	36-48 Hours
Diesel Driven Rope Mop System	2	Recovery of Oil from Near-Shore	Oil Spill Response Ltd	Singapore	36-48 Hours



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RESPONSE RESOURCES					
DESCRIPTION OF EQUIPMENT			ORGANIZATION		
NAME	QTY	FUNCTION	NAME	LOCATION	RESPONSE TIME (Hours)
Diesel Driven Rope Mop System	2	Recovery of Oil from Near-Shore	Oil Spill Response Ltd	Southampton, United Kingdom	36-48 Hours
Komara 20k Disc Skimmer Inc Power Pack	3	Recovery of Oil from Near-Shore	Oil Spill Response Ltd	Southampton, United Kingdom	36-48 Hours
Komara 12k Disc Skimmer Inc Power Pack	4	Recovery of Oil from Near-Shore	Oil Spill Response Ltd	Southampton, United Kingdom	36-48 Hours
Komara 7k Disc Skimmer Inc Power Pack	12	Recovery of Oil from Near-Shore	Oil Spill Response Ltd	Southampton, United Kingdom	36-48 Hours
Komara 7k Disc Skimmer Inc Power Pack	12	Recovery of Oil from Near-Shore	Oil Spill Response Ltd	Southampton, United Kingdom	36-48 Hours
Komara 7k Disc Skimmer Inc Power Pack	2	Recovery of Oil from Near-Shore	Oil Spill Response Ltd	Singapore	36-48 Hours
Elastec Combi Drum Skimmer Inc	2	Recovery of Oil from Near-Shore	Oil Spill Response Ltd	Southampton, United Kingdom	36-48 Hours
Elastec Combi Drum Skimmer Inc	2	Recovery of Oil from Near-Shore	Oil Spill Response Ltd	Singapore	36-48 Hours
Vikoma Minivac Vacuum System	5	Recovery of Oil from Near-Shore	Oil Spill Response Ltd	Southampton, United Kingdom	36-48 Hours
Vikoma Minivac Vacuum System	3	Recovery of Oil from Near-Shore	Oil Spill Response Ltd	Singapore	36-48 Hours
Roclean Minivac Vacuum System	9	Recovery of Oil from Near-Shore	Oil Spill Response Ltd	Southampton, United Kingdom	36-48 Hours
Roclean Minivac Vacuum System	9	Recovery of Oil from Near-Shore	Oil Spill Response Ltd	Singapore	36-48 Hours
Delta Skimmer - Weir Skimmer	3	Recovery of Oil from Onshore	Oil Spill Response Ltd	Singapore	36-48 Hours
Slickdisc MK- 13 Interchangeable	3	Recovery of Oil from Onshore	Oil Spill Response Ltd	Singapore	36-48 Hours
Egmolap Belt Skimmer Inc Power	1	Recovery of Oil from Near-Shore	Oil Spill Response Ltd	Southampton, United Kingdom	36-48 Hours
Ro-Skim System, Tandem, 120tph	2	Offshore Oil Containment	Oil Spill Response Ltd	Southampton, United Kingdom	36-48 Hours
Ro-Skim System, Tandem, 120tph	2	Offshore Oil Containment	Oil Spill Response Ltd	Singapore	36-48 Hours



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RESPONSE RESOURCES					
DESCRIPTION OF EQUIPMENT			ORGANIZATION		
NAME	QTY	FUNCTION	NAME	LOCATION	RESPONSE TIME, (Hours)
2 Pump Weir Boom Capacity 120	1	Offshore Oil Containment	Oil Spill Response Ltd	Southampton, United Kingdom	36-48 Hours
Nofi Harbour Buster	4	Offshore Oil Containment	Oil Spill Response Ltd	Southampton, United Kingdom	36-48 Hours
Nofi Harbour Buster	4	Offshore Oil Containment	Oil Spill Response Ltd	Singapore	36-48 Hours
Komara 40k Skimmer with Power	2	Offshore Oil Recovery System	Oil Spill Response Ltd	Southampton, United Kingdom	36-48 Hours
Komara 40k Skimmer with Power	2	Offshore Oil Recovery System	Oil Spill Response Ltd	Singapore	36-48 Hours
Desmi DS250 Skimmer with Power	1	Offshore Oil Recovery System	Oil Spill Response Ltd	Southampton, United Kingdom	36-48 Hours
Desmi DS250 Skimmer with Power	1	Offshore Oil Recovery System	Oil Spill Response Ltd	Southampton, United Kingdom	36-48 Hours
Ro-Disc Attachment for DS250	2	Offshore Oil Recovery System	Oil Spill Response Ltd	Southampton, United Kingdom	36-48 Hours
GT185 Weir Skimmer with Power	4	Offshore Oil Recovery System	Oil Spill Response Ltd	Southampton, United Kingdom	36-48 Hours
GT185 Weir Skimmer with Power	1	Offshore Oil Recovery System	Oil Spill Response Ltd	Singapore	36-48 Hours
Termite Weir Skimmer with Power	4	Offshore Oil Recovery System	Oil Spill Response Ltd	Southampton, United Kingdom	36-48 Hours
Termite Weir Skimmer with Power	1	Offshore Oil Recovery System	Oil Spill Response Ltd	Singapore	36-48 Hours
Termite Combi System Brush	2	Offshore Oil Recovery System	Oil Spill Response Ltd	Singapore	36-48 Hours
Termite Combi System Brush	2	Offshore Oil Recovery System	Oil Spill Response Ltd	Singapore	36-48 Hours
Terminator Weir Skimmer	1	Offshore Oil Recovery System	Oil Spill Response Ltd	Southampton, United Kingdom	36-48 Hours
Terminator Combi System Brush	1	Offshore Oil Recovery System	Oil Spill Response Ltd	Singapore	36-48 Hours



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RESPONSE RESOURCES					
DESCRIPTION OF EQUIPMENT			ORGANIZATION		
NAME	QTY	FUNCTION	NAME	LOCATION	RESPONSE TIME, (Hours)
Marflex Sweep - Arms Large Vol	2	Offshore Oil Recovery System	Oil Spill Response Ltd	Singapore	36-48 Hours
WP 130 Drum Skimmer With Power	1	Offshore Heavy Oil Recovery System	Oil Spill Response Ltd	Southampton, United Kingdom	36-48 Hours
WP 130 Drum Skimmer With Power	1	Offshore Heavy Oil Recovery System	Oil Spill Response Ltd	Singapore	36-48 Hours
Rotodrum With Power Pack	2	Offshore Heavy Oil Recovery System	Oil Spill Response Ltd	Southampton, United Kingdom	36-48 Hours
Sea Devil Skimmer with Power	3	Offshore Heavy Oil Recovery System	Oil Spill Response Ltd	Southampton, United Kingdom	36-48 Hours
Sea Devil Skimmer with Power	1	Offshore Heavy Oil Recovery System	Oil Spill Response Ltd	Singapore	36-48 Hours
Helix Skimmer	1	Offshore Heavy Oil Recovery System	Oil Spill Response Ltd	Southampton, United Kingdom	36-48 Hours
EARL Vessel Bow Skimmer	1	Offshore Heavy Oil Recovery System	Oil Spill Response Ltd	Singapore	36-48 Hours
Scan Trawl System	1	Offshore Heavy Oil Recovery System	Oil Spill Response Ltd	Southampton, United Kingdom	36-48 Hours
Scan Trawl System	2	Offshore Heavy Oil Recovery System	Oil Spill Response Ltd	Singapore	36-48 Hours
Ro-Tank Storage	6	Storage of Recovered Oil	Oil Spill Response Ltd	Singapore	36-48 Hours
Fastank	63	Storage of Recovered Oil	Oil Spill Response Ltd	Southampton, United Kingdom	36-48 Hours
Fastank	23	Storage of Recovered Oil	Oil Spill Response Ltd	Singapore	36-48 Hours
Fastank	4	Storage of Recovered Oil	Oil Spill Response Ltd	Southampton, United Kingdom	36-48 Hours
Storage Barge	4	Storage of Recovered Oil	Oil Spill Response Ltd	Southampton, United Kingdom	36-48 Hours
Storage Barge	5	Storage of Recovered Oil	Oil Spill Response Ltd	Singapore	36-48 Hours
Storage Barge	6	Storage of Recovered Oil	Oil Spill Response Ltd	Southampton, United Kingdom	36-48 Hours
Storage Barge	2	Storage of Recovered Oil	Oil Spill Response Ltd	Singapore	36-48 Hours



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No. 145-13-EHSR-EFP-PA-T3

RESPONSE RESOURCES					
DESCRIPTION OF EQUIPMENT			ORGANIZATION		
NAME	QTY	FUNCTION	NAME	LOCATION	RESPONSE TIME (Hours)
Unitor Oil Bag	1	Storage of Recovered Oil	Oil Spill Response Ltd	Singapore	36-48 Hours
Unitor Oil Bag	3	Storage of Recovered Oil	Oil Spill Response Ltd	Singapore	36-48 Hours
Waste Containment Tank	10	Storage of Recovered Oil	Oil Spill Response Ltd	Singapore	36-48 Hours
Oil Spill Tracking Buoy - I-Sp	1	Offshore Oil Slick Tracking System	Oil Spill Response Ltd	Southampton, United Kingdom	36-48 Hours
Oil Spill Tracking Buoy - I-Sp	1	Offshore Oil Slick Tracking System	Oil Spill Response Ltd	Singapore	36-48 Hours
Oil Spill Tracking Buoy – Ismd	2	Offshore Oil Slick Tracking System	Oil Spill Response Ltd	Southampton, United Kingdom	36-48 Hours
Oil Spill Tracking Buoy – Ismd	2	Offshore Oil Slick Tracking System	Oil Spill Response Ltd	Southampton, United Kingdom	36-48 Hours
Oil Spill Tracking Buoy – Ismd	2	Offshore Oil Slick Tracking System	Oil Spill Response Ltd	Singapore	36-48 Hours
Ro-Clean Desmi Termite Skimmer	2	Skimmer	NRC	Thailand	24-36 Hrs
Ro-Clean Desmi Termite Skimmer	2	Skimmer	NRC	Kazakhstan	24-36 Hrs
Ro-Clean Termite Skimmer/Brush	2	Skimmer	NRC	Thailand	24-36 Hrs
Ro-Clean Terminator Skim/Power Pack	1	Skimmer	NRC	Kazakhstan	24-36 Hrs
Ro-Clean Terminator Skim/Power Pack	1	Skimmer	NRC	Trinidad	24-36 Hrs
RBS 10 Twin Skimming Sys	1	Skimmer	NRC	Georgia	24-36 Hrs
Crucial ORD Disk Skimmer	1	Skimmer	NRC	Trinidad	24-36 Hrs
Crucial Oleophilic Drum Skimmer	1	Skimmer	NRC	Thailand	24-36 Hrs
Lamor Minimax 60 Brush Skim	2	Skimmer	NRC	Thailand	24-36 Hrs
Lamor Minimax 30 Brush Skim	1	Skimmer	NRC	Thailand	24-36 Hrs
MINIVAC System Complete	1	Skimmer	NRC	Georgia	24-36 Hrs
Ro-Vac Mini Sys w/Transfer Pump	2	Skimmer	NRC	Kazakhstan	24-36 Hrs
Ro-Tanker 2000 Rd Portable Vacuum	1	Skimmer	NRC	Kazakhstan	24-36 Hrs
KOMARA 40 Skimming System	1	Skimmer	NRC	Kazakhstan	24-36 Hrs
KOMARA 20 Skimming System	1	Skimmer	NRC	Georgia	24-36 Hrs



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# Noble Energy Mediterranean Ltd OSCP – Tier 3

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RESPONSE RESOURCES					
DESCRIPTION OF EQUIPMENT			ORGANIZATION		
NAME	QTY	FUNCTION	NAME	LOCATION	RESPONSE TIME, (Hours)
KOMARA 20 Skimming System	1	Skimmer	NRC	Kazakhstan	24-36 Hrs
Ro-Clean OM140D Rope Mope-Portable	1	Skimmer	NRC	Kazakhstan	24-36 Hrs
Manta Ray Head w/ Pump	1	Skimmer	NRC	Trinidad	24-36 Hrs
Vikoma Delta Head 2" w/ Pump	1	Skimmer	NRC	Georgia	24-36 Hrs
High Sprint Ocean 250M Unit	3	Boom	NRC	Thailand	24-36 Hrs
High Sprint Ocean 250M Unit	2	Boom	NRC	Kazakhstan	24-36 Hrs
High Sprint Ocean 250M Unit	4	Boom	NRC	Trinidad	24-36 Hrs
High Sprint Ocean 150M Unit	1	Boom	NRC	Thailand	24-36 Hrs
MEKE Fence Boom Foam 1200MMx25m	140	Boom	NRC	Kazakhstan	24-36 Hrs
Shore Guardian Boom 550MMx15m	4	Boom	NRC	Kazakhstan	24-36 Hrs
Shore Guardian Boom 550MMx10m	13	Boom	NRC	Thailand	24-36 Hrs
Shore Guardian Boom 550MMx10m	24	Boom	NRC	Kazakhstan	24-36 Hrs
Inflatable Sweep Boom 1400MMx3M	2	Boom	NRC	Trinidad	24-36 Hrs
Solid Sweep Boom 800MMx15M Sec	2	Boom	NRC	Trinidad	24-36 Hrs
Solid Buoyancy Boom 800MMx15M	10	Boom	NRC	Trinidad	24-36 Hrs
Solid Buoyancy Boom 1200MMx15M	10	Boom	NRC	Thailand	24-36 Hrs
Solid Buoyancy Boom 450MMx25M	15	Boom	NRC	Kazakhstan	24-36 Hrs
Solid Buoyancy Boom 750MMx25M	16	Boom	NRC	Kazakhstan	24-36 Hrs
Solid Buoyancy 750MMx30M	14	Boom	NRC	Georgia	24-36 Hrs
Solid Buoyancy 750MMx30M	20	Boom	NRC	Trinidad	24-36 Hrs
Portable Alum Barge 2-40'x8' Sec	1	Storage	NRC	Kazakhstan	24-36 Hrs
Canflex Tow Bladder 15 Cubic m	4	Storage	NRC	Thailand	24-36 Hrs
Canflex Tow Bladder 15 Cubic m	3	Storage	NRC	Trinidad	24-36 Hrs
Canflex Pillow Tank 10m3	1	Storage	NRC	Georgia	24-36 Hrs
Flexitank 34m3	4	Storage	NRC	Trinidad	24-36 Hrs
Portable Tank 1 Ton	1	Storage	NRC	Georgia	24-36 Hrs
Pillow Tanks 12m3	4	Storage	NRC	Thailand	24-36 Hrs
Pillow Tanks 4m3	13	Storage	NRC	Thailand	24-36 Hrs
Open Top Tanks 11m3	5	Storage	NRC	Thailand	24-36 Hrs



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RESPONSE RESOURCES					
DESCRIPTION OF EQUIPMENT			ORGANIZATION		
NAME	QTY	FUNCTION	NAME	LOCATION	RESPONSE TIME, (Hours)
ISO Tank 17.5m3	7	Storage	NRC	Kazakhstan	24-36 Hrs
ISO Tank 21m3	3	Storage	NRC	Kazakhstan	24-36 Hrs
Fastank 2000 10T (Complete)	1	Storage	NRC	Georgia	24-36 Hrs
Fastank 2000 10T (Complete)	1	Storage	NRC	Thailand	24-36 Hrs
Fastank 2000 10T (Complete)	10	Storage	NRC	Kazakhstan	24-36 Hrs
Ro-Tank 25m3 Floating Bladder	2	Storage	NRC	Kazakhstan	24-36 Hrs
Ro-Tank 50m3 Floating Bladder	1	Storage	NRC	Kazakhstan	24-36 Hrs
Vikoma 25T Floating Tanks	5	Storage	NRC	Middle East	24-36 Hrs
Vikoma 25T Floating Tanks	2	Storage	NRC	Thailand	24-36 Hrs
Overpack Drums 360 lbs	16	Storage	NRC	Thailand	24-36 Hrs
Overpack Drums 420 lbs	4	Storage	NRC	Thailand	24-36 Hrs
SCBA Set & Cylinder Per Day	10	PPE	NRC	Thailand	24-36 Hrs
Spare Cylinder Per Day	23	PPE	NRC	Thailand	24-36 Hrs
Filter Mask, Full Face Per Day	12	PPE	NRC	Thailand	24-36 Hrs
Lvl A Suit Reusable Zytron 500	6	PPE	NRC	Thailand	24-36 Hrs
Tychem TK Suit Level A ea	3	PPE	NRC	Thailand	24-36 Hrs
Lvl BC Suit Chemmastr Zy 400	9	PPE	NRC	Thailand	24-36 Hrs
Nitrite Gloves (if reusable)	60	PPE	NRC	Middle East	24-36 Hrs
Chemical Boots (Bata Hasmax)	12	PPE	NRC	Thailand	24-36 Hrs
Ro-Clean Desmi Dop 250 Transfer	1	Pump	NRC	Kazakhstan	24-36 Hrs
Ro-Clean Desmi Dop160 Transfer	2	Pump	NRC	Kazakhstan	24-36 Hrs
Alfa Laval Pentastic Pump	2	Pump	NRC	Thailand	24-36 Hrs
Selwood Spate Pump PD75	2	Pump	NRC	Thailand	24-36 Hrs
Kato 2"x2" Centrifugal Pump	4	Pump	NRC	Thailand	24-36 Hrs
Diaphragm Pump (Wilden)	2	Pump	NRC	Thailand	24-36 Hrs
Diaphragm Pump (Wilden)	1	Pump	NRC	Kazakhstan	24-36 Hrs
Transfer Pump	3	Pump	NRC	Georgia	24-36 Hrs
Water Pump	4	Pump	NRC	Georgia	24-36 Hrs
Water Pump	2	Pump	NRC	Kazakhstan	24-36 Hrs
Spate Pump w/ Power Pack	1	Pump	NRC	Georgia	24-36 Hrs
Spate Pump w/ Power Pack	6	Pump	NRC	Kazakhstan	24-36 Hrs
Air Driven Pump Chem Resis, SS	1	Pump	NRC	Thailand	24-36 Hrs
Air Driven Poly Pump ChemResis	1	Pump	NRC	Thailand	24-36 Hrs
Portable Blowers Inflating Boom	1	Pump	NRC	Georgia	24-36 Hrs



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RESPONSE RESOURCES					
DESCRIPTION OF EQUIPMENT			ORGANIZATION		
NAME	QTY	FUNCTION	NAME	LOCATION	RESPONSE TIME, (Hours)
Side Sweep Outrigger 10M	1	Support	NRC	Kazakhstan	24-36 Hrs
Side Sweep Outrigger System 10M Jib	1	Support Equipment	NRC	Trinidad	24-36 Hrs
Hot Pressure Washer	3	Support Equipment	NRC	Kazakhstan	24-36 Hrs
Anchor Kit Comp 50 -10, 50 - 20kg	100	Support Equipment	NRC	Kazakhstan	24-36 Hrs
VHF Radios	3	Support Equipment	NRC	Thailand	24-36 Hrs
Site Control Package	1	Support Equipment	NRC	Kazakhstan	24-36 Hrs
Decontamination Package	1	Support Equipment	NRC	Kazakhstan	24-36 Hrs
4x4 Vehicle	2	Vehicle	NRC	Kazakhstan	24-36 Hrs
Gazel Truck 4x4	1	Vehicle	NRC	Kazakhstan	24-36 Hrs
Gazel Truck 4x2	1	Vehicle	NRC	Kazakhstan	24-36 Hrs
Comms Caravan	1	Vehicle	NRC	Kazakhstan	24-36 Hrs
HIAB Truck	1	Vehicle	NRC	Kazakhstan	24-36 Hrs
Multigas Detector Per Day	2	Monitoring Equipment	NRC	Thailand	24-36 Hrs
PH Meter	1	Monitoring Equipment	NRC	Thailand	24-36 Hrs
Photo Ionization Detector	1	Monitoring Equipment	NRC	Thailand	24-36 Hrs
Draeger Pump	1	Monitoring Equipment	NRC	Thailand	24-36 Hrs
Apex RIB 6m	1	Vessel	NRC	Kazakhstan	24-36 Hrs
Nalco Corexit 9500, 55Gal Drum	4	Dispersant System	NRC	Trinidad	24-36 Hrs
Inductor Kit for V/L Fire Sys	2	Dispersant System	NRC	Trinidad	24-36 Hrs
Ayles Feme Boat Spray Set	1	Dispersant System	NRC	Trinidad	24-36 Hrs



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# NEML AOT Facility Emergency Plan – Tier 4

No. 042-14-EHSR-FEP-PA-T4

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## 1. PURPOSE

The purpose of the Ashdod Onshore Terminal (AOT) Facility Emergency Plan (FEP) is to ensure that personnel working in the facility know their role and responsibilities should an emergency occur.

## 2. SCOPE

The scope of the FEP encompasses all AOT functions, operations, and resources necessary to maintain or restore and resume operations and is applicable to the full spectrum of natural, human caused and technological hazards that could impact AOT operations. The FEP is not a substitute for, but a compliment to the Noble Energy Mediterranean Ltd (NEML) Emergency Management Plan (EMP). The EMP provides the structure to coordinate operations among Operational Area (OA) sections and, in the event of a major emergency or disaster, between the field and Incident Management Team (IMT). The EMP also provides the interface with OA stakeholders and local emergency response resources.

## 3. EHSR GLOBAL MANAGEMENT SYSTEM APPLICABILITY

The implementation of this Plan conforms to the following Global Management System (GMS) elements:

- Element 3 – Safe Work and Operating Practices and;
- Element 5 – Emergency Preparedness & Community Awareness

## 4. ADMINISTRATION

### 4.1 PLAN DEVELOPMENT

The AOT Facility Emergency Plan was developed jointly between the Emergency Response Coordinator for Eastern Mediterranean, the NEML Security Manager, and NEML Production Operations.

### 4.2 REVIEW

The FEP will be reviewed following any drills or exercises to ensure lessons learned are captured and incorporated. At a minimum, this plan will be reviewed annually by the Emergency Response Coordinator and updated appropriately to reflect any improved OA capabilities.

### 4.3 APPROVAL

Upon determination by the NEML Production Manager that this plan accurately reflects the strategic, operational, and tactical response capabilities of the OA, the plan will be approved by signature from the Production Manager and the NEI Emergency Response Manager, as reflected on the cover page.



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# NEML AOT Facility Emergency Plan – Tier 4

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## 4.4 IMPLEMENTATION

Upon approval, the NEML Production Superintendent will be responsible for implementing this plan, in whole or in part, based on the emergency situation and available resources.

## 5. CONCEPT OF OPERATIONS

In the event an emergency situation arises within the AOT with the potential to threaten life safety, property, or assets, the identifying person shall immediately alert personnel who may be in danger then notify the appropriate emergency authority (i.e. law enforcement, fire department, medical services). Without delay, AOT personnel shall implement the appropriate emergency plans and procedures. No person shall, by verbal or written directive, require any delay in the reporting of an emergency to the appropriate authorities.

### 5.1 SITUATION

- The AOT FEP is based on emergency response best practices for an onshore gas production facility.
- As an annex to the EMP, the AOT FEP defines threat specific actions to be taken in a given emergency situation.
- The general roles and responsibilities defined in Section 6 of the EMP are applicable to this plan if the position identified in that section is activated.

### 5.2 ASSUMPTIONS

- The AOT is equipped with appropriate resources to execute an initial response for the purpose of protecting life safety.
- AOT personnel have an appropriate level of training to execute emergency response actions.
- Visitors to the AOT are briefed on appropriate safety protocols and emergency response actions.

### 5.3 ROCKET ATTACK

#### 5.3.1 NOTIFICATION

The primary method of notification for an imminent rocket attack is from public sirens controlled by the Israel Home-front Command (HFC). Additionally, AOT Security directly communicates any potential aerial threat received from HFC to all AOT personnel.

#### 5.3.2 RESPONSE

- All personnel move to the nearest shelter.
- The Production Foreman will ensure all areas have been evacuated.



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# NEML AOT Facility Emergency Plan – Tier 4

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## 5.3.3 SHELTERING

- Production Foreman will obtain accountability of AOT personnel via radio.
- Production Foreman will notify the Operations Support Center (OSC) that AOT personnel are sheltering due to suspected Rocket Attack and that all personnel are accounted for.
- All sheltering personnel will adhere to Israeli Defense Force IDF/HFC instructions.

## 5.3.4 AFTERMATH

- Prior to moving out of shelters, Production Foreman verify with AOT Security that it is safe to exit shelters.
- Upon exiting the shelter, the Production Foreman will inspect the AOT for damage as needed.
- Upon determination that the facility is capable of continued operations, the Production Foreman will notify the OSC that normal operations have resumed.

## 5.4 FIRE AND/OR SMOKE

### 5.4.1 NOTIFICATION

The primary method of notification that an emergency situation exists resides in activation of the automated fire system. Emergency pull stations are located throughout the facility. Secondary method is verbal or person-to-person notification. Employees should be cognizant of guests and visitors within the facility. Guests and visitors should be directed to the designated assembly (muster) area and included as part of the accountability process, when evacuation/relocation is necessary.

### 5.4.2 INITIAL RESPONSE

If an emergency situation occurs, the Senior On-Site NEML Representative shall assume the role of Incident Commander and shall ensure the following initial actions are taken:

- Alert all on-site personnel.
- Account for all on-site personnel.
- Dispatch non-essential personnel from the area.
- Isolate the hazard area.
- Determine the source and nature of the emergency:
  - Are there any casualties or injuries?
  - Is public safety in jeopardy?
  - Are external support services required?
- Don the appropriate Personal Protective Equipment (PPE) and protective clothing.

**Note: Do not approach a hazardous condition alone, or without the proper PPE, if necessary; await the arrival of additional personnel and equipment prior to investigating the problem or implementing control procedures.**



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# NEML AOT Facility Emergency Plan – Tier 4

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- Notify the Production Foreman and request assistance, as required.
- **If a serious injury or fatality has occurred:**
  - Remove victim from further harm and provide first aid if safe to do so.
  - Request local medical services.
  - Ensure there is no disturbance of the incident/accident scene, other than to prevent further harm to personnel and if possible, take photographs of the scene.
- If public safety cannot be assured notify local authorities and recommend evacuation of the immediate area.
- Record all pertinent information on ICS Form 214.

## 5.4.3 REPORTING

If the following is reported to you, or if you see smoke, see flames, or smell something burning, or hear a fire alarm, IMMEDIATELY notify the Lead Operator in the primary building.

- The Lead Operator will notify AOT Security and the Production Foreman.
- AOT Security will liaise with any external resources dispatched to the facility and will report the incident to the appropriate agencies.

## 5.4.4 FIRE EXTINGUISHERS AND USAGE

Fire Extinguishers are located throughout the facility. Recognition and caution should be exercised before attempting to extinguish a fire. Ensure the proper type of extinguisher is available before attempting to extinguish a fire.

**Never attempt to engage a fire beyond incipient stage! Evacuate immediately!**

When using a fire extinguisher, make sure your back is to an unobstructed escape route and no closer than 6 feet from the fire. To use a fire extinguisher use the PASS method:

Pull the Pin

- There is a pin located at the handle and trigger on a fire extinguisher. It is easily recognized as a pull ring. When the pin is pulled, it unlocks the operating lever. With the lever unlocked, the trigger can be operated on the extinguisher.

Aim

- Point the nozzle or horn of the extinguisher at the base of the fire. Do not aim the nozzle or hose at the flames; aiming at the base of the fire will help to eliminate the fire's fuel source.

Squeeze the Handle

- After aiming the nozzle at the fire, squeeze the handle or trigger to release the fire-fighting chemical from the extinguisher. The chemical will come out with some force, so be sure to have a grip on the handle and the nozzle.

Sweep

- With the handle depressed and the nozzle aimed, sweep from side to side at the base of the fire. Move forward toward the fire and continue



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# NEML AOT Facility Emergency Plan – Tier 4

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sweeping back and forth at the base until the fire is out. If any part of the fire reignites, repeat the sweeping process.

## 5.4.5 EVACUATION

In the event of a fire all personnel, when notified to evacuate, should relocate to the assembly area without delay.

## 5.4.6 ASSEMBLY (MUSTER) AREA

The designated assembly (muster) areas for AOT are depicted in Appendix 2.

## 5.5 MEDICAL EMERGENCIES

### 5.5.2 NOTIFICATION

If a situation requiring medical assistance is presented the primary method of notification is through AOT Security. All AOT Security are trained in first aid and are tasked with managing any medical emergency, too include medical evacuation from the facility to a hospital, when required.

### 5.5.3 REPORTING

All medical emergencies will be reported to the OSC immediately. The OSC will make appropriate notifications based on the Israel Tier 3 Incident Reporting Procedures.

## 5.6 SECURITY THREATS

All security incidents as described in the AOT security plan, such as Unauthorized Access, Bomb Threat, Suspicious Package, Suspicious Persons, Active Shooter etc., shall be managed by the AOT Security Team. Any suspected security violation observed or discovered by AOT personnel shall immediately be reported to the AOT Security Team. Once AOT security has been notified, the AOT Production Foreman shall be notified. Regardless of threat, the Production Foreman has overall responsibility for AOT and will direct appropriate actions to ensure the safety and integrity of personnel and property.

## 6. ROLES AND RESPONSIBILITIES

### 6.1 EMPLOYEES

- Receive appropriate training.
- Be familiar and comply with the information described in Section 5 of this plan.
- Respond appropriately to an emergency.

### 6.2 PRODUCTION FOREMAN

- Ensure all employees receive appropriate training.
- Ensure all visitors to AOT receive a site safety briefing.
- Conduct drills to train on-site personnel to carry out the correct response to an emergency condition (as deemed necessary).



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## 6.3 AOT SECURITY

- Assist Production Foreman with planning and conducting drills.
- Serve as communication liaison with Israeli emergency response resources.
- Communicate security threats to Production Foreman and impacted AOT Employees.

## 6.4 EHSR MANAGER

- Investigate all EHS related incidents.
- Facilitate the After Action Report process with the Emergency Response Coordinator.
- Assist with development of post incident Corrective Actions and Improvement Plan.

## 6.5 EMERGENCY MANAGEMENT

- Assist with development and conduct of annual emergency response exercise.
- Facilitate the After Action Report process with the Emergency Response Coordinator.
- Assist with development of post incident Corrective Actions and Improvement Plan.

# 7. MAINTENANCE

## 7.9 MAINTENANCE

To ensure the FEP reflects the most current methods for responding to an office emergency, an active review schedule will be established and maintained.

### 7.9.2 TRAINING AND EXERCISE

- All employees will be briefed on the FEP during New Employee On-Boarding.
- Employees assigned an active role (use AED or Fire Extinguisher, etc.) for one or more emergency situations will be trained to execute that role prior to assuming ownership.
- If enhancements to the FEP or an Appendix are identified during an exercise, a formal review process will be conducted to incorporate the enhancements into the FEP or appropriate Appendix.
- If the FEP is activated for any reason, an After Action Report will be written to capture any opportunities for improvement.

### 7.9.3 REVIEW AND UPDATE

- The Emergency Response Coordinator is responsible for maintaining the FEP.



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- All opportunities for improvement identified during training or exercises will be forwarded to the Emergency Response Coordinator for updating of the plan.
- If an incident occurs, the EHSR Manager or Security Manager will conduct an After Action Review with Emergency Management, as early as is practical, to relay lessons learned and identify opportunities for improvement.

## 8. APPENDICES

APPENDIX	OA ACTIVITY
1	ACRONYMS AND DEFINITIONS
2	AOT FACILITY DIAGRAM
3	RESOURCES
4	EMERGENCY NUMBERS



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# NEML AOT Facility Emergency Plan – Tier 4

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## APPENDIX 1 – ACRONYMS AND TERMS

ACRONYMS	
AED	Automated External Defibrillator
AAR	After Action Report
AOT	Ashdod Onshore Terminal
BCP	Business Continuity Plan
EHSR	Environmental, Health, Safety, & Regulatory
EMP	Emergency Management Plan
FEP	Facility Emergency Plan
GMS	Global Management System
HFC	Home-Front Command
IC	Incident Commander
IDF	Israeli Defense Force
IMT	Incident Management Team
IT	Information Technology
NEI	Noble Energy, Inc.
NEML	Noble Energy Mediterranean Ltd
OA	Operational Area
OSC	Operations Support Center
PPE	Personal Protective Equipment
TERMS	
Global Management System	The umbrella framework under which NEI's legal requirements and best practices are incorporated within a model that integrates elements from both Occupational Health & Safety Administration and the Safety Environmental Management System.
Incident Management Team (IMT)	A team comprised of personnel from a respective OA organized into an Incident Command System (ICS) structure in the event of an incident that has grown beyond the capabilities of on-site personnel.
Operational Area	The area of responsibility identified for core business functions (i.e. Wattenberg, Rockies, Marcellus, Deep-water GOM, Israel, Cyprus, EG, Cameroon, Nicaragua and Falklands).
Qualified Individual	A designated NEI representative authorized to expend funds during emergency operations and serves as the link between the IMT and CST.
Stakeholder	External entities within the Operational Area that may be impacted by NEI emergency operations.



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## APPENDIX 2 – AOT DIAGRAM

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# NEML AOT Facility Emergency Plan – Tier 4

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## APPENDIX 3 – EMERGENCY RESPONSE RESOURCES

The following is a list of Emergency Response Resources and the corresponding location available for use by AOT personnel:

RESPONSE RESOURCES			
DESCRIPTION OF EQUIPMENT			
NAME	QTY	FUNCTION	LOCATION
AED	2	Medical Emergency	1 Each, Old and New Building
Absorbent Pads		HAZMAT Spills	



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## APPENDIX 4 – EMERGENCY NUMBERS

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## Annex 6 – AOT air and noise modelling

## איכות אוויר

### 4.8.1 מקורות הפליטה לאוויר הקיימים והמתוכננים בשטח תחנת הקבלה

פרק זה עוסק בנייתוח איכות האוויר החזויה בסביבה, לאחר הקמת מערך דחיסת הגז. הניתוח בוחן גם את הפלטות לאוויר מהמערך הקיים ואת ריכוזי הרקע בסביבה ממקורות שונים, במטרה להעריך את השפעת המתקן על איכות האוויר בסביבתו.

במתחם תחנת הקבלה קיימים ומתוכננים מקורות פליטה לאוויר משני סוגים:

1. מקורות פליטה מוקדיים הנוצרים כתוצאה משריפת דלק
2. מקורות פליטה בלתי מוקדיים - התנדפות פחמימנים לאוויר, וכן שחרור פחמימנים לאוויר ממקורות שונים.

#### טבלה 1: מקורות פליטה של מתקנים שורפי דלק

המתקן	ציוד נלווה	מספר מתקנים	הספק תרמי (MW)
טורבינת גז <sup>1</sup>	מדחס	2	2X55
טורבינת גז (גיבוי) 1	מדחס	1	55
מנוע גז <sup>2</sup>	מדחס	2	2X0.49
מנוע גז (גיבוי)	מדחס	1	0.49
דיזל גנרטור (חרום)	אין	1	3.5
דיזל גנרטור (חרום) <sup>1</sup>	אין	1	3.5

<sup>1</sup> מתקן מתוכנן

<sup>2</sup> המנועים עובדים לסרוגין.

#### טבלה 2: מקורות פליטה בלתי מוקדיים

המתקן	סוג הפליטה	מאפיינים
מיכל קונדנסט ABJ-0400	גז טבעי + פחמימנים	פליטה בעת מילוי וריקון וכתוצאה מהתנדפות
מיכל קונדנסט ABJ-0405	גז טבעי + פחמימנים	פליטה בעת מילוי וריקון וכתוצאה מהתנדפות
מיכל קונדנסט ABJ-0410	גז טבעי + פחמימנים	פליטה בעת מילוי וריקון וכתוצאה מהתנדפות
נשם שחרור גז - VENT	גז טבעי	פליטה בעת שחרור גז באופן מבוקר מהצנרת לצרכים שונים
פליטות בלתי מוקדיות ממחברים	גז טבעי	פליטה מפוזרת מכלל המחברים במתקן
פליטה מצידוד	גז טבעי	פליטת גז המשמש כ Instrument gas

### 4.8.2 תאור מערך הדחיסה המתוכנן

מערך הדחיסה המתוכנן מורכב משלוש טורבינות גז שיוקמו בתוך שטח תחנת הקבלה המופעלת ע"י חברת נובל אנרג'י. הטורבינות יפעילו את המדחסים וישפרו גז טבעי בלבד.

גז טבעי המופק בים מגיע אל תחנת הקבלה ומשם מוזרם, ע"י נתג"ז לרשת החלוקה הארצית. בתחנת הקבלה עובר הגז תהליכי ייבוש והפחתת לחץ.

נכון למועד הגשת המסמך הסביבתי, עומדת יכולת הזרמת הגז השעתית של תחנת הקבלה על כ 44,500 MMBTU/hr. הגידול הצפוי בצריכת הגז הטבעי במשק, מצריך את הגדלת כמות הגז המוזרמת דרך תחנת הקבלה לנתג"ז. הטורבינות מתוכננות להפעיל מדחסים, שמטרתם לדחוס את הגז המועבר לנתג"ז ובכך להגדיל את כמות הגז המסופקת תוך שימוש במערך הצנרת הקיימת.

כושר הזרמת הגז של תחנת הקבלה לנתג"ז, לאחר התקנת המדחסים יעמוד על כ 66,600 MMBTU/hr, כלומר מדובר בגידול של כ 60% בפוטנציאל הגז שניתן יהיה להעביר בצנרת הקיימת.

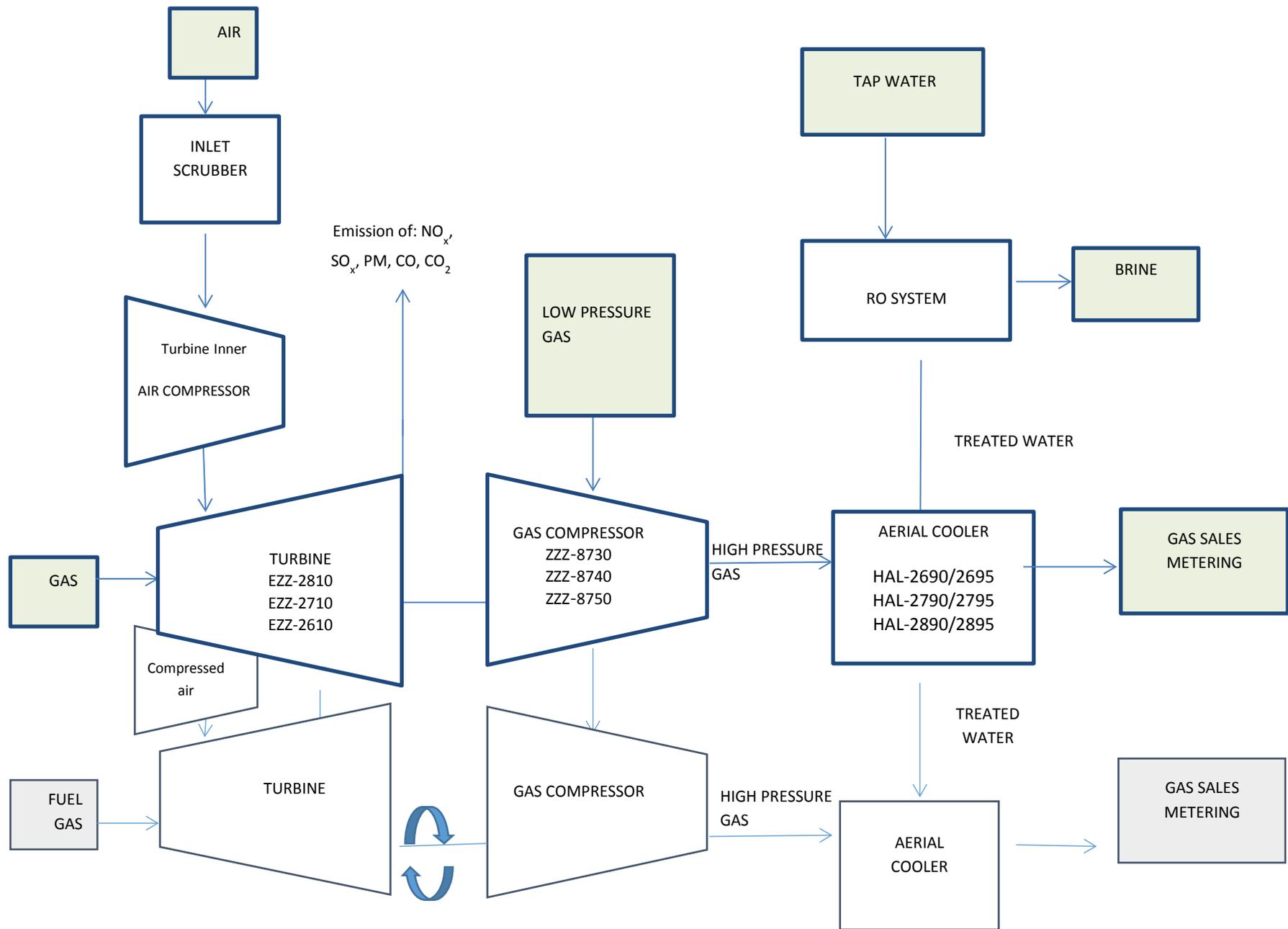
תהליך דחיסת הגז כולל שלוש טורבינות גז מתוצרת GE דגם LM2500 ובהספק תרמי של כ 55 מגוואט האחת. הטורבינות יופעלו בגז טבעי בלבד. מתוכננת הפעלה קבועה של שתיים מתוך שלוש הטורבינות וטורבינה שלישית מתוכננת כגיבוי. מערך הדחיסה מתוכנן באופן שישמור על אמינות גבוהה ככל הניתן של מערכת האספקה, על מנת למנוע מצב של כשל בהזרמת הגז שעלול לגרום להשבתת מערכות חיוניות במשק. משטר ההפעלה המתוכנן יהיה הפעלה של שתי טורבינות (ושני מדחסים) כל העת, גם בשעות השפל.

#### א. תיאור תהליך ייצור האנרגיה בטורבינות

גז טבעי (Fuel gas) בלחץ של כ 47 אטמוספרות מסופק לתא הבעירה של טורבינת הגז. במקביל מסופק לתא השריפה אוויר שטרם כניסתו הוא מסונן ונדחס. גזים חמים שנוצרים ע"י שרפת הדלק מתפשטים דרך הטורבינה. להבי הטורבינה הופכים את אנרגית ההתפשטות לאנרגיה מכנית. אנרגיה מכנית זו משמשת להפעלת מדחס המחובר לציר הטורבינה כוח הדחיסה מופעל על הגז הטבעי (Sales gas) המגיע אל המדחס (לאחר תהליכי הייבוש בתחנת הקבלה). הגז הטבעי נדחס, מקורר ומועבר אל צנרת ההולכה המופעלת ע"י נתג"ז.

#### טבלה 3: רשימת מתקנים וציוד

שם המתקן	כמות המתקנים	מספר מזהה
Booster Compressor	1	8730-ZZZ
Booster Compressor	1	8740-ZZZ
Booster Compressor	1	8750-ZZZ
Booster Comp.disch Gas Cooler	1	HAL-2690/2695
Booster Comp.disch Gas Cooler	1	HAL-2790/2795
Booster Comp.disch Gas Cooler	1	HAL-2890/2895
Compressor Metering Skid	3	
RO water system	1	
2500Gas turbine model LM	1	EZZ-2610
2500Gas turbine model LM	1	EZZ-2710
2500Gas turbine model LM	1	EZZ-2810



תרשים 4-5: תהליך הייצור בטורבינות EZZ-2810, EZZ-2710, EZZ-2610

המערך המתוכנן כולל שלוש יחידות עצמאיות נפרדות שכל אחת מהן כוללת טורבינת גז (EZZ-2610, EZZ-2810, EZZ-2710) המחוברת למדחס (8750, 8740, 8370-ZZZ). שתי יחידות יפעלו באופן רצוף והיחידה השלישית מיועדת לגיבוי בלבד. הטורבינות מופעלות בגז טבעי בלבד.

להלן תאור תהליך יצור האנרגיה בכל אחת מהטורבינות:

גז טבעי בלחץ גבוה של כ-47 אטמוספרות מסופק לתא הבעירה של טורבינת הגז, כאשר מדחס (המהווה חלק אינטגרלי של טורבינת הגז) מספק את האוויר הדרוש לשריפת הגז. טרם כניסת האוויר למדחס הוא מסונן ומקורר. טמפרטורת האוויר עולה באופן דרסטי בתוך תא הבעירה, כתוצאה משריפת הגז הטבעי.

גזים חמים שנוצרים ע"י שרפת הדלק מתפשטים דרך הטורבינה. להבי הטורבינה הופכים את אנרגיית ההתפשטות לאנרגיה מכנית. אנרגיה מכנית זו משמשת להפעלת מדחס המחובר לציר הטורבינה כוח הדחיסה מופעל על הגז הטבעי המגיע אל המדחס (לאחר תהליכי הייבוש בתחנת הקבלה). הגז הטבעי נדחס מלחץ של 48 barg (ב-10.6 מ"צ) ללחץ של 72.7-82.4 barg. הדחיסה גורמת לעליית הטמפרטורה של הגז הנדחס 44-56 מ"צ. הגז מקורר לאחר מכן לטמפרטורה מרבית של 45 מ"צ. הקרור מבוצע באמצעות מערכת מאווררים המופעלים בחשמל. כאשר טמפרטורת הסביבה עולה על 37.7 מ"צ מערך הקרור מתוגבר באמצעות מערכת התזת מים על מנת לסייע בקרור הגז. הגז המקורר מועבר אל צנרת ההולכה המועברת לנתג"ז. המערכת מייצרת כח דחיסה. כל מדחס בעל יכולת דחיסה של 944,300 מ"ק/שעה (שווה ל-800 MMSCFD).

הטורבינות מופעלות כאמור, בגז טבעי בלבד. כאשר ישנה תקלה באספקת הגז הטבעי הטורבינות אינן מסוגלות לפעול, אך גם אין בכך צורך היות וכאשר אין אספקת גז אין צורך בכושר דחיסה.

למעט בתהליך ההתנעה, הטורבינות אינן זקוקות למקור מתח חיצוני, ולכן אינן אמורות להפסיק לפעול בעת תקלה באספקת החשמל. במערך המתוכנן נדרשת אספקת מקור מתח חיצוני להפעלת מערכות עזר הכוללות את מערך המאווררים המקררים את הגז, מערכות בקרה חיצוניות ומערכות הניטור הרציף. במקרה של תקלה באספקת הגז מערכות העזר יופעלו בחשמל שיופק בדיזל גנרטור המיועד לגיבוי.

### 4.8.3 מקורות מוקדניים לפליטת המזהמים

#### א. טורבינות הגז

במערך המתקנים המתוכנן ישנם שלושה מוקדי פליטה והם טורבינות הגז:

EZZ-2610, EZZ-2710, EZZ-2810

כאמור, שתיים מתוך הטורבינות יפעלו באופן רציף והשלישית מיועד לגיבוי.

להלן נתוני הפליטה של כל טורבינה:

קצבי הפליטה המרביים של הטורבינות לתחמוצות חנקן ולפחמן חד חמצני מתרחשים כאשר טמפרטורת הסביבה היא כ- 5 מעלות צלזיוס, והטורבינות מופעלות בעומס הנמוך מ- 70% מהעומס המרבי (פחות מ- 10% מהזמן). פליטת תחמוצות גופרית חושבה לפי התכולה המרבית של גופרית בגז ופליטת חלקיקים חושבה לפי ההספקים המרביים של הטורבינה. קצבי הפליטה המרביים ששמשו לצורך בחינת ההשפעות הסביבתיות נגזרו מחישובים מרביים אלו והינם:

#### טבלה 4: נתוני הפליטה של כל אחת מהטורבינות

קוטר ארובה	גובה ארובה	טמפרטורת גזי הפליטה	פליטה:	NOX	PM	CO	SOx
מטר	מטר	מעלות צלזיוס		ק"ג שעה	ק"ג שעה	ק"ג שעה	ק"ג שעה
2.38	14	493		12	1.6	11	0.704

המתודולוגיה מבוססת על הגדרות היצרן לפליטה בעומסים שונים ובטווח הטמפרטורות האפשרי באזור בו יוקמו הטורבינות.

#### טבלה 5: נתוני הטורבינה

מדד	נתון
מהירות סיבוב הטורבינה (RPM)	6,484
ספיקת הדלק (ק"ג שנייה)	0.975
משקל גזי השריפה (ק"ג שנייה)	56.7
ספיקת גזי הפליטה בתנאי ארובה (מ"ק/שעה)	462,623
אחוז החמצן בגזי הפליטה	14%
אחוז המים בגזי הפליטה	3.91%

#### ב. מנועי גז

במערך המתקנים הקיים קיימים שלושה מנועי גז בהספק טרמי של כ- 0.49 מגהווט כ"א המפעילים מדחסים לטובת מערך הפרדת הגז מהנוזלים. מנועי הגז מופעלים בהתאם לצורך, ובד"כ רק אחד מהם מופעל. להלן שעות הפעילות של המנועים בשנת 2013:

מנוע מספר 1 סך 2681 שעות.

מנוע מספר 2 סך 2804 שעות.

מנוע מספר 3 סך 861 שעות.

הפליטה מהמנועים חושבה בהתאם למקדמי הפליטה של ה EPA למנועי גז, ובהנחה שמנוע אחד עובד ב 100% הספק כל הזמן.

טבלה 6: נתוני פליטה מחושבים של כל אחד ממנועי הגז

SOx	CO	PM	NOX	פליטה:	טמפרטורת גזי הפליטה	גובה ארובה	קוטר ארובה
ק"ג שעה	ק"ג שעה	ק"ג שעה	ק"ג שעה		מעלות צלזיוס	מטר	אינצ'
0.05	0.325	0.014	1.173		505	3.5	6

#### 4.8.4 מקורות פליטה בלתי מוקדדים

##### א. נשמי מיכלי הקונדנסט

נשמי מיכלי הקונדנסט מהווים מקור פליטה בלתי מוקדדי. לקונדנסט לחץ אדים גבוה מ- 1.3Kpa ולפיכך קיימת פליטה משמעותית של אדי VOC לאוויר, ונדרשת עמידה בדרישות ה BAT. הפליטה נובעת כתוצאה מדחיפת האוויר הרווי באדים בעת מילוי המיכלים וכן כתוצאה מהתפשטות הגזים במיכל כתוצאה מהפרשי טמפרטורה במהלך היממה.

בתחנת הקבלה מתקבלים שני סוגי קונדנסט: White Lightning (JT) ו-Normal. על מנת להעריך את לחצי האדים של כל אחד מהסוגים בוצע חישוב של לחץ האדים בטמפרטורה הממוצעת של פני הנוזל (26 מ"צ) של כל אחד מהמרכיבים בשני הסוגים. החישוב הסופי הינו סכום המכפלות של לחצי האדים של המרכיבים השונים מוכפל בריכוז המולרי שלהם בתערובת. כמויות הקונדנסט שעל פיהן בוצע החישוב הן על פי תרחיש הפקה מרבי כמתואר בטבלה להלן.

טבלה 7 : מכילי הקונדנסט ותכולתם

Characteristic\Tank ID	ABJ-0400	ABJ-0410	ABJ-0405
Content*	condensate	condensate	JT condensate
Tank volume (m3)	318	556.5	556.5
Roof type	cone	cone	cone
Tank color	light gray	light gray	light gray
Vapor pressure** (psi)	0.365 (2.51Kpa)	0.365 (2.51Kpa)	0.986 (6.8 Kpa)
pressure setting (psig)	0.1875	0.1875	0.25

על מנת לחשב את הפליטה ממכילי האחסון בוצעו ההנחות הבאות :

טבלה 8 : תרחיש מרבי של כמויות הקונדנסט השבועיות

Condensate type \ sales	Incoming weekly (Barrel)	Weekly sales (Barrel)
JT condensate	2100	1680
Condensate	8000	8000

הערכת הפליטות מנשמי המיכלים בוצעה באמצעות מודל ה TANKS שהוא המודל המקובל על ידי המשרד להגנת הסביבה לפליטות מסוג זה. המודל הוזן במשרעת הטמפרטורות האופיינית לעיר אשדוד. להלן ממצאי המודל :

טבלה 9 : כמויות אדי קונדנסט הצפויות להפלט מהמיכלים – ע"פ מודל ה TANKS.

Tank ID	Volume (m <sup>3</sup> )	Condensate type	Yearly VOC's (Kg) emission
ABJ-0410	556.5	Normal	3,404.63
ABJ-0400	318	Normal	1,994.8
ABJ-0405	556.5	JT condensate	6,741.5
<b>Total kg</b>			<b>12,140.95</b>

## ב. מערכת שחרור גז – VENT

בתחנת הקבלה מותקן נשם המשמש לשחרור גז במקרים שונים שבהם הדבר נדרש לצרכי בטיחות.  
עפ"י ההערכות שנתקבלו ממהנדסי המתקן בכל שחרור משתחררים לאוויר כ 10,000 מ"ק של גז טבעי.

## ג. פליטה מרכיבי ציוד

הגז הטבעי משמש כגז מכשירים במתקנים שונים. גז זה נפלט לאוויר ללא טיפול ממגוון מקורות. היקף הפליטה משתנה משנה לשנה בהתאם להיקף הפעילות במתקן. להלן נתונים על היקף פליטת גז מכשירים בשנים 2012 ו 2013:

טבלה 10 : פליטות מרכיבי ציוד לשנים 2012 - 2013

השנה	היקף הפליטה ממכשירים (ק"ג לשנה)	
	Methane	NMVOG
2012	1264	5
2013	218,095	1,304

הפליטה בשנת 2013 גדלה משמעותית ביחס לשנת 2012. ההערכה היא התוספת העיקרית נובעת מהגידול המשמעותי בכמויות הקונדנסט, היות ובמיכלי הקונדנסט הגז משמש כ Blanket gas. בעת מילוי המיכלים ישנה פליטה של גז, ובעת ריקונם המיכל מתמלא בגז טבעי נוסף המשמש לצורך זה.

## 4.8.5 אמצעים לצמצום פלטות מזהמי אוויר

### א. טורבינות הגז

הטורבינות יצוידו במערכת (Dry Low Emissions) DLE להפחתת תחמוצות חנקן ופחמן חד חמצני. המערכת מאפשרת הפחתת פליטה בטכניקה יבשה ללא הוספת מים. טכניקה זו מוגדרת כ BAT במסמכי ה LCP-Bref.

### עקרון הפעולה של מערכת DLE:

תא השריפה נשלט ע"י מבער ראשי. המבער מאפשר להשיג קצב פליטה נמוך של תחמוצות חנקן בתחום העומסים הגבוהים. ייחודיות המערכת היא יעילותה גם בעומסים נמוכים. המבער מבטיח שדה אחיד של גזים חמים מאד לפני להבי הטורבינה. תכנון מערכת השריפה פשוט, קונסרבטיבי ומשיג יעילות גבוהה בהפחתת קצב יצירת מזהמים.

הגז מתערבב עם האוויר לפני הכניסה למבער ובכך מקטינים את ייצור תחמוצות החנקן בתהליך השריפה (מקור החנקן הוא בעיקר מהאוויר).

בשיטה זו פועלים באחד משלושה שלבים בהתאם לעומס יחידת היצור:

שלב ראשון - בעומס נמוך המבער פועל כמבער דיפוזיוני.

שלב שני - שלב המעבר מעומס נמוך לבינוני.

שלב שלישי - בעומס הגבוה מ 20% - המבער פועל בשיטת הערבוב המוקדם (Premix) ואז יעילותו גבוהה במניעת יצור תחמוצות חנקן.

בכל אחד מן השלבים וויסות וחלוקת היחס דלק/אוויר באזורים שונים של הלהבה משתנה, טמפרטורת הלהבה נשמרת נמוכה וקצב חמצון החנקן שבאוויר לתחמוצות חנקן נשמר נמוך.

## ב. מנועי הגז

מנועי הגז עובדים בשיטה הסטוכיומטרית (כמות האוויר והדלק ביחס קרוב ל 1:16). על פי נתוני היצרן צפויה פליטה של כ 3-4% חמצן בגזי הפליטה. החישוב המובא להלן מבוסס על 5% חמצן ותיקון ל-0 מ"צ. להלן חישוב הפליטה הצפויה ממנועי הגז מהסוג המותקן בתחנת הקבלה.

טבלה 11: ריכוזים מחושבים לפליטת מנועי הגז

המזהם	NOx	PM	CO
ריכוז מחושב (mg/m3) 5% חמצן	2063	26.2	607

הריכוז חושב ע"פ מקדמי פליטה ולא ע"פ נתוני היצרן או מדידות. המנועים אינם כוללים אמצעי הפחתה כלשהם.

### 4.8.6 פערים בין המצב הקיים והמתוכנן לעומת ה-BAT (BAT Gap Analysis)

סעיף זה עוסק בסקירת הפערים בין המתקנים המתוכננים והקיימים לבין מסמכי ה-BREF הרלוונטיים לפעילות המערך.

להלן מסמכי ה-BREF הרלוונטיים לאתר ושלגביהן קיימת אפשרות של חוסר התאמה בפליטות לאוויר ביחס להגדרות ה-BAT:

1. Large Combustion Plants (LCP)

2. Emissions From Storage

3. Common Waste Water and Waste Gas Treatment/Management Systems in the Chemical Sector

4. את הפליטה ממנועי הגז יש לבחון כאמור על פי הגדרות התקינה הגרמנית: Ta-Luft 2002.

מסמכי ה-BREF (Best Available Reference) הם נגזרות של דירקטיבת האיחוד האירופאי (Integrated pollution prevention and control) 96/61/ EC. הדירקטיבה קובעת הליך רישוי המתאים למפעלי תעשייה גדולים בהתייחס לפליטות המפעל לסביבה. תנאי הרישיון למפעל "IPPC" יקבעו בהתאם לעקרונות המפורטים בדירקטיבה ובכללם: יישום הטכנולוגיה הזמינה הטובה ביותר למניעת פליטות לסביבה (BAT) תוך התחשבות במאפיינים הטכניים של המתקן, במחירים, בתועלת, במיקום המתקן ובתנאים הסביבתיים. תנאי הרישיון אמורים לקבוע מגבלות פליטה וערכי פליטה מירביים.

מסמכי ה-BREF מכילים מידע רב וכוללים:

1. תיאור תהליכי ייצור- תיאור מתקני ייצור, תיאור טכני של תהליכי ייצור, תיאור מקורות הפליטה, מזהמים אופייניים וכדומה.
2. פירוט הטכנולוגיות הזמינות הטובות ביותר (BAT).

לפי הדירקטיבה, הליך קביעת דרישות מבוססות BAT ברישיון מאפשר שיקול דעת ובחירה בין חלופות BAT על בסיס שיקולים טכנולוגיים, סביבתיים וכלכליים. ניתן לקבוע דרישות המחייבות טכנולוגיה מסוימת, מתוך מספר טכנולוגיות מוצעות, שכולן BAT.

להלן הפערים המרכזיים ביחס למסמכי ה- **BREF**:

#### א. **LCP-bref**:

1. סעיף 7.5.2 יעילות אנרגטית. הסעיף קובע כי טורבינות גז חדשות המיועדות לייצר חשמל צריכות להשתמש בחום השיווי לייצור אנרגיה (קיטור) או במחזור משולב לייצר חשמל. הטורבינות בתחנת הקבלה מיועדות ליצר כח דחיסה ולא חשמל, ואין הגדרה ברורה למצב זה ב BREF. חברת נובל אנרג'י אינה יצרנית חשמל ואינה מחזיקה ברישיון ייצור חשמל. יתרה מזאת, תמ"א 2/א/37 (2) שמכוחה הוקם המתקן, אינה כוללת שימושים לייצור חשמל. היעילות האנרגטית של הטורבינות היא 36% ביצור כח דחיסה.

2. סעיף 7.5.4 פליטת תחמוצות חנקן בטורבינות גז חדשות ליצור חשמל: על פי הגדרת ה BREF הפליטה היא 20-50 מ"ג למ"ק. הטורבינה אמורה לפלוט 51 מ"ג למ"ק ע"פ הגדרת היצרן. המשרד להגנת הסביבה דורש עמידה בערך הנמוך (20 מ"ג למ"ק).

#### ב. **Emissions From Storage**

BREF זה רלוונטי למיכלי אחסון הקונדנסט. להלן הפערים העיקריים ביחס להגדרת ה BAT במסמכי ה- BREF:

סעיף 5.1.1.2: במיכלים המכילים חומר בעל לחץ אדים גבוה מ-1.3Kpa ובנפח העולה על 300 מ"ק יש להתקין גג פנימי צף או מערכת יעודית לאיסוף אדים מנשמי המיכל ומניעת פליטתם לסביבה. מיכלי הקונדנסט בתחנת הקבלה אינם עומדים בדרישה זו. על פי מסמכי ה BREF התקנת גג פנימי צף יכול לצמצם כ 97% מפליטת אדי הקונדנסט.

#### ג. **Common Waste Water and Waste Gas Treatment/Management Systems in the Chemical Sector**

סעיף 4.3.2: בשחרור של VOC דרך ונט יש לשאוף לאיסוף החומר ומניעת פליטתו. במידה והדבר בלתי אפשרי יש לבצע שריפה. בתחנת הקבלה קיים ונט שדרכו משוחרר גז טבעי לסביבה ללא טיפול מקדים. יש לבחון אפשרות לטיפול בגז זה.

#### ד. **הפליטה ממנועי הגז בהשוואה להגדרות התקינה הגרמנית Ta-Luft 2002**

מנועי גז מהסוג המותקן בתחנת הקבלה נדרשים לעמוד בערכי פליטה שנקבעו על פי ה TA-LUFT 2002.

טבלה 12: ערכי הפליטה המתאימים למנועי גז מתוך סעיף 5.4.1.4 ב TA-Luft והשוואה לערכי הפליטה הצפויים מהמנועים

המזהם	NOx	PM	CO	Formaldehyde
ריכוז מרבי (mg/m3) 5% חמצן	250	300	300	60
ריכוז מחושב*	2063	26.2	607	

\* החישוב בוצע ע"פ מקדמי הפליטה של ה AP-42 EPA, ונתוני הפליטה שהועברו מחברת "נובל אנרג'י"

על מנת לעמוד בדרישות התקן הגרמני במנועים מסוג זה (סטוכיומטריים), מקובל להתקין מתקן של ממיר קטליטי (3-way- catalyst – TWC). ממיר מסוג זה מסוגל לצמצם פליטות CO ו- תחמוצות חנקן ביעילות של כ 90%.

#### 4.8.7 ניתוח תחזית פיזור מזהמים

##### א. רכיבי הניתוח

הניתוח בוצע על פי הנחיות המשרד להגנת הסביבה להיתרי פליטה. שלושת השלבים העיקריים בסקר הם:

1. בחירת המזהמים הנדרשים להרצת מודל הפיזור.
2. הרצת מודל פיזור מזהמים
3. ניתוח תוצאות מודל הפיזור

##### ב. בחירת המזהמים שיבדקו בניתוח

על פי הנחיות הממונה לטיפול בבקשה להיתר פליטה, מהדורה 3 ספטמבר 2013, פרק 7, יש להריץ מודל פיזור זיהום אוויר עבור מזהמי אוויר הנפלטים ממקור הפליטה להם נקבעו ערכי סביבה ואם מזהמי אוויר להם לא נקבעו ערכי סביבה אך קצב פליטתם עולה על ערך הסף התחתון כמפורט בטופס 7.1.2 בהנחיות הממונה לטיפול בבקשה להיתר פליטה, מהדורה 3 ספטמבר 2013.

טבלה 13: המזהמים שנבדקו במסגרת הבקשה להיתר פליטה, בנוסף בוצעה הרצה עבור חלקיקים

זהות החומר	ערך תחתון ארוך טווח	ערך תחתון קצר טווח	קצב הפליטה	קצב פליטה	נדרש בהרצה	שם החומר	
						cas no	
	[גרם/שניה]	[גרם/שניה]	[גרם/שניה]	[טון/שנה]	[לאוכן]		
Nitrogendioxide (for NO <sub>x</sub> and NO <sub>2</sub> )	1.41E-01	2.82E-01	6.67E+00	2.10E+02	כן	10102-44-0	
Sulfurdioxide (SO <sub>2</sub> )	2.20E-01	3.52E-01	4.22E+01	1.33E+01	כן	07446-09-5	
כלל חלקיקים מרחפים (TSP)					כן		
חלקיקים מרחפים עדינים (PM-10)					כן		

טבלה 14: המאפיינים הפיסיים של המקורות המוקדמים הצפויים מטורבינות הגז במערך הדחיסה המתוכנן וכן של מנוע הגז בתוך שטח תחנת קבלת הגז הטבעי

זיהוי	מקור	נקודת ציון (X)	נקודת ציון (Y)	גובה (מטר)	קוטר (מטר)	טמפרטורה (מעלות)	מהירות (מטר/שניה)
1	NOBLE_1	169888.21	639830.12	14	2.38	540.00	28.10
2	NOBLE_2	169912.2	639830.23	14	2.38	540.00	28.10
3	NOBLE_3	169936.18	639830.12	41	2.38	540.00	28.10
4	FGC	169880.00	639894.00	3.5	0.15	505.00	23.95

טבלה 15 : הפליטה (ק"ג/שעה) הצפויה מטורבינות הגז במתחם, למזהמים בעלי ערכי סביבה ויעד

זיהוי	מקור	תחמוצות חנקן (ק"ג/שעה)	חלקיקים (ק"ג/שעה)	גופרית דו חמצנית (ק"ג/שעה)
1	NOBLE_1 מערך דחיסה	12.00	1.58	0.704
2	NOBLE_2 מערך דחיסה	12.00	1.58	0.704
3	NOBLE_3 מערך דחיסה	12.00	1.58	0.704
4	FGC	1.17	0.014	0.05

נתוני הפליטות למקורות הרקע התקבלו ממאגר הנתונים של המשרד להגנת הסביבה בתאריך ה- 27 ליוני 2013. בהרצת המודל הוגדרו מפעלי תעשייה ובטון שנמצאו בשטח התוכנית כמקורות רקע לפליטות חלקיקים בשטח של 2,000 מטר רבועים. זמני הפעילות של מקורות אלו הוגדרו במודל כחמישה ימים וחצי בשבוע (ראשון עד שישי בשעות הצהריים) וכ- 12 שעות פעילות ביום (בין השעות 07:00 ל 19:00).

בתחנת קבלת הגז הטבעי אין מקורות שטח למזהמים שהוגדרו בסקר הסביבתי.

נתוני הרום חושבו באמצעות תוכנת Upper Air Estimator בממשק תוכנת AERMET .

זמני המיצוע של המזהמים נקבעו על פי הזמנים המוגדרים בתקנות אוויר נקי (ערכי איכות אוויר) (הוראת שעה), התשע"א – 2011, והם מופיעים בטבלה 112. עבור ערכי סביבה, יעד וייחוס הקצרים משעה הוערכו הריכוזים בהתאם למשוואת Turner המאפשרת מעבר בין זמני מיצוע קצרים משעה.

טבלה 16 ערכי הסביבה, היעד, הייחוס וההרתעה הקבועים בתקנות חוק אוויר נקי (ערכי איכות אוויר),  
(הוראת שעה, התשע"א – 2011)

מזהם	ערך סביבה (מיקרוגרם/מ"ק)	פרק זמן	ערך (מיקרוגרם/מ"ק)	פרק זמן
1 כלל חלקיקים מרחפים (TSP) (*1)	300	שלוש שעות	300	שלוש שעות
	200	יממה	200	יממה
	75	שנה	75	שנה
2 PM-10	150	יממתי	50	יממתי
	60	שנתי	20	שנתי
3 תחמוצות חנקן	940	חצי שעות	30	שנה
	560	יממה		
4 חנקן דו-חמצני (*2)	200	שעה	200	שעה
			40	שנה
5 גופרית דו-חמצנית (*3)	350	שעה	500	עשר דקות
	125	יממה	20	יממה
	60	שנה	20	שנה

\*1 ערך התרעה לחלקיקים נשימים עדינים (PM-10) הינו 300 מק"ג/מ"ק במשך יממה.

\*2 ערך התרעה לחנקן דו-חמצני הינו 400 מק"ג/מ"ק במשך שעות – במשך שלוש שעות רצופות.

\*3 ערך התרעה לגופרית דו חמצנית הינו 500 מק"ג/מ"ק במשך שלוש שעות רצופות.

להלן טבלאות המציגות את התוצאות המרביות של המזהמים שנבחנו במסגרת הסקר

א. כלל חלקיקים מרחפים

טבלה 17: ריכוזים מרביים מחושבים של כלל חלקיקים מרחפים (שלוש שעות, יממתי ושנתי), מיקרוגרם/מ"ק, מקורות הרקע במצב הקיים

ריכוז מרבי מחושב	X	Y	ריכוז קצר טווח מרבי	ריכוז קצר טווח השני הכי גבוה (2 <sup>nd</sup> )	ריכוז קצר טווח אחרון 99.9	אחוז מערך סביבה	אחוז מערך יעד	אחוז מערך ייחוס	ריכוז יממתי מרבי	ריכוז השני הכי גבוה (2 <sup>nd</sup> )	אחוז מערך סביבה יממתי		ריכוז שנתי מרבי	אחוז מערך ייחוס	אחוז מערך יעד שנתי	אחוז מערך ייחוס
											מק"ג/מ"ק	מק"ג/מ"ק				
[ITM]																
168912.2	636330.23	1337.32	1461.04	---	---	445.77%	445.77%	---	---	---	---	---	---	---	---	---
171912.2	632330.23	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
168412.2	636330.23	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
167610.00	635689.00	79.84	82.33	---	---	26.61%	26.61%	---	13.24	13.50	---	6.62%	6.62%	---	---	---
178946.00	635830.00	3.92	8.19	---	---	1.31%	1.31%	---	0.65	1.06	---	0.33%	0.33%	---	---	---
167462.00	633571.00	24.02	27.53	---	---	8.01%	8.01%	---	4.13	5.31	---	2.07%	2.07%	---	---	---
178566.00	635506.00	6.30	8.01	---	---	2.10%	2.10%	---	0.94	1.04	---	0.47%	0.47%	---	---	---
179052.00	636124.00	4.09	4.52	---	---	1.36%	1.36%	---	0.60	0.65	---	0.30%	0.30%	---	---	---
164349.00	630892.00	7.03	7.94	---	---	2.34%	2.34%	---	1.47	1.65	---	0.73%	0.73%	---	---	---
174738.00	642870.00	6.54	8.27	---	---	2.18%	2.18%	---	0.84	1.06	---	0.42%	0.42%	---	---	---
166635.00	633816.00	27.52	32.88	---	---	9.17%	9.17%	---	4.36	4.47	---	2.18%	2.18%	---	---	---
166808.00	634226.00	30.49	30.98	---	---	10.16%	10.16%	---	4.31	4.56	---	2.15%	2.15%	---	---	---
174550.00	633819.00	8.31	10.41	---	---	2.77%	2.77%	---	1.07	1.42	---	0.53%	0.53%	---	---	---
177478.00	640467.00	10.57	11.00	---	---	3.52%	3.52%	---	1.44	1.49	---	0.72%	0.72%	---	---	---
174775.00	636109.00	4.85	14.08	---	---	1.62%	1.62%	---	0.85	1.82	---	0.43%	0.43%	---	---	---
174270.00	640587.00	12.06	24.05	---	---	4.02%	4.02%	---	1.58	3.07	---	0.79%	0.79%	---	---	---
171041.00	636506.00	29.00	30.91	---	---	9.67%	9.67%	---	3.94	4.26	---	1.97%	1.97%	---	---	---
176616.00	639336.00	10.74	14.01	---	---	3.58%	3.58%	---	1.46	2.00	---	0.73%	0.73%	---	---	---
177986.00	643614.00	6.76	6.89	---	---	2.25%	2.25%	---	0.91	1.09	---	0.45%	0.45%	---	---	---
178822.00	636444.00	5.83	12.86	---	---	1.94%	1.94%	---	0.89	1.66	---	0.44%	0.44%	---	---	---
171833.00	634754.00	17.35	19.66	---	---	5.78%	5.78%	---	2.33	2.53	---	1.17%	1.17%	---	---	---
173176.00	633819.00	14.12	17.60	---	---	4.71%	4.71%	---	2.04	2.32	---	1.02%	1.02%	---	---	---
174425.00	642630.00	5.41	7.11	---	---	1.80%	1.80%	---	0.70	0.92	---	0.35%	0.35%	---	---	---
175050.00	643088.00	5.26	11.47	---	---	1.75%	1.75%	---	0.87	1.46	---	0.44%	0.44%	---	---	---
178592.00	635661.00	6.47	8.84	---	---	2.16%	2.16%	---	0.96	1.15	---	0.48%	0.48%	---	---	---
173910.00	631211.00	6.64	10.26	---	---	2.21%	2.21%	---	1.06	1.47	---	0.53%	0.53%	---	---	---
175069.00	643106.00	5.22	11.46	---	---	1.74%	1.74%	---	0.87	1.46	---	0.44%	0.44%	---	---	---
176734.00	634551.00	6.83	7.13	---	---	2.28%	2.28%	---	0.93	1.02	---	0.46%	0.46%	---	---	---
173613.00	637671.00	14.42	20.55	---	---	4.81%	4.81%	---	2.16	2.69	---	1.08%	1.08%	---	---	---
176336.00	643868.00	7.16	8.46	---	---	2.39%	2.39%	---	0.94	1.08	---	0.47%	0.47%	---	---	---
176758.00	637676.00	10.63	12.13	---	---	3.54%	3.54%	---	1.35	1.61	---	0.68%	0.68%	---	---	---
173767.00	636499.00	18.59	21.92	---	---	6.20%	6.20%	---	2.48	2.81	---	1.24%	1.24%	---	---	---
176914.00	636305.00	5.04	11.99	---	---	1.68%	1.68%	---	0.84	1.55	---	0.42%	0.42%	---	---	---
175313.00	636499.00	8.11	15.55	---	---	2.70%	2.70%	---	1.21	2.01	---	0.61%	0.61%	---	---	---
175530.00	634824.00	9.98	12.87	---	---	3.33%	3.33%	---	1.32	1.79	---	0.66%	0.66%	---	---	---
170130.00	637100.00	49.52	54.91	---	---	16.51%	16.51%	---	6.64	7.41	---	3.32%	3.32%	---	---	---
176377.00	636882.00	9.02	9.67	---	---	3.01%	3.01%	---	1.25	1.30	---	0.62%	0.62%	---	---	---
172115.00	649129.00	135.68	136.50	---	---	45.23%	45.23%	---	17.62	18.01	---	8.81%	8.81%	---	---	---
173806.00	635880.00	12.62	16.01	---	---	4.21%	4.21%	---	2.10	2.21	---	1.05%	1.05%	---	---	---
175794.00	637928.00	10.85	11.89	---	---	3.62%	3.62%	---	1.46	1.59	---	0.73%	0.73%	---	---	---
170094.00	631333.00	13.94	18.46	---	---	4.65%	4.65%	---	2.80	4.10	---	1.40%	1.40%	---	---	---

טבלה 18: ריכוזים מרביים מחושבים של כלל חלקיקים מרחפים (שלוש שעות, יממתי ושנתי), מיקרוגרם/מ"ק, מקורות רקע וטורבינות הגז במצב העתידי

ריכוז מרבי מחושב	X	Y	ריכוז קצר טווח מרבי	ריכוז קצר טווח השני הכי גבוה (2 <sup>nd</sup> )	ריכוז קצר טווח אחרון 99.9	אחוז מערך סביבה	אחוז מערך יעד	אחוז מערך ייחוס	ריכוז יממתי מרבי	ריכוז השני הכי גבוה (2 <sup>nd</sup> )	אחוז מערך סביבה יממתי		ריכוז שנתי מרבי	אחוז מערך ייחוס	אחוז מערך יעד שנתי	אחוז מערך ייחוס
											מק"ג/מ"ק	מק"ג/מ"ק				
[ITM]																
168912.2	636330.23	1337.33	1461.04	---	---	445.78%	445.78%	---	---	---	---	---	---	---	---	---
171912.2	632330.23	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
168412.2	636330.23	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
167610.00	635689.00	79.84	82.33	---	---	26.61%	26.61%	---	13.25	13.51	---	6.63%	6.63%	---	---	---
178946.00	635830.00	3.95	8.19	---	---	1.32%	1.32%	---	0.67	1.06	---	0.33%	0.33%	---	---	---
167462.00	633571.00	24.02	27.57	---	---	8.01%	8.01%	---	4.14	5.31	---	2.07%	2.07%	---	---	---
178566.00	635506.00	6.32	8.01	---	---	2.11%	2.11%	---	0.95	1.04	---	0.47%	0.47%	---	---	---
179052.00	636124.00	4.09	4.52	---	---	1.36%	1.36%	---	0.61	0.65	---	0.30%	0.30%	---	---	---
164349.00	630892.00	7.04	7.95	---	---	2.35%	2.35%	---	1.48	1.65	---	0.74%	0.74%	---	---	---
174738.00	642870.00	6.54	8.27	---	---	2.18%	2.18%	---	0.84	1.06	---	0.42%	0.42%	---	---	---
166635.00	633816.00	27.61	32.88	---	---	9.20%	9.20%	---	4.36	4.50	---	2.18%	2.18%	---	---	---
166808.00	634226.00	30.49	30.99	---	---	10.16%	10.16%	---	4.31	4.57	---	2.16%	2.16%	---	---	---
174550.00	633819.00	8.31	10.41	---	---	2.77%	2.77%	---	1.07	1.43	---	0.53%	0.53%	---	---	---
177478.00	640467.00	10.64	11.00	---	---	3.55%	3.55%	---	1.46	1.49	---	0.73%	0.73%	---	---	---
174775.00	636109.00	4.85	14.08	---	---	1.62%	1.62%	---	0.85	1.82	---	0.43%	0.43%	---	---	---
174270.00	640587.00	12.06	24.05	---	---	4.02%	4.02%	---	1.58	3.08	---	0.79%	0.79%	---	---	---
171041.00	636506.00	29.00	30.91	---	---	9.67%	9.67%	---	3.94	4.26	---	1.97%	1.97%	---	---	---
176616.00	639336.00	10.74	14.01	---	---	3.58%	3.58%	---	1.47	2.00	---	0.74%	0.74%	---	---	---
177986.00	643614.00	6.76	6.90	---	---	2.25%	2.25%	---	0.91	1.10	---	0.45%	0.45%	---	---	---
178822.00	636444.00	5.83	12.87	---	---	1.94%	1.94%	---	0.89	1.66	---	0.45%	0.45%	---	---	---
171833.00	634754.00	17.35	19.66	---	---	5.78%	5.78%	---	2.33	2.53	---	1.17%	1.17%	---	---	---
173176.00	633819.00	14.12	17.60	---	---	4.71%	4.71%	---	2.04	2.32	---	1.02%	1.02%	---	---	---
174425.00	642630.00	5.41	7.11	---	---	1.80%	1.80%	---	0.70	0.92	---	0.35%	0.35%	---	---	---
175050.00	643088.00	5.26	11.47	---	---	1.75%	1.75%	---	0.87	1.46	---	0.44%	0.44%	---	---	---
178592.00	635661.00	6.52	8.84	---	---	2.17%	2.17%	---	0.97	1.15	---	0.48%	0.48%	---	---	---
173910.00	631211.00	6.64	10.26	---	---	2.21%	2.21%	---	1.06	1.47	---	0.53%	0.53%	---	---	---
175069.00	643106.00	5.22	11.46	---	---	1.74%	1.74%	---	0.88	1.46	---	0.44%	0.44%	---	---	---
176734.00	634551.00	6.84	7.13	---	---	2.28%	2.28%	---	0.93	1.02	---	0.46%	0.46%	---	---	---
173613.00	637671.00	14.42	20.55	---	---	4.81%	4.81%	---	2.16	2.69	---	1.08%	1.08%	---	---	---
176336.00	643868.00	7.17	8.46	---	---	2.39%	2.39%	---	0.95	1.08	---	0.47%	0.47%	---		

טבלה 19: ריכוזים מרביים מחושבים של כלל חלקיקים מרחפים (שלוש שעות, יממתי ושנתי), מיקרוגרם/מ"ק, טורבינות הגז במצב העתיד

אחוז מערך ייחוס	אחוז מערך יעד שנתי	אחוז מערך סביבה שנתי	ריכוז שנתי מרבי	אחוז מערך ייחוס	אחוז מערך יעד יממתי	אחוז מערך סביבה יממתי	ריכוז יממתי	ריכוז יממתי מרבי	אחוז מערך ייחוס	אחוז מערך יעד	אחוז מערך סביבה	ריכוז קצר טווח אחוזון 99.9	ריכוז קצר טווח השנה הכי גבוה (2 <sup>nd</sup> )	ריכוז קצר טווח מרבי	Y	X	
---	---	---	---	---	0.82%	0.82%	1.63	2.84	---	1.68%	1.68%	---	5.04	5.61	639780.23	170162.20	ריכוז מרבי מחושב
---	---	---	---	---	0.82%	0.82%	1.63	2.84	---	---	---	---	---	---	639780.23	170162.20	ריכוז מרבי מחושב
---	0.15%	0.15%	0.11	---	---	---	---	---	---	---	---	---	---	---	639780.23	170162.2	ריכוז מרבי מחושב
---	0.01%	0.01%	0.00	---	0.02%	0.02%	0.05	0.05	---	0.07%	0.07%	---	0.20	0.22	635689.00	167610.00	1
---	0.00%	0.00%	0.00	---	0.02%	0.02%	0.04	0.04	---	0.05%	0.05%	---	0.15	0.16	635830.00	178946.00	2
---	0.01%	0.01%	0.01	---	0.02%	0.02%	0.04	0.06	---	0.08%	0.08%	---	0.23	0.24	633571.00	167462.00	3
---	0.00%	0.00%	0.00	---	0.02%	0.02%	0.03	0.03	---	0.06%	0.06%	---	0.18	0.18	635506.00	178566.00	4
---	0.00%	0.00%	0.00	---	0.02%	0.02%	0.03	0.05	---	0.05%	0.05%	---	0.15	0.19	636124.00	179052.00	5
---	0.00%	0.00%	0.00	---	0.02%	0.02%	0.03	0.04	---	0.05%	0.05%	---	0.16	0.16	630892.00	164349.00	6
---	0.01%	0.01%	0.00	---	0.03%	0.03%	0.06	0.07	---	0.07%	0.07%	---	0.20	0.28	642870.00	174738.00	7
---	0.00%	0.00%	0.00	---	0.02%	0.02%	0.04	0.04	---	0.06%	0.06%	---	0.19	0.20	633816.00	166635.00	8
---	0.01%	0.01%	0.00	---	0.02%	0.02%	0.04	0.04	---	0.06%	0.06%	---	0.19	0.21	634226.00	166808.00	9
---	0.01%	0.01%	0.01	---	0.03%	0.03%	0.06	0.06	---	0.08%	0.08%	---	0.23	0.23	633819.00	174550.00	10
---	0.01%	0.01%	0.01	---	0.02%	0.02%	0.05	0.06	---	0.07%	0.07%	---	0.20	0.21	640467.00	177478.00	11
---	0.01%	0.01%	0.01	---	0.03%	0.03%	0.05	0.05	---	0.07%	0.07%	---	0.21	0.22	636109.00	174775.00	12
---	0.01%	0.01%	0.01	---	0.04%	0.04%	0.08	0.08	---	0.09%	0.09%	---	0.28	0.33	640587.00	174270.00	13
---	0.01%	0.01%	0.01	---	0.04%	0.04%	0.08	0.08	---	0.09%	0.09%	---	0.26	0.29	636506.00	171041.00	14
---	0.01%	0.01%	0.01	---	0.03%	0.03%	0.05	0.06	---	0.07%	0.07%	---	0.20	0.22	639336.00	176616.00	15
---	0.00%	0.00%	0.00	---	0.01%	0.01%	0.03	0.05	---	0.05%	0.05%	---	0.15	0.20	643614.00	177986.00	16
---	0.00%	0.00%	0.00	---	0.02%	0.02%	0.03	0.05	---	0.05%	0.05%	---	0.14	0.15	636444.00	178822.00	17
---	0.01%	0.01%	0.01	---	0.03%	0.03%	0.05	0.06	---	0.07%	0.07%	---	0.22	0.23	634754.00	171833.00	18
---	0.01%	0.01%	0.01	---	0.03%	0.03%	0.06	0.06	---	0.07%	0.07%	---	0.22	0.23	633819.00	173176.00	19
---	0.01%	0.01%	0.00	---	0.03%	0.03%	0.06	0.08	---	0.07%	0.07%	---	0.21	0.30	642630.00	174425.00	20
---	0.01%	0.01%	0.00	---	0.03%	0.03%	0.05	0.07	---	0.07%	0.07%	---	0.20	0.26	643088.00	175050.00	21
---	0.00%	0.00%	0.00	---	0.02%	0.02%	0.03	0.03	---	0.05%	0.05%	---	0.16	0.17	635661.00	178592.00	22
---	0.01%	0.01%	0.00	---	0.02%	0.02%	0.03	0.04	---	0.05%	0.05%	---	0.15	0.15	631211.00	173910.00	23
---	0.01%	0.01%	0.00	---	0.03%	0.03%	0.05	0.07	---	0.07%	0.07%	---	0.20	0.26	643106.00	175069.00	24
---	0.01%	0.01%	0.00	---	0.02%	0.02%	0.05	0.05	---	0.06%	0.06%	---	0.19	0.20	634551.00	176734.00	25
---	0.01%	0.01%	0.01	---	0.04%	0.04%	0.07	0.07	---	0.09%	0.09%	---	0.26	0.26	637671.00	173613.00	26
---	0.00%	0.00%	0.00	---	0.02%	0.02%	0.04	0.05	---	0.07%	0.07%	---	0.20	0.21	643868.00	176336.00	27
---	0.01%	0.01%	0.00	---	0.02%	0.02%	0.04	0.06	---	0.05%	0.05%	---	0.15	0.16	637676.00	176758.00	28
---	0.01%	0.01%	0.01	---	0.03%	0.03%	0.06	0.07	---	0.07%	0.07%	---	0.22	0.26	636499.00	173767.00	29
---	0.01%	0.01%	0.00	---	0.02%	0.02%	0.04	0.04	---	0.06%	0.06%	---	0.18	0.21	636305.00	176914.00	30
---	0.01%	0.01%	0.01	---	0.03%	0.03%	0.05	0.05	---	0.06%	0.06%	---	0.19	0.20	636499.00	175313.00	31
---	0.01%	0.01%	0.00	---	0.02%	0.02%	0.04	0.05	---	0.06%	0.06%	---	0.19	0.20	634824.00	175530.00	32
---	0.01%	0.01%	0.01	---	0.03%	0.03%	0.07	0.08	---	0.09%	0.09%	---	0.27	0.29	637100.00	170130.00	33
---	0.01%	0.01%	0.00	---	0.02%	0.02%	0.05	0.05	---	0.06%	0.06%	---	0.19	0.20	636882.00	176377.00	34
---	0.00%	0.00%	0.00	---	0.01%	0.01%	0.02	0.02	---	0.04%	0.04%	---	0.12	0.20	649129.00	172115.00	35
---	0.01%	0.01%	0.01	---	0.03%	0.03%	0.05	0.06	---	0.08%	0.08%	---	0.23	0.25	635880.00	173806.00	36
---	0.01%	0.01%	0.01	---	0.03%	0.03%	0.05	0.07	---	0.06%	0.06%	---	0.17	0.18	637928.00	175794.00	37
---	0.00%	0.00%	0.00	---	0.01%	0.01%	0.02	0.02	---	0.04%	0.04%	---	0.12	0.13	631333.00	170094.00	38

ב. חלקיקים נשימים עדינים (PM-10)

טבלה 20: ריכוזים מרביים מחושבים של חלקיקים נשימים עדינים (יממתי ושנתי), מיקרוגרם/מ"ק, מקורות רקע במצב הקיים

ריכוז מרבי מחושב	X	Y	ריכוז קצר	ריכוז קצר טווח מרבי	ריכוז קצר טווח השני הכי גבוה (2 <sup>nd</sup> )	ריכוז קצר טווח אחוזון 99.9	אחוז מערך סביבה	אחוז מערך יעד	אחוז מערך ייחוס	ריכוז יממתי מרבי	ריכוז יממתי מרבי השני הכי גבוה (2 <sup>nd</sup> )	אחוז מערך סביבה יממתי	אחוז מערך יעד יממתי	אחוז מערך ייחוס	ריכוז שנתי מרבי	אחוז מערך סביבה שנתי	אחוז מערך יעד שנתי	אחוז מערך ייחוס	
																			[מק"ג/מ"ק]
ריכוז מרבי מחושב	171912.20	632330.23	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
ריכוז מרבי מחושב	168412.20	636330.23	---	---	---	---	---	---	---	---	---	---	---	---	---	---	65.65%	---	---
1	167610.00	635689.00	---	---	---	---	---	---	---	---	---	---	---	---	---	4.35%	---	---	
2	178946.00	635830.00	---	---	---	---	---	---	---	---	---	---	---	---	---	0.38%	---	---	
3	167462.00	633571.00	---	---	---	---	---	---	---	---	---	---	---	---	---	2.01%	---	---	
4	178566.00	635506.00	---	---	---	---	---	---	---	---	---	---	---	---	---	0.39%	---	---	
5	179052.00	636124.00	---	---	---	---	---	---	---	---	---	---	---	---	---	0.37%	---	---	
6	164349.00	630892.00	---	---	---	---	---	---	---	---	---	---	---	---	---	0.80%	---	---	
7	174738.00	642870.00	---	---	---	---	---	---	---	---	---	---	---	---	---	0.59%	---	---	
8	166635.00	633816.00	---	---	---	---	---	---	---	---	---	---	---	---	---	2.18%	---	---	
9	166808.00	634226.00	---	---	---	---	---	---	---	---	---	---	---	---	---	2.19%	---	---	
10	174550.00	633819.00	---	---	---	---	---	---	---	---	---	---	---	---	---	0.64%	---	---	
11	177478.00	640467.00	---	---	---	---	---	---	---	---	---	---	---	---	---	0.52%	---	---	
12	174775.00	636109.00	---	---	---	---	---	---	---	---	---	---	---	---	---	0.68%	---	---	
13	174270.00	640587.00	---	---	---	---	---	---	---	---	---	---	---	---	---	0.64%	---	---	
14	171041.00	636506.00	---	---	---	---	---	---	---	---	---	---	---	---	---	1.96%	---	---	
15	176616.00	639336.00	---	---	---	---	---	---	---	---	---	---	---	---	---	0.58%	---	---	
16	177986.00	643614.00	---	---	---	---	---	---	---	---	---	---	---	---	---	0.41%	---	---	
17	178822.00	636444.00	---	---	---	---	---	---	---	---	---	---	---	---	---	0.41%	---	---	
18	171833.00	634754.00	---	---	---	---	---	---	---	---	---	---	---	---	---	1.15%	---	---	
19	173176.00	633819.00	---	---	---	---	---	---	---	---	---	---	---	---	---	0.79%	---	---	
20	174425.00	642630.00	---	---	---	---	---	---	---	---	---	---	---	---	---	0.56%	---	---	
21	175050.00	643088.00	---	---	---	---	---	---	---	---	---	---	---	---	---	0.63%	---	---	
22	178592.00	635661.00	---	---	---	---	---	---	---	---	---	---	---	---	---	0.39%	---	---	
23	173910.00	631211.00	---	---	---	---	---	---	---	---	---	---	---	---	---	0.80%	---	---	
24	175069.00	643106.00	---	---	---	---	---	---	---	---	---	---	---	---	---	0.63%	---	---	
25	176734.00	634551.00	---	---	---	---	---	---	---	---	---	---	---	---	---	0.47%	---	---	
26	173613.00	637671.00	---	---	---	---	---	---	---	---	---	---	---	---	---	0.97%	---	---	
27	176336.00	643868.00	---	---	---	---	---	---	---	---	---	---	---	---	---	0.81%	---	---	
28	176758.00	637676.00	---	---	---	---	---	---	---	---	---	---	---	---	---	0.56%	---	---	
29	173767.00	636499.00	---	---	---	---	---	---	---	---	---	---	---	---	---	0.87%	---	---	
30	176914.00	636305.00	---	---	---	---	---	---	---	---	---	---	---	---	---	0.50%	---	---	
31	175313.00	636499.00	---	---	---	---	---	---	---	---	---	---	---	---	---	0.65%	---	---	
32	175530.00	634824.00	---	---	---	---	---	---	---	---	---	---	---	---	---	0.60%	---	---	
33	170130.00	637100.00	---	---	---	---	---	---	---	---	---	---	---	---	---	3.00%	---	---	
34	176377.00	636882.00	---	---	---	---	---	---	---	---	---	---	---	---	---	0.58%	---	---	
35	172115.00	649129.00	---	---	---	---	---	---	---	---	---	---	---	---	---	1.73%	---	---	
36	173806.00	635880.00	---	---	---	---	---	---	---	---	---	---	---	---	---	0.78%	---	---	
37	175794.00	637928.00	---	---	---	---	---	---	---	---	---	---	---	---	---	0.66%	---	---	
38	170094.00	631333.00	---	---	---	---	---	---	---	---	---	---	---	---	---	0.89%	---	---	

טבלה 21: ריכוזים מרביים מחושבים של חלקיקים נשימים עדינים (יממתי ושנתי), מיקרוגרם/מ"ק, מקורות רקע וטורינות הגז במצב העתיד

ריכוז מרבי מחושב	X	Y	ריכוז קצר	ריכוז קצר טווח מרבי	ריכוז קצר טווח השני הכי גבוה (2 <sup>nd</sup> )	ריכוז קצר טווח אחוזון 99.9	אחוז מערך סביבה	אחוז מערך יעד	אחוז מערך ייחוס	ריכוז יממתי מרבי	ריכוז יממתי מרבי השני הכי גבוה (2 <sup>nd</sup> )	אחוז מערך סביבה יממתי	אחוז מערך יעד יממתי	אחוז מערך ייחוס	ריכוז שנתי מרבי	אחוז מערך סביבה שנתי	אחוז מערך יעד שנתי	אחוז מערך ייחוס	
																			[מק"ג/מ"ק]
ריכוז מרבי מחושב	171912.20	632330.23	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
ריכוז מרבי מחושב	168412.20	636330.23	---	---	---	---	---	---	---	---	---	---	---	---	---	---	65.70%	---	---
1	167610.00	635689.00	---	---	---	---	---	---	---	---	---	---	---	---	---	4.37%	---	---	
2	178946.00	635830.00	---	---	---	---	---	---	---	---	---	---	---	---	---	0.39%	---	---	
3	167462.00	633571.00	---	---	---	---	---	---	---	---	---	---	---	---	---	2.03%	---	---	
4	178566.00	635506.00	---	---	---	---	---	---	---	---	---	---	---	---	---	0.41%	---	---	
5	179052.00	636124.00	---	---	---	---	---	---	---	---	---	---	---	---	---	0.39%	---	---	
6	164349.00	630892.00	---	---	---	---	---	---	---	---	---	---	---	---	---	0.81%	---	---	
7	174738.00	642870.00	---	---	---	---	---	---	---	---	---	---	---	---	---	0.61%	---	---	
8	166635.00	633816.00	---	---	---	---	---	---	---	---	---	---	---	---	---	2.20%	---	---	
9	166808.00	634226.00	---	---	---	---	---	---	---	---	---	---	---	---	---	2.21%	---	---	
10	174550.00	633819.00	---	---	---	---	---	---	---	---	---	---	---	---	---	0.67%	---	---	
11	177478.00	640467.00	---	---	---	---	---	---	---	---	---	---	---	---	---	0.55%	---	---	
12	174775.00	636109.00	---	---	---	---	---	---	---	---	---	---	---	---	---	0.70%	---	---	
13	174270.00	640587.00	---	---	---	---	---	---	---	---	---	---	---	---	---	0.68%	---	---	
14	171041.00	636506.00	---	---	---	---	---	---	---	---	---	---	---	---	---	2.00%	---	---	
15	176616.00	639336.00	---	---	---	---	---	---	---	---	---	---	---	---	---	0.61%	---	---	
16	177986.00	643614.00	---	---	---	---	---	---	---	---	---	---	---	---	---	0.43%	---	---	
17	178822.00	636444.00	---	---	---	---	---	---	---	---	---	---	---	---	---	0.43%	---	---	
18	171833.00	634754.00	---	---	---	---	---	---	---	---	---	---	---	---	---	1.18%	---	---	
19	173176.00	633819.00	---	---	---	---	---	---	---	---	---	---	---	---	---	0.82%	---	---	
20	174425.00	642630.00	---	---	---	---	---	---	---	---	---	---	---	---	---	0.59%	---	---	
21	175050.00	643088.00	---	---	---	---	---	---	---	---	---	---	---	---	---	0.65%	---	---	
22	178592.00	635661.00	---	---	---	---	---	---	---	---	---	---	---	---	---	0.41%	---	---	
23	173910.00	631211.00	---	---	---	---	---	---	---	---	---	---	---	---	---	0.82%	---	---	
24	175069.00	643106.00	---	---	---	---	---	---	---	---	---	---	---	---	---	0.65%	---	---	
25	176734.00	634551.00	---	---	---	---	---	---	---	---	---	---	---	---	---	0.50%	---	---	
26	173613.00	637671.00	---	---	---	---	---	---	---	---	---	---	---	---	---	1.01%	---	---	
27	176336.00	643868.00	---	---	---	---	---	---	---	---	---	---	---	---	---	0.83%	---	---	
28	176758.00	637676.00	---	---	---	---	---	---	---	---	---	---	---	---	---	0.59%	---	---	
29	173767.00	636499.00	---	---	---	---	---	---	---	---	---	---	---	---	---	0.90%	---	---	
30	176914.00	636305.00	---	---	---	---	---	---	---	---	---	---	---	---	---	0.52%	---	---	
31	175313.00	636499.00	---	---	---	---	---	---	---	---	---	---	---	---	---	0.67%	---	---	
32	175530.00	634824.00	---	---	---	---	---	---	---	---	---	---	---	---	---	0.63%	---	---	
33	170130.00	637100.00	---	---	---	---	---	---	---	---	---	---	---	---	---	3.04%	---	---	
34	176377.00	636882.00	---	---	---	---	---	---	---	---	---	---	---	---	---	0.60%	---	---	
35	172115.00	649129.00	---	---	---	---	---	---	---	---	---	---	---	---	---	1.75%	---	---	
36	173806.00	635880.00	---	---	---	---	---	---	---	---	---	---	---	---	---	0.82%	---	---	
37	175794.00	637928.00	---	---	---	---	---	---	---	---	---	---	---	---	---	0.69%	---	---	
38	170094.00	631333.00	---	---	---	---	---	---	---	---	---	---	---	---	---	0.91%	---	---	

טבלה 22: ריכוזים מרביים מחושבים של חלקיקים נשימים עדינים (יממתי ושנתי), מיקרוגרם/מ"ק, טורבינות הגז במצב העתידי

ריכוז מרבי מחושב	X	Y	ריכוז מרבי טווח מרבי	ריכוז קצר טווח השני הכי גבוה (2 <sup>nd</sup> )	ריכוז קצר טווח אחוזון 99.9	אחוז מערך סביבה	אחוז מערך יעד	אחוז מערך ייחוס	ריכוז יממתי מרבי	ריכוז יממתי השני הכי גבוה (2 <sup>nd</sup> )	אחוז מערך סביבה יממתי	אחוז מערך יעד יממתי	אחוז מערך ייחוס	ריכוז שנתי מרבי	אחוז מערך סביבה שנתי	אחוז מערך יעד שנתי	אחוז מערך ייחוס	[ITM]		
																		מק"ג/מ"ק	מק"ג/מ"ק	
ריכוז מרבי מחושב	170162.20	639780.23	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
ריכוז מרבי מחושב	170162.20	639780.23	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
1	167610.00	635689.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
2	178946.00	635830.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
3	167462.00	633571.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4	178566.00	635506.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
5	179052.00	636124.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
6	164349.00	630892.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
7	174738.00	642870.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8	166635.00	633816.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
9	166808.00	634226.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
10	174550.00	633819.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
11	177478.00	640467.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
12	174775.00	636109.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
13	174270.00	640587.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
14	171041.00	636506.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
15	176616.00	639336.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
16	177986.00	643614.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
17	178822.00	636444.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
18	171833.00	634754.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
19	173176.00	633819.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
20	174425.00	642630.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
21	175050.00	643088.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
22	178592.00	635661.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
23	173910.00	631211.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
24	175069.00	643106.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
25	176734.00	634551.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
26	173613.00	637671.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
27	176336.00	643868.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
28	176758.00	637676.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
29	173767.00	636499.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
30	176914.00	636305.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
31	175313.00	636499.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
32	175530.00	634824.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
33	170130.00	637100.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
34	176377.00	636882.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
35	172115.00	649129.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
36	173806.00	635880.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
37	175794.00	637928.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
38	170094.00	631333.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

ג. תחמוצות חנקן

טבלה 23: ריכוזים מרביים מחושבים של תחמוצות חנקן (חצי שנתי, יממתי ושנתי), מיקרוגרם/מ"ק, מקורות הרקע במצב הקיים

ריכוז מרבי מחושב	X	Y	ריכוז מרבי טווח מרבי	ריכוז קצר טווח השני הכי גבוה (2 <sup>nd</sup> )	ריכוז קצר טווח אחוזון 99.9	אחוז מערך סביבה	אחוז מערך יעד	אחוז מערך ייחוס	ריכוז יממתי מרבי	ריכוז יממתי השני הכי גבוה (2 <sup>nd</sup> )	אחוז מערך סביבה יממתי	אחוז מערך יעד יממתי	אחוז מערך ייחוס	ריכוז שנתי מרבי	אחוז מערך סביבה שנתי	אחוז מערך יעד שנתי	אחוז מערך ייחוס	[ITM]		
																		מק"ג/מ"ק	מק"ג/מ"ק	
ריכוז מרבי מחושב	169744.07	639883.53	---	---	---	23.03%	---	---	---	---	---	---	---	---	---	---	---	---	---	---
ריכוז מרבי מחושב	168412.2	636330.23	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
ריכוז מרבי מחושב	168412.2	636330.23	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
1	167610.00	635689.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
2	178946.00	635830.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
3	167462.00	633571.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4	178566.00	635506.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
5	179052.00	636124.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
6	164349.00	630892.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
7	174738.00	642870.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8	166635.00	633816.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
9	166808.00	634226.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
10	174550.00	633819.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
11	177478.00	640467.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
12	174775.00	636109.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
13	174270.00	640587.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
14	171041.00	636506.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
15	176616.00	639336.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
16	177986.00	643614.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
17	178822.00	636444.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
18	171833.00	634754.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
19	173176.00	633819.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
20	174425.00	642630.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
21	175050.00	643088.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
22	178592.00	635661.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
23	173910.00	631211.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
24	175069.00	643106.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
25	176734.00	634551.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
26	173613.00	637671.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
27	176336.00	643868.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
28	176758.00	637676.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
29	173767.00	636499.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
30	176914.00	636305.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
31	175313.00	636499.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
32	175530.00	634824.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
33	170130.00	637100.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
34	176377.00	636882.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
35	172115.00	649129.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
36	173806.00	635880.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
37	175794.00	637928.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
38	170094.00	631333.00	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

טבלה 24: ריכוזים מרביים מחושבים של תחמוצות חנקן (חצי שעות, יממתי ושנתי), מיקרוגרם/מ"ק, מקורות רקע וטורבינות הגז במצב העתידי

ריכוז מרבי מחושב	X	Y	ריכוז קצר טווח מרבי	ריכוז קצר טווח השני הכי גבוה (2 <sup>nd</sup> )	ריכוז קצר טווח אחוזון 99.9	אחוז מערך סביבה	אחוז מערך יעד	אחוז מערך ייחוס	ריכוז יממתי מרבי	ריכוז יממתי השני הכי גבוה (2 <sup>nd</sup> )	אחוז מערך סביבה יממתי	אחוז מערך יעד יממתי	אחוז מערך ייחוס	ריכוז שנתי מרבי	אחוז מערך סביבה שנתי	אחוז מערך יעד שנתי	אחוז מערך ייחוס	[ITM]		
																		מק"ג/מ"ק	מק"ג/מ"ק	
ריכוז מרבי מחושב	169744.07	639883.53	190.41	189.05	---	20.11%	---	---	---	---	67.62	81.15	---	---	---	---	---	---	---	---
ריכוז מרבי מחושב	168412.2	636330.23	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
ריכוז מרבי מחושב	168412.2	636330.23	168412.2	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
1	167610.00	635689.00	78.85	73.92	---	7.86%	---	---	---	---	13.39	15.31	---	---	---	---	---	---	---	---
2	178946.00	635830.00	59.84	56.07	---	5.97%	---	---	---	---	5.58	6.93	---	---	---	---	---	---	---	---
3	167462.00	633571.00	68.86	58.25	---	6.20%	---	---	---	---	10.95	11.50	---	---	---	---	---	---	---	---
4	178566.00	635506.00	58.82	49.75	---	5.29%	---	---	---	---	5.18	6.47	---	---	---	---	---	---	---	---
5	179052.00	636124.00	66.07	52.23	---	5.56%	---	---	---	---	5.96	7.23	---	---	---	---	---	---	---	---
6	164349.00	630892.00	68.97	63.67	---	6.77%	---	---	---	---	7.20	7.24	---	---	---	---	---	---	---	---
7	174738.00	642870.00	90.40	71.37	---	7.59%	---	---	---	---	6.81	7.57	---	---	---	---	---	---	---	---
8	166635.00	633816.00	60.91	59.21	---	6.30%	---	---	---	---	10.06	10.89	---	---	---	---	---	---	---	---
9	166808.00	634226.00	65.08	57.13	---	6.08%	---	---	---	---	11.24	11.45	---	---	---	---	---	---	---	---
10	174550.00	633819.00	57.55	54.38	---	5.78%	---	---	---	---	5.57	6.17	---	---	---	---	---	---	---	---
11	177478.00	640467.00	62.26	56.14	---	5.97%	---	---	---	---	6.41	6.51	---	---	---	---	---	---	---	---
12	174775.00	636109.00	60.87	56.11	---	5.97%	---	---	---	---	6.68	7.66	---	---	---	---	---	---	---	---
13	174270.00	640587.00	98.97	85.47	---	9.09%	---	---	---	---	8.17	8.69	---	---	---	---	---	---	---	---
14	171041.00	636506.00	63.77	60.80	---	6.47%	---	---	---	---	9.10	9.15	---	---	---	---	---	---	---	---
15	176616.00	639336.00	59.63	58.11	---	6.18%	---	---	---	---	8.01	9.03	---	---	---	---	---	---	---	---
16	177986.00	643614.00	81.50	59.83	---	6.37%	---	---	---	---	4.32	4.69	---	---	---	---	---	---	---	---
17	178822.00	636444.00	74.75	50.82	---	5.41%	---	---	---	---	6.39	7.57	---	---	---	---	---	---	---	---
18	171833.00	634754.00	53.24	52.39	---	5.57%	---	---	---	---	7.51	7.54	---	---	---	---	---	---	---	---
19	173176.00	633819.00	52.94	52.81	---	5.62%	---	---	---	---	5.61	6.12	---	---	---	---	---	---	---	---
20	174425.00	642630.00	95.42	74.44	---	7.92%	---	---	---	---	7.13	7.86	---	---	---	---	---	---	---	---
21	175050.00	643088.00	86.36	68.76	---	7.32%	---	---	---	---	6.50	7.31	---	---	---	---	---	---	---	---
22	178592.00	635661.00	59.10	54.71	---	5.82%	---	---	---	---	5.37	6.72	---	---	---	---	---	---	---	---
23	173910.00	631211.00	55.40	45.68	---	4.86%	---	---	---	---	5.03	5.70	---	---	---	---	---	---	---	---
24	175069.00	643106.00	85.97	68.59	---	7.30%	---	---	---	---	6.49	7.29	---	---	---	---	---	---	---	---
25	176734.00	634551.00	49.11	46.00	---	4.89%	---	---	---	---	4.92	5.51	---	---	---	---	---	---	---	---
26	173613.00	637671.00	70.54	62.29	---	6.63%	---	---	---	---	10.16	11.98	---	---	---	---	---	---	---	---
27	176336.00	643868.00	75.14	60.24	---	6.41%	---	---	---	---	5.37	6.41	---	---	---	---	---	---	---	---
28	176758.00	637676.00	88.81	58.96	---	6.27%	---	---	---	---	7.92	8.91	---	---	---	---	---	---	---	---
29	173767.00	636499.00	67.85	63.88	---	6.80%	---	---	---	---	7.79	9.13	---	---	---	---	---	---	---	---
30	176914.00	636305.00	63.61	62.77	---	6.68%	---	---	---	---	6.47	7.74	---	---	---	---	---	---	---	---
31	175313.00	636499.00	63.36	59.91	---	6.37%	---	---	---	---	7.74	7.94	---	---	---	---	---	---	---	---
32	175530.00	634824.00	48.48	48.21	---	5.13%	---	---	---	---	5.64	6.46	---	---	---	---	---	---	---	---
33	170130.00	637100.00	72.45	71.25	---	7.58%	---	---	---	---	14.28	15.67	---	---	---	---	---	---	---	---
34	176377.00	636882.00	74.58	59.28	---	6.31%	---	---	---	---	7.19	8.67	---	---	---	---	---	---	---	---
35	172115.00	649129.00	68.23	61.67	---	6.56%	---	---	---	---	3.70	3.95	---	---	---	---	---	---	---	---
36	173806.00	635880.00	59.68	56.27	---	5.99%	---	---	---	---	7.97	8.39	---	---	---	---	---	---	---	---
37	175794.00	637928.00	91.47	59.87	---	6.37%	---	---	---	---	9.36	9.43	---	---	---	---	---	---	---	---
38	170094.00	631333.00	42.84	42.17	---	4.49%	---	---	---	---	4.90	5.16	---	---	---	---	---	---	---	---

טבלה 25: ריכוזים מרביים מחושבים של תחמוצות חנקן (חצי שעות, יממתי ושנתי), מיקרוגרם/מ"ק, טורבינות הגז במצב העתידי

ריכוז מרבי מחושב	X	Y	ריכוז קצר טווח מרבי	ריכוז קצר טווח השני הכי גבוה (2 <sup>nd</sup> )	ריכוז קצר טווח אחוזון 99.9	אחוז מערך סביבה	אחוז מערך יעד	אחוז מערך ייחוס	ריכוז יממתי מרבי	ריכוז יממתי השני הכי גבוה (2 <sup>nd</sup> )	אחוז מערך סביבה יממתי	אחוז מערך יעד יממתי	אחוז מערך ייחוס	ריכוז שנתי מרבי	אחוז מערך סביבה שנתי	אחוז מערך יעד שנתי	אחוז מערך ייחוס	[ITM]			
																		מק"ג/מ"ק	מק"ג/מ"ק		
ריכוז מרבי מחושב	169744.07	639883.53	218.95	217.38	---	23.13%	---	---	---	---	42.88	50.29	---	---	---	---	---	---	---	---	
ריכוז מרבי מחושב	169744.07	639883.53	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
ריכוז מרבי מחושב	169844.97	639949.47	169844.97	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
1	167610.00	635689.00	6.84	6.82	---	0.73%	---	---	---	---	0.66	0.72	---	---	---	---	---	---	---	---	
2	178946.00	635830.00	4.30	4.25	---	0.45%	---	---	---	---	0.31	0.32	---	---	---	---	---	---	---	---	
3	167462.00	633571.00	5.32	5.30	---	0.56%	---	---	---	---	0.49	0.60	---	---	---	---	---	---	---	---	
4	178566.00	635506.00	4.65	4.63	---	0.49%	---	---	---	---	0.29	0.29	---	---	---	---	---	---	---	---	
5	179052.00	636124.00	4.71	4.71	---	0.50%	---	---	---	---	0.28	0.39	---	---	---	---	---	---	---	---	
6	164349.00	630892.00	2.81	2.80	---	0.30%	---	---	---	---	0.29	0.33	---	---	---	---	---	---	---	---	
7	174738.00	642870.00	8.92	8.89	---	0.95%	---	---	---	---	0.44	0.60	---	---	---	---	---	---	---	---	
8	166635.00	633816.00	5.45	5.43	---	0.58%	---	---	---	---	0.48	0.52	---	---	---	---	---	---	---	---	
9	166808.00	634226.00	5.70	5.68	---	0.60%	---	---	---	---	0.52	0.55	---	---	---	---	---	---	---	---	
10	174550.00	633819.00	4.52	4.51	---	0.48%	---	---	---	---	0.46	0.46	---	---	---	---	---	---	---	---	
11	174775.00	640467.00	6.31	6.10	---	0.65%	---	---	---	---	0.56	0.65	---	---	---	---	---	---	---	---	
12	174775.00	636109.00	5.46	5.45	---	0.58%	---	---	---	---	0.47	0.52	---	---	---	---	---	---	---	---	
13	174270.00	640587.00	10.41	10.39	---	1.11%	---	---	---	---	0.86	0.87	---	---	---	---	---	---	---	---	
14	171041.00	636506.00	9.65	9.30	---	0.99%	---	---	---	---	0.67	0.68	---	---	---	---	---	---	---	---	
15	176616.00	639336.00	5.46	5.45	---	0.58%	---	---	---	---	0.50	0.52	---	---	---	---	---	---	---	---	
16	177986.00	643614.00	5.66	5.34	---	0.57%	---	---	---	---	0.42	0.51	---	---	---	---	---	---	---	---	
17	178822.00	636444.00	3.80	3.70	---	0.39%	---	---	---	---	0.27	0.42	---	---	---	---	---	---	---	---	
18	171833.00	634754.00	5.96	5.40	---	0.57%	---	---	---	---	0.43	0.47	---	---	---	---	---	---	---	---	
19	173176.00	633819.00	4.33	4.32	---	0.46%	---	---	---	---	0.48	0.50	---	---	---	---	---	---	---	---	
20	174425.00	642630.00	9.78	9.67	---	1.03%	---	---	---	---	0.50	0.63	---	---	---	---	---	---	---	---	
21	175050.00	643088.00	8.35	8.34	---	0.89%	---	---	---	---	0.40	0.56	---	---	---	---	---	---	---	---	
22	178592.00	635661.00	4.02	4.02	---	0.43%	---	---	---	---	0.28	0.32	---	---	---	---	---	---	---	---	
23	173910.00	631211.00	3.94	3.86	---	0.41%	---	---	---	---	0.28	0.37	---	---	---	---	---	---	---	---	
24	175069.00	643106.00	8.45	8.44	---	0.90%	---	---	---	---	0.40	0.56	---	---	---	---	---	---	---	---	
25	176734.00	634551.00	5.02	4.71	---	0.50%	---	---	---	---	0.40	0.47	---	---	---	---	---	---	---	---	
26	173613.00	637671.00	8.15	8.09	---	0.86%	---	---	---	---	0.58	0.59	---	---	---	---	---	---	---	---	
27	176336.00	643868.00	7.34	7.33	---	0.78%	---	---	---	---	0.37	0.44	---	---	---	---	---	---	---	---	
28	176758.00	637676.00	4.47	4.40	---	0.47%	---	---	---	---	0.43	0.56	---	---	---	---	---	---	---	---	
29	173767.00	636499.00	6.36	6.19	---	0.66%	---	---	---	---	0.51	0.55	---	---	---	---	---	---	---	---	
30	176914.00	636305.00	4.70	4.68	---	0.50%	---	---	---	---	0.32	0.32	---	---	---	---	---	---	---	---	
31	175313.00	636499.00	4.90	4.88	---	0.52%	---	---	---	---	0.42										



טבלה 28: ריכוזים מרביים מחושבים של חנקן דו חמצני (שעתי ושנתי), מיקרוגרם/מ"ק, טורבינות הגז במצב העתידי

אחוז מערך ייחוס	אחוז מערך יעד שנתי	אחוז מערך סביבה שנתי	ריכוז שנתי מרבי	אחוז מערך ייחוס	אחוז מערך יעד יממתי	אחוז מערך סביבה יממתי	ריכוז	ריכוז	אחוז מערך ייחוס	אחוז מערך יעד	אחוז מערך סביבה	ריכוז קצר טווח אחוזון 99.9	ריכוז קצר טווח השני הכי גבוה (2 <sup>nd</sup> )	ריכוז קצר טווח מרבי	Y	X	
							השני הכי גבוה (2 <sup>nd</sup> )	יממתי מרבי									
---	---	---	---	---	---	---	---	---	---	39.88%	39.88%	79.76	143.57	157.60	639480.23	169862.20	ריכוז מרבי מחושב
---	9.25%	---	3.70	---	---	---	---	---	---	---	---	---	---	---	639949.47	169944.97	ריכוז מרבי מחושב
---	0.15%	---	0.06	---	---	---	---	---	---	2.42%	2.42%	4.84	5.93	5.94	635689.00	167610.00	1
---	0.08%	---	0.03	---	---	---	---	---	---	0.97%	0.97%	1.94	3.70	3.74	635830.00	178946.00	2
---	0.14%	---	0.06	---	---	---	---	---	---	1.18%	1.18%	2.37	4.61	4.63	633571.00	167462.00	3
---	0.08%	---	0.03	---	---	---	---	---	---	1.23%	1.23%	2.46	4.03	4.04	635506.00	178566.00	4
---	0.08%	---	0.03	---	---	---	---	---	---	0.91%	0.91%	1.82	4.09	4.09	636124.00	179052.00	5
---	0.08%	---	0.03	---	---	---	---	---	---	0.97%	0.97%	1.94	2.43	2.44	630892.00	164349.00	6
---	0.10%	---	0.04	---	---	---	---	---	---	1.24%	1.24%	2.47	7.73	7.76	642870.00	174738.00	7
---	0.11%	---	0.05	---	---	---	---	---	---	1.71%	1.71%	3.42	4.72	4.74	633816.00	166635.00	8
---	0.12%	---	0.05	---	---	---	---	---	---	1.77%	1.77%	3.55	4.94	4.96	634226.00	166808.00	9
---	0.14%	---	0.06	---	---	---	---	---	---	1.18%	1.18%	2.36	3.92	3.93	633819.00	174550.00	10
---	0.13%	---	0.05	---	---	---	---	---	---	1.55%	1.55%	3.09	5.31	5.49	640467.00	177478.00	11
---	0.12%	---	0.05	---	---	---	---	---	---	1.32%	1.32%	2.65	4.74	4.74	636109.00	174775.00	12
---	0.21%	---	0.08	---	---	---	---	---	---	2.44%	2.44%	4.88	9.04	9.05	640587.00	174270.00	13
---	0.18%	---	0.07	---	---	---	---	---	---	1.62%	1.62%	3.24	8.09	8.39	636506.00	171041.00	14
---	0.12%	---	0.05	---	---	---	---	---	---	1.08%	1.08%	2.17	4.74	4.75	639336.00	176616.00	15
---	0.08%	---	0.03	---	---	---	---	---	---	1.44%	1.44%	2.88	4.65	4.92	643614.00	177986.00	16
---	0.08%	---	0.03	---	---	---	---	---	---	0.92%	0.92%	1.85	3.22	3.31	636444.00	178822.00	17
---	0.12%	---	0.05	---	---	---	---	---	---	1.16%	1.16%	2.31	4.70	5.19	634754.00	171833.00	18
---	0.14%	---	0.05	---	---	---	---	---	---	1.11%	1.11%	2.21	3.76	3.76	633819.00	173176.00	19
---	0.11%	---	0.04	---	---	---	---	---	---	1.28%	1.28%	2.55	8.41	8.51	642630.00	174425.00	20
---	0.10%	---	0.04	---	---	---	---	---	---	1.16%	1.16%	2.33	7.25	7.26	643088.00	175050.00	21
---	0.08%	---	0.03	---	---	---	---	---	---	1.09%	1.09%	2.18	3.49	3.49	635661.00	178592.00	22
---	0.08%	---	0.03	---	---	---	---	---	---	0.96%	0.96%	1.91	3.36	3.43	631211.00	173910.00	23
---	0.10%	---	0.04	---	---	---	---	---	---	1.16%	1.16%	2.33	7.34	7.35	643106.00	175069.00	24
---	0.09%	---	0.04	---	---	---	---	---	---	1.30%	1.30%	2.60	4.10	4.37	634551.00	176734.00	25
---	0.18%	---	0.07	---	---	---	---	---	---	1.60%	1.60%	3.21	7.03	7.09	637671.00	173613.00	26
---	0.09%	---	0.04	---	---	---	---	---	---	1.10%	1.10%	2.19	6.37	6.38	643868.00	176336.00	27
---	0.11%	---	0.04	---	---	---	---	---	---	1.09%	1.09%	2.18	3.83	3.89	637676.00	176758.00	28
---	0.16%	---	0.06	---	---	---	---	---	---	1.25%	1.25%	2.50	5.38	5.53	636499.00	173767.00	29
---	0.10%	---	0.04	---	---	---	---	---	---	1.13%	1.13%	2.26	4.07	4.09	636305.00	176914.00	30
---	0.11%	---	0.05	---	---	---	---	---	---	1.29%	1.29%	2.57	4.24	4.26	636499.00	175313.00	31
---	0.11%	---	0.04	---	---	---	---	---	---	1.08%	1.08%	2.16	4.00	4.10	634824.00	175530.00	32
---	0.19%	---	0.07	---	---	---	---	---	---	2.74%	2.74%	5.48	9.53	9.77	637100.00	170130.00	33
---	0.10%	---	0.04	---	---	---	---	---	---	1.12%	1.12%	2.25	4.15	4.33	636882.00	176377.00	34
---	0.08%	---	0.03	---	---	---	---	---	---	1.19%	1.19%	2.38	4.95	4.95	649129.00	172115.00	35
---	0.17%	---	0.07	---	---	---	---	---	---	1.33%	1.33%	2.65	5.03	5.11	635880.00	173806.00	36
---	0.13%	---	0.05	---	---	---	---	---	---	1.12%	1.12%	2.25	4.48	4.97	637928.00	175794.00	37
---	0.07%	---	0.03	---	---	---	---	---	---	0.87%	0.87%	1.74	3.32	3.42	631333.00	170094.00	38

טבלה 29: ריכוזים מרביים מחושבים של גופרית דו חמצני (שעתי, יממתי ושנתי), מיקרוגרם/מ"ק, מקורות הרקע במצב הקיים

אחוז מערך ייחוס	אחוז מערך יעד שנתי	אחוז מערך סביבה שנתי	ריכוז מרבי	אחוז מערך ייחוס	אחוז מערך יעד יממתי	אחוז מערך סביבה יממתי	ריכוז יממתי מרבי	ריכוז יממתי השני הכי גבוה (2 <sup>nd</sup> )	אחוז מערך ייחוס	אחוז מערך יעד	אחוז מערך סביבה	ריכוז קצר טווח אחוזון 99.9	ריכוז קצר טווח השני הכי גבוה (2 <sup>nd</sup> )	ריכוז מרבי	Y	X	[ITM]	
																	[מק"ג/מ"ק]	
---	---	---	---	---	---	---	---	---	---	84.89%	85.02%	267.82	297.58	297.62	636330.23	168412.2	ריכוז מרבי מחושב	
---	---	---	---	---	617.45%	98.79%	123.49	149.39	---	---	---	---	---	---	---	636330.23	168412.2	ריכוז מרבי מחושב
---	147.95%	49.32%	29.59	---	---	---	---	---	---	---	---	---	---	---	---	636330.23	168412.2	ריכוז מרבי מחושב
---	14.09%	4.70%	2.82	---	100.38%	16.06%	20.08	25.35	---	30.15%	32.82%	95.10	114.88	115.43	635689.00	167610.00	1	
---	3.63%	1.21%	0.73	---	21.22%	3.40%	4.24	4.38	---	8.53%	13.38%	26.90	46.83	56.78	635830.00	178946.00	2	
---	15.15%	5.05%	3.03	---	80.28%	12.84%	16.06	16.07	---	25.17%	24.18%	79.42	84.62	84.63	633571.00	167462.00	3	
---	3.67%	1.22%	0.73	---	22.55%	3.61%	4.51	5.67	---	10.24%	18.98%	32.30	66.43	66.60	635506.00	178566.00	4	
---	3.53%	1.18%	0.71	---	21.62%	3.46%	4.32	4.56	---	8.86%	14.74%	27.97	51.60	60.11	636124.00	179052.00	5	
---	5.22%	1.74%	1.04	---	54.61%	8.74%	10.92	15.22	---	29.28%	30.37%	92.36	106.28	106.89	630892.00	164349.00	6	
---	4.61%	1.54%	0.92	---	21.35%	3.42%	4.27	4.28	---	9.49%	20.16%	29.94	70.57	85.86	642870.00	174738.00	7	
---	15.57%	5.19%	3.11	---	86.56%	13.85%	17.31	21.25	---	35.90%	36.42%	113.25	127.46	127.86	633816.00	166635.00	8	
---	14.57%	4.86%	2.91	---	101.57%	16.25%	20.31	22.55	---	31.21%	30.02%	98.46	105.09	106.55	634226.00	166808.00	9	
---	5.99%	2.00%	1.20	---	27.23%	4.36%	5.45	5.64	---	13.09%	22.50%	41.30	78.76	95.30	633819.00	174550.00	10	
---	3.72%	1.24%	0.74	---	28.90%	4.62%	5.78	5.92	---	10.70%	13.67%	33.75	47.85	48.73	640467.00	177478.00	11	
---	6.71%	2.24%	1.34	---	30.35%	4.86%	6.07	6.07	---	12.95%	18.01%	40.85	63.02	72.93	636109.00	174775.00	12	
---	4.85%	1.62%	0.97	---	33.86%	5.42%	6.77	6.78	---	11.37%	20.21%	35.89	70.75	70.91	640587.00	174270.00	13	
---	16.23%	5.41%	3.25	---	65.82%	10.53%	13.16	13.39	---	18.96%	21.99%	59.82	76.96	77.04	636506.00	171041.00	14	
---	4.17%	1.39%	0.83	---	29.95%	4.79%	5.99	6.95	---	10.69%	11.94%	33.73	41.80	42.58	639336.00	176616.00	15	
---	3.07%	1.02%	0.61	---	21.14%	3.38%	4.23	5.73	---	7.29%	18.77%	23.00	65.70	67.00	643614.00	177986.00	16	
---	3.85%	1.28%	0.77	---	27.31%	4.37%	5.46	5.63	---	10.24%	19.44%	32.31	68.02	68.18	636444.00	178822.00	17	
---	9.11%	3.04%	1.82	---	37.63%	6.02%	7.53	8.95	---	15.38%	20.98%	48.51	73.42	73.76	634754.00	171833.00	18	
---	6.87%	2.29%	1.37	---	31.74%	5.08%	6.35	7.31	---	13.96%	17.93%	44.05	62.76	66.91	633819.00	173176.00	19	
---	4.38%	1.46%	0.88	---	21.30%	3.41%	4.26	4.28	---	11.60%	23.04%	36.60	80.64	84.48	642630.00	174425.00	20	
---	5.16%	1.72%	1.03	---	24.47%	3.92%	4.89	4.91	---	9.26%	19.43%	29.20	68.02	86.25	643088.00	175050.00	21	
---	3.72%	1.24%	0.74	---	22.38%	3.58%	4.48	4.99	---	9.48%	16.94%	29.91	59.28	67.51	635661.00	178592.00	22	
---	5.79%	1.93%	1.16	---	32.47%	5.20%	6.49	6.64	---	12.56%	19.75%	39.62	69.11	73.72	631211.00	173910.00	23	
---	5.21%	1.74%	1.04	---	24.94%	3.99%	4.99	5.07	---	9.22%	19.39%	29.09	67.86	86.16	643106.00	175069.00	24	
---	4.60%	1.53%	0.92	---	23.27%	3.72%	4.65	5.02	---	11.89%	20.60%	37.52	72.11	79.97	634551.00	176734.00	25	
---	8.12%	2.71%	1.62	---	48.43%	7.75%	9.69	9.99	---	16.26%	21.43%	51.30	74.99	76.01	637671.00	173613.00	26	
---	7.49%	2.50%	1.50	---	39.89%	6.38%	7.98	8.50	---	8.40%	23.21%	26.52	81.23	83.04	643868.00	176336.00	27	
---	5.09%	1.70%	1.02	---	34.36%	5.50%	6.87	7.66	---	14.80%	27.21%	46.68	95.22	101.10	637676.00	176758.00	28	
---	7.80%	2.60%	1.56	---	45.55%	7.29%	9.11	9.84	---	16.68%	30.78%	52.61	107.74	107.80	636499.00	173767.00	29	
---	4.58%	1.53%	0.92	---	31.64%	5.06%	6.33	7.36	---	10.35%	15.65%	32.67	54.77	54.81	636305.00	176914.00	30	
---	6.34%	2.11%	1.27	---	40.99%	6.56%	8.20	9.40	---	14.71%	28.71%	46.40	100.48	100.68	636499.00	175313.00	31	
---	5.98%	1.99%	1.20	---	27.18%	4.35%	5.44	5.46	---	12.36%	21.03%	38.98	73.62	81.67	634824.00	175530.00	32	
---	30.62%	10.21%	6.12	---	139.50%	22.32%	27.90	34.05	---	29.78%	28.95%	93.96	101.32	111.91	637100.00	170130.00	33	
---	5.35%	1.78%	1.07	---	36.92%	5.91%	7.38	10.38	---	14.36%	23.11%	45.31	80.90	90.45	636882.00	176377.00	34	
---	3.15%	1.05%	0.63	---	18.75%	3.00%	3.75	3.86	---	10.81%	15.01%	34.10	52.53	54.41	649129.00	172115.00	35	
---	7.33%	2.44%	1.47	---	45.33%	7.25%	9.07	9.57	---	15.18%	26.44%	47.89	92.53	92.59	635880.00	173806.00	36	
---	5.50%	1.83%	1.10	---	38.03%	6.09%	7.61	7.68	---	13.42%	16.97%	42.33	59.39	60.35	637928.00	175794.00	37	
---	6.23%	2.08%	1.25	---	37.95%	6.07%	7.59	8.09	---	12.00%	13.85%	37.85	48.47	49.47	631333.00	170094.00	38	

טבלה 30: ריכוזים מרביים מחושבים של גופרית דו חמצני (שעתי, יממתי ושנתי), מיקרוגרם/מ"ק, מקורות רקע וטורבינות הגז במצב העתידי

אחוז מערך ייחוס	אחוז מערך יעד שנתי	אחוז מערך סביבה שנתי	ריכוז מרבי	אחוז מערך ייחוס	אחוז מערך יעד יממתי	אחוז מערך סביבה יממתי	ריכוז יממתי מרבי	ריכוז יממתי השני הכי גבוה (2 <sup>nd</sup> )	אחוז מערך ייחוס	אחוז מערך יעד	אחוז מערך סביבה	ריכוז קצר טווח אחוזון 99.9	ריכוז קצר טווח השני הכי גבוה (2 <sup>nd</sup> )	ריכוז מרבי	Y	X	[ITM]	
																	[מק"ג/מ"ק]	
---	---	---	---	---	---	---	---	---	---	84.58%	85.02%	266.83	297.58	297.62	636330.23	168412.2	ריכוז מרבי מחושב	
---	---	---	---	---	617.45%	98.79%	123.49	149.39	---	---	---	---	---	---	---	636330.23	168412.2	ריכוז מרבי מחושב
---	147.95%	49.32%	29.59	---	---	---	---	---	---	---	---	---	---	---	---	636330.23	168412.2	ריכוז מרבי מחושב
---	14.11%	4.70%	2.82	---	100.42%	16.07%	20.08	25.37	---	30.15%	32.82%	95.10	114.88	115.43	635689.00	167610.00	1	
---	3.64%	1.21%	0.73	---	21.23%	3.40%	4.25	4.39	---	8.53%	13.38%	26.90	46.83	56.78	635830.00	178946.00	2	
---	15.17%	5.06%	3.03	---	80.33%	12.85%	16.07	16.09	---	25.20%	24.19%	79.50	84.67	84.68	633571.00	167462.00	3	
---	3.68%	1.23%	0.74	---	22.57%	3.61%	4.51	5.67	---	10.24%	18.98%	32.31	66.43	66.60	635506.00	178566.00	4	
---	3.54%	1.18%	0.71	---	21.66%	3.47%	4.33	4.56	---	8.86%	14.74%	27.97	51.60	60.11	636124.00	179052.00	5	
---	5.23%	1.74%	1.05	---	54.62%	8.74%	10.92	15.22	---	29.28%	30.37%	92.38	106.29	106.90	630892.00	164349.00	6	
---	4.63%	1.54%	0.93	---	21.36%	3.42%	4.27	4.29	---	9.49%	20.16%	29.94	70.57	85.86	642870.00	174738.00	7	
---	15.58%	5.19%	3.12	---	86.63%	13.86%	17.33	21.26	---	35.90%	36.42%	113.25	127.46	127.86	633816.00	166635.00	8	
---	14.58%	4.86%	2.92	---	101.60%	16.26%	20.32	22.57	---	31.21%	30.03%	98.47	105.09	106.55	634226.00	166808.00	9	
---	6.00%	2.00%	1.20	---	27.25%	4.36%	5.45	5.64	---	13.09%	22.50%	41.30	78.76	95.30	633819.00	174550.00	10	
---	3.74%	1.25%	0.75	---	28.96%	4.63%	5.79	5.93	---	10.71%	13.67%	33.80	47.85	48.73	640467.00	177478.00	11	
---	6.73%	2.24%	1.35	---	30.36%	4.86%	6.07	6.07	---	12.95%	18.01%	40.85	63.02	72.93	636109.00	174775.00	12	
---	4.87%	1.62%	0.97	---	33.89%	5.42%	6.78	6.80	---	11.38%	20.21%	35.89	70.75	70.91	640587.00	174270.00	13	
---	16.25%	5.42%	3.25	---	65.82%	10.53%	13.16	13.39	---	18.96%	21.99%	59.82	76.96	77.04	636506.00	171041.00	14	
---	4.18%	1.39%	0.84	---	30.03%	4.81%	6.01	6.95	---	10.69%	11.96%	33.73	41.84	42.66	639336.00	176616.00	15	
---	3.08%	1.03%	0.62	---	21.16%	3.38%	4.23	5.73	---	7.29%	18.77%	23.00	65.70	67.00	643614.00	177986.00	16	
---	3.86%	1.29%	0.77	---	27.31%	4.37%	5.46	5.64	---	10.24%	19.44%	32.31	68.02	68.18	636444.00	178822.00	17	
---	9.12%	3.04%	1.82	---	37.65%	6.02%	7.53	8.95	---	15.38%	20.98%	48.51	73.42	73.76	634754.00	171833.00	18	
---	6.88%	2.29%	1.38	---	31.78%	5.08%	6.36	7.31	---	13.96%	17.93%	44.05	62.76	66.91	633819.00	173176.00	19	
---	4.39%	1.46%	0.88	---	21.31%	3.41%	4.26	4.30	---	11.60%	23.04%	36.60	80.64	84.48	642630.00	174425.00	20	
---	5.17%	1.72%	1.03	---	24.47%	3.92%	4.89	4.91	---	9.26%	19.43%	29.20	68.02	86.25	643088.00	175050.00	21	
---	3.73%	1.24%	0.75	---	22.40%	3.58%	4.48	4.99	---	9.48%	16.94%	29.91	59.28	67.51	635661.00	178592.00	22	
---	5.80%	1.93%	1.16	---	32.47%	5.20%	6.49	6.64	---	12.56%	19.75%	39.62	69.11	73.72	631211.00	173910.00	23	
---	5.22%	1.74%	1.04	---	24.95%	3.99%	4.99	5.07										

טבלה 31: ריכוזים מרביים מחושבים של גופרית דו חמצני (שעתי, יממתי ושנתי), מיקרוגרם/מ"ק, טורבינות הגז במצב העתיד

אחוז מערך ייחוס	אחוז מערך יעד שנתי	אחוז מערך סביבה שנתי	ריכוז שנתי מרבי	אחוז מערך ייחוס	אחוז מערך יעד יממתי	אחוז מערך סביבה יממתי	ריכוז הישני הכי גבוה (2 <sup>nd</sup> )	ריכוז יממתי מרבי	אחוז מערך ייחוס	אחוז מערך יעד	אחוז מערך סביבה	ריכוז קצר טווח אחוזון 99.9	ריכוז קצר טווח השני הכי גבוה (2 <sup>nd</sup> )	ריכוז קצר טווח מרבי	Y	X	ריכוז מרבי מחושב	
																		[מק"ג/מ"ק]
---	---	---	---	---	---	---	---	---	---	1.90%	2.31%	6.00	8.07	8.13	639880.23	169662.2	ריכוז מרבי מחושב	
---	---	---	---	---	9.30%	1.49%	1.86	2.15	---	---	---	---	---	---	---	639883.53	169744.07	ריכוז מרבי מחושב
---	1.19%	0.40%	0.24	---	---	---	---	---	---	---	---	---	---	---	---	63949.47	169844.97	ריכוז מרבי מחושב
---	0.02%	0.01%	0.003	---	0.17%	0.03%	0.03	0.03	---	0.07%	0.07%	0.21	0.25	0.25	635689.00	167610.00	1	
---	0.01%	0.00%	0.002	---	0.08%	0.01%	0.02	0.02	---	0.03%	0.05%	0.11	0.18	0.19	635830.00	178946.00	2	
---	0.02%	0.01%	0.003	---	0.14%	0.02%	0.03	0.03	---	0.04%	0.06%	0.13	0.20	0.20	633571.00	167462.00	3	
---	0.01%	0.00%	0.002	---	0.08%	0.01%	0.02	0.02	---	0.04%	0.06%	0.14	0.22	0.22	635506.00	178566.00	4	
---	0.01%	0.00%	0.002	---	0.08%	0.01%	0.02	0.02	---	0.03%	0.07%	0.11	0.24	0.24	636124.00	179052.00	5	
---	0.01%	0.00%	0.002	---	0.09%	0.01%	0.02	0.02	---	0.03%	0.03%	0.10	0.12	0.14	630892.00	164349.00	6	
---	0.01%	0.00%	0.002	---	0.13%	0.02%	0.03	0.03	---	0.04%	0.09%	0.14	0.33	0.33	642870.00	174738.00	7	
---	0.01%	0.00%	0.003	---	0.12%	0.02%	0.02	0.03	---	0.05%	0.06%	0.15	0.20	0.20	633816.00	166635.00	8	
---	0.01%	0.00%	0.003	---	0.13%	0.02%	0.03	0.03	---	0.05%	0.06%	0.15	0.21	0.21	634226.00	166808.00	9	
---	0.02%	0.01%	0.003	---	0.13%	0.02%	0.03	0.03	---	0.04%	0.06%	0.13	0.20	0.20	633819.00	174550.00	10	
---	0.01%	0.00%	0.003	---	0.14%	0.02%	0.03	0.03	---	0.04%	0.07%	0.14	0.23	0.24	640467.00	177478.00	11	
---	0.01%	0.00%	0.003	---	0.13%	0.02%	0.03	0.03	---	0.05%	0.06%	0.14	0.22	0.22	636109.00	174775.00	12	
---	0.02%	0.01%	0.005	---	0.20%	0.03%	0.04	0.04	---	0.07%	0.11%	0.21	0.39	0.39	640587.00	174270.00	13	
---	0.02%	0.01%	0.004	---	0.19%	0.03%	0.04	0.04	---	0.05%	0.10%	0.16	0.35	0.36	636506.00	171041.00	14	
---	0.01%	0.00%	0.003	---	0.15%	0.02%	0.03	0.03	---	0.04%	0.06%	0.12	0.20	0.20	639336.00	176616.00	15	
---	0.01%	0.00%	0.002	---	0.10%	0.02%	0.02	0.03	---	0.04%	0.06%	0.13	0.21	0.21	643614.00	177986.00	16	
---	0.01%	0.00%	0.002	---	0.08%	0.01%	0.02	0.02	---	0.03%	0.05%	0.10	0.17	0.17	636444.00	178822.00	17	
---	0.01%	0.00%	0.003	---	0.13%	0.02%	0.03	0.03	---	0.04%	0.06%	0.13	0.21	0.23	634754.00	171833.00	18	
---	0.02%	0.01%	0.003	---	0.14%	0.02%	0.03	0.03	---	0.04%	0.05%	0.13	0.17	0.17	633819.00	173176.00	19	
---	0.01%	0.00%	0.003	---	0.15%	0.02%	0.03	0.04	---	0.04%	0.10%	0.14	0.36	0.36	642630.00	174425.00	20	
---	0.01%	0.00%	0.002	---	0.12%	0.02%	0.02	0.03	---	0.04%	0.09%	0.13	0.30	0.30	643088.00	175050.00	21	
---	0.01%	0.00%	0.002	---	0.08%	0.01%	0.02	0.02	---	0.04%	0.05%	0.12	0.19	0.19	635661.00	178592.00	22	
---	0.01%	0.00%	0.002	---	0.08%	0.01%	0.02	0.02	---	0.03%	0.05%	0.11	0.16	0.16	631211.00	173910.00	23	
---	0.01%	0.00%	0.002	---	0.12%	0.02%	0.02	0.03	---	0.04%	0.09%	0.13	0.31	0.31	643106.00	175069.00	24	
---	0.01%	0.00%	0.002	---	0.12%	0.02%	0.02	0.03	---	0.05%	0.06%	0.14	0.22	0.23	634551.00	176734.00	25	
---	0.02%	0.01%	0.004	---	0.17%	0.03%	0.03	0.03	---	0.05%	0.09%	0.16	0.31	0.31	637671.00	173613.00	26	
---	0.01%	0.00%	0.002	---	0.11%	0.02%	0.02	0.03	---	0.04%	0.08%	0.12	0.27	0.27	643868.00	176336.00	27	
---	0.01%	0.00%	0.003	---	0.12%	0.02%	0.02	0.03	---	0.04%	0.05%	0.12	0.18	0.18	637676.00	176758.00	28	
---	0.02%	0.01%	0.004	---	0.14%	0.02%	0.03	0.03	---	0.04%	0.07%	0.14	0.24	0.25	636499.00	173767.00	29	
---	0.01%	0.00%	0.002	---	0.09%	0.01%	0.02	0.02	---	0.04%	0.05%	0.12	0.18	0.18	636305.00	176914.00	30	
---	0.01%	0.00%	0.003	---	0.12%	0.02%	0.02	0.02	---	0.04%	0.06%	0.13	0.20	0.20	636499.00	175313.00	31	
---	0.01%	0.00%	0.002	---	0.11%	0.02%	0.02	0.02	---	0.04%	0.05%	0.12	0.19	0.19	634824.00	175530.00	32	
---	0.02%	0.01%	0.004	---	0.19%	0.03%	0.04	0.05	---	0.07%	0.12%	0.24	0.41	0.42	637100.00	170130.00	33	
---	0.01%	0.00%	0.002	---	0.11%	0.02%	0.02	0.02	---	0.04%	0.05%	0.13	0.19	0.20	636882.00	176377.00	34	
---	0.01%	0.00%	0.002	---	0.07%	0.01%	0.01	0.02	---	0.04%	0.06%	0.12	0.21	0.21	649129.00	172115.00	35	
---	0.02%	0.01%	0.004	---	0.13%	0.02%	0.03	0.03	---	0.04%	0.07%	0.14	0.23	0.23	635880.00	173806.00	36	
---	0.01%	0.00%	0.003	---	0.12%	0.02%	0.02	0.04	---	0.04%	0.06%	0.12	0.20	0.22	637928.00	175794.00	37	
---	0.01%	0.00%	0.002	---	0.07%	0.01%	0.01	0.01	---	0.03%	0.04%	0.09	0.14	0.15	631333.00	170094.00	38	

## ג. מפות ריכוזים

מפות ריכוזים של תחזית איכות אוויר במצב עתידי מצורפות בנספח מספר 10.

## 4.8.8 ניתוח תוצאות המודל

### א. תרחיש מצב קיים - מקורות רקע - ניתוח תוצאות המודל למהמים בעלי ערכי סביבה ויעד

#### כלל חלקיקים מרחפים

עבור מזהם זה הייתה התייחסות לפליטות מכלל מקורות הרקע ומטורבינות הגז המתוכננות. תוצאות חישוב איכות האוויר במצב הקיים בהתייחס לחלקיקים נשימים מראות חריגות מערכי הסביבה ממקורות הרקע. הריכוז המרבי שהתקבל ממקורות הרקע עמד על 1461.04 מק"ג/מ"ק, הריכוז השני הגבוה ביותר ממקורות הרקע עמד על 1337.32 מק"ג/מ"ק ומהווה חריגה של פי 4.5 מתקן הסביבה והיעד.

הריכוזים שהתקבלו עבור טורבינות הגז ומנוע הגז במצב העתידי הראו כי השפעתן הצפויה על ריכוזי החלקיקים בסביבה הינה מזערית, הריכוז המרבי המתקבל במצב העתידי עמד על 5.61 מק"ג/מ"ק, הריכוז השני עמד על 5.04 מק"ג/מ"ק שהם 1.68% מתקן הסביבה ויעד השלוש שעות. בזמני המיצוע היממתיים והשנתיים לא מתקבלות חריגות מערכי הסביבה הקבועים בחוק בכל התרחישים שנבדקו. הריכוז היממתי המרבי השני שהתקבל ממקורות הרקע עמד על 189.13 מק"ג/מ"ק והוא מהווה 94.57% מערך הסביבה והיעד, הריכוז השנתי המרבי שהתקבל ממקורות הרקע עמד על 13.13 מק"ג/מ"ק ומהווה 17.51% מערך הסביבה והיעד. עבור טורבינות הגז ומנוע הגז הריכוזים שהתקבלו בזמני מיצוע היממתיים והשנתיים היו נמוכים משמעותית מערכי הסביבה והיעד. הריכוז היממתי המרבי השני שהתקבל מטורבינות הגז עמד על 1.63 מק"ג/מ"ק ומהווה 0.81% מערך הסביבה, הריכוז השנתי שנמדד במצב העתידי עמד על 0.11 מק"ג/מ"ק ומהווה 0.15% מערך הסביבה והיעד. בחינת הריכוזים המרביים המתקבלים עבור כל זמני המיצוע בנקודות הרגישות ובכל התרחישים שנבדקו מראה כי תרומתן של טורבינות הגז ומנוע הגז בנקודות אלו הינה מזערית.

לסיכום, ניתן לומר כי השפעתן הצפויה של טורבינות הגז ומנוע הגז במתחם הקבלה על ריכוזי החלקיקים הנשימים באוויר ביחס למקורות הרקע וביחס לתקני הסביבה והיעד הינה מזערית.

#### חלקיקים נשימים עדינים (PM-10)

עבור מזהם זה הייתה התייחסות לפליטות ממקורות הרקע ומטורבינות הגז המתוכננות ומנוע הגז הקיים. תוצאות חישוב איכות האוויר בהתייחס לחלקיקים הנשימים העדינים (PM-10) מראות כי יש חריגות מערכי הסביבה והיעד ממקורות הרקע בלבד. הריכוז המרבי היממתי שהתקבל עמד על 224.78 מק"ג/מ"ק, הריכוז המרבי השני שהתקבל ממקורות הרקע עמד על 189.13 מק"ג/מ"ק, ריכוז זה מהווה חריגה של 26.09% מערך הסביבה ו 278% מערך היעד, הריכוז השנתי המרבי שהתקבל ממקורות הרקע עמד על 13.13 מק"ג/מ"ק ומהווה 21.88% מערך הסביבה ו 65.65% מערך היעד. עבור טורבינות הגז ומנוע הגז הריכוזים היממתיים והשנתיים שהתקבלו היו נמוכים משמעותית מערכי הסביבה והיעד. הריכוז היממתי המרבי שהתקבל עמד על 2.84 מק"ג/מ"ק, הריכוז השני הגבוה ביותר שהתקבל עמד על 1.63 מק"ג/מ"ק ומהווה 1.09% מערך הסביבה ו 3.26% מערך היעד, הריכוז השנתי שהתקבל עמד על 0.11 מק"ג/מ"ק וריכוז זה מהווה 0.18% מערך הסביבה השנתי ו 0.55% מערך היעד השנתי. בחינת הריכוזים המרביים המתקבלים עבור כל זמני המיצוע בנקודות הרגישות ובכל התרחישים שנבדקו מראה כי תרומתן של טורבינות הגז ומנוע הגז לזיהום האוויר בנקודות אלו הינה מזערית. וניתן לומר כי ההשפעה הצפויה של טורבינות הגז במתחם הקבלה על ריכוזי החלקיקים הנשימים העדינים באוויר ביחס למקורות הרקע וביחס לתקני הסביבה והיעד הינה מזערית.

בחינת הריכוזים המרביים – מקורות רקע - שהתקבלו בהרצת המודל בהתייחס לתקנות אוויר נקי (ערכי איכות אוויר) (הוראת שעה) (תיקון), התשע"ג 2013 המאפשרים 18 חריגות מערך יממתי מרבי של 130 מק"ג/מ"ק מוצגים בטבלה 7.4.1.2.1 עבור מקורות הרקע, מקור טעון ההיתר אינו עובר את ערך של 130 מק"ג/מ"ק בכל התרחישים שנבדקו. כפי שניתן לראות מספר החריגות נמוך ממספר החריגות המותר בכל השנים שנבדקו.

**טבלה 32: מספר החריגות מערך של 130 מק"ג/מ"ק בכל שנה, זמן מיצוע יממתי. מקורות רקע**

שנה	מספר חריגות יממתי בשנה	עומד בתקן החדש
2008	2	כן
2009	2	כן
2010	9	כן
2011	3	כן
2012	1	כן

**תחמוצות חנקן**

עבור מזהם זה הייתה התייחסות לפליטות ממקורות הרקע ומטורבינות הגז המתוכננות ומנוע הגז הקיים. תוצאות חישוב איכות האוויר בהתייחסות לתחמוצות חנקן מראות כי אין חריגות מתקני הסביבה והיעד הן ממקורות הרקע והן מטורבינות הגז. בחינה של הריכוזים המרביים החצי שעותיים שהתקבלו מראה כי הריכוז החצי שעותי המרבי שהתקבל ממקורות הרקע עמד על 190.41 מק"ג/מ"ק, הריכוז המרבי השני ממקורות הרקע עמד על 189.05 מק"ג/מ"ק ומהווה 20.11% מתקן הסביבה. הריכוזים שהתקבלו עבור טורבינות הגז ומנוע הגז במתחם הקבלה הראו כי הריכוז החצי שעותי המרבי עמד על 218.95 מק"ג/מ"ק, הריכוז החצי שעותי השני שהתקבל עמד על 217.38 מק"ג/מ"ק מהווה 23.13% מערך הסביבה.

בזמני המיצוע היממתיים והשנתיים לא מתקבלות חריגות מערכי הסביבה והיעד הקבועים בחוק. הריכוז המרבי היממתי שהתקבל ממקורות הרקע עמד על 81.15 מק"ג/מ"ק הריכוז השני הגובה ביותר עמד על 67.72 מק"ג/מ"ק המהווים 12.08% מערך הסביבה היממתי. הריכוז השנתי המרבי שהתקבל ממקורות הרקע עמד 17.23 מק"ג/מ"ק המהווים 57.43% מערך היעד השנתי. עבור טורבינות הגז ומנוע הגז הריכוז היממתי המרבי שהתקבל עמד על 50.29 מק"ג/מ"ק, הריכוז המרבי השני עמד על 42.88 מק"ג/מ"ק ומהווים 7.66% מערך הסביבה. הריכוז השנתי המרבי שהתקבל מטורבינות הגז ומנוע הגז עמד על 5.44 מק"ג/מ"ק המהווים 18.13% מערך היעד השנתי. בחינת הריכוזים המרביים המתקבלים עבור כל זמני המיצוע בנקודות הרגישות ובכל התרחישים שנבדקו מראה כי תרומתן של טורבינות הגז ומנוע הגז לזיהום האוויר בנקודות אלו הינה מזערית.

לסיכום, ניתן לומר כי השפעתן הצפויה טורבינות הגז במתחם הקבלה על ריכוז תחמוצות החנקן באוויר ביחס למקורות הרקע וביחס לתקני הסביבה הינה נמוכה.

**חנקן דו חמצני**

עבור מזהם זה הייתה התייחסות לפליטות ממקורות הרקע ומטורבינות הגז המתוכננות ומנוע הגז הקיים. תוצאות חישוב איכות האוויר בהתייחסות לחנקן דו חמצני מראות כי לא התקבלו חריגות מתקני הסביבה והיעד הן ממקורות הרקע והן מטורבינות הגז במתחם הקבלה. בחינה של הריכוזים המרביים השעותיים שהתקבלו מראה כי הריכוז השנתי המרבי שהתקבל ממקורות הרקע עמד על 106.09 מק"ג/מ"ק, הריכוז המרבי השני עמד על 94.65 מק"ג/מ"ק והריכוז המרבי באחוזון 99.9 עמד על 67.49 מק"ג/מ"ק ומהווה 33.75% מערכי הסביבה והיעד. בחינה של הריכוזים המרביים השעותיים שהתקבלו מטורבינות הגז ומנוע הגז מראים כי הריכוז השנתי המרבי שהתקבל מטורבינות הגז עמד על 157.60 מק"ג/מ"ק, הריכוז המרבי השני עמד על 143.57 מק"ג/מ"ק והריכוז המרבי באחוזון 99.9 עמד על 79.76 מק"ג/מ"ק ומהווה 39.88% מערך הסביבה והיעד. בזמני המיצוע השנתיים לא מתקבלות חריגות מערכי הסביבה והיעד הקבועים בחוק, הריכוז השנתי המרבי שהתקבל ממקורות הרקע עמד על 6.33 מק"ג/מ"ק המהווים 15.83% מערך היעד. הריכוז השנתי המרבי שהתקבל מטורבינות הגז ומנוע הגז עמד על 3.70 מק"ג/מ"ק המהווים 9.25% מערך היעד. בחינת הריכוזים המרביים המתקבלים עבור כל זמני המיצוע בנקודות הרגישות ובכל התרחישים שנבדקו מראה כי תרומתו של טורבינות הגז לזיהום האוויר בנקודות אלו הינה נמוכה וניתן לומר כי ההשפעה הצפויה של טורבינות הגז במתחם הקבלה על ריכוז החנקן הדו חמצני באוויר ביחס למקורות הרקע וביחס לתקני הסביבה הינה נמוכה.

בחינת הריכוזים המרביים שהתקבלו בהרצת המודל בהתייחס לתקנות אוויר נקי (ערכי איכות אוויר) (הוראת שעה) (תיקון), התשע"ג 2013 המאפשרים 8 חריגות מערך שעתי מרבי של 200 מק"ג/מ"ק אינם רלוונטיים בשל העובדה כי המקורות אינם עוברים את ערך זה בכל התרחישים שנבדקו.

#### גופרית דו חמצנית

עבור מזהם זה הייתה התייחסות לפליטות ממקורות הרקע ומטורבינות הגז המתוכננות ומנוע הגז הקיים. תוצאות חישוב איכות האוויר בהתייחסות לגופרית דו חמצנית מראות כי במצב הקיים ישנן חריגות מערכי היעד ממקורות הרקע. בחינה של הריכוזים המרביים השעתיים שהתקבלו ממקורות הרקע מראה כי הריכוז המרבי שהתקבל עמד על 279.62 מק"ג/מ"ק, הריכוז השני הגבוה ביותר עמד על 297.58 מק"ג/מ"ק והריכוז שהתקבל באחוזון 99.9 עמד על 267.82 מק"ג/מ"ק המהווים חריגה של 85.02% מערך הסביבה השעתי, עבור ערך היעד העשר דקתי הריכוז שהתקבל מהווה חריגה של 84.89% מערך היעד. הריכוזים שהתקבלו עבור טורבינות הגז המתוכננות ומנוע הגז הקיים הראו כי לא מתקבלות חריגות מערכי הסביבה והיעד בזמני המיצוע קצרי הטווח, הריכוז המרבי שהתקבל עמד על 8.132 מק"ג/מ"ק, הריכוז המרבי השני שהתקבל עמד על 8.07 מק"ג/מ"ק והריכוז שהתקבל באחוזון 99.9 עמד על 6.00 מק"ג/מ"ק שהם כ 2.31% מערך הסביבה, עבור ערך היעד העשר דקתי הריכוז שהתקבל מהווה 1.90% מערך היעד. בזמני המיצוע היממתיים והשנתיים התקבלו חריגות מערכי היעד ממקורות הרקע בלבד. הריכוז היממתי המרבי שהתקבל ממקורות הרקע עמד על 149.39 מק"ג/מ"ק, הריכוז היממתי השני עמד על 123.49 ומהווה 97.79% מערך הסביבה ו 617.79% מערך היעד. הריכוז השנתי שהתקבל ממקורות הרקע עמד על 29.59 מק"ג/מ"ק ומהווה 49.32% מערך הסביבה וחריגה של 47.95% מערך היעד. עבור טורבינות הגז ומנוע הגז הריכוז היממתי המרבי עמד על 2.15 מק"ג/מ"ק, הריכוז השני הגבוה ביותר עמד על 1.86 מק"ג/מ"ק ומהווה 1.49% מערך הסביבה ו 9.30% מערך היעד. הריכוז השנתי שהתקבל עבור טורבינות הגז ומנוע הגז עמד על 0.24 מק"ג/מ"ק ומהווה 0.40% מערך הסביבה ו- 1.19% מערך היעד. בחינת הריכוזים המרביים המתקבלים עבור כל זמני המיצוע בנקודות הרגישות ובכל התרחישים שנבדקו מראה כי תרומתן של טורבינות הגז לזיהום האוויר בנקודות אלו הינה מזערית. ניתן לומר כי ההשפעה הצפויה של טורבינות הגז במתחם הקבלה על ריכוז הגופרית הדו חמצנית באוויר ביחס למקורות הרקע וביחס לתקני הסביבה הינה נמוכה.

בחינת הריכוזים המרביים של מקורות הרקע שהתקבלו בהרצת המודל בהתייחס לתקנות אוויר נקי (ערכי איכות אוויר) (הוראת שעה) (תיקון), התשע"ג 2013 המאפשרים 8 חריגות מערך שעתי מרבי של 350 מק"ג/מ"ק, ו 4 חריגות מערך יממתי של 50 מק"ג/מ"ק מוצגים בטבלה 7.4.1.2.2 עבור מקורות הרקע בזמן מיצוע יממתי. כפי שניתן לראות מקורות הרקע אינם עומדים בתקנים החדשים ומספר החריגות גבוהה ממספר החריגות המותר בכל השנים שנבדקו.

**טבלה 33: מספר החריגות מערך של 50 מק"ג/מ"ק בכל שנה, זמן מיצוע יממתי. מקורות רקע**

שנה	מספר חריגות יממתי בשנה	עומד בתקן החדש
2008	60	לא
2009	40	לא
2010	83	לא
2011	52	לא
2012	52	לא

#### **4.8.9 סיכום ניתוח איכות האוויר החזויה ממערך הדחיסה**

מטרת הניתוח הסביבתי של איכות האוויר היתה להעריך את התרומה וההשפעה הצפויים של הקמת טורבינות גז במתחם תחנת הקבלה באזור התעשייה הצפוני באשדוד על איכות האוויר.

במתחם צפויים להיות שלוש טורבינות גז וגנרטור, שתי הטורבינות ומנוע הגז יפעלו באופן שוטף וטורבינה אחת ושני מנועי גז הינם לגיבוי. בהתאם להנחיות המשרד להגנת הסביבה הורף מודל פיזור מזהמים עבור המזהמים שלגביהם קיימים ערכי סביבה ויעד. המזהמים שלהם ישנם ערכי סביבה ונכללו בהרצת המודל היו כלל חלקיקים מרחפים (TSP), חלקיקים נשימים עדינים (PM-10), תחמוצות חנקן, חנקן דו-חמצני וגופרית דו-חמצנית.

**סימולציית פיזור המזהמים במצב הקיים מראה כי הריכוזים המחושבים המרביים שהתקבלו במודל עבור טורבינות הגז ומנוע הגז במתחם הקבלה נמוכים מתקני הסביבה והיעד, ותרומת המתקן לאיכות האוויר בסביבה צפויה להיות נמוכה.**

#### 4.8.10 סיכום פרק איכות אוויר

1. המתקנים הקיימים והמתוכננים בתחנת הקבלה אינם צפויים לגרום לתוספת חריגות מתקני הסביבה והיעד בסביבתם למזהמים שנבדקו. עם זאת, הסביבה שבה נמצאים המתקנים הינה רוויה במקורות פליטה שונים וכתוצאה מכך צפויות בסביבה חריגות מתקני הרקע לחלק מהמזהמים שנבדקו (חלקיקים ותחמוצות גפרית). במצב מעין זה, המשרד להגנת הסביבה מקפיד על עמידה בדרישות התקן ואף החמרה מהן גם למתקנים אשר תרומתם נראית נמוכה.
2. השוואת הפליטות והטכנולוגיות המותקנות במתחם לערכי ה-BAT מראות מספר נושאים שיש לתת עליהם את הדעת. להלן סיכום הנושאים שבהם המתקנים או הפליטות מהם אינם עומדים בערכי ה-BAT:

א. יעילות אנרגטית של טורבינות הגז. הדרישה קובעת כי טורבינות גז חדשות המיועדות לייצר חשמל צריכות להשתמש בחום השירי לייצור אנרגיה (קיטור) או במחזור משולב לייצר חשמל. הטורבינות בתחנת הקבלה מיועדות לייצר כח דחיסה ולא חשמל, ואין הגדרה ברורה למצב זה ב-BREF. היעילות האנרגטית של הטורבינות היא 36% ביצור כח דחיסה. העובדה שלא מדובר בפעילות ייצור חשמל, יחד עם העובדות שחברת נובל אנרג'י אינה יצרן חשמל בעל רשיון ובהתייחס לכך שתכנית המתאר המאושרת לתחנת הקבלה אינה כוללת שימוש לייצור חשמל, מיתרות להערכתנו ישימות של שימוש במחזור משולב בשלב זה.

ב. מיכלי הקונדנסט: מנשמי המיכלים נפלטת כמות גבוהה יחסית של אדי דלק ומתאן (המשמש כ-Blanket gas). יש להתקין בעדיפות גג פנימי צף (או כל פתרון אחר לאיסוף אדים) היות והוא צפוי להפחית גם את פליטת המתאן. אפשרות שנייה היא להתקין מערכת ייעודית לאיסוף אדים מנשמי המיכלים ומניעת פליטתם לסביבה. על פי מסמכי ה-BREF התקנת גג פנימי צף יכול לצמצם כ-97% מפליטת אדי הקונדנסט.

ג. בתחנת הקבלה קיים וונט שדרכו משוחרר גז טבעי לסביבה במקרים שבהם נדרש לרוקן את הצנרת לצרכים שונים, ללא טיפול מקדים. יש לבחון אפשרות להתקנת לפיד לטיפול בגז זה.

ד. מנועי הגז שהותקנו להפעלת מדחסים במערך הוצאת הנוזלים מהגז ידרשו לעמוד בדרישת תקינה הגרמנית TA-Luft 2002. על מנת לעמוד בדרישות תקן זה לתחמוצות חנקן, CO ופחמימנים במנועים מסוג זה (סטוכיומטריים), מקובל להתקין ממיר קטליטי ( 3-way-catalyst – TWC). ממיר מסוג זה מסוגל לצמצם פליטות CO, פחמימנים ותחמוצות חנקן ביעילות של כ 90%.



## רעש

סעיף זה מבוסס על המדידות והניתוח האקוסטי שנערכו בפרק א' המייצגות את תמונת הרעש מתחנת המעבר טרם הקמת מערך המדחסים. בהתבסס על תמונת הרעש הקיימת נערך חיזוי לתוספת הרעש הצפויה עם הקמת מערך הדחיסה.

### 4.3.1 תוכנת ההדמיה

החישובים לקביעת מפלסי הרעש החזויים בוצעו באמצעות תוכנת SoundPLAN. התוכנה פותחה בגרמניה על ידי המהנדסים ברנדט ובראונשטיין והיא נחשבת כמתקדמת מסוגה ומקובלת ברחבי העולם לחישובים אקוסטיים.

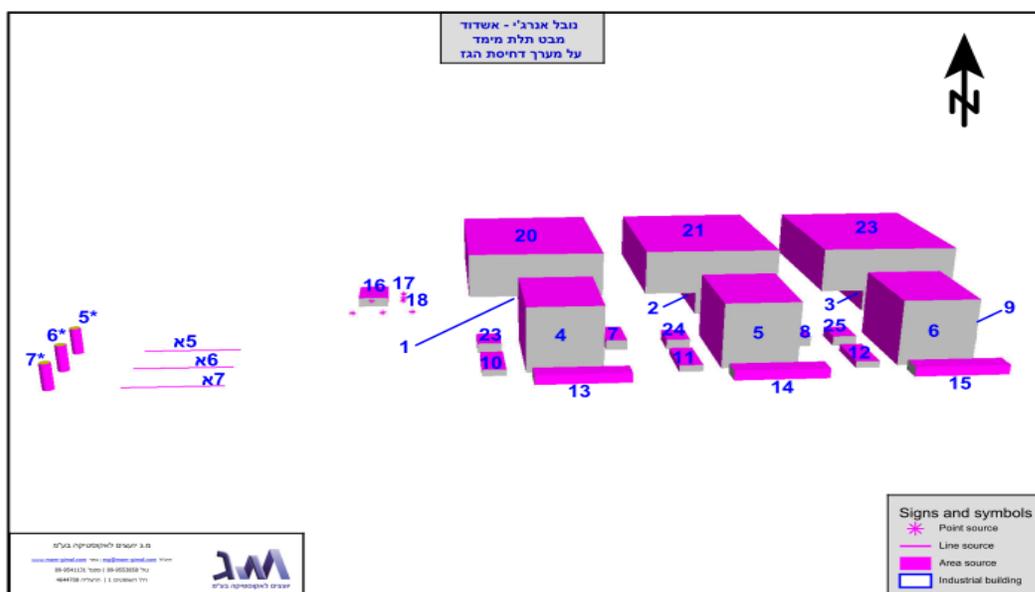
התוכנה מאפשרת חישובים של רעש ממקורות שונים: מקור נקודתי, מקור קווי, מקור משטחי, חישובים של רעש תעשייתי (מקור קול בתוך מבנה ויציאתו דרך רכיבי המבנה) ורעשי תחבורה של כבישים, רכבות ומגרשי חנייה.

התוכנה מאפשרת חישובים על פי תקנים אירופאים שונים ותקנים בינלאומיים לכל אחד ממקורות הרעש.

### 4.3.2 מקורות הרעש במערך דחיסת הגז

בטבלה הבאה רשומים מקורות הרעש ונתוניהם, כפי שהוצגו במסמך שכותרתו:

"Noise Study - Onshore Compression Project" שהוכן ע"י משרד המהנדסים מטקסס "WoodGroup Mustang, Inc.". מקורות הרעש, כפי שהוצגו בתוכנת ההדמיה "SoundPLAN", מופיעים בתרשים הבא. מספור המקורות הינו כפי שנקבע במסמך הנ"ל. רשימת המקורות, מפלסי הרעש וממדי המקורות מופיעים בטבלה מס' 93.



תרשים 1-4: הדמיה של מקורות הרעש במתקן דחיסת הגז

טבלה 1: מקורות הרעש במערך דחיסת הגז

מפלס רעש במרחק 1 מ' dB(A)	משטחים מקרינים	סוג המקור	מידות, מטרים			שם המתקן	מספר
			גובה	רוחב	אורך		
79	כל ההיקף	מבנה	4.0	קוטר 0.7		Filter coalescer	*5,6,7
79	כל האורך	קווי			4.0	J.T. cooler	א7,א6,א5
83	2 דפנות ארוכות	מבנה	5.0	3.6	19.0	Booster compressor	1,2,3
75	גג ושתי דפנות	מבנה	10.0	9.5	14.0	Comp. disch. Gas cooler	4,5,6
79	גג ושתי דפנות	מבנה	1.5	2.5	6.0	Fuel gas skid	7,8,9
79	גג ושתי דפנות	מבנה	1.5	2.7	7.0	Booster comp. valve skid	10,11,12
89	גג ושתי דפנות	מבנה	1.5	11.5	2.7	Gas meter skid	13,14,15
79	גג ושתי דפנות	מבנה	1.5	4.0	6.6	Instrument air skid	16
79		נקודתי	2.0	2.0	1.0	Instrument air receiver skid	17
79		נקודתי	2.0	2.0	1.0	Utility air receiver skid	18
79	גג ושתי דפנות	מבנה	12.0	18.0	24.0	Booster compressor Bd.	20,21,22
79	גג ושתי דפנות	מבנה	1.5	2.8	4.2	Booster compressor scrubber	23,24,25
92		נקודתי	1.5			Mee fog pumps (2 יחידות)	--
92		נקודתי	1.5			Ro transfer pump skids (3 יחידות)	--

### 4.3.3 מפלסי הרעש החזויים ממערך דחיסת הגז

#### בתחום תחנת הקבלה:

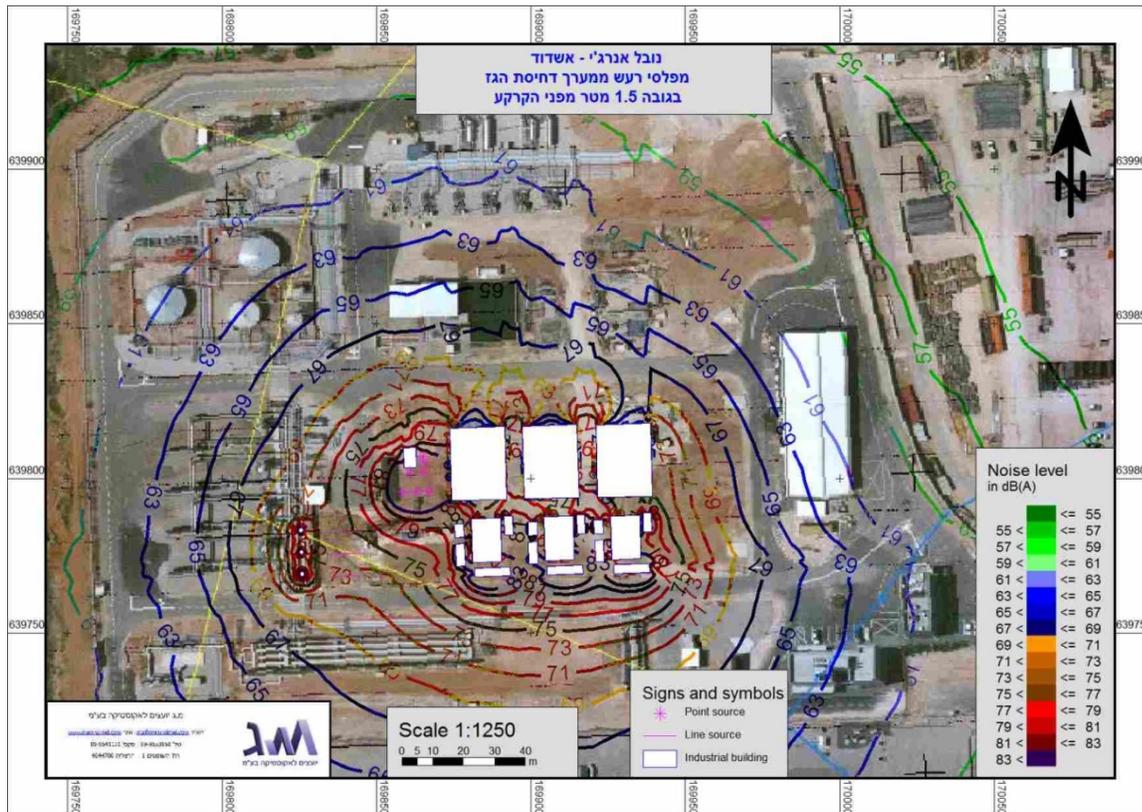
בטבלה הבאה מפורטים מפלסי הרעש החזויים בתחום תחנת הקבלה של "נובל אנרג'י". יש לציין, כי לא נלקחו בחשבון ממדי המתקנים הקיימים והמבנים, אשר בחלק מהמקרים יכולים לשמש כמיסוך אקוסטי חלקי, אך המשמעות של מיסוך זה היא שולית (למעט קולטי רעש מאחורי מבני המשרדים).



טבלה 2: מפלסי רעש חזויים בתחום תחנת הקבלה

מפלסי רעש חזויים, LAeq (dB)		מיקום קולט הרעש
המערכות הקיימות ומערך דחיסת הגז	מערך דחיסת גז בלבד	
50+61 = 61	61	חזית מערבית של בנין הבקרה
50+63 = 63	63-65	חזית צפונית של מבנה חשמל
57/62+58 = 61/64	58-59	גבול צפוני של המתקן
57+58 = 61	58	גבול דרומי של המתקן
50+59 = 60	59	גבול מזרחי של המתקן
58/62+58 = 61/63	58-59	גבול מערב של המתקן

מפלסי רעש ממערך דחיסת הגז מופיעים בתרשים הבא.



תרשים 2-4: מפלסי הרעש החזויים ממערך דחיסת הגז בתחום תחנת הקבלה

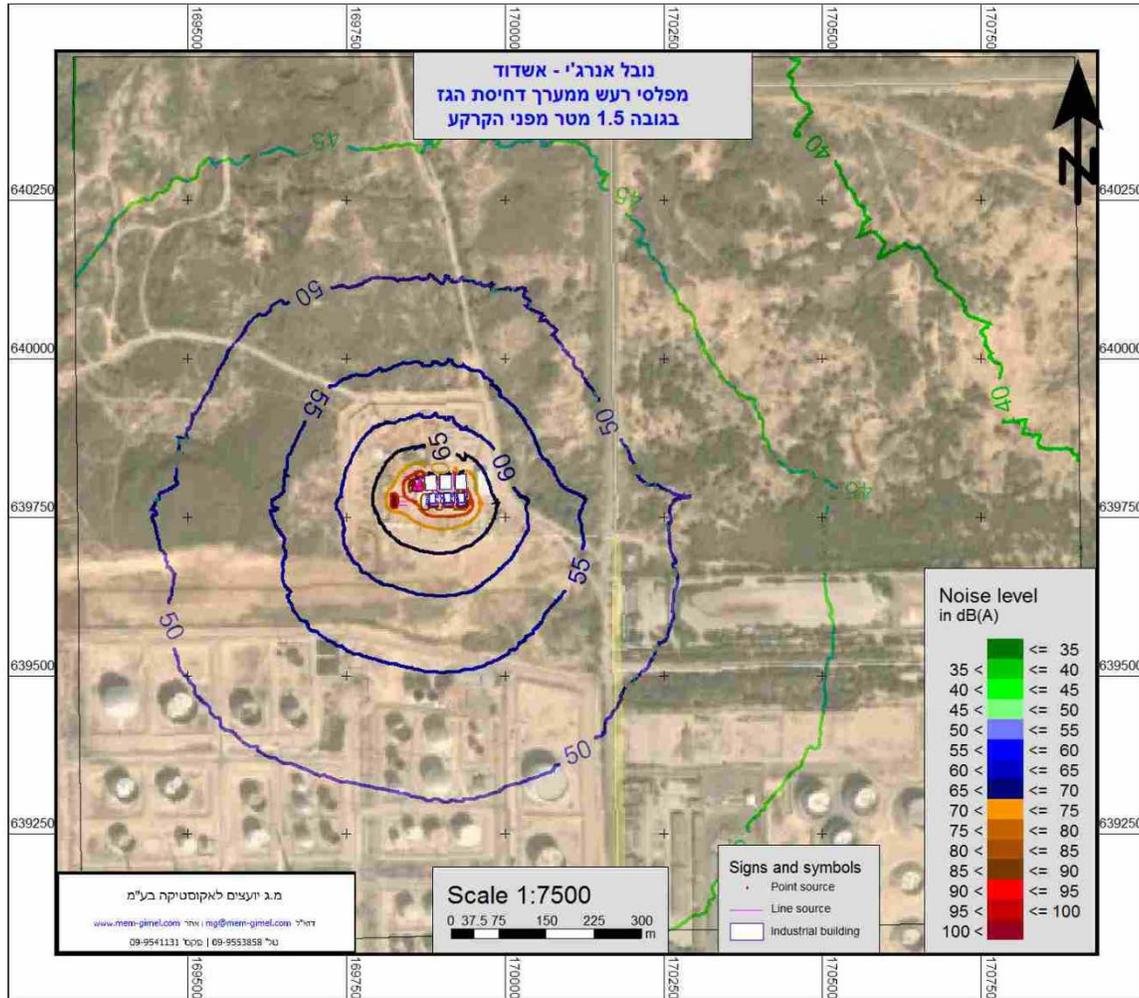
מפלסי הרעש החזויים אינם עשויים לגרום כל נזק לשמיעה. במשרדים שחלונותיהם נמצאים בכיוון של מערך דחיסת הגז, לא ייגרם כל מטרד כאשר החלונות סגורים.



## מחוץ לגבולות המתקן

המתקן נמצא בתחום אזור התעשייה הצפוני של אשדוד.

על פי התקנות למניעת מפגעים (רעש בלתי סביר) התש"ן-1990, מותר מפלס רעש של 70 dB(A) בתוך מבנה ה' - "בניין המשמש למטרות תעשייה, מסחר או מלאכה באזור שהמקרקעין בו משמשים למטרות תעשייה, מסחר או מלאכה".



תרשים 3-4: מפלסי הרעש החזויים ממערך דחיסת הגז מחוץ לתחנת הקבלה

### 4.3.4 סיכום השפעות הרעש החזוי מתחנת הקבלה

א. מפלסי הרעש מהציוד המתוכנן במערך דחיסת הגז יהיו בתחום של 79-92 dB(A) במרחק 1 מ' מהמתקנים השונים.  
לאחר הפעלת המתקן יש לפעול על פי תקנות הבטיחות בעבודה (גיהות תעסוקתית ובריאות העובדים ברעש) התשמ"ד-1984.

- ב. מחוץ למבני המשרדים מפלסי הרעש יהיו  $61-65 \text{ dB(A)}$ . רמות רעש אלה אינן מהוות סכנה לשמיעה. עבודה במשרד כאשר החלונות סגורים תמנע מטרד.
- ג. בגבולות המתקן, מפלסי הרעש הן מהציווד הקיים והן ממערך דחיסת הגז, יהיו  $60-64 \text{ dB(A)}$  ולא יהוו סכנה לשמיעה.
- ד. **מפלס הרעש המרבי המותר בתוך מבני תעשייה הוא  $70 \text{ dB(A)}$ , לפי התקנות למניעת מפגעים. מפלסי הרעש הצפויים מחוץ לגבולות תחנת הקבלה יהיו נמוכים משמעותית ממפלס זה.**